CHAPTER 1

MAKING THE TRANSITION TO STABILITY

Financial stability risks are in transition. Although prospects for U.S. growth are solidifying, market and liquidity risks have risen. Expectations of reduced monetary accommodation in the United States may cause further global market adjustments and expose areas of financial excess and systemic vulnerability. Emerging markets face tighter financial conditions as they cope with weaker economic outlooks and rising domestic vulnerabilities. In the euro area, further progress has been made toward banking union, but the outlook remains clouded by the unfinished business of restoring bank health and credit transmission and reducing the corporate debt overhang. Japan's bold policies hold hope for reinvigorating growth and ending corrosive debt deflation dynamics, but implementation challenges are large and halfway policies would pose serious downside risks.

Prepared by Peter Dattels and Matthew Jones (team leaders), Sergei Antoshin, Yingyuan Chen, Julian Chow, Nehad Chowdhury, Reinout De Bock, Martin Edmonds, Xiangming Fang, Sanjay Hazarika, Anna Ilyina, William Kerry, Koralai Kirabaeva, Rebecca McCaughrin, André Meier, Paul Mills, Nada Oulidi, Evan Papageorgiou, Vladimir Pillonca, Jean Portier, Jaume Puig, Narayan Suryakumar, and Chris Walker.

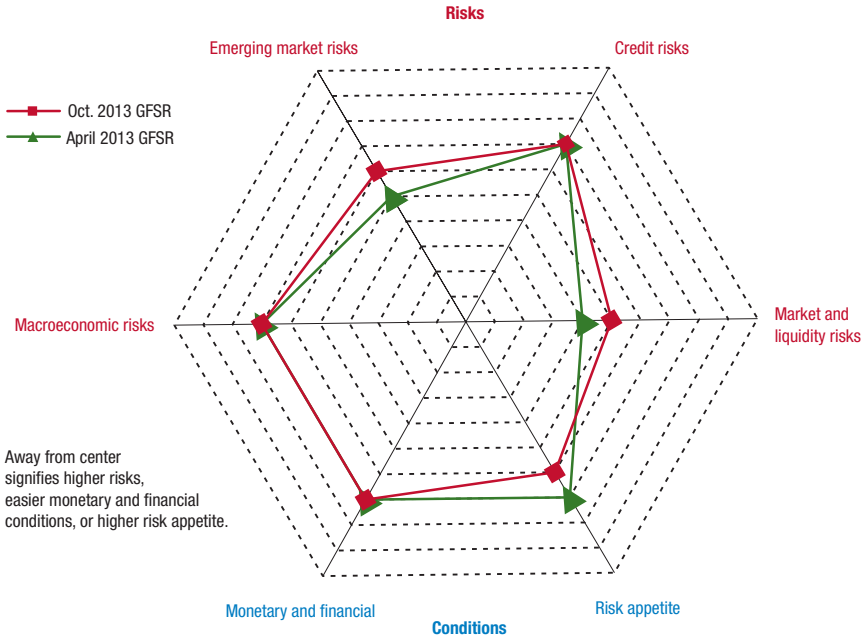
Financial Stability Overview

The Global Financial Stability Map indicates that risks are in transition (Figures 1.1 and 1.2).

Macroeconomic risks remain unchanged overall, with global activity expected to strengthen moderately, though with forecast risks remaining to the downside, as discussed in the October 2013 *World Economic Outlook* (WEO). European recovery has been tepid, and growth in an increasing number of emerging market economies is slowing. At the same time, the U.S. recovery is gaining ground, which is positive for global growth, but is also leading markets to price in an earlier tightening of U.S. financial conditions. Thus, the process of normalization of global asset allocations has begun, pushing up interest rates and risk premiums as markets shift away from a regime of suppressed market volatility and very favorable liquidity conditions. These changes are creating a host of new challenges for financial stability, leading to higher *market and liquidity risks*.

Developments since late May 2013 have brought about a "mini stress test" in the form of a global volatility shock, uncovering some important channels of potential financial

Figure 1.1. Global Financial Stability Map

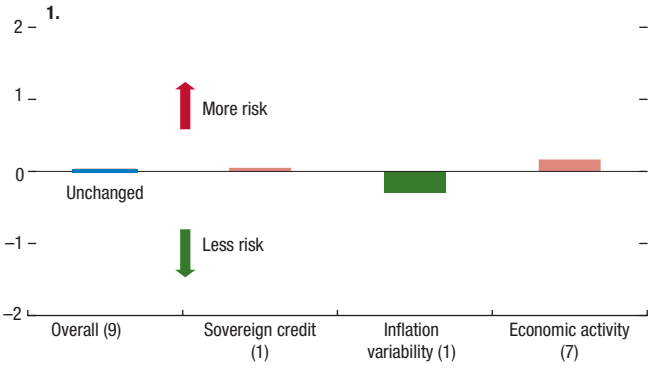


Source: IMF staff estimates.

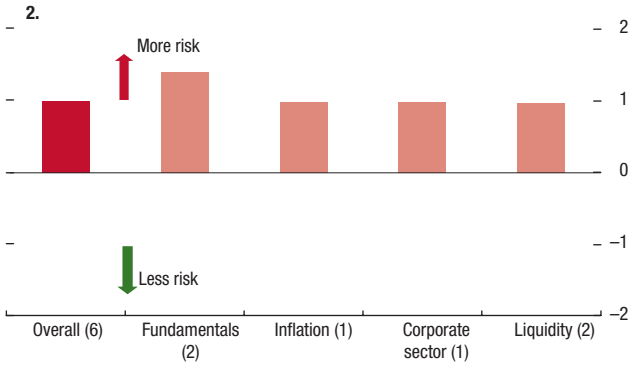
Figure 1.2. Global Financial Stability Map: Assessment of Risks and Conditions

(Notch changes since the April 2013 GFSR)

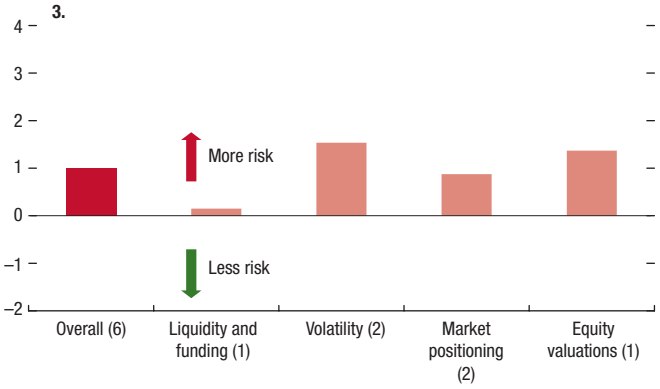
Macroeconomic risks remain unchanged, but global activity has become more uneven and is projected to expand only modestly in 2014.



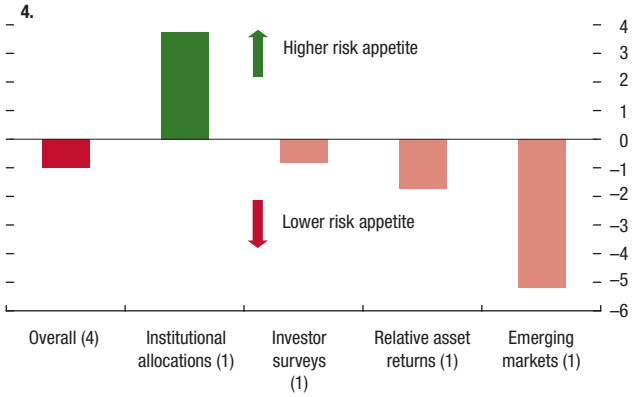
Emerging market risks have increased as the result of weaker growth prospects and rising domestic and external vulnerabilities.



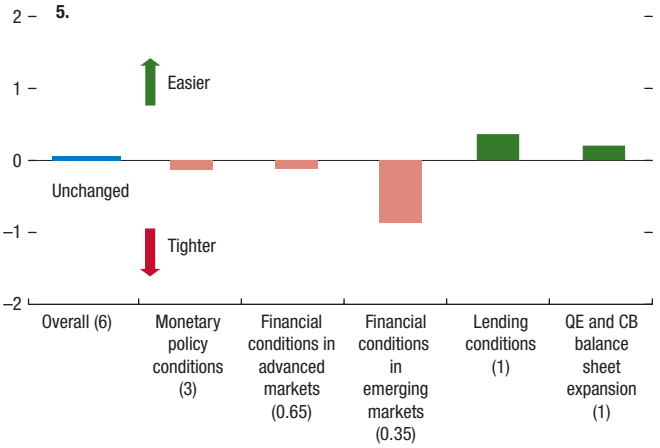
Market and liquidity risks have increased as markets adjust to prospects of reduced monetary accommodation with implications for asset prices.



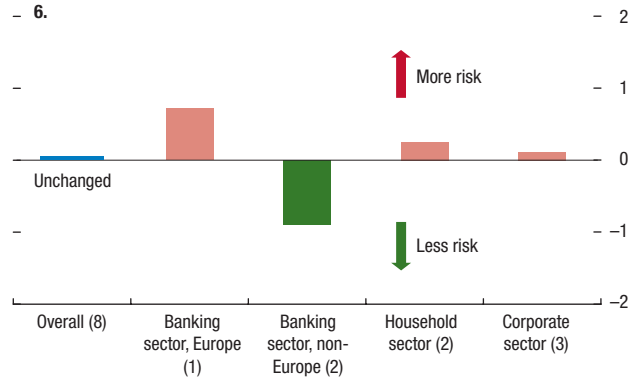
Risk appetite has contracted, resulting in reversals of capital flows to emerging markets.



Monetary and financial conditions remain broadly accommodative, as lending conditions have improved, but emerging market risk premiums have risen.



Credit risks are broadly unchanged, reflecting the uneven progress in balance sheet repair and pressures on euro area banks.

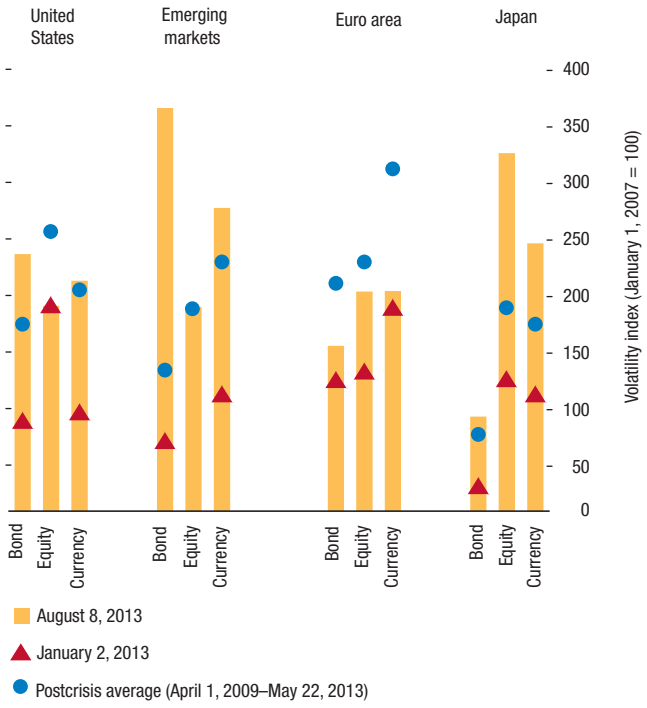


Source: IMF staff estimates.

Note: Changes in risks and conditions are based on a range of indicators, complemented with IMF staff estimates (see Annex 1.1 in the April 2010 GFSR 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 next to each legend 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.

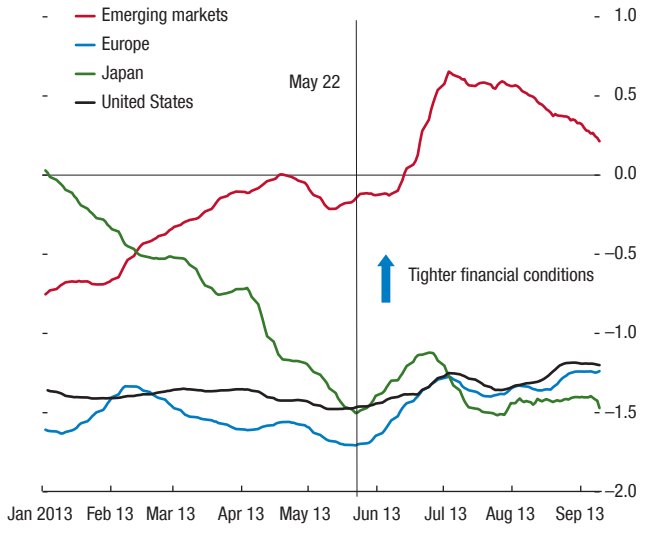
fragility. A substantial increase in volatility occurred, especially through the interest rate channel, as monetary policy expectations reset and strongly affected emerging markets (Figure 1.3). Market conditions have subsequently calmed, but transition challenges remain. At the time of writing, a political standoff in the United States has led to a shutdown of its federal government. The analysis in this report assumes that the shutdown is short, discretionary public spending is approved and executed as assumed in the forecast, and the debt ceiling—which may be reached by mid-October—is raised promptly. There is uncertainty on all three accounts. While the damage to the U.S. economy from a short shutdown is likely to be limited, a longer shutdown could be quite harmful. And, even more importantly, a failure to promptly raise the debt ceiling, leading to a U.S. selective default, could seriously damage the global economy and financial system. Although *monetary and financial conditions* overall remain accommodative, risk premiums in emerging markets have risen, tightening financial conditions in those markets (Figure 1.4). Against this backdrop, *emerging market risks* have increased because of weaker growth prospects coupled with less accommodative external conditions and more worries about domestic and external vulnerabilities. *Risk appetite* has fallen, resulting in some outflows from emerging market funds.

Figure 1.3. Market Volatility Shock
(Index)



Sources: Bloomberg, L.P.; and IMF staff estimates.
Note: The historical volatilities are computed using a rolling 60-day standard deviation of index returns, which are then indexed with January 1, 2007, as the reference point.

Figure 1.4. Global Financial Conditions
(Index; normalized, two-week moving averages)



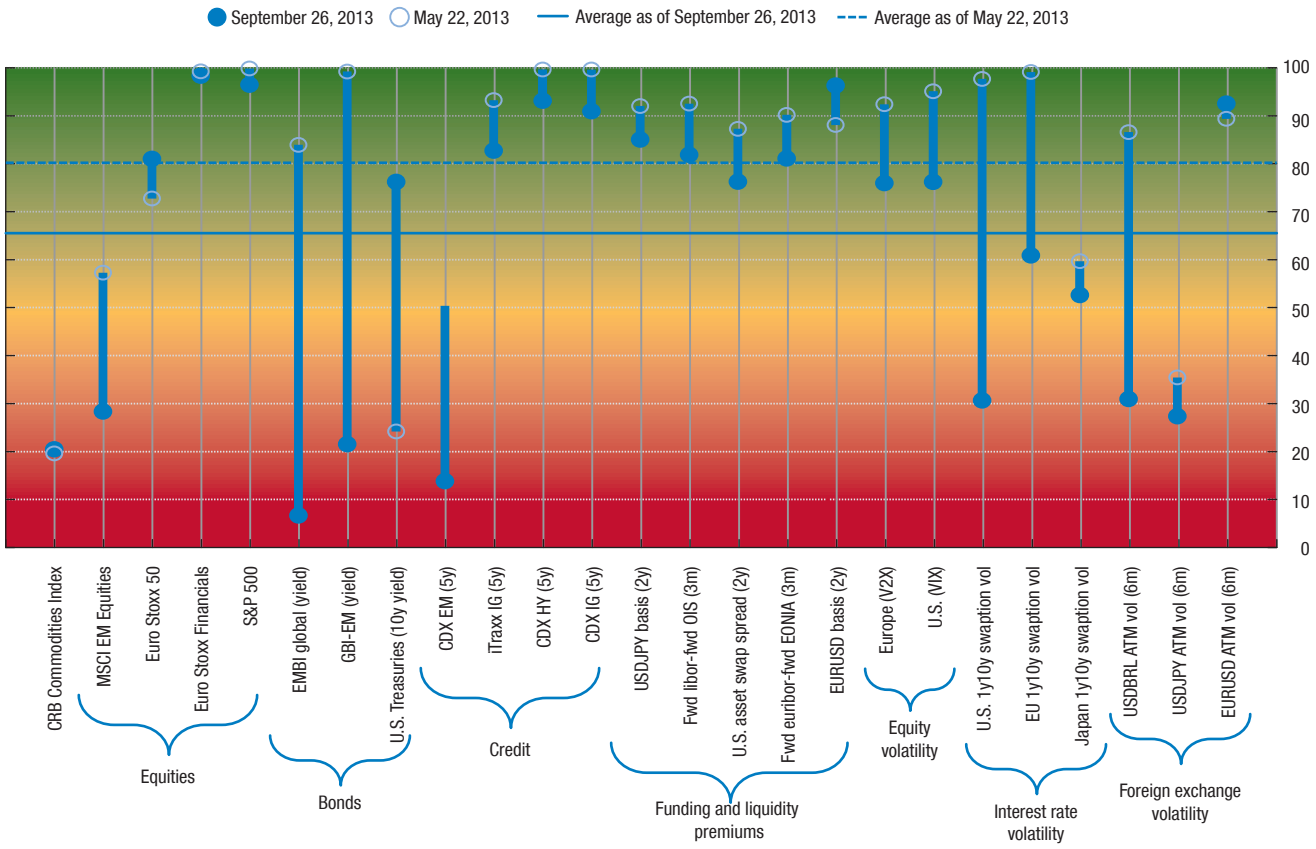
Source: Goldman Sachs Financial Conditions Index.

Credit risks remain broadly unchanged, reflecting insufficient balance sheet repair and slow progress in addressing the lingering risks that materialized as a result of the crisis. The subdued outlook in Europe and challenges in bank asset quality and capital continue to keep credit risks elevated, and this has been compounded by the problems posed by debt-burdened companies, further undermining the prospects of a recovery.

This chapter examines prospects for and risks to global financial stability. The next section asks whether the prospect of tighter financial conditions in the United States will result in a smooth normalization of financial markets and portfolio allocations, or whether markets will become turbulent and financial stability risks will arise. How will emerging markets be affected by changes in advanced economy monetary policies and asset allocations? Do domestic risks in emerging markets themselves pose a threat? Will Japan's bold policies be successful, and what are the downside risks if policy commitments are not met?

The task of addressing legacy risks from the global financial crisis remains unfinished. The third section assesses these risks by focusing on the remaining challenges in the euro area. The analysis suggests that addressing the debt overhang in the nonfinancial corporate sector is critical. If it is not addressed, bank health cannot be restored and the sovereign-banking-corporate nexus will remain unbroken. The fourth section examines developments in systemically important banks and the progress they have made in

Figure 1.5. Market Dashboard
(Percentiles over the past three years)



Sources: Bloomberg, L.P.; and IMF staff estimates.
Note: Each marker corresponds to the percentile of the level of the asset in relation to its three-year history of levels. Fifty corresponds to the median during the period, zero corresponds to the level consistent with the highest risk aversion during the period, and 100 corresponds to the level consistent with the lowest risk aversion during the period. 10y = 10 years; 5y = 5 years; 2y = 2 years; 6m = 6 months; V2X = Dow Jones EURO STOXX 50 Volatility Index; VIX = Chicago Board Options Exchange Market Volatility Index; EM = emerging market; OIS = overnight index swap.

strengthening their balance sheets. The fifth section tackles key policies that can safeguard financial stability.

Challenges Related to Accommodative Monetary Policies Will Test Markets and Policymakers

Before the market correction that began in May 2013, prices of many assets had risen to multi-year highs, underpinned by three key expectations. First, quantitative easing in the United States was expected to be protracted. Second, U.S. economic prospects were expected to catch up to the buoyancy in markets. Third, low yields were expected to persist alongside low volatility and rising asset prices. Starting in May, markets were rattled by shifts in the perceived regime (Figure 1.5). The Federal Reserve signaled that improvements in the U.S. economy could prompt a tapering of its asset purchase program before the end of the year. Emerging markets faced sustained capital outflows for the first time since the Lehman Brothers collapse in September 2008, while evidence of slowing growth mounted. Markets came to question both the upside and the downside risks of Japan's bold set of quantitative and qualitative monetary easing policies, reflected in rising market volatility observed in April and May 2013. Against this backdrop, this section explores the transition challenges from an end to accommodative monetary policies and describes how markets and policymakers could be tested.

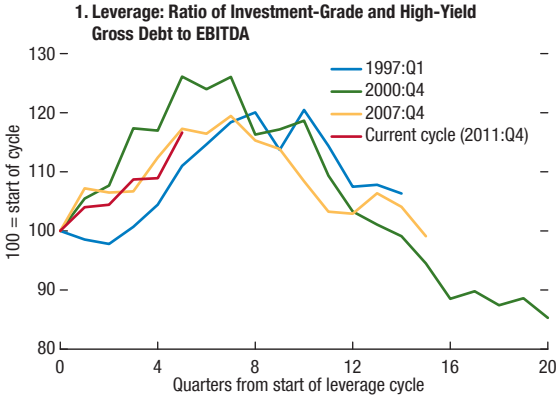
The United States: Uncertainties in Making the Transition to a New Regime

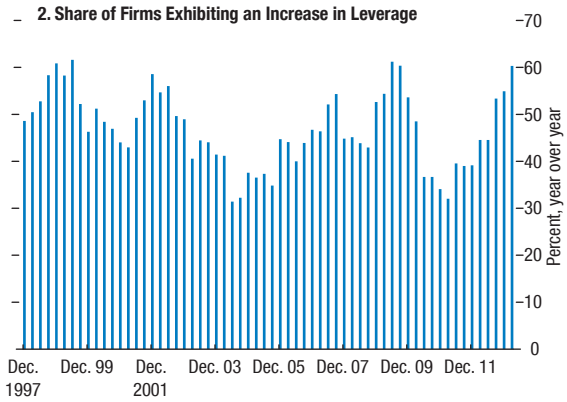
Stronger growth in the United States is setting the stage for a start toward monetary normalization. From a financial stability standpoint, such a transition should help limit risks associated with a prolonged period of low interest rates. Yet managing a smooth transition could prove challenging, with a key risk being the potential for long-term interest rates to overshoot. A

Figure 1.6. U.S. Nonfinancial Firms' Credit Fundamentals

Leverage has risen meaningfully as debt levels have grown and EBITDA gains have slowed.

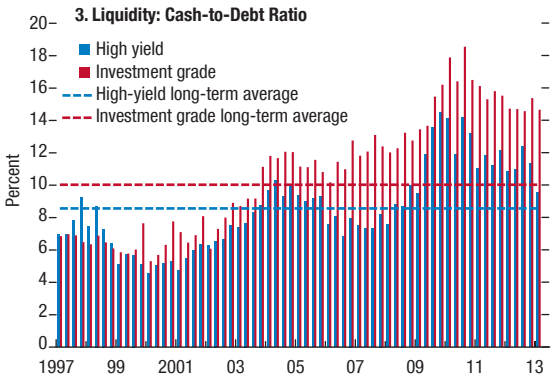
The trend has been broad based, with leverage rising among both low- and high-quality credit.

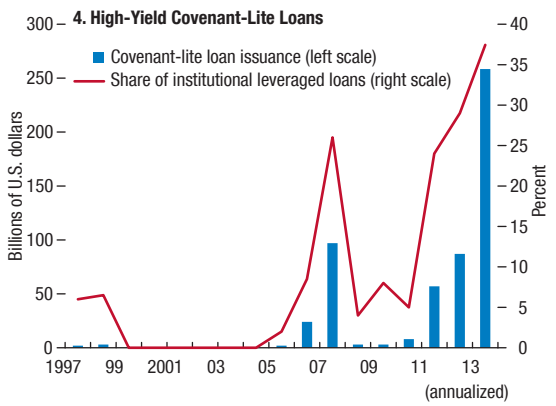




Liquidity conditions are deteriorating...

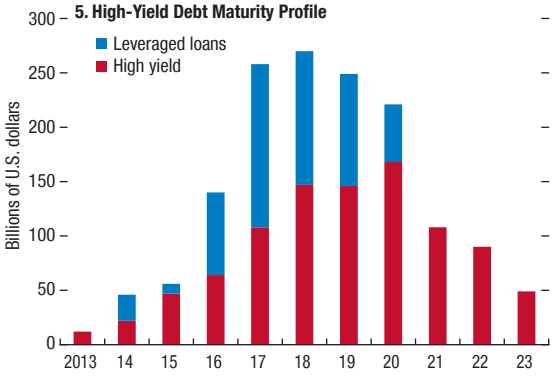
…while underwriting standards continue to weaken.

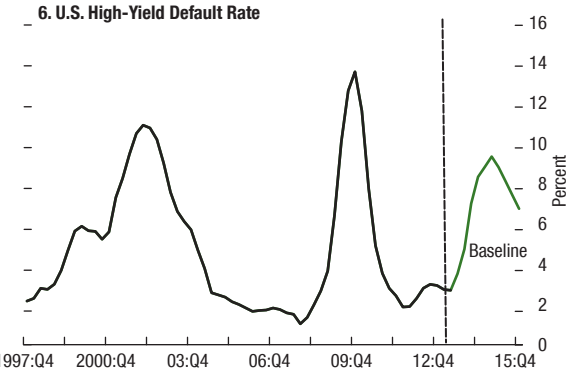




Refinancing risk is not an immediate concern because of low rates and liability management…

…but defaults are still on track to rise owing to past excesses and a turn in the credit cycle.





Sources: Deutsche Bank; Federal Reserve; Moody's; Morgan Stanley; S&P Leveraged Commentary and Data; Thomson Reuters; and IMF staff estimates.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization.

decline in structural market liquidity, coupled with leveraged funding and mortgage structures, could amplify market movements and lead to systemic financial strains in the United States and across the globe.

The Federal Reserve has indicated that if the economic recovery continues as expected, it would be appropriate to begin scaling back its asset purchase program as a first step toward phasing out monetary stimulus.[1] Gradually making the transition to a higher interest rate regime should be positive for financial stability, because risks associated with low rates and the accumulation of financial excesses will be curtailed. This is especially critical given that some of these risks have continued to build, including the deterioration in corporate credit conditions (Figure 1.6), yield-seeking behavior among pension funds and insurers (see the April 2013 GFSR), and an extension in portfolio duration.[2]

Ideally, the normalization of interest rates and volatility would be orderly and unfold as follows: short-term interest rate expectations rise along a smooth, gentle path, consistent with current market expectations; the term premium compression unwinds gradually; the portfolio adjustment response occurs smoothly, and credit valuations reprice modestly; pockets of balance sheet leverage are unwound at a gradual pace, with limited knock-on effects; market liquidity is sufficient to accommodate these adjustments; and all of these developments occur in the context of an economy gathering strength. The current WEO projections assume that the latest tightening in financial conditions was largely a one-time event and that the actual tapering of purchases will further tighten conditions only modestly.

But a less-benign scenario is a distinct risk. The failure of any one or all of the elements outlined here could lead to a more abrupt, sustained move in long-term interest rates and excess market volatility as prior accommodation is reversed (IMF, 2013c). The shift in short-term interest rate expectations and term premiums could be sharper and the cycle more frontloaded, leading to a rapid tightening in financial conditions and increased portfolio losses, potentially aggravated by reduced market liquidity and forced asset sales (particularly where leverage and maturity mismatches are sizable), with spillover implications for broader global financial conditions.[3] These developments could lead to a bumpier transition and strain financial stability.

Table 1.1. Market-Implied Interest Rate Pricing versus Historical Cycles

Start of Federal Reserve Rate Hiking Cycle	Cycle Length (months)	Total Hikes (basis points)	Total Hike in First Year (basis points)	Average Hike per Month (basis points)
Jul-1958	19	342	246	18
Jan-1962	59	425	150	7
Jun-1967	27	625	200	23
Dec-1971	31	1,031	250	33
Dec-1976	49	1,783	236	36
Apr-1983	17	288	188	17
Dec-1986	30	394	94	13
Jan-1994	14	300	250	21
Mar-2004	28	425	175	15
Median	**28**	**425**	**200**	**18**
Mar-2015	49	381	73	6

Sources: Bloomberg, L.P.; Deutsche Bank; and IMF staff estimates.
Note: March 2015 figures are projections.

Containing long-term rates and market volatility will be a key challenge.

Following the turbulence in May and June 2013, financial markets shifted forward their expectations about the start of the tightening cycle in response to an anticipated scaling back in Federal Reserve asset purchases. Then at its September meeting, the Federal Reserve surprised markets by deciding to delay the start of its tapering process. Nevertheless, interest rate futures markets are still pricing in only a very gradual, modest tightening relative to the historical trend (Table 1.1). Although the actual path could ultimately prove to be sharper and swifter, the Federal Reserve has a number of tools to guide short-term rates.

In contrast, controlling long-term rates is more difficult. Various factors influence term premiums and long-term rates that are collectively more difficult for central banks to contain. To assess the potential trajectory of long-term rates, a term premium model is estimated based on changes in macroeconomic fundamentals, macroeconomic volatility, financial market volatility, market expectations about the future interest rate path, and the size and persistence of the Federal Reserve's asset purchase program.

[1]The Federal Reserve surprised markets in mid-September by voting not to scale back asset purchases at that time, but suggested that if the economy continued to recover as it expected, it would, at subsequent meetings, assess incoming information to determine when to moderate the pace of asset purchases. See IMF U.S. Article IV Consultation Report (IMF, 2013c).

[2]Both high-yield and investment-grade firms continue to relever as debt levels have risen and earnings growth has slowed. The leverage distribution has worsened, suggesting that the cycle is moving toward a later, less-healthy stage. Meanwhile, free cash flow and overall cash balances are diminishing, issuance quality has deteriorated, there is a more persistent willingness to accept weaker covenants, and credit conditions have weakened further.

[3]Box 1.1 in the October 2013 WEO finds that the external consequences of an eventual tightening of U.S. monetary policy are more damaging the faster the pace of the adjustment and the weaker the external policy framework.

The model reveals a substantial and statistically significant effect of quantitative easing policies on long-term rates. The decline in the term premium accounts for roughly half of the compression in 10-year nominal Treasury bond yields since late 2008, when quantitative easing policies were first announced. Decomposing the term premium further into its individual components shows that market expectations about the Federal Reserve's balance sheet (for example, the various asset purchase announcements and forward guidance), the reduction in market volatility, and lower interest rate uncertainty account for almost the entire decline in the term premium (Figure 1.7).[4]

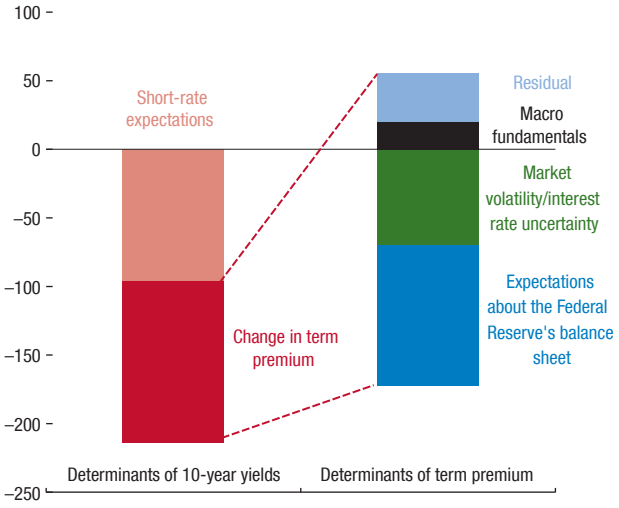
Future shocks to market volatility and uncertainty about asset purchases and forward guidance could have a pronounced impact on the term premium and thus on long-term rates. Figure 1.8 presents two simulation exercises based on different assumptions about volatility and the Federal Reserve's balance sheet evolution (IMF, 2013d):

- The *baseline scenario* assumes a return to trend in financial market volatility from depressed levels and an exit process that is consistent with current Federal Reserve guidance. Under this scenario, the compression in term premiums gradually eases and returns to its precrisis level by 2020.
- The *adverse scenario* reflects the effects of increased bond market volatility and market expectations that could result from a sharper, frontloaded tapering of quantitative easing. This scenario results in a similarly sized adjustment (100 basis points) in long-term rates as the baseline case, but the adjustment is abrupt.

The rise in long-term rates that took place during the May-June episode mostly reflected an increase in term premiums rather than short-rate expectations. That trajectory (represented by the blue dot in Figure 1.8) so far lies above the baseline scenario, but overall term premiums are still at extraordinarily low levels. If the adverse scenario materializes, the Federal Reserve would likely seek to temper such a shock through communication and by fine-tuning policies (for example, adjusting its asset purchase schedule), but its effectiveness may be limited by persistent financial stability risks and difficulty in offsetting sudden, large portfolio shifts and managing volatility shocks. Although long-term rates under the adverse scenario eventually converge with rates under the baseline scenario, the frontloaded nature of the shock would have pervasive effects on financial markets.

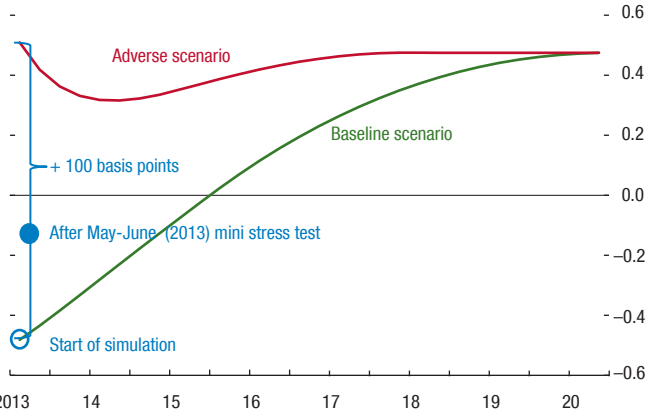
[4]To capture variations in the market's expectation of the size and persistence of the asset purchase program, a measure is constructed following Chung and others (2011). In particular, the measure estimates a present discounted value of the current and expected future securities holdings in excess of its historical normal level as a ratio to potential GDP.

