

## Summary

Risks to global financial stability have declined since the October 2010 *Global Financial Stability Report*, helped in part by improving macroeconomic conditions. However, sovereign balance sheets remain under strain in many advanced economies, structural weaknesses and vulnerabilities in the euro area pose significant risks to bank balance sheets, credit risks remain high, and capital inflows to emerging markets could strain their absorptive capacity.

Many advanced economies are struggling with the legacy of high debt and excessive leverage. High debt levels are evident in many parts of the global economy, including households with negative equity, banks with thin capital buffers and uncertain asset quality, and sovereigns facing debt sustainability challenges.

Sovereign balance sheets are under strain in many advanced economies. As long as sovereign funding concerns persist, investors are likely to have a diminished appetite for riskier credits, in turn driving up funding costs and posing rollover risks. Economies with higher marginal funding costs and larger near-term financing needs are most vulnerable.

Incomplete policy action and reform has left segments of the global banking system vulnerable to further shocks. Despite improvements to balance sheets and significant policy initiatives, some banks remain insufficiently capitalized and vulnerable to rising funding costs. The weak tail of banks needs to be restructured or resolved, and the remaining institutions need to be adequately capitalized.

Elevated household leverage in the United States poses downside risks to housing markets. More structural policies may be needed to reduce this debt burden. Corporate balance sheets in most economies have improved, but some areas remain vulnerable, including small and medium-sized enterprises, the commercial real estate sector, and, in the euro area periphery, domestically focused firms. The ingredients are also in place for increased risk-taking among larger firms.

Capital inflows to emerging markets have rebounded but remain volatile. While inflows are not yet excessive in most markets, closing output gaps and rising inflation complicate policy responses. There are pockets of rising corporate leverage and evidence that weaker firms are accessing capital markets, making corporate balance sheets vulnerable to external shocks.

Policymakers face three key challenges in putting the recovery onto a durable path. They need to (1) address the legacy problems of high debt burdens and weakened balance sheets in advanced economies; (2) develop a stronger, more robust financial system that is subject to greater market discipline; and (3) guard against risks of overheating and the buildup of financial imbalances in emerging markets. For advanced economies, this will require a shift in the balance of policies away from reliance on macroeconomic and liquidity support toward more structural financial policies. In contrast, for emerging markets policies need to rely more on macroeconomic measures, while macroprudential and, in some cases, capital control measures can play a supportive role. In the short run, fragile balance sheets need continued support to ensure an orderly deleveraging, while in the medium run, public assistance needs to be withdrawn and effective market discipline reestablished.

## A. What Are the Key Stability Risks and Challenges?

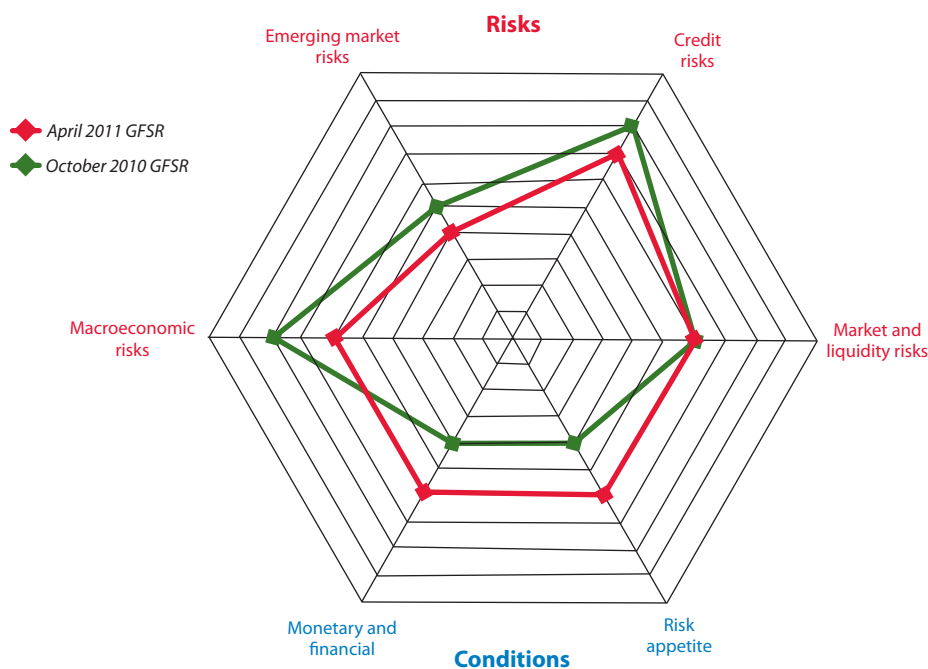
*Risks to global financial stability have declined since the October 2010 Global Financial Stability Report (Figures 1.1 and 1.2). Improvements in macroeconomic performance in advanced economies and strong prospects for emerging markets are supporting overall financial stability. However, sovereign and banking system risks still remain high, and are lagging the overall economic recovery. Accommodative monetary and financial conditions helped ease balance sheet strains and supported an increase in risk appetite. However, remaining structural weaknesses and vulner-*

*abilities in the euro area still pose significant downside risks if not addressed comprehensively. Capital inflows to emerging markets could strain their absorptive capacity, raising concerns about the gradual build up of macrofinancial risks.*

The global recovery has gained pace since the October 2010 GFSR, but remains uneven: heavy debt burdens and high unemployment continue to weigh on economic growth in advanced economies, while emerging market economies continue to grow strongly. Overall *macroeconomic* risks have declined, driven down by improvements in activity and lower risks of deflation (see the April 2011 *World Economic Outlook*). Section B of this chapter shows, however, that even nearly four years since the onset of the financial crisis, balance sheet fragilities continue to pose key downside risks to global financial stability and the economic recovery. Geopolitical risks could also threaten the economic and financial outlook, with oil prices increasing sharply amid fears of supply disruptions in the Middle East and North Africa (see **Box 1.1** on page 37).

Note: This chapter was written by a team led by Peter Dattels and comprised of Sergei Antoshin, Ivailo Arsov, Reinout de Bock, Phil de Imus, Joseph Di Censo, Martin Edmonds, Luc Everaert, Vincenzo Guzzo, Kristian Hartelius, Geoffrey Heenan, Matthew Jones, Geoffrey Keim, William Kerry, Taline Koranchelian, Peter Lindner, Estelle Liu, Yinqiu Lu, Andrea Maechler, Rebecca McCaughrin, Andre Meier, Fabiana Melo, Paul Mills, Ken Miyajima, Michael Moore, Jaume Puig, Faezeh Raei, Marta Sánchez-Saché, Christian Schmieder, Gabriel Sensenbrenner, Narayan Suryakumar, Morgane de Tollenaere, and Nico Valckx.

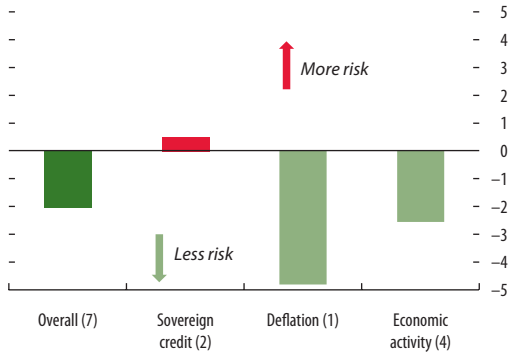
**Figure 1.1. Global Financial Stability Map**



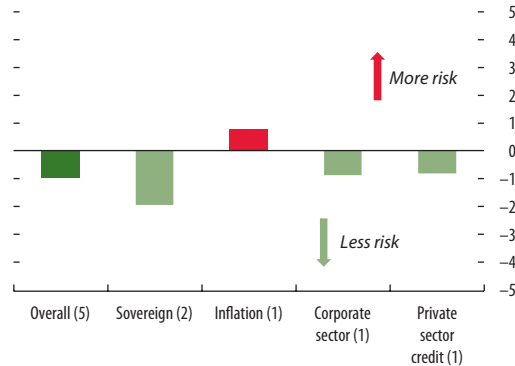
Note: Away from center signifies higher risks, easier monetary and financial conditions, or higher risk appetite.

**Figure 1.2. Global Financial Stability Map: Assessment of Risks and Conditions**  
(In notch changes since the October 2010 GFSR)

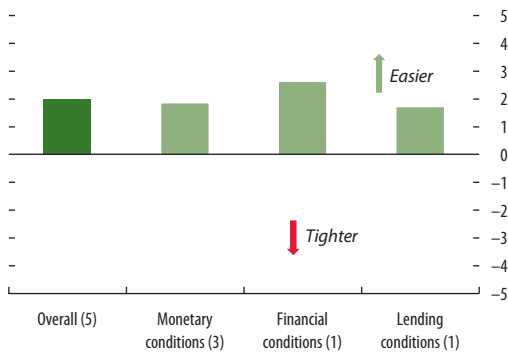
Macroeconomic risks declined despite continued strains in sovereign balance sheets, as the recovery remained on track and deflation risks eased.



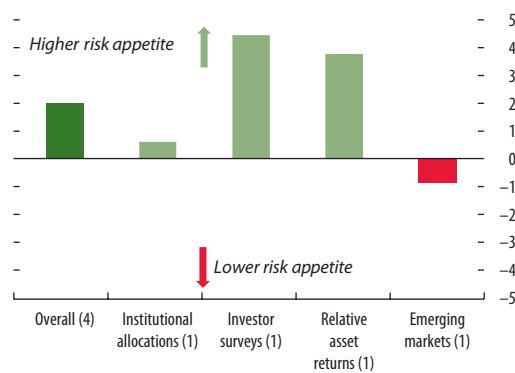
Notwithstanding rising inflationary pressures, emerging market risks were also lower, as reflected in continued rating upgrades and favorable growth prospects.



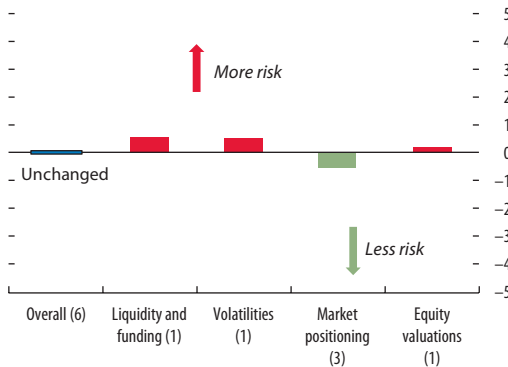
Easier monetary and financial conditions driven by continued accommodative policies, including QE2....



... coupled with the improved macroeconomic outlook boosted risk appetite, although inflows to emerging markets decelerated recently.



Supportive policies also helped contain broader market and liquidity risks despite new stresses in the euro area.



However, improvements in credits risks lagged the real economy, as supportive policies and strong risk appetite may be temporarily masking elevated underlying vulnerabilities.

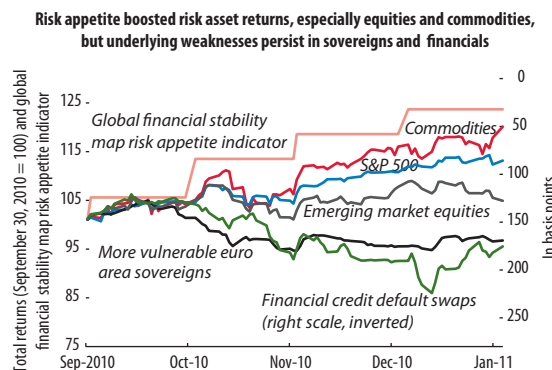


Source: IMF staff estimates.

Note: Changes in risks and conditions are based on a range of indicators, complemented by IMF staff judgment (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 represents slower pace of tightening or faster easing.

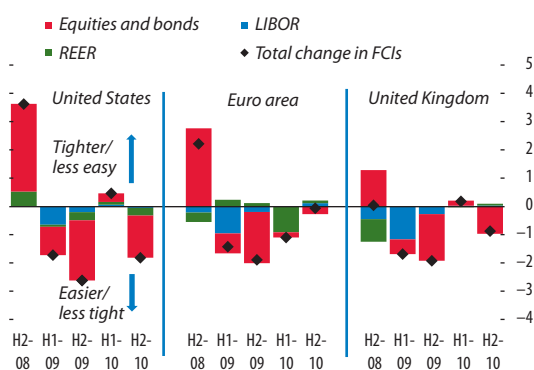
*Monetary and financial conditions* have eased further since the October 2010 GFSR (Figure 1.3), helping to remove deflation-related tail risks. Continued accommodative policies, including quantitative easing, coupled with the improved macroeconomic outlook, boosted *risk appetite* and encouraged a rally in risk assets, helped by a search for yield and a shift from fixed-income securities to equities (Figure 1.4). Equities—especially in advanced economies—have benefited from continued positive economic data, though geopolitical tensions and higher and more volatile oil prices have erased some of the recent gains. High-yield and investment-grade credit spreads in the United States, Europe, and Asia have continued to tighten, while investors are moving toward weaker-quality credit in search of yield. As a result, *market and liquidity risks* remain contained, despite renewed episodes of market turmoil in the euro area. Nevertheless, easy monetary and liquidity conditions may be masking underlying vulnerabilities. Rising expectations of monetary policy tightening in the wake of growing inflationary pressures could result in increased funding risks for vulnerable sovereign balance sheets and banking systems. While the financial stability risks from the recent earthquake and tsunami in Japan seem manageable (see **Box 1.2** on page 40), the energy shortages, supply chain disruptions, and continuing problems at the Fukushima

**Figure 1.4. Risk Appetite**



Sources: Bank of America Merrill Lynch; Bloomberg L.P.; Credit Suisse; EPFR Global; and IMF staff estimates.  
 Note: The global financial stability map risk appetite indicator represents changes in risk appetite based on a range of indicators (see Figure 1.2). Returns on commodities are measured by the Goldman Sachs GSCI commodity index. Emerging market equities are measured by the MSCI EM index. The more vulnerable euro area sovereigns index includes Greece, Ireland, Portugal, and Spain. Financial credit default swap spreads are the simple average of CDS spreads on U.S. and euro area financials.

**Figure 1.3. Changes in Financial Conditions**



Sources: Goldman Sachs; and IMF staff estimates.  
 Note: A 1 percent change in the financial conditions index (FCI) is scaled to represent the change in financial conditions when each component variable changes by one unit (1 percent change in equity returns and the real effective exchange rate [REER], and 100 basis point changes in LIBOR and bond yields). FCI weights are based on relative effect of financial variables on GDP four to six quarters ahead.

Daiichi nuclear power plant leave considerable uncertainty surrounding the growth impact and ultimate cost of damages.

Sovereign balance sheets remain under strain in many advanced economies, as illustrated by increased sovereign bond market volatility in some euro area countries over the past six months. Sovereign bond yields are higher across advanced economies, partly as economic data have improved (see Annex 1.1), and mainly in the case of certain countries in the euro area, in response to concerns about weakening public sector balance sheets. Section D examines these weaknesses, focusing on the financial stability implications of the ongoing repricing of risk in government funding markets and the associated narrowing of the investor base in more vulnerable euro area sovereigns. The analysis also shows that sovereign funding challenges could extend beyond the euro area, as both the United States and Japan are sensitive to higher funding burdens if interest rates increase substantially from current levels.

Improvements in underlying *credit risks* in the private sector are lagging behind the overall economic recovery. Major stability risks remain that could derail the economic recovery, despite significant policy initiatives and some strengthening of bank balance sheets. Since the October

2010 GFSR, banks have sought to raise both the quantity and quality of capital, but progress has been uneven, with European banks generally lagging U.S. banks. European banks have also made less progress in lengthening the maturity of their funding, and remain highly dependent on wholesale funding, with second-tier banks increasingly reliant on covered bond markets and the European Central Bank (ECB) for funding. Banks are also facing pressures on the asset side of their balance sheet, reflecting concerns about exposures to troubled sovereigns and to property markets in Ireland, Spain, the United Kingdom, and the United States. Underlying credit measures show further deterioration in residential and commercial mortgage loans. Although credit growth has been steadily recovering in most advanced economies, it remains sluggish and well below pre-crisis levels, in part owing to still weak bank balance sheets. These weaknesses include excessive leverage, uncertainties about the quality of bank assets, insufficient capitalization in some banks, and generally higher bank funding costs (Section C). In the United States, the weak housing market is likely to extend the household deleveraging process, slowing the economic recovery and weighing on bank balance sheets (Section E).

Emerging markets have continued to receive strong capital inflows, which reflect the still-accommodative policies and relatively slow recovery in mature economies. Overall, *emerging market risks* have declined further since the October 2010 GFSR; renewed stress in the euro area and increased political uncertainty in the Middle East have had only limited spillovers, and growth prospects remain buoyant (Section F). However, the increase in corporate and financial leverage, rising asset valuations, and growing inflationary pressures in emerging market economies raise concerns about the gradual buildup of imbalances, calling for increased vigilance by policymakers and adroit use of policy tools.

The path to durable financial stability remains studded with difficult challenges for policymakers. As discussed in the final section of this chapter, legacy problems of the recent crisis—weak banks and fragile sovereign balance sheets—will need to

be fully addressed in advanced economies to attain a more robust financial system that can be subject to full market discipline. The transition to a stronger financial system must be navigated carefully, while advancing the near-term economic recovery in advanced economies and minimizing spillovers to emerging markets and developing economies.

## B. Living Dangerously—The Legacy of High Debt Burdens in Advanced Economies

*The global financial crisis has put balance sheet weaknesses into sharp relief. Many advanced economies are struggling with the legacy of high debt and excessive leverage, notably in the financial sector. For policymakers, the challenge consists of reducing these vulnerabilities over time and restoring market discipline, without choking off the ongoing economic recovery.*

At the heart of the global financial crisis was an abrupt rediscovery of credit risk. Following a period of almost indiscriminate availability of cheap credit, lenders suddenly took a fresh look at borrowers' capacity to repay debt and found reasons for concern. Focused initially on problems in the U.S. subprime mortgage sector, the reassessment of credit risk broadened over time, affecting households, nonfinancial corporations, banks, and sovereigns across much of the industrialized world. The turbulence in some euro area financial markets over the past six months suggests that the process is still ongoing.

Revived fear among investors about credit risk has put a spotlight on high debt levels in many parts of the global economy, including households with negative equity in their homes, banks with thin capital buffers and uncertain asset quality, and sovereigns facing market concerns about debt sustainability (Table 1.1). The global financial crisis also highlighted the interconnectedness of balance sheets across sectors and economies. Initially, debt problems spread from the private to the public sector because of sharp declines in tax revenue and the cost of bank bailouts. More recently, weaknesses in some sovereign balance sheets have come back to haunt the private sector through higher country risk

**Table 1.1. Indebtedness and Leverage in Selected Advanced Economies<sup>1</sup>**  
(Percent of 2010 GDP, unless noted otherwise)

	United States	Japan	United Kingdom	Canada	Euro area	Belgium	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Government gross debt, 2011 <sup>2</sup>	100	229	83	84	87	97	88	80	152	114	120	91	64
Government net debt, 2011 <sup>2,3</sup>	72	128	75	35	67	82	78	55	n.a.	95	101	86	53
Primary balance, 2011 <sup>2</sup>	-9.0	-8.6	-5.5	-4.1	-1.7	-0.5	-3.5	-0.3	-0.9	-7.5	0.2	-1.6	-4.6
Households' gross debt <sup>4</sup>	91	74	107	93	72	55	69	62	68	129	50	103	90
Households' net debt <sup>4,5</sup>	-230	-231	-184	n.a.	-129	-204	-131	-130	-56	-60	-178	-126	-74
Nonfinancial corporates' gross debt <sup>4</sup>	76	138	128	n.a.	142	161	157	69	71	278	119	154	205
Nonfinancial corporates' debt over equity (percent)	105	176	89	72	106	43	76	105	218	113	135	145	152
Financial institutions' gross debt <sup>4</sup>	97	188	735	n.a.	148	139	148	95	21	664	99	65	113
Bank leverage <sup>6</sup>	13	23	24	18	26	30	26	32	17	18	20	17	19
Bank claims on public sector <sup>4</sup>	8	76	7	20	n.a.	22	19	25	27	28	32	16	22
Total economy gross external liabilities <sup>4,7</sup>	144	64	696	91	174	417	254	181	194	1,598	153	293	215
Total economy net external liabilities <sup>4,7</sup>	19	-52	14	7	13	-43	11	-39	99	102	20	106	90
Government debt held abroad <sup>8</sup>	32	7	27	20	29	68	64	53	61	59	47	57	50

Sources: Bank for International Settlements (BIS); Bloomberg, L.P.; EU Consolidated Banking Data; U.S. Federal Deposit Insurance Corporation; Haver Analytics; IMF, International Financial Statistics, Monetary and Financial Statistics, and World Economic Outlook databases; BIS-IMF-OECD-World Bank Joint External Debt Hub; and IMF staff estimates.

<sup>1</sup>Cells shaded in red indicate a value in the top 25 percent of a pooled sample of all countries shown in table from 1990 through 2009 (or longest sample available). Green shading indicates values in the bottom 50 percent, yellow in the 50th to 75th percentile. The sample for bank leverage data starts in 2008 only.

<sup>2</sup>World Economic Outlook projections for 2011.

<sup>3</sup>Net general government debt is calculated as gross debt minus financial assets corresponding to debt instruments.

<sup>4</sup>Most recent data divided by 2010 GDP.

<sup>5</sup>Household net debt is calculated using financial assets and liabilities from a country's flow of funds.

<sup>6</sup>Leverage is defined as tangible assets to tangible common equity for domestic banks.

<sup>7</sup>Calculated from assets and liabilities reported in a country's international investment position.

<sup>8</sup>Most recent data for externally held general government debt (from Joint External Debt Hub) divided by 2010 gross general government debt.



premia and fears about writedowns on government bond holdings. These interconnections have become even more complex because of the cross-border dimension of integrated financial markets.

***High debt levels represent a lingering vulnerability in many advanced economies.***

Heavy debt burdens weigh on economic activity and threaten financial stability by making balance sheets more fragile. When debt is at high levels, its sustainability becomes increasingly sensitive to changes in funding costs and rollover rates, exposing borrowers to sudden shifts in sentiment or market conditions. Moreover, shocks can spread quickly throughout the financial system, especially if they affect highly leveraged entities or if a lack of transparency promotes contagion. Overall, the mosaic of highly indebted balance sheets documented in Table 1.1 suggests that the following issues are likely to keep risks to global financial stability elevated in the period ahead:

- *Government debt is generally high and on a worrying upward path in a number of advanced economies.* Market concerns about high public debt and large contingent liabilities related to financial sector support have been concentrated so far on a few countries in the euro area. Despite the progress already made, additional policy efforts are needed to secure a comprehensive solution to the fiscal problems and to prevent further contagion. Meanwhile, public debt is also on a problematic trajectory in other parts of the world, notably in Japan and the United States.
- *Households remain highly indebted in the United States and several other advanced economies.* High mortgage debt and the sharp fall in house prices left many U.S. households with negative equity and raised risks to banks from mortgage defaults. Significant vulnerabilities also loom in the household sector in Ireland, and households also face challenges in Spain, following the bursting of housing bubbles there. Household debt remains high in several other advanced economies, notably in Canada, Japan, Portugal, and the United Kingdom.
- *While leverage ratios among nonfinancial firms have trended down and do not seem stretched in*

*many advanced economies, the corporate sector in parts of the euro area and, to some extent, in Japan still exhibit relatively high leverage.* Gross debt levels are high among nonfinancial corporations in many economies, but are often backed by significant equity cushions.

- *In the euro area, the prospects for the financial sector remain closely tied to sovereign stress.* Although their capital ratios have been bolstered since the onset of the crisis, many banks still face investor doubts about their financial future. Problems are most acute in those euro area countries where the very adverse situation in the real estate markets heralds further writedowns, and where strained public balance sheets weigh on the creditworthiness of banks. More generally, still-high bank leverage means that many financial institutions find it difficult to secure market funding on adequate terms in the absence of some form of public support.

For the broader economy, overcoming the legacy of high debt is bound to be a drawn-out process.

In principle, there are three possible ways to reduce overall debt levels in the private and public sectors, each presenting specific downsides or risks:

- Any strategy will likely involve the difficult, protracted process of creating financial surpluses for several consecutive years. In the household sector, this process has been under way for some time, as witnessed by the rise in saving rates from pre-crisis levels. Yet, much of the needed public sector belt-tightening is still to come.
- A continued low-interest-rate policy would support deleveraging by effectively transferring resources from savers to borrowers and providing a supportive macroeconomic environment, but there are limits to the effectiveness of monetary policy in expediting the deleveraging process.
- Debts could be reduced through some form of writedown, restructuring, or one-off transfer, as for example in the case of an over-indebted household. This strategy can potentially restore borrower viability very quickly, but it might prove disruptive to the financial position of the creditors involved.

The main task facing policymakers in advanced economies is to promote deleveraging and restore market discipline, while avoiding financial or economic disruption during the transition. Lingering fragilities in the banking system require particularly urgent attention, as they could amplify and propagate any new shocks to financial stability. Thus, ongoing policy efforts to withdraw implicit public guarantees and ensure bondholder liability for future losses must build on rapid progress toward stronger bank balance sheets.

### C. Banking System—Not Enough Has Been Done

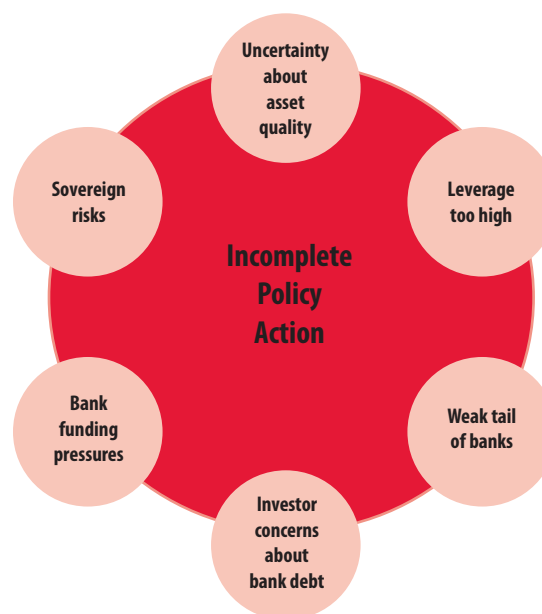
*Nearly four years after the start of the global financial crisis, confidence in the stability of the banking system as a whole has yet to be fully restored. Markets remain concerned that some banks are too highly leveraged and have insufficient capital, given the uncertainty about the quality of their assets. This is despite improvements to balance sheets and significant policy initiatives. A rise in funding costs is squeezing bank revenues and limits capital generation. The weakest banks need to be restructured or resolved, and the remaining institutions need to be adequately capitalized. This should help restore investor confidence in the banking system, increase lending and profitability, and enable the banking sector to fully support the economic recovery.*

Incomplete policy actions and inadequate reforms of the banking sector have left segments of the global banking system vulnerable to further shocks. Many institutions—particularly weaker European banks—are caught in a maelstrom of interlinked pressures that are intensifying risks for the system as a whole (Figure 1.5).

*Progress in strengthening capital positions and reducing leverage has been uneven...*

Banks have made progress in raising capital ratios, particularly in the United States, where they recapitalized following the publication of the U.S.

**Figure 1.5. Banking Sector Challenges**



stress tests in early 2009 (Figure 1.6). Other factors, such as action by the Federal Reserve, have helped to support institutions in the United States. Banks in Europe have also raised capital, but aggregate balance sheets still remain leveraged and reliant on wholesale funding.<sup>1</sup>

*...and euro area banks in particular remain vulnerable to funding pressures as their needs mount.*

Euro area banks as a whole are still highly dependent on wholesale funding (Figure 1.6).<sup>2</sup> This contrasts with banks in other countries, such as the United Kingdom, where the use of wholesale markets has been reduced significantly, or with banks in Japan, where aggregate reliance on wholesale funding is lower.<sup>3</sup> Moreover, a number of euro area

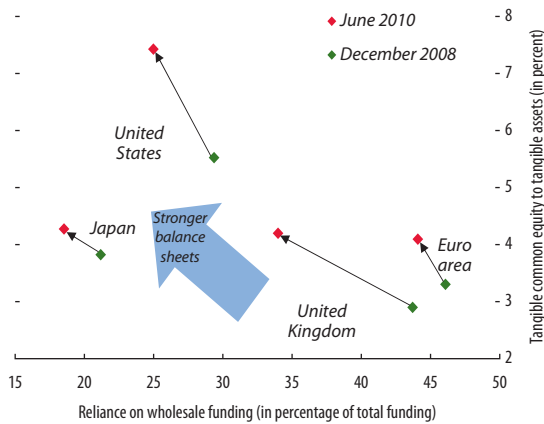
<sup>1</sup> It is important to note that U.S. banks' relatively favorable leverage ratio is due, in part, to differences in regulatory accounting, in addition to the other factors mentioned above.

<sup>2</sup> Central bank liquidity support is included in wholesale funding, though this does not significantly impact the relative rankings in Figure 1.6.

<sup>3</sup> U.K. banks, however, have been making use of new wholesale funding instruments, such as put-able certificates of deposit, extendible repos, and long-dated secured funding. Although these instruments are helpful in increasing the maturity of bank funding, they also create new liquidity risks. See Bank of England (2010, Box 3).



**Figure 1.6. Banking System Capital and Reliance on Wholesale Funding**



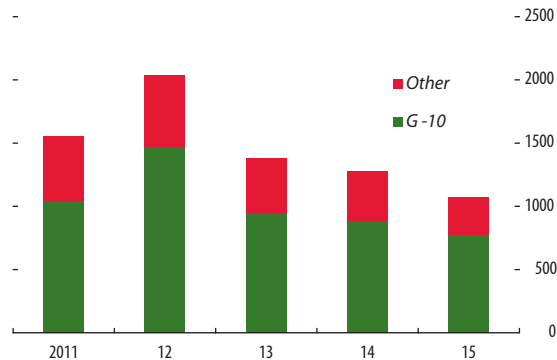
Sources: EU Consolidated Banking Data; national authorities; and IMF staff estimates.  
 Note: Wholesale funding includes debt and interbank borrowing. Total funding is wholesale funding plus deposits.

banks have substantial short-term wholesale funding requirements. Current market conditions, with low short-term rates and a steep yield curve, may provide incentives for banks to maintain this short-dated funding. But such funding brings additional vulnerabilities given its high rollover rate and quick repricing. Some larger European banks also fund a significant part of their short-term positions in foreign currency, much of which is from U.S. money market funds. But this funding comes with further risks as it could be subject to quick withdrawal by money managers, as has been seen in the past.

The result is that global banks face a wall of maturing debt, with \$3.6 trillion due to mature over the next two years (Figure 1.7). Bank debt rollover requirements are most acute for Irish and German banks, from 40 percent to one-half of all debt outstanding is due over the next two years (Figure 1.8). These bank funding needs coincide with higher sovereign refinancing requirements (see Section D), heightening competition for scarce funding resources.

A number of banks in Europe—including nearly all banks in Greece, Ireland, Portugal, many of the small and mid-size Spanish *cajas*, and some German *Landesbanken*—have lost cost-effective access to term funding markets. As a result they have turned

**Figure 1.7. Global Bank Debt Maturity Profile**  
 (In billions of U.S. dollars)



Source: Moody's.

in varying degrees to repo markets and the ECB for refinancing. But there is still a risk that, in the event of further negative news, a greater number of institutions could face difficulties in rolling over their wholesale funding.

*Investor demand for bank debt is falling, reflecting not only underlying vulnerabilities but also changes in the structure of the markets...*

In Europe, the entire liability structure at banks is being repriced given investor concerns about potential future private sector burden sharing. The repricing follows the initial communication of the future European permanent crisis resolution framework, the debate on the Irish private sector bail-in,

**Figure 1.8. Bank Rollover Requirement, 2011–12**  
 (In percent of total debt)



Sources: Bloomberg, L.P.; and IMF staff calculations.  
 Note: The data are for a sample of banks in each country.

and the *Amagerbanken* insolvency in Denmark.<sup>4</sup> As losses on senior debt become a credible threat to market participants, demand for bank debt from some current investors will decline, potentially reducing the overall funding pool available to banks.

These investor concerns, along with the prospect of increased requirements under Basel III for stable funding sources, are prompting some European banks to issue longer-term debt, such as covered bonds. Although useful as an additional means of raising funds privately, covered bonds effectively subordinate senior unsecured funding, making it even less attractive to investors. Moreover, this type of funding can only provide a limited alternative to unsecured senior bank debt, as issuance will be constrained by the level of collateralization required for the highest ratings.

