

Global Stability Assessment

For the first time since the October 2008 Global Financial Stability Report, risks to global financial stability have increased (Figures 1.2 and 1.3), signaling a partial reversal in progress made over the past three years. The pace of the economic recovery has slowed, stalling progress in balance sheet repair in many advanced economies. Sovereign stress in the euro area has spilled over to banking systems, pushing up credit and market risks. Low interest rates could lead to excesses as the “search for yield” exacerbates the turn in the credit cycle, especially in emerging markets. Recent market turmoil suggests that investors are losing patience with the lack of momentum on financial repair and reform (Box 1.1). Policymakers need to accelerate actions to address long-standing financial weaknesses to ensure stability.

Overall *macroeconomic risks* have increased, reflecting a significant rise in sovereign vulnerabilities in advanced economies. The World Economic Outlook (WEO) baseline has shifted downward since April 2011, as the recovery appears more fragile. Weaker growth prospects and higher downside risks have contributed to concerns about debt sustainability, especially in the euro area periphery. Downgrades in sovereign ratings have spread beyond Greece, Ireland, and Portugal into the larger countries of the European periphery. Elsewhere, political risks to achieving medium-term fiscal adjustment have risen in a few advanced economies, notably the United States and Japan. Many sovereigns are vulnerable across multiple dimensions, raising market concerns about debt sustainability.

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Market and liquidity risks have risen, partly as a result of increased macroeconomic and sovereign risks. Higher volatility and rising yields on government bonds issued by countries on the periphery of the euro area are threatening a loss of investor confidence, weakening the investor base, and further driving up funding costs. As a result, public debt has become more difficult to finance, while higher sovereign risk premiums are disrupting bank funding markets. These concerns are eroding confidence in broader markets (Figure 1.4), reflected in a two-notch contraction in *risk appetite* since the April 2011 *Global Financial Stability Report* (GFSR).

Credit risks have risen as sovereign strains have spilled over to the banking system in the euro area. This GFSR assesses the impact of the rise in sovereign credit risk on the financial system and its negative implications for funding markets and for the flow of credit to the real economy.

Monetary and financial conditions remain unchanged from the April 2011 GFSR. This GFSR cautions that low interest rates, although necessary under current conditions, can carry longer-term financial stability risks. With balance sheet repair still incomplete in many advanced economies, and notwithstanding the overall pullback in risk appetite, the search for yield is pushing some market segments to become vulnerable and overleveraged, contributing to future risks.

Emerging markets risks have increased. Rapid domestic credit growth, balance sheet releveraging, and rising asset prices may ultimately lead to deteriorating bank asset quality in emerging markets as the credit cycle matures. At the same time, emerging markets remain vulnerable to external shocks. The analysis in this report reveals that a sudden stop of capital flows coupled with a rise in funding costs and a fall in global growth could strain capitalization in emerging market banks.

Deep-seated challenges remain, and rapid progress is needed to increase financial system robustness. The economic and financial context for fiscal adjustment and

reducing bank risks is daunting. First, most advanced economies are facing a combination of relatively low inflation and subdued real growth. This limits the scope for growing the denominator of the debt-to-GDP ratio and highlights the importance of structural measures to raise potential growth rates. Second, in many countries, the peak in sovereign debt burdens coincides with that of private debt burdens (Table 1.1). The consequence is likely to be a prolonged period of economy-wide deleveraging. Third, bank balance sheets are more extended, and though some repair has occurred, they remain highly leveraged and vulnerable to both economic and funding shocks. Fourth, cross-border dimensions increase the vulnerability of global financial stability to shocks, making the system more fragile and subject to contagion risks. Fifth, and perhaps most crucially, the policy tools available in most advanced economies are geared to combating temporary liquidity shocks rather than tackling concerns about solvency. The result is that balance sheets have not been “cured,” and the financial system remains highly vulnerable to sovereign risks. As discussed in the final section

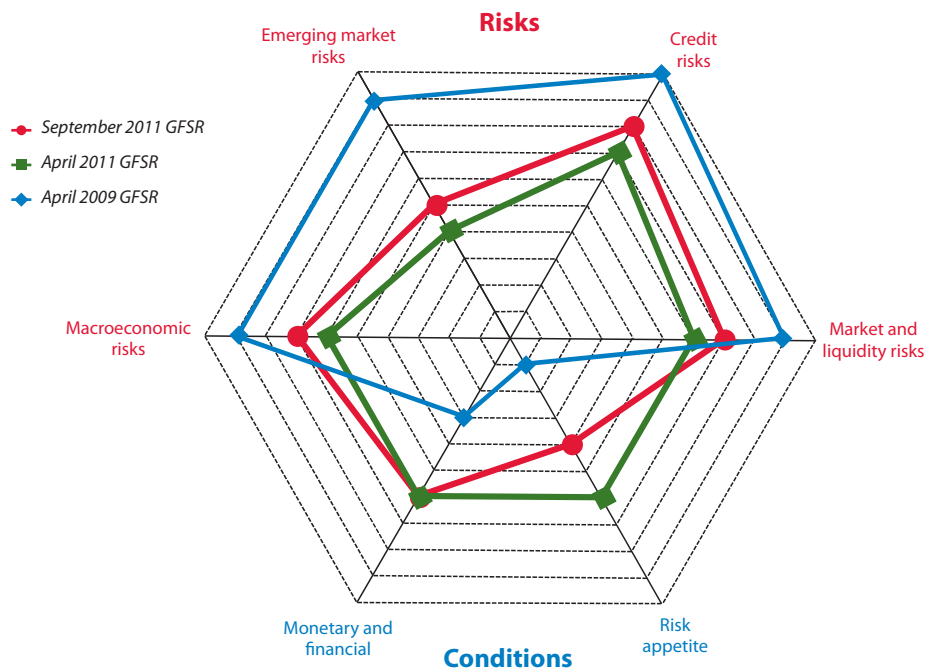
of this chapter, financial stability requires addressing these underlying vulnerabilities, mitigating the risks of contagion and spillovers, raising the capital buffers in banks, and completing the financial reform agenda.

Sovereign Vulnerabilities and Contagion Risks

Sovereign balance sheets remain fragile in a number of advanced economies despite steps toward fiscal consolidation. The lack of sufficient political support for medium-term fiscal adjustment and growth-enhancing reforms worsens funding pressures for sovereigns amidst a softer growth outlook. These pressures increase the risk that the debt dynamics of vulnerable sovereigns will slide into a spiral of deterioration in the absence of a coherent policy framework and adequate backstops to prevent the spread of contagion.