Figure 1.7. Decomposition of Term Premium: Change from September 2008 to March 2013
(Basis points)



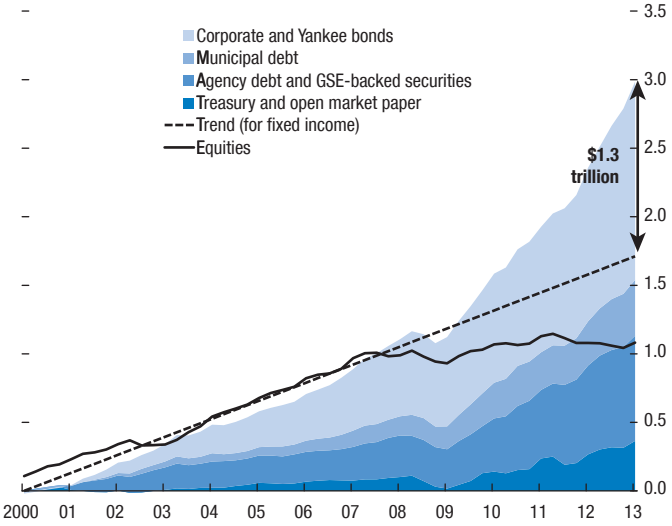
Sources: Bloomberg, L.P.; and IMF staff estimates.

Figure 1.8. Simulated Shock to 10-Year Treasury Term Premium
(Percentage points)



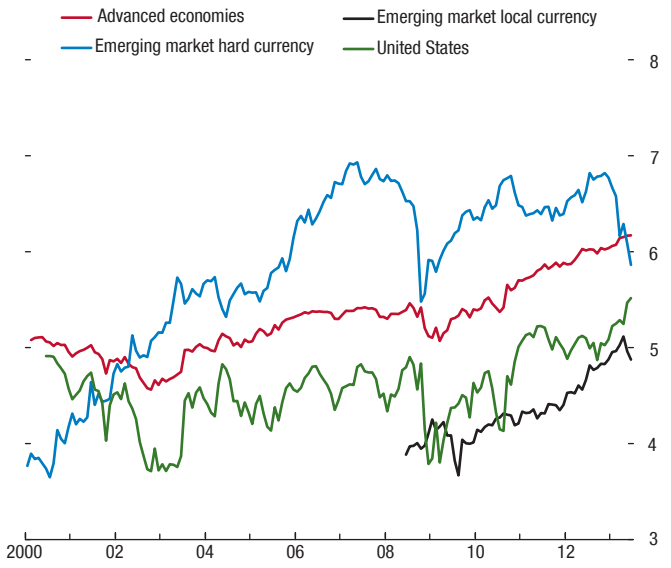
Sources: Bloomberg, L.P.; and IMF staff estimates.

Figure 1.9. U.S. Mutual Fund Cumulative Flows
(Trillions of U.S. dollars)



Sources: Federal Reserve; and IMF staff estimates.
Note: GSE = government-sponsored enterprise.

Figure 1.10. Global Bond Portfolio Duration
(Benchmarks; years)



Sources: Barclays Capital; and IMF staff estimates.

Overextended fixed-income allocations and duration risk are likely to magnify losses.

To illustrate how such a shock would affect financial markets, an instantaneous hike of the same magnitude is applied to major bond portfolios. Recall that as part of the yield-seeking behavior under quantitative easing, there was a broad-based shift into fixed-income assets and an extension in portfolio duration well above the historical norm (Figures 1.9 and 1.10). This increase in duration significantly raises the sensitivity of portfolios to rising interest rates: a 100 basis point increase in interest rates from current levels generates higher aggregate losses on global bond portfolios (5.6 percent or $2.3 trillion) than a similarly sized increase has generated on prevailing portfolios during previous historical tightening episodes (Table 1.2).[5] This is the case for global, U.S., and emerging market bond portfolios. Of course, the impact of such losses depends on the nature of the underlying shock, distribution, time frame, and other conditions. A normalization in response to improved economic conditions and broadly distributed losses would likely be more easily absorbed, whereas losses concentrated in entities with large unhedged positions or asset-liability mismatches would increase instability.

Structural reductions in market liquidity could amplify these effects, leading to an overshooting of interest rates.

It is important to stress that a more probable outcome would be a smooth portfolio rebalancing out of longer-duration, fixed-income assets on the back of a gradual rise in interest rates and repricing of credit risk. However, overshooting may occur as a result of any number of unanticipated events. For instance, some fund managers may seek to adjust portfolios ahead of future monetary policy tightening to avoid crystallizing losses, thereby exacerbating market volatility.

Recent changes in structural market liquidity could also magnify an increase in long-term rates as financial conditions normalize.[6] Securities dealers' inventories of fixed-income instruments have declined since 2007

[5]For instance, during the last three tightening episodes in 1994–95, 1999–2000, and 2004–06, an instantaneous 100 basis point increase would have resulted in an average 4.8 percent loss on U.S. bond portfolios prevailing at the time.

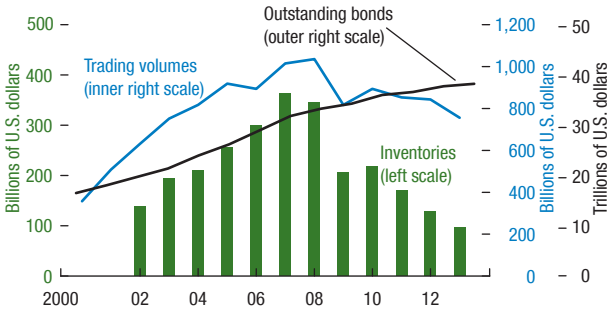
[6]Liquidity risk premiums—defined as the ability to trade in large size without having a significant impact on market prices—are not directly captured in this term premium model.

Table 1.2. Bond Portfolio Interest Rate Sensitivities

	Global Bond Aggregate	U.S. Bond Aggregate	Emerging Market Hard Currency	Emerging Market Local Currency[1]
Duration (years)				
Average for Last Three Tightening Cycles[2]	5.0	4.8	4.0	. . .
July 2013	6.2	5.5	5.9	4.9
Total Market Value (billions of U.S. dollars)				
Average for Last Three Tightening Cycles[2]	13,319	5,833	209	. . .
July 2013	41,541	16,065	1,225	1,634
Impact from 100 Basis Point Increase (billions of U.S. dollars)				
Average for Last Three Tightening Cycles[2]	–664	–281	3	. . .
July 2013	–2,325	–876	–68	–76
Impact from 100 Basis Point Increase (percent)				
Average for Last Three Tightening Cycles[2]	–4.9	–4.8	3.2	. . .
July 2013	–5.6	–5.5	–5.5	–4.6

Sources: Barclays Capital; Bloomberg, L.P.; and IMF staff estimates.
[1]Data are unavailable before July 2008.
[2]Cycles include 1994–95, 1999–2000, and 2004–06.

Figure 1.11. Nongovernment Bond Inventories, Total Trading Volumes, and Outstanding Bonds



Sources: Federal Reserve; Securities Industry and Financial Markets Association; and IMF staff estimates.
Note: Average daily volumes include municipal securities, treasuries, agencies, asset- and mortgage-backed securities, corporate debt, and federal agency securities.

owing to efforts to reduce market leverage and to a shift in funding and trading models. The decline has been accompanied by lower trading volumes even though the outstanding stock of fixed-income tradable instruments has expanded (Figure 1.11). Leaner inventories and tight nongovernment repo financing has led securities dealers to migrate toward more frequently traded issues, resulting in a bifurcation between large, more recently issued bonds and smaller, seasoned credits. Other changes since the crisis have also affected market liquidity, including shifts in the investor base (for example, a shift from more active, leveraged investors to unleveraged, buy-and-hold investors), risk appetite, and trading behavior.[7] Although the postcrisis system has yet to be tested, this shift potentially reduces dealers' ability to act as shock absorbers during market stress.[8] In a higher-volatility environment, inventories are likely to be even lower and the willingness to make markets and intermediate liquidity more pronounced as dealers adjust their value-at-risk frameworks.

Higher interest rates may also reveal weak links in the shadow banking system, exacerbating liquidity and market strains.

Repo and other forms of short-term wholesale funding markets in the United States have been a potential source of systemic stress ever since the crisis.[9] A deep, well-functioning repo market is critical to ensuring sufficient market liquidity in the underlying collateral because repo is the primary market used by market participants for financing positions.

Some progress has been made in reducing financial stability risks surrounding repo markets.[10] In particular, the Financial Stability Board has made policy recommendations to mitigate the risk of fire sales of collateral securities by limiting the buildup of excessive leverage and reducing procyclicality. These recommendations include minimum haircuts, regulation of cash collateral reinvestment, requirements on rehypothecation, and the introduction of central counterparties (which also helps to mitigate contagion effects arising from over-the-counter derivatives markets) (FSB, 2013). Shadow banking liabilities have continued to decline, repo concentration risks have eased, collateral

[7]See Box 2.6 in the October 2012 GFSR.
[8]Some nonbank entities have emerged as agents using their own portfolios to match buyers and sellers, but this has not been sufficient to fill in the gaps left by retrenching broker-dealer intermediation capacity.
[9]See Begalle and others (2013) and Dudley (2013). See Chapter 3 of this report for a discussion of recent changes in bank funding structures.
[10]These efforts include a reduction in excessive reliance on intraday credit, improvement in risk management policies, bolstered capital and liquidity buffers for large banks, diversified funding sources for large financial institutions, and strengthened liquidity requirements and concentration limits for money market mutual funds.

quality has improved, and the volume of intraday credit has decreased.

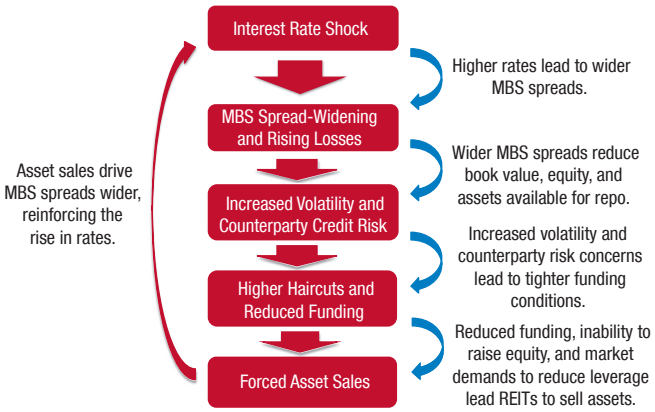
However, short-term secured funding markets are still exposed to potential runs that a rising-rate, higher-volatility environment may reveal, owing to the following vulnerabilities:

- *Asset fire sales:* Fire sales may result either from a borrower default that leads to a liquidation of collateral in a volatile market or in response to preemptive asset sales triggered by the mere risk of default.
- *Flight-prone investor base:* Lenders may cease rolling over repo funding with limited notice.[11]
- *Contagion risks:* Forced liquidations or the inability to unwind illiquid assets could lead to greater pressure on other traditionally more liquid securities and market participants.

Entities in the shadow banking system that use repo markets as a source of funding for longer-term, less-liquid assets are vulnerable to these risks. One example of such entities is mortgage real estate investment trusts (mREITs). Although their sheer size does not signal systemic importance as a sector (assets total about $500 billion), mREITs have grown significantly in recent years and now have a more important role in mortgage-backed security (MBS) markets (see Box 1.1). Furthermore, the mREIT business model layers on other risks that could amplify market dislocations in a rising-rate environment. Specifically, mREITs are leveraged, exposed to volatility shocks (as a result of the prepayment option embedded in their MBS holdings), and highly dependent on short-term repo funding to finance their long-term assets. The combination of these risks increases their vulnerability to a fire sale event (Figure 1.12) in which higher interest rates pressure mortgage rates and MBS spreads to widen and volatility to increase, leading repo lenders to raise margins or reduce funding. This in turn induces mREITs to unwind their holdings in a declining market, thereby triggering a more disorderly adjustment in MBS valuations and exacerbating broader market discontinuities as MBS investors rebalance the hedges they use to manage the interest rate exposure of their portfolios.

A version of this scenario played out during the market correction in May-June 2013. Many mREITs were forced

Figure 1.12. Fire Sale "Risk Spiral"



Source: IMF staff estimates.
Note: MBS = mortgage-backed security; REIT = real estate investment trust.

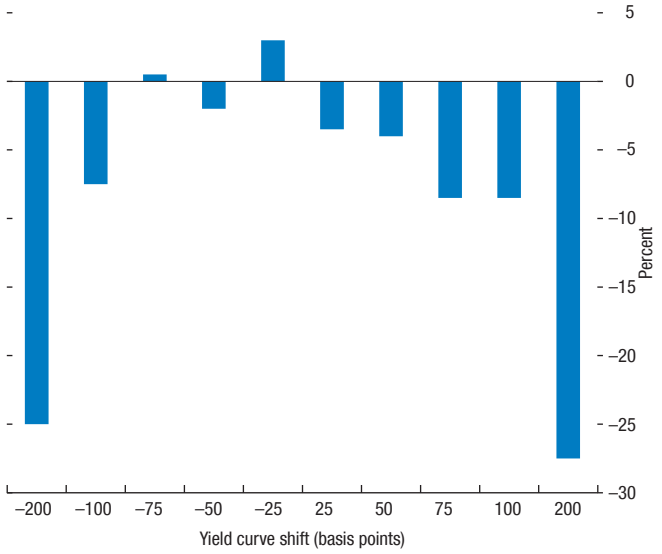
to sell MBSs because higher rates and wider MBS spreads were leading to declining portfolio values, reduced equity cushions, and higher margins. To sustain the level of borrowing relative to their net worth, the largest mREITs unwound $30 billion of MBS over the course of a single week. To put that figure into context, a daily liquidation of more than $4 billion by any MBS investor under *normal* market conditions adversely affects MBS prices (Begalle and others, 2013). These large sales weighed on overall MBS valuations and fueled an increase in primary mortgage rates. Further interest rate increases could lead to a more destabilizing unwinding of positions (Figure 1.13), with higher leverage magnifying losses (Figure 1.14). An instantaneous interest rate shock of 50 basis points or more would lead to portfolio value declines among the top mREITs large enough to generate at least temporary dislocations in the MBS market.[12]

Such a scenario of rapid mREIT deleveraging has important spillover implications. Consistent selling pressure could negatively affect MBS valuations and thus weigh on the balance sheets of other MBS investors (for example, commercial banks, government-sponsored enterprises, the Federal Reserve). Sizable disruptions in secondary mortgage markets against a backdrop of rising mortgage rates could also have macroeconomic implications, jeopardizing the still-

[11]Money market mutual funds, for instance, are important cash providers in the repo market but have limited ability to deter or slow an exit by investors. Reforms made in 2010—as well as the U.S. Securities and Exchange Commission's proposal to require prime funds to adopt floating share prices or impose liquidity fees or restrictions on withdrawals—have significantly reduced the risk of investor flight. But the system has yet to be tested.

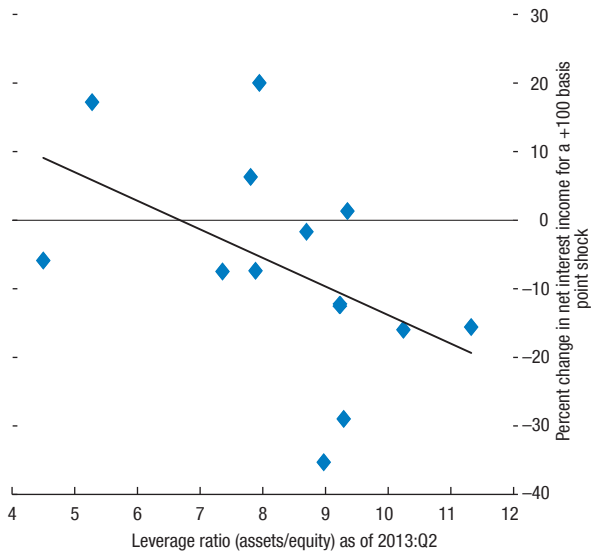
[12]This assumes that declines in mREIT portfolio values lead to forced asset sales of a similar size over a compressed time frame, owing to reduced funding availability, an inability to raise equity, and market pressure to reduce leverage, all of which further magnify valuation declines.

Figure 1.13. Estimated Average Change in Mortgage Real Estate Investment Trust Portfolio Value for Parallel Interest Rate Shifts



Sources: Company filings; and IMF staff estimates.
Note: Includes impact of interest rate hedges.

Figure 1.14. Leveraged Mortgage Real Estate Investment Trusts Are More Vulnerable to Interest Rate Increases



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

fragile housing recovery. For instance, rising mortgage rates and widening MBS spreads have already led to a significant pullback in mortgage refinancing activity.[13] Given the importance of MBS collateral in repo markets, a large enough shock to MBS valuations, combined with a weakening in risk sentiment, could also induce repo lenders to pull back funding or raise rates more broadly (or both), with negative consequences for other leveraged short-term borrowers.[14] Securities dealers are currently net borrowers using MBS repo (their borrowing exceeds their lending by about $185 billion), increasing the risk that repo lines would likely be cut fairly quickly to leveraged investors in the event of a deterioration in MBS valuations. Disruptions to secured funding markets that occurred during the global financial crisis, following the deterioration in credit quality of structured finance markets, are an apt reminder of the ripple effects. Granted, agency MBS markets are deeper, more liquid, and less risky, and mREIT balance sheets are too small to allow counterparty risks to substantially affect the underlying collateral credit risk for a protracted period. However, given that the repo funding of the two largest mREITs is comparable to Lehman Brothers' precrisis repo book, at the very least the mREITs point to a microcosm of fragilities in the shadow banking system that deserve closer monitoring.[15]

[13]The 115 basis point uptick in mortgage rates since May has been accompanied by a 52 percent decline in overall mortgage applications during the same period, mostly reflecting reduced refinancing activity.

[14]MBS collateral represents nearly 40 percent of repo-funded transactions.

Policymakers can take a number of actions to help ensure a smooth transition.

Achieving a smooth transition requires policies that manage the effects of increased volatility and destabilizing portfolio adjustments and that address structural liquidity weaknesses and systemic vulnerabilities in the shadow banking system. This is a major policy challenge that requires a number of actions, as outlined in the following.

- A clear and well-timed *communication strategy* by central bank officials is critical. Compared with previous tightening cycles, the authorities have a broader toolkit at their disposal and have made progress in developing a more refined communica-

[15]The two largest mREITs currently have repo liabilities of about $100 billion to $125 billion each (one-third of which is less than 30 days in maturity), as compared with Lehman's repo book of $150 billion in September 2008.

Box 1.1. Mortgage Real Estate Investment Trusts: Business Model Risks

This box discusses the main institutional weaknesses that expose mortgage real estate investment trusts to risk along a number of dimensions.

Real estate investment trusts (REITs) own, and in most cases operate, income-producing real estate. A subset of these companies, mortgage REITs (mREITs), are involved in lending money to owners of real estate and buying (mostly agency-backed) mortgage-backed securities (MBSs).[1] The mREITs engage in leveraged maturity transformation by relying on short-term repo funding—some of which is channeled indirectly from money market mutual funds via securities dealer intermediaries—to finance their long-term MBSs (Figure 1.1.1).

Although mREITs are not large holders of MBSs on a relative basis (Figure 1.1.2), they have grown in importance since the global financial crisis, and their business model layers on other risks that could amplify market dislocations:

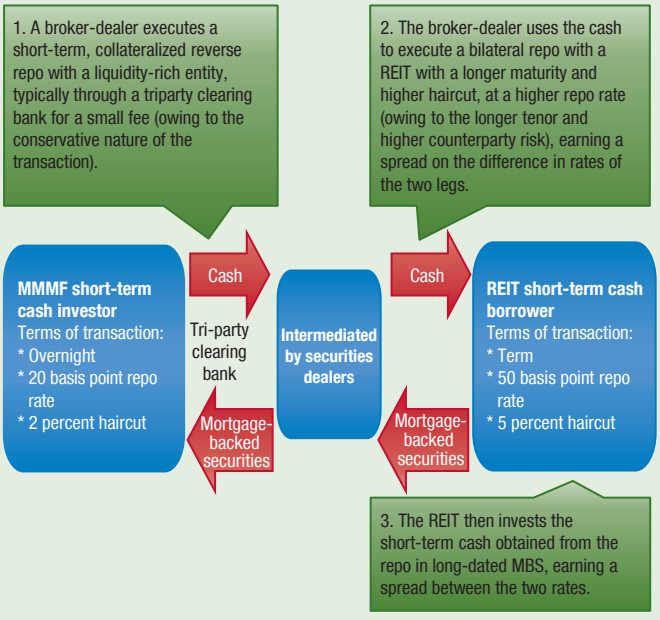
- *Funding and liquidity risk:* Although mREITs have always relied to a certain extent on short-term secured financing, that share mushroomed during the financial crisis when the cost advantage between the secured and unsecured market expanded and the availability of long-term financing dried up (Figure 1.1.3).
- *Refinancing and rollover risk:* Because debt maturities are short, considerable refinancing and rollover risks also arise. Unlike European banks—which when faced with a pullback in repo funding by U.S. money market funds in mid-2011 turned to cross-currency basis swap markets and European Central Bank long-term refinancing operations as a substitute—mREITs have limited funding alternatives. Furthermore, because the bulk of mREIT earnings are required to be paid out to investors, minimal cash flow can be retained for other purposes, resulting in slim liquidity buffers.[2]

This box was prepared by Rebecca McCaughrin.

[1]Agency mREITs represent roughly 85 percent of the REIT sector. Another smaller subset, credit REITs, typically securitize pools of loans and sell the senior tranche, while retaining the subordinate first-loss (credit) tranche.

[2]To maintain their advantageous tax status, REITs are required to pay a large share of their taxable income as dividends.

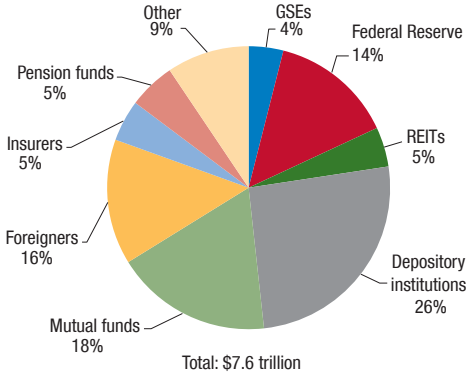
Figure 1.1.1. Example of the Real Estate Investment Trust Maturity Transformation Process



Sources: Company statements; Fitch Ratings; and IMF staff.
Note: MBS = mortgage-backed security; MMMF = money market mutual fund; REIT = real estate investment trust. Transaction terms relate to intermediating securities dealers.

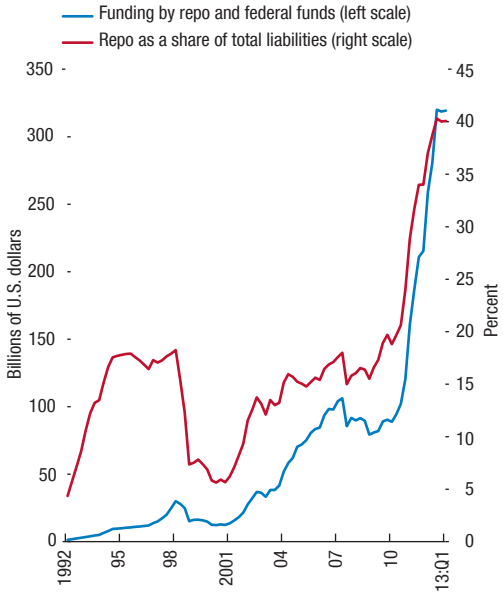
Box 1.1 *(continued)*

Figure 1.1.2. Holdings of Agency Mortgage-Backed Securities



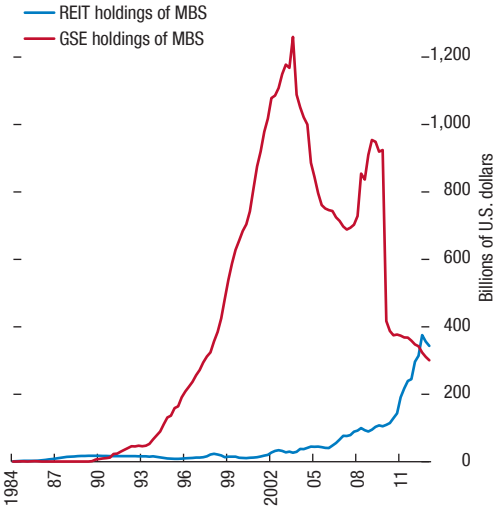
Sources: Federal Reserve; and IMF staff estimates.
Note: Total may differ from 100 percent due to rounding.
GSE = government-sponsored enterprise; REIT = real estate investment trust.

Figure 1.1.3. Real Estate Investment Trust Dependence on Short-Term Funding



Sources: Federal Reserve; and IMF staff estimates.

Figure 1.1.4. REITs' Agency MBS Holdings versus GSEs' MBS Investment Portfolio Holdings



Sources: Federal Reserve; and IMF staff estimates.
Note: GSE = government-sponsored enterprise; MBS = mortgage-backed securities; REIT = real estate investment trust.

- *Maturity mismatch risk:* Some REITs have sought to increase the maturity of their repo-related financing, diversify their repo counterparties, and shift into other (more costly) sources, but most mREITs are still highly dependent on short-term funding to finance long-term assets.[3] This maturity transformation risk is akin to the funding problems that emerged during 2008 in the asset-backed commercial paper market.
- *Convexity risk:* All mREITs are exposed to interest rate and convexity risk. Given the prepayment options embedded in MBSs, the effective duration of MBSs increases as interest rates rise, because higher rates reduce mortgage refinancing activity and slow the rate of prepayments. Generally, mREITs hedge the interest rate risk of their mortgage portfolios through Treasury bills, interest rate swaps, swaptions, and other MBSs, but only partly. In addition to a worsening in the duration mismatch, rising rates result in higher valuation losses on MBS holdings. Given current convexity risk, the average

[3]Among the largest mREITs, about 90 percent of assets are used as collateral in repos, which leaves limited unencumbered assets.

Box 1.1 *(concluded)*

mREIT MBS portfolio value would decline by roughly 10 percent in the event of a 100 basis point parallel interest rate shock.

- *Concentration and correlation risk:* Most mREITs hold fixed-rate agency MBSs, private-label MBSs, and commercial MBSs, and so are sensitive to shocks to mortgage and property markets.[4] (By contrast, the other large investors in MBSs, as shown in Figure 1.1.2, have more diversified portfolios.) Their assets have expanded significantly since the crisis, to the point that mREITs now hold a larger stock of agency MBSs than the government-sponsored entities do in their investment portfolios (Figure 1.1.4). Furthermore, these risks are concentrated in two large institutions.
- *Wrong-way risk:* Because mREITs pledge collateral on the asset side of the balance sheet to fund themselves, they may be simultaneously exposed to pressure to make payments to investors and pressure on the value of assets pledged for financing.
- *Market risk:* Increased capital market volatility tends to reduce access to sources for refinancing and capital.

These risks are interrelated. Higher interest rates exacerbate convexity-related risks, which in turn raise lenders' concerns about the underlying collateral, aggravate short-term funding conditions, and reinforce the maturity transformation risk. Collateral and counterparty correlation risk also raise investors' concerns about the strength of future earnings and dividends, in turn increasing the cost of capital. Figure 1.12 in the main text illustrates how the presence of these risks could lead to a fire sale event.

[4]Regulatory guidelines require mREITs to hold a minimum of 75 percent of agency MBSs.

tion policy. But unexpected large increases in long-term rates, as the May-June episode suggests, cannot be ruled out.

- In the event of adverse shocks, *contingency backstops* need to be in place that reduce the likelihood of cascading forced asset sales. Although a number of steps have been taken to mitigate the risks present in short-term wholesale funding markets, other options should be considered to address the risk of fire sales. Establishing incentives that lengthen the maturity of repo contracts for borrowers in the shadow banking system may help reduce the initial buildup of maturity and liquidity transformation risk. In a severe crisis scenario, a mechanism (such as a resolution authority) that can manage an orderly and appropriately timed unwinding or liquidation of repo collateral may be warranted.[16]
- Policies also need to be focused on *structural vulnerabilities*. In particular, increased oversight of shadow banking entities (including repo market participants and the larger mREITs)—given such entities' inherent vulnerability to prepayment and interest rate risk and susceptibility to short-term funding pressure—would help reduce the risk of a cascading failure of counterparties. A review of repo haircuts and margins would be desirable to limit the degree of leverage and procyclicality inherent in these markets. Greater disclosure by repo market participants and mREITs would also help markets more accurately assess the risks to which these entities are exposed. In addition, the authorities could consider changing the exemption status for certain mREITs, or if warranted, designate the largest mREITs as systemically important entities, subjecting them to greater supervisory oversight.
- Finally, further efforts are needed to assess how market developments and regulatory initiatives affecting dealer-bank business models may affect the cost and provision of market liquidity. At a minimum, *increased surveillance of and vigilance over the effects of trading liquidity pressures* will be needed as financial markets make the transition to a regime with higher interest rates and volatility. In the longer term, securities and market regulators need to ensure that fund managers in illiquid and opaque underlying markets are mindful of the risks of liquidity drying up.[17]

[16]Such a facility would allow a repo cash lender to sell its collateral to a well-capitalized liquidation agent with the ability to manage an orderly sale of the underlying collateral instead of liquidating the collateral received from a failing counterparty in a stressed market. See Acharya and Öncü (2013).

[17]See the recommendations by the International Organization of Securities Commissions in OICV-IOSCO (2012).

Emerging Markets: Riding the Ebbing Tide of Capital Flows

Accommodative monetary policies in advanced economies have encouraged foreign inflows into emerging market bond markets squarely above their long-term trend. This raises the question of whether monetary policy normalization in the United States will result in further turbulence in emerging markets. Although emerging market economies in general now have more buffers than in previous episodes of market volatility, events since May point to new financial stability concerns. The sensitivity of emerging market yields to changes in external conditions has increased as foreigners have crowded into local markets, duration has lengthened, and market liquidity has diminished. Emerging market fundamentals have recently weakened against the backdrop of weakening macroeconomic positions and rising financial leverage.

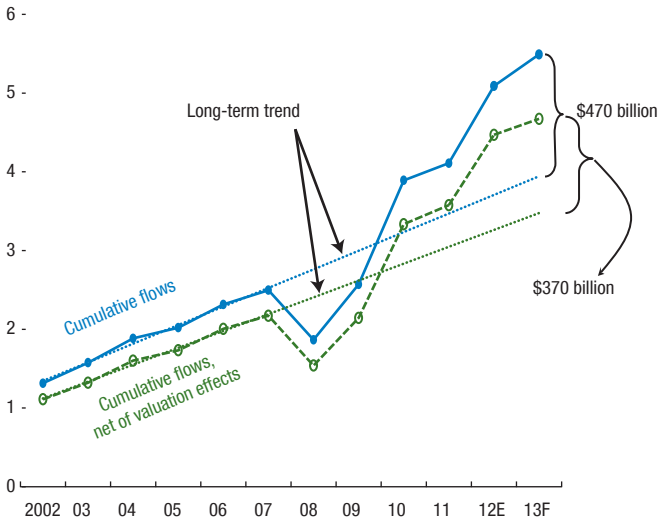
Low growth, low rates, and unconventional monetary policies in advanced economies have boosted inflows to the bond markets of emerging market economies.

Foreign portfolio investment in emerging market bonds has been on an increasing long-term path since 2002, reflecting higher growth differentials and a structural increase of allocations into emerging market assets. But since the pullback during the 2008 global financial crisis, cumulative bond inflows have risen by an estimated $1.1 trillion through 2013, or $0.9 trillion excluding portfolio and currency effects. These cumulative flows represent 5.5 percent of advanced economy nominal GDP (or 4.7 percent in net terms), and puts the 2013 forecast squarely above its long-term structural trend by an estimated $470 billion (or $370 billion in net terms; Figure 1.15).[18]

Foreign inflows into bonds have averaged more than 2 percentage points of recipient-country GDP a year during the previous four years, mainly into higher-yielding, more liquid markets (Figure 1.16). Equity portfolio flows have been less consistent than fixed-income flows since 2009, albeit of the same order of magnitude, and they are more dependent on growth

[18]The 2012 estimate and 2013 forecast of the cumulative fixed-income portfolio flows are extrapolated from the linear trend of the previous three years, taking into consideration the outflows in 2013:Q2–2013:Q3 and assuming continuing outflows in 2013:Q4. They are conservative estimates of the portfolio flow increases when compared with more high frequency portfolio allocation surveys, or the increase in the market capitalization of major bond indices.

Figure 1.15. Above-Trend Bond Flows from Advanced to Emerging Market Economies
(Percent of advanced economies' GDP)



Sources: IMF Consolidated Portfolio Investment Survey (CPIS); JP Morgan; and IMF staff calculations.
Note: E = estimate; F = forecast. The long-term trends were extrapolated from the 2002–07 period to remove the effects of the global financial crisis and unconventional monetary policies. Data for 2012–13 were calculated from the trend of 2009–11 and estimates. Advanced economies = Bermuda, Canada, Cayman Islands, France, Germany, Hong Kong SAR, Italy, Japan, Jersey, Luxembourg, Netherlands, Singapore, Switzerland, United Kingdom, and United States.