*...acting to push up funding costs and squeezing net revenues...*

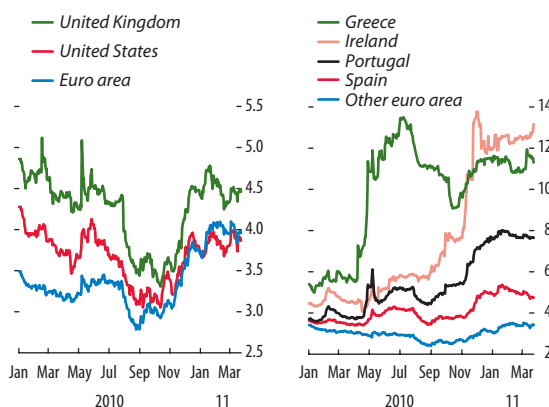
Wholesale funding pressures have been reflected in a sharp rise in bank debt yields in some euro area countries (Figure 1.9). Marginal wholesale funding costs have risen most in economies where the sovereign is facing greatest market pressure. The spillover of sovereign risk to the banking sector reflects the fact that bank downgrades often follow sovereign downgrades and that implicit (or explicit) government guarantees to the banking sector are perceived to be eroded as sovereign pressures mount.

Increased wholesale funding costs have, in turn, led some banks to bid for deposits in an attempt to bolster their secure funding base. The fierce competition for deposits, in part due to the excess capacity in banking systems, leaves institutions vying for a limited pool of depositors and in some cases has driven up deposit rates paid in new business (Figure 1.10).

The rise in the cost of marginal wholesale and deposit funding—along with lower interest income—has led to a squeeze in net interest

<sup>4</sup> Some market participants argue that without state support, banks are effectively highly leveraged and illiquid credit funds that should be priced closer to the high-yield corporate market than the sovereign curve. Yet the existing investor base for senior bank debt is dominated by insurance companies and pension funds that have only limited appetite for risk.

**Figure 1.9. Bank Debt Yields**  
(In percent)



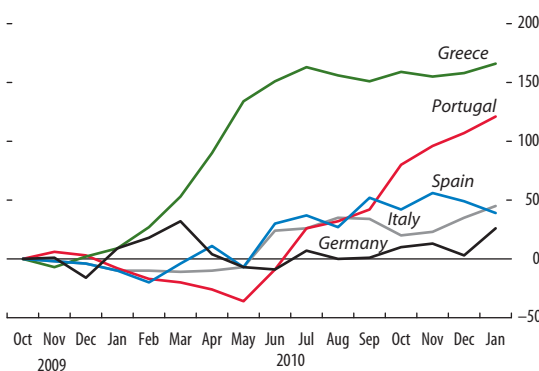
Sources: Barclays Capital; Bloomberg L.P.; and IMF staff estimates.  
Note: Figure shows asset-weighted average yields for five-year debt issued by a sample of banks in each economy.

margins in some economies (Figure 1.11). This has occurred because increases in second-tier bank funding costs have little impact on the benchmark market rates used to price their loans.

*...while markets remain concerned about the quality of bank assets.*

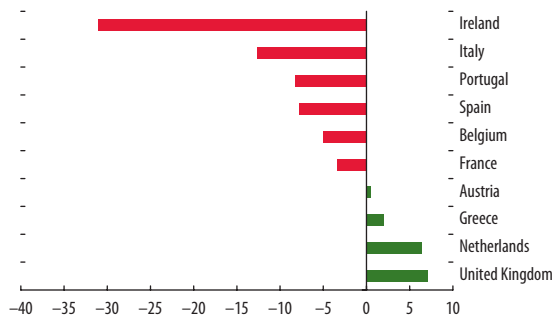
Banks also face pressures on the asset side of their balance sheets because of concerns about the quality of bank exposures. This is particularly the case for exposures to real estate—either residential or com-

**Figure 1.10. Increase in Bank Deposit Rates**  
(Basis points)



Source: European Central Bank.  
Note: Figure shows deposit rates on new business up to one year.

**Figure 1.11. Change in Bank Net Interest Margin, June 2010**  
(Percent, year-on-year)



Sources: EU Consolidated Banking Data; and IMF staff estimates.  
Note: The figure shows the percentage change in net interest income over total assets from 2009 to June 2010 (annualized), and shows data for domestic banks in each country.

mercial—in Ireland, Spain, the United Kingdom, and the United States.

Estimates of potential losses on property exposures vary significantly. First, real estate is of uncertain value in a number of markets, such as commercial real estate, where the number of transactions is low. Second, some banks have been rolling over loans that would otherwise have been considered delinquent, a practice that may have been exacerbated by the persistence of low interest rates.<sup>5</sup> Third, banks—particularly in the United States—have built up an inventory of repossessed properties, and a key challenge is how to reduce that stock without further destabilizing house prices (Section E discusses this in more detail).

The value of bank exposures to troubled sovereigns is also uncertain. In Europe, the majority of sovereign debt is held in the banking book and so is accounted for at book value. But investors are concerned that the market value of some of these assets may be considerably lower than the current accounting value. Bank holdings of government bonds issued by countries facing fiscal pressures are large in relation to capital in several banking systems, so the market value of these assets is an

<sup>5</sup>These loans are recorded as performing in bank accounts, but as was discussed in the October 2010 GFSR, these assets often have a higher eventual default rate than standard performing loans.

important factor in assessing the overall health of these banking systems.

### *What needs to be done?*

Banking sector risks are not homogenous, with vulnerabilities varying across economies and between different types of banks within the same country. Looking across a range of risk indicators for a sample of banks suggests that institutions in Greece and Ireland are currently facing the greatest balance sheet pressures, given the level of sovereign stress, concerns about loans, and high marginal wholesale funding costs (Table 1.2). However, both countries operate under European Commission/ECB/IMF programs, which include capital backstops and space for sovereigns to address fiscal deficit and debt problems. Within the parameters of these programs, these countries' banks benefit from the temporary nonconventional measures of the ECB, which means they are partially and temporarily shielded from higher funding costs.

The analysis also suggests that Spanish *cajas* and Portuguese banks are vulnerable from their holdings of sovereign bonds through exposures to real estate and from high marginal wholesale funding costs. Banks in Austria, the United Kingdom, and the United States have high loan losses, but are aided by relative profitability. German banks, conversely, have low revenues and this has fed through into low capital levels for *Landesbanken* and cooperative banks. These low levels of capital make some German banks, as well as weak Italian, Portuguese, and Spanish savings banks, vulnerable to further shocks.<sup>6</sup> These findings are based on a sample of banks in each country (Table 1.2). It is possible, however, that there are weak banks that are outside this sample.

So what needs to be done? The authorities in Ireland, Spain, Germany, the United Kingdom, and the United States have made or are making considerable efforts to crystallize losses, increase capital, and implement deleveraging and divestiture plans

<sup>6</sup>In Spain, all credit institutions are required to raise capital to meet the new standard of core capital worth at least 8 percent of risk-weighted assets. Recapitalization plans are to be implemented by September 2011.

**Table 1.2. Banking Vulnerability Indicators**

	Sample Size	Revenue	Asset Quality		Wholesale Funding Costs	Capital Ratios	
			Sovereign bonds	Loans		Aggregate	Distribution
			Loss rate	Loss rate			
(1)	(2)	(3)	(4)	(5)	(6)		
United States	40						
United Kingdom	4						
Austria	2						
Belgium	2						
France	3						
Germany: Commercial	2						
Germany: Landesbanken	8						
Germany: Cooperative	2						
Greece	6						
Ireland	2						
Italy	5						
Netherlands	3						
Portugal	4						
Spain: International	2						
Spain: Domestic	5						
Spain: Savings	17						

Notes: Colors are allocated by ranking each column into relative tertiles, adjusted for borderline cases. The bank-level analysis for (1)–(3) and (5)–(6) is based on a sample of institutions which for European banks is similar to that used in the 2010 CEBS stress test. The CEBS covers around 65 percent of EU banking assets and at least 50 percent of the banking system in each country. In some countries, such as Spain, the sample covers a significantly greater proportion of the banking system.

<sup>1</sup>Pre-provision net revenues as a percentage of total assets (2010 or latest available). The tertiles are (in percent): >1.2 (green); 1.2 – 0.8 (yellow); <0.8 (red).

<sup>2</sup>Estimated mark-to-market changes in sovereign bond holdings over total assets. Mark-to-market changes are calculated from end-2009 to March 2011 using sovereign credit default swap spreads. The tertiles are (in percent): <0.2 (green); 0.2 – 0.6 (yellow); >0.6 (red).

<sup>3</sup>Loan loss impairments as a percentage of total loans (2010 or latest available). The tertiles are (in percent): <0.6 (green); 0.6 – 1.3 (yellow); >1.3 (red).

<sup>4</sup>Asset-weighted average five-year bank bond yields in March 2011. The tertiles are (in percent): <3.9 (green); 3.9 – 5.0 (yellow); >5.0 (red).

<sup>5</sup>Core Tier 1 ratios, per banks’ own definition, which in some cases includes public support, aggregated across the countries and sectors (2010 or latest available). The tertiles are (in percent): >9.2 (green); 9.2 – 8.5 (yellow); <8.5 (red).

<sup>6</sup>The share of banks in our sample, in terms of total assets, with core Tier 1 ratios below 8 percent (2010 or latest available). The tertiles are (in percent): 0 (green); 1 – 49 (yellow); >49 (red).

in the banking system. But these measures need to be reinforced, broadened across the entire banking system in each country, and extended to a greater range of economies to ensure that the vulnerabilities in the global banking system are removed once and for all (Figure 1.12).

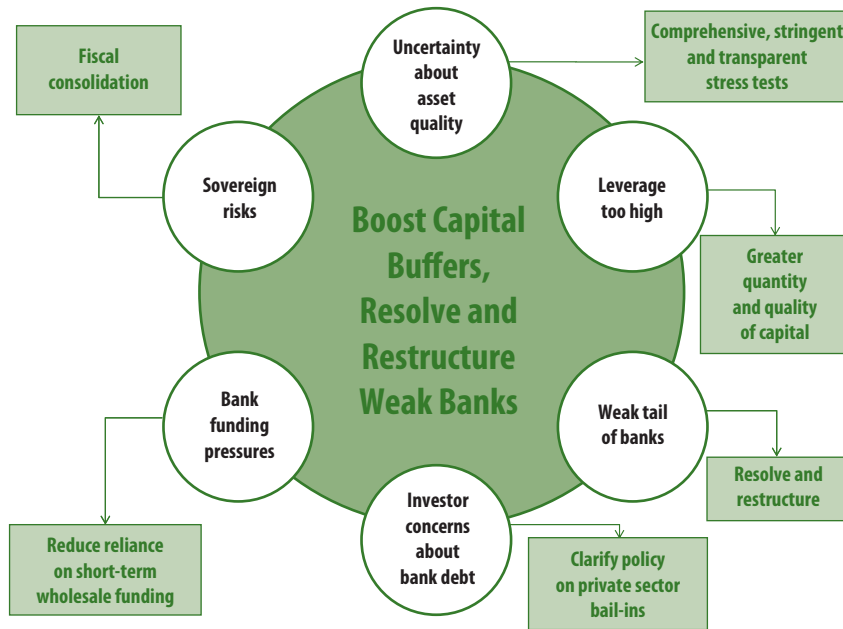
***Banks need larger capital buffers...***

To restore investor confidence, European bank leverage needs to be reduced further through an increase in the quantity and quality of capital. Better capital buffers will not only provide a greater cushion against future losses, but will also reduce bank credit risks and help restore access to funding markets. This should start a virtuous circle: as lower

funding costs improve bank net revenues, capital generation will be restored and capital levels raised further.

But in times of uncertainty, markets are likely to require a capital buffer in excess of regulatory norms. The crisis has shown that banks that meet regulatory capital requirements can be shut out of wholesale funding markets. Where significant uncertainties remain about bank asset values, creditors will take a conservative view of asset values. Investors will worry about their position in the repayment hierarchy in the event of a bank default and will assess the market value of assets available to repay creditors. In current conditions, this implies lower asset values and hence greater capital

**Figure 1.12. Policy Solutions to Banking Sector Challenges**



needs for banks to meet capital hurdles. Markets are increasingly assessing banks against higher quality capital, such as core capital, and are anticipating the stricter conditions that are likely under Basel III.

This all means that banks in Europe still need to raise a significant amount of capital to regain funding market access. In current market conditions, it is unlikely that they will be able to raise all of this in markets. Institutions could build capital by reducing dividend payout ratios and retaining a greater proportion of earnings. Banks could also gradually downsize balance sheets to reduce capital and funding needs. But it is likely that some of the capital will need to come from public sources.

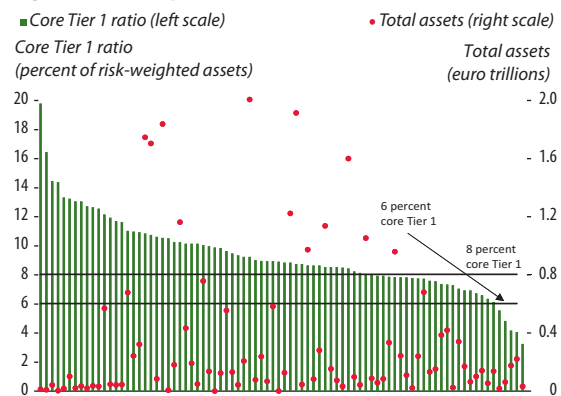
**...the weakest banks need to be addressed...**

Figure 1.13 shows that over 5 percent of banks, representing 2 percent of bank assets in our sample, had core Tier 1 ratios below 6 percent at end-2010. But this figure rises to over 30 percent of banks and almost 20 percent of assets against an 8 percent core Tier 1 ratio. This weak tail of banks has created overcapacity in some banking systems, raising funding costs for all banks in the system, reducing profitability, and adversely affecting capital generation. Further policy action is needed to restructure

and, where necessary, resolve this weak tail of undercapitalized banks.

Some efforts to address the weaker banks are already under way. For example, in Germany, banks are being required to strengthen capital levels further, reduce balance sheet size, and adjust business models. In Spain, fundamental consolidation of the banking system is under way, with capital standards being raised and most of the savings banks likely to spin off their banking operations into commercial banking arms and to seek private equity through initial public offerings (IPOs). These measures need

**Figure 1.13. European Union Bank Core Tier 1 Ratios, 2010**



Source: SNL Financial.



to be implemented fully to ensure that banking systems emerge stronger.

*...and measures should be taken to reduce uncertainty about asset quality.*

Measures to reduce uncertainty about asset quality should also help reduce the level of capital required by markets and encourage banks to raise private sources of capital. Bank balance sheets currently lack transparency. Measures to enhance transparency have started to be put in place in Spain, but such measures need to be taken forward more thoroughly across a range of economies. A fundamental improvement is needed in the frequency and quality of bank reporting in the European Union (EU), for example by all institutions reporting a common template that is publically disclosed on a quarterly basis.

The publication of stress-test results can also make an important contribution to greater transparency. The stress test run by the Committee of European Banking Supervisors (CEBS) in the summer of 2010 initially helped to calm markets. But there is a golden opportunity to improve on this when new stress tests are conducted by the European Banking Authority later this year. These new stress tests should (1) be embedded in a broader crisis management strategy, including the clarification of support for sovereigns and backstops for banks; (2) ensure the broadest possible coverage of banks in each country; (3) incorporate funding costs and liquidity strains; (4) have a more stringent capital hurdle, especially for banks that rely on wholesale funding markets; (5) include ex ante verification of weak assets—particularly real estate—by private consultants for loan books in economies with property overhangs; (6) have stronger supervisory scrutiny to ensure consistency across economies; and (7) require upfront and higher quality capitalization for weaker but viable banks.

Banks could also help to mitigate concerns about asset quality by continuing to write down portfolios to better reflect their risk. For example, in the United States, banks should engage in principal reductions on loans that have been modified. Our analysis suggests that banks in the United States have room to take such measures, which could

help relieve some of the problems in residential real estate markets (Section E).

*Comprehensive policy measures are needed to allow the banking system to support the economic recovery.*

Overall, a comprehensive set of policies—including capital-raising, restructuring and where necessary resolution of weak banks, and increased transparency about banking risks—is needed to solve banking system vulnerabilities. Without these reforms, downside risks will reemerge. If those banks fail to raise capital buffers, they will likely continue to have difficulties in obtaining cost-effective access to funding markets and will increasingly have to rely on central bank financing. This situation is neither healthy nor sustainable. Banks without access to funding markets may also be forced to shed assets as liabilities come due. Such forced deleveraging could be particularly severe and would cut back the supply of credit to the real economy. Fire sales would also lower asset prices, leading to mark-to-market losses for banks exposed to those assets. Increased bank losses could raise contingent liabilities for governments and raise sovereign risks. This could spill back over to banks through increased funding costs, intensifying the sovereign-bank feedback loop. It is, therefore, imperative that weak banks raise capital to avoid a pernicious cycle of deleveraging, weak credit growth, and falling asset prices.

## D. Sovereign Funding Challenges

*As recent market developments have demonstrated, sovereign credit risks are a key source of financial instability. Market concerns about the sustainability of public debt can prompt a sharp repricing of assets that damages bank balance sheets and creates an adverse feedback loop through the real economy. In the euro area, recent episodes of volatility in financial markets have weakened the investor base for some countries' government bonds. This erosion of investor demand risks concentrating exposures among vulnerable financial institutions, while increasing funding uncertainty for the sovereign. Under*

*a baseline scenario, government interest bills in advanced economies are projected to rise, notably in parts of the euro area. However, the interest burden should generally remain manageable provided that deficit reduction proceeds as foreseen and contingent liabilities related to the financial sector remain contained. While the United States and Japan continue to benefit from low current rates, both are very sensitive to a potential rise in funding costs.*

Sovereign balance sheets in many advanced economies remain vulnerable. Still-high primary deficits have kept public debt on an upward trajectory (Table 1.3). Sizable support schemes for domestic banking systems have further worsened debt dynamics in some economies. Large near-term financing requirements heighten the market pressure on governments whose credit quality has come under scrutiny, as evidenced by elevated credit default swap (CDS) spreads and recent rating downgrades. Linkages between the sovereign and the financial system have also intensified in a few cases. The most notable recent examples are Greece and Ireland, where the proportion of public debt held by domestic banks has increased. This trend mirrors a simultaneous decline in the share of government bonds held by nonresidents.

Looking across all indicators shown in Table 1.3, the upward repricing of sovereign credit risk in government funding markets emerges as a key risk to global financial stability. Higher sovereign spreads directly worsen public debt dynamics, which may further ratchet up investor concerns in a self-fulfilling manner—even more so in an environment where risk-free rates are also on the rise as some central banks start tightening policy. Writedowns on government bond holdings could, in turn, weaken balance sheets among banks and other leveraged investors. By acting as a benchmark for interest rates across the whole economy, higher government bond yields also tend to raise the cost of credit for banks, companies, and households. Such repricing can deal a significant blow to the real economy, potentially feeding back into financial instability via higher credit losses in banks. Against this backdrop, this section analyzes

current tensions in government funding markets and their interaction with investor perceptions of sovereign risk.<sup>7</sup>

*Policymakers have stepped up efforts to forestall further turmoil in euro area financial markets.*

Euro area sovereign bond markets suffered another significant bout of volatility over the past six months. Yields on Irish government bonds surged in October 2010 on news about further losses in the national banking system. Spreads for the sovereign bonds of Belgium, Greece, Italy, Portugal, and Spain also reached new highs (Figure 1.14). Even the CDS of France and Germany rose by some 30 to 40 basis points during that period, as the crisis of confidence spilled over to the wider euro area.

Policymakers responded to the turbulence with a range of measures. The ECB made fresh purchases of government bonds in secondary markets under the Securities Market Program, and a joint EU-IMF program provided financial support to Ireland. Fiscal policy efforts complemented these initiatives, as all euro area members have taken steps to reduce their deficits in 2011, in some cases significantly so. A few countries have also made important policy changes in other areas. Spain, for example, has launched labor market and pension reforms while, as described in the previous section, accelerating bank restructuring and putting in place a new bank recapitalization program.

Euro area policymakers also announced in November 2010 the creation of a European Stabilization Mechanism (ESM) that will replace the current European Financial Stability Facility (EFSF) when it expires in 2013. The ESM will stand ready to offer financial assistance to member states facing funding difficulties. In extreme cases where debt sustainability cannot be achieved, the ESM will require the government to negotiate a sovereign debt restructuring plan with private creditors. To facilitate this process, standardized collective action clauses must be included in the terms of all euro area government bonds issued after June 2013. As such, the ESM aims to reduce moral hazard and

<sup>7</sup> Further discussion of public sector balance sheets is provided by the April 2011 *Fiscal Monitor* (IMF, 2011b).

**Table 1.3. Sovereign Market and Vulnerability Indicators***(Percent of 2011 projected GDP, unless otherwise indicated)*

	Fiscal and Debt Fundamentals <sup>1</sup>		Financing Needs <sup>4</sup>		External Funding		Banking System Linkages		Sovereign Credit		Sovereign CDS	
	Gross general government debt <sup>2</sup>	Net general government debt <sup>3</sup>	Primary balance	Gross general government debt maturing plus budget deficit	General government debt held abroad <sup>5</sup>	Domestic depository institutions' claims on general government <sup>6</sup>	(percent of 2010 GDP)	(percent of depository institutions' consolidated assets)	BIS reporting banks' consolidated international claims on public sector <sup>7</sup>	Rating/Outlook (notches above speculative grade/outlook)	(as of 3/10/11) <sup>8</sup>	Five-year (basis points) (as of 3/9/2011)
Australia	24.1	7.8	-2.1	4.5	3.3	2.2	1.2	3.2	9	Stable	51	
Austria	70.5	50.7	-1.0	7.8	8.6	15.7	4.5	14.4	10	Stable	76	
Belgium	97.3	82.3	-0.5	22.4	22.6	22.0	6.8	18.3	9	Negative	166	
Canada	84.2	35.1	-4.1	18.5	16.4	19.6	10.3	3.6	10	Stable	n.a.	
Czech Republic	41.7	n.a.	-2.6	11.0	10.8	15.9	13.3	4.9	5	Stable	88	
Denmark	45.6	4.4	-3.2	9.3	9.8	15.5	3.2	6.0	10	Stable	44	
Finland	50.8	-52.6	-1.8	11.2	9.7	6.2	2.3	11.3	10	Stable	35	
France	87.6	77.9	-3.5	20.6	19.7	19.0	4.7	8.8	10	Stable	85	
Germany	80.1	54.7	-0.3	11.4	10.5	25.4	7.6	10.4	10	Stable	48	
Greece	152.3	n.a.	-0.9	24.0	26.0	27.4	12.2	23.3	-1	Negative	1,037	
Ireland	114.1	95.2	-7.5	19.5	18.0	28.2	2.8	8.7	3	Negative	587	
Italy	120.3	100.6	0.2	22.8	23.1	32.1	13.1	15.2	7	Stable	180	
Japan	229.1	127.8	-8.6	55.8	52.5	76.3	23.7	1.6	7	Negative	77	
Korea	28.8	27.5	3.5	8.9	5.8	6.1	4.4	4.8	5	Stable	98	
Netherlands	65.6	30.5	-2.2	19.9	16.6	13.8	3.6	9.2	10	Stable	47	
New Zealand	35.8	10.4	n.a.	15.0	7.7	6.8	3.6	3.0	9	Negative	63	
Norway	54.3	-157.3	10.4	-1.2	-3.0	n.a.	n.a.	7.4	10	Stable	19	
Portugal	90.6	86.3	-1.6	21.6	21.0	15.7	4.8	17.2	5	Negative	498	
Slovak Republic	45.1	n.a.	-3.6	14.5	12.8	19.4	22.0	6.1	6	Stable	88	
Slovenia	42.3	n.a.	-3.4	7.2	7.3	10.9	7.4	6.7	8	Negative	84	
Spain	63.9	52.6	-4.6	19.3	18.7	22.3	6.8	7.1	8	Negative	253	
Sweden	37.3	-13.8	-0.9	5.4	4.6	6.5	2.3	5.3	10	Stable	33	
United Kingdom	83.0	75.1	-5.5	15.7	13.6	6.9	1.5	2.9	10	Stable	58	
United States	99.5	72.4	-9.0	28.8	25.6	7.7	5.3	3.7	10	Stable	43	

Sources: Bank for International Settlements (BIS); Bloomberg, L.P.; IMF; International Financial Statistics, Monetary and Financial Statistics, and World Economic Outlook databases; BIS-IMF-OECD-World Bank Joint External Debt Hub; and IMF staff estimates.

Note: Based on projections for 2011 from the April 2011 *World Economic Outlook*. Please see the WEO for a summary of the policy assumptions.

<sup>1</sup>As a percent of GDP projected for 2011. Data for Korea are for central government.

<sup>2</sup>Gross general government debt consists of all liabilities that require future payment of interest and/or principal by the debtor to the creditor. This includes debt liabilities in the form of Special Drawing Rights (SDRs), currency and deposits, debt securities, loans, insurance, pensions, and standardized guarantee schemes, and other accounts payable.

<sup>3</sup>Net general government debt is calculated as gross debt minus financial assets corresponding to debt instruments. These financial assets are monetary gold and SDRs, currency and deposits, debt securities, loans, insurance, pensions, and standardized guarantee schemes, and other accounts receivable.

<sup>4</sup>As a proportion of projected GDP for the year. Assumes that short-term debt maturing in 2011 will be refinanced with new short-term debt that will mature in 2012.

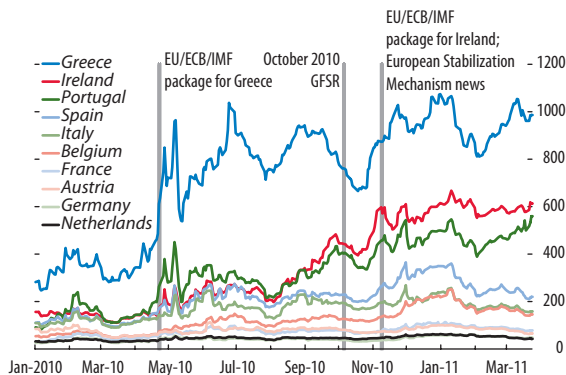
<sup>5</sup>Most recent data for externally held general government debt (from Joint External Debt Hub) divided by 2010 gross general government debt. New Zealand data are from Reserve Bank of New Zealand.

<sup>6</sup>Includes all claims of depository institutions (excluding the central bank) on general government. UK figures are for claims on the public sector. Data are for third quarter 2010 or latest available.

<sup>7</sup>BIS reporting banks' international claims on the public sector on an immediate borrower basis for the third quarter of 2010, as a percentage of projected 2010 GDP.

<sup>8</sup>Based on average of long-term foreign currency debt ratings of Fitch, Moody's, and Standard & Poor's, rounded down. Outlook is based on the most negative of the three agencies' ratings.

**Figure 1.14. Sovereign Credit Default Swap Spreads**  
(Five-year tenors, basis points)



Source: Bloomberg L.P.

provide a safety valve for cases of unsustainable debt. Its short-term impact, however, may be to complicate the funding of weaker euro area sovereigns, as the new rules for bondholder bail-ins were announced amid serious investor concerns about *existing* debt levels. Indeed, while spreads have generally retreated from their recent peaks, some euro area sovereigns continue to face tense financing conditions.

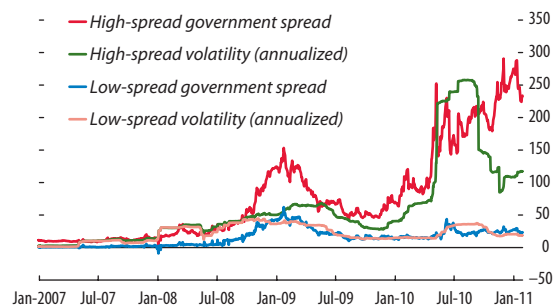
**Public financing requirements remain high in many advanced economies, raising funding risks...**

In many advanced economies, the public sector has high funding needs because of persistent primary deficits and the increased reliance on short-term debt financing in the early stages of the financial crisis. For 2011, Japan and the United States face the largest public debt rollovers of any advanced economy at 56 percent and 29 percent of GDP, respectively (Table 1.2). Those euro area sovereigns currently facing the highest market pressure need to cope with rollover rates above 15 percent of GDP. In this environment, the adverse consequences of a poorly received bond auction or weak bond syndication are magnified as investors closely scrutinize sovereign credit risk.

**...while a hollowing out of the investor base reduces the demand for high-spread euro area government debt.**

The European sovereign debt crisis has fundamentally altered investors' perception of the credit risks and funding prospects of euro area government bonds. Before the crisis, government bonds of countries now considered "high-spread" provided a small additional yield—about 8 basis points more than German bunds—without any perceived increase in risk, partly because volatility was roughly equivalent (Figure 1.15).<sup>8</sup> Since the crisis, the spreads of all euro area government bonds versus German bunds have widened, but those of the high-spread economies now exceed 200 basis points, reflecting a new perception of sovereign credit risk and related funding concerns. In a portfolio context, such wide spreads prompt a recategorization of these government bonds, moving them from the low-credit-risk bucket of (quasi-) governments and supnationals to the higher-credit-risk category of corporate bonds and securitized products. In other words, high-

**Figure 1.15. Euro Area Treasury Bond Spreads over German Bunds, and Volatility**  
(In basis points)



Sources: Barclays Capital; and IMF staff estimates.

<sup>8</sup> In this section, the term "high-spread" euro area countries refers to Belgium, Greece, Ireland, Italy, Portugal, and Spain, each of which had a sovereign CDS spread that averaged over 150 basis points in the fourth quarter of 2010 and first quarter of 2011. The sample of "low-spread" countries in this section includes Austria, Finland, France, Germany, and the Netherlands. Any composites of these countries are calculated on the basis of the market value of their debt, as implied by the Barclays Capital Indices.

spread euro area government debt is now evaluated against other nongovernment debt classes, such as industrials, utilities, banks, and covered bonds (Figure 1.16).

Yet the increase in high-spread euro area yields may not even be sufficient to compensate for the higher risk, at least when yield volatility is used as the risk indicator. Since late 2009, the volatility of high-spread euro area government bonds has surged to three to four times that of low-spread euro area sovereigns and well above that of other bond classes, including triple-A agencies and supranationals. As a result, the recent elevated volatility sharply reduces the attractiveness of high-spread euro area governments on a risk-adjusted basis (Figure 1.16), both versus their pre-crisis ranking and vis-à-vis unsecured corporate debt, local authority paper, and covered bonds. And as long as important sovereign funding concerns remain, investors are unlikely to lower their estimates of future volatility.

The appetite for high-spread euro area government bonds may have diminished among several institutional investor groups:

- *Fund managers.* Portfolio mandates with minimum rating thresholds may prompt asset managers to limit their exposure to such bonds. In the event of a downgrade to the minimum ratings criteria, a portfolio manager may be forced to sell the securities unless the client agrees to change

the investment mandate.<sup>9</sup> Slippage below these rating thresholds may reduce demand from benchmarked bond funds, and could be sufficiently large to reduce market liquidity and further deter prospective buyers.

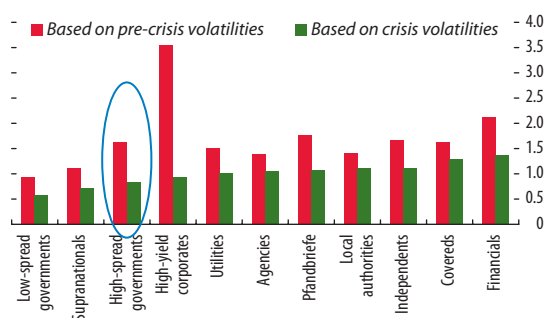
- *Banks.* As detailed in Section C, European banks face significant deleveraging pressures and are unlikely to be in a position to absorb incremental government debt issuance at the pace sustained in 2010.
- *Nonbank financial institutions.* Conservative buy-and-hold investors such as insurers and pension funds may eschew riskier sovereigns, because their investment objectives are to match assets with their long-term liabilities, not to take large market directional bets. European insurers will also be preparing for the 2012 implementation of the prudential regulatory requirements of Solvency II, which includes moving to a risk-based capital framework.<sup>10</sup>

As a result, investors with mark-to-market requirements may be inclined to sell distressed bonds outright to limit losses and assuage client concerns. Banks and other institutions with shorter maturity exposures are more likely to allow their portfolios to run off naturally to reduce overall exposure. Other investors may prefer to hedge their riskier holdings through CDS purchases or short positions. Although such hedging represents a diminished economic exposure, it would not be reflected in statistics on debt ownership.