The spillover of sovereign risks to the banking sector has put funding strains on many banks operating in the euro area and depressed their market capitalization. Analysis quantifies the substantial impact that the spillovers from high-spread euro area sovereigns have had on the European banking systems and that help explain current levels of market

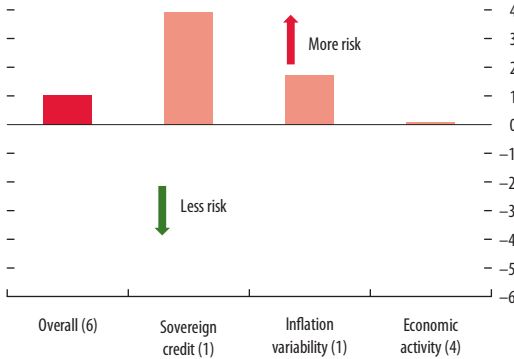
Figure 1.2. Global Financial Stability Map



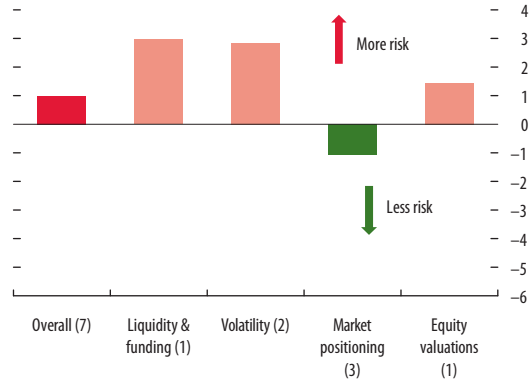
Source: IMF staff estimates.
 Note: Away from center signifies higher risks, easier monetary and financial conditions, or higher risk appetite.

Figure 1.3. Global Financial Stability Map: Assessment of Risks and Conditions
(In notch changes since the April 2011 GFSR)

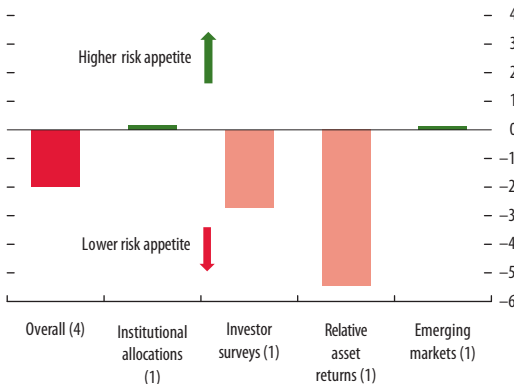
Macroeconomic risks rose, reflecting an increase in sovereign risk in advanced economies, and unexpected weakness in economic activity.



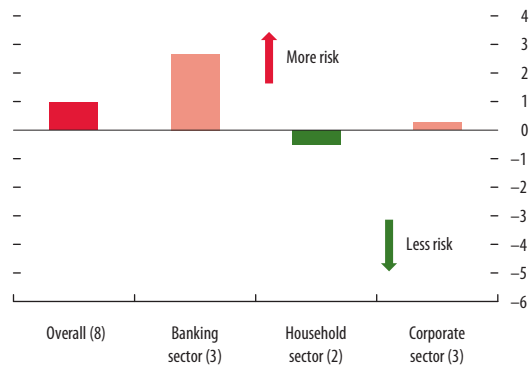
Market and liquidity risks also rose, as greater volatility led to heightened uncertainty about future funding conditions.



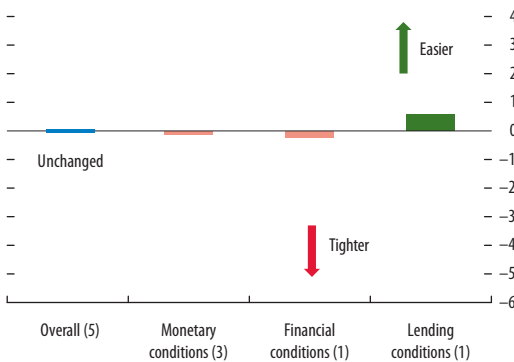
Risk appetite dropped, prompting investors to reduce exposure to sovereign and macroeconomic risks.



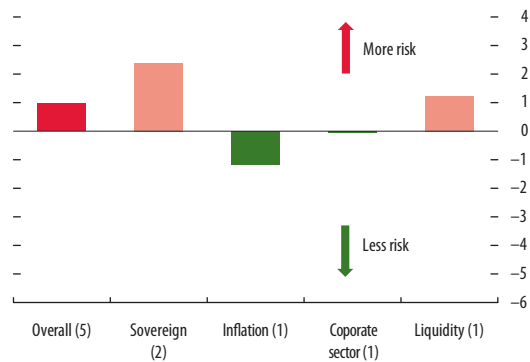
Credit risk rose, as concern over banks' sovereign exposures drove up market measures of contagion risk.



Monetary and financial conditions were broadly unchanged, with interest rates in advanced economies remaining near record lows...



...pushing investors into a search for yield that has contributed to strong capital inflows and high credit growth in EMs, raising emerging market risks.



Source: IMF staff estimates.

Note: Changes in risks and conditions are based on a range of indicators, complemented with IMF staff judgment (see the April 2010 GFSR, especially Annex 1.1, and Dattels and others, 2010, for a description of the methodology underlying the Global Financial Stability Map). Overall notch changes are the simple average of notch changes in individual indicators. The number next to each legend indicates the number of individual indicators within each subcategory of risks and conditions. For lending standards, positive values represent slower pace of tightening or faster easing.

stress.¹ These effects are amplified through the network of highly interconnected and leveraged financial institutions. The impact of these spillovers has been greatest on the most exposed banks in high-spread euro area countries. The disruption to funding markets could spread further, which would increase deleveraging pressures on banks and reduce credit growth in the most affected economies, reigniting a negative feedback loop with the real economy.

Credible efforts are required to strengthen the resilience of the financial system. Appropriate fiscal action, combined with bank balance sheet repair and adequate levels of capital, can help break the link between sovereign risk and banks. Weak banks need to be restructured and where necessary resolved. If private capital is not available and national public balance sheets have no spare capacity, EU-wide public backstops for banks should be used.

The crisis legacy has left public balance sheets vulnerable.