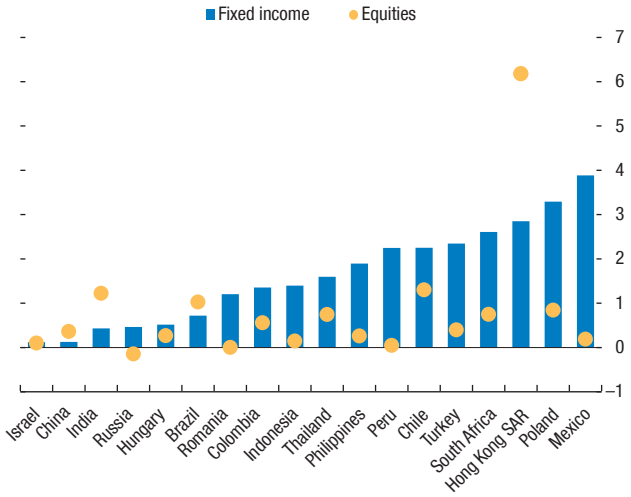
expectations than on the effects of unconventional monetary policies in advanced economies.

Countries receiving relatively higher bond inflows generally experienced greater yield compression, with 10-year bond yields in Indonesia, Mexico, and the Philippines declining by more than 300 basis points from their long-term average levels through mid-May 2013 (Figure 1.17). As discussed in the April 2013 GFSR, external factors accounted for about two-thirds of the local currency yield compression since 2008, with domestic improvements explaining the smaller share. These conditions have also enabled low-income countries to issue hard currency debt (Box 1.2).

Foreign investors have crowded into local emerging markets but market liquidity has deteriorated, making an exit more difficult.

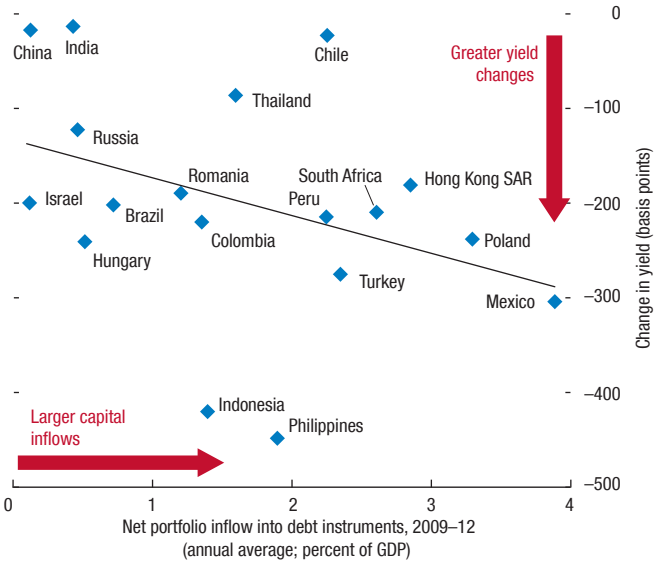
Yield-sensitive (so-called crossover) investors have much larger positions in emerging markets today than in 2009. A trend that started out with mostly dedicated emerging market funds now includes "global total return bond funds" and other crossover investors attracted by yield and an improvement in credit

Figure 1.16. Net Portfolio Flows into Fixed-Income Equity Markets by Country, 2009–12
(Annual average; percent of GDP)



Sources: Bloomberg, L.P.; CEIC Data; Haver Analytics; IMF, International Financial Statistics database; and IMF staff calculations.
Note: Data for some countries are not necessarily until 2012 but are instead the latest data available.

Figure 1.17. Impact of Portfolio Flows on Local Currency Bond Yields



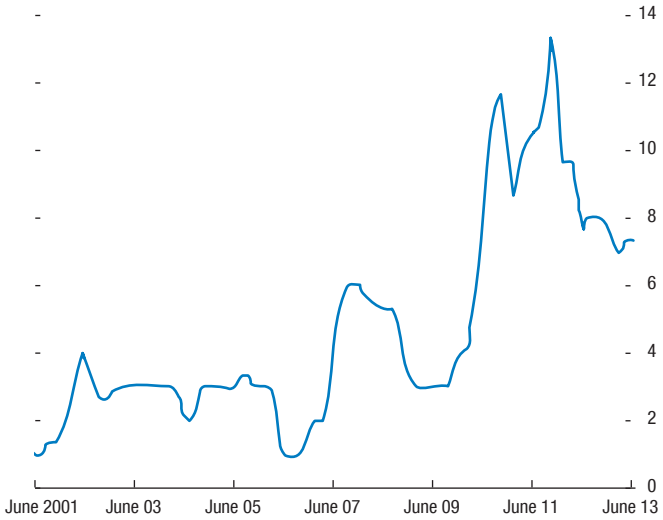
Sources: Bloomberg, L.P.; CEIC Data; Haver Analytics; IMF International Financial Statistics database; and IMF staff calculations.
Note: The vertical axis shows the deviation of the mid-May 2013 10-year local government bond yield from its average since 2005.

fundamentals (Figure 1.18). At the same time, the benign external environment and search for yield facilitated a lengthening of maturities. Although this is supportive of government debt liability management, the increased duration of bond issues poses greater risks to investors from a rise in interest rates (Figure 1.19).

At the same time that foreign investors have crowded into fixed-income assets, liquidity in several emerging market economy bond markets has declined considerably in recent years (Figure 1.20). Offshore banks have scaled back their market-making activities, increasing reliance on local players for liquidity. Reduced turnover in secondary markets during the last year is particularly evident in Hungary, Indonesia, and Malaysia, where foreign investor holdings now amount to more than 20 times (75 for Indonesia) the average daily trading volume (see Figure 1.20). In turn, during periods of reduced liquidity, the increased foreign exchange hedging activity by foreign institutional investors can weaken local currencies, despite relatively few outflows from domestic assets. This effect has occurred in many countries since May 2013 on expectations of reduced U.S. monetary accommodation.

Furthermore, the domestic investor base in many countries may be unwilling or unable to increase its holdings of fixed-income assets to provide adequate buffers against volatility during protracted sell-offs, as analysis in the Octo-

Figure 1.18. Allocation of Major Bond Funds to Emerging Markets
(Percent)



Source: PIMCO.
Note: Allocation of PIMCO total return fund to emerging market fixed income.

Box 1.2. First-Time Issuers: New Opportunities and Emerging Risks

Hard currency bond issuance by first-time issuers has risen in recent years.[1] Although these issuers do not currently appear to pose systemic risks to the global financial system, in some instances these developments represent a significant rise in external indebtedness, and may heighten stability risks within particular countries.[2] Such countries should issue external debt in the context of a comprehensive medium-term debt management strategy and concurrently deepen local markets to reduce dependence on volatile foreign capital. Debut issuers performed less poorly than their more liquid emerging market counterparts in the ongoing sell-off, but they have not been tested by a more prolonged period of repricing and therefore merit ongoing monitoring.

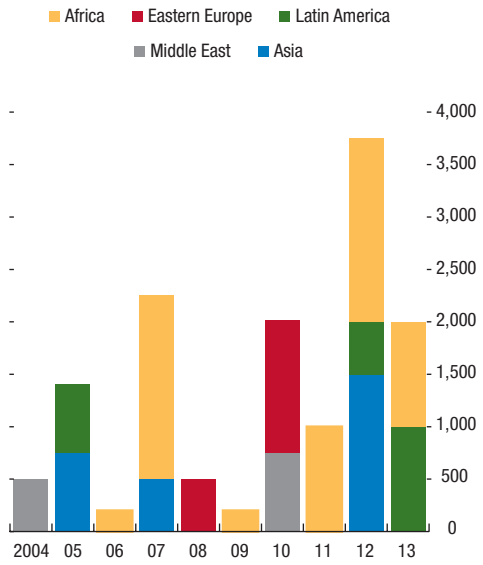
During the past 10 years, 23 emerging market economies and low-income countries have issued bonds internationally for the first time or have reentered the market after a long hiatus (Figure 1.2.1).[3] The issuers are diverse, both geographically and in terms of income levels, but generally have a sub-investment-grade (BB) rating.

The recent spike in issuance can be explained by demand and supply factors. The search for yield and demand for portfolio diversification have resulted in demand-driven easy financing conditions, despite an ambiguous improvement in fundamentals.[4] Furthermore, rising financing needs, coupled with reduced access to concessional financing, relatively undeveloped domestic markets, and a favorable interest rate environment, have made international bonds an attractive financing alternative.

Despite many similarities in the investor bases of debut issuers and frequent issuers, notable differences are apparent. In recent years, investors in global

Figure 1.2.1. International Bond Debut Issuance

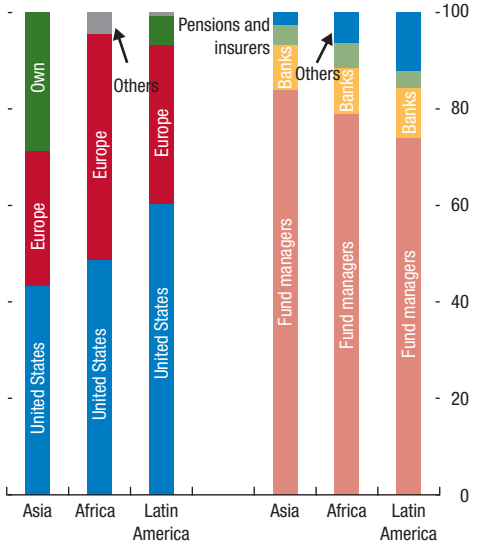
(Millions of U.S. dollars)



Source: Dealogic.

Figure 1.2.2. Investor Base by Region and Type

(Percent)



Source: Based on lead-managers information.
Note: Weighted average for deals by Bolivia, Guatemala, Honduras, Mongolia, Nigeria, Paraguay, and Zambia.

The authors of this box are Nehad Chowdhury, Anastasia Guscina, Guilherme Pedras, and Gabriel Presciuttini.

[1]Most of these issuers would be considered frontier markets by bond investors, but for the purpose of this box, the term "first-time" or "debut" is used. For the purpose of this study, we classified as first-time issuers only countries that have issued for the first time since 2004, in amounts of at least $200 million.

[2]The sum of issuance since 2004 ($14 billion) represents less than 3 percent of the market capitalization of emerging market bonds. The market capitalization of JP Morgan's EMBIG was $579 billion at end-April 2013.

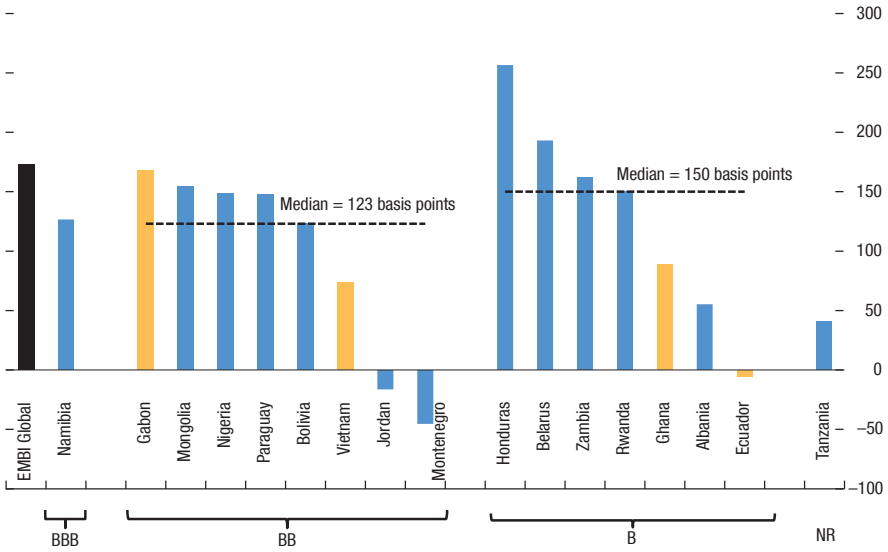
[3]The 23 economies are Albania, Angola, Belarus, Bolivia, Ecuador, Gabon, Georgia, Ghana, Honduras, Jordan, Mongolia, Montenegro, Namibia, Nigeria, Pakistan, Paraguay, Rwanda, Senegal, Seychelles, Sri Lanka, Tanzania, Vietnam, and Zambia.

[4]Real GDP growth in the year of issuance was higher than the average of the previous three years. However, current accounts deteriorated in the year of issuance compared with historical averages, indicating borrowers' need for hard currency.

Box 1.2 *(continued)*

Figure 1.2.3. Performance of Frontier Markets during Emerging Market Bond Sell-Off

(Yield change in basis points May 1– June 25, 2013)



Sources: Bloomberg, L.P.; and IMF staff estimates.
Note: Yellow bars represent issuances before 2008, and blue bars represent issuances thereafter. Average remaining maturity of the "first wave" is 2.9 years, whereas for the "second wave" it is 7.6 years. EMBI = Emerging Markets Bond Index; NR = not rated.

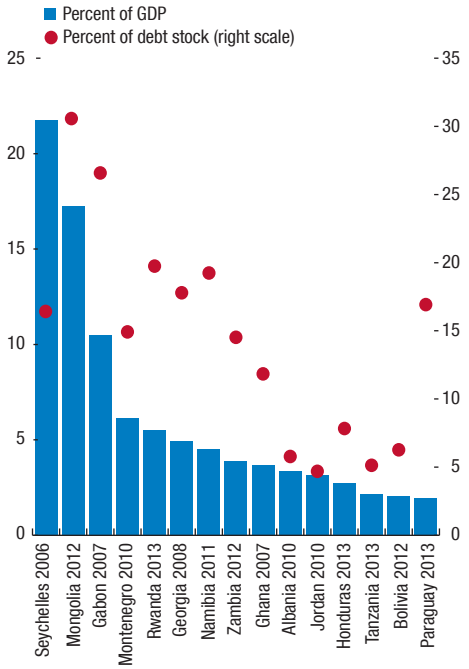
investment-grade credit have crossed over (and are therefore referred to as crossover investors) to purchase investment-grade and relatively liquid emerging market debt (that of Brazil, Mexico, Russia, and others), but have not purchased the mostly lower credit quality debt of debut issuers, and neither have hedge funds. In contrast, the investor base for debut issuers is still dominated by dedicated, real money investors (Figure 1.2.2).

First-time issuers typically access markets at spreads notably wide of the Emerging Markets Bond Index (EMBI). The higher spreads reflect their weaker credit profiles, poorer secondary market liquidity, poorer transparency, and lack of capital market financing track record.[5]

Although debut issuers have not sold off more dramatically than the higher credit quality issuers during the current sell-off (Figure 1.2.3), how they will fare in a more prolonged period of repricing remains to be seen. On average, debut issuers were able to withstand the shock on par with the more liquid issuers because investors across the board, particularly cross-over

[5]According to IMF staff estimates, first-time issuers are borrowing at a spread over EMBI that can only partially be explained by ratings, macroeconomic and institutional characteristics, and fiscal variables.

Figure 1.2.4. Size of Selected Frontier Market International Bond Issuance



Source: Dealogic.

Box 1.2 *(concluded)*

investors and hedge funds, first sold the most-liquid assets. The relative illiquidity of debut issuers' bonds protected them from a more dramatic sell-off in the initial stage. It remains to be seen what would happen in a more sustained sell-off.

Debut issuers should adopt policies that mitigate risks associated with external debt. Some countries have issued bonds in large amounts compared with the size of their economies (Figure 1.2.4) or without a clearly defined use of the proceeds. The unwinding of unconventional monetary policies and increases in interest rates may pose refinancing challenges, especially if accompanied by depreciating exchange rates.[6] Policymakers should tap international markets only in the context of a comprehensive medium-term debt management strategy that makes the trade-off between costs and risks explicit, and at the same time should deepen local markets to reduce dependence on volatile foreign capital.

[6]Exposure to exchange rate depreciation is the most prominent risk, given that many countries' already-significant exposures to currency risk in their portfolios has further increased with the issuance of Eurobonds.

ber 2012 GFSR explained. Accordingly, asset prices may be more vulnerable in Hungary, Indonesia, Mexico, and, to a lesser extent, South Africa, as coverage of foreign investor outflows by local investors is limited (Figure 1.21).[19]

Corporate sector vulnerabilities are on the rise as the leverage cycle advances.

Corporate sector borrowing has surged since the crisis began, facilitated by foreign investors (Figure 1.22). While in general highly rated firms typically raise the most capital, so far in 2013 the credit quality of new issues has deteriorated (Figure 1.23). Indeed, improvements in the overall credit profile of emerging market companies have peaked and are showing signs of deterioration as credit downgrades rise (Figure 1.24). Corporate leverage is also on the rise: net debt to common equity increased to more than 60 percent for Latin American companies in 2012, and it remains elevated for Asian companies (Figure 1.25, panel 1). This trend, together with some slowdown in corporate earnings, has caused interest coverage ratios among Asian corporates to dip to a multiple of three times in 2012, down from a multiple of almost five times in 2010 (Figure 1.25, panel 2). In 2012, corporate defaults reached their highest level since the global financial crisis with 20 credit events amounting to $22 billion (Figure 1.26).

These trends are also evident in China, where slower economic growth has begun to put pressure on domestic firms. Faced with underlying weakness in demand and excess capacity across many industries, corporate earnings have been falling (Figure 1.27, panel 1). This development, along with the rise in corporate leverage in the past few years, explains why interest coverage ratios have progressively weakened (Figure 1.27, panel 2; see also Box 1.1 of the April 2013 GFSR). Sustained pressure on financial positions in the corporate sector would undoubtedly hit banks' loan portfolios, putting at risk the still-intact pattern of strikingly low reported nonperforming loan ratios.

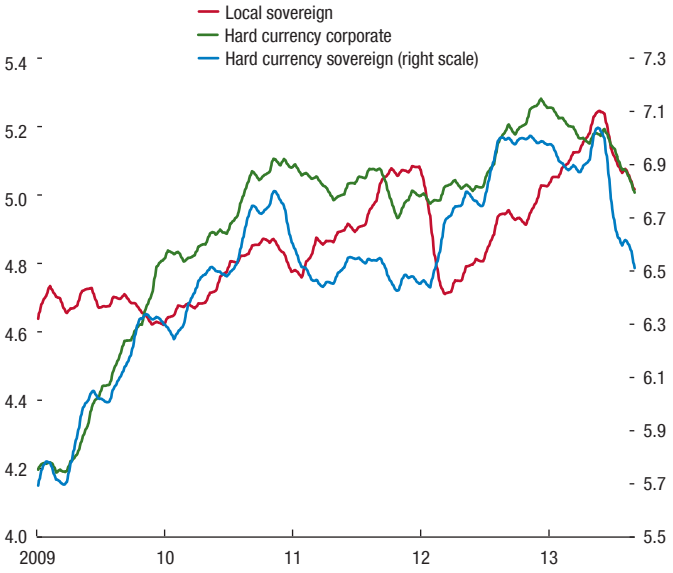
[19]In Poland, the size of the nonbank financial sector may decline relative to the nonresident holdings of local currency bonds following plans to absorb the government bond holdings of the pillar II pension fund assets into general government debt.

Financial vulnerabilities are rising because macroeconomic fundamentals have recently weakened.

The external positions of emerging markets have deteriorated since 2007, partly because of economic weakness in advanced economies, with the exception of those eastern European countries that were previously running exceptionally high deficits. This change in external positions has arguably supported global rebalancing, but has left some economies (especially Asian) that traditionally have large current account surpluses in a weaker external position. Against the backdrop of weak global growth since 2009, many emerging markets pursued countercyclical policies that expanded domestic credit. The long period of rapid credit expansion and easy access to funding has given rise to greater domestic financial vulnerabilities. For example, countries in the shaded areas of Figure 1.28 are faced with increased external and domestic vulnerabilities at a time when many are also finding themselves with shrinking fiscal space (see the October 2013 *Fiscal Monitor*).

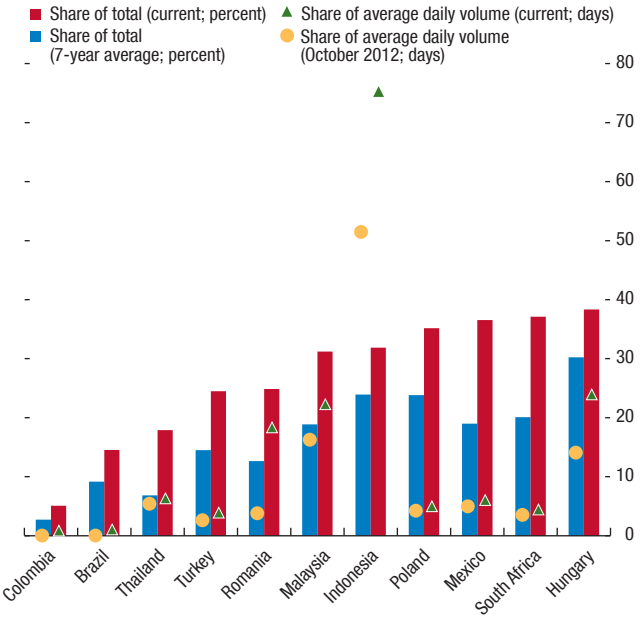
Figure 1.19. Duration of Emerging Market Fixed-Income Indices

(Years; 30-day moving average)



Source: Bank of America Merrill Lynch.

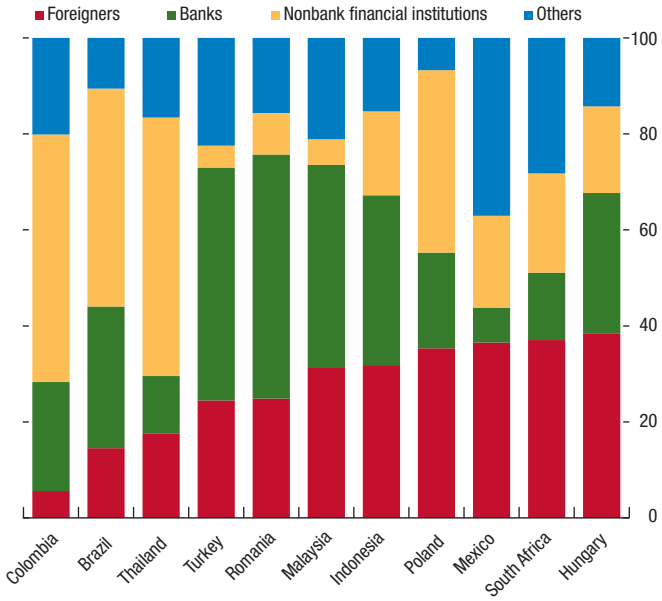
Figure 1.20. Share of Nonresident Holdings of Local Currency Government Debt and Market Liquidity



Sources: Asian Development Bank; national authorities; and IMF staff calculations.

Figure 1.21. Composition of the Holders of Local Currency Government Debt

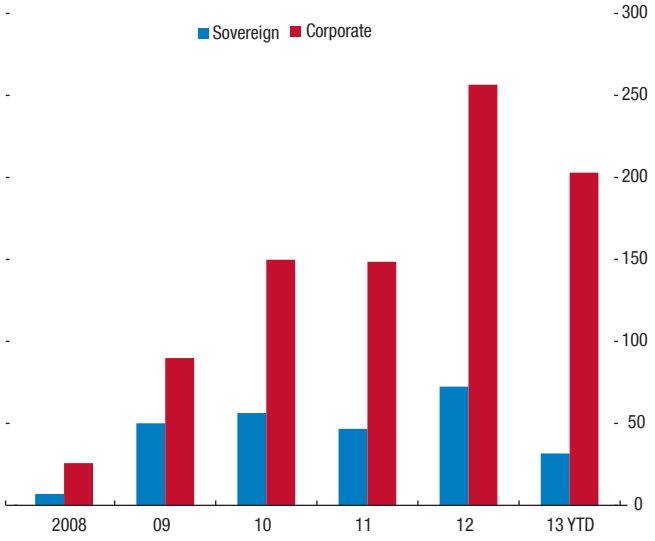
(Percent)



Sources: Asian Development Bank; national authorities; and IMF staff calculations.

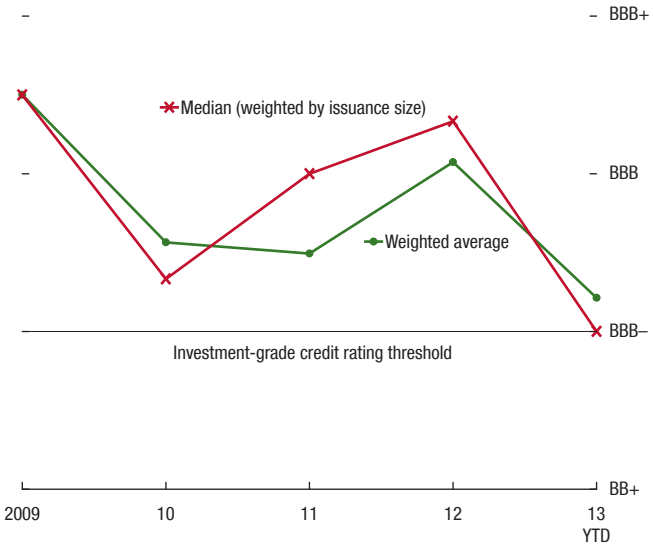
Figure 1.22. Net New Issuance of Emerging Market Bonds

(Billions of U.S. dollars)



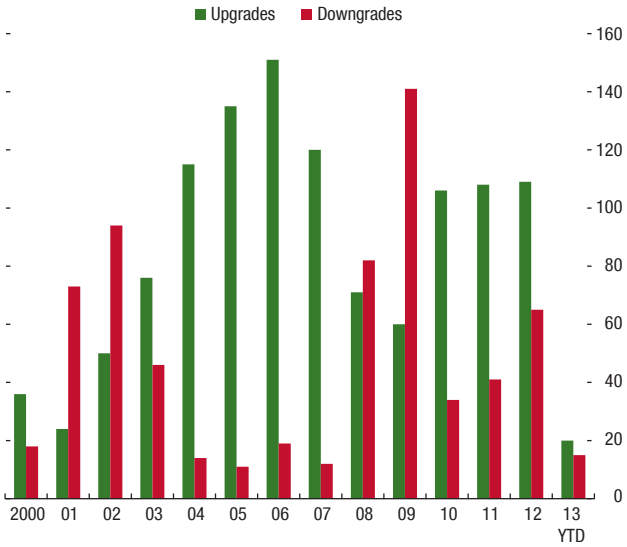
Sources: Bond Radar; and Morgan Stanley.
Note: Data available through August 2013. YTD = year to date.

Figure 1.23. Credit Ratings of Emerging Market Corporate Bond Issues



Sources: Bond Radar; and IMF staff calculations.
Note: Data available through July 2013. YTD = year to date.

Figure 1.24. Corporate Rating Changes in Emerging Markets
(Number of changes)



Source: Fitch Ratings.
Note: Data available through 2013:Q1. YTD = year to date.

Rapid credit growth in the shadow banking system in China remains a key vulnerability.

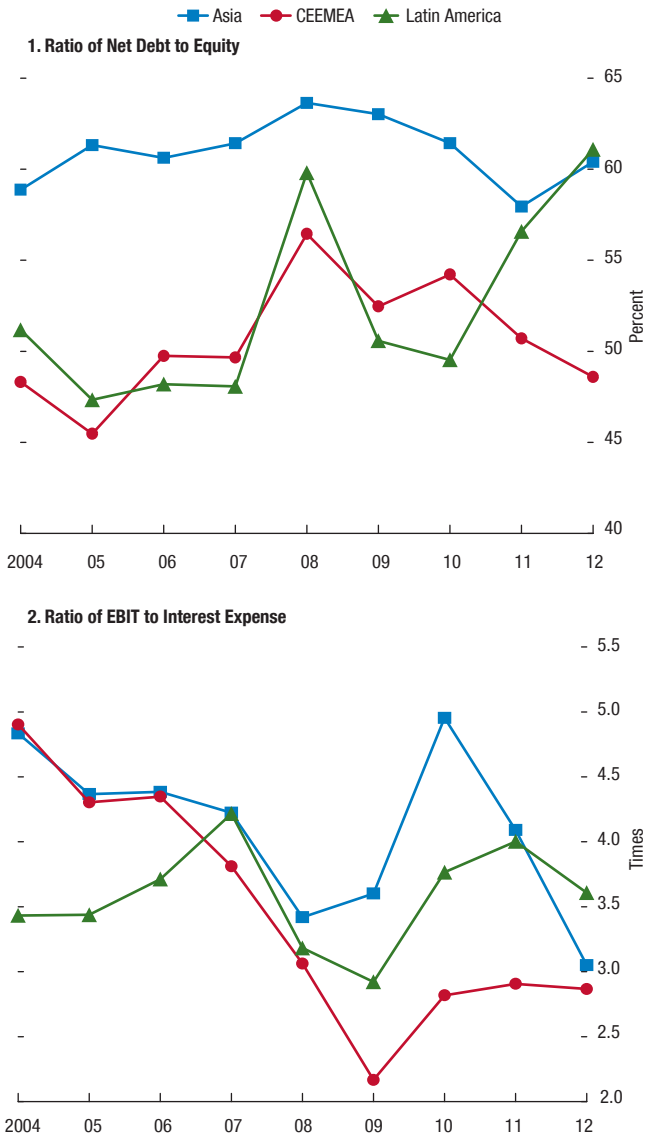
Credit creation in China reaccelerated in early 2013, as broad credit expanded by more than 22 percent (year over year). This level was well below the peak rates of credit growth in 2009–10 but further extends the sharp rise in China's credit-to-GDP ratio to almost 180 percent of GDP (Figure 1.29). It also heightens worries that the rapid credit expansion may foreshadow a marked worsening of asset quality. Rapid disintermediation has pushed the share of bank loans in total new credit down to just above 55 percent in the first half of the year. This trend has helped diversify the financial system and introduce more market-based lending and investment products, but the surge in nonstandard instruments—exemplified by the doubling of trust loans in less than 12 months—also carries considerable risks:

- *Lack of oversight:* Many of the new funding channels are subject to lighter regulation and supervision. Trust companies have faced little regulatory constraint in ramping up their exposure to two sectors that are largely excluded from access to new bank loans: local government financing vehicles and the property sector. Both of these sectors have been important drivers of recent economic activity, but face serious questions about their financial sustainability.
- *Lack of market disclosure:* The new credit instruments lack the central element of market-based intermediation, that is, effective market discipline. The possibility of default is crucial to inducing proper pricing of credit risk. Yet China's financial system features a pervasive perception that alternative saving vehicles, including wealth management products, are effectively guaranteed by issuers. A history of bail-outs has created similar moral hazard in the market for corporate bonds.
- *Ties with the traditional banking system remain too close for comfort:* Although financial innovation superficially reduces their role, China's banks remain deeply involved in many new forms of credit intermediation, although without the safeguards of capital requirements, provisioning, or detailed disclosure. For example, some trust companies rely on banks to both refer borrowers and provide funding.

As the United States approaches exit from unconventional monetary policies, emerging market vulnerabilities have come to the fore.

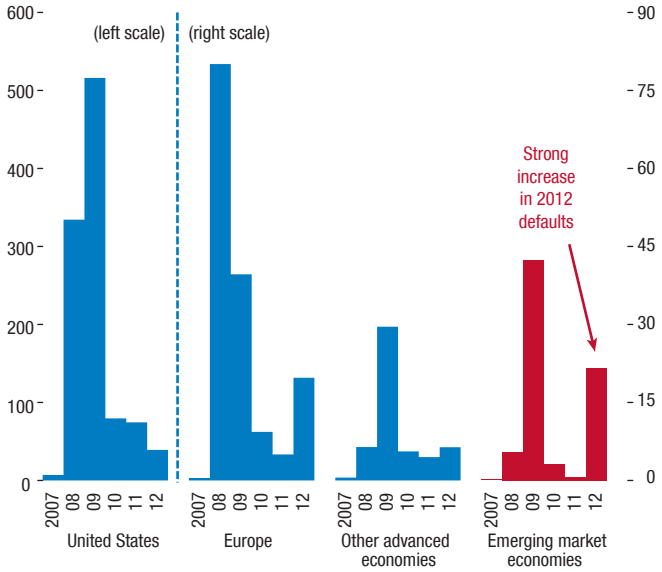
Since Federal Reserve Chairman Ben Bernanke's testimony to Congress on May 22, emerging market assets have come under pressure. Initially, the sell-off was strong in most countries, reflecting the first two key vulnerabilities: (1) yields and risk premiums had

Figure 1.25. Nonfinancial Corporate Balance Sheet Metrics



Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: CEEMEA = central and eastern Europe, Middle East, and Africa; EBIT = earnings before interest and taxes. Computed as the median of all available firm data. Firms with negative net debt were excluded.