*With foreign demand shrinking, increased reliance on domestic sources of government financing could heighten risks to financial stability.*

Foreign investors are gradually reducing their exposures to the bonds of high-spread euro area governments through both active selling and passive means. In the cases of Greece, Ireland, and Portugal, the challenge of absorbing growing government debt

**Figure 1.16. Risk-Adjusted Yields for Euro-Denominated Bonds**  
(In percent)



Sources: Barclays Capital; and IMF staff estimates.  
Note: Pre-crisis estimated from June 2003 to June 2007; post-crisis July 2007 to December 2010.

<sup>9</sup> Central banks often apply AAA rating criteria for securities in their reserve portfolios, while Baa3/BBB- is a critical threshold for many private sector bond funds.

<sup>10</sup> To the extent that recent volatility casts high-spread euro government bonds in an unfavorable light from a risk-adjusted return perspective, future demand for these bonds from insurance companies may be constrained.



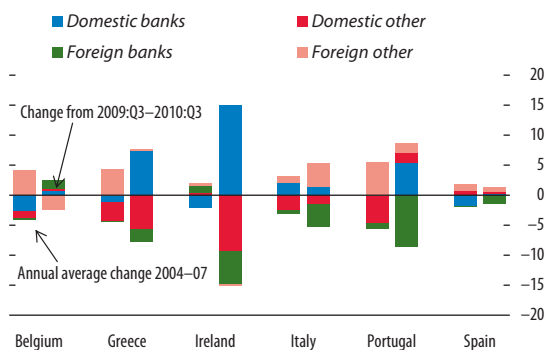
issuance has mostly fallen on domestic banks (Figure 1.17) In Italy and Spain, domestic banks have kept their relative holdings of local government debt constant as foreign banks were net sellers. An imbalanced bond investor base poses rollover risks, especially at a time when that marginal buyer confronts deleveraging pressures (Annex 1.2).

*The shift in investor attitudes vis-à-vis certain euro area sovereigns foreshadows a sustained rise in government funding costs.*

In the absence of confidence-enhancing policy actions, unfavorable investor perceptions could over time lead to a significant increase in average funding costs. The outlook for individual economies depends on two considerations:

- *Marginal rates:* The expected repricing of sovereign debt will be greater if marginal interest rates are well above the *average* rate paid on the current stock of debt. Economies differ significantly in this regard. Indeed, most large economies currently face marginal rates *below* their average rate. The opposite is true for the sovereign debt of Greece, Ireland, and Portugal, because of the sharp run-up in their bond yields since late 2009 (Figure 1.18).<sup>11</sup>

**Figure 1.17. Change in General Government Debt Holdings (As a percent of total debt)**

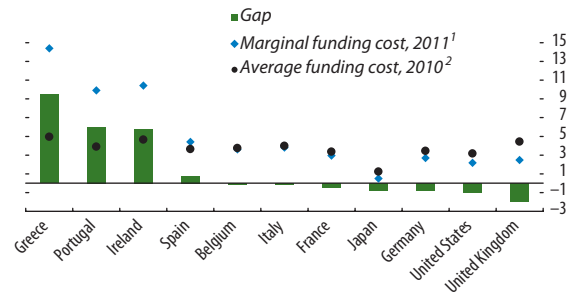


Sources: IMF-BIS-World Bank Joint External Debt Hub (external debt); IMF, International Financial Statistics database (domestic bank holdings); Bank for International Settlements (foreign bank holdings); Eurostat (general government debt).

Note: All series adjusted for market value changes. See Annex 1.2 for details on data methodology.

<sup>11</sup> Like most figures in this section, Figure 1.18 focuses on the largest G-7 economies along with those euro area countries currently in the spotlight of financial markets.

**Figure 1.18. Average versus Marginal Government Funding Costs (In percent)**



Sources: Bloomberg L.P.; IMF, World Economic Outlook database; and IMF staff estimates.

<sup>1</sup>Yield on five-year government bond as of March 31, 2011.

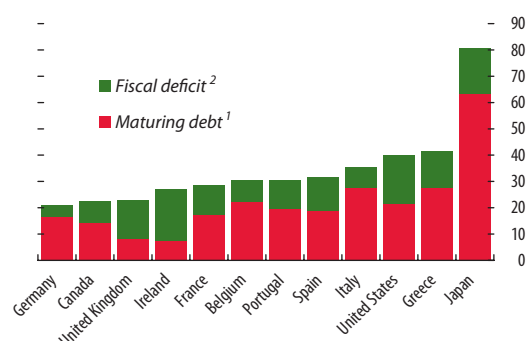
<sup>2</sup>Computed as 2010 general government interest outlays divided by beginning-of-period debt stock.

- *Timing:* The higher the sovereign’s near-term financing needs, the faster will be the repricing of debt. Hence, the spotlight will be on economies with high projected deficits or large amounts of debt coming due. Average debt maturities do not vary significantly across advanced economies, ranging mostly around six to seven years. The only notable exception is the United Kingdom, whose public debt is unusually long-dated.<sup>12</sup> A more detailed analysis of near-term debt maturities and projected deficits in Figure 1.19 reveals particularly large funding needs through end-2012 in Japan, followed at some distance by Greece, the United States, and Italy.

To obtain a more precise sense of the challenges facing these economies, we project average funding costs through 2015 using detailed data on debt maturities and WEO forecasts for primary deficits. Debt issuance is assumed to maintain the maturity profile of existing debt, while being priced according to current market forward rates. For Greece and Ireland, the funding contributions from the European Union and the IMF are explic-

<sup>12</sup>Controlling for the effect of quantitative easing changes this picture somewhat. Specifically, the Bank of England’s large-scale gilt purchases have effectively replaced longer-term government debt with short-term monetary liabilities, increasing the interest rate risk faced by the consolidated government sector and lowering the effective average maturity of government debt by nearly three years to just above 11 years.

**Figure 1.19. Sovereign Funding Needs**  
(Percent of 2011 GDP)



Sources: Bloomberg L.P.; and IMF, World Economic Outlook database.  
<sup>1</sup>All debt (principal only) maturing between April 1, 2011 and December 31, 2012, based on Bloomberg data.  
<sup>2</sup>Sum of projected general government net borrowing in 2011 and 2012.

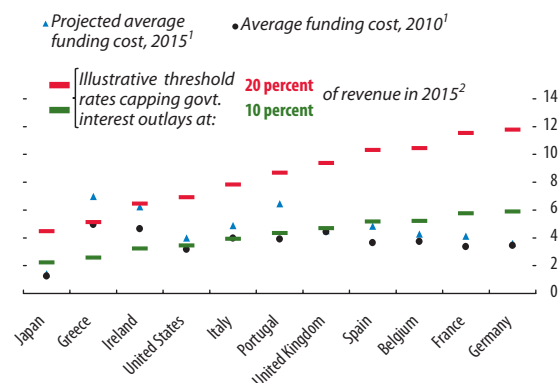
itly taken into account. Under these assumptions, average funding costs are set to rise by as much as 249 basis points for Greece, 149 basis points for Portugal, 211 basis points for Ireland, and 117 basis points for Spain (Figure 1.20). In most other cases, funding costs are projected to increase modestly, reflecting the upward slope of current forward curves.

***Investor concerns about sovereign risk can be usefully analyzed through the lens of the government interest bill.***

How severe are these changes in funding costs implied by market rates? The answer depends on a country’s fiscal position. Rising interest rates weigh more heavily on sovereigns, the higher the debt stock to which they apply, and the lower the revenue flow from which they are paid. In this vein, the ratio of government interest payments to total revenue is routinely used by financial market participants to gauge “debt affordability.”<sup>13</sup> A higher interest bill effectively raises the political price of staying current on the debt, as it requires the public to pay a larger share of taxes without obtaining government services in return. Consistent with this argument, large interest outlays tend to heighten market

<sup>13</sup>For instance, a 2009 report by rating agency Moody’s proposes a 10 percent ratio to mark the boundary of Aaa rated sovereign credit.

**Figure 1.20. Government Funding Costs in 2015**  
(In percent)



Sources: Bloomberg, L.P.; IMF, World Economic Outlook database; and IMF staff estimates.  
<sup>1</sup>Computed as interest outlays divided by beginning-of-period debt stock.  
<sup>2</sup>Threshold rates computed to keep interest payments on gross government debt at 10 or 20 percent of revenue, respectively. A 10 percent ratio marks the upper boundary of the Aaa rated sovereign universe under Moody’s rating approach. For Japan, based on net debt, given large holdings of interest-bearing assets.

concerns about sovereign risk, as reflected in credit or inflation risk premia. Rising risk premia, in turn, drive up funding costs over time, compounding the problem of debt affordability and access to market funding.

In light of these considerations, Figure 1.20 presents illustrative interest rate thresholds, denoted by horizontal bars, for each country. The thresholds are computed as those interest rates that would limit the government interest bill to 10 percent (green) or 20 percent (red) of revenue in 2015.<sup>14</sup> Although any numerical choice is ultimately arbitrary, these values capture the notion of a relatively moderate (10 percent) and a more elevated (20 percent) interest burden, as commonly considered by market participants in assessing credit risk.

Indeed, the average interest bill in most advanced economies since 1980 has been no greater than 8 to 10 percent of revenue, thus staying just within the range considered typical of Aaa rated sovereigns. Ratios above 20 percent have been observed in only about one-tenth of cases over this period, and

<sup>14</sup>The threshold values refer to nominal interest rates conditional upon current inflation forecasts, as embedded in WEO projections for government revenue.

ratios above 30 percent have been exceedingly rare. Nonetheless, economies can, in principle, sustain even higher funding costs. The purpose of considering specific numerical benchmarks, therefore, is not to pass a definitive judgment on debt affordability, but to indicate the relative strain put on a country's fiscal position by a given cost of funding, and how market participants are likely to assess the associated credit risk.

*The largest interest bills are looming for a few euro area countries, although they should remain manageable at projected levels.*

As Figure 1.20 makes clear, Greece's projected funding costs appear the most challenging, with an interest bill approaching 30 percent of revenue by 2015. Although this would imply a significant fiscal burden, the country has sustained similarly large interest-to-revenue ratios in the past (see Annex 1.4).<sup>15</sup> Moreover, the very objective of Greece's current IMF-supported program is to restore market confidence and thus lower the country's risk premium over time, notably by delivering on the authorities' commitment to sustained fiscal and structural adjustment. Several other euro area countries currently in the market spotlight are also set to face higher interest bills by 2015, compounding a continued rise in debt (Figure 1.21), but should be able to avoid very elevated ratios under the baseline projections.

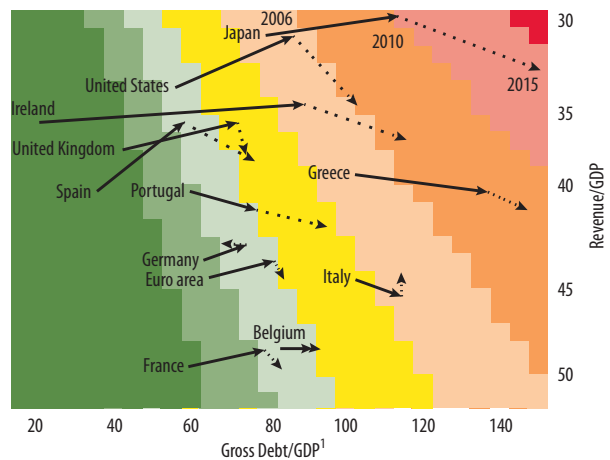
*Although interest rates in the United States and Japan have remained low, both countries are increasingly sensitive to a possible rise in funding costs.*

Also striking is the high sensitivity of the United States and especially Japan to a possible rise in funding costs. Indeed, the illustrative interest rate thresholds are lower for those countries than for most euro area members, reflecting a combination of large and rising debt and relatively low government revenue (Figure 1.21).<sup>16</sup> Nonetheless,

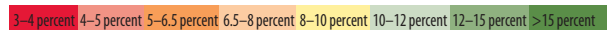
<sup>15</sup> There are also precedents from past IMF-supported programs, including Mexico in the mid-1990s and Turkey in the early 2000s, when interest burdens were at least as high.

<sup>16</sup> Low revenue ratios in both countries suggest that there is considerable scope to raise taxes. While this should indeed provide some buffer, voters may not readily accept a larger tax

**Figure 1.21. Funding Cost Thresholds, Debt, and Revenue**



To keep the government interest bill below 20 percent of total revenue for a given combination of revenue and debt, the average interest rate must not exceed:



Sources: IMF, World Economic Outlook database; and IMF staff estimates.  
<sup>1</sup>For Japan, based on net debt.

both countries are projected to maintain comparatively moderate, albeit increasing, interest burdens through 2015. The reason is the very low level of current funding costs, which are in turn attributable to ample global demand for U.S. treasuries as a reserve asset; and a large and loyal domestic investor base for Japanese government bonds. The flip side of these benign circumstances is the potential for severe dislocations if investors were to take fright at some point in the future.

No single indicator captures all relevant aspects of a country's vulnerability to debt repricing. For example, market perceptions of sovereign risk may extend beyond overall debt or interest burdens to include the composition of the investor base or the quality of fiscal institutions. Moreover, markets price not only the baseline outlook, but also the risks around it. The WEO projections considered here generally build in significant improvements in fiscal balances through 2015. Without such improvements, or with growth falling short of forecasts, debt dynamics and financing costs could turn out considerably worse. Similarly, debt service costs could rise sharply—even without new shocks

burden. Thus, the general point remains that a high ratio of interest outlays to revenue exacts a significant political price.

to sovereign risk premia—if higher-than-expected inflation were to force central banks to “normalize” real policy rates more sharply than currently envisaged.<sup>17</sup>

**Strategies to contain financial stability risks must combine credible medium-term deficit reduction with adequate multilateral backstops for near-term funding needs.**

The most pressing financial stability challenge is to bring down marginal funding costs in vulnerable euro area countries. Regaining investor confidence will likely take time and require a comprehensive set of measures that build on the progress achieved so far. At the core of any successful strategy must be a credible medium-term plan to cut the fiscal deficit and arrest the rise in public debt. Where market worries are centered on banking sector fragilities, it is critical to reduce uncertainty by addressing identified weaknesses. Such domestic efforts should be backed at the multilateral level by EFSF/ESM support where necessary. To be effective, these facilities require sufficient scale and flexibility, and should lend at interest rates low enough to support debt affordability, subject to strict conditionality. Looking beyond the euro area, preserving global financial stability will also require much greater clarity on strategies for medium-term fiscal consolidation in both Japan and the United States, as explained in the April 2011 *Fiscal Monitor* (IMF, 2011b).

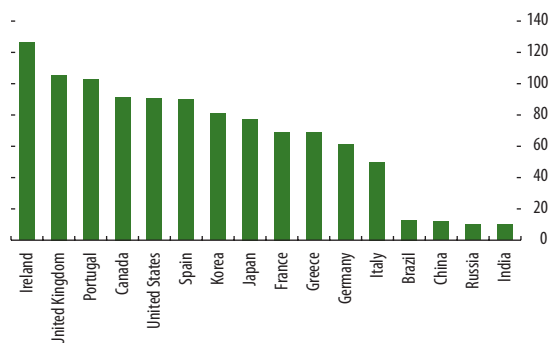
### E. Alleviating Pressures on Households and Firms

***U.S. households are highly leveraged, with many in a negative equity position on their home loans. The housing market’s inventory overhang raises the risk of further mortgage defaults. More structural policies are needed to reduce the debt burden of households while promoting orderly deleveraging. Weakness persists in parts of the corporate sector of advanced economies, especially among small and medium-sized firms and in the commercial real estate sector.***

<sup>17</sup>The April 2011 *Fiscal Monitor* provides a series of useful sensitivity tests in this regard (IMF, 2011b).

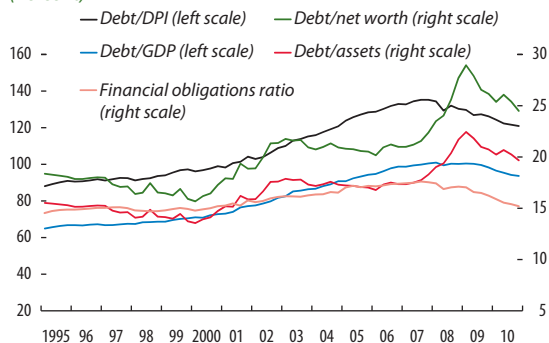
Household leverage ratios in the United States are elevated relative to some peers (Figure 1.22) and have only recently come off historic highs (Figure 1.23).<sup>18</sup> Mortgage-related debt is the key driver of the overall trajectory of household liabilities, accounting for about three-fourths of total household debt. During the decade preceding the crisis, leverage rose in the U.S. corporate and commercial banking sectors, but household leverage rose at nearly twice the rate of those sectors over the same period.

**Figure 1.22. Leverage Ratios: Household Debt as a Percent of GDP**



Sources: Haver Analytics; national authorities; McKinsey & Co.; and IMF staff estimates.  
Note: Various dates, but mostly 2010. In some cases, household debt includes debt issued by non-profit institutions serving households.

**Figure 1.23. Various Measures of U.S. Household Leverage (Percent)**



Sources: Federal Reserve.  
Note: DPI = disposable personal income.

<sup>18</sup>This section focuses primarily on the U.S. household sector, given its higher leverage ratio, large links to a still impaired housing sector, and importance for financial stability.

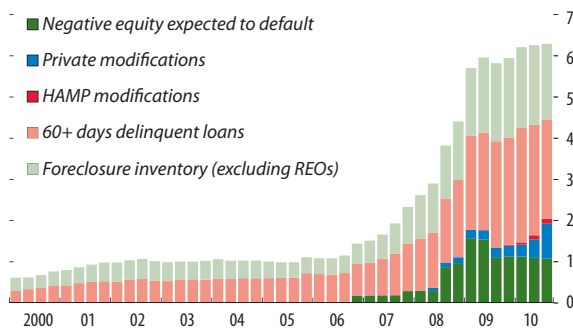
**Large debt burdens pose downside risks to housing markets.**

The large overhang of household debt risks further weakening bank balance sheets and credit availability and weighs on housing and other asset prices, an effect that in turn further exacerbates the household debt burden.

The large shadow inventory of houses expected to come to the market will likely continue to dampen the recovery of house prices and exacerbate negative equity (Figure 1.24).<sup>19</sup> Negative equity borrowers who are still current on their payments represent a potential addition to the shadow inventory because they are at high risk of default. Once negative equity exceeds 20 percent, the delinquency or default propensity rises sharply and loan modifications start to lose effectiveness (Annex 1.5). The share of residential mortgages with negative equity has declined since October 2010 from almost 25 percent to around 23 percent, but the decline is mostly attributable to foreclosures rather than a rise in home prices. For now, the time required to recognize foreclosures has slowed the decline in house prices, but a change in banks' behavior to accelerate recognition could push prices lower, leaving more borrowers with negative equity and spurring strategic defaults where homeowners who can afford

**Figure 1.24. Shadow Inventory of Houses Potentially for Sale**

(In millions of loans)



Sources: Mortgage Bankers Association; and IMF staff estimates.

Note: REOs = Real-estate owned. HAMP = Home Affordable Modification Program.

<sup>19</sup>The shadow inventory represents as many as 6.3 million mortgages, or one in seven home loans and 16 months of additional housing supply. Box 1.3 discusses some options to reduce the shadow inventory of housing and the potential impact of such reductions on bank balance sheets.

their mortgage payments choose to default because of negative equity (see **Box 1.3** on page 43).<sup>20</sup>

**Substantial debt reduction is needed to return leverage to more manageable levels.**

There is no established threshold for optimal household leverage. Table 1.4 shows the change in leverage ratios, debt, and GDP that are required to return leverage to four different benchmarks: the long-term trend, the leverage ratio that prevailed in 1998 (just before the growth rate in leverage accelerated), liabilities growing in line with GDP since 1998, and liabilities growing along a path similar to that seen in other advanced economies that underwent a banking crisis. These illustrative scenarios indicate that fairly substantial reductions in leverage (ranging from 10 to 30 percentage points) are needed to return to more “normal” levels.

**The limited ability of monetary policy to expedite deleveraging among households puts the spotlight on structural policies.**

In theory, lower policy rates and quantitative easing should help smooth the household deleveraging process by increasing the value of household assets through higher asset prices and by reducing the cost of household liabilities through lower interest rates.<sup>21</sup> These policies (especially during the first round of quantitative easing, or QE1, by the Federal Reserve) appear to have had a positive impact on the asset side of the household balance sheet, as the portfolio rebalancing effect helped to boost the prices of some risky assets held by households and increase new inflows as investors moved money from cash equivalents to higher-yielding assets (Figures 1.25 and 1.26).<sup>22</sup>

<sup>20</sup>Delays in foreclosures are exacerbated by banks' fear of loan put-backs—the return to their balance sheets of loans previously securitized with such return specified in the event of default.

<sup>21</sup>The objective of QE1 was geared to reducing mortgage funding costs, while the second round of quantitative easing (QE2) was intended to reduce the risk of deflation.

<sup>22</sup>Both flows to risky assets and asset price gains under QE1 were higher than under QE2, even when considering the anticipation effects. Other coinciding factors (such as fiscal stimulus, a successful round of stress tests, restored market confidence, an improvement in corporate fundamentals) may have contributed to the rebalancing under QE1. The more limited impact under QE2 may reflect the fact that markets were already fairly stable



**Table 1.4. Different Scenarios for Return to “Equilibrium” Household Debt-to-GDP Ratios**

	Leverage Ratio (percent)	Difference from Current Ratio (percentage points)	Change in Debt		Change in GDP	
			(in trillions of dollars)	(percent change)	(in trillions of dollars)	(percent change)
Return to long-term average	63.9	-30.7	-4.5	-32	7.1	48
Return to 1998 levels	68.2	-26.3	-3.9	-28	5.7	39
Growth in line with GDP	67.5	-27.0	-4.0	-29	5.9	40
Other post-crisis experiences	82.7	-11.8	-1.7	-12	2.1	14

Sources: Bureau of Economic Analysis; Federal Reserve; and IMF staff estimates.

Note: The table shows the magnitude of declines in debt or increases in GDP needed to return household leverage to more moderate levels, but some combination thereof is also possible.

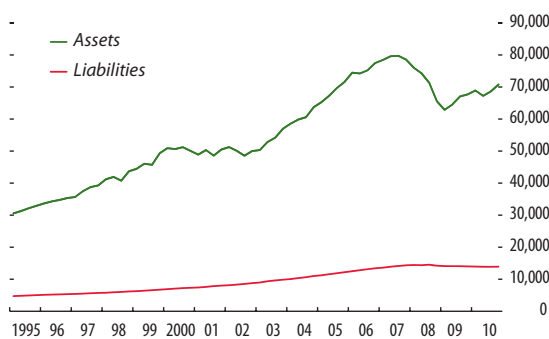
However, on the liabilities side, the effectiveness of lower rates is more limited. Large numbers of homeowners with delinquent mortgages or low equity cannot benefit from refinancing into lower mortgage rates because home price declines have reduced the value of assets they can pledge as collateral. Banks are also still concerned about conserving liquidity and capital, particularly as the shadow inventory remains large and the issue of mortgage put-backs has not been resolved (see Section D).<sup>23</sup> Other policies aimed at reducing mortgage rates or maturity extensions have also had only limited success in reducing negative equity and the shadow inventory. These considerations suggest that more structural policies, such as renegotiation or some

form of debt reduction—including writedowns of mortgage principal by banks—may be needed.<sup>24</sup>

*In contrast to households, nonfinancial corporations generally entered the crisis with relatively low leverage, high cash balances, and strong balance sheets.*

U.S., European, and Asian nonfinancial corporations were in relatively good shape going into the crisis and strengthened further as they derisked and

**Figure 1.25. Household Balance Sheets**  
(In billions of dollars)

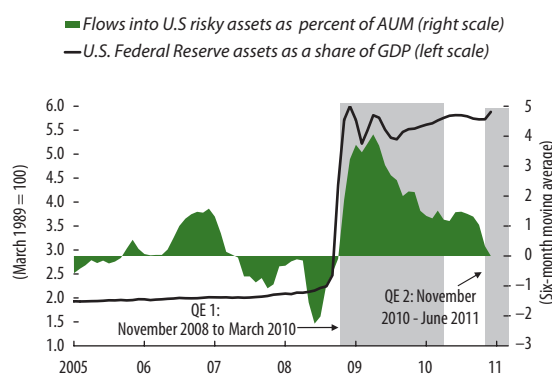


Sources: Federal Reserve; and Haver Analytics.

and that most of the benefits had already accrued by the time the program was introduced.

<sup>23</sup>Refinancing data illustrate this conundrum: activity picked up sharply in the early months of 2009 and again in mid-2010, but neither the market speculation of QE2, the announcement of the program, nor its implementation appear to have boosted refinancings further.

**Figure 1.26. Federal Reserve Assets and Flows into U.S. Risky Assets**



Sources: Investment Company Institute; Federal Reserve; Organization for Economic Cooperation and Development (OECD); and IMF staff estimates.

Note: Monthly OECD leading indicators for the United States is used as a proxy for GDP. AUM = assets under management. QE 1 and 2 refer to the Federal Reserve’s first and second rounds of quantitative easing.

<sup>24</sup>The U.S. administration is already moving in this direction, proposing a settlement with mortgage servicers that calls for banks to bear the loss of principal writedowns on mortgages in negative equity or else face civil fines. However, forging a comprehensive settlement may be complicated legally. For various household debt restructuring options, see Laeven and Laryea (2009).

deleveraged their balance sheets. As market confidence deteriorated, they built up cash balances, paid down short-term debt, and reduced their dependence on bank loans. The resulting improvements in net/gross leverage, interest coverage, cash balances (now historically high), cash flow generation, and default rates remain broadly intact. Meanwhile, corporate debt issuers continue to benefit from abundant liquidity, easy monetary policy, a gradual easing in lending standards, and improving credit ratings. At the same time, corporate earnings have rebounded from the crisis lows. Although the recession has ended, companies continue to maintain lean operations.

*However, spillovers to the corporate sector from the European sovereign debt turmoil are evident.*

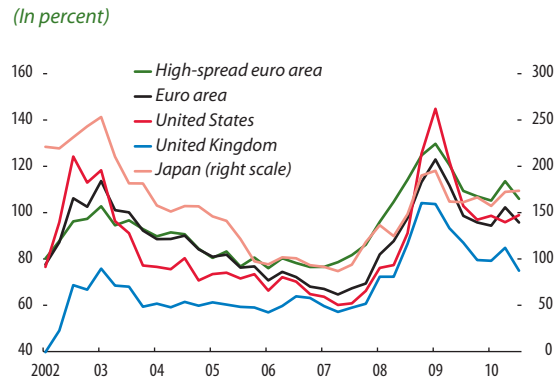
Large firms have been mostly insulated from sovereign- and bank-related credit disruptions because of their strong internal finances and access to non-bank sources of funds. Nonetheless, there have been some spillovers from the sovereign debt turmoil to the corporate sector in Europe. Borrowing rates there have risen above those in the United States, particularly for more domestically focused firms in the euro area periphery, as markets differentiate based on country risk rather than credit risk (Figure 1.27). Such companies were already more exposed, given their higher leverage ratios relative to the rest of the euro area (Figure 1.28) and diminishing cash flows owing to weaker economic activity. Japanese

**Figure 1.27. Nonfinancial Corporate Credit Default Swap Spreads**  
(In basis points)



Sources: Citigroup; Markit; and IMF staff estimates.  
Note: High-spread euro area includes Belgium, Greece, Ireland, Italy, Portugal, and Spain. Low-spread euro area includes Austria, Finland, France, Germany, and the Netherlands.

**Figure 1.28. Nonfinancial Corporates' Debt-to-Equity Ratios**  
(In percent)



Sources: Haver Analytics; national authorities; and IMF staff estimates.  
Note: High-spread euro area includes Belgium, Greece, Ireland, Italy, Portugal, and Spain.

corporations also still bear the burden of substantial debt as a legacy of the 1980s bubble period, but their cash cushion is fairly sizeable.

*Although there are few signs of releveraging, the ingredients are in place for increased risk-taking among larger firms.*

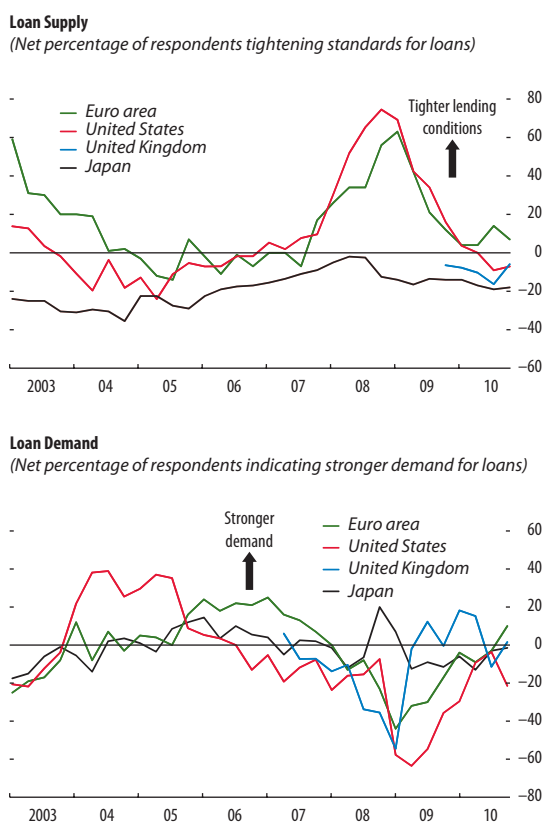
With rising confidence, low volatility, cheap borrowing rates, and ample liquidity, corporations are starting to releverage, albeit very cautiously. For instance, increases in debt-financed mergers and acquisitions and leveraged recapitalizations are beginning to pick up. Leveraged buyout activity has also begun to increase, though deals are small in size and number, and terms are fairly conservative. At the margin, momentum to take on risk is also rising, with the quality of issuance shifting slightly downward (especially in the United States). Excessively low risk-free rates for a protracted period could prompt borrowers to releverage to less sustainable levels. In the absence of demand, large firms flush with cash and with access to cheap credit are likely to exhibit more risk-taking behavior.

*Parts of the corporate sector in advanced economies remain weak—especially small and medium-sized enterprises (SMEs) and the commercial real estate sector.*

While the trend has improved since the October 2010 GFSR, credit growth among SMEs continues

to remain more lackluster than for larger firms. In most advanced economies the difference appears to be due more to constraints on credit demand than on credit availability (Figure 1.29).<sup>25</sup> However, where banking systems are still under duress, as in the euro area periphery, credit availability is likely more problematic. In addition, the cost of credit is still an issue, as the interest rate spread paid by SMEs relative to the rest of the corporate sector remains above pre-crisis levels. Given their greater

**Figure 1.29. Lending Conditions for Small and Medium-Sized Enterprises**



Sources: Haver Analytics; national authorities; and IMF staff estimates. Note: U.S. data are only for small companies, while data for other countries reflect conditions for small and mid-sized firms.

<sup>25</sup> Lending officer surveys increasingly point to demand-side factors as the dominant constraint. This trend is also reflected in SME surveys such as that of the National Federation of Independent Business, which has found limited credit availability to be only third in the ranking of cited causes of low credit growth, the first being weak sales volume and the second uncertainty in business conditions.

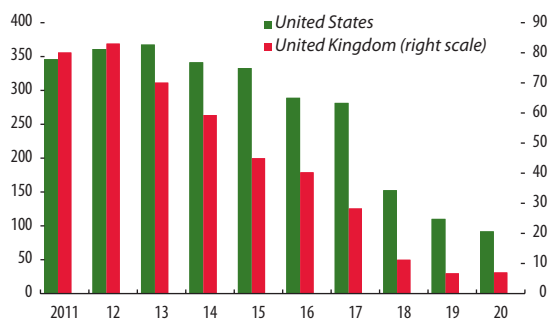
dependence on bank financing and especially on smaller banks, SMEs have few alternative sources of credit.<sup>26</sup> Since their loans are often collateralized with the owner’s personal wealth—usually housing—their collateral value has likely weakened along with the collapse in house prices. Ensuring sufficient support to the SME sector is critical given its economic importance.<sup>27</sup>

Lending conditions in the U.S. and U.K. commercial real estate sectors have improved markedly and financing markets have reopened, but loan performance continues to deteriorate and prices remain depressed. Tiering by collateral type and lender is significant, and refinancing needs over the next three to five years are daunting (Figure 1.30).<sup>28</sup>

**What are the financial stability implications?**

Further structural policies are needed to address the large number of delinquent and underwater mortgages and to facilitate the deleveraging process. In addition, policies should be geared toward

**Figure 1.30. Debt Maturity Profile for the Commercial Real Estate Sector**  
(In billions of U.S. dollars)



Sources: Foresight Analytics; CB Richard Ellis; and IMF staff estimates. Note: Data for the United States are updated as of the third quarter of 2010. Data for the United Kingdom are updated as of the end of 2010.