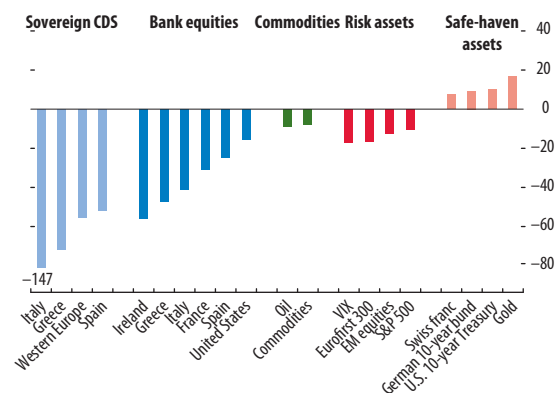
After four years of financial crisis, public balance sheets have been saddled with onerous debt burdens and sharply higher funding needs (Table 1.2). Lower tax revenue, weaker growth prospects, and large-scale support for ailing financial institutions have driven public finances into precarious territory. In many cases, these challenges have been added to a legacy of fiscal irresponsibility, as some governments lived beyond their means during more benign times. Policymakers in many advanced economies have begun to address these challenges by tightening the fiscal stance and laying out multiyear plans for deficit reduction. Indeed, as described in the IMF’s September 2011 *Fiscal Monitor*, progress has been substantial in a few cases, notably in parts of the European Union.

Despite progress toward fiscal consolidation, policymakers and political leaders have not yet commanded broad political support for medium-term fiscal adjustment and growth-enhancing reforms. Some countries, notably Japan and the

¹The set of high-spread euro area countries is the same as that used in the April 2011 GFSR (Belgium, Greece, Ireland, Italy, Portugal, and Spain). This diverse group includes program and nonprogram countries and wide differences in debt burden indicators, as shown by Tables 1.1 and 1.2. The grouping reflects the market pressures that governments in these countries have faced (as measured by bond spreads) and is not an assessment of their sovereign and other economic fundamentals.

Figure 1.4. Asset Price Performance since the April 2011 GFSR

(In percent; VIX in percentage points; VIX and sovereign CDS are inverted)



Sources: Bloomberg L.P.; and IMF staff estimates.
 Note: CDS = credit default swap; VIX = implied volatility index on S&P 500 index options; and EM = emerging market.

United States, need to formulate and implement credible medium-term plans to address looming fiscal challenges. At the same time, a more fragile growth outlook and deteriorating market sentiment over recent months have increased market pressures on sovereigns to adjust further, just to achieve their original targets.²

Markets have reacted to increased risks to policy implementation and a weaker growth outlook with higher sovereign risk premiums and successive rating downgrades or negative outlooks. Some sovereigns find themselves with challenges across multiple dimensions, with weak balance sheets increasing funding pressures (Figure 1.5). These sovereigns are especially prone to periodic bouts of financial market volatility, as changing fundamentals or political developments can dramatically shift the investor base and their perceptions about debt sustainability.

The recent political brinkmanship over raising the U.S. debt ceiling created significant market volatility.

The U.S. federal debt ceiling has been in place for several decades, but its nominal nature has

²For a more detailed analysis, see the IMF’s *Fiscal Monitor*, September 2011.

Table 1.1. Indebtedness and Leverage in Selected Advanced Economies¹*(Percent of 2011 GDP except as noted)*

	United States	Japan	United Kingdom	Canada	Euro area	Belgium	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Government gross debt, 2011 ²	100	233	81	84	89	95	87	83	166	109	121	106	67
Government net debt, 2011 ^{2,3}	73	131	73	35	69	80	81	57	n.a.	99	100	102	56
Primary balance, 2011 ²	-8.0	-8.9	-5.6	-3.7	-1.5	-0.3	-3.4	0.4	-1.3	-6.8	0.5	-1.9	-4.4
Households' gross debt ⁴	92	77	101	n.a.	70	53	61	60	71	123	50	106	87
Households' net debt ^{4,5}	-232	-236	-184	n.a.	-126	-195	-137	-132	-57	-67	-178	-123	-78
Nonfinancial corporates' gross debt ⁴	90	143	118	n.a.	138	175	150	80	74	245	110	149	192
Nonfinancial corporates' debt over equity (percent)	92	181	83	70	106	48	69	92	182	90	125	136	134
Financial institutions' gross debt ⁴	94	188	547	n.a.	143	112	151	98	22	689	96	61	111
Bank leverage ⁶	12	24	24	18	26	30	26	32	17	18	20	17	19
Bank claims on public sector ⁴	8	80	9	19	n.a.	23	17	23	28	25	32	24	24
Total economy gross external liabilities ^{4,7}	151	67	607	98	169	390	264	200	202	1,680	140	284	212
Total economy net external liabilities ^{4,7}	16	-54	11	12	13	-40	10	-41	104	98	26	106	88
Government debt held abroad ⁸	30	15	19	16	25	58	50	41	91	61	51	53	28

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

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

²World Economic Outlook projections for 2011.

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

⁴Most recent data divided by annual GDP (projected for 2011). Nonfinancial corporates' gross debt includes intercompany loans and trade credit, and these can differ significantly across countries.

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

⁶Leverage is defined as the ratio of tangible assets to tangible common equity for domestic banks.

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

⁸Most recent data for externally held general government debt (from JEDH) divided by 2011 GDP from WEO. Note that debt data from the JEDH are not comparable to WEO debt data when they are at market value.

Box 1.1. Market Confidence Deteriorates amid Policy Uncertainty

Recent market developments illustrate how political uncertainty and the perception of a weak policy response to stress can rapidly erode market confidence.

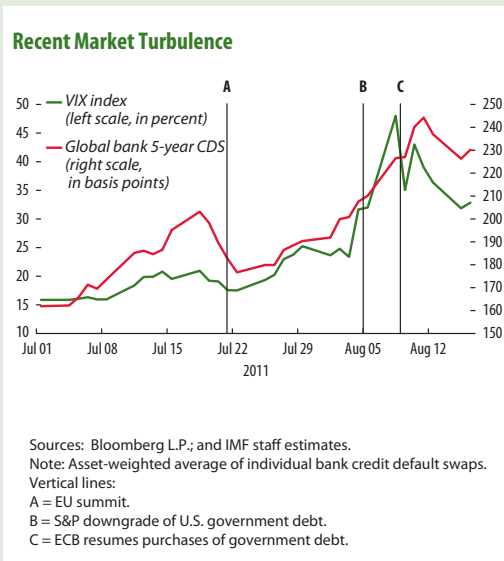
The failure to stem contagion risks and credibly address sovereign and banking system strains—assessed in detail in this GFSR—has led to a wide-scale pullback in risk assets, stoked fears of recession, and sent investors rushing into safe havens (first figure). Market volatility increased markedly beginning in mid-July. The main triggers appear to have been

- the protracted impasse over the debt ceiling in the United States;
- S&P's subsequent downgrade of the U.S. sovereign credit rating;
- rising concerns about potential downgrades of European sovereigns still rated AAA; and
- renewed economic growth concerns.