Figure 1.26. Sharp Increase in Corporate Debt Defaults
(Billions of U.S. dollars)



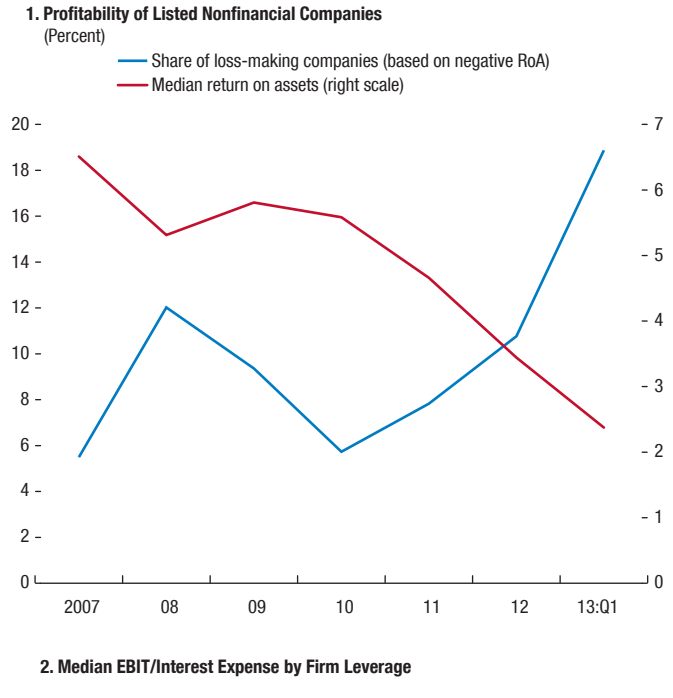
Source: Standard & Poor's.
Note: Other advanced economies = Australia, Canada, Japan, and New Zealand.

become overly compressed and are likely to be repriced further as monetary conditions normalize; and (2) the sensitivity of emerging market yields to changes in external conditions and foreign flows has increased, owing to crowded positions in local markets, lengthening duration, and reduced market liquidity. After June, the sell-off became more concentrated along country fundamentals, highlighting the third key vulnerability, (3) slowing growth and rising domestic financial vulnerabilities.

Currencies and bonds in Brazil, India, Indonesia, South Africa, and Turkey came under intense weakening pressure since May as their current account deficits persist, inflation remains elevated, and monetary policy room seems limited in the face of decelerating growth (Figure 1.30). The perception of good fundamentals and prudent approaches to macroeconomic and fiscal policies, together with robust financial systems, have contributed to resilience. For example, Chile, Mexico, and Poland fared relatively better with their local and hard currency bond spreads over U.S. Treasuries remaining within their long-term range. (See also Box 2.2 in the May 2013 *Western Hemisphere Regional Economic Outlook* about the role of exchange rates in capital outflows.)

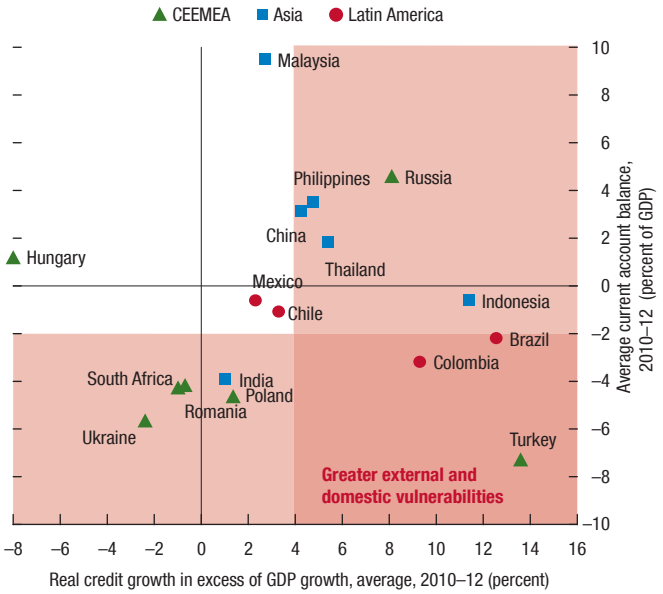
The pattern of volatility in emerging markets continues to be driven by expectations of monetary policy in the United States. Following the Federal Reserve's

Figure 1.27. China: Corporate Sector Fundamentals



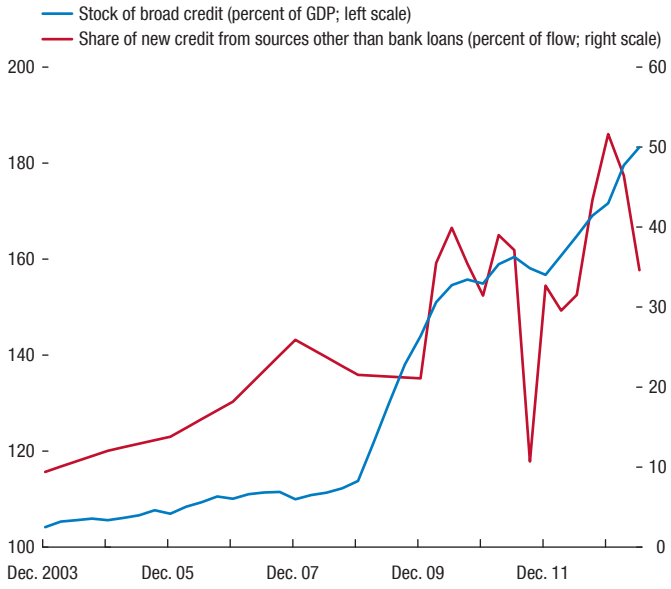
Sources: WIND; and IMF staff calculations.
Note: EBIT = earnings before interest and taxes; firm leverage = total liabilities/total assets; RoA = return on assets. Top panel is computed for a balanced panel of 2,146 companies. Data for 2013:Q1 for the RoA are annualized, but may somewhat overstate the deterioration in performance, as a result of seasonal effects. Bottom panel is computed for a balanced panel of 1,210 nonfinancial companies.

Figure 1.28. External and Domestic Vulnerabilties



Sources: IMF, International Financial Statistics and World Economic Outlook databases.
Note: CEEMEA = central and eastern Europe, Middle East, and Africa.

Figure 1.29. China: Credit Developments

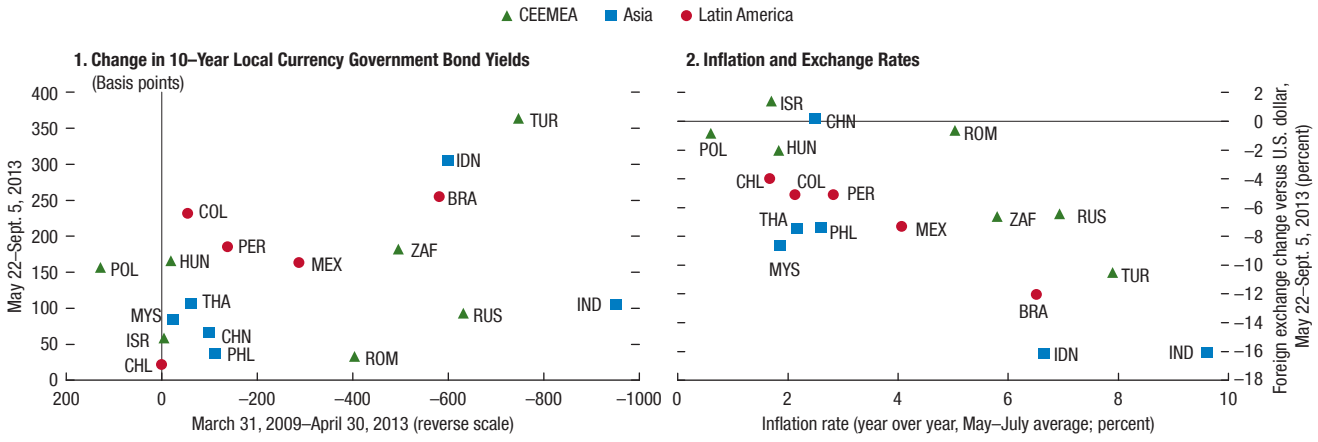


Sources: CEIC data; Haver Analytics; and IMF staff calculations.
Note: Broad credit comprises bank loans, entrusted loans, trust loans, acceptance bills, and corporate bonds.

Figure 1.30. Recent Stress in Emerging Markets

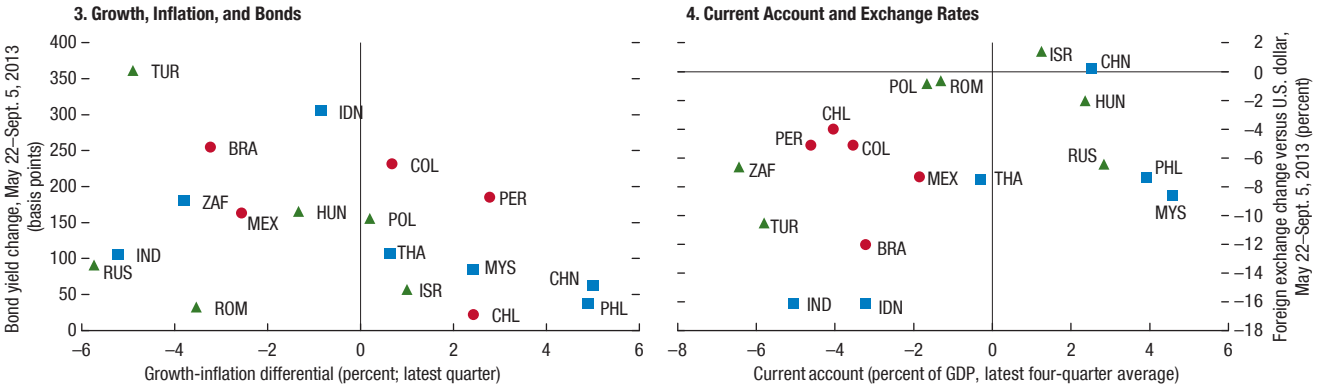
Yields rose the most in the economies that had the greatest declines.

Countries with macroeconomic weaknesses, such as high inflation…

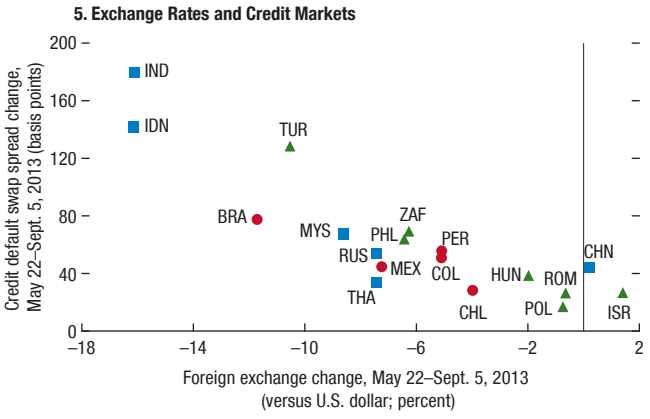


…unfavorable growth and inflation dynamics…

…and external imbalances, underwent the most pressure...



…with potential feedback to credit markets.



Sources: Bloomberg, L.P.; and national authorities.
Note: CEEMEA = central and eastern Europe, Middle East, and Africa; BRA = Brazil; CHL = Chile; CHN = China; COL = Colombia; HUN = Hungary; IDN = Indonesia; IND = India; ISR = Israel; MEX = Mexico; MYS = Malaysia; PER = Peru; PHL = Philippines; POL = Poland; ROM = Romania; RUS = Russia; THA = Thailand; TUR = Turkey; ZAF = South Africa.

decision in September to delay tapering of its asset purchasing program, emerging market bond yields and spreads over U.S. treasuries declined, and currencies reversed some of their earlier declines against the U.S. dollar. Primary issuance of corporate and sovereign bonds picked up significantly, and flows into emerging market debt funds restarted in late September.

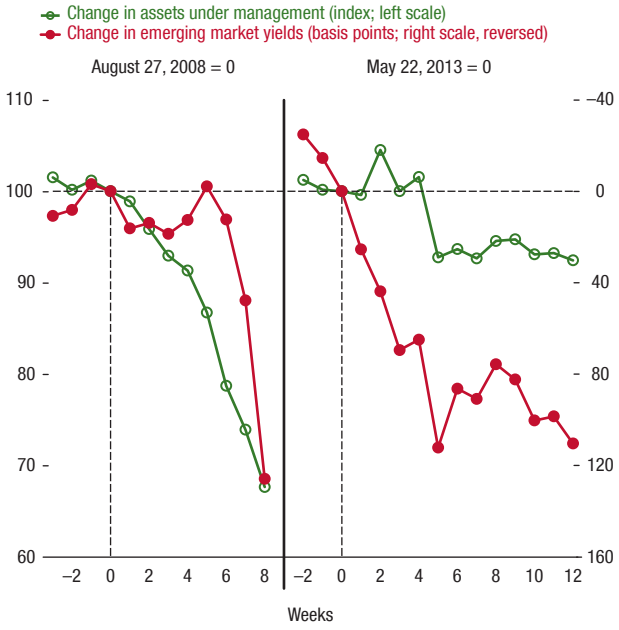
What would happen if flows reversed more sharply in emerging markets?

These factors suggest that emerging markets may have become more vulnerable during the transition to a more challenging external financing environment. In the 12 weeks following the May 22, 2013, reversal of risk sentiment, assets under management for emerging market fixed-income funds fell 7.6 percent (or $19 billion). This pullback was much smaller compared with the one accompanying the systemic financial shock in 2008, when assets under management fell by 36 percent (or $26 billion) during the first round of the asset sell-off in September–October 2008 (Figure 1.31). Yet the impact on local currency bond yields was similar across the two episodes, which suggests that emerging markets are highly vulnerable to sudden outflows that would further strain liquidity conditions.

A pricing model is used to highlight a stress scenario in which 10-year bond yields are explained by domestic and external variables. An external shock consisting of a 30 percent reduction of current foreign holdings of local currency government debt, an increase of 100 basis points in the U.S. treasury note yield, and a 10-percentage point increase in the Chicago Board Options Exchange Market Volatility Index (VIX), and domestic variables along the October 2013 WEO forecasts for 2014 (for debt-to-GDP ratios, real GDP growth and fiscal balances), as well as unchanged monetary policy rates would result in substantial increases in government bond yields in several countries (Figure 1.32). Yields on 10-year bonds in Indonesia, South Africa, and Turkey would increase by more than 150 basis points, all mostly attributable to external factors, while most countries' bond yields would increase by more than the U.S. Treasury note yield change.

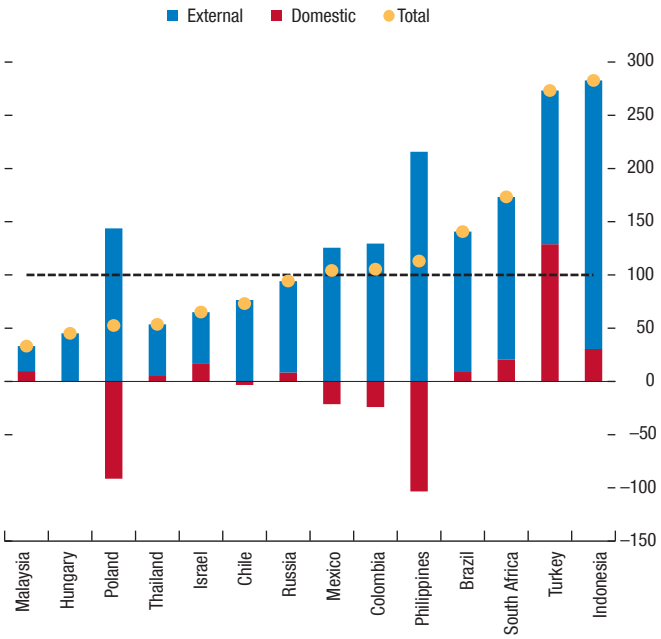
Domestic policies can counteract the rise in term premiums, such as in Colombia, Mexico, and the Philippines, or add to external woes, like in Indonesia, South Africa, and Turkey (red portions of the bars in

Figure 1.31. May 2013 Sell-Off of Emerging Market Bonds versus the Lehman Brothers Episode



Sources: EPFR Global; JP Morgan; and IMF staff calculations.

Figure 1.32. Estimated Impact on Bond Yields from a Reversal of Capital Flows and Other Factors
(Basis points)



Source: IMF staff calculations.
Note: The shock consists of a 100 basis points rise in U.S. Treasury yields, a 30 percent reduction in foreign holdings, and a 10 percentage point rise in the VIX. Values of domestic variables are those used in the October 2013 WEO forecasts for 2014 (for debt-to-GDP ratios, real GDP growth, and fiscal balances), and the policy rate is assumed unchanged.

Figure 1.32).[20] The simulation underscores the need for emerging markets to rebuild resilience and address vulnerabilities. More broadly, the ongoing rise in yields and credit spreads and the depreciation of emerging market currencies could impose further refinancing and default risks on firms with inadequate debt-servicing buffers, although looser domestic monetary policy may offset some of the higher risk premiums.

What actions can emerging market countries take?

The episodes of financial market turmoil in the second and third quarters of 2013 underscore that some emerging market economies need to address macroeconomic imbalances, enhance policy credibility, and rebuild policy space to reduce vulnerabilities as financial conditions normalize. Emerging market economies need to make a transition to a more balanced and sustainable financial sector, while maintaining robust growth and financial stability. These actions will position them to effectively withstand future market turbulence.

In the event of significant capital outflows, and with elevated emerging market contagion risk, policymakers can take various actions to mitigate potential damage. Depending on the extent of outflows and liquidity pressures in market segments, some countries may need to act to ensure orderly market operations, such as using cash balances, reducing the supply of long-term debt, and performing switching auctions to temporarily reduce supply on the long-end of yield curves. Reversing macroprudential tightening measures and/or previous restrictions on capital inflows may also help maintain orderly conditions.

Exchange rates should be allowed to depreciate in response to changing fundamentals but policymakers need to guard against disorderly adjustment. Brazil's announcement of a transparent, but temporary, foreign exchange intervention program to dampen the uncertainty around intraday currency volatility is a step in that direction. In addition, emerging market economies may benefit from establishing swap lines with major central banks to remove liquidity shortages in foreign exchange markets.

[20]The size of the improvement of domestic policies in Poland may be overstated by the decline in the debt-to-GDP ratio owing to the transfer of the government bond holdings of the pillar II pension fund assets to general government debt.

Maintaining central bank credibility is paramount in times of increased risk aversion, so monetary policy recommendations hinge on inflation expectations. Countries with well-anchored inflation and inflation expectations may have more room for policy easing or less tightening to withstand the cyclical growth slowdown. The scope for easing may be very limited in countries with high inflation pressures, which may have to do more to anchor inflation expectations. Brazil, India, and Indonesia have tightened monetary conditions to address inflation pressures.

Policymakers should carefully monitor and contain the rapid growth of corporate leverage. Also, local bank regulators need to guard against foreign currency funding mismatches building up directly on bank balance sheets, or indirectly through foreign currency borrowing by firms.

Containing the risks to China's financial system is as important as it is challenging. As elaborated in the IMF's China 2013 Article IV Staff Report (IMF, 2013b), broad credit growth needs to be reined in to contain financial stability risks and promote the rebalancing of China's economy away from credit-fueled investment. However, a sudden credit squeeze could further decelerate economic activity and trigger serious asset quality problems. The spike in interbank market rates in June 2013 illustrates the risks from policies that are not clearly communicated. Similarly, introducing default risk to the financial system will be critical for sustainable market development, but steps in this direction need to be finely calibrated to avoid causing a full-blown run on new investment products. Against this backdrop, it is important for the following actions to be taken:

- Tighten prudential oversight, especially of shadow banking activity, while removing incentives for regulatory arbitrage through continued financial liberalization (for example, of deposit interest rates);
- Enforce stronger disclosure practices for new financial products, and counteract the current pattern of implicit guarantees and bail-outs; and
- Use on-budget fiscal stimulus toward boosting consumption if economic growth starts falling significantly short of the target.

Japan's Bold Policies

The firing of the monetary arrow of "Abenomics" by the Bank of Japan (BoJ) in April 2013 reverberated through domestic markets and the banking system,

boosting equities but increasing bond volatility.[21] The weakening of the yen before and after the BoJ's action reflected expectations for eventual outflows and substantial spillovers to both emerging market and advanced economies. If the other two reform arrows (fiscal and structural) are effectively deployed, and efforts at pulling the economy out of deflation are successful, major gains to financial stability could occur. But if policy follow-through is inadequate, new risks to domestic and global stability could arise.

What would the success of Abenomics mean for financial stability?

Successful implementation of the full Abenomics policy framework—consisting of the three arrows of monetary stimulus, flexible fiscal policy, and structural reform—would have important benefits for stability. As projected in the "complete Abenomics package" scenario of the October 2013 WEO, effective deployment of all three arrows would raise inflation and inflation expectations toward the BoJ's target of 2 percent and would increase domestic investment and credit demand. Banks would continue to scale back their bond holdings,[22] and the nominal 10-year Japanese government bond (JGB) rate would shift up toward 3 percent. Capital outflows would accelerate, possibly to historically high rates, prompted by a new search for yield and the scarcity of domestic government bonds.

Under the scenario described here, the vulnerability of domestic banks to bond market shocks would likely decline. BoJ purchases during the next two years should reduce the total amount of JGBs available to the market (the current market structure is shown in Table 1.3). Accordingly, if all aspects of Abenomics are successfully implemented, the interest sensitivity of both regional and major banks would be expected to decline sharply as those institutions shift their portfolios toward foreign asset purchases and more domestic lending to meet increased credit demand.[23]

Full implementation of Abenomics would likely lead to an increase in capital outflows to both advanced and emerging market economies (Lam, 2013). Japanese households and institutions already have substantial holdings of foreign assets, totaling ¥542 trillion ($6.2 trillion) at the end of 2012, or 114 percent of GDP (Table 1.4). A return of Japanese flows to peak historical rates could have significantly positive effects for some of the receiving markets and could even compensate for net redemptions prompted by monetary tightening elsewhere.

Flows to emerging markets are likely to be led by individual investors, who are already moving to increase their foreign currency exposures. The willingness of individuals to take on emerging market risk has risen sharply in recent years, supported by the development of new investment products. Among the most popular are currency overlay funds (Figure 1.33), which are structured products that consist of an outright investment in an underlying asset such as domestic equities, compounded with a derivative exposure to a high-yielding emerging market currency. Such funds have continued to receive inflows even during periods of yen strength, and now total more than ¥10 trillion, up from only ¥1 trillion in 2009.[24] Other emerging-market-oriented investments include foreign currency positions held by retail traders, and some broader investment funds that do not feature a specific overlay.

Under a complete Abenomics scenario, outflows to developed markets would also increase, led by conservative investors such as life insurance companies and pension funds. Purchases of developed market assets, largely investment-grade bonds, would take longer to develop, because these conservative institutions often have extensive approval processes for major portfolio reallocations. Japanese purchases of some specific classes of assets, such as higher-grade euro area government bonds, as well as other G7 bonds, could be significant. Japanese banks have already stepped up acquisition of foreign assets (see Table 1.4), both loans and direct investment, in some cases filling in for deleveraging European banks. Major city banks have been especially active on this front, acquiring retail banking operations in developing Asia, Latin America, and the United States. These capital outflows improve financial

[21]"Abenomics" refers to a set of economic policies advocated by Prime Minister Shinzo Abe. The "three arrows" is the symbolic name given to the three foundational pillars of the plan.

[22]Major city banks sold more than ¥15 trillion ($150 billion) in government bonds, about 14 percent of their overall portfolio of JGBs, in April and May 2013, following the BoJ's April 4 policy announcement, and bond market volatility increased sharply.

[23]This analysis, the results of which are presented in Table 1.5, is based on Arslanalp (2013). See also the October 2012 GFSR discussion.

[24]As an overall gauge of the scale of these holdings, Japan's current account surplus is projected to be ¥7 trillion (1.3 percent of GDP) in 2013. The steady-state surplus is somewhat higher, at about 1.7 percent of GDP.

Table 1.3. Structure of the Japanese Government Bond Market

	Stock, end-2012 (trillions of yen)	Share of JGB Market (percent)	Share of Own Assets (percent)
Banks	299	38.1	18.2
City banks	102	13.0	22.0
Regional and Shinkin	43	5.5	16.2
Insurers and Pensions[1]	277	35.3	39.3
Investment Trusts and Households	24	3.1	50.9
Foreign	35	4.5	8.8
Other	57	7.3	. . .
Bank of Japan	91	11.6	54.0
Total	783	100.0	. . .

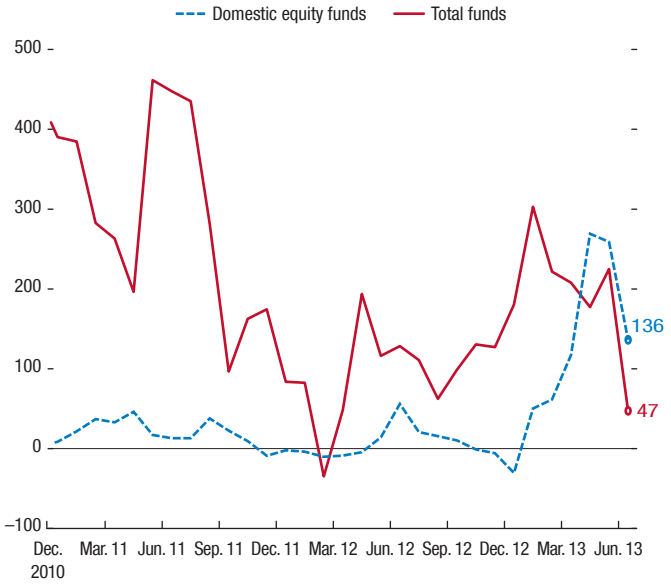
Source: Bank of Japan, Flow of Funds.
[1]Includes Government Pension Investment Fund.
Note: JGB = Japanese government bond.

Table 1.4. Foreign Assets Held by Japanese Investor Groups, end-2012
(Trillions of yen)

	Foreign Assets	Net Purchases in 2012 (Flows)
Banks	145	10.1
Insurers and Pensions	115	0.7
Households	8	2.0
Investment Trusts	57	–1.7
Nonfinancial Corporations	111	17.1
Government[1]	105	–0.5
Total	542	27.7

Source: Bank of Japan, Flow of Funds.
[1]Excludes Government Pension Investment Fund.

Figure 1.33. Japanese Flows into Currency Overlay Funds
(Billions of yen; monthly)



Sources: Bank of Japan; and IMF staff estimates.

stability in Japan through portfolio diversification and frequently in destination markets, where they may compensate for net sales by other investors.

Incomplete implementation of Abenomics would pose risks to banks.

The promising start for Abenomics could still end in disappointment if support from fiscal and structural reforms is not forthcoming. In such a case, described in the October 2013 WEO as an "incomplete" scenario, initial success in raising inflation and inflation expectations could eventually be followed by a decline of inflation below the 2 percent target, and domestic credit demand could falter. Banks may return to their previous course of accumulating government bonds (Table 1.5A), equity prices could dip, and capital outflows subside.

The shift into an incomplete scenario would revive long-standing financial stability concerns about banks' accumulation of government bonds. In this scenario, city banks are projected to initially scale back government bond holdings in response to the BoJ's bond-buying program. But these reductions would eventually be reversed as banks absorb the extra bond issuance needed to sustain economic growth, while domestic loan demand stagnates. The consequence of such a scenario would be rising susceptibility to interest rate shocks (Figure 1.34). Associated risks, such as simultaneous large sales of domestic bonds due to value-at-risk (VaR) "model herding," could persist or even increase.

A "disorderly" scenario with high risk premiums would pose numerous stability and spillover risks.

Failure to deliver on key components of the ambitious reform agenda could also have a more pernicious downside. Market disillusionment could lead to fiscal and inflation concerns, particularly if medium-term fiscal adjustments are not completed and the structural

Table 1.5. Japan Scenarios: Complete, Incomplete, and Disorderly

A. Net JGB Purchases (trillions of yen)				
	Complete	Incomplete	Disorderly	
Banks	–55	–21	–60	
Insurers and Pensions	10	8	8	
Households and Investment Trusts	0	0	0	
Foreigners	12	–3	9	
Bank of Japan	100	100	100	
Ministry of Finance	–67	–84	–57	
B. Medium-Term Outcomes (percent)				
	Complete	Incomplete	Disorderly	
Average Inflation Rate, 2013-17	1.7	1.0	3.6	
Average Growth Rate, 2013-17	1.4	0.9	0.9	
Ten-Year JGB Rate in 2017	3.2	2.9	6.2	
Equity Market Change to 2017	50	–10	–10	
C. Flows to Emerging Markets (trillions of yen)				
Investor Group	Complete	Incomplete	Disorderly	Memo: Stock[1]
Toshin Emerging Market Portfolio	1.8	0.2	3.5	3.6
Toshin Emerging Market Overlay	2.0	1.3	4.0	5.5
Bank FDI	0.5	0.4	0.5	2.8
Bank Portfolio	0.4	0.4	0.4	1.8
Bank Loans	1.0	–0.1	1.0	19.1
Corporate FDI	1.3	1.3	2.6	13.0
Total	**7.0**	**3.5**	**12.0**	**45.7**

Source: IMF staff estimates.

Note: For complete scenario, outflow in each is maximum historical, except Toshin overlay. For disorderly scenario, outflow is twice maximum historical for Toshin and corporates; maximum historical for banks. EU = European Union; FDI = foreign direct investment; JGB = Japanese government bond.

[1]Stock of foreign assets at end of 2012.

reform arrow is never fired. In this "disorderly" alternative to the incomplete scenario (Table 1.5B), calculated using the same analytical framework as the other two scenarios, banks would continue to sell government bonds at a faster rate than in the complete scenario, and capital outflows would accelerate to record rates, led by outflows from individual investors. Risks to financial stability would escalate sharply because inflation and risk premiums on government bonds would rise to levels well beyond those experienced in recent decades.

The chances of a large "VaR shock" could increase sharply. Although measured VaR spiked during bouts of bond market volatility in April and May 2013, few major banks appear to have hit their VaR limits during this period (Figure 1.35). In part, these limits were not hit because other major assets such as equities were registering gains even as bond prices dropped, so that overall portfolio volatility did not rise as much as it otherwise would have.[25] However, in a disorderly scenario in which prices of most asset classes decline, this dampening effect might not come into play. Joint declines in bond and equity prices could exacerbate portfolio volatility, forcing up the measured VaR, and triggering a wave of selling, which would, in turn, prompt further volatility spikes and price declines.

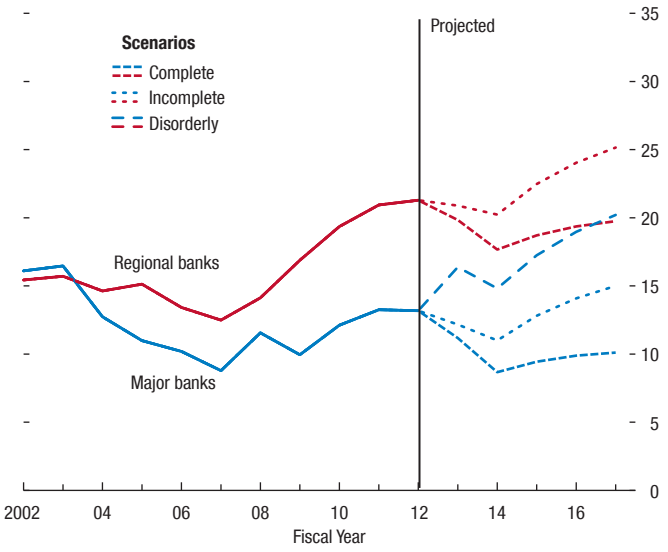
Strains could develop in the banking system. In the disorderly scenario, banks would experience pressure from withdrawals as households scale back bank deposits (now 55 percent of their financial assets) in favor of higher-yielding instruments, such as foreign bonds. A lack of profitable lending opportunities at home would limit revenues, thus squeezing margins and shrinking capital buffers. Further pressure would come from mark-to-market losses on remaining bond holdings, which would reduce the Tier 1 capital ratios of regional banks to 6 percent from 10 percent, and those of major banks to 9 percent from 12 percent.

Weak domestic conditions would likely accelerate outflows to both advanced and emerging markets. With limited opportunities for funneling savings into the domestic stock market or domestic lending, individuals, banks, and companies would be even more inclined to shift capital offshore. The lack of a recent history of substantial inflation in Japan makes it difficult to project outflows in the disorderly case, but given the availability of numerous foreign investment channels through an open financial account, a large increase could be possible at a rate well beyond that of the complete scenario (Table 1.5C). Based on recent flows, the net increase in exposure to emerging market currencies could be considerably more

[25]Rather, bond sales were precipitated by losses to capital, market uncertainty, and a desire to shrink exposures before VaR limits became binding. This stands in contrast to the VaR shock of 2003, when binding internal limits forced fire sales of bonds.

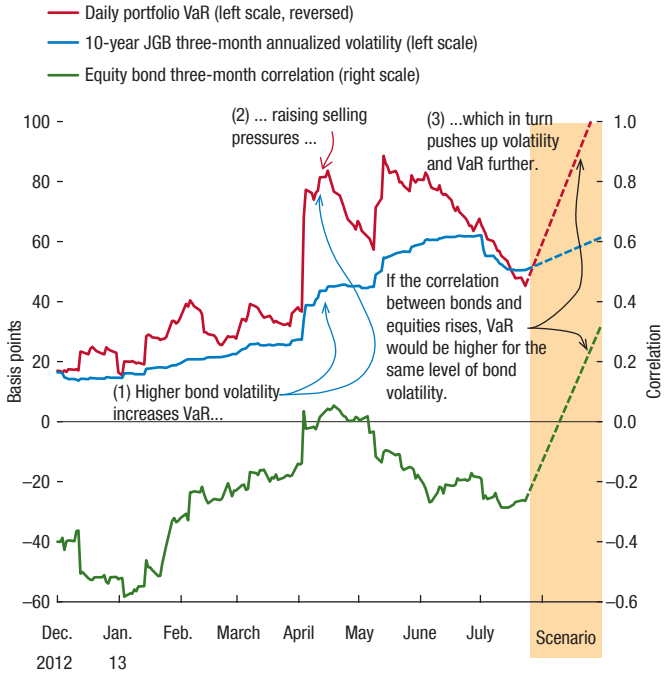
Figure 1.34. Japanese Banks' Sensitivity to an Interest Rate Shock

(Percent of Tier 1 capital; response to a 100 basis point shock)



Sources: Bank of Japan; and IMF staff estimates.