<sup>26</sup> For instance, in the United States, nearly 90 percent of SME funding comes from banks (e.g., lines of credit, loans, credit cards), compared to 30 percent for larger businesses.

<sup>27</sup> SMEs account for 70 percent of the labor force in Europe and 84 percent in the United States. In both regions, SME job reductions were steeper during the crisis and have lagged the rest of the corporate sector in recovering during this economic cycle.

<sup>28</sup> More than half of outstanding U.K. commercial real estate debt, and 40 percent of such U.S. debt, is maturing over the next three years.

absorbing the excess housing supply resulting from liquidations (e.g., conversions to rental properties). At the same time, the authorities need to continue to provide support to the private sector until the debt overhang is reduced or nominal GDP growth rises to a level adequate to support it. Private securitization continues to contract, leaving the overall securitization market dominated by the agency mortgage-backed securities market, which has accounted for 90 to 95 percent of gross issuance since 2008. As stressed in earlier GFSRs, restarting private securitization is critical to repairing credit intermediation. Private demand for credit is likely to remain sluggish for some time as the private sector deleverages, but it is probably time to transfer some of the government-sponsored lending to the private sector. That requires revamping and clarifying the role of the housing-related government-sponsored enterprises, ensuring that they are adequately capitalized, and providing adequate government support during the transition.<sup>29</sup> In addition, a secure, robust private securitization market requires further policy action in credit rating agency oversight, accounting practices, capital charges, and retention policies (IMF, 2009b, Chapter 2). See Section G for further details on policy prescriptions.

## F. Macro and Stability Implications of Capital Inflows into Emerging Markets

*Emerging market economies are receiving an increased flow of foreign capital at a time when their output gaps are closing and their inflation rates are rising. The flows complicate efforts to manage local demand through tighter monetary policy, as rate hikes could spur additional capital inflows. Furthermore, the flows may exacerbate domestic dynamics and add to financial imbalances and vulnerabilities. Strong local issuance of debt and equity has helped absorb the inflows and ease pressures on asset prices, but it is contributing to higher leverage. Macroprudential and in some cases capital control measures can play a supportive role in managing the flows and their*

<sup>29</sup> See Chapter 3 for a discussion on reform of U.S. housing policy.

*effects. But as inflows may prove long lasting, and especially in the context of strong domestic momentum, policies need to rely more on macroeconomic measures—including rate hikes, more flexible exchange rates, and fiscal tightening—to avoid overheating, accumulating financial risks, and undermining policy credibility.*

Capital inflows to emerging markets have rebounded from their post-Lehman troughs that persisted into the second quarter of 2010, but aggregate levels remained below previous highs (Figure 1.31).<sup>30</sup> Portfolio investment represents a greater share of inflows relative to historical experience, reflecting the slower recovery in advanced economies. Bank inflows remain subdued as mature market banks continue to face challenges in repairing their balance sheets, and foreign direct investment flows have stagnated as lingering uncertainty around global growth hampers long-term investment.

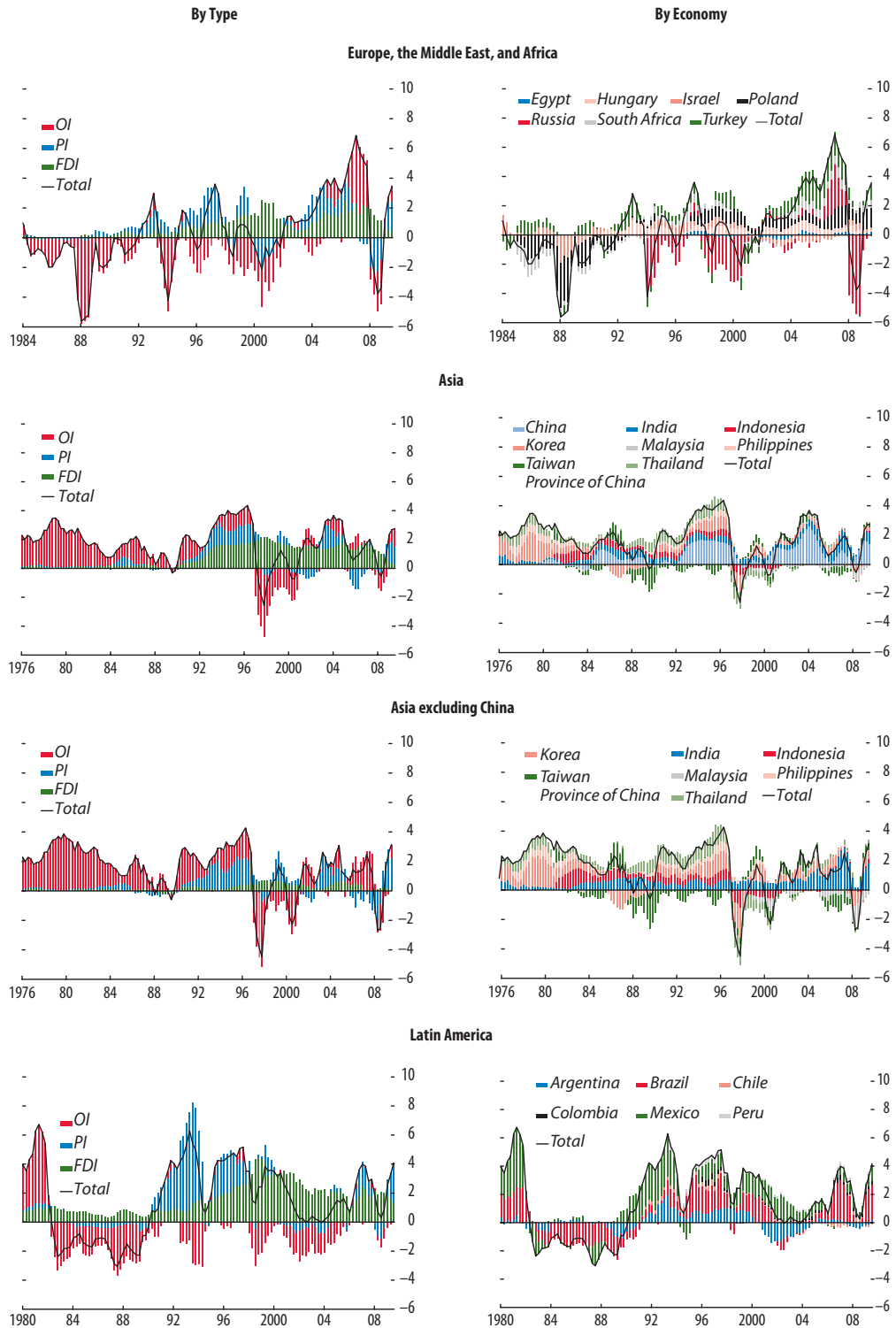
*There is little evidence that cross-border flows surged owing to quantitative easing in the large advanced economies...*

Many market participants and policymakers have attributed the recent strong portfolio inflows in emerging markets to low interest rates and high levels of liquidity created by central banks in large advanced economies. To the extent that quantitative easing increases liquidity and demand for higher-return assets, investments in emerging market assets could be expected to increase, spurring cross-border outflows from the United States to these economies. Contrary to expectations, however, U.S. residents' net purchases of foreign securities recovered during quantitative easing conducted by the Federal Reserve, although they remained below average purchase levels prior to the crisis.<sup>31</sup>

<sup>30</sup> Net capital inflows to Latin America rose to their highest levels in more than a decade, and in Asia, those inflows surpassed their pre-global crisis highs but remain below their pre-Asian crisis peaks. Net capital inflows to emerging market economies in Europe, the Middle East, and Africa rebounded but remained below their previous highs. See Chapter 4 of the April 2011 WEO for further statistical analyses of capital inflows to emerging markets.

<sup>31</sup> U.S. investors historically represent a large share of portfolio investment in emerging markets. U.S. balance of payment data

**Figure 1.31. Net Capital Inflows to Emerging Markets**  
 (Percent of aggregate GDP, through 2010:Q2, four-quarter moving average)



Sources: Haver Analytics; and IMF, International Financial Statistics database.  
 Note: FDI = foreign direct investment; PI = portfolio investment; OI = other investment.

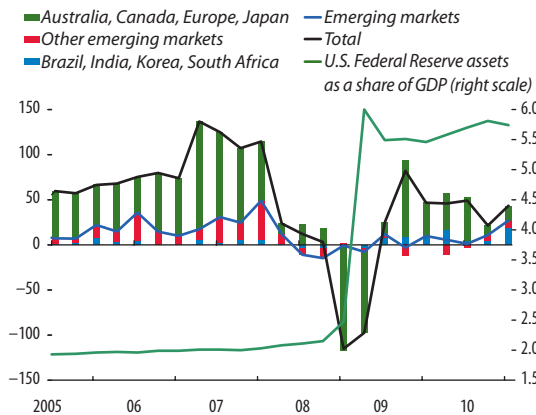


*...even though they have may have prompted asset reallocation into debt and liquid markets in emerging markets, raising worries that such inflows could complicate monetary policy setting and eventually reverse direction.*

Nonetheless, as Figure 1.32 shows, U.S. investors showed a preference for emerging market assets with stronger growth, higher yields, and more liquid asset markets through the third quarter of 2010.<sup>32</sup>

Debt inflows were particularly strong, with economies that offered higher levels of risk-adjusted local government bond yields (prior to the surge in capital flows) attracting greater foreign inflows (Figure 1.33). This may have excessively compressed long rates and raised risks of volatility (Figure 1.34). Search for yield and a greater willingness to take interest-rate risk has led investors to extend the duration of their local-currency debt holdings, leading to a flattening of local yield curves, which runs counter to the desired normalization of policy rates. Moreover, portfolio inflows could reverse direction

**Figure 1.32. U.S. Investment Flows in Foreign Securities**  
(In billions of U.S. dollars)

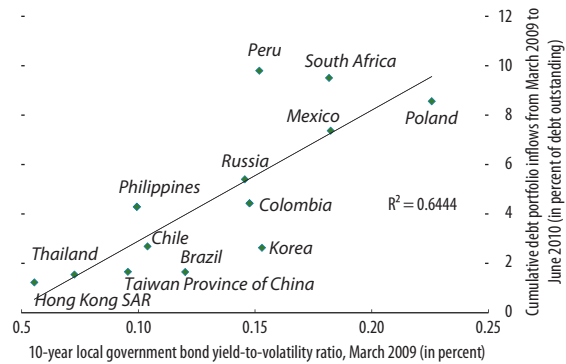


Sources: Bureau of Economic Analysis; Federal Reserve; Organization for Economic Cooperation and Development (OECD); and IMF staff estimates.  
Note: Europe includes emerging Europe. Monthly OECD leading indicators for the United States are used as a proxy for GDP. Federal Reserve assets adjusted for OECD leading indicators.

with destinations are not available for the second round of quantitative easing by the Federal Reserve.

<sup>32</sup>Chapter 4 of the April 2011 WEO shows that U.S. monetary policy tightening has a negative marginal effect on net private capital flows to other economies.

**Figure 1.33. Portfolio Debt Inflows and Risk-Adjusted Local Government Yields**



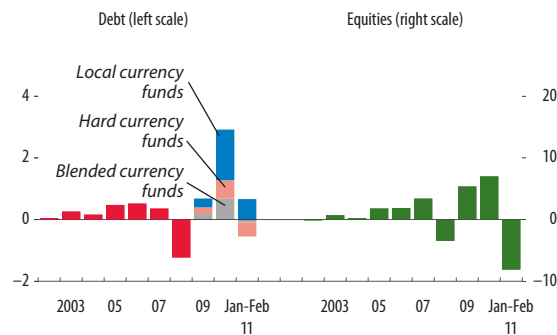
Sources: Haver Analytics; national authorities; and IMF staff estimates.

relatively quickly, as evidenced by a pullback from some emerging market assets earlier this year.

*A continuation of strong capital inflows could eventually contribute to financial imbalances and vulnerabilities.*

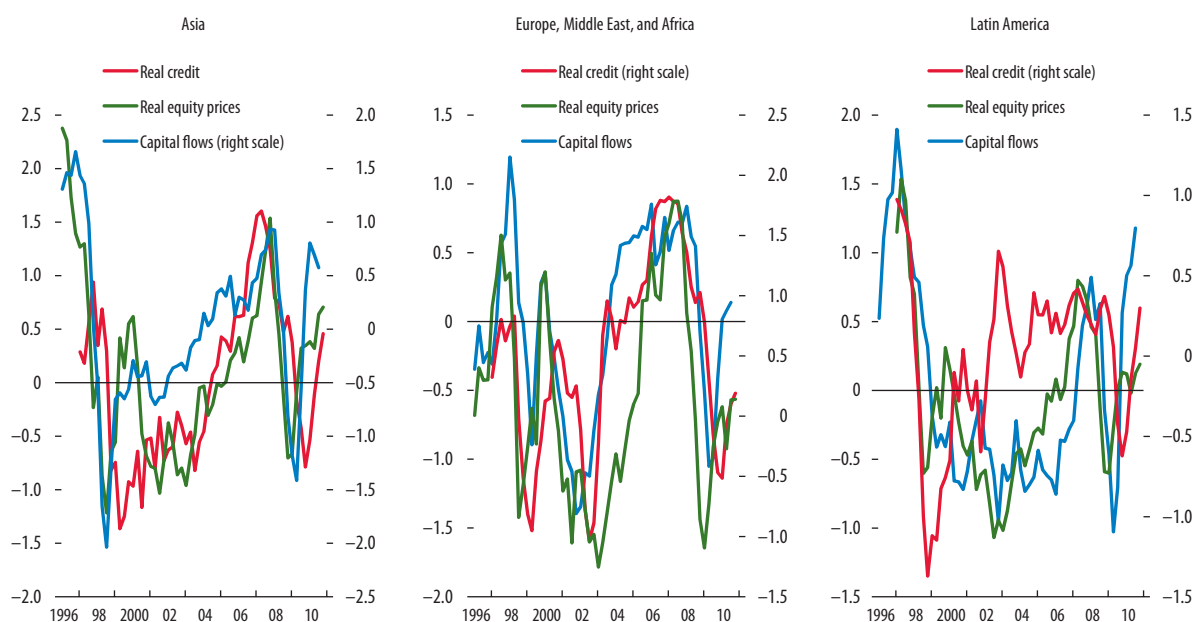
Strong inflows need not lead to financial instability if they (1) are met with a solid supply response that curbs asset appreciation; (2) do not contribute to a buildup of excessive balance sheet leverage; and (3) are allocated toward productive purposes. However, historical episodes of rising capital flows have been associated with acceleration in real credit growth and asset price increases

**Figure 1.34. Average Monthly Retail Flows to Emerging Market Debt and Equity Mutual Funds**  
(In billions of U.S. dollars)



Sources: EPFR Global; and IMF staff estimates.  
Note: 2011 data through week ending March 2.

**Figure 1.35. Capital Inflows, Real Credit, and Real Equity Prices**  
(Z score)



Sources: IMF International Financial Statistics database; Haver Analytics; and IMF staff estimates.

Note: Portfolio and other investment as a percentage of the size of financial markets. Year-on-year real credit growth. Real equity prices deviations from trend. All variables are transformed into a z score (difference from average in terms of standard deviation). Asia includes India, Indonesia, Korea, Malaysia, and Thailand; EMEA includes Hungary, Poland, Russia, South Africa, and Turkey; Latin America includes Brazil, Chile, Colombia, Mexico, and Peru.

(Figure 1.35). In such mutually reinforcing cycles, capital flows could add to domestic imbalances if brisk capital market issuance were to fuel a corporate leverage boom or if large portfolio inflows stretched asset price valuations. Overall increases in liquidity from external sources could stimulate domestic demand and contribute to inflationary pressures. The paragraphs that follow explore these separate transmission channels and attempt to gauge the extent of the increase in associated vulnerabilities.

*The strong issuance of debt and equity by corporations in emerging market economies has absorbed inflows and mitigated pressures for asset prices to rise...*

The response of emerging market firms to equity and debt inflows has been strong. Equity issuance rose to the highest levels ever in Brazil and China, and although in India and Korea such issuance

remained below pre-global crisis highs, it surpassed pre-Asian crisis levels.<sup>33,34</sup> Similarly, the supply of emerging market external corporate bonds in 2010 surpassed historical records in aggregate, led

<sup>33</sup> Emerging market equity issuance (local and external) rose to record levels because of a mega-issue by Brazil's Petrobras in the third quarter and a number of large issues in China and other parts of Asia. Petrobras sold \$70 billion in equity, \$40 billion of which was acquired by the Brazilian government, and the Agricultural Bank of China raised \$22 billion. The outperformance of equity issuance in emerging market economies is also attributable to the favorable cost of equity funding for firms in emerging markets.

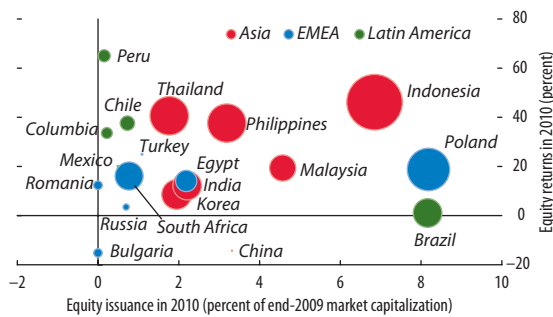
<sup>34</sup> The outperformance of emerging market equity issuance also owes to the favorable cost of equity funding for emerging market corporations. Firms in advanced economies are financing more through debt issuance, rather than equity, as the cost of debt financing has fallen to historically low levels at a time when equity financing is expensive. In contrast, emerging market companies have access to relatively cheap equity (along with debt), leading to greater equity financing than that being undertaken by their developed economy counterparts.

by Latin American corporate bonds.<sup>35</sup> Figure 1.36 shows that large equity issuance appears in some cases to have mitigated equity appreciation stemming from strong foreign portfolio inflows. Brazilian firms issued actively through IPOs, absorbing large inflows without stretching valuations. Some Asian corporate markets have displayed a combination of price and supply responses.

*...but, reminiscent of previous capital flow cycles, corporate leverage is increasing and weaker borrowers are accessing funds.*

Corporate leverage has increased above historical averages in the largest emerging market economies, and corporate balance sheets look increasingly vulnerable to external shocks to funding costs. Such conditions call for heightened vigilance by policymakers (see **Box 1.4** on page 45). Bank have issued a large amount of external bonds and have increasingly been moving away from deposits to wholesale markets to fund their balance sheets (see **Box 1.5** on page 48).<sup>36</sup> Overall, as investors moved down the rating spectrum in 2010 amid a shortage in net supply of credit products globally, wholesale funding by lower-rated emerging market corporations

**Figure 1.36. Emerging Market Equities: Foreign Inflows, Issuance, and Returns in 2010**



Sources: Bloomberg L.P.; BNY Mellon iFlow™; Dealogic; and IMF staff estimates.  
 Note: Bubble is the size of equity inflows in 2010 as a percentage of end-2009 market capitalization. EMEA = Europe, the Middle East, and Africa.

<sup>35</sup> Brazilian and Mexican firms sold bonds for near-record amounts in 2010.  
<sup>36</sup> Some of nonfinancial issuance may represent substitution for bank lending.

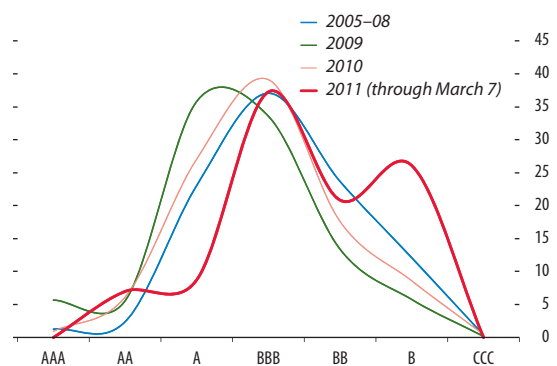
rose, a pattern that resembled the profile of the pre-global credit crisis period (Figure 1.37).

*Capital flows could exacerbate imbalances by complicating policies in emerging markets...*

Risks of overheating vary significantly across economies, depending not only on the strength of capital flows, but also on other domestic circumstances and policies. Table 1.5 shows that inflows of portfolio equity and debt have been rising in large emerging market economies with favorable growth prospects and strong incentives for carry (columns I and II)<sup>37</sup> at a time when output gaps are closing and inflation is rising (columns III through V). This has complicated policies to manage local demand, as rate hikes could spur additional capital inflows.

The mosaic of these policy challenges varies across emerging market regions. For instance, risks of a new round of inflation appear to be higher in Asia, where the authorities have reacted to rebounding capital inflows largely by accumulating reserves (column VI), and where real interest rates in the regional economies tend to be low and negative as a result (column VII). Expansionary fiscal policies to counterbalance the slowdown in advanced economies also risk adding to inflationary pressures in

**Figure 1.37. Emerging Market External Corporate Issuance by Rating**  
 (Percent of total)



Sources: Bond Radar; and IMF staff estimates.

<sup>37</sup> Brazil and India attracted the largest equity inflows to emerging markets, while Indonesia, Korea, South Africa, Israel, and Poland were the top destinations for global bond investments.

the region (column VIII). There are also signs of a substantial acceleration of credit growth, especially in larger emerging market economies and in Latin America more broadly (columns IX to XI). The possibility of systemic asset price bubbles seems remote, but valuations are relatively elevated in smaller Latin American equity markets (column XII) with limited capacity to absorb flows through new issuance, and in Asian local government bond markets (column XIII) that have been the main destination of foreign debt flows.<sup>38</sup> In Europe, the Middle East, and Africa (EMEA), weak fiscal positions and high loan-to-deposit ratios tend to reflect legacy problems from the global credit crisis that hit these economies harder. Economies in all regions that are more dependent on portfolio and bank flows to meet their external financing needs (column XIV) could be more vulnerable to flow reversals. These possibilities highlight the importance of maintaining sound policies to deal with macroeconomic and financial risks while safeguarding policy credibility in a context of exuberant domestic conditions and strong capital inflows.

*...prompting some emerging markets to introduce macroprudential and capital control measures in managing the financial stability implications of strong inflows...*

The policy challenges stemming from the resurgence of capital inflows to emerging markets have been met with macroeconomic policies as well as macroprudential and capital control measures. Macroprudential measures aim to improve the resilience and soundness of the financial sector without discriminating by residency, even though some measures are geared more toward limiting capital inflows. Capital control measures, in contrast, dis-

criminate against inflows by residency. The form of prudential and control measures has varied according to country-specific circumstances (Annex 1.6).

Historically, strong capital flows have challenged the ability of local authorities to manage exchange rates and inflation. Figure 1.38 suggests that over the last decade, willingness to allow greater exchange rate volatility in the face of external shocks has tended to reduce inflation volatility. However, policymakers' sensitivity to currency appreciation and its negative impact on growth may have increased during this difficult moment when uncertainty continues to cloud the global growth outlook. Under these circumstances, volatility in capital flows could have a greater impact on inflation volatility. In addition, the earlier sharp increase in foreign bond flows, and the attendant surge in the share of foreign holdings, have heightened policymakers' concerns about the implications of capital flow volatility for financial stability.

*...although policies may need to rely more on macroeconomic measures to safeguard credibility.*

Macroprudential and capital control measures are a complement, not a substitute, for macroeconomic policies. However, policymakers in a number of emerging market economies are relying more on prudential and control measures while delaying macroeconomic policy responses. Consequently, real interest rates have remained negative in many economies in Asia, raising worries among market participants about inflation risks and the credibility of policy management (Figure 1.39). This has led to foreign selling of regional debt and equities.

To address strong momentum in inflation and credit growth, it would be more appropriate to rely on interest rate policies. To the extent that holding currencies at lower exchange rates increases capital inflows in anticipation of future appreciation, greater currency flexibility can mitigate pressure on local absorption and asset prices. Moreover, a more balanced policy mix with tighter fiscal policies could offer a more sustained response to inflows.

Finally, continuing to promote the development of local capital markets through more solid infrastructure and by enhancing the robustness of the banking system are key to ensure that economies

<sup>38</sup> High prices and speculative dynamics have become a concern in segments of real estate markets in Hong Kong SAR and China. Some Asian and Latin American countries have addressed rising capital inflows and related financial stability issues by tightening macroeconomic policies and introducing macroprudential measures (see Annex 1.6). Some market participants believe the growing popularity of exchange-traded funds (ETFs) may have contributed to equity price appreciation in some emerging economies, and warn that leverage embedded in ETFs could pose financial stability risks if equity prices were to decline for a protracted period (see Annex 1.7).

**Table 1.5. Macro and Financial Indicators for Selected Emerging Economies**

(Shaded cells represent five economies with highest values for each indicator)<sup>1</sup>

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV													
Net Portfolio Inflows <sup>2</sup>	Equities		Debt		Inflation		Output		External and Domestic Policies		Real interest rate <sup>6</sup>		Structural fiscal balance <sup>7</sup>		Credit		Bank loan to deposits <sup>11</sup>		Asset Valuations <sup>12</sup>		Debt		Non-FDI External Financing Needs <sup>13</sup>				
	Equities	Debt	Level <sup>3</sup>	Change <sup>3</sup>	gap <sup>4</sup>	Official reserves <sup>5</sup>	Real interest rate <sup>6</sup>	Structural fiscal balance <sup>7</sup>	Credit to private sector <sup>8</sup>	Level <sup>9</sup>	Change <sup>10</sup>	loan to deposits <sup>11</sup>	Equities	Debt	Equities	Debt	Equities	Debt	Equities	Debt	Equities	Debt	Equities	Debt	Equities	Debt	
<b>EMEA</b>																											
Egypt	n.a.	n.a.	-0.1	0.2	n.a.	4.2	-3.7	n.a.	-1.9	3.0	0.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-0.7	-0.7	
Hungary	0.3	-0.5	-0.3	-0.6	-5.6	1.8	2.2	-1.6	1.0	5.9	1.6	-0.5	-1.7	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	
Poland	1.1	2.0	0.3	0.8	-0.4	17.0	0.2	-7.8	1.7	6.7	1.1	-0.4	-1.0	2.2	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Russia	0.0	0.8	-0.8	3.0	-4.4	6.5	-0.4	-1.8	0.1	2.5	1.1	-0.5	-1.0	-4.7	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Israel	-3.8	2.9	0.3	0.2	0.1	17.0	-0.4	-4.2	-1.4	4.0	1.0	-0.3	n.a.	-2.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
South Africa	0.6	1.8	-0.7	-0.7	-3.0	8.3	1.2	-5.0	-0.5	3.1	1.2	0.5	-1.0	2.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Turkey	0.5	0.4	-1.5	-2.0	1.0	13.9	0.5	-3.7	1.0	19.0	0.8	0.0	1.4	5.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
<b>Asia</b>																											
China	-1.7	0.1	0.9	2.2	n.a.	18.6	1.6	-2.9	1.6	22.1	0.8	0.5	n.a.	-7.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
India	2.1	n.a.	1.2	-0.9	0.0	3.8	-3.7	-10.0	0.2	20.5	0.7	1.0	-1.3	1.7	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	
Indonesia	0.2	1.9	-0.3	1.9	-0.3	46.2	0.0	-0.5	0.6	6.2	0.7	0.9	1.0	-2.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Korea	0.8	1.8	0.5	0.9	-0.5	8.0	-0.9	2.5	0.1	7.4	1.4	0.9	1.3	-0.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Malaysia	n.a.	n.a.	-0.2	0.5	-0.5	9.9	0.0	-5.3	0.8	7.4	0.9	0.3	0.7	-9.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Philippines	n.a.	n.a.	-0.9	-0.9	n.a.	42.8	-0.4	n.a.	0.3	5.7	0.5	0.4	n.a.	-5.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Taiwan																											
Province of																											
China	-0.8	-1.3	-0.4	0.1	n.a.	9.7	-0.3	n.a.	0.0	5.5	0.7	-0.3	n.a.	-11.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Thailand	-1.2	0.2	0.0	-0.2	-2.0	23.7	-1.2	-2.3	1.0	6.8	1.0	0.6	0.9	-5.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
<b>Latin America</b>																											
Brazil	2.8	0.1	0.5	1.1	n.a.	20.9	5.7	-3.0	1.4	15.0	0.8	0.6	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Chile	-2.4	1.8	-0.1	1.8	-1.8	10.0	-0.5	-2.0	-0.5	8.6	1.5	1.8	-0.2	-5.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	
Colombia	n.a.	0.2	-1.1	0.9	-0.8	12.2	-0.4	n.a.	1.1	5.3	1.8	1.4	n.a.	2.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Mexico	n.a.	1.6	-0.0	0.7	n.a.	20.8	0.7	-4.1	1.3	7.6	0.7	0.9	-0.1	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	
Peru	-0.6	1.2	-0.4	0.4	-0.3	33.2	0.7	-0.4	0.6	8.6	0.9	1.2	-0.3	-3.1	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	

Sources: Bank for International Settlements; Bloomberg, L.P.; Consensus Economics; Haver Analytics; IBES; IMF, International Financial Statistics and WEO databases; and IMF staff estimates.

Note: FDI = foreign direct investment; EMEA = Europe, the Middle East, and Africa.

<sup>1</sup>Red cells signal two highest values in each column and orange cells signal next three highest values, except for columns VII and VIII, where shaded values represent lower values.

<sup>2</sup>In percent of GDP, four-quarter moving average, in z-scores. Mostly up to June 2010.

<sup>3</sup>End-2010 levels in z-scores relative to 2004–10 period, and change in year-on-year Consumer Price Index from June to December 2010. Wholesale price index used in the case of India.

<sup>4</sup>In percent of potential GDP, 2010 (April 2011 WEO).

<sup>5</sup>Gross international reserves, excluding gold (in dollars), year-on-year percentage changes in end-2010.

<sup>6</sup>Policy rate as of end-February 2011 minus 2011 inflation expectations, in percent.

<sup>7</sup>Estimates of 2010 cyclically-adjusted overall balance, in percent of potential GDP (see IMF April 2011 *Fiscal Monitor*).

<sup>8</sup>Total credit to households and corporates obtained from domestic and international banks and capital markets.

<sup>9</sup>Deviations from 1996–2010 trend, in z-scores in June 2010.

<sup>10</sup>In percent, annual change to June 2010.

<sup>11</sup>Mostly up to September 2010.

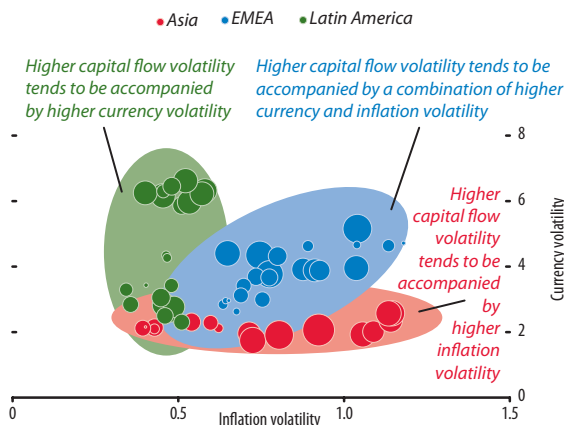
<sup>12</sup>Z-scores of valuation ratios for equities (average of price-to-book ratio and dividend yield) and of deviations from estimated equilibrium values for local government bond yields at end-2010 (see April 2010 GFSR, Annex 1.9).

<sup>13</sup>Current account balance plus net FDI inflows (reverse signs) in percent of GDP, 2010 (April 2011 WEO). Positive number represents financing need.



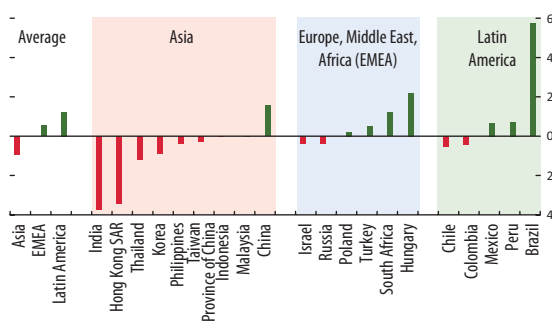
**Figure 1.38. Median Volatility of Inflation, Currencies, and Capital Flows**

(2001:Q1 – 2010:Q4, bubble size is capital flow volatility in z-score calculated for each region)



Sources: Haver Analytics; national authorities; and IMF staff estimates.  
 Note: Three-year standard deviation of (1) quarterly percentage change in goods price index (x axis); (2) quarterly percentage change in nominal effective exchange rates (y axis), and (3) quarterly percentage point change in portfolio investment as a percentage of GDP (bubble size), which is shown in a z-score (deviation from average in the number of standard deviation) calculated for each region, showing data points with above-average capital flow volatility.