Although the euro area summit of July 21 was an important step toward enhancing the crisis management framework, markets worried about the length of the political process required to implement the summit's decisions and whether the adopted solutions would be sufficient. The latest bout of market volatility has reminded some investors of the collapse in asset prices following the September 2008 Lehman Brothers bankruptcy. Although the current reaction has not been as severe or as widespread as it was after that event, risk perceptions are greater for European banks and sovereigns (second figure). There is a risk of a further deterioration if appropriate policies are not implemented.

As discussed in the main text, contagion has spread deeper into the euro area, highlighting the speed with which failure to address legacy problems and structural weaknesses can propel financial markets into a downward spiral. Spreads on CDS (and, to a lesser extent, on underlying debt) widened on high-spread sovereigns as well as on AAA-rated euro area credits. Sovereign strains spilled into those parts of the euro area banking system perceived to be heavily exposed to the euro area periphery, or to have a greater reliance on dollar or short-term funding, or to have an insufficient capital base. These strains have raised concern in some cases over

Note: Prepared by Kristian Hartelius, William Kerry, and Rebecca McCaughrin.



bank capital cushions and increased bank funding costs. The sharp declines in bank equity prices prompted U.S. money funds to further reduce lending to European banks, leading to higher dollar funding costs for these banks and a widening of the dollar-euro basis spread. Euro area interbank financing conditions deteriorated amid rising counterparty concerns, pushing the Euribor-OIS spread to its widest level since April 2009 (third figure).

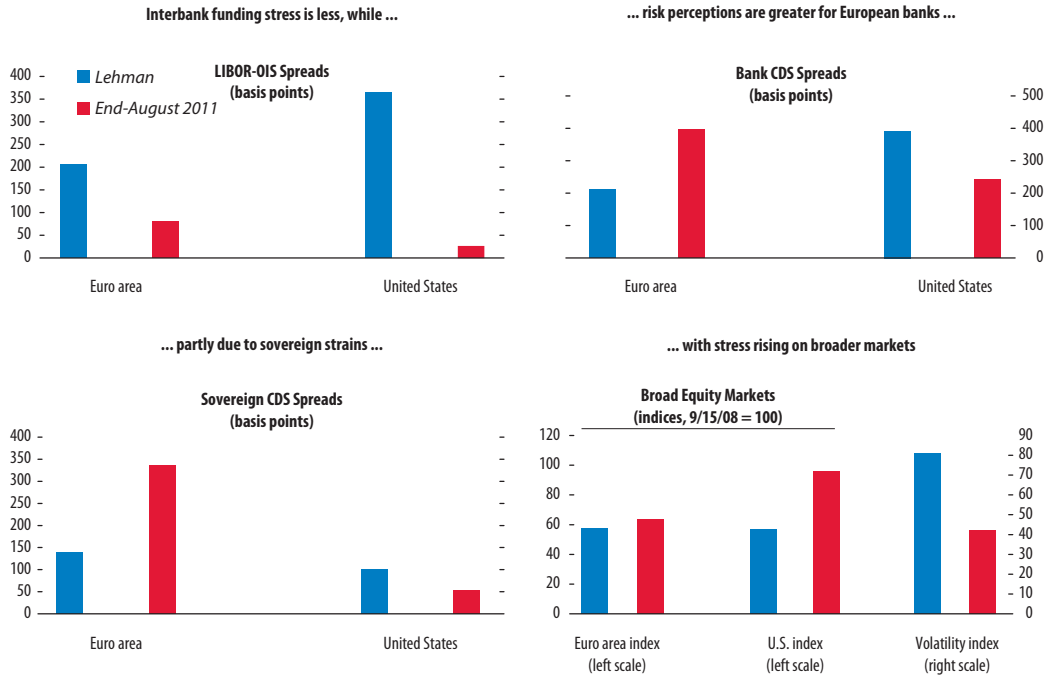
Increased and spreading volatility—exacerbated by tightening credit lines, increased margin requirements, and shallow summer liquidity conditions—led to a broader pullback in global risk assets (such as corporate and emerging market credit) and greater demand for traditional safe-haven assets (including gold, U.S. Treasuries, Japanese yen, Swiss francs, and Singapore dollars). The fall in risk appetite, along with weaker growth prospects, drove U.S. real rates into negative territory and led to a sell-off in growth-sensitive equities and commodities.¹ Asset prices of U.S. banks were especially hard hit, as investors perceived some banks as having insufficient capital and funding bases, given their large portfolios of legacy mortgages and the weak economic outlook.

As market stress intensified, the European Central Bank (ECB) responded by extending purchases

¹During a period of two weeks, \$7.3 trillion in global equity market wealth was wiped out. In comparison, in the two weeks after the Lehman Brothers bankruptcy, global equity market wealth fell by \$11 trillion.

Box 1.1 (continued)

What's Different after "Lehman"?



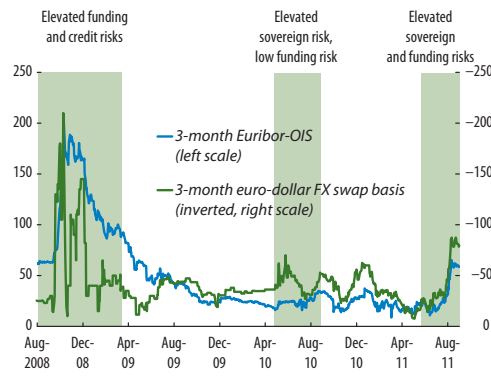
Sources: Bloomberg L.P.; and IMF staff estimates.
 Note: Lehman Brothers declared bankruptcy on September 15, 2008.

under its Securities Market Programme to the government bonds of Italy and Spain and increasing its term liquidity provision. The Federal Reserve conditionally pledged to keep interest rates low and signaled a readiness to employ a range of tools; Swiss and Japanese authorities resumed intervention in the foreign exchange market; regulators instituted short-selling bans on selected European equities; and the Federal Reserve and major central banks announced coordinated dollar auctions. For now, these actions have helped to slow the downward spiral, but liquidity conditions are still tight, and sentiment remains fragile.