Figure 1.35. Value-at-Risk in the Disorderly Scenario



Source: IMF staff estimates.
Note: JGB = Japanese government bond; VaR = value at risk.

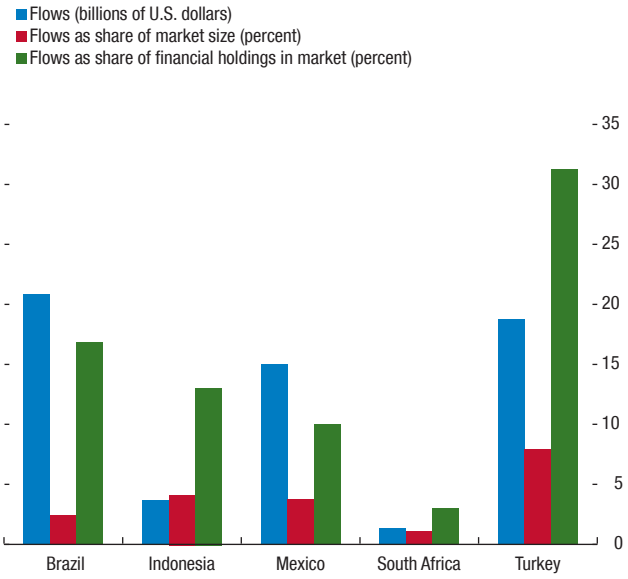
than the ¥7 trillion ($70 billion) a year that represents previous periods of heavy outflows (Table 1.5C and Figure 1.36), even under the assumption that advanced economy assets would make up the bulk of new purchases.[26] Popular targets for recent outflows have included higher-yielding and more liquid currencies, such as the Brazilian real, Mexican peso, Indonesian rupiah, and Turkish lira. As projected in Figure 1.36, annual flows from Japan into these fixed-income markets could be significant, amounting to as much as 8 percent of the overall government bond market and more than 30 percent of foreign holdings in the case of Turkey. Such investments, particularly those employing structured products, can be volatile, raising the prospect of increased volatility for currencies and asset markets in emerging markets.

[26]The largest increase in outflows would be among individual investors, which is the group with the highest average share of foreign assets in emerging markets.

Successful deployment of the three arrows of reform would support domestic financial stability, but incomplete implementation could bring new risks.

The success of the Japanese government's economic revitalization efforts would yield dividends for domestic financial stability, notably by reducing interest rate risks to the banking sector, improving portfolio diversification, and dampening volatility. Beyond the broad policy framework of Abenomics, certain specific changes in market structure would help mitigate risks. Technical adjustments in derivatives markets, including widening tolerance zones for the operation of circuit breakers, could increase the usefulness of available hedging instruments. VaR models could be further adjusted to reduce herding behavior. Regional banks should strengthen their capital bases to take better advantage of the BoJ's increased purchases of JGBs and increase lending to households and corporates. On the external front, regulators need to be conscious of the potential for risky structured products, such as currency overlay funds, to generate sudden price movements, large losses on household balance sheets, and spillovers to other markets.

Figure 1.36. Projected Flows to Selected Emerging Markets in the Disorderly Scenario



Sources: Haver Analytics; and IMF staff estimates.

The Euro Area Banking, Corporate, and Sovereign Nexus

Policy actions at the euro area and national levels have reinforced a collective commitment to the euro. This renewed commitment has helped ease the severe market stresses that had been weighing on sovereigns and banks. While funding conditions have improved, financial fragmentation persists, allowing the adverse feedback loop between banks, corporates, and sovereigns to continue in stressed economies.[27] *While there has been progress on bank repair, weak banks have been reinforcing the problems of weak corporates, while weak corporates have been exacerbating the pressures on weak banks. As a result, interest rates on corporate loans have remained elevated. Taking steps to reverse financial fragmentation will help reduce interest rates in stressed economies, but will not be sufficient to resolve the corporate debt overhang. Therefore, it is essential that efforts to repair bank balance sheets and to move to full banking union be complemented by a comprehensive assessment and strategy to address the problem of debt overhang in the nonfinancial sector. Further monetary support by the European Central Bank (ECB) and credit support to viable firms by the European Investment Bank are crucial to provide time for the repair of private balance sheets.*

The ECB's Outright Monetary Transactions (OMT) framework has increased confidence that policymakers will avoid tail risks. Initial progress has also been made on banking union, including through the Single Supervisory Mechanism, political agreements on the European Stability Mechanism framework for direct bank recapitalization, and the Bank Recovery and Resolution Directive. This progress has helped ease the severe market pressures that had been weighing down on weaker sovereigns and banks, stabilize bank deposits, staunch capital flight, and narrow Target2 imbalances.[28]

Weak banks have been reinforcing the problems of weak corporates.

Nonetheless, financial fragmentation within the euro area has persisted,[29] reinforcing an adverse feedback loop between weak banks, corporates, and sovereigns in stressed economies and entrenching divergence in financial and economic conditions (Figure 1.37). As a result of this feedback loop, along with weak demand for credit, bank lending to stressed economies continues to contract, as discussed in more detail in Chapter 2 (Figure 1.38). Weak banks have been exacerbating the problems of weak corporates because institutions with thin buffers have been tightening credit conditions for corporates by rationing credit and increasing the interest rates on new loans (Figure 1.39). Evidence from individual banks suggests that even within stressed economies in the euro area, weaker banks are more likely to cut back lending (Figure 1.40).[30]

Sovereign risks have abated, but sovereign spreads remain differentiated within the euro area (Figure 1.41). Furthermore, spreads widened somewhat during the recent period of market volatility, though in most cases they are now tighter than they were at the

[27]The term "stressed economies" generally includes Cyprus, Greece, Ireland, Italy, Portugal, Spain, and Slovenia, though in some parts of the section it may refer to a subset of these economies.

[28]Target2, the main payment system within the European Monetary Union, works through the individual national central banks (NCBs) of each of the euro area countries. The settlement of cross-border payment flows between euro area countries in Target2 results in claims and liabilities for each NCB. The Target2 balance for an NCB is the net of these claims and liabilities.

[29]Foreign claims of core euro area banks on stressed economy sovereigns, banks, and the nonfinancial private sector are at 40, 38, and 26 percent of their June 2011 peaks, respectively.

[30]This is consistent with the Bank of Italy's April 2013 *Financial Stability Report,* which presents evidence that in 2012 the growth of lending to firms was positive for banks with stronger capital ratios and lower funding gaps.

time of the April 2013 GFSR. As discussed in previous GFSRs, as well as IMF (2013a), divergence in sovereign spreads has raised funding costs for banks in stressed economies, putting further upward pressure on lending rates. Second-tier and small banks in stressed economies have been facing the greatest wholesale funding strains, and it is these banks that tend to be the main providers of credit to small and medium enterprises (SMEs) (see ECB, 2013b, pp. 67–68).

Weak corporates have exacerbated the pressures at weak banks.

At the same time, weak corporates have exacerbated the problems of weak banks. Corporate leverage increased in stressed economies during the boom years, especially in Portugal and Spain, in contrast to the core euro area (Figure 1.42).[31] This is particularly the case for SMEs, which tend to have higher leverage than do larger firms (Figure 1.43). Overall, more than three-quarters of corporate debt in Portugal and Spain and about half of corporate debt in Italy is owed by companies with debt-to-assets ratios at or above 40 percent (Figure 1.44).[32]

High to moderate leverage has interacted with weak profitability to create debt-servicing difficulties for companies, particularly because sovereign and banking stress along with other factors that contributed to financial fragmentation have raised corporate funding costs in stressed economies.[33] Overall, almost 50 percent of debt in Portugal, 40 percent of debt in Spain, and 30 percent of debt in Italy is owed by firms with an interest coverage ratio of less than 1 (Figure 1.45).[34] These firms would be unable to service their debts in the medium term unless they make adjustments such as reducing debt, operating costs, or capital expenditures.

These debt-servicing pressures—along with a weak economic environment—have led to an increase in nonperforming loans, worsening the quality of the assets on bank balance sheets (Figure 1.46). Banks have raised

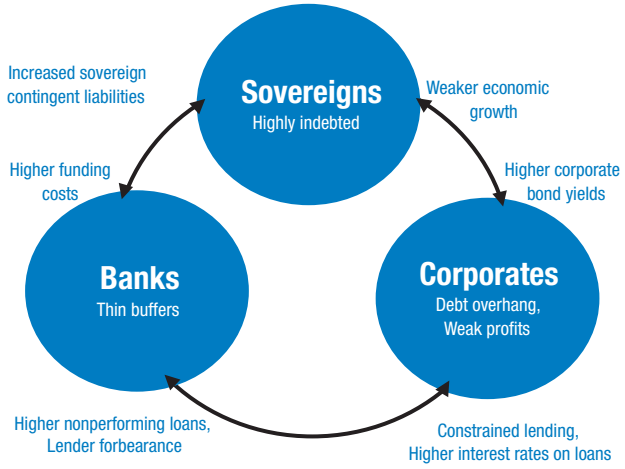
[31]ECB (2013a) also discusses the accumulation of corporate debt in the euro area. IMF (2013a) also looks at constraints to growth and credit posed by the negative feedback loop between high private debt and the weak financial sector.

[32]A debt-to-assets ratio of 30 percent usually corresponds to a Ba credit rating, and a 35 percent debt-to-assets ratio usually corresponds to a B credit rating.

[33]See also Chapter 2.

[34]Interest coverage ratio (ICR) is defined as earnings before interest and taxes (EBIT) divided by interest expense. Interest revenues or financial revenues are included in the calculation of earnings (and thus partly offset interest expense).

Figure 1.37. Bank-Corporate-Sovereign Nexus



Source: IMF staff.

interest rates in response to the increased riskiness of corporate loans, starting the cycle again. Figure 1.47 shows that bank interest rates tend to be higher in economies in which corporate risks are higher, as proxied by Moody's expected default frequencies of publicly traded firms. Furthermore, greater debt-servicing difficulties at SMEs are reflected in higher interest rates on small bank loans.

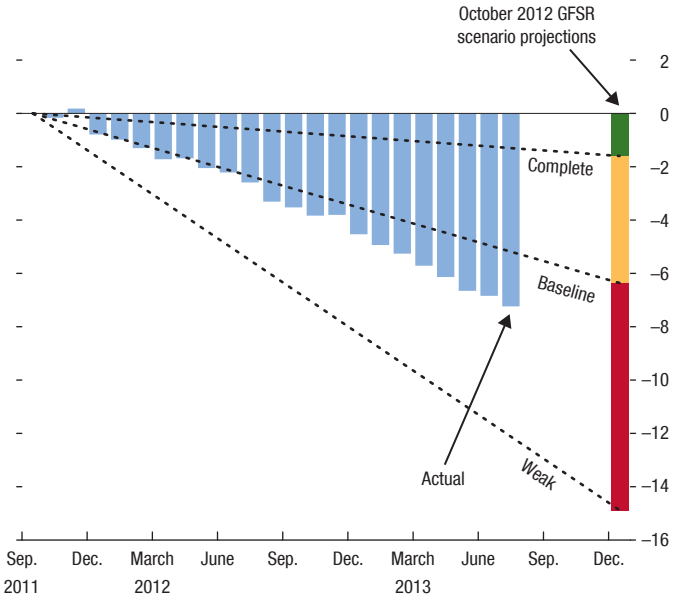
Banks with weak balance sheets will be less able and willing to recognize losses and so will become more likely to forbear on loans. Although some forbearance may help ease pressures on individual borrowers, widespread forbearance poses the risk that banks will devote scarce resources to unhealthy corporates, crowding out lending to healthier and more productive firms.

In addition, firms facing higher debt-servicing costs—caused by high leverage and remaining fragmentation—have been forced to adjust their businesses, as discussed in the April 2013 GFSR. In 2012, dividend payments were reduced sharply by Spanish and Italian companies, and large international firms have been selling foreign assets.[35] In addition, publicly traded firms in Portugal and Spain reduced capital expenditures by over 15 percent (Figure 1.48). Although deleveraging is needed, excessive cutbacks in capital expenditure—especially amid remaining fragmentation—may further undermine economic growth prospects.

[35]The need to preserve or obtain investment-grade credit ratings to maintain or gain access to capital markets is a critical driver of deleveraging efforts by large companies in stressed euro area economies. This is especially the case because rating agencies have tightened requirements for the ratio of debt to EBITDA (earnings before interest, taxes, depreciation, and amortization) during the euro area crisis.

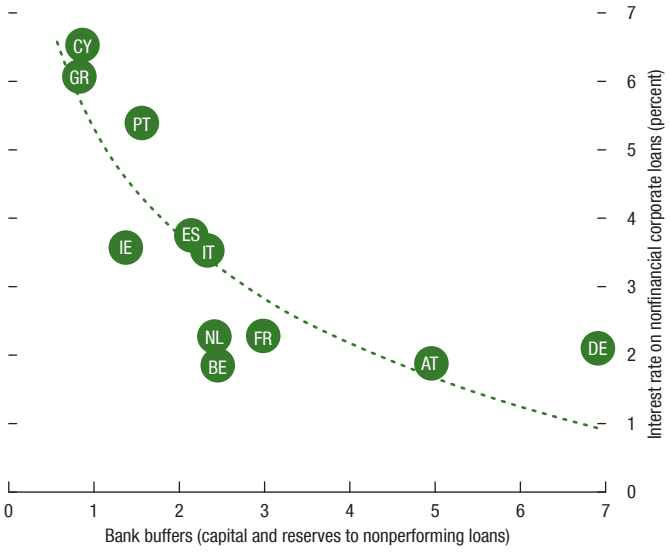
Figure 1.38. Stressed Euro Area Economy Bank Credit

(Percent change, cumulative since September 2011)



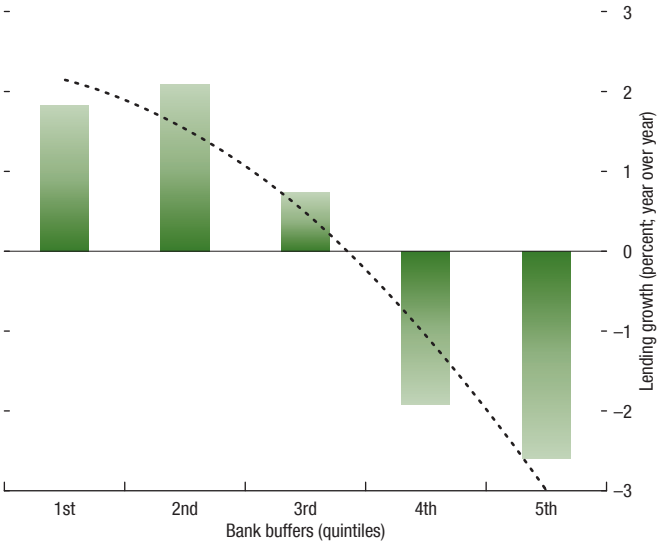
Sources: Haver Analytics; and IMF staff estimates.
Note: Euro area lending by banks located in Ireland, Italy, Portugal, and Spain, adjusted for securitizations.

Figure 1.39. Bank Buffers and Interest Rates on Corporate Loans



Sources: European Central Bank (ECB); ECB Consolidated Banking Data; IMF Financial Soundness Indicators; and IMF staff estimates.
Note: Differences in definitions of nonperforming loans complicate comparisons across economies. Italian nonperforming loans have been adjusted to make them more comparable with other economies, following Barisitz (2013). German nonperforming loans are estimated using ECB Consolidated Banking Data. Figure shows data as of July 2013 or latest data available. AT = Austria; BE = Belgium; CY = Cyprus; DE = Germany; ES = Spain; FR = France; GR = Greece; IE = Ireland; IT = Italy; NL = Netherlands; PT = Portugal.

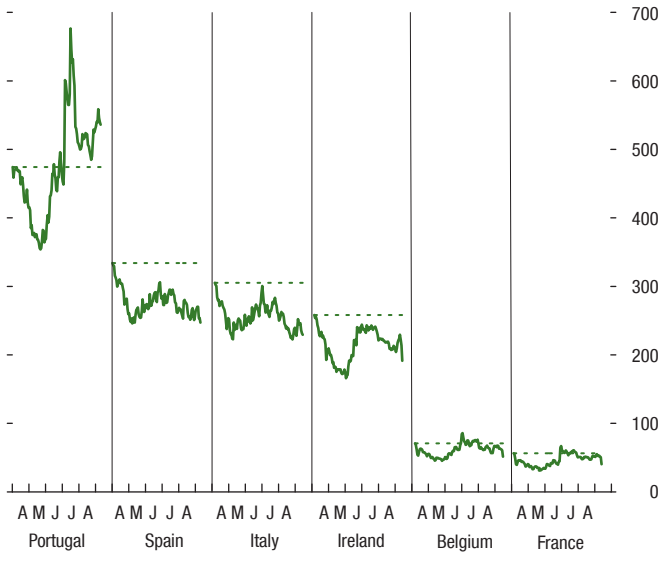
Figure 1.40. Individual Bank Buffers and Lending in Stressed Economies, 2013:Q1



Sources: SNL Financial; and IMF staff calculations.
Note: The figure shows average lending growth for the individual banks in each quintile. The figure is based on consolidated data for a sample of almost 70 banks headquartered in Cyprus, Greece, Ireland, Italy, Portugal, Slovenia, and Spain. Bank buffers are defined as the ratio of core Tier 1 capital and loan loss reserves to impaired loans. The figure uses 2013:Q1 or latest available data.

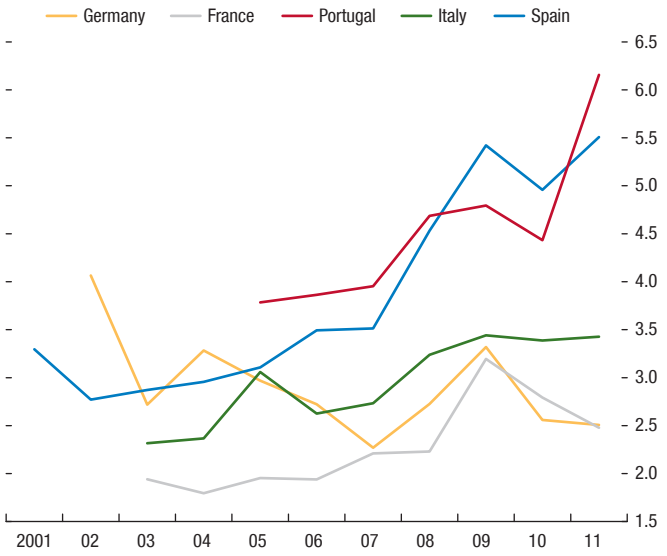
Figure 1.41. Euro Area Sovereign Spreads, April–August 2013

(Five-year spreads to German bunds; basis points)



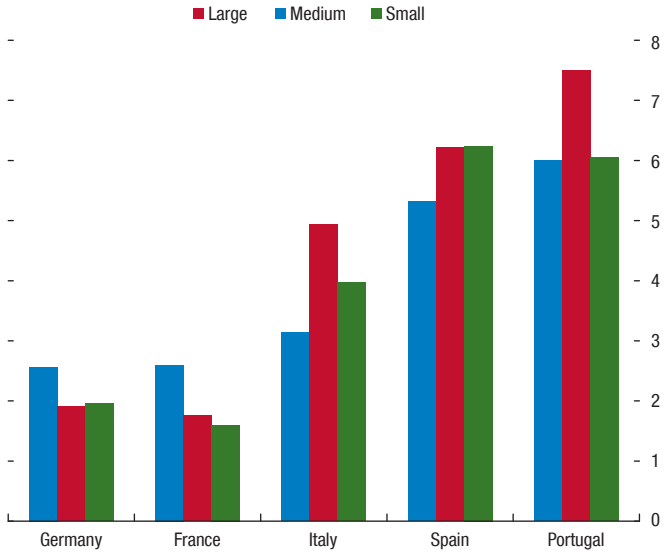
Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: AMJJA = April, May, June, July, August. Dotted line represents April 2013 level.

Figure 1.42. Leverage Ratios
(Debt to EBITDA)



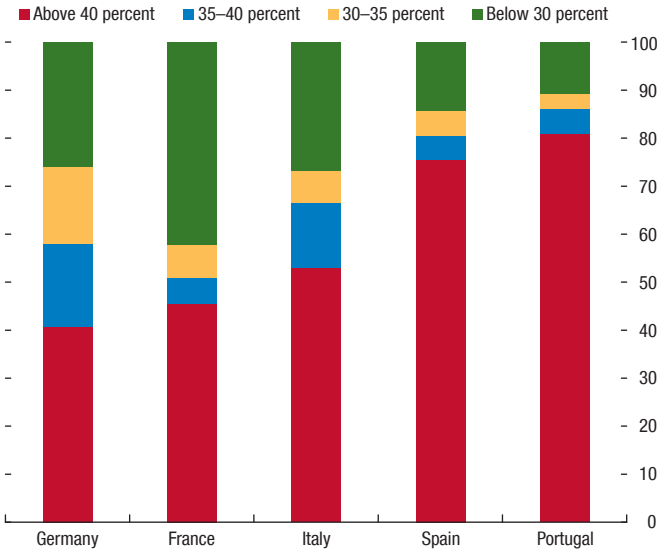
Sources: Amadeus database; and IMF staff estimates.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization.

Figure 1.43. Leverage Ratios by Firm Size, 2011
(Debt to EBITDA)



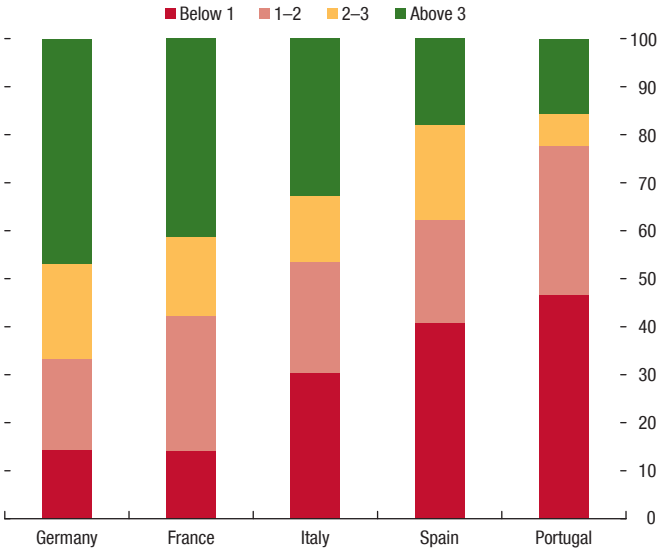
Sources: Amadeus database; and IMF staff estimates.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization.

Figure 1.44. Share of Debt at Firms with Various Debt-to-Assets Ratios, 2011
(Percent of total debt)



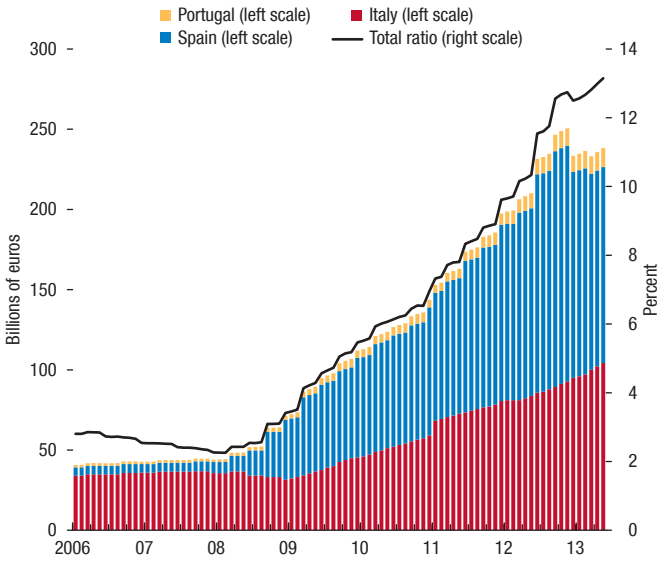
Sources: Amadeus database; and IMF staff estimates.

Figure 1.45. Share of Debt at Firms with Various Interest Coverage Ratios, 2011
(Percent of total debt)



Sources: Amadeus database; and IMF staff estimates.

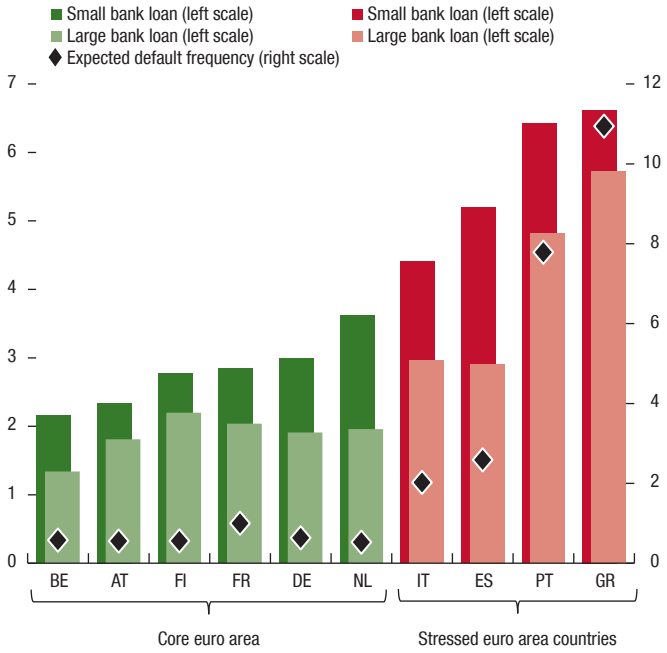
Figure 1.46. Nonperforming Corporate Loans



Sources: National central banks; and IMF staff calculations.
Note: Differences in definitions complicate the comparison of nonperforming loans across economies. Data for Italy show bad loans only.

Figure 1.47. Corporate Expected Default Frequencies and Bank Loan Interest Rates

(Percent; July 2013)



Sources: Bloomberg, L.P.; European Central Bank; Moody's Credit Edge; and IMF staff calculations.
Note: Small loans have a value of €1 million or less. Expected default frequencies (one year) are the average of the 25th, 50th, and 75th percentiles; the sample comprises publicly traded firms. AT = Austria; BE = Belgium; DE = Germany; ES = Spain; FR = France; GR = Greece; FI = Finland; IT = Italy; NL = Netherlands; PT = Portugal.

How has the bank-corporate-sovereign nexus affected interest rates on corporate loans?

In general, banks should price loans so that the interest rate is greater than the sum of their funding costs, required return on equity backing the loan, and a credit margin. In stressed economies of the euro area, these three components of interest rates have been affected by several factors: (1) higher sovereign risk, (2) bank balance sheet health, (3) corporate riskiness, and (4) the economic and policy environment, as illustrated in Figure 1.49.

The importance of these factors is assessed econometrically using monthly data over 2003–13 for France, Italy, and Spain for interest rates on small loans, many of which are extended to SMEs.[36] The results suggest, as expected, that sovereign stress and banking system weaknesses have been the key driving forces behind higher interest rates on small loans in Italy and Spain, particularly from mid-2011 onward (Figure 1.50). Corporate credit risk is also a significant factor in higher lending rates in Italy and Spain (see Annex 1.1 for details).

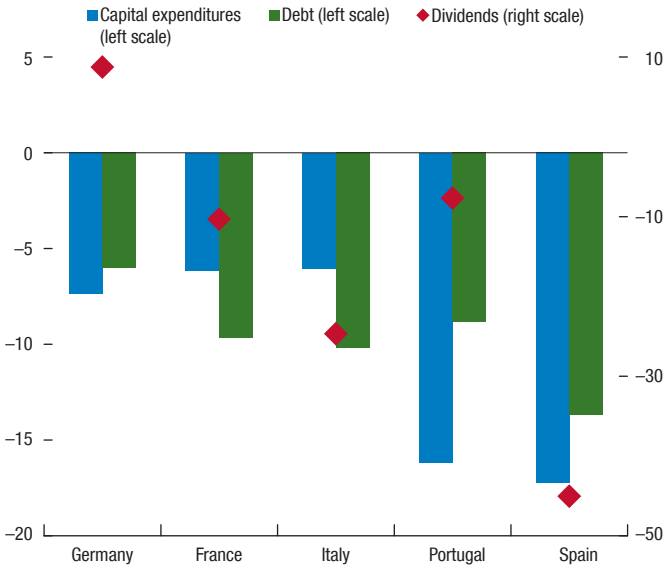
These findings are broadly consistent with recent studies, including the ones on Portugal.[37]

Conversely, the pass-through of the ECB's easy monetary policy stance has provided some downward pressure on bank lending rates. Yet monetary policy has been insufficient to offset other pressures that have driven up interest rates on loans to SMEs. In addition, deep and prolonged recessions in Italy and Spain have depressed the demand for loans from nonfinancial corporates.

[36]The analysis is based on a vector error correction model, which includes money market rates, sovereign stress, and banking and business cycle variables as endogenous variables that determine equilibrium lending rates, as well as a number of exogenous variables, including corporate credit risk. (See Annex 1.1 for details.)

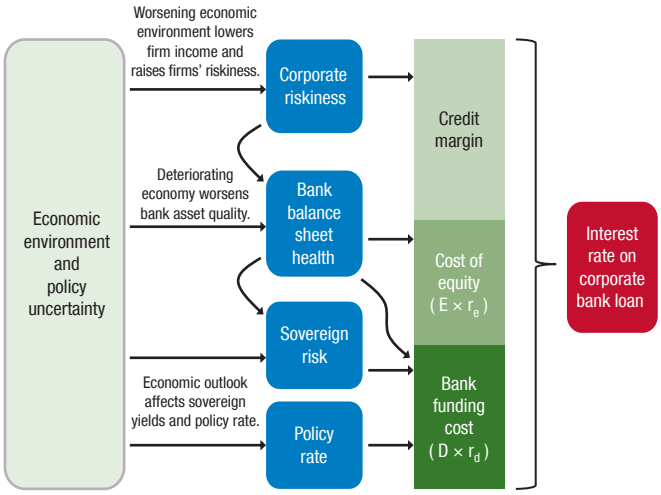
[37]IMF (2013a) concludes that "funding costs, credit risk, and leverage have become important determinants of lending rates since the onset of the crisis, particularly for stressed countries, and that these factors appear to be more relevant for small loans, typically associated with SMEs." A recent study by the Bank of Portugal (Santos, 2013) using data on new loans to nonfinancial firms found that the firm-level z-score indicator (which captures the firm's credit risk) and bank deposit rates are significantly and positively related to the level of interest rates (after controlling for several loan-, firm-, and bank-specific characteristics). Furthermore, IMF (2013e) identifies sovereign debt crisis and bank funding pressures as the key determinants of the higher lending rates in Portugal, together with weak domestic conditions and profitability in the context of overleveraged private sector balance sheets.

Figure 1.48. Listed Firms: Changes in Debt, Capital Expenditures, and Dividends
(Percent; end-2011 to end-2012)



Sources: Worldscope; and IMF staff estimates.

Figure 1.49. Factors Affecting Bank Interest Rates on Corporate Loans



Source: IMF staff.
Note: E = proportion of equity backing the loan; r_e = required rate of return on equity; D = proportion of wholesale funding and deposits backing the loan; r_d = marginal bank funding cost. This simplified loan pricing equation abstracts from tax rates and other expenses or benefits related to the loan.

The factor decompositions in Figure 1.50 suggest that sovereign and banking stresses have played an important role in keeping the lending rates elevated in Italy and Spain.[38] Spanish bank stress had been simmering since early 2010, a longer period than in Italy, where the sovereign crisis did not escalate until mid-2011. Figure 1.50 also shows that the contributions of sovereign and banking stress have declined since the establishment of the ECB's OMT framework and because of the reform progress at the national level.[39] In contrast, in France, sovereign and banking stress have played virtually no role in determining interest rates on corporate loans with lending rates driven primarily by monetary policy.

This framework can be used to estimate the impact of financial fragmentation—the contribution of sovereign and banking stress—on bank lending rates. If the influence of sovereign and bank stress (the red bars in Figure 1.50) is removed, the current interest rate on new small loans would be about 100 basis points lower in Italy and 160 basis points lower in Spain. As with any model, these point estimates are only indicative. That said, if lending rates were to decline to the levels consistent with their precrisis spreads over 7-year swap rates (see Figure 1.50), they would be about 150 and 200 basis points lower in Italy and Spain, respectively.

Can the corporate debt overhang be resolved by removing financial fragmentation?

To assess the scale of the current corporate debt overhang—measured as the share of corporate sector debt with an interest coverage ratio (ICR) of less than 1—a detailed data set covering more than 3 million individual companies is used (see Annex 1.2 for more details).[40] The current debt overhang is estimated to

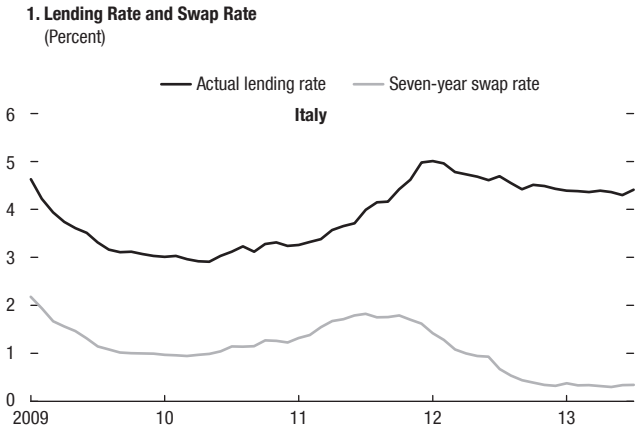
[38]See also Chapter 2. A high degree of interdependence between sovereign and banking risks means that any separation of their respective contributions is bound to be imprecise and dependent on the specific way in which these risks are measured (see Annex 1.1 for details).