**Figure 1.39. Real Policy Rates in February 2011**  
(In percent)



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

have the capacity to absorb structurally higher capital inflows and cope with capital flows volatility.

### G. Durable Financial Stability: Getting There from Here

*Having made progress in treating the symptoms of the financial crisis, policymakers are now confronted with three key challenges to put the*

*recovery onto a durable path: (1) address the legacy problems highlighted by the crisis, including high debt burdens and weakened balance sheets in many advanced economies; (2) navigate to a stronger, more robust financial system that is less reliant on public support and subject to greater market discipline; and (3) guard against overheating and the further buildup of financial imbalances, especially in emerging and developing economies. The first two challenges present a delicate problem of sequencing and balance because, pursued too aggressively, they would threaten the still limited recovery in the advanced economies. Yet unless these challenges are addressed starting now, the recovery cannot be shifted to a durable trajectory. In the short run, sovereigns, households, and financial institutions in several economies have fragile balance sheets that need continuing support to avoid a rapid deleveraging. In the medium run, this public and international assistance needs to be withdrawn and effective market discipline reestablished. Legal and policy frameworks need to be amended to facilitate debt restructuring and bank wind-ups without jeopardizing market access of borrowers still heavily dependent on wholesale funding. Thus, policymakers have to find the right balance between progress on the first two challenges without jeopardizing financial stability or the economic recovery in the process.*

The run-up to the financial crisis was marked by excess leverage and high debt burdens for households, sovereigns, and banks in many advanced economies. The policy response to the crisis relied heavily on accommodative monetary and fiscal policies and the transfer of private risk to sovereign balance sheets, further increasing public debt burdens and contingent liabilities. Despite this public support, a significant proportion of bank assets remain in a large number of undercapitalized banks, particularly in some euro area economies.

Lingering fragilities in the banking system require particularly urgent attention, as they remain a potential catalyst for any shock to financial stability. Thus, ongoing efforts to withdraw the public guarantees implied by crisis-born policies and ensure the potential for bondholder bail-in (the conversion of

debt to equity in a recapitalized bank) to contain the cost of future losses within the private sector should build on the foundation of stronger bank balance sheets.

Overcoming the legacy of high debt will be a gradual process.<sup>39</sup> Any strategy will likely involve a politically and economically demanding process of generating successive years of financial surpluses—high saving among households, strong profits and retained earnings for banks, and fiscal consolidation among governments. These efforts may need to be supported by continuing low policy rates, but there are limits to the effectiveness of monetary policy in facilitating the deleveraging process.

*Policymakers should now shift their focus from accommodative macroeconomic policies to more structural approaches to strengthening balance sheets and reducing debt burdens.*

In the banking sector, viable banks require better capital buffers to provide a greater cushion against future losses and facilitate ongoing access to market funding. This chapter highlights the need for a further core capital within the euro area banking system. Policymakers simultaneously need to reduce balance sheet uncertainty and identify and resolve nonviable banks. This will require greater disclosure about asset quality and exposures as well as rigorous stress tests that examine solvency and funding risks and are backed up by capital support where necessary. In the euro area, weak banks need to be restructured or resolved in order to reduce overcapacity. In the United States, banks should continue to write down distressed loans and reduce principal on mortgages that could benefit from modification.<sup>40</sup>

Sovereign balance sheets also need to be strengthened. Reducing the stock of debt will require credible commitments to limit fiscal deficits on a sustained basis and strengthen institutions to promote better fiscal discipline.<sup>41</sup> Providing greater clarity on the potential support for the banking system will help limit governments' contingent

liabilities arising from the financial system. Key structural goals concerning sovereign balance sheets include the following:

- In the euro area, the most pressing challenge is to reduce funding costs for those sovereigns subject to greater market pressure. Regaining investor confidence requires a comprehensive package of measures to arrest the rise in public debt. These could include improved governance of fiscal decision making, including through independent monitoring of targets and enhanced transparency over accruing obligations and contingent liabilities. Domestic efforts aimed at fiscal consolidation and growth-enhancing structural reforms should be backed by EFSF/ESM support, where necessary, with the aim of improving debt sustainability but subject to strict conditionality. The introduction of any mechanism that envisages sovereign debt restructuring needs to be as clear and nondiscretionary as possible to attract foreign investors back to sovereign debt of presently vulnerable euro area countries. See **Box 1.6** on page 51 for a discussion of recent developments in Euro area crisis management and prevention.
- For other economies with vulnerable fiscal positions (notably Japan and the United States), it is now crucial to establish convincing plans for medium-term deficit reduction to preserve confidence. Although these countries continue to enjoy extraordinarily low funding costs, they will not remain immune forever to deteriorating fiscal developments. Even if the probability of significant turmoil in these large government bond markets is low, its consequences on financial stability could be very severe, for example, from a rapid increase in risk premia.
- National debt management offices need to articulate credible funding strategies centered around limiting refinancing risk by lengthening maturities where necessary, active management of cash flows to smooth bond maturities, and developing a sufficiently diversified investor base.

*Policymakers must also navigate the transition to a stronger, more robust financial system that is less reliant on public support and subject to greater market discipline.*

<sup>39</sup> See Annex 1.3 on Dubai's progress in recovering from a debt crisis.

<sup>40</sup> See FDIC (2011) and IMF (2008, 2009a).

<sup>41</sup> See the April 2011 *Fiscal Monitor* (IMF, 2011b).

The focus of current reform efforts—financial sector regulation and supervision—is aimed at building larger amounts of loss-absorbing capital and sufficient liquidity to survive systemic shocks without public support and to manage those buffers in a countercyclical fashion.<sup>42</sup> Such reforms (detailed in **Box 1.7** on page 53) should help immunize sovereign balance sheets from the failure of financial institutions, limit the corrosive dynamic between sovereigns and banks that was manifest in recent years, and, through countercyclical provisions, reduce the tendency of banks to amplify credit swings.

As well as preventative measures, better crisis management arrangements, such as strengthened domestic and cross-border bank resolution regimes, are necessary to promote future financial stability. Authorities in various jurisdictions have already embarked on these endeavors.

***Policymakers must avoid sowing the seeds of a new crisis in emerging market and developing economies, and ensure that emerging risks are properly addressed.***

Foreign capital inflows to emerging markets have risen at a time when output gaps are closing and inflation is rising, complicating macroeconomic policies to manage local demand. At the same time, strong capital inflows warrant increased vigilance by policymakers, as they could eventually contribute to a buildup of financial imbalances and vulnerabilities. Policies in emerging markets need to rely more

<sup>42</sup> See Chapter 2 for detailed discussion of Basel III liquidity requirements.

on macroeconomic measures and, in some cases, capital control measures can play a supportive role. As inflows may prove long lasting, and especially in the context of strong domestic momentum, policies need to rely more on macroeconomic measures, such as rate hikes, more-flexible exchange rates, and fiscal tightening to avoid overheating, accumulating financial risks, and undermining policy credibility.

***Moving to a durable financial system requires a careful balance.***

How do we get to there from here? The main task facing policymakers in advanced countries is to shift the balance of policies away from reliance on macroeconomic and liquidity support toward more structural policies—less “leaning” and more “cleaning” of the financial system. Policymakers in advanced economies need to reduce leverage and restore market discipline, while avoiding financial or economic disruption during the transition. Private sector participation in future resolutions is necessary to restore market discipline. However, the transition is best sequenced by addressing legacy problems revealed in the run-up to or in the aftermath of the crisis. Lingering fragilities in the banking system require particularly urgent attention, as they could amplify and propagate any new shocks to financial stability. Thus, ongoing policy efforts to withdraw implicit public guarantees and ensure bondholder liability for future losses must build on rapid progress toward stronger bank balance sheets, ensuring medium-term fiscal sustainability and addressing excessive debt burdens in the private sector.

### Box 1.1. The Middle East: Geopolitical Risk to the Financial Stability Outlook

The political crisis in the Middle East is likely to have a profound and lasting effect on the region. Despite the spike in oil prices, the impact on global markets has been relatively contained so far. The potential for contagion through non-oil channels is moderated by the region's relatively limited trade and financial links to the rest of the world. However, some vulnerable economies in the euro area, as well as some emerging markets, could experience additional pressures if interest rates rise more sharply to combat inflation. If the political crisis deepens and oil supplies are severely disrupted, the potential impact on the world economy would be much more severe.

#### *Regional markets have come under significant pressure...*

The events of recent months represent a historic change in the politics and governance of the Middle East and North Africa, and their effect is likely to be felt for years to come. Although most of the financial repercussions were initially limited to the countries at the epicenter of the political events, the oil-exporting countries were eventually affected as the unrest spread (first figure). Overall, since early January stock markets have fallen sharply, and credit default swap spreads are much wider, although some markets have recovered from their worst levels. Citing heightened political risk, and in some cases, disruptions in real activity and fiscal weakening, rating agencies have undertaken numerous actions regarding several Middle Eastern and North African countries, with Bahrain, Egypt, Jordan, Libya, and Tunisia among the countries downgraded. Financial links within the region—cross-border equity holdings as well as Bahrain's position as a regional banking hub—may lead to heightened regional transmission of shocks.

Although intraregional trade links are relatively weak, tourism and remittance flows from the Gulf Cooperation Council countries and other oil-exporting countries to some of the oil import-

ers are expected to weaken substantially, with an adverse real sector impact. Furthermore, reverse migration—from historical host countries back to the home countries—would add to already stressed labor markets in the region.

#### *...while contagion to global markets has thus far been limited.*

The potential for contagion through non-oil channels is moderated by the region's relatively limited trade and financial links to the rest of the world:

- **Trade links.** Outside of the oil sector, the Middle East and North Africa region does not have extensive trade and financial links with the rest of the world. The region is a net importer, and non-oil exports are relatively low. For example, oil exports in 2010 represented 63 percent of the region's total exports of goods and services, and 71 percent for the subgroup of oil exporters.
- **Banking sector links.** The risk of contagion through the international banking system is moderated by the limited credit exposure of western banks to the region. Banks in the United States, United Kingdom, Japan, and Europe have a combined exposure to the larger regional economies of approximately \$330 billion, according to data for the third quarter of 2010 from the Bank for International Settlements. However, the exposures of U.K., U.S., and French banks are not insignificant (second figure). For the United Arab Emirates, U.K. bank exposure is \$57 billion, U.S. exposure is \$13 billion, and French exposure is \$12 billion. French banks have \$22 billion of exposure to Morocco, \$19 billion to Saudi Arabia, and \$17 billion to Egypt.
- **Petrodollar funding flows.** European (and especially U.K.) money markets have been a traditional venue for the recycling of petrodollars for decades, and in recent years the flows have been extended to money markets in other parts of Asia such as Singapore and Tokyo. However, these flows have been working normally so far and are unlikely to be disrupted unless civil

Note: This box was prepared by Gohar Abajyan, Adolfo Barajas, Jaime Espinosa, and Sanjay Hazarika.

**Box 1.1 (continued)**

unrest becomes severe enough to disrupt the governments of large oil exporters.

As a result of these limited links, spillovers to broader risk markets have been limited, although there has been some flight to safety, with gold and the Swiss franc trading higher. Market volatility has remained below the levels reached during the euro zone crisis of 2010.

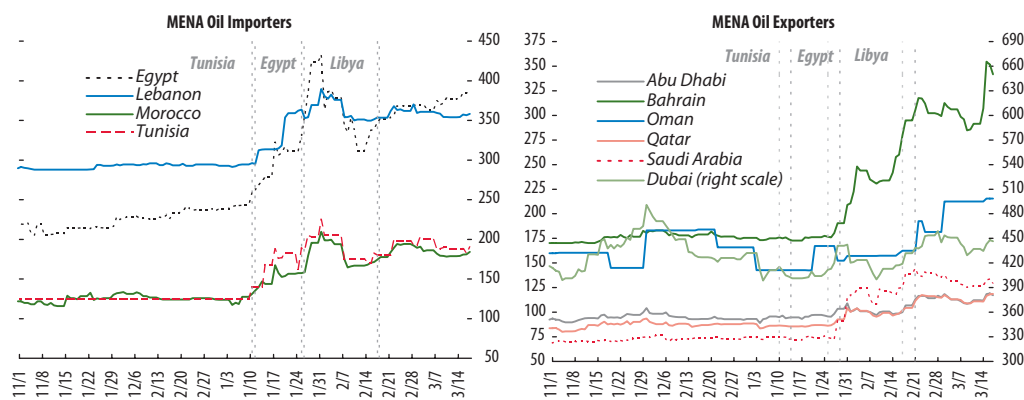
*Nonetheless, vulnerable economies in the euro area, as well as some emerging markets, could*

*see additional pressures if interest rates rise more sharply to combat inflation.*

The rise in oil prices is contributing to upward pressure on inflation (third figure) and may lead to earlier-than-expected increases in interest rates. This may put further pressures on funding costs faced by euro area peripheral economies. Rising rates in advanced economies relative to emerging markets could result in a pullback of capital flows to some emerging economies that have received large carry-trade related inflows.

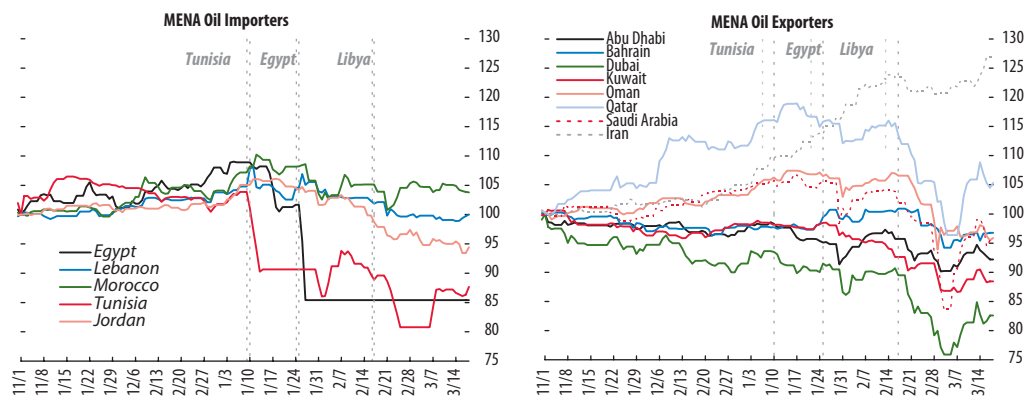
**Credit Default Swap Spreads**

(Basis points, November 1, 2010 - March 17, 2011)



**Stock Markets**

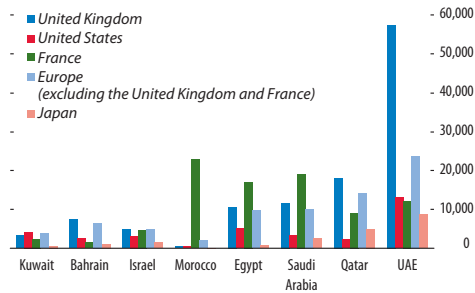
(Index; November 1, 2010=100, November 1, 2010 - March 18, 2011)



Sources: Bloomberg L.P.; and Markit.  
Note: MENA = Middle East and North Africa.

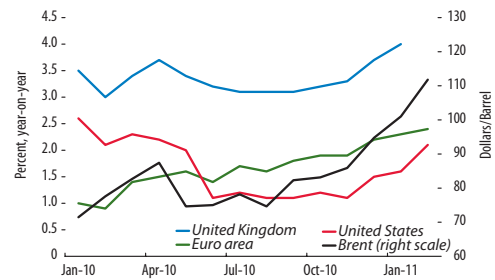


**Developed Market Bank Exposures to Selected Middle East and North African Countries**  
(Millions of U.S. dollars)



Source: Bank for International Settlements.

**Consumer Price Inflation and Oil Price**



Source: Bloomberg L.P.

*A spread of political instability represents a tail risk to the global economic and stability outlook.*

The worst case scenario is if civil unrest spreads to one or more of the larger oil producers and seri-

ously disrupts oil supplies from the region, leading to extremely high oil prices and the destabilization of global markets. The shock to the real economy would hit bank balance sheets and raise the prospect of a double-dip global recession.

### Box 1.2. Implications of Japan’s Earthquake for Financial Stability

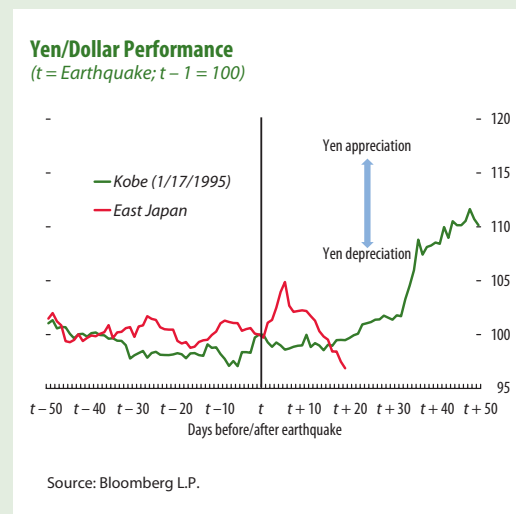
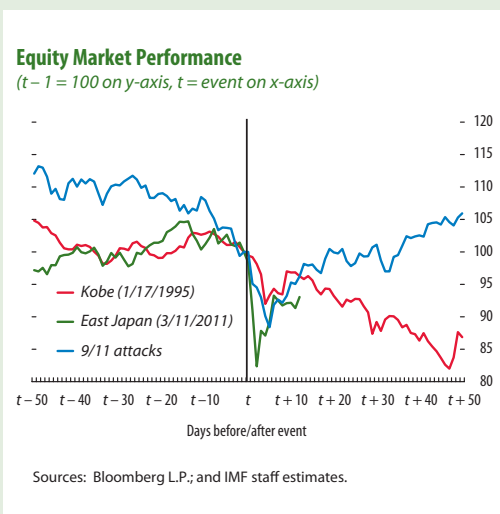
Japanese financial institutions and capital markets remain remarkably resilient in the aftermath of the recent earthquake and tsunami. The Bank of Japan’s decisive liquidity operations and expansion of asset purchases have helped financial institutions meet higher liquidity demand and stabilize financial markets, while a coordinated currency intervention successfully prevented excess exchange rate volatility. Based on current estimates, financial stability risks seem manageable and limited to the areas most affected by this natural disaster. Yet energy shortages, supply chain disruptions, and the continuing problems at the Fukushima Daiichi nuclear power plant leave considerable uncertainty surrounding the growth impact and the ultimate cost of damages. The longer-term financial stability consequences of this tragic disaster will likely be most manifest in Japan’s fiscal balances. Once reconstruction efforts are under way and the size of the damage is better understood, attention should turn to linking reconstruction spending to a clear fiscal strategy for bringing down the public debt ratio over the medium term.

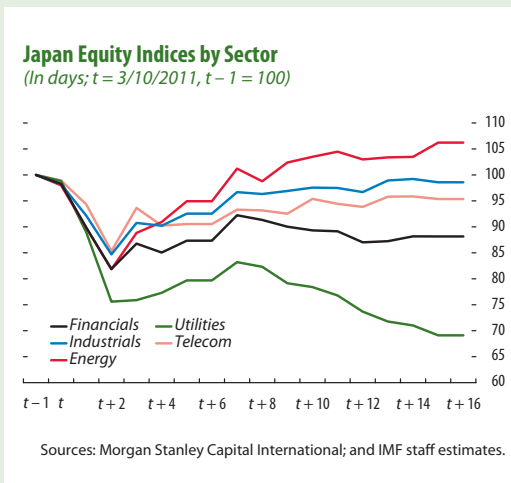
Decisive and coordinated policy actions helped to maintain stability in financial markets in the early days after the earthquake and tsunami. The interbank market remained resilient without serious

interruptions to the payments system as the Bank of Japan swiftly responded with ¥15 trillion in the same-day funds-supplying operations, exceeding the previous record of ¥4½ trillion injected after the Lehman collapse. The Bank of Japan also doubled its asset purchase scheme to ¥10 trillion, mainly through an increase in the acquisition of risk assets. An initial bout of panic selling that sent the Topix down 18 percent and wiped out nearly ¥57 trillion (\$710 billion) in market capitalization subsided after a few days (first figure). After a disorderly spike in the yen, the G-7’s coordinated intervention stabilized the currency, thereby reducing contagion risks to other asset classes and economies (second figure).

Nonfinancial Japanese corporations are well positioned to weather short-term disruptions from the disaster and fund rebuilding costs. While the debt-to-equity ratio of Japanese companies is high (see Table 1.1), they hold a large amount of liquid assets, including cash and bank deposits. In addition, profitability has recently improved, corporate defaults are low, financing conditions remain accommodative, and the generally high credit ratings of Japanese firms facilitates access to global capital markets as sources of financing. Yet the earnings impact of the disaster remains uncertain and share prices of companies in the most affected sectors have yet to recover fully (third figure).

Note: This box was prepared by Sean Craig, Joseph Di Censo, and Akira Otani.





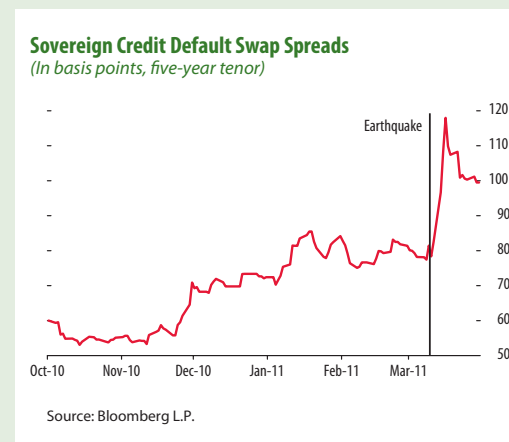
The Japanese banking sector has limited exposure to the affected regions. As of end-2010, loans in the three hardest hit prefectures—Iwate, Miyagi, and Fukushima—represent 2.4 percent of total banking system loans and 1.2 percent of total assets. The three megabanks (Mitsubishi-UFJ, Sumitomo-Mitsui, and Mizuho), which account for 53 percent of total banking system assets, are well diversified to any localized increase in credit risk stemming from the disaster. Some regional banks that have high exposures in the affected prefectures could see a material impact, but these institutions do not pose a systemic risk. In addition to loan exposure, these banks also have holdings of regional firms' equity.

Japanese domestic insurance companies are likely to have sufficient reserves to handle claims, though it will take a few months before losses can be estimated with accuracy. The current solvency margin ratios of major Japanese life and non-life insurance companies stand above 700 percent, well in excess of the minimum 200 percent requirement. According to Japanese Cabinet Office estimates, total damages are in the neighborhood of ¥16 trillion to ¥25 trillion, while government-provided co-insurance of residential claims for private non-life insurance companies caps the liability at ¥593 billion (or \$7 billion).<sup>1</sup> Japanese insurance solvency margin

<sup>1</sup> Residential earthquake claim risk is mostly transferred to the Japan Earthquake Reinsurance Company and government.

ratios would not fall by more than 100 percentage points under the maximum residential earthquake insurance costs and life insurance claims. Insurance companies would still have several times the minimum capital requirements even after factoring in these losses and the reduced unrealized gain from equity holdings due to the decline in share prices. However, depending on the size of commercial property insurance and business interruption claims, solvency margins could decline further.<sup>2</sup>

Concerns about Japan's fiscal position have been subdued so far, but could come to the fore as policymakers contemplate reconstruction funding. Priorities would be to focus on reconstruction spending to repair damaged infrastructure and prevent any substantial bottlenecks to restore growth. On balance, the earthquake has raised sovereign risks, even if only at the margin. Though not widely traded, sovereign credit default swaps topped 100 basis points, versus 80 basis points pre-crisis (fourth figure). Japan's gross general government debt of an estimated 230 percent of GDP at end-2011 is the highest among advanced economies, and the primary balance of  $-8.5$  percent of 2011 GDP is the second highest (see Table 1.3). Against this backdrop, spending on reconstruction and on insurance claims shared with private insurance companies is likely to make the fiscal adjustment more challenging, although by how much is not yet known. Japanese government bond



<sup>2</sup> A nontrivial portion of commercial losses will likely be passed on to the global reinsurers. In addition, nuclear risk is a standard exclusion in contracts, so damage related to the nuclear reactors will most likely not affect the industry.

**Box 1.2 (continued)**

yields have so far remained stable, as bond investors see reconstruction costs as only temporarily increasing debt issuance given the government's wide range of financing options.<sup>3</sup> Furthermore, government bonds are held mostly by domestic investors. Nonetheless, if interest rates rise substantially, there could be an impact on financial stability, as Japanese financial institutions have large government bond holdings (16.8 percent of their total assets). In addition, regional banks have recently increased the duration of their Japanese government bond portfolio, thereby raising their exposure to interest rate risk (see IMF, 2010e, Box 1.1).

Global spillovers will depend on the amount of foreign capital repatriation and the overall growth impact of the disaster. Japanese overseas assets are large and represent a potential source of capital for reconstruction or paying out insurance claims. However, corporates, institutional investors, and households are likely to draw upon liquid yen-

<sup>3</sup>As detailed in Section D, a relatively minor increase in average funding rates could push Japan's interest costs as a share of GDP over the 10 percent threshold (see Figure 1.20).

denominated assets (mostly cash and deposits) before resorting to selling foreign currency assets in order to generate cash. Based on current estimates, the covered damages to be borne by private insurers seem easily manageable based on their large cash holdings and Japanese government bonds. In addition, official capital flow statistics so far show no evidence of large-scale capital repatriation by either households or institutions. Much uncertainty remains about the growth impact from the earthquake, and supply chain disruptions could ripple through the global economy.

Decisive policy action helped maintain financial stability in the immediate aftermath of Japan's tragic disaster. Large holdings of liquid assets will assist Japanese corporations during the reconstruction effort. Though damage estimates are still preliminary, Japanese financial institutions are well capitalized to meet those claims. Once the reconstruction efforts are under way and the size of the damage is better understood, attention should turn to linking reconstruction spending to a clear fiscal strategy for bringing down the public debt ratio over the medium term.

### Box 1.3. Examining the Ability of U.S. Banks to Absorb Mortgage Principal Reductions

A key challenge for the U.S. housing market is clearing the large shadow inventory—houses potentially for sale because of current or expected loan delinquency—without destabilizing the normalization in house prices. So far, public and private efforts to mitigate foreclosures have met with limited success. The primary shortcoming has been the inability to induce the payment reductions needed to address borrowers' high-debt profiles and/or the principal reductions to address the large negative equity position of many homeowners (IMF, 2008, 2009a, 2010a, b, and c).<sup>1</sup> As a result, modified loans have had high redefault rates, slowing homeowners' efforts to deleverage and restore their credit scores and lengthening the foreclosure process.

The costly foreclosure process has indeed slowed considerably, raising loss severities. The value destruction associated with foreclosure is generally greater than that associated with loan modification, and loss severities tend to rise the longer it takes to foreclose on a home (IMF, 2010b; Fitch Ratings, 2010).<sup>2</sup> Since 2005, the average liquidation process has more than doubled to 22 months (Goodman, 2010). A number of issues have complicated this resolution process:

- Many seriously delinquent homeowners have extremely high debt service loads, including junior liens. The median ratio of total debt payments to income of borrowers whose loans have been modified under the Home Affordable Modification Program was 63 percent as of September 30, 2010. In the absence of principal reductions, loan restructurings are likely to be unsustainable, leading to high redefault rates and a postponement of resolutions.

Note: This box was prepared by Geoffrey Keim and Andrea Maechler, with helpful input from John Kiff.

<sup>1</sup> According to CoreLogic, 23.1 percent of U.S. homeowners owed more on their mortgages than their homes were worth in the fourth quarter of 2010.

<sup>2</sup> The longer it takes to foreclose on a loan, the worse shape it is in and the lower its recovery value. The recovery rate would also be lower during severe housing weaknesses, when a large volume of foreclosed properties are likely to hit the market.

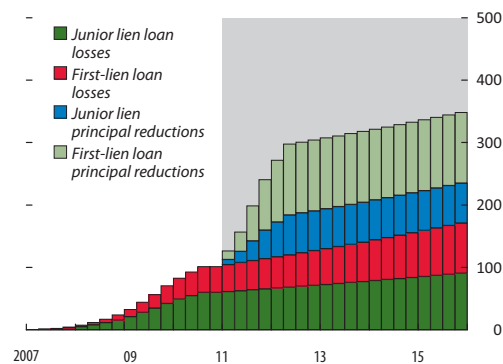
- Principal reductions reduce servicers' fee income, as they lower the outstanding balance on which their various fees are based (Levitin and Twomey, 2011). Servicers' compensation structure is inadequate to cover the time-intensive and complex nature of servicing and modifying delinquent loans, while conflicts of interest among investors in mortgage-backed securities further reduce their scope for loan modifications.

One way of assessing the size of the problem is to estimate the ability of the top 40 U.S. bank holding companies to absorb large up-front reductions in principal. We applied a 15 percent principal reduction over six quarters beginning in the first quarter of 2011 on all first-lien residential loans expected both to be at risk of foreclosure and to benefit from restructuring (e.g., negative equity performing loans, modified loans expected to redefault, and loans past due less than 90 days). We also applied a 30 percent writedown on seriously delinquent and foreclosed loans through 2015, to account for a worst-case loss scenario on those loans. For junior liens, we also assumed a 15 percent principal reduction except for those seriously delinquent, which received a 50 percent writedown (see figure).

Our stress tests highlight the capital strength of U.S. banks, showing that capital shortfalls are

#### Stress Scenario (15 Percent Principal Reduction): Cumulative Residential Real Estate Losses of Top 40 U.S. Banks

(In billions of dollars)



Sources: SNL Financial; and IMF staff estimates.



**Box 1.3 (continued)**

manageable even under a severe shock. Despite elevated loss rates, capital needs over five years are only \$4.4 billion under a 6 percent Tier 1 common equity ratio (see table). If the top 40 banks were to apply a more aggressive 20 percent principal reduction on first and junior liens, they would require an additional \$8.1 billion in capital to maintain a 6 percent Tier 1 common equity ratio.<sup>3</sup>

These estimates and their implications for the shadow inventory of houses for sale need to be interpreted with caution. Many uncertainties remain, including the sustainability of the loan restructurings and the impact of more aggres-

sive writedowns on the house price outlook and related loss severities. Furthermore, our analysis is restricted to the \$2.1 trillion in total home mortgage loans held on banks' balance sheets, ignoring the role of the \$7.1 trillion residential mortgage-backed securities (18 percent of which are held in private-label mortgage-backed securities).<sup>4</sup> While the fate of these securities matters for the speed at which the shadow inventory is liquidated, their impact on banks' balance sheets is likely to be limited, given that 85 percent of the \$1.3 trillion held on banks' balance sheets is either guaranteed or issued by a government-sponsored enterprise.

### Size and Extent of Capital Shortfalls at Top U.S. Banks under Alternative Scenarios for Capital Reductions on Residential Loans

	Ratio of Tier 1 Common Equity to Risk-Weighted Assets							
	Capital shortfall (in billions of dollars)				Banks falling below ratio (number)			
	6 percent ratio		8 percent ratio		6 percent ratio		8 percent ratio	
	Top 4	Top 40	Top 4	Top 40	Top 4	Top 40	Top 4	Top 40
Current baseline	0	1.3	1.9	10.7	0	2	1	12
Principal writedowns								
15 percent	0	4.4	17.3	36.7	0	7	2	18
20 percent	0	8.1	36.2	62.8	0	8	2	21

Source: IMF staff estimates.

Note: See box text for details on writedown amounts for first- and junior-lien loans.

<sup>3</sup>This scenario implies a 20 percent principal reduction on all categories of first and junior liens except for seriously delinquent and foreclosed junior liens, which receive a 40 percent writedown. The larger principal reduction is also assumed to help raise banks' recovery rates by 10 percentage points (to 80 percent for first liens and 60 percent for junior liens).