The latest bout of volatility demonstrates that high hurdles for debt rollover can telescope concerns over medium-term debt sustainability into more immediate sovereign funding stress (third figure). The episode also serves as a reminder that bank funding and capital constraints can generate deleveraging pressures and establish a negative feedback loop to the real economy. Until a sufficiently comprehensive strategy is in place to address sovereign contagion,

bolster the resilience of the financial system, and reassure market participants of policymakers' commitment to preserving stability in the euro area, markets are likely to remain volatile.

Euro Area Funding and Dollar Liquidity Risks
 (In basis points)



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

Table 1.2. Sovereign Debt: Market and Vulnerability Indicators
(Percent of 2011 projected GDP except as noted)

	Fiscal and Debt Fundamentals ¹			Financing Needs ⁵		External Funding	Banking System Linkages			Sovereign Credit		Sovereign CDS
	Gross general government debt ²	Net general government debt ³	Primary balance ⁴	Gross general government debt maturing plus budget deficit		General government debt held abroad ⁶	Domestic depository institutions' claims on general government ⁷		BIS reporting banks' consolidated international claims on public sector ⁸	Rating/outlook (notches above speculative grade/outlook as of 8/31/11) ⁹	Five-year (basis points) (as of 8/31/2011)	
	2011	2011	2011	2012	2013	Percent of 2011 GDP	Percent of depository institutions' consolidated assets					
Australia	22.8	7.7	-3.4	5.1	4.3	9.6	2.2	1.2	2.6	9	Stable	69
Austria	72.3	52.5	-1.3	9.2	9.4	55.5	15.0	4.5	10.6	10	Stable	113
Belgium	94.6	79.9	-0.3	22.2	21.8	58.2	22.7	7.8	12.9	9	Negative	228
Canada	84.1	34.9	-3.7	18.6	17.3	16.2	18.5	9.9	3.1	10	Stable	n.a.
Czech Republic	41.1	n.a.	-2.7	11.7	12.1	11.2	16.6	14.1	3.3	6	Stable	107
Denmark	44.3	1.8	-2.6	10.8	10.1	17.9	14.7	3.7	4.7	10	Stable	98
Finland	50.2	-59.7	-1.5	8.3	8.0	39.1	6.0	2.3	8.9	10	Stable	65
France	86.9	81.0	-3.4	20.8	20.2	50.3	16.8	4.3	7.4	10	Stable	153
Germany	82.6	57.2	0.4	10.5	8.1	41.4	22.9	7.5	9.3	10	Stable	75
Greece	165.6	n.a.	-1.3	16.5	14.9	91.3	28.3	12.4	18.2	-8	Negative	2233
Ireland	109.3	98.8	-6.8	13.9	14.9	60.8	24.6	2.8	6.4	2	Negative	768
Italy	121.1	100.4	0.5	23.5	18.9	51.4	31.7	13.2	11.4	7	Negative	361
Japan	233.1	130.6	-8.9	58.6	53.6	15.1	80.2	24.3	1.4	7	Negative	104
Korea	32.0	30.8	3.3	1.0	-0.1	3.8	5.7	4.2	3.2	5	Stable	127
Netherlands	65.5	30.6	-2.2	16.0	16.4	37.9	13.5	3.6	7.0	10	Stable	78
New Zealand	35.3	7.8	n.a.	9.3	11.6	20.7	7.7	4.2	2.8	9	Negative	80
Norway	55.4	-161.0	9.3	-1.0	0.9	23.9	n.a.	n.a.	8.1	10	Stable	44
Portugal	106.0	101.8	-1.9	22.3	21.0	53.3	24.0	7.2	12.4	0	Negative	914
Slovak Republic	44.9	n.a.	-3.3	14.2	14.2	17.1	18.1	21.1	4.9	6	Stable	158
Slovenia	43.6	n.a.	-4.8	8.2	5.7	29.7	10.3	7.2	6.3	8	Negative	182
Spain	67.4	56.0	-4.4	20.6	19.4	28.4	24.2	7.4	6.2	8	Negative	357
Sweden	36.0	-20.8	0.3	3.6	0.5	12.6	6.4	2.4	4.0	10	Stable	52
United Kingdom	80.8	72.9	-5.6	14.7	13.3	18.7	8.9	2.0	2.2	10	Stable	75
United States	100.0	72.6	-8.0	30.4	29.1	29.6	7.7	5.4	3.4	9	Negative	50

Sources: Bank for International Settlements (BIS); Bloomberg, L.P.; IMF: International Financial Statistics database, Monetary and Financial Statistics database, World Economic Outlook database (WEO); BIS-IMF-OECD-World Bank Joint External Debt Hub (JEDH); and IMF staff estimates. Note that debt data from the JEDH are not comparable to WEO when they are at market value.

Based on projections for 2011 from the September 2011 World Economic Outlook (WEO). Please see the WEO for a summary of the policy assumptions. Debt data from the JEDH are not comparable to WEO debt data when they are at market value.

¹ As a percent of GDP projected for 2011.

² 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 SDRs, currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes, and other accounts receivable.

³ 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, pension, and standardized guarantee schemes, and other accounts receivable.

⁴ Primary balance is general government primary net lending/borrowing balance. Data for Korea are for central government.

⁵ As a proportion of WEO projected GDP for the year. Note that for Greece these numbers have been calculated assuming a successful debt exchange operation with 90 percent participation.