[39]In the case of Spain, progress on the restructuring of the banking sector has been an important factor in the improvement of financial conditions.

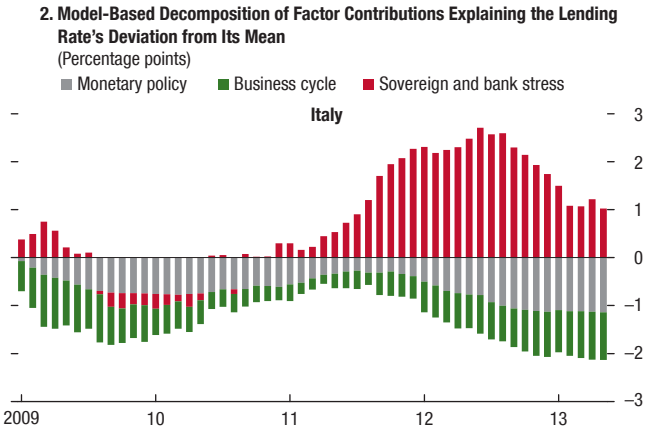
[40]ICRs for 2013 are estimated based on a regression of corporate profitability (EBIT over assets) on GDP growth estimates and actual interest rates on corporate loans (see Annex 1.2). In the case of Portugal, the estimated ICRs are adjusted using actual 2012 data by sector/size provided by the Bank of Portugal. Debt is assumed to be constant at 2011 levels throughout the projection period of the exercise. This assumption may overstate the extent of debt overhang estimated for 2013 in the three economies. The available data for Spain show a significant decline in corporate debt levels in 2012. However, data on reduction in assets are not available, and these are necessary to estimate the effect on profitability and, consequently, the debt overhang. In addition, price effects of asset sales have to be taken into account, as price discounts that are likely to be incurred by SMEs and firms under deleveraging pressures would hurt profitability.

Figure 1.50. Interest Rates on Small Bank Loans and Model-Based Factor Decomposition

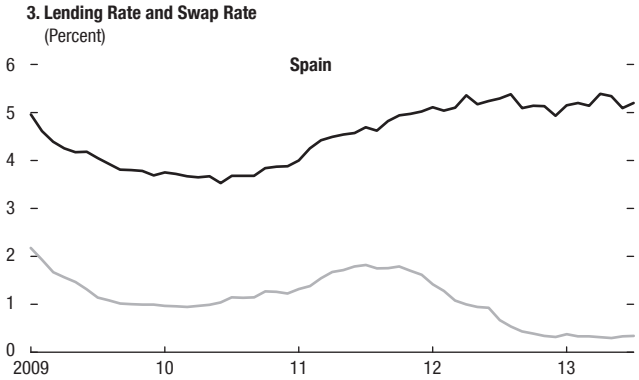
Italian lending rates on small loans have remained elevated despite a significant decline in swap rates…



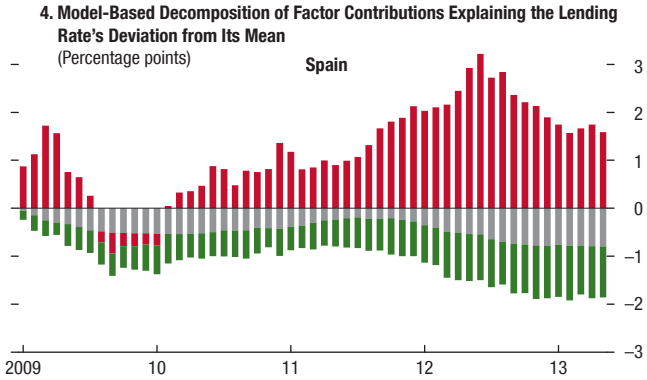
…reflecting elevated banking stress and residual sovereign pressures.



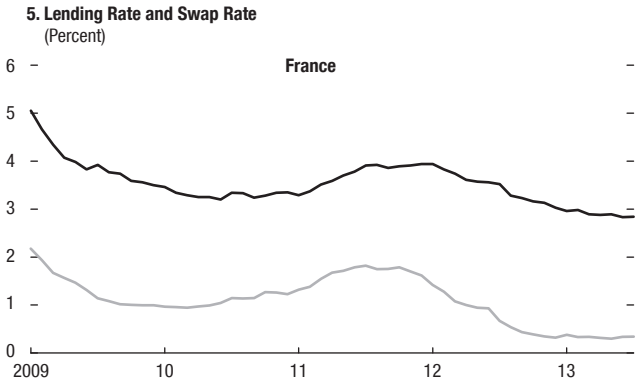
In Spain, the spread between the interest rate on small loans and the swap rate has also widened well beyond its historical norm…



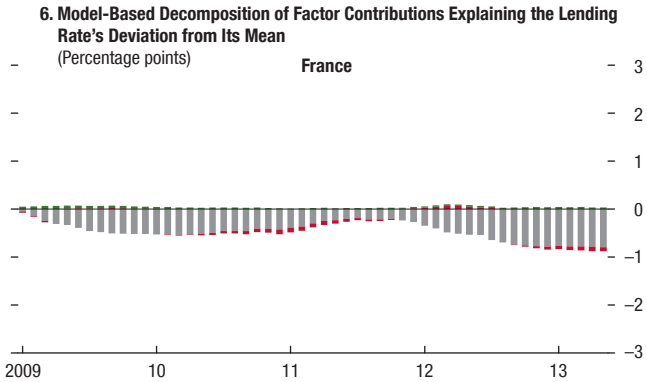
…predominantly due to persistent banking strains…



…while in France, it remained constant.



In France, the transmission from monetary policy is the dominant factor keeping lending rates low.



Source: IMF staff estimates.

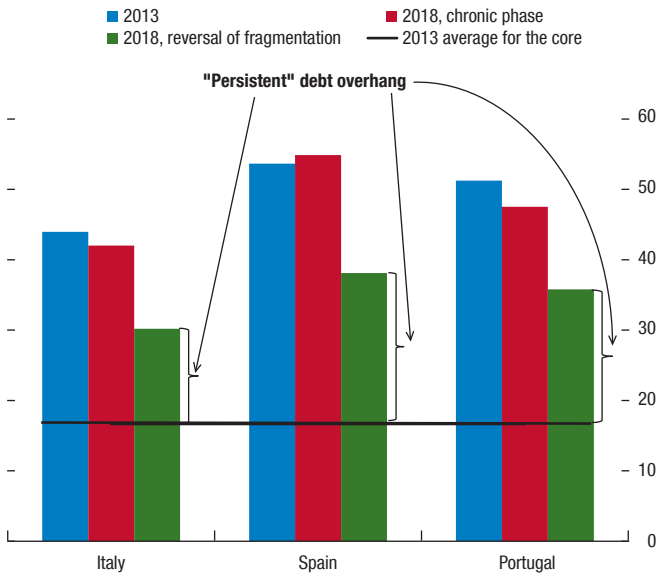
be large, amounting to between 45 and 55 percent in the stressed economies of the euro area in 2013 (Figure 1.51). To gauge the scale of the debt overhang on a forward-looking basis, two scenarios are used:

- *Chronic-phase scenario.* This scenario assumes that bank lending rates rise further as stalled delivery on policy commitments leads to persistent financial fragmentation and as credit margins increase, following a deterioration in the economic outlook under the October 2013 WEO alternative baseline scenario.
- *Reversal-of-fragmentation scenario.* This scenario assumes that sovereign and banking risks abate as further progress is made toward banking and fiscal union, leading to a decline in corporate funding costs (in line with the results shown in Figure 1.50). Growth in stressed economies recovers along the lines of the October 2013 WEO baseline scenario, which assumes an improvement in competitiveness on the back of continued implementation of national reforms.

Under the chronic-phase scenario, the size of the debt overhang remains broadly unchanged from current high levels, and corporates fail to escape the debt overhang trap even in the medium term, further suppressing prospects for economic recovery (see Figure 1.51). Under the reversal-of-fragmentation scenario, the debt overhang is reduced substantially as corporate profitability benefits from economic recovery underpinned by structural reforms and favorable financing conditions. However, even when economic growth picks up and financial fragmentation is reversed, a sizable portion of firms in stressed economies remains financially vulnerable. Hence, a more comprehensive approach to address this "persistent" debt overhang, amounting to almost one-fifth of total corporate debt in these three countries, will be required to support the flow of credit to healthier companies needed for sustained economic recovery.[41]

[41]The "persistent" debt overhang is the share of debt in the stressed economies owed by financially vulnerable firms (those with an ICR of less than one) under the reversal-of-fragmentation scenario, in excess of the equivalent share of debt in the core euro area economies. The core euro area is chosen as a benchmark because the debt-at-risk levels in the core have been relatively stable before and throughout the crisis (see Annex 1.2) and under the reversal-of-fragmentation scenario, corporates in the stressed economies and the core euro area will face similar financial conditions. The cross-country differences in the industrial structure per se should not lead to divergent levels of debt-at-risk across countries with similar economic and financial conditions.

Figure 1.51. Corporate Debt Overhang
(Debt of firms with an interest coverage ratio < 1 as a percentage of total debt)



Sources: Amadeus database; and IMF staff estimates.

The systemic nature of the debt overhang in Italy, Portugal, and Spain is further underscored by the fact that corporate sector strains are not limited to just the sectors that experienced credit booms (construction and real estate in Spain and Portugal). Estimated probabilities of default (PDs) suggest that stresses are also high in the cyclical and manufacturing sectors in the stressed economies (Figure 1.52).[42] In addition, strains at SMEs are greater relative to those at large corporates in Italy, Portugal, and Spain, and also in France, because large corporates benefit from stronger fundamentals and financing conditions.

What are the implications of the corporate debt overhang for banks?

This GFSR examines the corporate exposures of banks in Portugal, Spain, and Italy, as these are systemically important economies where the corporate debt overhang is sizable and where firm-level data are sufficiently comprehensive to carry out this type of exercise. This analysis provides an illustration of the potential magnitude of corporate risks for banking systems, thus making the strong case that the ECB's upcoming bank balance sheet assessment should, among other

[42]See Annex 1.2 for details.

Figure 1.52. Distribution of Estimated Corporate Sector Probabilities of Default
(2011, over the next two years; based on interest coverage ratios of nonfinancial firms)

	Large			Small and medium enterprises		
	Construction	Manufacturing	Cyclicals	Construction	Manufacturing	Cyclicals
Germany	1	1	1	1	1	2
France	1	2	1	3	4	3
Italy	2	3	1	3	3	3
Spain	2	2	2	4	4	4
Portugal	3	2	4	4	4	4

Source: IMF staff estimates.
Note: The numbers indicate quartiles for the distributions of probabilities of default (PDs) across countries, sectors, and firm sizes. Segment-specific PDs are weighted averages of firm-specific PDs. Manufacturing includes manufacturing, utilities, and information technology. Cyclicals include wholesale and retail trade and all services.

things, focus on corporate exposures.[43] It is important to note, however, that to properly assess potential bank losses, a detailed bank-by-bank asset quality review and stress test is required, which is a different and a more precise exercise than the one presented in this report. The forthcoming bank balance sheet assessment and stress tests provide a golden opportunity to carry out a comprehensive and transparent evaluation across euro area banks that could help restore investor confidence in the quality of their balance sheets.

The analysis in this report aims to assess the impact of corporate strains on banks in the stressed economies from the corporate sector balance sheet perspective. It maps corporate vulnerability indicators (such as ICRs) into historical default rates to estimate firm-level probabilities of default (PDs). The country-level PDs are then calculated as weighted averages of the firm-level PDs.[44] Finally, the bank losses by country are estimated as the product of the country-level PDs, an assumed loss given default (LGD) rate, and the stock of corporate loans in the banking system. The potential losses for banks operating in Italy, Portugal, and Spain are estimated for 2014–15 based on projected corporate sector vulnerability indicators as of 2013 (Figure 1.53). A range of potential losses is estimated using a standard Basel LGD of 45 percent as the mid-point and a 10 percentage point variation around it to capture uncertainties about collateral valuations and recoveries.[45] Because the LGD assumptions are exogenous and the same for all countries, they may not capture some country-specific circumstances, including ongoing bank restructuring processes.

Assuming no further improvement in economic and financial conditions—which would correspond to a *more adverse outcome* than the cyclical improvement built into the October 2013 WEO baseline—some banks in the stressed economies could face sizable potential losses on their corporate exposures. Figure 1.53 presents estimates of potential losses over the next two years for the banking systems in Portugal, Spain, and Italy and compares them with banks' estimated total loss-absorption capacity, which includes current provisions for corporate loans, future pre-provision earnings, and capital buffers (green bars in Figure 1.53).[46]

Based on this indicative exercise for the more adverse outcome and under the 45 percent LGD assumption, the Spanish banking system could face an estimated €104 billion of gross losses on corporate exposures, but this is fully covered by existing provisions. Following several asset quality reviews and stress tests, Spanish banks have significantly increased provisions, especially on construction and real estate exposures. In the case of Italy, the estimated gross losses on corporate exposures could amount to €125 billion, which exceeds existing provisions by €53 billion. As Figure 1.53 illustrates, these estimated net losses (€53 billion) are covered by operating profits without eroding existing capital buffers, under the 45 percent LGD

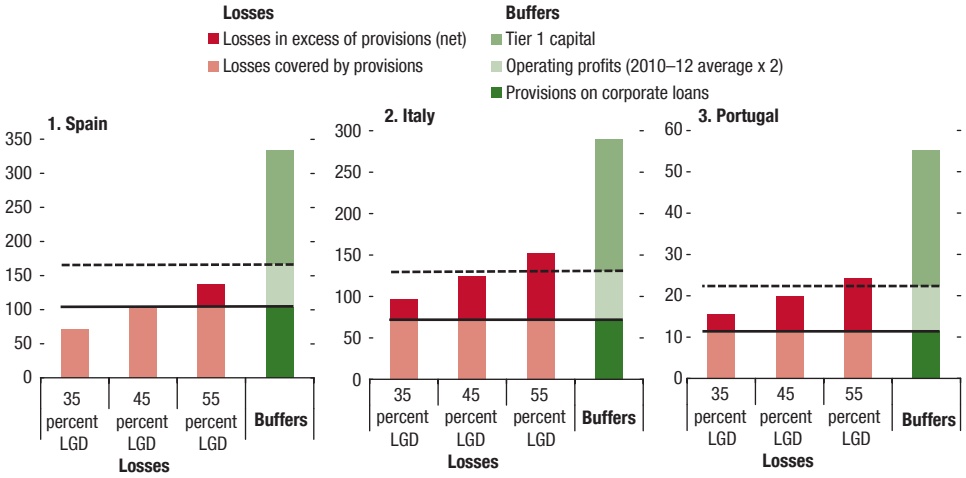
[43]The upcoming balance sheet review by the ECB will cover a wider range of assets, including those in other euro area countries and stemming from other types of exposures.

[44]In the absence of more precise bank-level information on corporate loan portfolios, ICRs are mapped into PDs by (1) assigning implied credit ratings to companies in the sample based on average ICRs by credit rating for companies rated by Moody's and (2) assigning PDs to each implied rating based on historical default rates of companies rated by Moody's (see Annex 1.2 for more details).

[45]In the case of Spain, the stress test carried out by Oliver Wyman has reduced uncertainty about collateral valuations.

[46]Spain's operating profits include domestic operating profits and foreign net profits (after provisions and taxes abroad), while provisions refer to business in Spain only.

Figure 1.53. Potential Losses on Corporate Loans and Banking System Buffers
(For the next two years, based on projected corporate vulnerability indicators as of 2013; billions of euros)



Sources: Amadeus database; Financial Soundness Indicators database; national central banks; and IMF staff estimates.
Note: LGD = loss given default. Spanish potential losses are adjusted for transfers to SAREB, the Spanish asset management company that took over the bad debt of restructured banks during the global financial crisis. Spanish operating profits include domestic operating profits and foreign net profits (after provisions and taxes abroad). Spanish provisions include about €4 billion of dynamic provisions.

assumption. For Portugal, the estimated gross losses on corporate exposures could be €20 billion, or €8 billon in excess of existing provisions. As Figure 1.53 illustrates, these estimated net losses (€8 billion) could be covered by operating profits without eroding existing capital buffers, under the 45 percent LGD assumption.[47]

Despite recent efforts to assess asset quality and boost provisions, this analysis suggests that some banks in the stressed economies might need to further increase provisioning to address the potential deterioration of asset quality on their corporate loan books, which could absorb a large portion of future bank profits.[48] Recently increased capital provides additional loss-absorption capacity, if needed.[49] Further measures, such as cuts in operating costs and reductions in dividends, will also help improve profitability and/or boost capital. However, as mentioned previously, provisioning and/or capital needs can only be ascertained precisely through a bank-by-bank asset quality review that looks into individual bank loan portfolios and takes into account provisions and capital held by each bank.

Specifically, the analysis in this report differs from the standard bank solvency stress tests in several important respects: (1) it considers gross corporate sector exposures of a banking system, including both performing and nonperforming loans (and hence, both expected and unexpected losses), whereas bank stress tests tend to focus on performing loans (unexpected losses); (2) it relies on PDs derived from the detailed firm-level data on corporate sector vulnerabilities using the same methodology for all economies, whereas solvency stress tests typically use country-specific PDs based on national historical default rates and models, as well as country-specific LGDs; and (3) it does not rely on bank-specific data and is not suitable for assessing bank capital needs (see Annex 1.2 for more details). Hence, the main goal of this exercise is to illustrate the potential scale of the asset quality issues in banks' corporate exposures for the forthcoming bank balance-sheet review to focus on.

[47]Buffers on domestic corporate exposures may be overestimated because provisions (including generic provisions), operating profits, and Tier 1 capital data are available only on a consolidated basis at the system level. Also, some of the losses may be borne by the household sector, as some SMEs may be able to draw on their owners' personal wealth.

[48]The central bank of Portugal has conducted three in-depth asset quality reviews with support from external consultants, including a detailed review of construction and real estate exposures (39 percent of the corporate sector), as well as a recent review of large exposures and collateral valuations (49 percent of total assets). Both reviews identified some shortfalls that were subsequently addressed. Similarly, the central bank of Italy has evaluated provisioning in selected banks (see Box 1.4 for more details).

[49]In some cases, banks are also able to provision against future losses. Core Tier 1 ratios of several banks in countries with IMF programs are comfortably above the hurdle rates set under the baseline and stress test scenarios on a forward-looking basis, according to banks' medium-term funding and capital plans. In general, implementation of forward-looking provisioning rules is, however, being undermined by the stalled attempts to adopt forward-looking impairment loss recognition in accounting standards.

What needs to be done to address bank weaknesses and the bank-sovereign negative feedback loop?

Investors' faith in euro area banks' balance sheets must be fully restored:

- A first step will be to conduct a comprehensive and rigorous bank balance sheet assessment and stress test, with involvement of independent, third-party auditors, as planned by the ECB.
- For the exercise to be credible, the sources of additional capital should be identified ahead of time, if shortfalls are found and private funds are insufficient. These funds need to be sufficiently large to accommodate the limited ability of some sovereigns to take on more debt. Adequate backstops are also important to avoid putting pressure on banks to scale back their balance sheets ahead of the assessment.
- Determination to resolve nonviable institutions will be critical to restoring the financial system to long-term health and to improving credit supply, especially to SMEs.

The banking union must be completed:

- Completion entails expediting reforms already under way, such as implementing the legislation for the Single Supervisory Mechanism and reaching final agreement on the Bank Resolution and Recovery Directive.
- The process should also involve the introduction of a strong Single Resolution Mechanism that ensures the swift restructuring or winding-up of banks while limiting the overall cost to taxpayers and establishing clear rules for investors. The euro area bank resolution process, as proposed in the draft Bank Resolution and Recovery Directive, will help weaken the bank-sovereign link. However, in the current environment, the limited scope and "negative leverage" entailed in European Stability Mechanism direct bank recapitalization places the burden of raising capital firmly back on bank shareholders and creditors or on the sovereign (even if financed upfront by European Stability Mechanism loans), or on both, and thus may not provide sufficient backstop should substantial capital shortfalls be found in economies with weak sovereign balance sheets.

What needs to be done to address the corporate sector debt overhang?

Measures to deal with the overhang should include the following:

- Expediting improvements to corporate bankruptcy frameworks in stressed economies to allow for swifter court processes, to provide clarity of collateral ownership and the exercising of rights over security, and to encourage out-of-court debt resolutions and write-offs, as recently done in Portugal.[50]
- Taking a more comprehensive approach to corporate debt cleanup. Where warranted, measures could include establishing a special asset management company to restructure corporate loans or providing incentives to banks to aggressively provision for nonperforming loans through tax or capital rules. Provisioned loans could then be written down or sold at a discount to specialist third parties.
- Actively facilitating nonbank sources of corporate credit. Steps could be taken to emulate France in developing a domestic corporate medium-term note market that has maintained positive net supply to domestic companies in recent years (e.g., through the maintenance of a domestic SME credit register by the central bank). Similarly, life insurers and pension funds could be encouraged to hold longer-term corporate loans or bonds if the authorities were to give them capital or regulatory relief for mitigating reinvestment risk.[51]

Further monetary support by the ECB is crucial to provide time for the repair of private balance sheets. Additional unconventional measures—including ensuring term funding for weak but solvent banks, or targeting credit-easing measures to SMEs—would be in line with the recent strengthening of the ECB's collateral framework and would help reduce fragmentation and prevent a more severe contraction in credit, while further conventional easing through lower policy rates would support demand across the euro area. At the same time, recent initiatives by the European Investment Bank and the European Commission to increase lending to SMEs could complement these efforts.

Global Banking Challenges: Profitability, Asset Quality, and Leverage

Global bank capitalization remains divergent because institutions are at different stages of balance sheet repair and operate in different economic and regulatory environments. Asset quality and profitability

[50]See Chapter 2.

[51]Solvency II proposals currently provide limited capital benefits for holding longer-maturity assets against long-term liabilities.

pressures at some euro area banks have reduced their ability to increase capital levels through retained earnings. Some institutions may, therefore, need to further cut back their balance sheets or raise capital to meet higher capital standards. The way in which this adjustment will take place has implications for the financial system and the real economy and has to be monitored. The key tasks are to improve credibility, transparency, and the strength of balance sheets, while avoiding undue pressures on banks from uncoordinated national regulatory initiatives and uncertainty.

Bank capitalization remains divergent.

Bank capital ratios—for this section's sample of institutions from jurisdictions with systemically important financial sectors—remain diverse.[52] Tier 1 capital ratios reported at end-2012 ranged from 5 to 21 percent, with the asset-weighted average standing just under 13 percent (Figure 1.54). Although these ratios are above the current regulatory minimum, full implementation of the Basel III standards will raise both the quantity and the quality of capital that banks have to hold to meet these standards.[53]

As Basel III capital standards became effective in 2013, many banks began reporting their capital ratios on a Basel III basis.[54] Based on the latest available information and IMF staff estimates for sample banks, fully loaded Basel III Tier 1 capital ratios are more than 2 percentage points lower than Tier 1 ratios reported at end-2012, on average (see Figure 1.54). Based on these estimates, banks from advanced economies tend to have slightly higher fully loaded Basel III Tier 1 ratios (more than 10 percent, on average) than do banks headquartered in emerging market economies (over 9 percent, on average).

In addition to risk-weighted capital ratios, investors are increasingly using unweighted leverage ratios to assess bank capitalization. This is partly in anticipation of new rules: the Basel Committee on Banking Supervision has finalized its leverage ratio proposal, and the United States has proposed new leverage standards.[55] But it also reflects lingering concerns about the consistency of approaches used by banks in different jurisdictions for calculating risk-weights, an issue that is being examined by the Basel Committee and by the European Banking Authority.[56] Because the data on netting and off-balance-sheet positions, which are needed to calculate the Basel III leverage ratio, are not published by all banks, investors often use tangible leverage ratios—such as the ratio of tangible equity to tangible assets—to gauge the relative strength of banks (Figure 1.55).

For some banks, these simple tangible leverage ratios and Tier 1 ratios appear to give conflicting signals about the strength of bank balance sheets. This tension is illustrated in Figure 1.56, which shows a number of banks in either the bottom-right or top-left quadrants of the figure; these quadrants are where the two ratios give different signals about bank balance sheet strength.

This apparent conflict reflects, in part, differences in business models and regulatory environments. The "universal banking" model, which tends to be used more in Europe, will naturally lead to a larger balance sheet when compared with a bank with the originate-to-distribute model, more commonly used in North America. The conflicting signals also highlight the importance of restoring investor confidence in the accuracy and consistency of bank risk weights. This also suggests that risk-weighted capital ratios should be supplemented by leverage ratios, as proposed in the Basel III framework.

[52]The analysis in this section is based on a sample of 113 large banks headquartered in jurisdictions with systemically important financial sectors (see IMF, 2010), plus two European banks headquartered in other countries that are considered systemically important for the region. Large banks in the following economies are included: advanced Asia-Pacific (Australia, Hong Kong SAR, Japan, Korea, Singapore); emerging Asia (China and India); emerging Europe (Russia and Turkey); euro area (Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Spain); Latin America (Brazil and Mexico); North America (Canada and United States); and other advanced Europe (Denmark, Norway, Sweden, Switzerland, United Kingdom).

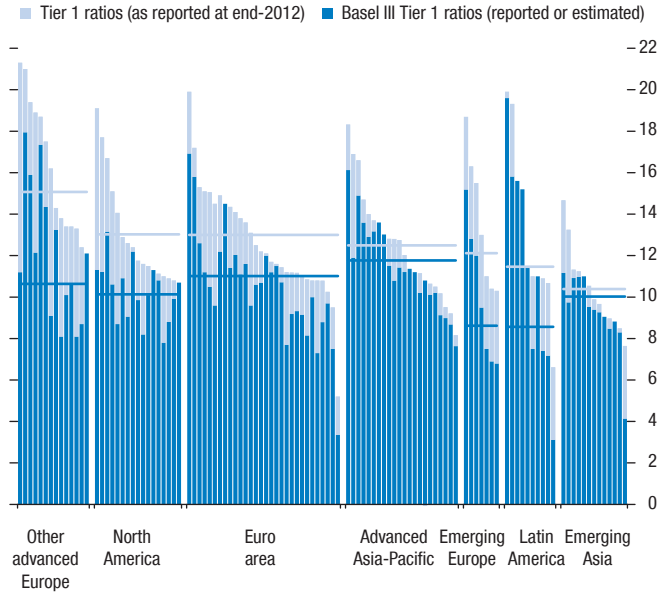
[53]See Box 1.3 for a comparison of regulatory requirements in selected jurisdictions.

[54]As of June 2013, 38 percent of sample banks had published their fully loaded Basel III Tier 1 capital ratios and another 17 percent of sample banks had published their core Tier 1 ratios. The September 2013 Basel III Monitoring Report, which uses detailed information that is not always publicly available, found that Basel III Tier 1 ratios for a group of large internationally active banks were around 3 percentage points lower than current Tier 1 ratios, based on December 2012 data. The report is available at http://www.bis.org/publ/bcbs262.htm.

[55]The Basel III leverage ratio began parallel run with the Basel II leverage ratio in January 2013 (see Box 1.3).

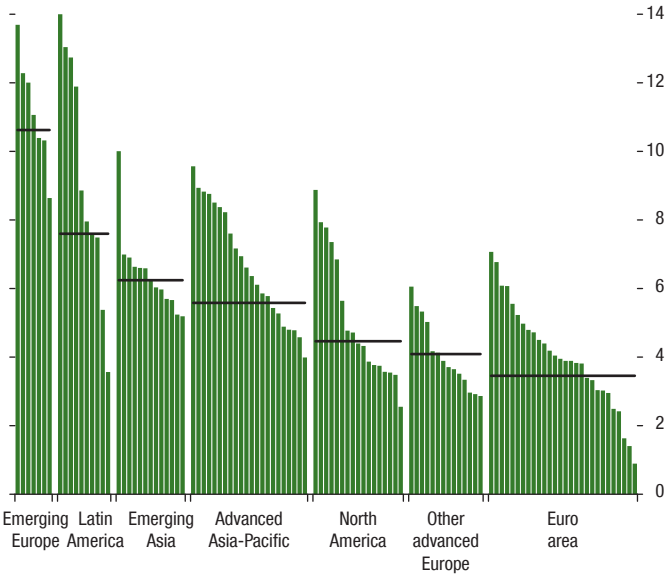
[56]Details of the Basel Committee's Regulatory Consistency Assessment Program can be found at http://www.bis.org/publ/bcbs216.htm; the European Banking Authority's work on this issue is available at http://www.eba.europa.eu/risk-analysis-and-data/review-of-consistency-of-risk-weighted-assets.

Figure 1.54. Large Bank Tier 1 Ratios
(Percent)



Sources: Bloomberg, L.P.; company reports; and IMF staff estimates.
Note: The fully loaded Basel III Tier 1 ratios are either values reported by banks (June 2013 or latest available) or are estimated by adjusting the Basel III core Tier 1 ratios (or the Tier 1 ratios reported according to current regulatory standards) by the average gap between the ratios reported by banks in the same region. The horizontal lines show the asset-weighted average ratios for the banks in each region. See footnote in text for makeup of regions.

Figure 1.55. Large Bank Tangible Leverage Ratios, 2012:Q4
(Percent)



Sources: Bloomberg, L.P.; company reports; Federal Deposit Insurance Corporation; and IMF staff estimates.
Note: The tangible leverage ratio is the ratio of adjusted tangible equity to adjusted tangible assets. The adjustment is made by subtracting goodwill, other intangibles, and deferred tax assets. For U.S. banks, these numbers also include adjustments for accounting differences in derivatives netting, in line with the methodology used in Hoenig (2013). However, some differences in accounting definitions may remain. The horizontal lines show the asset-weighted average ratio for the banks in each region. See footnote in text for makeup of regions.

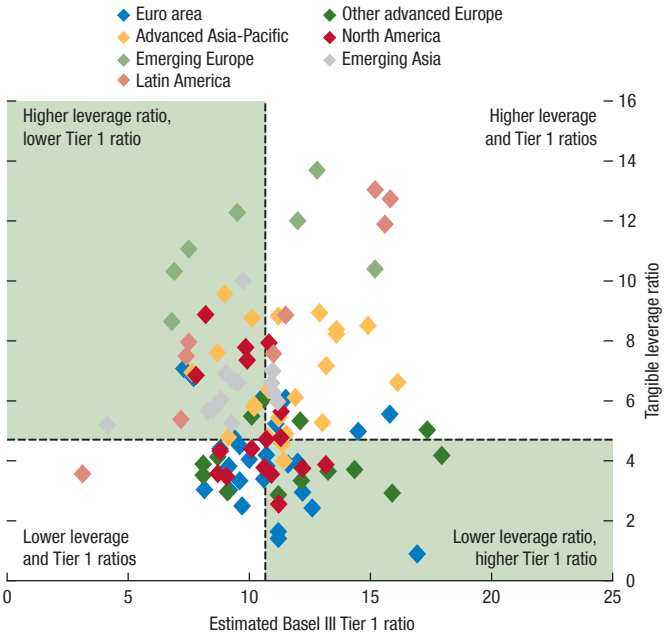
Asset quality pressures at some banks are affecting their profitability.

Bank profitability is now generally lower than it was before the onset of the global financial crisis, but this is likely the result of some unwinding of unsustainable levels of pre-crisis profitability. In emerging market economies, large banks are able to generate higher profits from their assets (return on assets of about 1.4 percent) than are large banks in advanced economies (return on assets of about 0.4 percent), on average (Figure 1.57). Revenues, especially net interest income, are significantly higher for banks in emerging Europe and Latin America than for banks in advanced economies, although loan loss provisions and expenses tend to be larger as well.

Among advanced economy banks, European institutions—and euro area banks, in particular—currently have the weakest profitability. Euro area banks have faced the combined pressures of increased funding costs, falling operating incomes, and rising loan loss provisions. The latter reflects deteriorating asset quality from the weak cyclical positions of these economies, exacerbated by the corporate debt overhang in stressed economies of the euro area. Some euro area banks—including Dutch, Irish, as well as Spanish banks—face challenges from their exposures to household debt. Recent IMF Financial Sector Assessment Program (FSAP) assessments of a number of European economies also found that continuing deterioration of credit quality weighs heavily on banks' already-thin profitability (see Box 1.4).

Concerns about bank asset quality are further compounded by uncertainty about the extent and nature of lender forbearance. Although the ECB's upcoming euro area asset quality review should help resolve some of these concerns, some supervisors are acting preemptively. The Italian central bank recently carried out a review of asset quality; the Bank of Spain is conducting an assessment of restructured loan classification; the Dutch central bank is reviewing commercial real estate lending; and U.K. authorities completed their asset

Figure 1.56. Large Bank Tier 1 Capital and Tangible Leverage Ratios
(Percent)



Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: See Figure 1.54 for details on the estimated Basel III Tier 1 ratio and Figure 1.55 for details on the tangible leverage ratio. The dotted lines show asset-weighted average ratios. See footnote in text for makeup of regions.

quality review in June 2013 by publishing bank-by-bank capital shortfalls.[57]

The link between weak profitability and asset quality is reflected in market valuations of institutions. Figure 1.58 shows that market capitalization as a percentage of assets—a market indicator of the effect of asset quality on bank capital—tends to be lower for banks with weak profitability.

Asset quality and earnings pressures will affect some banks' ability to increase their capitalization.