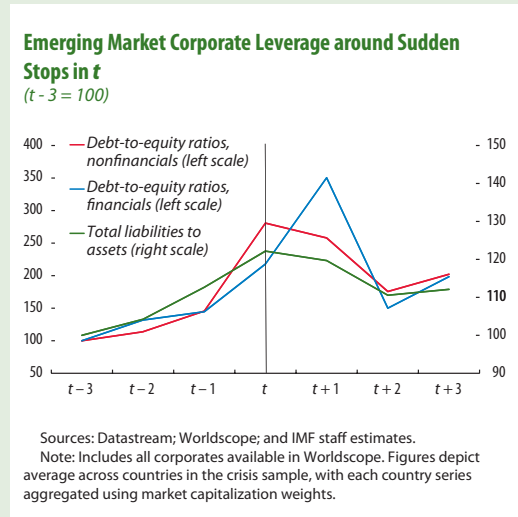
<sup>4</sup>Credit losses associated with the conforming loans underlying agency mortgage-backed securities are covered by the agency guarantee and hence would become a fiscal contingent liability.

### Box 1.4. Are Debt Vulnerabilities Building in the Emerging Market Corporate Sector?

Leverage has increased for both financial and nonfinancial corporations in emerging market economies, but so far it has not risen at the scale or pace historically observed in the run-up to sudden stops in capital inflows. Nevertheless, the debt of emerging market corporations has increased rapidly, making these firms vulnerable to higher funding costs and weaker earnings.

#### Leverage and Debt Servicing Capacity around Sudden Stops

The leverage of financial and nonfinancial corporations in emerging markets tended to increase dramatically in the run-up to sudden stops as businesses took advantage of ample foreign funding. On average, the ratio of debt to common equity for all emerging market corporations almost tripled in the three-year period before sudden stops, while the ratio of liabilities to assets increased by around 25 percent (first figure).<sup>1</sup> Leverage tended to spike



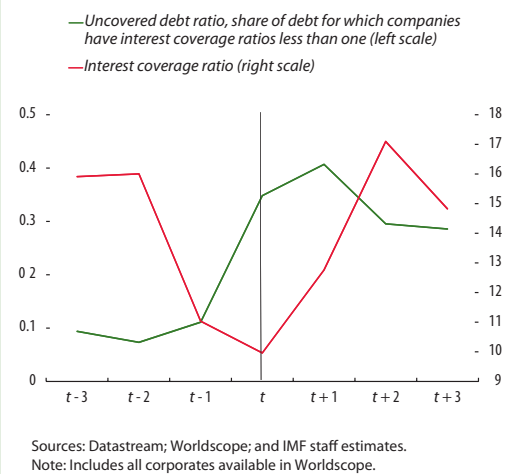
Note: This box was prepared by Kristian Hartelius and Estelle Liu.

<sup>1</sup>The data used in the box are taken from the IMF's Corporate Vulnerability Utility (CVU) based on Thomson Reuters data, and Moody's KMV. The CVU data contain annual observations between 1991 and 2009, while the data from Moody's KMV are monthly between January 2006 and

as total common equity declined with the onset of economic contraction. Leverage of nonfinancial businesses tended to peak in the year of a sudden stop (first figure, period  $t$ ), whereas leverage of financial corporations tended to peak one year later, in  $t + 1$ , as weakening credit quality affected bank balance sheets with a lag.<sup>2</sup>

The capacity to service debt tended to weaken in the run-up to crises, as gauged by the interest coverage ratio (ICR), while the uncovered debt ratio (UDR)—the share of debt for which ICR is less than one—typically increased dramatically during the crises (second figure).<sup>3</sup>

#### Debt Service Indicators for Nonfinancials around Sudden Stops in $t$



November 2010. Similar to Calvo, Izquierdo, and Talvi (2006), the following years are used for crises in the sample: Argentina (1998), Chile (1998), Colombia (1997), Indonesia (1997), Korea (1997), Malaysia (1997), Mexico (1994), the Philippines (1997), Russia (1998), Thailand (1997), and Turkey (2001).

<sup>2</sup>The share of short-term debt tended to increase in the years preceding sudden stops, raising vulnerability to sudden reversals of funding flows.

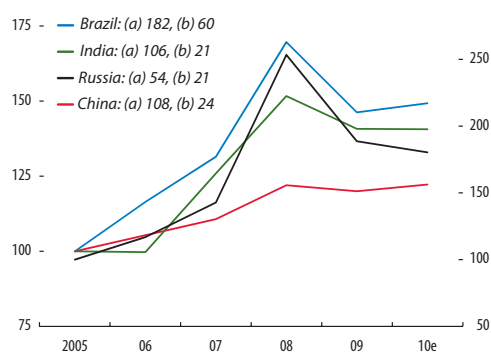
<sup>3</sup>ICR is calculated as earnings before interest and taxes (EBIT) divided by total interest rate expense. For a discussion of the concept of UDR, see Jones and Karasulu (2006).

### Box 1.4 (continued)

#### Assessment of the Current Situation

The advent of the financial crisis in 2008 appears to have caused a correction in leverage, though signs point to a rebound. Leverage ratios have increased above historical averages in the largest emerging markets since 2005, but firms in Brazil, Russia, India, and China (the BRIC countries) have deleveraged to some extent since the fourth quarter of 2008.<sup>4</sup> In fact, Russian corporations in 2008 experienced leverage dynamics reminiscent of a sudden stop.<sup>5</sup> Available data for 2010 suggest leverage in the BRIC countries has not recently

**Debt-to-Equity Ratios of the Corporate Sector for Brazil, Russia, India, and China**  
(2005 = 100, Russia on right scale)

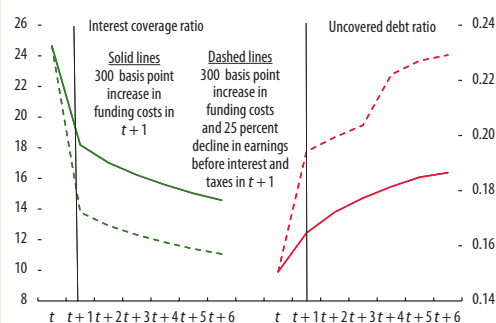


Sources: Datastream; Worldscope; and IMF staff estimates.  
Note: (a) Debt-to-equity ratio, 2010, in percent; (b) Debt-to-equity ratio, 2010, in percentage points above the average during the period 1994–2009.

<sup>4</sup>The pattern of declining leverage ratios since 2008 is similar for other emerging markets. The data sample for the analysis for 2005–10 consists of Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, Russia, South Africa, Sri Lanka, Taiwan Province of China, Thailand, and Turkey.

<sup>5</sup>There has been some sectoral differentiation in recent years in the BRIC countries, with bank leverage growing more strongly in Brazil and Russia, and nonfinancial sector leverage rising more strongly in India. In China, bank leverage has been contained despite strong growth in debt in recent years, helped by large initial public offerings in the banking sector.

#### Stress Test Scenarios for Nonfinancials



Sources: Datastream; Worldscope; and IMF staff estimates.

been building at the scale typically observed ahead of sudden stops (third figure).<sup>6</sup>

Readings on debt service indicators look less worrying than those typically observed ahead of sudden stops. The share of short term-debt, for both nonfinancials and financials, has declined over the past two years, while interest rate coverage ratios in aggregate are above their historical averages.

However, leverage ratios could deteriorate rapidly if the growth of assets or earnings were to weaken.<sup>7</sup> Stylized stress tests of the nonfinancial sector suggest that a 300 basis point increase in funding costs—driven by a normalization of interest rates in mature markets or a widening of emerging market spreads—would have a significant negative effect on interest rate coverage ratios and increase the average share of uncovered debt to 18 percent, somewhat higher than the levels seen in the run-up to sudden stops (fourth figure).<sup>8</sup> If corporate earn-

<sup>6</sup>Data for 2006–09 are from the CVU. The 2010 data point is estimated using the dynamics in the Moody’s KMV data for the debt-to-equity ratio through November 2010.

<sup>7</sup>Leverage ratios and debt servicing measures can be misleading when both assets and liabilities are growing rapidly, and when global interest rates are at historical lows. The level of corporate debt has risen rapidly in recent years, with real rates of debt growth in many countries approaching or exceeding those in the run-up to sudden stops historically.

<sup>8</sup>The share of uncovered debt (UDR) rose to around 15 percent on average in emerging markets in 2008 in the wake of the financial crisis, and has since then remained well above

ings in addition were to decline by 25 percent—a possible scenario if the more extreme risks to

---

the levels seen in the period 2004–07, despite the environment of generally low interest rates. The stress tests are carried out by increasing the estimated average interest rate on debt by 300 basis points for each nonfinancial firm, taking into account the average maturity of corporate debt in each country when calculating the cost of funding for each year over a five-year horizon.

financial stability in the advanced economies were to materialize—the share of uncovered debt would increase to 23 percent according to the analysis, which would be similar to the level of stress during some of the sudden stops included in the sample.<sup>9</sup>

<sup>9</sup>The drop in EBIT in our stress test is milder than the 35 percent drop in earnings that Asian firms experienced in the Southeast Asian crisis of 1997–98.

### Box 1.5. Emerging Market Banks: Fueling Growth or Frenzy?

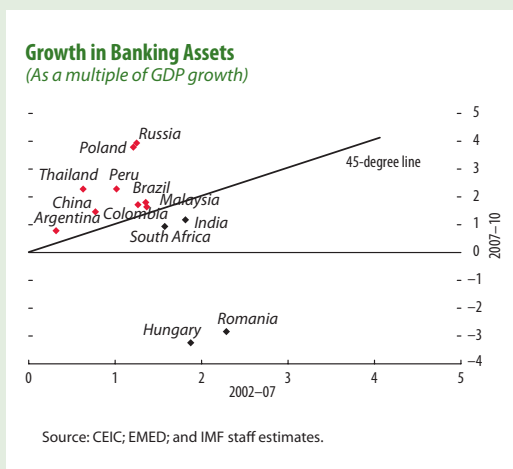
Bank lending in some emerging market economies, particularly in Asia and Latin America, grew at a faster pace between 2007 and 2010 than in the five years leading up to the global financial crisis (first figure). Three factors drove the increase: (1) domestic economic growth, (2) a pullback in international banking, which has provided growth opportunities for local banks, and (3) domestic policies promoting bank lending.<sup>1</sup> Equipped with relatively sound balance sheets in the period leading up to the crisis, banks in emerging markets have supported this growth comfortably so far. But the accelerated credit growth has increased vulnerabilities and raised the risk of overheating in the macroeconomy.

Larger banks, especially state-owned banks in China and Brazil, have been primarily responsible for the sharp rise in credit. Major banks in those two countries expanded their balance sheets by more than 100 percent during the 2007–10 period, reaching sizes comparable to those at large banks in the United States and Europe. Meanwhile, the

capital positions of the big lenders remained relatively healthy and benefited from the relatively easy access to capital markets (second figure). Regulatory capital ratios for the bigger banks in emerging markets were at relatively comfortable levels in the second quarter of 2010, although state-owned banks in some emerging markets might need to bolster their capital ratios to sustain current rates of balance sheet growth.<sup>2</sup>

The accelerated credit growth has come with an increase in vulnerabilities at banks. They have increased their reliance on external financing, shifted away from deposits into wholesale funding, and increased financial leverage while allowing asset quality to deteriorate. This box focuses on the shifts to external financing and wholesale funding, while Box 1.4 addresses the developments in leverage.

The surge in global debt issuance in 2010 facilitated releveraging of balance sheets at emerging market banks, with smaller banking systems increasing their reliance on external funding. Emerging market banks issued a record \$110 billion in dollar-denominated debt in 2010, led by banks in Russia, Korea, and Brazil. On a positive note, the larger banks extended the duration of their liabilities and used most of the sale proceeds for new lending. However, debt sales in 2010 saw several new names, notably small and medium-sized banks in Brazil, Peru, and Chile, and the apparent increase in reliance on global wholesale funding markets (third figure) raises questions about the capacity of some of the smaller institutions to refinance themselves under tighter conditions.<sup>3</sup>



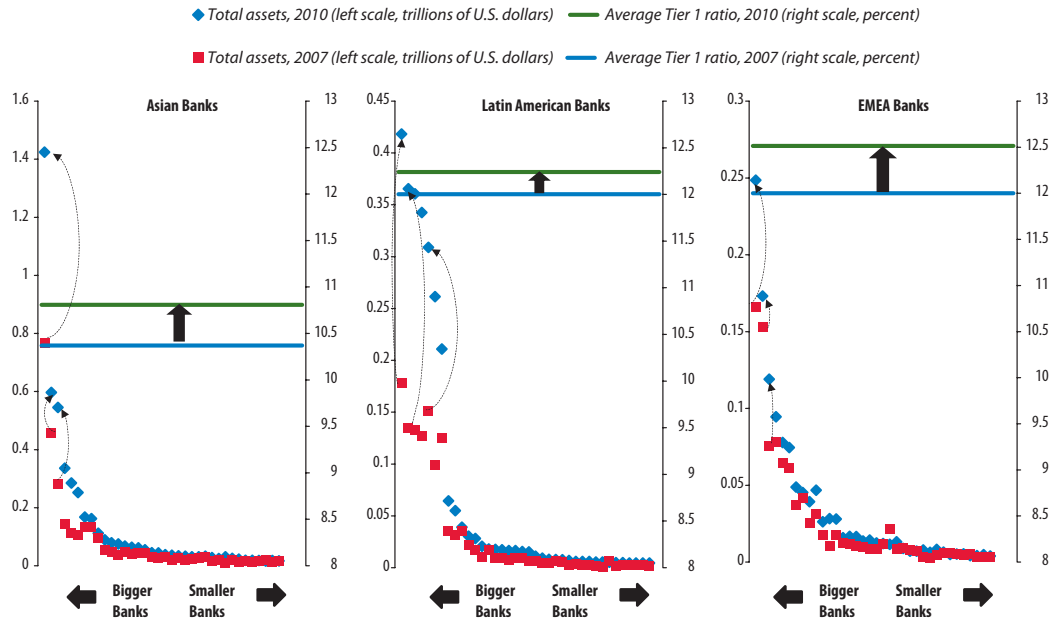
Note: This box was prepared by Narayan Suryakumar.

<sup>1</sup>Aggregate assets in the banking system compared with nominal GDP, in U.S. dollars. Banking data include public and private banks, domestic and foreign banks, and specialized credit institutions in some countries and are obtained from the respective central bank databases. For some countries, a higher reading on the y axis could be partly a result of relatively slower economic growth rather than entirely the result of bank asset growth.

<sup>2</sup>Tier 1 capital ratios for the larger banks averaged around 10.8 percent in Asia, 12.4 percent in Latin America, and 12.5 percent in emerging Europe.

<sup>3</sup>Foreign-currency-denominated debt includes short-term and long-term debt issuance. Debt issued in 2007 is used for comparison purposes, as foreign-exchange-denominated issuance for several emerging market banks in the run-up to the crisis peaked in that year. The figure highlights increased reliance on external wholesale funding and is not representative of increased reliance on overall foreign liabilities.

### Emerging Market Banks: Asset Growth and Capital Positions



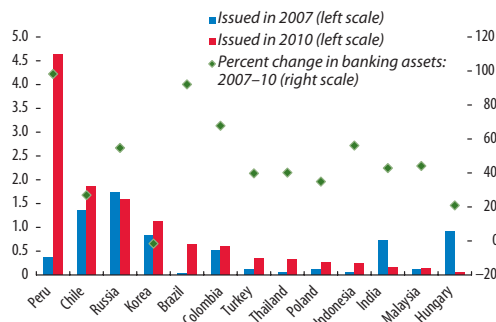
Sources: Bankscope; and IMF staff estimates.  
 Note: Tier 1 ratios are based on average estimates of large banks only. EMEA = Europe, the Middle East, and Africa.

Easy access to alternative financing options and ample growth opportunities are luring some banking systems away from deposit-driven asset growth, suggesting that banking-driven credit bubbles may be developing. Lenders in fast-growing economies, such as Brazil and Turkey, are relying less on deposits for expanding their loan books, pushing the ratio of loans-to-deposits sharply higher (fourth figure). The financial crisis helped slow this trend in some of the larger emerging economies (such as Russia and Korea), but weaker lending standards and regulatory forbearance in other economies helped advance the trend.<sup>4</sup>

<sup>4</sup> Calculated as total domestic credit extended divided by total domestic deposits. Data on loan-to-deposit (LTD) ratios for Brazil include commercial banks and the state-owned banks *Banco do Brasil* and *Caixa Econômica Federal*. LTD ratios are relatively higher for commercial banks in Brazil because of increased reliance on transfers from state-owned lender BNDES and on funding from mutual funds. In Turkey, despite the sharp increases in the recent past, LTD ratios are below peer averages, as evident in the figure.

In summary, emerging market banks have supported domestic credit growth and, given their strong balance sheets, have proved resilient through the financial crisis. However, the rapid credit growth seen in some economies raises the risk of overheating, potentially leading to a deterioration

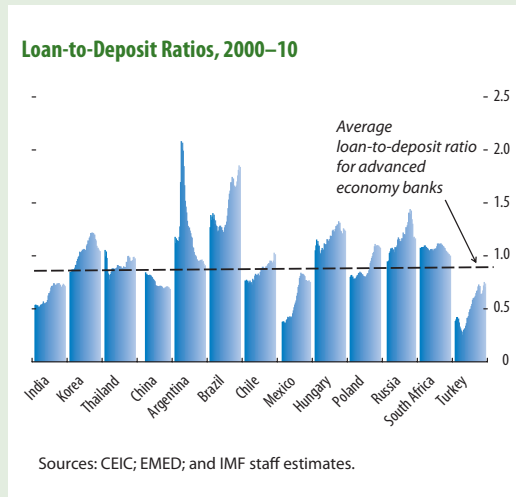
### Foreign-Currency-Denominated Debt Issuance (As a percent of banking assets in 2010)



Sources: Dealogic; CEIC; EMED; and IMF staff estimates.



**Box 1.5 (continued)**



in credit quality, and increased bank reliance on external sources of financing and noncore funding options. These mounting risks call for increased vigilance from authorities and policy actions to tighten credit.

### Box 1.6. Euro Area Crisis Management and Prevention

Since the onset of the sovereign and banking crisis affecting various parts of the euro area, European policymakers have undertaken several episodes of policy reforms in an attempt to get ahead of the crisis. The March 24–25, 2011 decision by the European Council is so far the most comprehensive reform effort, designed to “turn the corner of the financial crisis.” Indeed, adopting a proactive rather than a reactive approach is long overdue, and ensuring consistency of policies has become paramount. A number of elements of the package remain to be clarified and specifics elaborated, expected by June 2011. And the interdependence of national banking systems and sovereigns and the cross-border dimension of the financial crisis still need to be addressed.

The main elements of the March 2011 package are a commitment to increasing the effective amount of financing available under the European Financial Stability Facility (EFSF); clarification of the key parameters of the permanent European Stabilization Mechanism (ESM); a commitment to ambitious stress tests coupled with follow-up plans to deal with vulnerabilities; and better coordination of economic policies and strengthening of the economic governance of the euro area (European Semester, Euro Plus Pact, revised Stability and Growth Pact, and the new Excessive Imbalances Procedure).

#### *Securing a Durable Exit from the Crisis*

A number of elements of the March package remain to be clarified, and progress needs to be made in individual country cases. The strengthening of the mechanisms to support countries that are experiencing financing difficulties underpins the authorities’ claim that sufficient resources are available to meet actual and potential member states’ financing needs. The larger effective size of the EFSF is likely to bolster market confidence but the mechanism by which this is to be secured should be clarified as soon as possible. In addition, decisions about adapting the interest rate

Note: This box was prepared by Luc Everaert and Nico Valckx.

of the EFSF are urgently needed to help support fiscal sustainability.

Repair and reform of financial systems remain urgent. While stringent stress tests can play a crucial role, they will be effective only when accompanied by clear plans to force banks to build capital buffers commensurate with the uncertainty about the value of their assets and to wind up unviable business models and banks. Policymakers seem committed to this approach, but the March package has left the onus of dealing with financial sector issues squarely on the national authorities, despite the high potential for cross-border contagion. Hence, to the extent that national fiscal capacity falls short of what is needed to deal with domestic banking problems, countries should seek support from the available euro-area wide facilities. Moreover, action in other countries is also needed to tackle banks that are relying in a chronic manner on European Central Bank (ECB) liquidity support.

National policy action aimed at securing fiscal sustainability and growth continues to be essential. The March package includes a commitment by all national authorities to specific actions to strengthen budgetary positions and boost employment and growth. Increased coordination of these actions under the European Semester and the Euro Plus Pact is highly welcome. Yet the specific actions to be identified by June will need to be ambitious and swiftly implemented to facilitate exit from the crisis.

#### *Preventing a Recurrence of the Sovereign and Financial Tensions*

The March package correctly calls for a further strengthening of the economic governance of the euro area to ensure lasting financial stability. It recognizes that, while boosting market discipline will be helpful to discipline fiscal policy, it is better to prevent an unsustainable situation from developing in the first place. Subjecting individual member states to binding commitments on their budgets would be ideal. Short of that, enhanced coordination through the European Semester, strengthening of the Stability and Growth Pact,

**Box 1.6 (continued)**

and the introduction of national fiscal rules (e.g., debt brakes) is likely to go a long way toward establishing fiscal discipline. Should access to market financing nonetheless become problematic, the proposed ESM provides a robust and orderly framework to assist euro area member states, subject to conditionality in order to support discipline. To broaden the avenues of support, some additional flexibility of the ESM's instruments would be helpful.

But the crisis was not only of fiscal origin. Private sector imbalances, financed by cross-border capital flows, also contributed, as they were associated with equally unbalanced developments in competitiveness. The March 2011 package contains an explicit commitment to boost competitiveness, but specific reforms will need to be identified and implemented without further delay, and peer pressure may not be sufficient to

bring about the required reforms. Adding a more binding element to the new excessive imbalance procedure and the Euro Plus Pact would make them more effective in preventing imbalances and promoting sustained growth.

In the wake of the global financial crisis, and given the recent adverse feedback loop between the sovereign and financial tensions, the high degree of financial integration poses a particular challenge for the euro area. It underscores the potential for financial contagion to cross borders and thus the need for robust regulation and a strong European-wide element of supervision and resolution. To decouple banking and sovereign risks and make financial integration in the euro area safer and more effective, a pan-European framework for crisis management and resolution of financial institutions, with a euro area-wide fiscal backstop, should be established.

### Box 1.7. Regulatory Reforms: Are We There Yet?

The crisis has provided the impetus for a major revision of the financial regulatory framework, but action on the G-20 reform agenda is far from completed. The Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) have announced a comprehensive framework to address the root causes of the crisis: excessive leverage, low levels of loss-absorbing capital, bad liquidity management, misaligned incentives, and lack of transparency. Although the framework provides an important starting point, the agenda of unfinished business remains daunting.

Most of the agreed-upon reforms seek to make individual banks less likely to fail. Key measures include improving the quantity and quality of capital, aligning capital requirements to better capture market and counterparty risk and risk in securitized portfolios; introducing a leverage ratio; and establishing measures to increase liquidity buffers and reduce unstable funding structures (BCBS, 2010a and b). There is also progress on other fronts:

- The FSB announced a general proposal to address institutions that are perceived to be “too important to fail” (FSB, 2010a and b). This covers more effective resolution regimes; additional loss-absorption capacity for systemically important financial institutions (SIFIs); more intensive supervision; stronger standards for core financial infrastructure, including for over-the-counter derivatives; and peer review of national policies for global systemically important financial institutions (G-SIFIs).
- Next steps on prudential reform are already under way. The BCBS is revising the market risk framework (including a fundamental review of the distinction between the trading book and the banking book), monitoring the levels of capital for operational risk, and studying how to address concentration of risk.
- The role of hedge funds has drawn renewed attention. Agreements are in place that call for better information about their activities along

with a regime for registration, reporting, and oversight (IOSCO, 2009).

- The FSB in April 2009 set forth recommendations to address procyclicality in the financial system (FSF, 2009). In response, the BCBS has proposed a countercyclical buffer designed to accumulate as systemic risk builds up. Accounting standard setters have also proposed expected loss provisioning approaches that will facilitate earlier recognition of credit losses and thus help to dampen procyclicality. Finally, the FSB published in October 2010 new approaches for the use of credit rating agency ratings aimed at reducing procyclicality (FSB, 2010c).
- Several international financial standards have been or are being revised, including in the areas of banking, insurance, and securities regulation as well as payments and securities settlement systems and central counterparties. The FSB is revising its compendium of standards, which is expected to include among “key standards” the new Principles for Effective Deposit Insurance Systems and a new standard on cross-border resolution.

These achievements are laudable, but real progress is also needed in areas where much has been said but less has been accomplished. These include developing (1) a macroprudential policy framework to deal with system-wide risks; (2) coherent resolution mechanisms at both the national level and for cross-border financial institutions; and (3) regulatory approaches to the “shadow banking system.”

The greatest challenge ahead is national implementation of the measures agreed-upon internationally and ensuring the necessary coordination for their success. There is still work ahead related to the SIFI/G-SIFI proposals, with decisions on critical elements yet to be completed. These include (1) the actual definition of a G-SIFI; (2) the size of the capital surcharge; and (3) the composition of supplementary instruments that have loss-absorbing characteristics (e.g., contingent capital).

G-20 economies have agreed to incorporate the new standards and submit to international assessment and peer review processes to ensure consistency in implementation. The agenda for

Note: This box was prepared by Michael Moore and Fabiana Melo.

**Box 1.7 (continued)**

future work is coincident with the priorities already identified by the IMF: global coordination to minimize regulatory arbitrage; coherent resolution mechanisms at the national level and for cross-border financial institutions; an enhanced macro-prudential focus; a broadened regulatory perimeter to address emerging exposures and risks across the entire financial system, not just at banks; and, importantly, more effective supervision (Viñals and others, 2010).

The agenda for the future needs to combine some profound changes in supervisory approach and incentives for the industry to internalize sustainable risk management. For reform initiatives

to be successful, it is ultimately the industry that will need to translate them into practice, including risk management and governance. Supervisors will need to be better coordinated to deal with cross-border and cross-sector exposures, supervising key risks, and taking timely corrective action.<sup>1</sup> If financial stability is to be achieved and maintained, the industry and regulators need to restore the credibility of market discipline, correcting misaligned incentives and enhancing transparency and disclosures.

<sup>1</sup> For more on the importance of effective supervision, see Viñals, Flichter, and others (2010).

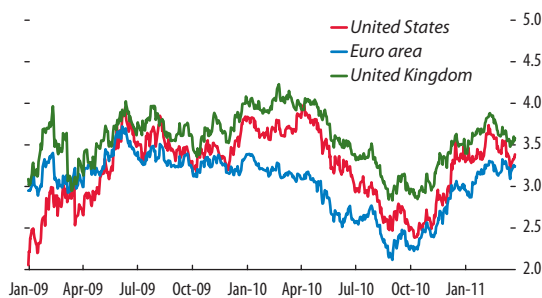
## Annex 1.1 What Factors Are Driving U.S. Bond Yields Higher?<sup>43</sup>

*This annex seeks to disentangle the factors that have contributed to the rise in long-term U.S. bond yields. Despite concerns around debt sustainability, much of the rise in long-term yields does not appear to reflect fiscal issues. Rather, the rise mainly reflects higher real rates and an increase in the term premium. The implementation of the Federal Reserve's second round of quantitative easing (QE2) appears to have had only a fleeting impact.*

Long-term U.S. treasury yields have risen more than 100 basis points since the October 2010 GFSR. This trend is not unique to the United States, with 10-year yields rising by similar magnitudes in other advanced economies as well (Figure 1.40) despite continued accommodative global monetary policy.<sup>44</sup> The uptick in U.S. yields seems to be partly due to steadily improving growth prospects, as reflected in the “positive surprise gap” (representing upside surprises in incoming economic data) since October (Figure 1.41).

The rise in rates also appears to be attributable to a normalization in inflation expectations. Although actual inflation indicators show subdued price pressures, market-implied inflation indicators point to upside risks in inflation and an upward trajectory in long-term inflation expectations on the back of

**Figure 1.40. Ten-Year Government Bond Yields**  
(In basis points)

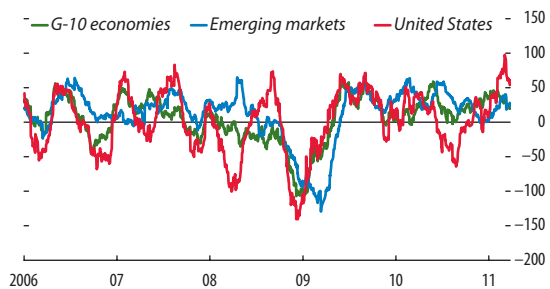


Source: Bloomberg L.P.

<sup>43</sup> This annex was prepared by Rebecca McCaughrin.

<sup>44</sup> For further analysis on the rise in global bond yields, see Chapter 2 of the April 2011 *Fiscal Monitor* (IMF, 2011b).

**Figure 1.41. Macroeconomic Surprise Indices**



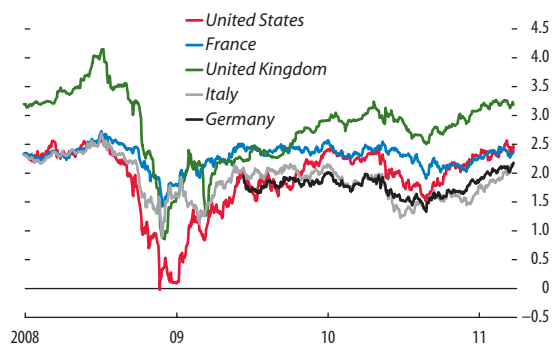
Sources: Bloomberg L.P.; and Citigroup.

Note: Weighted historical standard deviations of data surprises, based on actual releases and Bloomberg median consensus. A positive reading indicates that the data beat expectations; a negative print means that the data disappointed.

quantitative easing, stronger growth prospects, and rising commodity prices. This is evident in the rise in 10-year inflation break-evens, five-year/five-year forward break-even inflation rates, and by the increased probabilities of one-year ahead inflation implied by options on inflation-linked debt (Figure 1.42).

Higher nominal yields also reflect a rise in the term premium. The term premium is intended to compensate holders of long-term bonds for the risk of future interest rate changes. In an environment of low policy rates for a protracted period, the market should charge a lower premium for duration risk since longer-dated debt is less exposed to the risk of an unexpected rise in interest rates. To the extent that quantitative easing reduces duration risk, this should result in a declining term premium.<sup>45</sup>

**Figure 1.42. Ten-Year Break-Even Rates**  
(In percent)



Source: Bloomberg L.P.

<sup>45</sup> Gagnon and others (2010) showed that the effect of the Federal Reserve's purchases on the yield curve was primarily through the reduction of the term risk premium.



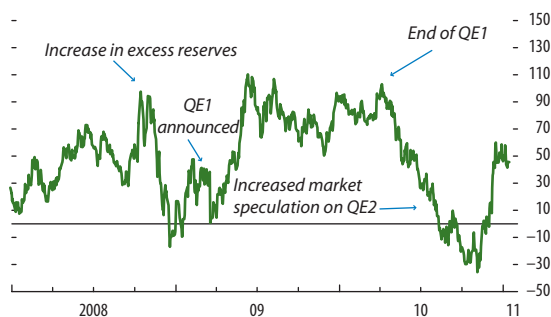
Indeed, the term premium had been steadily falling since the QE1 program ended and the market started to speculate on the prospects for another program (Figure 1.43). But the impact was short-lived, with the term premium rising once QE2 was implemented. The quick retracement may have partly reflected the smaller ultimate size announced and other offsetting factors that increased duration risk. During QE1, the decline in the term premium also quickly reversed, well before the program concluded.

Credit premia do not appear to have contributed to the rise in nominal yields. Prior to the global credit crisis, it was reasonable to assume that credit risk was negligible for major sovereigns. Pre-crisis sovereign credit default swap (CDS) spreads used to trade around 10–20 basis points on U.S. treasuries and were fairly illiquid and rarely traded. However, as the crisis broadened to sovereign debt markets, CDS spreads widened to 50 basis points, and the risk-free assumption on sovereign debt was invalidated. Given the increased focus on debt sustainability concerns, it now makes sense to incorporate credit risks in deciphering fluctuations in long-term bond yields. Using 10-year CDS pricing as a proxy for credit risk, credit premia in the United States have been unchanged since the October 2010 GFSR,

as developments on the fiscal side have had only a modest impact on CDS pricing.<sup>46,47</sup> Other traditional market-based measures of fiscal vulnerability, such as the shape of the Treasury yield curve and asset swap spreads (e.g., bank credit risk-adjusted swap spreads, the spread between forward rates and Treasury yields, the spread between treasury and overnight index swap rates) show similarly limited fiscal concerns.