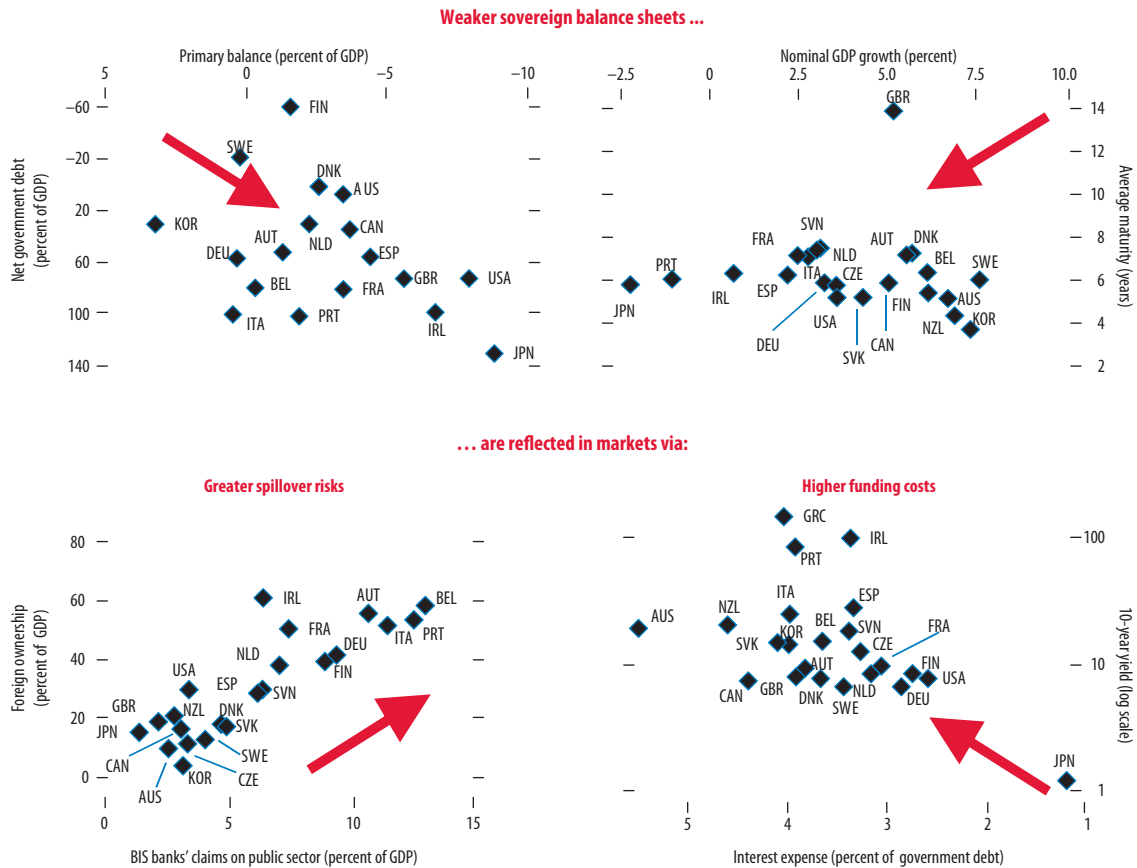
⁶ Most recent data for externally held general government debt from the JEDH divided by projected 2011 GDP. Depending on the country, the JEDH reports debt at market or nominal values. New Zealand data are from Reserve Bank of New Zealand.

⁷ Includes all claims of depository institutions (excluding the central bank) on general government. U.K. figures are for claims on the public sector. Data are for second quarter of 2011 or latest available.

⁸ BIS reporting banks' international claims on the public sector on an immediate borrower basis as of December 2010, as a percentage of projected 2011 GDP.

⁹ Based on average of long-term foreign currency debt ratings of Fitch, Moody's, and Standard & Poor's agencies, rounded down. Outlook is based on the most negative of the three agencies' ratings.

Figure 1.5. Sovereign Vulnerabilities and Market Pressures



Sources: Bank for International Settlements (BIS); IMF: International Financial Statistics database, World Economic Outlook database; BIS-IMF-OECD-World Bank Joint External Debt Hub; and IMF staff estimates.
 Note: See Table 1.2 for a description of the variables. Average maturity and 10-year yield on government debt are from Bloomberg (7/25/2011). Nominal GDP growth is for 2011 based on WEO projections. Foreign ownership refers to the sovereign bond holders.

failed to provide any control over rising debt-to-GDP ratios driven by separate budgetary processes. Moreover, the unpredictable political process that accompanies increases in the debt ceiling erodes confidence in policymaking and triggers spurts of market volatility (Figure 1.6).³ During the latest episode, rates on near-term Treasury bills and other money market instruments spiked; repo transaction volumes fell as corporations, money funds, and others shifted holdings into cash; the Treasury bond curve steepened sharply; sovereign credit default swap

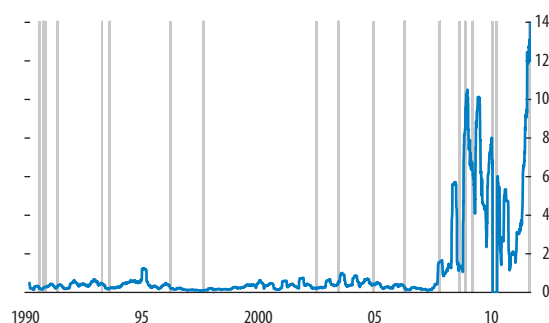
³Since 1962, the U.S. Congress has approved a debt ceiling increase 74 times, including 11 times since 2002.

(CDS) spreads inverted as one-year rates reached record highs; and a flight to quality drove flows into alternative assets like gold, the Swiss franc, and foreign AAA-rated sovereign debt. (Box 1.2 discusses market indicators for assessing U.S. sovereign risk.)

Because challenges to achieving the longer-term sustainability of U.S. government debt remain unaddressed, they could potentially reignite sovereign risks, with important adverse market implications and global repercussions.

At the eleventh hour, U.S. policymakers agreed to raise the debt ceiling to a level adequate only to get past the November 2012 elections and cut the

Figure 1.6. Historical Volatility in One-Month Treasury Bills during Debt Ceiling Negotiations
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.
Note: Vertical lines mark dates of changes in debt ceiling.

deficit by an initial \$917 billion, to be followed by at least \$1.2 trillion of additional cuts over a 10-year period. The debt reduction plan marks an important step toward fiscal stabilization, but it does not put the United States on a sustainable fiscal trajectory. And although market pressures receded, the debt reduction plan was insufficient to avoid a (one-notch) downgrade of U.S. sovereign debt by Standard & Poor's. This, in turn, led to market fears that other important sovereigns could be downgraded, augmenting sovereign strains in the euro area.

While a one-notch downgrade of U.S. debt is likely to have only a limited long-term market impact, a larger or broader downgrade would have far more serious implications, adversely affecting global confidence. Possible channels and effects include:

- *Increased Treasury risk premiums.* Historical precedents in advanced economies indicate little sustained impact on yields following a downgrade (Figure 1.7).⁴ Those data show that, in the case

⁴Since 1990, there have been roughly 70 sovereign downgrades by the top three rating agencies (Moody's, Fitch, and Standard & Poor's) across 12 countries. The downgrade episodes included in this analysis were Belgium (1998); Canada (1994–95); Finland (1990, 1992–93); Greece (1998, 2004, 2009–11); Ireland (2009–11); Italy (1991–93, 1995–96, 2004, 2006, 2011); Japan (1998, 2000–02, 2009–11); New Zealand (1991, 1998); Portugal (2005, 2009–11); Spain (1992, 2009–11); Sweden (1991–95); and the United States (2011). Episodes were based on changes (excluding warnings) in long-term debt ratings, and the impact was based on average changes in 10-year government bond yields over selected periods in each country.

of a single-notch or even a two- or three-notch downgrade from AAA, yields rise marginally in the run-up to the downgrade but more than fully recover within a year. That pattern is most consistent in the case of a single-notch downgrade from AAA by only one credit rating agency (as was the case in the U.S. episode). Indeed, 10-year Treasury yields have fallen by roughly 50 basis points since S&P's downgrade. However, a more pronounced downgrade has historically had a more sustained impact, with government bond yields rising more sharply and for a longer period.