Weak profitability makes it more difficult for banks to raise their capitalization organically through retained earnings. This effect can be illustrated through a forward-looking exercise that projects bank capitalization in 2018 using analysts' forecasts of bank net income, assuming that balance sheets are unchanged. The objective of this exercise is to see how many institutions will likely not be able to reach these targets through retained earnings alone and therefore would

[57]For more information on the U.K. exercise, please see www.bankofengland.co.uk/publications/Pages/news/2013/081.aspx.

Figure 1.57. Bank Profitability Comparison
(Percent of total assets)

Sources: Bloomberg, L.P.; Federal Deposit Insurance Corporation; and IMF staff calculations.
Note: Shows the unweighted average for large banks in each region. Total assets of U.S. banks have been adjusted for netting of derivatives. See footnote in text for the countries in each region.

have to make further adjustments, that is, shrink their balance sheets, reduce risk-weighted assets, or raise capital. Projected bank capital levels are tested against two targets: an 11 percent target for the Basel III Tier 1 capital ratios and a 4 percent target for tangible leverage ratios. Although these two targets are not minimum regulatory requirements, they represent ratios that institutions may seek to reach given regulatory and market expectations.[58]

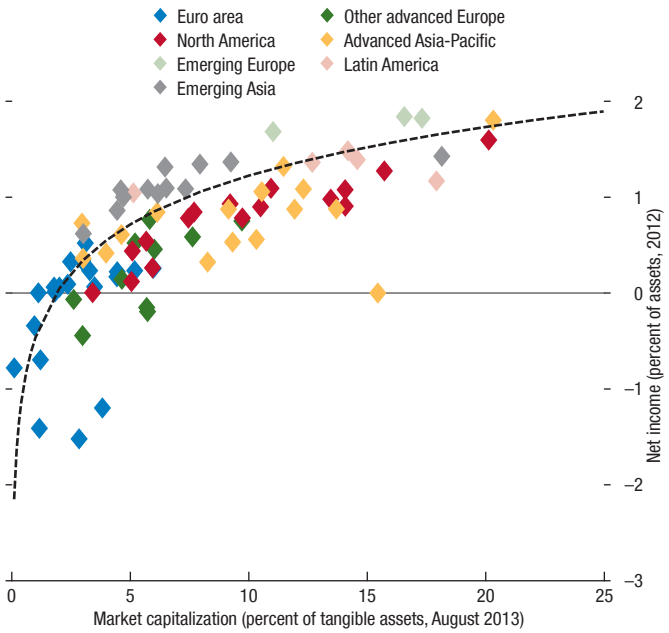
This projection exercise reveals that most banks in the sample already have, or should have, an estimated Basel III capital ratio of 11 percent (a tangible leverage ratio of 4 percent) by 2018 (Figure 1.59). However, around 4 percent of banks may not be able to meet these targets organically through retained earnings. Most of these institutions are in the euro area.

European banks have been deleveraging in response to market and regulatory concerns about capital levels, and may continue to do so.

Banks that are unable to meet capital ratio targets organically through retained earnings will need to either raise fresh equity in markets or cut back balance sheets. Indeed, a combination of market and regulatory concerns about bank capitalization has already led to an increase in capital levels at EU banks.[59] At the same time, large EU banks have continued to shrink their balance sheets, in aggregate. Over the period 2011:Q3–2013:Q2, large EU banks reduced their assets by a total of $2.5 trillion on a gross basis—which includes only those banks that cut back assets—and by $2.1 trillion on a net basis (Table 1.6).[60] These cutbacks in assets are currently running at a similar pace to the baseline scenario in the October 2012 GFSR. About 40 percent of the reduction by the banks in the EU as a whole was through a cutback in loans, with the remainder through scaling back noncore exposures and sales of some parts of their businesses.

Banks have been reducing their risk-weighted assets at a faster speed and have already cut back risk-weighted assets more than was envisaged in the October 2012 GFSR baseline scenario (see Table 1.6). As discussed in the April 2013 GFSR, banks have been concentrating on derisking their balance sheets by reducing capital-intensive businesses, holding greater proportions of assets with lower risk weights (such as government bonds), and optimizing risk-weight models. The capital ratio projection exercise previously discussed suggests that some banks will need to continue raising equity or cutting back balance sheets as they endeavor to repair and strengthen their balance sheets.

Figure 1.58. Bank Profitability and Market Valuation of Assets



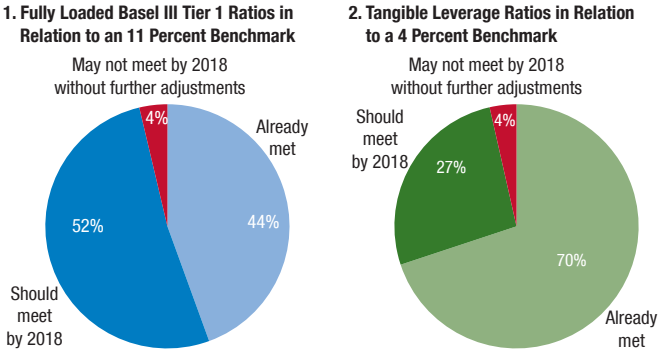
Sources: Bloomberg, L.P.; and IMF staff estimates.
Note: Assets of U.S. banks have been adjusted for netting of derivatives. See footnote in text for the countries in each region.

[58]Because the Basel III standards have not been universally adopted, identifying a common benchmark that banks across more than 20 jurisdictions may strive to achieve is not straightforward. Some regulators may actually set more ambitious and/or different targets for their banks than the Basel III minimum requirements described in Box 1.3. For example, (1) the U.K. Prudential Regulatory Authority has asked banks to meet a Basel III 7 percent common equity Tier 1 ratio by end-2013, ahead of the Basel III timetable, after implementing additional deductions from capital for potential losses and expected conduct-related costs, as well as using higher risk weights for certain exposures; (2) the United Kingdom's 3 percent leverage ratio has similarly been set in more tightly defined terms than in Basel III; and (3) the United States has proposed its own leverage ratio minimum of 4 percent. Furthermore, some banks may seek to have capital ratios that are above regulatory minimums and so other institutions could be under pressure to catch up with their peers.

[59]EBA (2012) provides the results of their capital exercise, which resulted in an increase in capital levels at the banks included in the exercise.

[60]Adjustment is also occurring on the liabilities side of the balance sheet, although generally more slowly (see Chapter 3).

Figure 1.59. Large Bank Capitalization



Sources: Bloomberg, L.P.; company reports; and IMF staff estimates.
Note: For the categories "Should meet by 2018" and "May not meet by 2018 without further adjustments," the test is to allow banks to reach the target by retaining all of their net income (but without reducing their risk-weighted assets or raising new equity), where future average annual income is based on consensus analysts' forecasts. See Figures 1.54 and 1.55 for details of the estimated Basel III and tangible leverage ratios. Totals may not equal 100 percent due to rounding.

The transition to a stronger banking system requires further policy effort.

Banks in advanced economies continue to face profitability and asset quality pressures against a weak economic backdrop. These pressures keep banks focused on rationalizing their business models and balance sheets. However, bank balance sheet repair has yet to be completed. Although European banks have made significant progress on derisking and deleveraging their balance sheets, more needs to be done to improve earnings prospects and investor perceptions. Further deleveraging will need to be monitored to ensure that it occurs in an orderly manner and does not create adverse spillovers to the financial system and the real economy. In particular, it is important for the upcoming balance sheet review in the euro area to encourage banks to adjust in a "healthy" manner (for example through disposal of nonperforming assets and by raising capital) to avoid putting undue pressure on the real economy.

Credibility and transparency of balance sheets need to be shored up. Finalizing work on risk weights, harmonizing definitions of key financial indicators (such as nonperforming loans) used in different jurisdictions, completing accounting convergence, and introducing forward-looking provisioning will all help in that regard. Restoring investor faith in risk weights will also help ensure that risk-weighted capital ratios remain the main capital benchmark, with leverage ratios having a supplementary backstop function, as envisaged in the Basel III framework.

Finally, regulatory uncertainty and unintended consequences from multiple uncoordinated national regulatory initiatives should be minimized. National structural measures for banks (such as the Volcker, Vickers, and Liikanen proposals, as well as others) are another potential challenge, if implemented differently across jurisdictions, and could have unintended consequences on markets.[61]

[61]As discussed in the April 2013 GFSR and Viñals and others (2013).

Table 1.6. European Union Bank Deleveraging

	Change in Balance Sheet						
	Actual Change 2011:Q3–2013:Q2 (trillions of U.S. dollars)		October 2012 GFSR Scenarios 2011:Q3–2013:Q4 (trillions of U.S. dollars)			Progress against GFSR Baseline (percent)	
	Gross	Net	Complete	Baseline	Weak	Gross/Baseline	Assuming Smooth Adjustment
Tangible Assets (minus derivatives and cash)	–2.5	–2.1	–2.3	–2.8	–4.5	88	78
Risk-Weighted Assets	–1.3	–1.2	–0.8	–1.0	–1.9	126	78

Sources: SNL Financial; and IMF staff estimates.
Note: For a sample of 58 large European Union banks (see the April 2012 GFSR for a description of the sample). Gross shows the results for banks in the sample that cut back balance sheets. Net shows the change for all banks in the sample. The figures are rounded to the nearest 0.1 trillion.

Box 1.3. Financial Regulatory Reform Update

Although progress in global regulatory reform has been achieved over the past six months, there are a number of areas where further coordinated efforts are needed. While many of the reform initiatives are under way, gaps remain. Focus on timely and consistent implementation of agreed measures will remain a high priority. Priorities include strengthening prudential supervision through such measures as securing resources and independence of supervisors, restoring confidence in bank balance sheets, developing and implementing effective domestic and cross-border resolution regimes; facilitating implementation of over-the-counter (OTC) derivatives reforms through further cross-border coordination; and enhancing monitoring of shadow banking.

Progress on Basel III continues with 25 of the 27 Basel Committee on Banking Supervision member jurisdictions having issued the final set of Basel III capital regulations.[1] Two main jurisdictions—the United States and the EU—published their final Basel III regulations in the first week of July 2013

The authors of this box are Ana Carvajal, Marc Dobler, Ellen Gaston, Eija Holttinen, Fabiana Melo, Mala Nag, Oana Nedelescu, Nobuyasu Sugimoto, and Mamoru Yanase.

[1]For details, see the August 2013 BCBS progress report on Basel III implementation (www.bis.org/publ/bcbs260.pdf).

Table 1.3.1. Comparison of Bank Regulations across Jurisdictions

Regulation	Basel Minimum Standard	United States	European Union
		Capital	
Quality of Capital	Common equity to compose CET1, conservation and countercyclical buffers, and G-SIB surcharge Full compliance by 2018	Common equity to compose CET1, conservation and countercyclical buffers; no G-SIB surcharge (separately treated) Full compliance by 2018	Common equity to compose CET1, conservation and countercyclical buffers, and G-SIB surcharge Full compliance by 2018
Quantity of Capital	CET1 4.5% Conservation buffer 2.5% Countercyclical buffer 2.5%	CET1 4.5% Conservation buffer 2.5% Countercyclical buffer 2.5%	CET1 4.5% Conservation buffer 2.5% Countercyclical buffer 2.5%
G-SIB Buffer	Surcharge 1.0–3.5%	Not part of U.S. Basel III	Surcharge 1.0–3.5%
Leverage Ratio	BCBS has set minimum requirement at 3% for leverage ratio to complement risk-based capital ratio.	U.S. has revised its existing leverage ratio to require 4% (minimum) for all banking organizations. Supplementary ratio (BCBS format) was adopted at 3% (minimum) for internationally active banking organizations. Enhanced supplementary ratio has been proposed for bank holding companies (with over $700 bn in assets or $10 trn in assets under custody) at 5%. Further, insured depository subsidiaries of these firms will have to meet 6% leverage ratio to be well capitalized under the prompt corrective action regime.	EU is expected to adopt leverage ratio within Basel III proposed framework. CRR/CRDIV includes the calculation and reporting of a leverage ratio but does not yet establish it as a pillar 1 requirement.
		Liquidity	
Liquidity Supervision		U.S. Dodd-Frank Act, Section 165, requires banks with assets of more than $50 billion to hold liquidity buffers of highly liquid assets; this is broadly consistent with the objective of Basel III liquidity ratios.	The EU plans to adopt LCR and Net Stable Funding Ratio. LCR implementation phased in beginning in January 2015 at 60%, with full compliance by 2019. EU member states are to carry out supervision and monitor reporting of LCR compliance progress.
Liquidity Coverage Ratio	BCBS has identified the list of eligible Level 1 and Level 2 assets to constitute High Quality Liquid Assets. BCBS has proposed phase-in period starting in January 2015 and lasting through 2019.	No proposals.	The EU has outlined outflows and inflows in Capital Requirements Regulation. Further refinements to come from EBA on regulatory standards and to be adopted by the European Commission.
Net Stable Funding Ratio	BCBS intends to review NSFR. The objective is to ensure that banks maintain stable asset-liability profiles over a one-year horizon.	No proposals but expected at later date.	EU plans to adopt NSFR once the BCBS has finalized it.

Source: IMF staff.

Note: BCBS = Basel Committee on Banking Supervision; CET1 = common equity Tier 1; EU = European Union; G-SIB = global systemically important bank; LCR = Liquidity Coverage Ratio; NSFR = Net Stable Funding Ratio. U.S. leverage ratio is defined as Tier 1 capital over on-balance-sheet assets, whereas the U.S. supplementary leverage ratio is defined as Tier 1 capital over total leverage exposure, which includes both on-balance-sheet and certain off-balance-sheet exposures.

Box 1.3. *(continued)*

(Table 1.3.1). The BCBS is assessing the quality of implementation of its members through "Level 2" assessments of its Regulatory Consistency Assessment Program (RCAP).[2]

The BCBS is assessing the consistency of regulatory outcomes of its capital standards ("Level 3"). Preliminary findings focusing on the application of risk weights by advanced approaches in the banking and trading books indicate discrepancies due to national supervisory action and variations in accepted modeling practices. The findings from this analysis will feed into further policy recommendations and guidance to harmonize risk-weighting approaches. A fundamental review is under way regarding the standardized approaches to regulatory capital for market, credit, and operational risks.

The first of two liquidity standards—the Liquidity Coverage Ratio—was agreed on in January 2013. With implementation scheduled to start in January 2015, the final standards include a broadened definition of High Quality Liquid Assets and a phase-in period. Discussions are ongoing regarding design and calibration of the second liquidity standard—the Net Stable Funding ratio.

In June 2013, the BCBS issued a consultative document on the revised Basel III leverage ratio framework and disclosure requirements.[3] The numerator of the leverage ratio is Tier 1 capital of the risk-based capital framework and the denominator is the sum of balance sheet exposures, derivatives exposures, securities financing transaction exposures, and other off-balance-sheet exposures. The minimum requirement in the transition period is 3 percent. Adjustments to the definition and calibration of the leverage ratio will be made by 2017 based on the results of the parallel run consultations, with a view to migrating to a Pillar 1 treatment on January 1, 2018.

"Structural measures" that would impose business model restrictions on banks are still under discussion. The so-called Volcker Rule has not yet been implemented in the United States, but the recommendations from the Vickers report in the United Kingdom have become part of U.K. banking law, and a draft German banking law setting some restrictions is also in progress. The French legislature passed its version of structural regulation in the summer of 2013. Appropriately designed and judiciously implemented, these policies can work in tandem with traditional prudential regulatory and bank resolution tools to enhance financial stability. Nevertheless, given their potentially significant costs, which can permeate the global economy, the implications of these measures for other jurisdictions should be weighed in.

Efforts are pending to develop effective domestic and cross-border resolution regimes, and implementation remains challenging. Many countries are in the process of upgrading their legislation to reflect the *Key Attributes of Effective Resolution Regimes for Financial Institutions (Key Attributes).*[4] An assessment methodology to evaluate country compliance has been published and pilot assessments are being planned. Implementation of the *Key Attributes* will require capacity-building and resources, as well as strengthened and more systematic cooperation among relevant authorities both within and across borders. The Financial Stability Board (FSB) is leading efforts to offer more specific guidance on operationalizing recovery and resolution plans and on the resolution of financial market infrastructure and insurers.

The International Association of Insurance Supervisors (IAIS) has agreed on a methodology for identifying globally systemically important insurers (G-SIIs) and on policy measures for G-SIIs focused on shielding traditional insurance activities from designated non-traditional and non-insurance (NTNI) activities. Based on the assessment methodology, the FSB and national authorities, in consultation with the IAIS, identified an initial list of G-SIIs in July 2013. The policy measures that will apply to G-SIIs include the development and implementation of systemic risk management plans, recovery and resolution planning requirements under the *Key Attributes,* enhanced group-wide supervision, and higher loss absorbency capital requirements. The IAIS is also developing a straightforward group-wide capital requirement that will serve as a foundation for higher loss absorbency requirements.

The International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB) are continuing to work on the convergence of financial reporting standards, but progress has been slow. All four convergence projects (Financial Instruments, Revenue Recognition, Insurance Contracts, and Leases), which started after the global financial crisis, are at various stages of discussion. Convergence between the two proposed models for asset impairment loss recognition remains challenging.

International standard setting on OTC derivatives reforms is almost complete but implementation chal-

[2]Details of the Regulatory Consistency Assessment Program can be found at www.bis.org/publ/bcbs216.htm.

[3]See www.bis.org/press/p130626.htm.

[4]See www.financialstabilityboard.org/publications/r_111104cc.htm.

Box 1.3. *(concluded)*

lenges remain. Important policy developments include the September 2013 publication of the BCBS-IOSCO final report on margin requirements for non-centrally cleared derivatives. In June 2013, the BCBS proposed final capital requirements for banks' exposures to central counterparties (CCPs) to replace the current interim rules. New policy work streams have also been launched, focusing on recovery and resolution of Financial Market Infrastructures and conducting a feasibility study on aggregating OTC derivatives data reported to trade repositories. While most of the larger jurisdictions are finalizing their OTC derivatives frameworks, key implementation issues remain outstanding, in particular in relation to the treatment of cross-border activities. The recent set of understandings between the United States and the EU on the establishment of a mutual reliance framework to regulate the cross-border activities of swap dealers and the broader understandings reached by the major OTC derivatives regulators could pave the way for much needed progress.

Data constraints remain a key challenge for proper monitoring and supervision of shadow banking at the global level. The FSB will address data constraints by developing standards for data collection on securities financing markets and information-sharing processes for shadow banking entities in 2014. In the policy arena, some progress has been made with the adoption by the IOSCO of principles for money market funds and with the proposals by BCBS to limit large exposures to shadow banking entities and to introduce risk-sensitive capital requirements on equity investment. In addition, the FSB has published documents setting out (1) an overall approach to address financial stability concerns associated with shadow banking entities and (2) a policy framework for addressing shadow banking risks in securities lending and repos.

Box 1.4. Recent Financial Sector Assessment Program Mission Findings

Recent IMF Financial Sector Assessment Program (FSAP) missions to a number of European countries determined that financial sectors have largely stabilized since the peak of the global financial crisis, but challenges remain as continuing deterioration of credit quality weighs heavily on banks' already-thin profitability.[1] Substantial amounts of euro area public debt on banks' and insurers' balance sheets still bear considerable risks. Central recommendations common to all of these FSAPs include the strengthening of capital buffers, further cleanup of balance sheets, and derisking of activities.

During the recent crisis, the *Austrian financial system* benefited from limited exposures to sovereign and other market risks and relatively favorable domestic macroeconomic conditions. Stress test results indicate that, under adverse medium-term scenarios, virtually all Austrian banks, including all internationally active institutions, would meet regulatory capital requirements (taking into account Basel III implementation). However, stronger capital buffers appear desirable to address concerns about risks in the southeastern and central European region and to repay government capital. Some banks should also further strengthen their foreign currency funding structures.

The FSAP found that, despite effective bank supervision practices, some governance improvements should be pursued in both the financial market authority and the industry, and certain supervisory powers could be enhanced. A special bank resolution regime is needed in Austria to provide a wide range of tools and powers to resolve failing banks in an orderly and least-cost manner. The existing fragmented system of deposit guarantee schemes should be replaced with a unified, prefunded, and publicly administered scheme.

The *Belgian financial sector* has become smaller, less complex, and less leveraged. Its ongoing transformation, however, involves significant downside risks from low profitability and weak macroeconomic prospects. Structurally high costs for banks are compounded by increased competition, diminished earning capacity, and the impact of regulatory reforms. The links between banks, insurers, and the Belgian sovereign have intensified against the backdrop of large public debt. The government's limited fiscal capacity makes it important to guard against inaction and supervisory forbearance.

A prolonged period of low interest rates would create vulnerabilities for banks and life insurers, while a

The authors of this box are Javier Hamann and Emanuel Kopp.

[1]FSAPs assess the stability of the financial system as a whole and not that of individual institutions. They are intended to help countries identify key sources of systemic risk in the financial sector and implement policies to enhance its resilience to shocks and contagion.

Box 1.4 *(concluded)*

downturn in housing prices would further exacerbate bank capital pressures. Stress tests revealed that initial capital levels are solid in aggregate, but several banks would experience significant deterioration of profitability under stress, inducing solvency pressures. The FSAP mission recommended strengthening banks' capital buffers. Insurers meet the requirements of the current solvency regime, but vulnerabilities are apparent, which means that supervisors must remain vigilant and contingency plans need to be put in place under the new recovery and resolution framework. Although the new regulatory structure is functioning well, more intensive and intrusive supervision is needed. Compliance with international standards for regulation and supervision of banks and insurers is generally high, but national resolution and deposit insurance frameworks need to be strengthened, and positive changes to supervisory practices need to be sustained.

The *Italian financial sector* has shown resilience in the face of a severe and prolonged recession. Continuing weaknesses in the real economy and the link between the financial sector and the sovereign remain key risks. If these risks materialize, the impact on banks could be significant, albeit cushioned by their own capital buffers and the availability of European Central Bank liquidity.

The FSAP concluded that targeted financial sector action should be taken to shore up the defenses of Italian banks. Increasing provisions, improving bank efficiency and profitability, developing a market to dispose of impaired assets, and strengthening capital and funding plans, where needed, can make important contributions. Some of these steps have already been initiated by the Bank of Italy.

The *financial sector in Poland* emerged unscathed from the crisis. Banks have been profitable and hold relatively high levels of core Tier 1 capital. Vulnerabilities lie in euro area interconnectedness and exposure to foreign exchange risk. Stress tests suggest, however, that these vulnerabilities are unlikely to become systemic.

The FSAP stressed that persistent nonperforming loans and the cyclical deterioration in credit quality need to be addressed. Furthermore, tax disincentives, income accrual practices, and obstacles to out-of-court restructurings need to be removed, and improvements in restructuring, accounting practices, and the insolvency framework would be helpful. To prevent a further rise in nonperforming loans, care should be taken with ongoing regulatory revisions, including the removal of uniform debt-to-income thresholds, tightening of loan-to-value ratios, and currency matching of income and borrowing.

Poland was found to be broadly compliant with core principles in the regulation and supervision of banks, insurance companies, and deposit insurance schemes. However, the supervisor needs greater powers, independence, and resources, and legislation to introduce a systemic risk board needs to be accelerated. Rebalancing the financial system toward capital market development is also important.

Making the Transition to Stability

The global financial system is undergoing a series of transitions along the path toward greater financial stability. The United States may soon move to less accommodative monetary policies and higher sustained long-term interest rates as its recovery gains ground. After a prolonged period of strong portfolio inflows, emerging markets are facing a transition to more volatile external conditions and higher risk premiums. Some need to address financial and macroeconomic vulnerabilities and bolster resilience as they progress to a regime in which financial sector growth is more balanced and sustainable. Japan is moving toward the new Abenomics policy regime marked by more vigorous monetary easing coupled with fiscal and structural reforms. The euro area is moving toward a stronger monetary union with a common framework for risk mitigation while strengthening financial systems and reducing excessive debt levels. Finally, the global banking system is phasing in stronger regulatory standards. A number of policy actions can help promote an orderly passage to greater financial stability, as summarized in Table 1.7.

The shift from prolonged periods of monetary accommodation poses challenges.

Experience suggests that transitions from monetary accommodation can give rise to financial stability risks. As Figure 1.60 illustrates, during the period of Great Moderation, benign monetary and financial conditions drove investors to adopt similar investment strategies, leading to a rise in correlation of asset prices and a

Table 1.7. Policy Recommendations

Reducing the market impact of monetary policy transition	• Carefully communicate the Federal Reserve's quantitative easing asset-purchasing intentions to minimize interest rate volatility. • Increase oversight of mutual fund, mortgage real estate investment trust, and exchange-traded fund liquidity terms for investors and management practices. • Develop a contingency leverage unwinding facility in the United States to act as a circuit-breaker in markets that heavily use repo funding. • In Japan, deliver on structural reforms and medium-term fiscal consolidation in addition to monetary stimulus to contain fiscal risk premiums in government bond yields. • Monitor Japanese regional bank exposures to interest rate risks. • Pursue reforms in Japanese bond and derivatives markets to manage rate volatility.
Tackling emerging market vulnerabilities	• Address underlying macroeconomic vulnerabilities through credible fiscal or regulatory reforms. • Prepare for and manage the reversal of capital inflows by ensuring orderly market operations and establishing swap lines with major central banks. • Restore policy buffers where needed, including through tighter monetary policy if inflation or currency vulnerabilities warrant. • Focus surveillance on domestic bank exposure to vulnerable corporates, especially liquidity and currency mismatches. • In China, rein in total credit growth, notably via the shadow banking system, by gradually liberalizing deposit rates and addressing moral hazard concerns. • Enhance supervision and disclosure in the Chinese nonbank financial system, including insurers and trust funds.
Addressing legacy balance sheet issues	• Restore investor confidence in euro area bank balance sheets with a credible balance sheet assessment and stress test, with clearly identified capital backstops. • Address euro area financial fragmentation through speedy implementation of the Single Supervisory Mechanism and the Single Resolution Mechanism with a commitment to cross-border deposit insurance. • Resolve the corporate debt overhang in stressed economies through a more systematic approach, including improved insolvency and debt workout arrangements, while fostering nonbank sources of corporate credit. • Provide time to repair private balance sheets through further European Central Bank monetary support and European Investment Bank credit support to viable firms.
Improving regulation and market liquidity	• Continue progress on strengthening regulatory frameworks and monitor progress toward achieving goals of higher capital standards. • Minimize regulatory uncertainty and unintended consequences on markets from national structural measures for banks (e.g., Volcker, Vickers, and Liikanen proposals). • Finish work on risk weights, complete accounting convergence, and introduce forward-looking provisioning to improve the credibility and transparency of bank balance sheets. • Assess the impact of regulatory and transaction tax proposals on market liquidity and rebalance where necessary, while clarifying issues that have increased uncertainty surrounding market liquidity and funding providers. • Increase focus on the implications of lower market liquidity and higher volatility through enhanced stress testing of bank's mark-to-market books and repo-funded nonbank intermediaries.

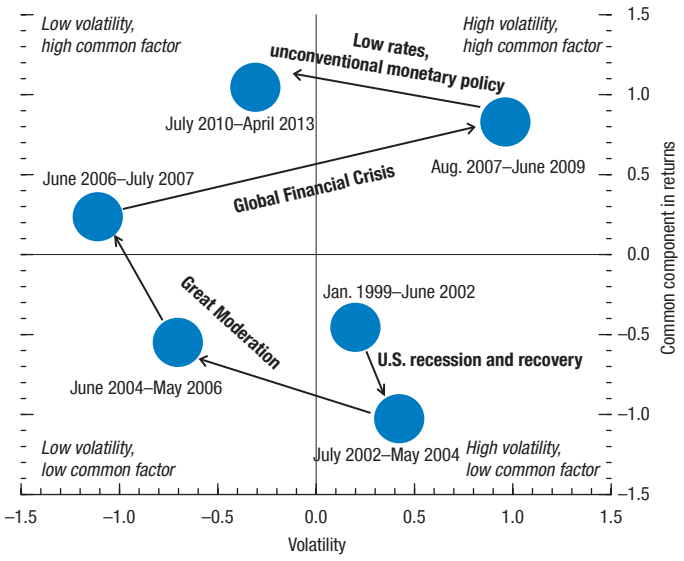
decline in volatility. Arguably, those strategies resulted in excesses that led to the global financial crisis. In its wake, crisis measures and monetary accommodation have suppressed volatility, while the sensitivity of asset prices to central bank monetary policy remains high.

Policymakers and markets need to prepare for structurally higher market volatility because the probable withdrawal of the Federal Reserve's quantitative easing stimulus and tighter regulatory constraints on financial intermediaries mean that market liquidity is likely to be further curtailed. Indeed, the rise in global rates and volatility since May 2013—prompted first by uncertainty over Bank of Japan policy implementation and then by concerns about the Federal Reserve tapering its quantitative easing—precipitated a volatility spike in global bond markets, prompting turbulence in a number of important emerging markets.

Achieving a smooth transition requires policies that carefully manage portfolio adjustments while addressing structural liquidity weaknesses and systemic vulnerabilities. Policymakers can take a number of actions to reduce the impact of elevated market volatility. These include clarity of communication about the parameters for the withdrawal of monetary stimulus, and regulatory scrutiny

Figure 1.60. Normalization of Monetary Policy: Smooth or Turbulent?

(Standard deviations from mean)



Source: IMF staff estimates.
Note: Common factor refers to the principal component that explains the largest possible variation in asset returns, based on the historical daily data (1994–2013) for advanced and emerging market economies.

of the liquidity offered to investors in funds exposed to illiquid assets, especially when repo-funded, to mitigate spikes in asset correlations and volatility. Indeed, authorities may need to develop contingency backstops to reduce the likelihood of cascading forced asset sales.

The transition to higher rates and volatility puts a premium on addressing legacy balance sheet problems.

The rise in nominal global rates and volatility will make the refinancing of stretched corporate and bank balance sheets more costly and difficult. The analysis of the euro area corporate debt overhang in this GFSR shows that unless steps are taken to break the feedback loop between weak banks and corporates, a long period of weak asset quality and a drag on economic activity are probable risks. Hence, further progress in reducing debt overhangs and strengthening bank balance sheets remains urgent, especially in the stressed economies of the euro area. To succeed, investors' faith in euro area bank balance sheets must be restored (through the planned asset quality review and resulting recapitalization, if necessary) and banking union completed to fully reverse financial fragmentation. Otherwise, the euro area risks entering a lengthy, chronic phase of low growth and balance sheet strains.

Keeping emerging markets resilient calls for an increased focus on addressing domestic vulnerabilities.

Emerging markets are now encountering a less benign external environment. The fundamental drivers of recent capital flows to emerging markets are weakening as relative growth prospects moderate, U.S. nominal rates rise, and volatility picks up. These inflows have been intermediated primarily through sovereign and corporate bond markets, rather than through domestic banks engaged in cross-currency credit intermediation. Therefore, the principal transmission channel of volatility is likely to be through liquidity strains on sovereigns and leveraged corporates with immediate borrowing and refinancing needs, rather than through bank funding channels. Consequently, emerging market investors are likely to focus more on country-specific factors and institutional robustness in evaluating risk-return tradeoffs, with the increasing likelihood that the portfolio capital inflows of recent years will be partly reversed, at least in the near term.

In the event of significant capital outflows, some countries may need to focus on ensuring orderly market functioning, using their policy buffers wisely. Keeping emerging market economies resilient calls for an increased focus on domestic vulnerabilities. Policymakers should carefully monitor and contain the rapid growth of corporate leverage. Local bank regulators need to guard against foreign currency funding mismatches building up directly on bank balance sheets, or indirectly through unhedged foreign currency borrowing by corporates.

Annex 1.1. Exploring the Factors Driving Bank Interest Rates on Corporate Loans

Objectives and Analytical Approach

This exercise aims to explain the dynamics of bank interest rates on corporate loans in the euro area economies in relation to their fundamental determinants. The starting point, building on previous research, is the notion that the interest rate on corporate loans is a function of the monetary policy stance, which influences banks' funding costs via money market rates; the business cycle, which affects the demand for loans and asset quality; and stress in the banking sector, which determines banks' ability to finance themselves, borrow, and extend credit (see also ECB, 2009; IMF, 2013a). The analysis also includes sovereign stress, given the importance of feedback effects between sovereign and bank stresses, and a measure of corporate credit risk.

The main building block of this analysis is the (cointegrating) equilibrium that links the long-term dynamics of the following five variables:[62]

- The *lending rate* on new corporate loans (r_t^{nfc}) of less than €1 million in France, Italy, and Spain; many of these loans are extended to small and medium enterprises (SMEs).
- The *monetary policy* stance, as captured by the seven-year swap rate (r_t^{7swp}). The seven-year swap rate was found to significantly outperform shorter-dated maturities and other money market rates. For example, a recent study by the ECB concluded that "through its influence on expectations on future monetary policy actions, changes in monetary policy stance will often also have a strong impact on longer-term market rates, such as long-term government bond yields and swap rates, by moving the yield curve" (ECB, 2009, p. 97).
- *Sovereign stress*, as proxied by the deviations of asset swap spreads (10-year sovereign bond yields minus swap rate of the same maturity) from their time-varying trend (dev_t^{aswp}).[63] This spread was used as a proxy for sovereign credit risk because it behaves similarly to the sovereign bond yield spreads, but is not biased by episodes of flight to quality that tend to drive down German yields and exert an upward bias on sovereign spreads measured against German bunds.
- *Bank health*, as proxied by the banking system price-to-book ratio (pbk_t). A healthier banking system will have a higher average price-to-book ratio, which captures the perceived health and expected future profitability of banks, enabling them to borrow and lend more cheaply. The higher price-to-book ratio outperformed alternative measures of bank balance sheet strength (such as bank equity prices and credit default swap spreads) in diagnostic tests.
- The state of the *business cycle*, as captured by the industrial production index (ip_t). When the level of output declines, economic uncertainty rises, profits come under pressure, and demand for corporate loans typically falls. Consistent with other studies (ECB, 2009) and bank lending surveys, one would expect weaker loan demand from firms and households to put downward pressure on bank lending rates, especially during the deep and extended recessions seen in Italy and Spain.