Aggregating the underlying components of the nominal yield curve—real yields, inflation premia, term/risk premia, and credit risk—provides a more complete understanding of the specific factors underpinning the rise in rates. As Figure 1.44 illustrates, the rise in 10-year nominal Treasury yields primarily reflects an increase in real rates, reflecting the improvement in growth prospects and a higher (noncredit risk) term premium (possibly reflecting supply/demand imbalances)—while credit premia and inflation compensation (and other miscellaneous factors) have exerted less obvious upward pressure on nominal yields.<sup>48</sup>

**Figure 1.43. Term Premium on U.S. Treasuries**  
(In basis points)



Sources: Bloomberg L.P.; Federal Reserve; Macroeconomic Advisers; and IMF staff estimates.

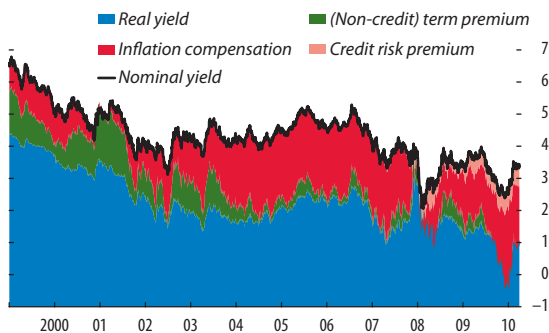
Note: QE1 and QE2 refer to the first and second rounds of quantitative easing by the Federal Reserve.

<sup>46</sup> Sovereign CDS do not solely reflect the probability of sovereign default. First, various studies show that sovereign CDS overstate the probability of a sovereign debt default. This is because spreads may be driven by factors other than pure default risk, such as market liquidity, counterparty hedging, proxy hedging, speculation, or other factors. For instance, at 50 basis points, 10-year U.S. CDS have a market-implied default probability of 4 percent, assuming a recovery rate of 40 percent. This is high compared with historical default episodes and with the default probabilities assigned by credit rating agencies. Second, since CDS transactions are illiquid, especially on major sovereigns, and represent only a fraction of trading on cash bonds, the liquidity premium embedded in CDS prices likely exaggerates the credit risk. (That said, using bid-ask spreads as a proxy for liquidity, the premium is probably no more than a few basis points.) Third, deriving default probabilities on sovereigns from CDS is more complicated than in the corporate sector: there have been few sovereign debt defaults, not all defaults are alike, and none have involved a major advanced economy.

<sup>47</sup> Ten-year CDS are used for the sake of consistency with the framework. Using prices on more liquid five-year CDS had no impact on the main conclusions.

<sup>48</sup> There are two main caveats to this interpretation: first, inflation risk premia include inflation expectations and other miscellaneous factors (e.g., inflation risk premia, liquidity risk, effects of indexation lags, and index basis risk). Second, credit risk and inflation risk may influence the term premium, which would not be captured in this type of mechanistic approach.

**Figure 1.44. Components of 10-Year Nominal Treasury Yield**  
(In percent)



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

In sum, this analysis suggests that fiscal concerns do not appear to have led to a higher cost of funding during the most recent run-up in nominal bond yields. Rather, improving growth prospects and higher term premia are the main factors pressuring long-term rates higher. Furthermore, QE2 does not appear to have contained long-term rates. While the anticipation of QE2 initially led to a sharp compression in term premia, that impact was either fleeting or has been more than offset by other factors.

## Annex 1.2. Compilation of Investor Base Data for General Government Debt<sup>49</sup>

*In this annex, the investor base of total general government debt for each country in Figure 1.17 is decomposed along two dimensions—residency and nonresidency; and bank and nonbank. This decomposition captures a country’s funding reliance on external investors and banks. All the debt data are based on the market value to facilitate the comparison and analysis.*

Total general government debt data are from Eurostat’s Quarterly Summary Government Finance Statistics. The sum of all the liabilities in the gov-

ernment balance sheet is taken as the total general government debt.

Total external debt is from the Joint External Debt Hub (JEDH) database. The end-of-period exchange rates in the IMF’s International Financial Statistics (IFS) are used to convert U.S. dollar debt into euros, given that the exchange rates in the IFS are more in line with the European Central Bank (ECB) reference rates than other sources, such as Bloomberg.

Total domestic debt is a residual after deducting external debt from total general government debt.

Domestic banks’ holdings of general government debt come from the IFS statistics on other depository corporations’ claim on the general government in their respective countries. The category “other depository corporations” is equal to the category of “other monetary financial institutions” for the euro area. It excludes national central banks and ECB but may include corporations engaged in granting mortgages, mutual funds, and municipal credit institutions.

Foreign banks’ holdings of general government debt are calculated with two types of Bank for International Settlements (BIS) cross-border banking statistics. The BIS Consolidated Banking Statistics present banks’ international claims on the public sector (Table 9A: G and Table 9C: G). However, the data are not consistent with the principles of external debt statistics as they cover worldwide-consolidated international financial claims of domestically owned banks. The BIS Locational Banking Statistics are consistent with those principles; however, they do not offer information on banks’ international claims on the public sector. To address the data limits, the ratio of banks’ claims on the public sector to all sectors is assumed to be the same in both the consolidated and locational banking statistics. Accordingly, the share of foreign bank holdings is calculated from the consolidated banking statistics (data in Table 9A:G divided by those in Table 9A:A) and then applied to the external positions of BIS reporting banks in the locational banking statistics (Table 6A) to derive foreign banks’ holding of government debt.

<sup>49</sup>This annex was prepared by Peter Lindner and Yinqiu Lu.

### Annex 1.3. Dubai: From Debt Overhang to Restructuring, but Risks Remain<sup>50</sup>

*The global crisis highlighted the vulnerabilities of Dubai's growth model, which had relied heavily on highly leveraged property development.<sup>51</sup> In November 2009, Dubai World, one of the largest conglomerates owned by the government of Dubai, announced a moratorium on debt payments. After initial market disruptions, Dubai World achieved a successful debt restructuring thanks to support from the government of Abu Dhabi. Equity injections by the government of Dubai provided lenders the incentive to agree on the restructuring terms, but refinancing problems could re-emerge when restructured loans mature, including those from local banks. Lingering risks to the sovereign balance sheet have also kept Dubai spreads elevated.*

Dubai's growth model had remarkable achievements, but it entailed high risks. The model, which was largely implemented through government-related enterprises (GREs), allowed Dubai to multiply its gross national product tenfold between 1990 and 2008 and to become a prime regional hub. Nevertheless, the large-scale and highly leveraged property investments, as well as the expansion into real estate and private equity abroad, generated significant risks: Dubai's debt tripled during 2005–08 to almost 100 percent of GDP, and rollover needs increased dramatically (Figure 1.45).<sup>52</sup>

#### Onset of the Crisis

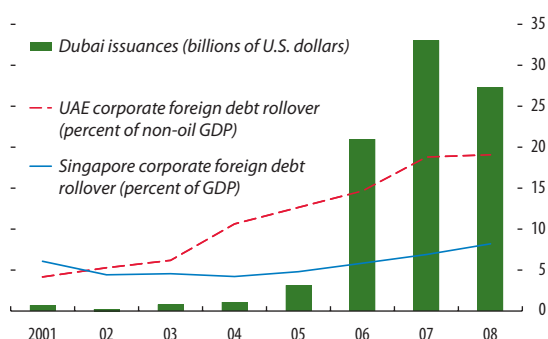
Starting in mid-2008, tight global financial conditions heightened these risks, and a financial crisis erupted in late 2009. The reversal of real estate

<sup>50</sup> This annex was prepared by Gabriel Sensenbrenner.

<sup>51</sup> Dubai is the second largest by GDP of the seven federated states that make up the United Arab Emirates (UAE). The UAE has the fifth largest oil and gas reserves in the world. Abu Dhabi, the largest emirate in the UAE, produces 95 percent of the federation's oil and gas and owns one of the largest sovereign wealth funds in the world. In contrast, Dubai has a more diversified economy, driven by trade, services, and real estate.

<sup>52</sup> Compiled from various sources; no official consolidated information exists on Dubai debt.

**Figure 1.45. Dubai: Foreign Borrowing Surge and Rollover Risk**

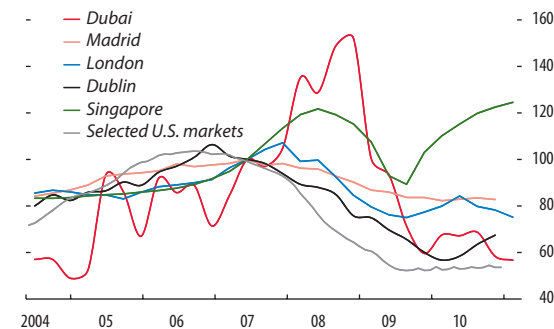


Sources: Dealogic; Joint External Debt Hub; and IMF staff estimates.

prices, which had risen sharply in Dubai even relative to global urban centers (Figure 1.46), put pressure on the leveraged GREs, compelling Dubai World to seek the debt standstill in November 2009.

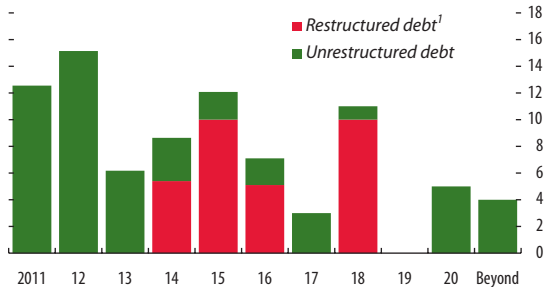
Crisis resolution was relatively quick, owing largely to Abu Dhabi's support. The support amounted to \$20 billion and was disbursed over 2009–10. The government of Dubai used part of the proceeds to bail out Dubai World by injecting equity and paying off bondholders (Figure 1.47). This helped secure rapid agreement from banks on extended maturities to 2014 and beyond, lower interest rates, and make principal and most interest due at maturity. Dubai World's debt restructuring was completed in a few months, with relatively low haircuts of 16 percent or less. Similar restructurings are ongoing in other Dubai GREs. The terms give Dubai time to com-

**Figure 1.46. Urban Real Estate Prices, CPI-Deflated (Index, 2007:Q1 = 100)**



Sources: Case-Shiller; Dubai Land Department; Haver Analytics; national authorities; and IMF staff estimates.  
Note: CPI = consumer price index.

**Figure 1.47. Maturity Profile of Debt of Dubai Government-Related Enterprises (GREs)**  
(In billions of U.S. dollars)



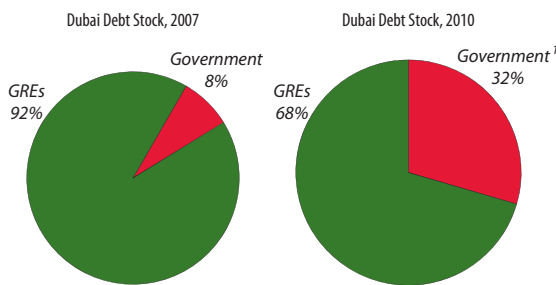
Sources: Bloomberg L.P.; Dealogic; Zawya; and IMF estimates.  
<sup>1</sup>Preliminary estimates based on public information about Dubai Holding and other GRE ongoing debt restructurings as well as Dubai World's completed restructuring, excluding explicit government guaranteed debt.

plete projects and wait for better market conditions to begin selling assets.

The bailout of the GREs helped push up Dubai's sovereign debt by almost 20 percent of GDP in 2009, demonstrating the fiscal risks posed by GREs (Figure 1.48). Although Dubai regained market access in September 2010, the cost remains elevated, reflecting contingent liabilities from other GREs; rollover needs of \$31 billion in 2011–12; and broader concerns about the solvency of restructured GREs if asset values do not recover to enable repayment of the restructured loans at maturity. These uncertainties are likely to persist even as the government of Dubai develops a strategy to put its GREs on a viable path.

So far, the debt restructuring has affected local banks mainly through higher provisioning, but

**Figure 1.48. Dubai: Composition of Debt**  
(Percent)



Sources: Dealogic; and IMF staff estimates.  
 Note: GREs = government-related enterprises.  
<sup>1</sup>Including GRE debt guaranteed by the Dubai government.

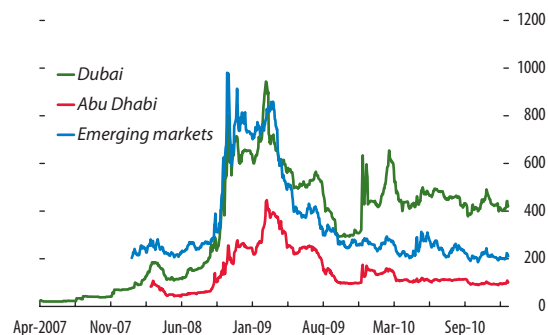
risks may materialize as restructured loans start to mature. Provisioning started after haircuts on Dubai World debt were firmed up in mid-2010, but early indications are that banks remained profitable in 2010. Dubai World haircuts ranged between 7 and 16 percent, implying provisions of \$1 billion, against net profits of \$4 billion in 2009. Dubai-based banks face additional challenges from greater exposure to Dubai GREs and Dubai real estate: their nonperforming loan ratios are twice the size of those of their peers in Abu Dhabi, and provisioning ratios are lower. Local banks may also require further provisioning in light of the ongoing restructurings of other firms, and they face the 2014 rollover risk. Government support has helped raise the capital adequacy ratio to 21 percent from 13 percent before the crisis, but support will start to decline in 2012.

**The Way Forward**

The successful restructuring of Dubai World's debt improved market confidence (Figure 1.49), but additional steps are needed to address remaining uncertainties regarding the solvency of GREs and to mitigate the risks they pose to the sovereign balance sheet (Figures 1.50 and 1.51). These steps include:

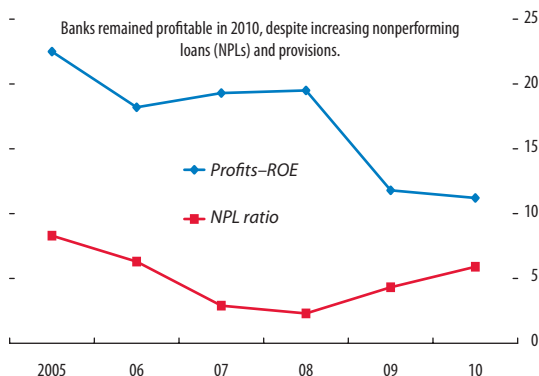
- Enhancing transparency and disclosure of information, particularly regarding GRE liabilities and financial statements and GRE relations with the government. In the UAE as a whole, this also entails a broader need for improved data capacity.

**Figure 1.49. Credit Default Swap Spreads**  
(Basis points)



Source: Markit.

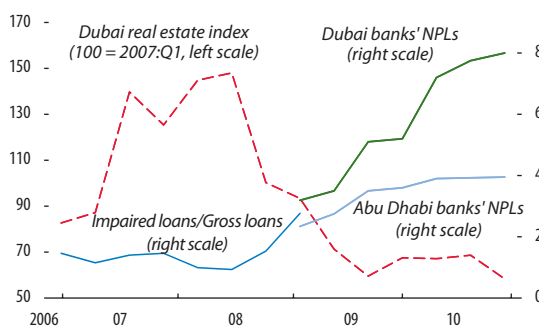
**Figure 1.50. United Arab Emirates: Recent Developments in Local Banks (Percent)**



Sources: Central Bank of the United Arab Emirates; and IMF staff estimates.  
Note: ROE = return on equity.

- Complementing the debt and operational restructuring of GREs to ensure their financial viability without recourse to government guarantees; and clarifying their governance structure.
- Strengthening risk management, through close monitoring of balance sheets and financial transactions of GREs and banks, establishing a fiscal framework that captures the fiscal risks posed by GREs, and enhancing debt management at the national and subnational levels.
- Improving economic surveillance by adopting countercyclical fiscal policy in the context of a pegged exchange regime, which calls for close coordination between the national and subnational governments and developing consolidated

**Figure 1.51. Nonperforming Loans (NPLs) and Real Estate (Nonperforming loans in percent)**



Sources: Bankscope until 2008; Central Bank of the United Arab Emirates for 2009–10; Dubai Land Department.

fiscal accounts; and by developing macroprudential policies to discourage high leverage and help avert the resurgence of imbalances.

- Establishing effective legal and institutional frameworks with clear rules for the insolvency regime, creditor rights system, and arbitration to foster confidence in the credit system and in bankruptcy procedures, and to enhance the integrity of the financial markets.

### Annex 1.4. Projecting Government Funding Costs through 2015<sup>53</sup>

*This annex describes the methodology, inputs, and assumptions used to project future government funding costs for selected advanced economies. It also provides some additional detail on the results summarized in Section D of this chapter.*

#### Methodology, Inputs, and Assumptions

Governments' annual funding needs for 2011 through 2015 are calculated from the following four inputs:

- The primary deficit of the general government as projected by the IMF's April 2011 *World Economic Outlook*.
- The detailed repayment schedule for principal and interest on existing debt, as provided by Bloomberg. Because this data source does not contain all elements of general government debt, the Bloomberg data are scaled up to ensure that the end-2010 debt stock matches the amount of general government gross debt as estimated by the WEO. This corresponds to the implicit assumption that debt instruments not captured by Bloomberg have the same maturity structure and interest rates as those included in the Bloomberg database. For Greece, the projections are adjusted to reflect the March 2011 agreement with its EU partners whereby the bilateral loans will have their average maturity extended to 7.5 years and interest rate spread lowered by 100 basis points.
- For Greece and Ireland, the prospective repayment schedule on borrowing from the IMF and

<sup>53</sup> This annex was prepared by Andre Meier and Faezeh Raci.



EU under their respective financial arrangements, as projected in IMF Country Reports No. 10/366 (Ireland) and No. 10/372 (Greece).

- Repayment schedules for new debt contracted after end-2010, as per the assumptions on government funding (see below).

These gross financing needs are assumed to be covered by (1) disbursements from the IMF and EU under the financial arrangements for Ireland and Greece, as projected in the above-mentioned documents; and (2) market issuance of debt. With respect to the latter, governments are assumed to issue new debt in a way that leaves the average maturity of debt outstanding unchanged. To this end, issuance is assumed to occur in seven maturity brackets (1-year, 2-year, 3-year, 5-year, 10-year, 20-year, and 30-year), with relative weights chosen to match the distribution of debt outstanding by maturity bracket at end-2010 (as per Bloomberg). For Greece and Ireland, no issuance is assumed in the 30-year maturity. In each case, the relative weights in the longest two maturities are fine-tuned to ensure that the average maturity of new debt matches exactly that of the initial end-2010 debt stock. While this prevents results from being affected by assumed changes in debt maturities, unreported simulations show that a possible shift toward longer or shorter maturities would not materially affect any of the key results.

The yield on new debt issuance for the period 2012–15 is projected on the basis of market forward rates as of March 31, 2011.<sup>54</sup> Specifically, future interest rates for Germany, Japan, the United Kingdom, and the United States are based on the forward curves of the respective government bonds. For Belgium, France, Greece, Ireland, Italy, Portugal, and Spain, future interest rates are computed from spreads over the German benchmark curve, in line with market convention. The country- and maturity-specific spreads are equally based on market data as of March 31, 2011. Thus, the yield on the bond of country  $i$  with maturity  $\tau$  issued at time  $t$ ,  $y_{it}(\tau)$  is assumed to have a spread  $s_i(\tau)$  over the German benchmark yield curve  $YB_i(\tau)$ , i.e.,  $y_{it}(\tau) = YB_i(\tau)$

<sup>54</sup> For 2011, projected interest rate payments are based on WEO projections.

+  $s_i(\tau)$ . For simplicity, all new debt instruments are assumed to carry fixed-rate annual coupons. Any debt service arising from new debt issuance is naturally taken into account in calculating principal and interest payments for subsequent years.

To ensure consistency, future gross debt stocks are computed from the above inputs, i.e., as a function of primary balances and interest bills. Other possible sources of variation in debt stocks, such as valuation effects and asset purchases or sales, are not taken into account. The resulting projections generally differ very little from those in the WEO. Average interest rates, in turn, are computed as the total interest bill in year  $t$ , divided by the end-of-period debt stock of year  $t - 1$ .

Figure 1.20 compares these average interest rates on government debt to illustrative threshold rates, which are computed so as to keep the government interest bill at a fixed proportion of government revenue. For instance, the interest rate threshold corresponding to a 10-percent ratio would be computed as follows:  $i_{10,t} = 0.1 \times \frac{\text{revenue}_t}{\text{debt}_{t-1}}$ . These calculations are based on (1) the gross debt projections resulting from the exercise described above, except in the case of Japan, where we rely on net debt projections taken from the WEO, to account for the significant amount of interest-bearing financial assets held by the government; and (2) WEO projections for general government revenue.

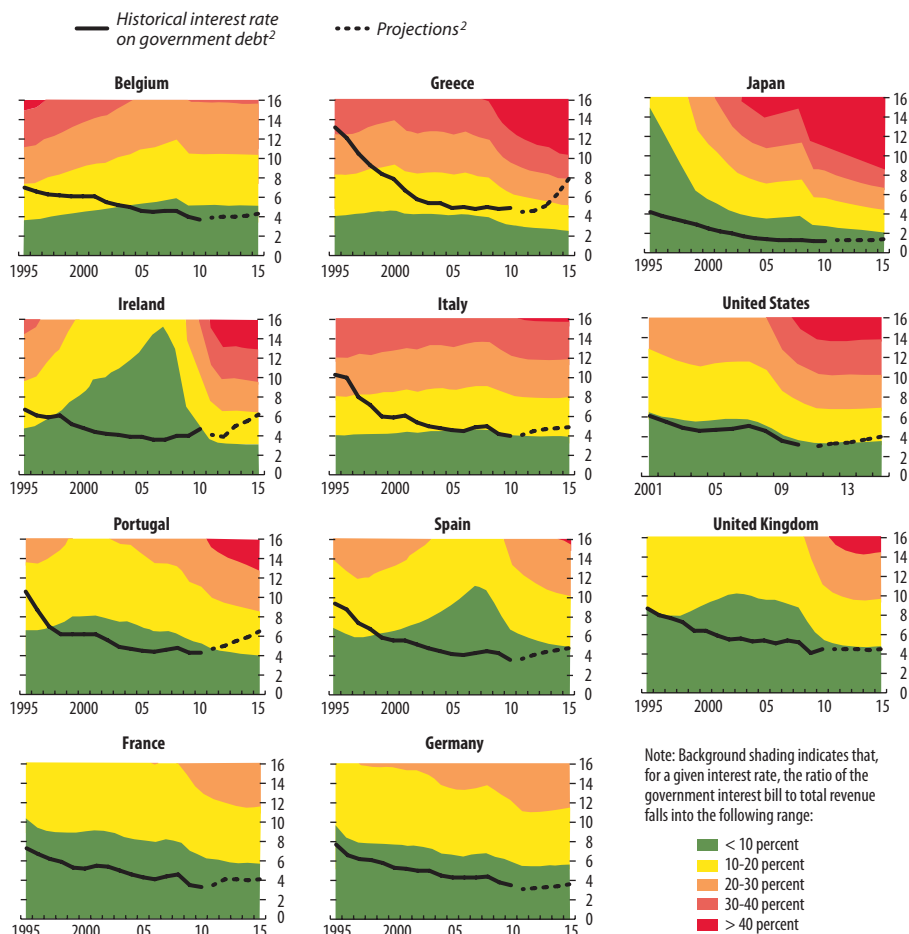
### Key Results for Baseline Projections

Figure 1.52 provides a more detailed illustration of the interest burden dynamics summarized in Figure 1.20. Specifically, it shows, for each of the 11 countries in the sample, historical average government funding costs since 1995 (in the case of the United States, since 2001, because earlier data are not available from WEO); and the corresponding projections through 2015. The evolution of funding costs is indicated by black lines. To set these funding costs in relation to debt service capacity, the charts also contain background shading. Each horizontal segment represents an interest rate interval that keeps the overall government interest bill in a certain range relative to govern-



**Figure 1.52. Government Funding Costs and Debt Affordability**  
(Interest rate, in percent)

These panels show historical and projected average funding costs for selected advanced-economy sovereigns (black lines). In addition, the background shading indicates the "affordability" of different interest rate levels, as defined by the ratio of the resulting government interest bill to total revenue. Green shading denotes a low ratio, red shading a high ratio. For details, see legend at the bottom.<sup>1</sup>



Sources: Bloomberg L.P.; IMF, World Economic Outlook database; and IMF staff calculations.

<sup>1</sup>Based on WEO data and projections for general government revenue and primary balance. Funding cost projections based on current market forward rates, taking into account the detailed profile of future financing needs as well as EU/IMF funding in the case of Greece and Ireland. Maturity structure of issuance assumed to be held constant over time. Interest bill based on gross debt, except for Japan (net debt).

<sup>2</sup>General government interest expenditure divided by beginning-of-period debt stock.

ment revenue. For instance, green shading indicates that at these interest rates, the interest bill would not exceed 10 percent of revenue; orange shading indicates interest rates that imply an interest bill between 10 and 20 percent of revenue; and so forth. Together, black lines and background shading allow a quick assessment of the strain put on the public finances by actual (historical or prospective) funding costs.

### Annex 1.5. Strategic Defaults and Housing Prices in the United States<sup>55</sup>

*Borrowers have become more strategic in their default decisions by becoming more willing to exercise their default option on underwater (negative equity) mortgages. This annex quanti-*

<sup>55</sup>This annex was prepared by Ivailo Arsov.

*ifies the potential impact of further house price declines on the default rates of U.S. residential mortgages.*

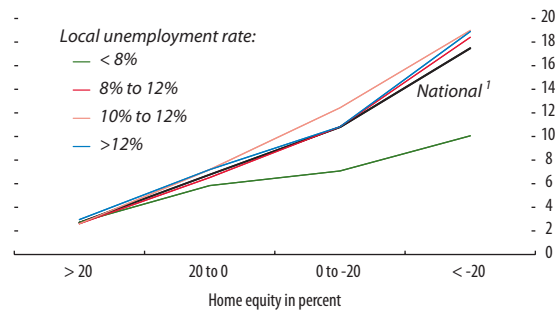
The increase in strategic defaults, coupled with the large share of mortgages that are underwater, is a significant headwind facing the U.S. housing market.<sup>56</sup> Negative equity poses a major risk because the propensity of borrowers to become delinquent on residential mortgages tends to increase with lower home equity values. The propensity to delinquency increases particularly sharply when home equity is very low. For example, the delinquency probabilities on a mortgage with severe negative home equity (defined as negative home equity of more than 20 percent) is nearly 50 percent higher than the delinquency probability on a mortgage with moderate negative home equity (defined as negative home equity between 0 and 20 percent). Borrowers appear to be more likely to fall behind on mortgage payments when their home equity becomes sufficiently negative even when they are able to service their mortgages. This tendency can be seen by observing that, after controlling for the level of home equity, the probability of delinquency is virtually the same irrespective of the local unemployment rate, which is an indication of the general ability of borrowers to service their mortgages (Figure 1.53).<sup>57</sup>

Mortgage defaults are likely to remain elevated for some time because many borrowers who are current on their payments have experienced substantial declines in their home equity as a result of the large U.S. housing market correction since 2006 and because these borrowers face higher incentives

<sup>56</sup> It is difficult to measure the importance of strategic defaults because the reasons for the default cannot be observed, which raises questions about the direction of the causality between defaults and home equity: do defaults increase as home equity declines, or does an increase in defaults (due, for example, to an increase in unemployment) depress house prices and reduce home equity? Recent studies have produced mixed results on the importance of strategic defaults. Some, such as Elul and others (2010), find strong support for the argument that negative equity drives mortgage defaults, while others, such as Bhutta, Dokko, and Shan (2010), find that negative equity causes a default only when the borrower is also subject to an income shock such as loss of employment.

<sup>57</sup> The unemployment rate is that in the metropolitan statistical area of the property.

**Figure 1.53. Annualized Transition Probability of a Performing Prime Mortgage to 60-Plus Day Delinquency Conditional on Local Unemployment Rate (In percent)**



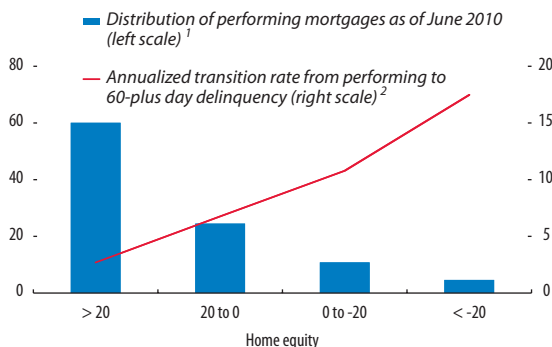
Sources: Amherst Securities; Datastream; Mortgage Bankers Association; IMF staff estimates.

<sup>1</sup> Transition rates estimated in three months to June 2010. The national transition rate is the weighted average of the transition rates conditional on the local unemployment rate, with weights given by outstanding mortgages and state unemployment rates as of June 2010.

to strategically default. In mid-2010, around 23 percent of outstanding U.S. mortgages had negative home equity. A large number of these mortgages are likely to be already delinquent or in the process of foreclosure and will not contribute to future delinquencies. An estimate of the home equity distribution of performing mortgages, which adjusts for mortgages that are already delinquent or in foreclosure, suggests that, in mid-2010, about 15 percent of performing mortgages had negative home equity and about 4 percent of performing mortgages had negative home equity greater than 20 percent (Figure 1.54). The estimated home equity distribution of performing mortgages and the observed delinquency propensity indicate that, even in a scenario in which house prices do not decline further, more than 5 percent of the performing mortgages as of mid-2010 are likely to become delinquent because of strategic defaults. To put this in context, the 60-plus day delinquency rate in mid-2010, which includes the mortgages in the process of foreclosure, was 11 percent. Therefore, the estimated additional delinquencies of around 5 percent of performing mortgages represent a significant addition to the already high stock of delinquent mortgages.

Mortgage defaults are at risk of increasing beyond what is indicated by the current large share of mortgages with negative home equity. This is because

**Figure 1.54. U.S. Mortgage Delinquency Probabilty and Home Equity Distribution**  
(Percent)



Sources: Amherst Securities; CoreLogic; Mortgage Bankers Association; IMF staff estimates.

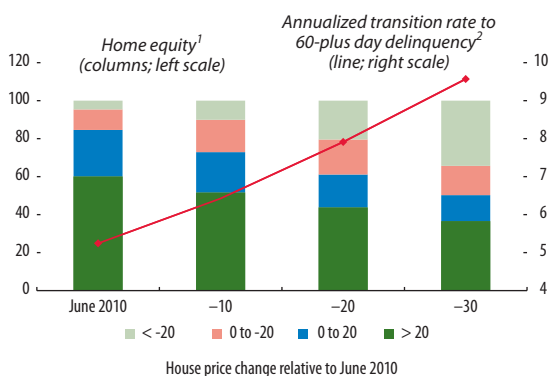
<sup>1</sup>Estimated home equity distribution of performing mortgages.

<sup>2</sup>U.S. transition rate to serious delinquency is weighted average of transition rates conditional on the local unemployment rate.

a large number of performing U.S. mortgages have only a small amount of positive home equity. Further house price declines can push a significant share of the performing mortgages with small positive equity (for which delinquency rates are relatively low) into the set of mortgages with negative equity (for which delinquency rates are significantly higher). Although consensus (average) expectations are for U.S. house prices to decline marginally in 2011 and then to begin a gradual recovery, the range of reported expectations is very wide. The wide range reflects the large degree of uncertainty and the possibility of further large house price declines—some economists are forecasting a drop of 10–15 percent in the next two years.<sup>58</sup> If declines on the magnitude of the more pessimistic forecasts occur, then mortgage defaults are likely to increase substantially. For example, an instantaneous house price decline of 10 percent will increase the share of performing mortgages in negative equity from 15 percent to 27 percent (see the gray and red bars in Figure 1.55) and will, in turn, increase the delinquency rate on performing mortgages in the first year after the price decline from just over 5 percent to around 6.5 percent (see red line in Figure 1.55). A more severe house price decline of 20 percent will increase the

<sup>58</sup> See MacroMarkets (2010), which reports the expectations of 110 economists, real estate experts, and investment and market strategists for U.S. house prices until 2015.

**Figure 1.55. Home Equity, Delinquency Rate, and House Price Declines**  
(In percent)



Sources: Amherst Securities; CoreLogic; Datastream; Mortgage Bankers Association; and IMF staff estimates.

<sup>1</sup>Estimated distribution of the home equity of performing mortgages as of June 2010.

<sup>2</sup>Calculated from the estimated distribution of home equity of performing mortgages. The transition rates for the house price decline scenarios assume that the declines occur instantaneously.

share of performing mortgages with negative equity to nearly 40 percent and will push the delinquency rate to 8 percent in the first year after the house price decline. Potential house price declines further worsen mortgage losses because they will not only increase defaults due to lower home equity but will also reduce the recovery rate on defaulted mortgages by lowering the value of the housing collateral.

## Annex 1.6. Recent Measures to Manage Capital Flows in Selected Economies<sup>59</sup>

*The policy challenges stemming from the resurgence of capital flows to Asia and Latin America since mid-2009 have been met with both conventional macroeconomic policies and more direct measures. The latter have varied widely among countries, reflecting (1) a limited willingness to adjust macroeconomic policy, related partly to concerns about excessive exchange rate appreciation; (2) the need to limit risks to the stability of the financial sector; and (3) the goal of reducing the volatility of inflows. The effectiveness of such measures needs to be measured by their effects on*

<sup>59</sup> This annex was prepared by Geoffrey Heenan, Ceyda Oner, and Rebecca McCaughrin.

*the volume and composition of inflows and their impact on financial stability.*

Direct measures have had four broad objectives: (1) mitigate complications for central bank market operations stemming from inflows to short-term instruments, (2) limit inflows into local bond markets, (3) reduce risks in both the banking system and the real economy, and (4) limit private sector external borrowing. Table 1.6 summarizes measures used to manage capital flows since 2009 in Asian economies, and this annex elaborates on some of the measures taken in Asia and Latin America.

### **Indonesia: Managing the Impact on Central Bank Operations**

Strong foreign demand for central bank securities has complicated sterilization efforts, prompting Bank Indonesia to introduce counter measures. As capital inflows gathered pace through 2009 and into 2010, Bank Indonesia rebuilt its international reserves, partially sterilizing its currency market intervention by selling one- and three-month central bank bills (SBI) (Figure 1.56). However, foreign investors were buying an increasing proportion of these securities, raising concerns that these sterilization operations were attracting additional inflows. In June 2010, seeking to reduce foreign demand for its sterilization instruments, Bank Indonesia introduced a holding period on SBIs. Bank Indonesia also lengthened the term of the SBIs from six to nine months and introduced nontradable term deposits with maturities of up to four months for banks.

While overall inflows have continued to grow, these measures have directed foreign funds into the longer-term SBIs and government bonds (SUNs). Foreign holdings of both long-term SBIs and SUNs have increased both in absolute terms and as a proportion of the total outstanding. Overall, the measures have been effective in reducing foreign ownership of short-term SBIs. As of March 2011, the Bank Indonesia reimposed a limit on short-term foreign currency borrowing of banks to 30 percent of capital, which could limit the capacity of banks to intermediate short-term inflows.

### **Thailand and Korea: Limiting Inflows into Local Bond Markets**

Thailand and Korea re-imposed withholding taxes on foreign investors' holdings of government securities to limit inflows into local bond markets (Thailand in October 2010 and Korea in January 2011), but with little effect so far. In Thailand, inflows fell initially, mostly because of uncertainty about the operational details, but resumed strongly by December (Figure 1.57). In both countries, the impact of these measures on investor behavior is likely to be limited, given the wide coverage of double-taxation treaties signed by each country.

### **Macroprudential Controls: Reducing Financial Stability Risks Arising from Inflows**

Concerns that inflows could fuel excessive credit growth and asset price bubbles, particularly in real estate, have prompted many Asian countries to tighten prudential requirements in order to reduce potential threats to financial stability (Figure 1.58). Several countries tightened real estate lending criteria, including China, Hong Kong SAR, India, Korea, Malaysia, Singapore, and Thailand. Hong Kong SAR also raised the stamp duty on all property transactions. Other policies have included changes in requirements for loan-loss provisioning, increased capital adequacy requirements, and limits on maturity mismatches on bank balance sheets, in line with proposals that were emerging in 2009 and 2010 from the Basel Committee on Banking Supervision. Many central banks have increased reserve requirements, though in part this reflects the unwinding of measures taken at the height of the financial crisis to alleviate funding pressures.

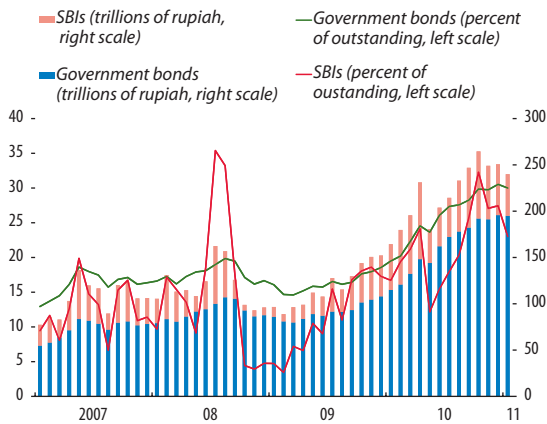
These macroprudential measures do not directly affect capital inflows, but they could limit them by altering banks' demand for external funding and the expectations of both domestic and foreign investors for asset returns. The efficacy of these measures needs to be judged by the extent to which they have reduced financial stability risks, and, to the extent they may have substituted for monetary and exchange rate policies, by whether they effectively contain these macroeconomic risks. It may be too soon to

**Table 1.6. Selected Capital Flow Management Measures in Asian Economies**

Policy Tool	Recent Country Examples	Motivation/Objective
Limits to direct and indirect foreign exchange exposure	Korea (June 2010): Capped foreign exchange forward positions of banks relative to their equity capital. Reduced corporate foreign exchange hedging limit from 125 percent to 100 percent of export receipts.	By limiting derivatives positions, the measure indirectly targets a reduction in external borrowing by the private sector, particularly the banking sector. This exposure was also associated with carry trades onshore, including through “over hedging” of dollar receivables by Korean exporters.
Increase restrictions on external borrowing	India (December 2009): Reinstated interest rate cap on eligible external commercial borrowing that was eliminated during the crisis.	To limit access to foreign credit to best corporate credits and prevent high-cost borrowing.
Minimum holding period on central bank bills	Indonesia (June 2010): One month holding period on central bank bills (SBIs) introduced for both domestic and foreign investors	To limit volatility of flows. SBIs had been subject to sharp shifts in positions relative to global risk appetite, as they were used as a carry trade vehicle. Holding period limits the volatility of flows on exit from positions.
Limited foreign access to central bank instruments	Indonesia (June 2010 - present): Phased out one- and three-month SBIs in favor of six- and nine-month SBIs, and expanded offerings of nontradable term deposits up to six months tenor available to banks operating in Indonesia.	To reduce volatility of inflows, and address concerns that central bank sterilization was attracting further inflows. Short-term SBIs, largely used to sterilize foreign exchange intervention, were a favored vehicle for carry trades.
Other restrictions on foreign access	Taiwan Province of China (November 2009): Financial Supervisory Commission (FSC) barred access to time deposit accounts for foreign investors.  Taiwan Province of China (November 2010): FSC extended existing investment of nonresident inbound remittances in domestic securities to 30 percent, to include government securities of remaining maturity greater than one year.	To dampen speculative flows. Time deposits are one avenue for carry trades/currency speculation.  Reduced access of nonresidents to government bonds.
Measures to encourage outbound investment by residents	Malaysia (October 2010): Announced that the overseas investment limit of the Employee Provident Fund would be raised from 7 to 20 percent.	
Reserve requirements on foreign currency and nonresident accounts	Taiwan Province of China (January 2011): Raised reserve requirement on local currency accounts held by nonresidents to 90 percent on balances exceeding the outstanding balance on December 30, 2010. Balances below end-2010 levels subject to 25 percent reserve requirement. Required reserves for such accounts are no longer remunerated.	
Withholding tax on foreign holdings of government bonds	Thailand (October 2010): Reimposed 15 percent withholding tax (withdrawn in 2005) for state bonds on foreign investors. Korea (January 2010): Introduced 15 percent withholding tax on foreign holdings of government bonds and central bank securities. In both cases, the impact has been limited due to wide coverage of double taxation treaties.	To slow inflows into government bond markets.
Real estate market measures	Hong Kong SAR (October 2009): Mortgages for luxury property capped at 60 percent loan-to-value (LTV) ratio. Maximum loan amount for nonluxury property capped at \$1.5 million, stamp duty on sales increased. Guidance on mortgage rates.  Korea (2009): Ceiling on LTV ratios lowered in Seoul.  Singapore (September 2009; February and August 2010): Minimum holding period on private residential property raised to three years. Cap on LTV ratio for mortgage lending lowered for second homes. Interest-only loans banned.  India (October 2009): Increase in provisioning requirements for real estate credit; (January March, April 2010): Incrementally increased required reserves for banks.  China (2010): Taxes on resale of properties within five years increased. Greater administrative guidance on financing, including lower LTV ratios for second or third homes, higher down payments requirements for mortgages. There was a mandated increase in mortgage rates for second homes, third mortgages were officially discouraged. Property tax being considered.	To curb real estate speculation, in part due to inflows from mainland, particularly at top end of market.  To dampen real estate prices.  Series of incremental measures target residential property speculation amid signs of overheating.  To address potential risks in banking sector from recovery of credit growth.  To lessen speculative activity by lowering transaction volumes and leveling off prices.

Source: Country authorities.

**Figure 1.56. Indonesia: Foreign Holdings of Government Bonds and Bank Indonesia Certificates (SBIs)**



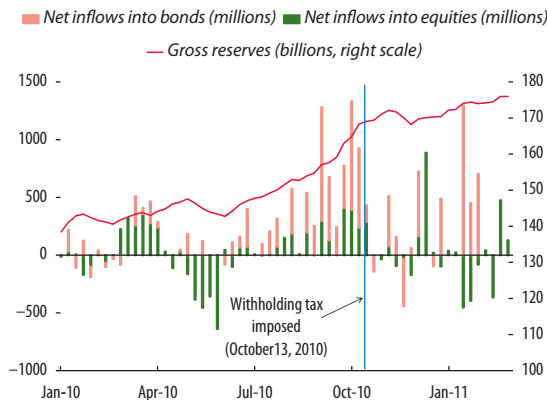
Sources: Bank Indonesia; and CEIC.

judge, but these measures may have had some effect. Apart from China, overall credit growth remains broadly in line with historical norms, and property price inflation has slowed in the most overheated markets. However, inflation has been rising in a number of countries.

**Korea: Limiting Private Sector Foreign Exchange Borrowing**

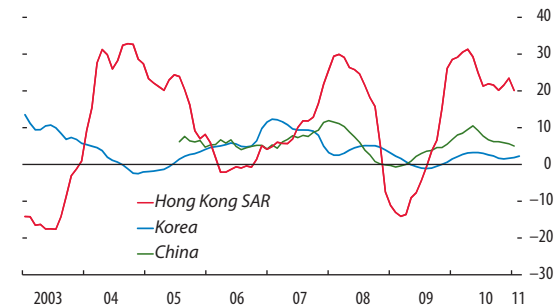
Faced with a sharp reversal in bank short-term funding flows in 2008, Korea tightened limits on

**Figure 1.57. Thailand: Weekly Foreign Portfolio Inflows and Reserves**  
(In U.S. dollars)



Sources: Bloomberg L.P.; and Thai Bond Market Association.

**Figure 1.58. Asian Residential Property Prices**  
(In year-on-year percent change)

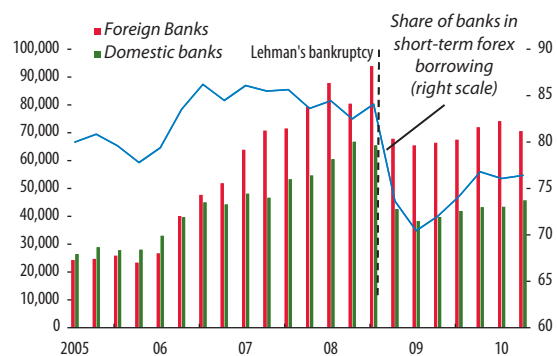


Sources: CEIC; Haver Analytics; and national authorities; and IMF estimates.

bank and corporate funding in foreign currencies (Figure 1.59). In June 2010 and again in October 2010, Korea reduced the allowable size of banks' foreign currency derivatives contracts relative to bank capital and reduced the allowable size of such contracts for corporations relative to their export receivables. Since banks that offer currency forwards typically hedge their position by borrowing externally, the limits on forwards indirectly constrain foreign borrowing by banks.

Korea's measures may not curb capital flow volatility, but they could reduce foreign currency exposures among market segments that are relatively vulnerable. The measures have already led to a reduction in foreign exchange derivative positions and related short-term external borrowing

**Figure 1.59. Korea: Short-Term External Borrowing**  
(In millions of U.S. dollars)



Source: CEIC.



among onshore banks. However, as the measures are largely targeted at bank flows, and the capital account remains relatively open, the reliance of other market segments on capital inflows remains unaffected, and they continue to face the risks of reversals.

### **Brazil: Limits on Foreign Flows into Local Bond Markets and Derivatives**

Capital flows have entered Brazil mainly through the equity market and foreign direct investment (FDI). The share of fixed-income inflows is considerably smaller, though it has grown rapidly. Inflows mostly represent real money investors (e.g., sovereign wealth funds, mutual funds, pension funds), but retail inflows have also increased, mostly from Japan.

Brazil was among the first emerging markets to raise taxes on foreign fixed-income investment. Having introduced the *Imposto sobre Operações Financeiras* (IOF, a tax on financial operations) in October 2009, the Brazilian government raised it in late 2010 on fixed-income investments in two consecutive hikes, from 2 percent to 6 percent, and raised the tax on daily margin adjustments on foreign positions in foreign exchange and interest rate futures contracts from 0.38 percent to 6 percent. The IOF on equity inflows was left unchanged at 2 percent. Macroprudential measures were introduced in early 2011 that subject local banks' short dollar positions to reserve requirements of 60 percent on amounts that exceeded the smaller of either \$3 billion or the bank's equity reference level. In addition, the IOF tax on foreign borrowing by local institutions was increased to 6 percent on loans with maturities of up to two years.

Increases in the IOF and the other measures successfully reduced short-term fixed-income inflows, but FDI and other investment equity inflows accelerated. The measures also had some impact on the currency and the local rates market, with the appreciation of the *real* temporarily slowing (though not reversing) and the local nominal debt curve initially shifting upward.

### **Peru: Limits on Certain Currency-Related Transactions**

In Peru, capital flows are dominated by longer-term inflows. FDI accounts for about 80 percent of total foreign flows, while longer-term loans represent 20 percent of total foreign flows. Shorter-term portfolio flows remain small (comprising roughly 1 percent of total foreign inflows), although, considering the small size of the domestic market, even a minor increase in portfolio flows could contribute to increased pressures.

In response to strong capital inflows, strong credit growth and other pressures, the central bank introduced a number of administrative measures several times over the last year. These measures include tighter remunerated and unremunerated reserve requirements on local and foreign exchange deposits for residents and nonresidents and new limits on banks' net open derivatives positions. The government is also considering raising the limit on pension fund holdings of foreign assets from 30 percent to 50 percent, which could result in near-term capital outflows, as pension funds raise their exposure to foreign assets.

Although there are important differences in how various countries have responded to the challenge of managing inflows, many of the measures discussed here have been prudential in nature and do not aim to control the volume of portfolio inflows. Rather, they are designed to reduce risks to financial stability and stem the volatility of inflows. The limited evidence so far suggests that these measures have been somewhat effective in altering the composition of inflows, but it may be too early to assess their aggregate impact on credit growth and asset inflation. So far, the volume of capital inflows does not appear to be much affected.

If this experience is repeated in other countries, such capital inflow measures should be seen as complements to, rather than substitutes for, macroeconomic policy responses. Governments may choose to rescind some of these measures when inflows subside, but those that deal with the volatility of inflows and financial stability risks—including

sudden reversals—are more likely to be maintained over the long run.

### Annex 1.7. Exchange-Traded Funds: Mechanics and Risks<sup>60</sup>

*Exchange-traded funds (ETFs) have become increasingly popular over the past few years. They give investors increased access to emerging market assets while also offering flexibility and leverage to specialized investors. Traditionally, ETFs have physically held underlying assets, but a new breed of ETFs have emerged in Europe that use synthetic replication techniques and derivatives to reduce costs and thereby boost returns. A small percentage of these funds also use leverage to cater to the hedging needs and speculative positions of their nonretail client base. While these enhancements have reduced costs, they add a layer of complexity and increase counterparty and liquidity risks. The disproportionately large size of some ETFs compared with the market capitalization of the underlying reference indices poses a risk of disruptions in some markets from heavy ETF trading. This annex surveys the growth and mechanics of ETFs and highlights some of the key risks pertaining to synthetic replication and the use of leverage and derivatives in ETFs.*

#### Growth

ETFs have grown rapidly since 2007 because of increased interest in fixed-income and emerging market equity funds. Global ETFs saw strong inflows in 2010, growing by more than 14 percent in the first three quarters to nearly \$1.2 trillion in assets under management. The outflows from global mutual funds over this period were of a similar dollar amount.<sup>61</sup> Flows into emerging market ETF equity funds have also been robust, with exposures to this asset class in 2010:Q3 at \$210 billion, or 18 percent of the ETF universe. U.S., European, and

<sup>60</sup> This annex was prepared by Narayan Suryakumar.

<sup>61</sup> Inflows to ETFs were \$84 billion, and outflows from global mutual funds were \$130 billion.

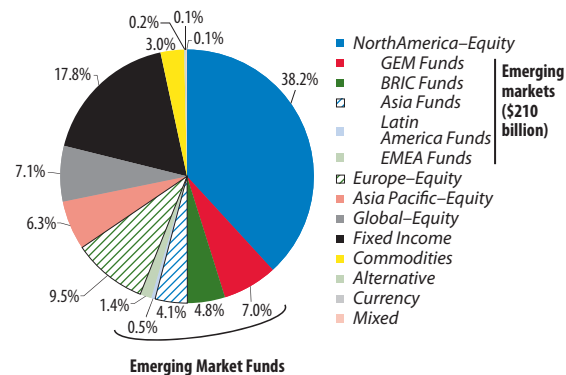
Japanese equities constitute more than 50 percent of overall ETF exposures, while Brazil, Russia, India, and emerging Asia equities form the bulk of the emerging market ETF exposures (Figure 1.60). By assets, two-thirds of the ETFs are listed in the United States, while European (22 percent) and Asia-Pacific (7 percent) funds were the fastest growing segments in 2010.

#### Market Structure and Trading

ETFs are generally index-tracking funds that are traded on exchanges and allow investors to gain exposure to several asset classes on a real-time basis at a relatively low cost compared with similar investment products. ETFs are regulated independently in United States and Europe and have a slightly different investor base in each region.<sup>62</sup> U.S.-based ETFs have a sizable hedge fund and retail investor base, while institutional holdings are larger among European ETFs.

ETFs emulate the returns on an index by *physically replicating* the underlying index constituents,

**Figure 1.60. Exchange-Traded Fund Assets (\$1.2 Trillion), by Type of Exposure**



Source: BlackRock.

Note: BRIC = Brazil, Russia, India, and China; GEM = global emerging markets; EMEA = Europe, the Middle East, and Africa.

<sup>62</sup> U.S. ETFs are governed by the SEC's Investment Company Act of 1940, while those in Europe operate under directives of the Undertaking for Collective Investments in Transferable Securities (UCITS). Other exchange-traded products such as exchange-traded notes (ETNs), which are not discussed in this feature, are bound by different rules.

by *synthetically replicating* the index returns using swaps and other derivatives, or by using some combination of the two. U.S.-based ETFs typically use the physical replication technique due to regulatory constraints.<sup>63</sup> When underlying securities are illiquid or unavailable or transaction costs are significant, ETF managers use portfolio sampling techniques to match index returns closely without using full replication.<sup>64</sup> Nearly half of all ETFs in Europe use the synthetic replication technique, given its lower costs and the regulations particularly favoring the growth of this segment in the region. Newer types of ETFs, such as *leveraged* and *inverse* ETFs, offer magnified and inverse returns on the performance of an index and use derivatives to match benchmark performances closely, all of which adds layers of complexity and poses higher risks to investors. In 2010:Q3, leveraged and inverse ETFs constituted around \$41 billion of total ETF assets (less than 5 percent of total assets under management), with exposures primarily to US equities.

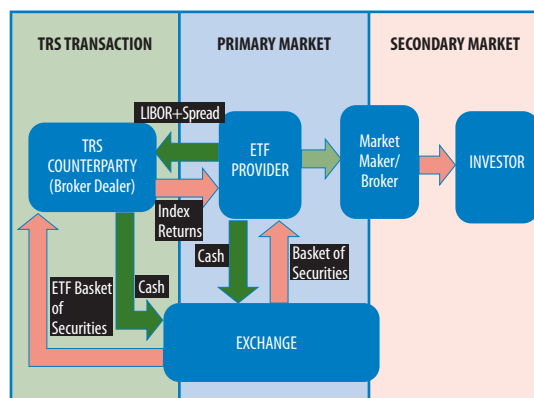
Unlike traditional index funds, dealers typically receive *creation units* of the ETFs in the primary market in exchange for a basket of securities that closely match the ETF's portfolio.<sup>65</sup> These creation units are then typically split up by dealers and sold as individual ETF shares to investors in the secondary market. In synthetic replication, ETF managers hold a basket of assets, different from the benchmark index's constituents, and swap the returns of this basket for the actual returns on the reference index through total return swaps (TRS) (Figure 1.61). Thus, the provider has effectively transferred

<sup>63</sup>The SEC requires that at least 80 percent of a fund's net asset value (NAV) be in physical assets, and that 85 percent of the assets be highly liquid (convertible to cash within seven days).

<sup>64</sup>Portfolio sampling involves grouping index securities based on some characteristics (such as industry, value versus growth, market capitalization) and assigning weights to the groups in line with the equivalent weights of the securities in the reference index. Sample securities are then chosen from these groups, and the group weighting is used to match the reference index's performance.

<sup>65</sup>A creation unit is essentially a block of ETF shares (typically 50,000 shares), with each share roughly representing one unit of the reference index. To redeem shares, dealers sell creation units to ETF providers in exchange for the basket of securities. The redemption of creation units does not involve selling the reference index securities outright, in contrast to mutual funds, and so does not constitute a tax event in the United States.

**Figure 1.61. Exchange-Traded Fund Trading: Synthetic Replication Based on Total Return Swaps**



Note: ETF = exchange-traded fund; TRS = total return swaps.

the tracking error and rebalancing risk to the TRS counterparty (broker).<sup>66</sup>

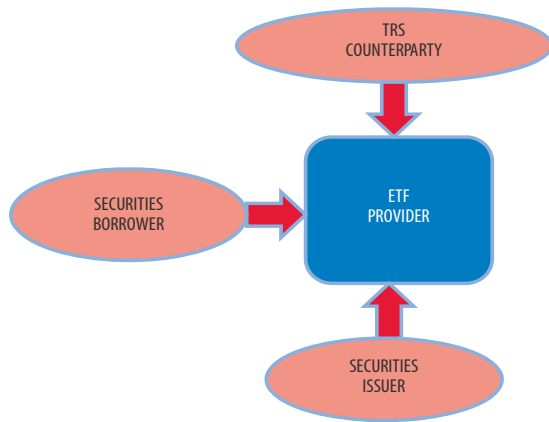
## Risks and Distortions

### *Counterparty and Mark-to-Market Risk for the ETF Provider*

While synthetic replication eliminates tracking error, it comes at the cost of higher counterparty credit risk. Because the counterparties' creditworthiness guarantees the return on these funds, ETFs, and subsequently investors, are exposed to the risk of one or more counterparties defaulting (Figure 1.62). Current regulations in Europe on swap-based ETFs mitigate some of this credit risk, as they impose minimum requirements on cash and securities holdings to pay investors if a counterparty defaults.<sup>67</sup> However, given that a majority of Euro-

<sup>66</sup>Tracking error is the deviation of an ETF portfolio's return from its benchmark index. Swap-based synthetic replication ETFs have a smaller tracking error than their traditional counterparts, as the drag from dividend withholdings and taxes is eliminated at the provider and is instead managed by the counterparty.

<sup>67</sup>According to the UCITS rules in Europe for ETF funds employing synthetic replication, the maximum risk exposure to a single TRS counterparty should be no greater than 10 percent of the fund's NAV, provided the swap exposure is with a major European credit institution. Also, the total risk exposure to all such derivative contracts should not exceed the fund's NAV. In

**Figure 1.62. Counterparty Risks in Exchange-Traded Funds**

Note: TRS = total return swap.

pean ETF providers use the synthetic replication method, the gross exposures of these funds raises some concerns on whether current restrictions on derivative contracts are sufficient to curtail counterparty risks from becoming systemic under stressed market conditions.

Securities lending poses yet another counterparty risk, in which a default of the securities borrower could potentially leave the ETF provider scrambling to replace the securities it lent out. Tracking errors can be partially offset by lending securities to hedge funds and other institutions for short-selling and receiving a fee in return.<sup>68</sup> Regulation currently requires ETF providers to be able to recall securities lent at a short notice and to adequately collateralize such lending. However, participants claim this process currently lacks transparency and that the cash reinvestment guidelines have not been clearly laid out by regulators. In addition, the ETF provider is exposed to the mark-to-market losses on the securities it holds in the swap basket.

in addition, an ETF manager could hold a maximum of 10 percent of the fund's NAV in transferable securities and money market instruments issued by a single body. The synthetic replication technique is currently not used in US-based ETFs due to regulatory restrictions.

<sup>68</sup>ETFs are bound by rules on securities lending similar to those governing traditional mutual funds. In Europe, ETF providers can technically lend up to 80 percent of their basket of securities to a third party to generate revenues and offset costs due to the TRS agreement.

### *Leverage Risk for Investors*

Leveraged and inverse ETFs are one of the fastest-growing sectors of the ETF industry.<sup>69</sup> Exposures of these funds are currently concentrated in U.S. and European equities and less so in emerging market securities. Retail investors typically do not buy these leveraged funds, which are generally used by hedge funds for hedging and placing speculative bets. Market sources say that inverse ETFs are popular from a risk management perspective, as investors do not lose any more than their initial investment in the fund, in contrast to a direct short position, in which the investor's losses could potentially be infinite if the index rises. However, besides the obvious leverage risk that investors are exposed to, most leveraged and inverse ETFs reset daily, that is, they are designed to achieve their stated objectives on a daily basis. Hence their performance over longer periods of time can be significantly different from that of the benchmark performance (or inverse of the performance). Therefore, the use of such instruments as risk management tools is limited.

### *Liquidity Risk*

Illiquid assets, reduced market access, and a dearth of derivatives in some emerging markets, combined with the sudden exit of market makers can exacerbate volatility under stressed conditions. While most ETFs are supported by one or more market makers, there is no guarantee of active trading under illiquid conditions. Analysts point to the so-called flash crash in May 2010 as an example of the risks ETFs are susceptible to, when market makers were overwhelmed by a surge in computer-driven selling.<sup>70</sup> Market makers stopped offering bid-ask quotes, fueling volatility further and the eventual meltdown in equity prices on the

<sup>69</sup>While growth rates for this segment have been the fastest among ETF types, leveraged and inverse ETFs still comprise only a small portion of the ETF universe, at less than 5 percent of total assets under management.

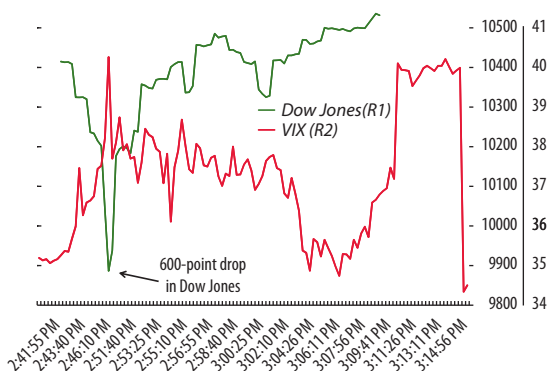
<sup>70</sup>On May 6, 2010, the Dow Jones index plunged 600 points within minutes, resulting in several thousand trades being canceled that day. Data show that ETFs were most affected during that incident—nearly 68 percent of all cancelled trades involved ETFs.

Dow Jones index (Figure 1.63) triggered heavy losses for some ETFs. In addition to risks posed by market makers, some illiquid emerging market assets also present challenges to ETF liquidity, as the issuing and redeeming of *creation units* become increasingly difficult under stressed conditions. Some market makers use derivatives to side-step the illiquidity issue, but given that such instruments are either absent or too expensive in most emerging markets, turnovers in such ETFs are typically low.<sup>71</sup> As a significant number of turnovers do not happen on an exchange but are rather over-the-counter transactions, liquidity is difficult to assess under stressed conditions.

### Market Disruptions

The recent increase in commodity price volatility has been partly attributed to the strong flows into commodities-based funds, particularly gold ETFs, amid mounting concerns that the flows are distorting prices away from fundamental factors. Gold ETF funds received net inflows of around \$12 billion in 2009 and another \$9 billion in 2010 as prices surged 62 percent in the two years to over \$1,400 an ounce.<sup>72</sup> However, flows sharply reversed

Figure 1.63. Flash Crash: Intraday Prices, May 6, 2010



Source: Bloomberg L.P.  
 Note: VIX = Index for S & P 500 volatility; Dow Jones = Dow Jones Industrial Average for U.S. stocks.

<sup>71</sup> Calculated as total shares traded on a monthly basis divided by the ETF's price.

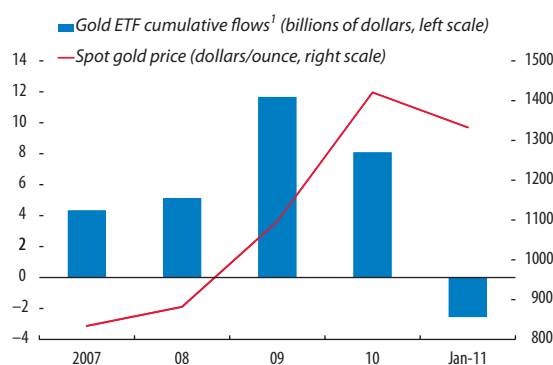
<sup>72</sup> Most large gold ETFs (such as SPDR Gold Shares ETF) physically hold gold bullion, while others (such as Powershares DB Gold ETF) track the performance of reference indices.

course in January 2011, with \$3 billion in outflows in one month alone, driving prices sharply lower (Figure 1.64). Such dynamics raise concerns that a reversal of investor flows from other commodity-based funds could potentially increase volatility in the broader market and influence price action in related sector indices. Data show that assets under management in commodity-based funds (including mutual funds, ETFs, and index-linked funds) stood at over \$320 billion in 2010:Q3.

### Legal and Policy Risks

Bankruptcy laws surrounding counterparty defaults and the potential freezing up of collateral at custodial banks remain areas of concern for ETFs involved in TRS and securities lending. In a variation of the swap-based ETF, the provider sometimes transfers all the cash from investors to the TRS counterparty, which in turn pledges collateral to the ETF's account at the fund's custodian bank.<sup>73</sup> In such a scenario, if the swap counterparty were to default, it could potentially lead the bankruptcy administrator to freeze all ETF assets, preventing the ETF from liquidating its assets if the need arises. Also, the TRS counterparty has an incentive to provide lower-quality collateral in such an

Figure 1.64. Gold Exchange-Traded Funds



Sources: Bloomberg L.P.; IndexUniverse; and IMF staff estimates.  
<sup>1</sup>Cumulative annual net flows of large gold exchange-trade funds (ETFs) only.

<sup>73</sup> This agreement is commonly referred to as a fully funded swap. Following Lehman's collapse in 2008, several funds could not access their assets parked at custodial banks because of the bankruptcy proceedings.

exchange, leaving the ETF provider with potentially illiquid assets to offload in the case of a default of the counterparty.

Separately, local tax laws can affect nonresident investors quite differently, particularly pertaining to dividend withholding. Some ETFs are designed to take advantage of the tax arbitrage between two regional jurisdictions. These strategies have been a source of friction between local authorities and foreign investors, leaving such funds exposed to sudden policy shifts aimed at closing the tax loopholes.

### Conclusions

The growth of exchange-traded funds is likely to accelerate over the near term, given their cost

advantages and the increased access to emerging markets that they provide. Some analysts put the annual growth estimate at roughly 20–30 percent, citing the growing interest among hedge funds to create and distribute ETFs to a broader investor base. However, this outlook also signals that ETF providers are likely to venture further into more complex instruments to replicate and magnify index returns in relatively closed economies. Regulators in the United States and Europe are beginning to take note of this trend toward complexity, even as investors are calling for a move toward exchange trading of the derivatives-based ETFs, standardizing of reporting, and increasing the transparency of securities lending practices.



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