Furthermore, a number of exogenous variables are included, notably a *corporate credit risk* variable based on Moody's KMV expected rates of default. This variable was added exogenously because its time-series properties did not make it amenable to inclusion in the cointegrating vector. Other variables included exogenously are contemporaneous changes in euro overnight index average (EONIA) rates, and changes in economic policy uncertainty (see Bloom, 2009).

By exploiting the vector error correction model's (VECM) long-term cointegrating relationship, the analysis determines the "equilibrium" levels of lending rates under the current state of financial fragmentation. Subsequently, by setting banking and sovereign stresses to zero in the cointegrating vector, a hypothetical shadow rate is constructed that captures the notion of no fragmentation. The construction of this latter no-fragmentation proxy is what differentiates this analysis from previous studies. The cointegrating relationship can be expressed in terms of the key variable of interest, the corporate lending rate r_t^{nfc}:[64]

$$r_t^{nfc} = \psi_1 + \beta_1 r_t^{7swp} + \beta_2 dev_t^{aswp} + \beta_3 pbk_t + \beta_4 ip_t + \xi_t. \quad (1.1.1)$$

The author of this annex is Vladimir Pillonca.

[62]Cointegration tests were performed using the Johansen methodology (see Johansen, 2009).

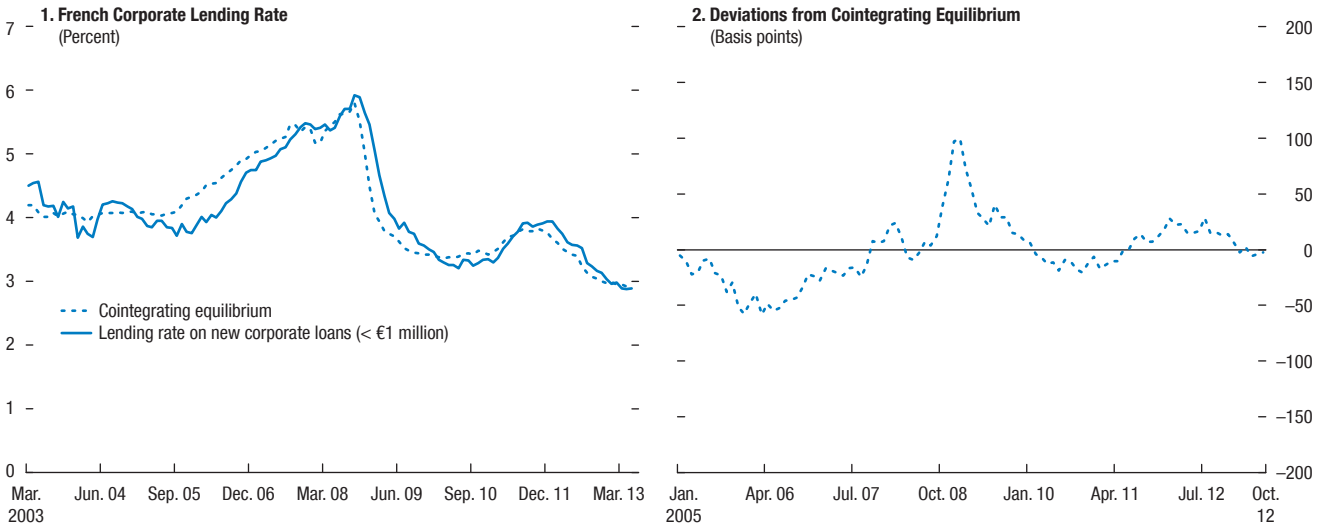
[63]The fixed-rate arm of an interest rate swap captures a highly liquid risk-free rate needed to compute bond spreads, as an alternative to German bund yields. The time-varying trend was estimated with a Christiano-Fitzgerald asymmetric bandpass (Christiano and Fitzgerald, 1999), which allowed the extraction of a signal of sovereign stress that was not overly collinear with the other variables in the system.

[64]As is standard practice, the coefficient on the variable of interest is normalized to unity.

Figure 1.61. France: Deviations from Cointegrating Equilibrium

The French corporate lending rate has not deviated sharply from its cointegrating equilibrium.

The deviations from equilibrium tend to be corrected over time.



Source: IMF staff estimates.

The beta coefficients (β_1, β_2, β_3, β_4) define the cointegrating relationship, and ψ_1 is a constant. These five variables are individually nonstationary, but are jointly stationary, and thus share a common stochastic trend. The ξ_t term can be thought of as a deviation from equilibrium, the expected value of which is zero.[65] The economic interpretation is that these variables share a common equilibrium driven by a small set of factors; econometrically, this is a "state from which there is no endogenous tendency to deviate" (see Amisano and Giannini, 1997).

Most of the time, however, the cointegrating vector will not be exactly in equilibrium. Figure 1.61 shows that the actual corporate lending rate on small loans in France has been fairly close to equilibrium.

Since 2007, there have been a large number of shocks to sovereign, banking, and monetary variables; therefore, the deviations from equilibrium have been large and persistent. Figure 1.62 shows that the actual interest rates on small loans in Italy and Spain are currently more than 100 basis points higher than what their cointegrating equilibrium relationship would suggest. These can be interpreted as short-term deviations from equilibrium that are corrected over time as the variables dynamically adjust toward their cointegrating equilibrium.[66] Although these deviations reflect relatively small shocks for France, they point toward much larger and more persistent shocks for Italy and Spain.

Data and Estimation

The models for France, Italy, and Spain were estimated using monthly data for 2003–13 (about 120 observations).[67] The estimation was carried out in two steps. In the first step, the cointegrating relationships were estimated following the Johansen methodology.[68] In the second step, the error correction terms from the estimated cointegrating relationships were constructed to enable the estimation of a vector autoregression in first differences (with the error correction terms as regressors). The final specification was obtained by starting out with a large number of variables proxying the key determinants of bank lending rates (the mon-

[65]This measure captures the short-term deviation of the actual lending rate from the equilibrium lending rate, as characterized by the full sample (2003–13) parameter estimates of the cointegrating vector, conditional on the current level of the endogenous variables.

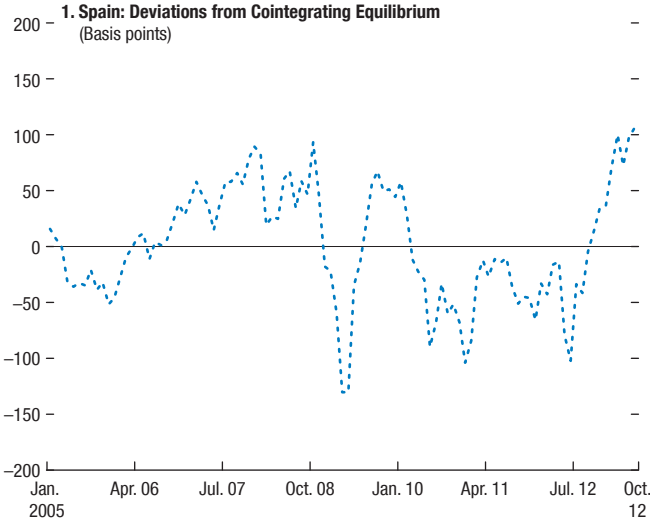
[66]The difference between the current lending rate and the no-fragmentation proxy reflects these deviations in addition to the steady-state contributions of sovereign and banking stresses (estimated at 100 basis points for Italy and 160 basis points for Spain).

[67]Lending rates on new small loans are from the ECB; swap, money market rates, and sovereign yields are from Bloomberg, L.P.; price-to-book ratios and other equity variables are from MSCI; and industrial production data are from national statistical offices.

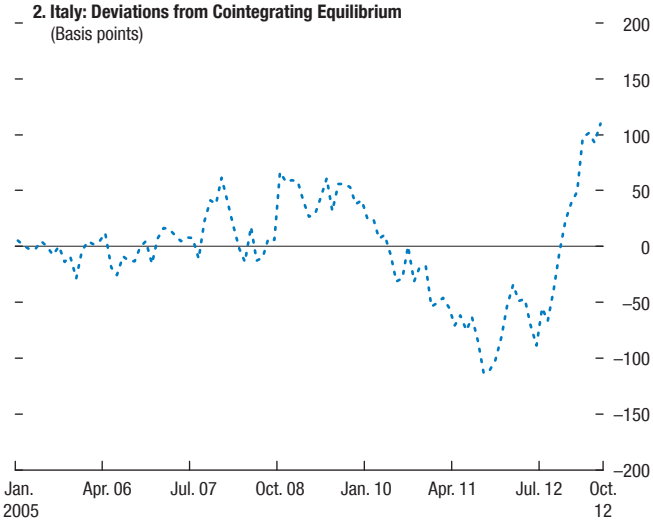
[68]Unrestricted rank and maximum eigenvalue cointegration tests were performed (see Johansen, 2009).

Figure 1.62. Spain and Italy: Deviations from the Cointegrating Equilibrium

Corporate lending rates for both Italy and Spain are above their cointegrating equilibrium levels…



…signaling that lending rates are too high relative to their fundamental determinants.



Source: IMF staff estimates.

etary policy, sovereign stress, bank health, and business cycle), then narrowing them down to the "best" proxies using general-to-specific modeling and extensive diagnostic testing.[69]

Model Estimates

Table 1.8 shows the coefficients of the cointegrating vector for each country estimated for 2003–13 (the same model was also estimated for the crisis period, but the results are not shown because the sample period is short and volatile).

The key findings follow:

- The first factor, the seven-year swap rate, captures the pass-through of *monetary policy* to lending rates. It is highly statistically significant and has the expected sign. In Italy and France, a 100 basis point policy rate cut translates into a decline of 57 basis points in the corporate lending rate and a decline of 40 basis points in Spain.
- The second factor is *sovereign stress*. This factor is significant for Spain and Italy, but not for France.
- The third factor is *bank health*, as captured by the price-to-book ratio of the banking system.[70] A healthier banking system will have a higher price-to-book ratio, which, in turn, enables banks to lend more cheaply. Negative and statistically significant coefficients for Italy and Spain confirm these dynamics are at play. In contrast, the bank health coefficient for France is not statistically significant, reflecting considerably lower banking and sovereign pressures.
- The fourth factor is the state of the *business cycle*, as captured by the industrial production index. As found in other studies, the coefficient results indicate that weaker loan demand from firms has put downward pressure on lending rates. This parameter is not significant for France, highlighting the lack of sensitivity of lending rates to the state of the business cycle, especially compared with Italy and Spain.
- Finally, the sensitivity of lending rates to the *corporate credit risk* factor and the statistical significance of this coefficient have increased during the crisis in all three countries, although the size of the coefficients are significantly larger for Italy and Spain.

[69]Akaike Information Criteria (AIC), Schwarz-Bayes Criteria (SBC), recursive stability tests, and analysis of residual behavior, among others.

[70]Alternative measures of bank health, such as bank equity prices and credit default swap spreads, produced similar results.

Table 1.8. Determinants of Bank Interest Rates on New Small Loans

(Loans of <€1 million)

	Italy	France	Spain
	Full Sample 2003–13	Full Sample 2003–13	Full Sample 2003–13
Endogenous Cointegrating Factors			
1. Monetary Policy Stance	0.5689***	0.5669***	0.3965***
2. Sovereign Stress	0.0074***	0.004	0.0042***
3. Bank Health	–1.0061***	0.490	–2.5011***
4. Business Cycle	6.4442***	–0.074	5.6004***
Exogenous Factor			
5. Corporate Credit Risk	0.0117**	0.0004***	0.0460**
R-squared	0.79	0.58	0.69

Source: IMF staff.

1. Seven-year swap rate.

2. Deviation of asset swap spreads (10-year sovereign bond yields minus swap rate of the same maturity) from their trend. The trend is time-varying and is estimated with a Christiano-Fitzgerald (1999) asymmetric band pass.

3. Bank price-to-book ratio, log.

4. Industrial production, log.

5. The rate of change of the difference between the 90th percentile and the mean of the corporate sector expected default frequency distribution, at the country level.

***, ** and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Annex 1.2. Euro Area Corporate Debt Overhang and Implications for Bank Asset Quality

Objectives and Analytical Approach

The challenges posed by the debt overhang for large publicly traded firms in stressed euro area economies were analyzed in the April 2013 GFSR.[71] In this GFSR, the analysis of debt overhang is extended to the broader corporate sector, particularly to the small and medium enterprise (SME) segment. Because smaller firms in stressed euro area economies tend to have higher leverage and lower profitability than larger firms, and also face tighter financing constraints and fewer deleveraging options, the focus is on firms' debt-servicing capacity. The capacity to service debt can be gauged by looking at a firm's interest coverage ratio (ICR).[72] The size of the debt overhang in the broader corporate sector is defined as the share of total debt outstanding owed by firms with ICRs of less than 1; this concept is often referred to as debt-at-risk. An ICR of less than 1 means that a firm is unable to service its debt without making some adjustments, such as reducing operating costs, or drawing down its cash reserves, or even borrowing more. The analysis of corporate debt overhang concludes by drawing the implications for bank asset quality.

Data

The analysis is based on firm-level annual data from the Bureau van Dijk's Amadeus database. The sample includes more than 3 million nonfinancial firms, both publicly traded and private, from France, Germany, Italy, Portugal, and Spain (see Table 1.9). In these economies, Amadeus's coverage approaches 100 percent of available coverage from public and official sources.[73] Coverage of the SME segment is especially good in Italy, Portugal, and Spain. Although coverage of the SME segment is considerably smaller in Germany, Amadeus still captures two-thirds of corporate sector assets.

Table 1.9. Amadeus Database, 2011

	Number of Firms (thousands)	Total Assets	
		Billions of Euros	Percent of Total[1]
France	866	3,398	43
Germany	145	3,389	66
Italy	1,035	3,194	100
Portugal	352	361	52
Spain	818	2,199	67

Sources: Amadeus; national central banks; and IMF staff estimates.
[1]Percent of financial and nonfinancial assets of the entire corporate sector, based on central bank flows of funds data; and IMF staff estimates.

Leverage, Profitability, and Debt-at-Risk

Debt-at-risk in stressed euro area economies has increased since 2001 and tends to be larger in the SME sector (Figure 1.63, panels 1 and 2). SMEs have higher debt-at-risk because of a combination of high leverage and weak profitability:

- *Leverage*—as measured by the debt-to-EBITDA ratio—increased sharply in stressed euro area economies and is now much higher than in the core, especially in Portugal and Spain, and among SMEs (Figure 1.63, panels 3 and 4).
- These firms entered the crisis with weak *profitability* (Figure 1.63, panel 5). In contrast to the core economies, in stressed economies, SMEs tend to have much weaker profitability than large firms have (panel 6).

Higher lending rates caused by financial fragmentation in the euro area have contributed to the higher debt-at-risk among corporates and SMEs in stressed euro area economies (Figure 1.64).

Analysis of Corporate Debt Overhang

The "Chronic-Phase" and "Reversal-of-Fragmentation" Scenarios

To assess debt-at-risk on a forward-looking basis, ICRs are forecast under a "chronic-phase" scenario and a "reversal-of-fragmentation" scenario.

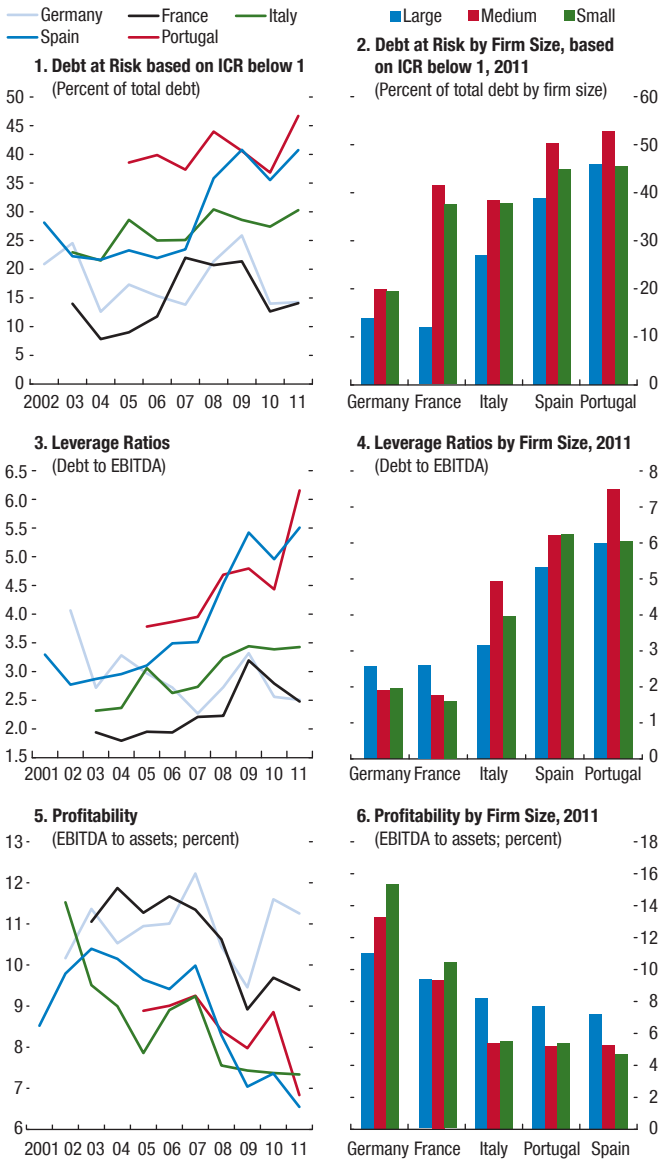
The authors of this annex are Sergei Antoshin, Xiangming Fang, and Jaume Puig.

[71]The analysis in the April 2013 GFSR focused on debt repayment capacity. The debt overhang was defined as debt owed by firms that are unable to generate sufficient cash flows to repay debt (i.e., to reduce debt to sustainable levels in the medium term). The main conclusion was that the deleveraging required to bring the stock of debt down to sustainable levels could be a significant drag on growth.

[72]The interest coverage ratio (ICR) is defined as earnings before interest and taxes (EBIT) divided by interest expense. Interest revenues or financial revenues are included in the calculation of earnings (and thus partly offset interest expense). Given that the focus of the analysis is on firms' medium-term prospects, the concept of EBIT—rather than EBITDA—is used because it allows the analysis to assess whether a firm is economically viable. In some cases, rating agencies and analysts may use EBITDA when the focus is on a firm's short-term cash position.

[73]Variations in coverage across countries reflect mostly the stringency of filing requirements at local registries and associated penalties for failure to comply.

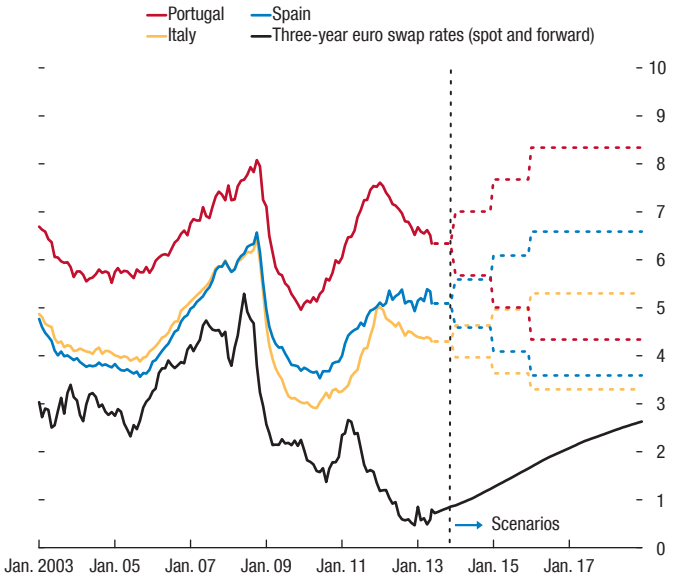
Figure 1.63. Leverage, Profitability, and Debt at Risk



Sources: Amadeus database; and IMF staff estimates.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization.
ICR = interest coverage ratio.

Figure 1.64. Bank Lending Rates to Small and Medium Enterprises

(Percent)



Sources: Haver Analytics; and IMF staff estimates.

Earnings before interest and taxes (EBIT) are projected using GDP growth forecasts. Time-series regressions specific to country, sector, and firm size are estimated, as are country-specific panel regressions, where corporate profitability (EBIT over assets), is regressed on GDP growth. GDP growth projections under the October 2013 *World Economic Outlook* baseline and alternative scenarios are used in the reversal-of-fragmentation and chronic-phase scenarios, respectively.

Interest rates on corporate debt are also projected under the chronic-phase and reversal-of-fragmentation scenarios. The symmetric shocks are calibrated based on the econometric exercise presented in Annex 1.1.[74] This is broadly consistent with a return of SME lending spreads over swaps to precrisis levels under the reversal-of-fragmentation scenario (see Figure 1.64). The shock for large companies is assumed to be half that for SMEs, also in line with a return to precrisis lending spreads.

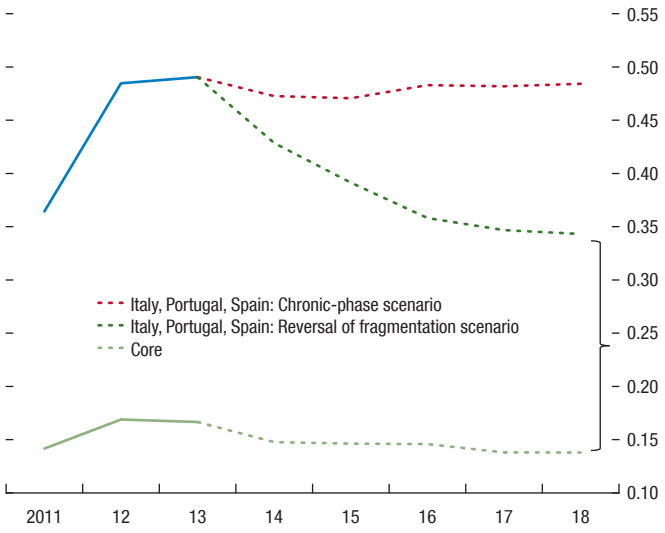
[74]The exercise described in Annex 1.1 finds that removing fragmentation would result in a reduction of lending rates to small and medium enterprises (SMEs) of about 100 basis points in Italy and 160 basis points in Spain. We assume that the effect on lending rates to SMEs in Portugal would be about 200 basis points. The reduction in lending rates under the reversal-of-fragmentation scenario is assumed to be phased in during 2014–16 as gradual progress is made toward banking and fiscal union. A symmetric shock is assumed under the chronic-phase scenario.

"Persistent" Debt Overhang

The debt overhang declines significantly as growth recovers and financing costs decline under the reversal-of-fragmentation scenario.[75] Sensitivity analysis shows that the debt overhang declines by about 5 percentage points, on average, if fragmentation is reduced by 100 basis points or growth improves by 3 percentage points.

The reversal-of-fragmentation scenario provides a basis for assessing the size of the *"persistent" corporate debt overhang*. This persistent debt overhang is defined as the share of debt in stressed euro area economies that is owed by firms with an ICR of less than 1 under the reversal-of-fragmentation scenario, in excess of the equivalent share in the core. Firms in stressed economies and in the core are expected to face similar financial conditions under the reversal-of-fragmentation scenario, but even under these benign financing conditions, and the assumed recovery in profitability in line with the projected economic recovery, a sizable persistent debt overhang of almost one-fifth of total corporate debt remains in stressed economies (indicated by the bracket in Figure 1.65).

Figure 1.65. Projected Corporate Debt Overhang in Italy, Portugal, and Spain
(Based on ICR < 1; share of total debt)



Sources: Amadeus database; and IMF staff estimates.
Note: ICR = interest coverage ratio.

Assessing Implications for Bank Asset Quality

Finally, this GFSR illustrates the implications of corporate sector stresses for bank asset quality by estimating potential bank losses on corporate exposures (assuming no improvement in corporate fundamentals over the next two years) and comparing them with bank buffers to gauge the extent to which these asset quality problems might not have yet been dealt with.

Compared to the standard bank solvency stress tests, the GFSR analysis provides a complementary (yet, less precise) perspective on the problem of corporate stress and its implications for bank asset quality. While standard bank solvency stress tests typically rely on granular information on the individual bank exposures to different types of borrowers, the GFSR analysis considers *aggregate* banking system exposures, and hence cannot yield any insights about individual banks. On the other hand, the GFSR analysis uses very detailed nonfinancial firm-level data to assess the extent of potential credit quality deterioration on corporate exposures of the entire banking system. In addition, the GFSR analysis has the advantages of using a consistent approach across firms and countries, and providing an up-to-date assessment of corporate sector stress and its implications for banks (see Box 1.5 for more details).

Assuming that corporate fundamentals remain unchanged, the potential losses during 2014–15 arising from the corporate exposures of the banking system are assessed as follows:

- ICRs as of 2013 are extrapolated using the latest data available, with estimates of EBIT based on the 2011 firm-level data from Amadeus and October 2013 *World Economic Outlook* GDP growth and the estimates of interest expense based on actual lending rates.[76]
- The firm-level ICRs are mapped into the probabilities of default (PDs) by (1) assigning implied credit ratings to companies in the sample based on average ICRs by credit rating for companies rated by Moody's, and (2) assigning PDs over the next two years to each implied rating based on historical

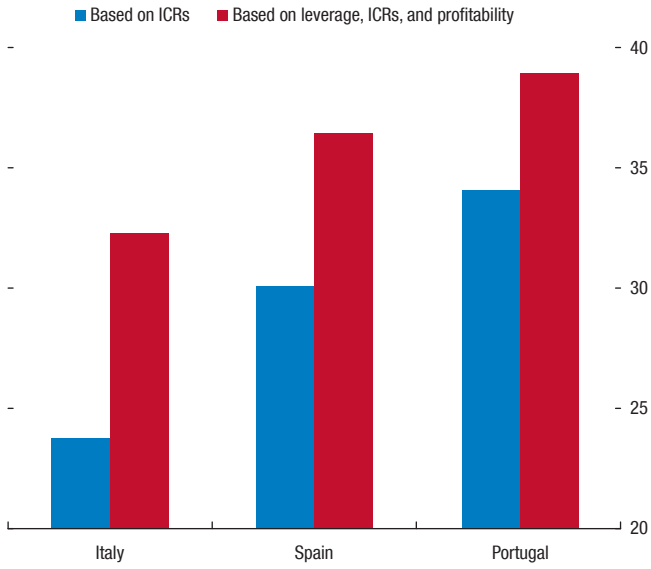
[75]The analysis assumes that balance sheets remain static in the forecast period. Aggregate data for 2012 show that corporate debt declined in Spain, and credit data suggests that the decline in debt is greater in weaker companies. However, the lack of data on the asset side and on the effect of asset sales on the income statement prevents this study from taking deleveraging into account.

[76]The EBIT projections use the same empirical relationships between profitability and GDP growth as the ones discussed in the section on "Analysis of Corporate Debt Overhang" in this Annex. In the case of Portugal, the estimated ICRs are adjusted using actual 2012 data (available to date) by sector/size that were provided by the Bank of Portugal.

default rates of companies rated by Moody's. Aggregate PDs on corporate debt owed to banks are estimated at the country level as the average of PDs of individual firms weighted by the share of each firm's debt in aggregate country debt.[77] This mapping of corporate credit scores into implied ratings and PDs is a standard approach used by rating agencies and banks. The estimation of PDs is robust to the use of alternative corporate vulnerability indicators (other than ICRs), such as profitability and leverage ratios (Figure 1.66), and to the use of historical default rates from other rating agencies (Table 1.10). Generally, PDs based on ICRs and on Moody's historical default rates tend to be lower than those based on other vulnerability indicators and rating agencies.

- Loss rates at the country level are obtained by multiplying estimated aggregate PDs by loss given default (LGD) ratios. A range of 10 percentage points around the standard Basel LGD ratio of 45 percent is used to estimate a range of potential loss rates (to reflect uncertainties about collateral valuations). Potential bank losses from corporate exposures at the aggregate country level are obtained by applying these aggregate loss rates to the stock of loans extended to nonfinancial corporates by monetary financial institutions in each country.[78]
- The estimated potential losses are related to existing buffers, including provisions on corporate loans, operating profits, and Tier 1 capital[79] (see Figure 1.53 in the main text of the chapter).

Figure 1.66. Probabilities of Default in the Corporate Sector
(Percent as of 2011; over the next two years)



Sources: Amadeus database; and IMF staff estimates.
Note: ICR = interest coverage ratio.

The key parameters used in the GFSR analysis, such as PDs and LGD ratios, appear to be broadly in line with those used in available stress testing exercises that consider the entire stock of loans. For example, using the same approach as described previously to estimate three-year PDs at the end of 2011 yields an estimated aggregate PD for Spain that falls within the range of the parameters used in the Oliver Wyman stress tests published in 2012 (Table 1.11); the same is true for the LGD assumptions.

[77]Fifty percent of debt of large corporates and all debt of SMEs is assumed to be owed to banks.

[78]For Spain, potential losses on bank loans are adjusted for the loans transferred to SAREB (Spain's asset management company) in December 2012 and February 2013.

[79]Buffers on domestic corporate exposures may be overestimated because provisions, operating profits, and core Tier 1 capital data are available only on a consolidated basis at the system level. Provisions on corporate loans are estimated by applying the share of corporate loans in nonperforming loans to the stock of total provisions, including general provisions.

Table 1.10. Mapping of Corporate Vulnerability Indicators to Probabilities of Default

Corporate Vulnerability Indicators[1,2]				Cumulative Default Rates[3]					
				Moody's		Standard & Poor's		Fitch	
ICR	Profitability	Leverage	Implied Rating	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
27.0	21.1	0.6	Aaa/AAA	0.0	0.0	0.0	0.0	0.0	0.0
14.7	13.5	1.5	Aa/AA	0.0	0.1	0.0	0.0	0.0	0.0
9.3	12.0	2.0	A/A	0.1	0.2	0.1	0.2	0.1	0.2
5.2	9.9	2.6	Baa/BBB	0.2	0.5	0.2	0.6	0.2	0.7
3.4	9.3	3.2	Ba/BB	1.1	3.1	0.9	3.0	1.1	2.8
1.6	7.3	4.8	B/B	4.1	9.6	4.5	10.0	2.0	4.8
0.5	3.2	7.6	Caa-C/CCC-C	16.4	27.9	26.8	36.0	24.9	31.9

Sources: Fitch; Moody's; Standard and Poor's; and IMF staff estimates.
[1]ICR is defined as EBIT/interest expense; profitability is defined as EBIT/average assets; leverage is defined as Debt/EBITDA.
[2]The probabilities of default are extrapolated beyond those corresponding to the implied rating C for firms with weaker vulnerability indicators.
[3]Based on 1970–2012 for Moody's, 1981–2011 for S&P, and 1990–2012 for Fitch.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization; ICR = interest coverage ratio.

Table 1.11. Comparison of the GFSR Analysis with Oliver Wyman's Stress Tests for Spain

	PD Baseline	PD Adverse	LGD Baseline	LGD Adverse
Oliver Wyman, as of 2011 (for 2012–14)				
Real Estate Developers	0.61	0.88	0.39	0.47
Large Corporates	0.09	0.17	0.47	0.49
Small and Medium Enterprises	0.21	0.35	0.40	0.42
Total Corporate Sector	**0.29**	**0.45**	**0.42**	**0.46**
GFSR, as of 2011 (for 2012–14)	**0.37**		**0.45**	

Sources: Bank of Spain; IMF staff estimates.
Note: LGD = loss given default; PD = probability of default.

Box 1.5. The GFSR Analysis of Corporate Credit Quality versus Bank Stress Tests

The methodological approach used in this GFSR to assess potential losses on corporate exposures of the banking systems can be compared with standard stress tests that are carried out in the context of Financial Sector Assessment Programs, by looking at the main elements of the analysis:

Exposures

- Standard bank solvency stress tests focus mainly on additional losses on performing loans and, in some cases, capture the impact on existing nonperforming loans (NPLs) through, for instance, adjusting loss given default (LGD) rates in the stress scenario. The analysis is based on granular, bank-level data on loan exposures. In some cases, the adequacy of provisions against the existing stock of NPLs is assessed as well.
- The GFSR analysis considers the entire stock of loans, sidestepping the issue of banks' classification of exposures as performing or nonperforming and any cross-country differences in NPL definitions. The analysis considers aggregate corporate loan exposures of all banks operating in a given country.

Probabilities of Default

- In a standard bank solvency stress test, PD is typically defined as the one-year probability that a performing loan becomes nonperforming (actual default rates from the central credit registry provided by central banks are commonly used; forward-looking PDs are also often tied to specific macroeconomic assumptions).
- In the GFSR analysis, the PDs are estimated at the firm level (not at the loan level) and are obtained by mapping current corporate vulnerability indicators into PDs through implied credit ratings for individual companies.

Loss Given Default Rates

- The LGD rate used in many standard stress tests are typically provided by supervisory authorities, who may use different methodologies to estimate aggregate LGDs (e.g., coverage ratios, LGDs estimated from collateral valuation models, and so forth).
- The GFSR analysis uses the *Basel LGD ratio of 45 percent* (and a range of ±10 percentage points around the 45 percent level to reflect uncertainties about collateral valuation).

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