- *Loss of liquidity advantage.* U.S. Treasury securities were not unique in their top rating: a number of other sovereigns have equally high credit ratings. But what still sets Treasuries apart is their exceptionally high liquidity. A mult notch downgrade would likely erode that advantage.
- *Destabilizing impact on broader leveraged markets.* Given the widespread role that Treasuries play in financial transactions, further downgrades would likely prompt lenders to increase haircuts on repo positions, leading to a rise in margin calls. This could, in turn, lead to a round of deleveraging, with some impact on asset prices as some borrowers are forced to curtail positions financed with Treasuries as collateral.⁵
- *Forced asset sales.* Although most institutional investors are either free from ratings restrictions or have the flexibility to ease them, especially if the downgrade is small, a larger downgrade could lead to some forced sales of Treasuries.
- *Effects on other securities.* Further downgrades would likely erode the reserve status of the dollar; weaken counterparty confidence of large investors; and possibly lead to ratings downgrades on debt issued by other U.S. entities (especially Fannie Mae and Freddie Mac), municipalities, insurance companies, banks, and other financial institutions. This would likely be accompanied by repricing across a wide range of assets priced off the Treasury curve, further exacerbating collateral

⁵Nearly \$4 trillion in U.S. government securities are used as collateral in repo agreements, futures, clearinghouses, and OTC derivatives. Prime brokers increased haircuts on Treasury securities from 0.25 percent to 3 percent in late 2008 after Lehman Brothers collapsed and the Reserve Primary Fund “broke the buck.”

Box 1.2. How Concerned Are Markets about U.S. Sovereign Risks?

Although markets signaled increased concerns after the U.S. downgrade, they appear to remain confident that stress will be contained. This relatively sanguine view potentially creates a false sense of security: By reducing the urgency to act, it increases the potential for a negative credit event to have a significant adverse market reaction.

Financial markets can provide important signals on market concerns about sovereign risk. The figure in this box summarizes a set of indicators used by market participants to assess concerns about U.S. sovereign risks. None of the measures perfectly captures concerns: Other fundamental and technical factors can also affect market pricing, there is a wide range of potential scenarios and outcomes, and markets may overstate or understate risks. Still, taken together, the indicators may provide useful high-frequency signals on perceptions about sovereign risks. Overall, they suggest that market-implied U.S. sovereign risks have increased, but pricing is still below maximum levels despite a U.S. rating downgrade by Standard & Poor's, an increased potential for a further U.S. downgrade, increased concerns about sovereign debt risks globally, and limited progress in U.S. domestic debt consolidation.¹

Some metrics in the figure that are signaling increased risks include nominal and real Treasury rates, swaps, and other rate curves which have steepened (though yields generally remain below historical averages), suggesting increased concerns

Note: Prepared by Rebecca McCaughrin.

¹Granted, changes in market pricing reflect information other than sovereign risk, such as changes in expectations on interest rates, growth, and inflation as well as technical factors like market liquidity, hedging activity, and supply-demand dynamics. For instance, renewed concerns about downside risks to economic growth and a reduction in interest rate expectations may be obfuscating or dominating market concerns about sovereign risks.

²Curvature depends on the market's horizon. A steepening may reflect market concerns about debt deterioration in the longer run, whereas a flattening may suggest more immediate concerns and the expectation that a missed coupon payment in the near term will prompt more urgent action on fiscal reform in the longer run. With the increase in the debt ceiling, markets are now generally concerned that longer-term debt consolidation will be further delayed.

about long-term debt consolidation.² Longer-dated swaption volatility is close to its highest level, as the shape of the curve has fluctuated more, reflecting concerns about a wider range of possible outcomes. At the same time, both near- and long-term CDS spreads have widened, suggesting increased demand for protection against default. The dollar has weakened against both the euro and a broad basket of currencies, and gold prices have continued to surge, suggesting some loss of confidence in the dollar's status as a reserve currency and concerns about external financing needs.

However, other markets are signaling more modest concerns. For example, 30-year swap spreads are not signaling extreme stress, even though they have tended to be well-correlated with CDS spreads and a steepening in the Treasury curve during spikes in sovereign risk; the spreads between U.S. Treasuries and German bunds are contained; and most funding market conditions paint a fairly benign picture.³

Other metrics underscore the U.S. Treasury market's relative resilience: Auctions have been well received, prime brokers have not increased haircuts, repo volumes normalized following a brief period of volatility during the debt ceiling impasse, major institutions have not substantially altered their holdings of Treasuries relative to cash or other assets, and liquidity in the Treasury market has not been impaired.

A number of financial market issues and considerations may be limiting the stress arising from sovereign risk concerns:

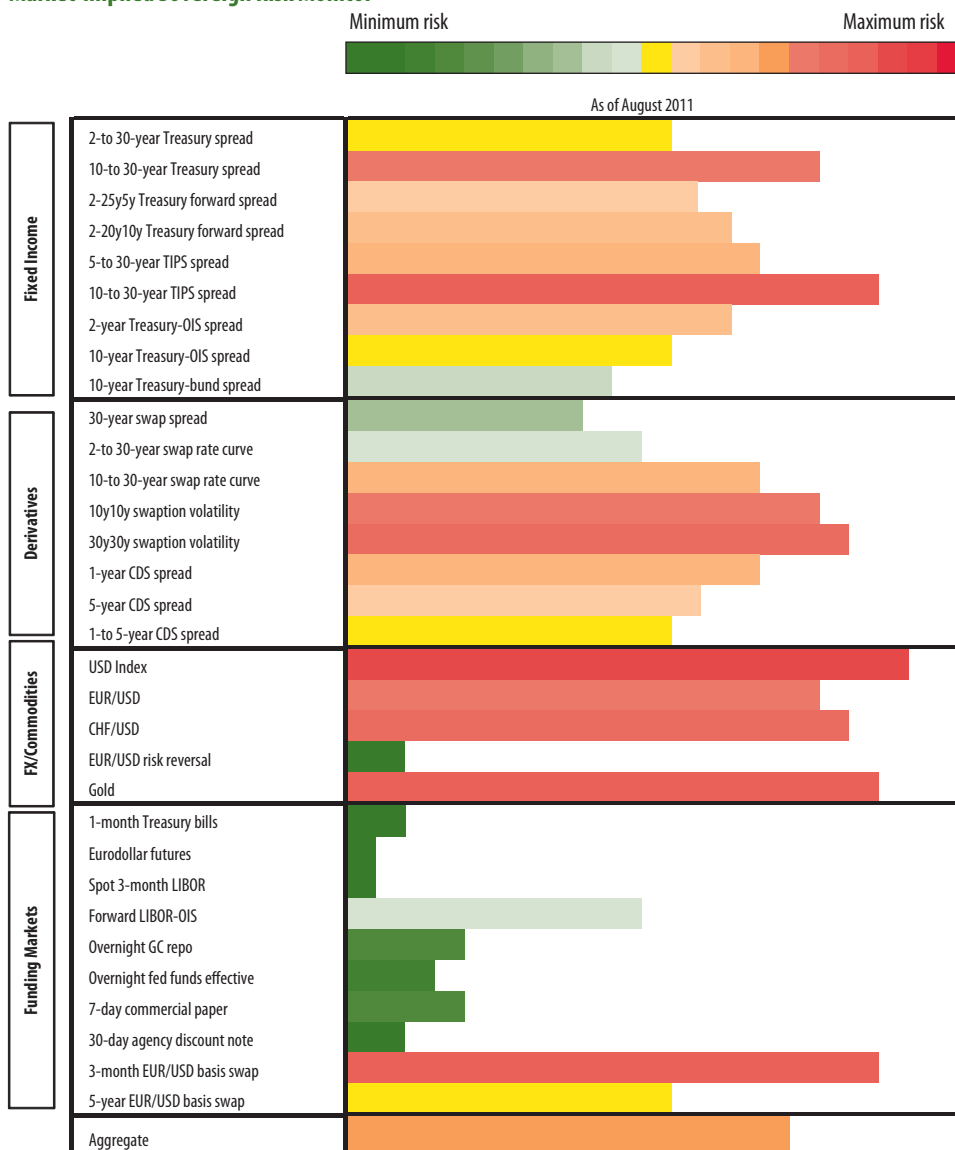
- *Countervailing pressures.* Factors such as flight-to-quality flows generated by concerns over growth prospects and European sovereign risks are considered more significant market drivers.

³Interest rate swap spreads are an indicator of the relative risk of private versus government long-term bonds. The interest rate swap market is very liquid, and, as a derivatives market, it is not affected by the supply-demand imbalances of the Treasury market.

⁴Apart from two special episodes, one in 1933 and the other in 1979. The United States defaulted in 1933 when it left the gold standard and canceled bondholders' option to be repaid in gold. In April–May 1979, there was a technical default when payments on maturing Treasury bills were delayed by a processing glitch (see Zivney and Marcus, 1989).

Box 1.2 (continued)

Market-Implied Sovereign Risk Monitor



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

Note: The figure represents the average pricing of each underlying indicator during August 2011 compared with maximum and minimum daily levels prevailing over the period January 1, 2009, to the present. January 1, 2009, roughly marks the point at which the financial crisis started to morph into more of a sovereign credit crisis and thus provides a useful basis for comparison. Green signifies that current pricing is closest to the minimum prevailing level or relative complacency on fiscal risks; red signifies proximity to the maximum prevailing level or increased alarm. The aggregate measure is a simple, unweighted average of the underlying market indicators.

Box 1.2 (continued)

- *Past is prologue.* Many take comfort from the fact that the U.S. government has never defaulted.⁴ Even in the event of a cash crunch, most expect the U.S. Treasury to prioritize payments.
- *A lack of substitutable assets.* Market participants are confident that no other market is sufficiently deep and liquid to supplant the U.S. Treasury market, which suggests that Treasury investors are a captive investor base.
- *The effect of haircuts.* Increased haircuts may (perversely) increase demand for Treasuries. Since Treasury securities are used as collateral to meet margin requirements in a wide range of transactions, some market participants argue that a downgrade would (paradoxically) increase demand for Treasuries as margin calls increase.
- *Flexibility in mandates.* Market participants argue that rating-constrained investors would likely adjust their mandates to allow them to purchase lower-rated debt.

- *Extraordinary policy actions.* In the event of increased instability in the Treasury market, market participants expect the Federal Reserve to act as a backstop through another round of quantitative easing or some other unconventional measure.

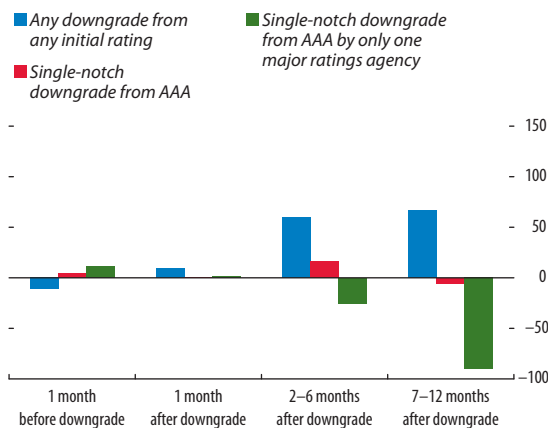
In sum, while market pricing suggests increased concerns about the buildup of fiscal risks, overall signals are still fairly mixed and are below maximum levels.

The policy risk: The lack of a strong market signal may create a false sense of security, thereby reducing the urgency to act and increasing the potential for a negative credit event to produce a significant adverse market reaction. As the main text indicates, a mult notch downgrade or default could increase term premiums, lead to a loss in liquidity, and—given the widespread role that Treasuries play in the pricing and collateralization of other assets—have a destabilizing impact on broader markets and market sentiment.

mark-downs and haircut increases. Additional downgrades would also likely raise concerns about potential downgrades of other AAA-rated

sovereigns. To some extent, these fears are already materializing, with spreads widening on a number of highly rated European sovereign debt and CDS credits.

Figure 1.7. Change in Advanced Economy Government Bond Yields around Sovereign Debt Downgrades
(In basis points)

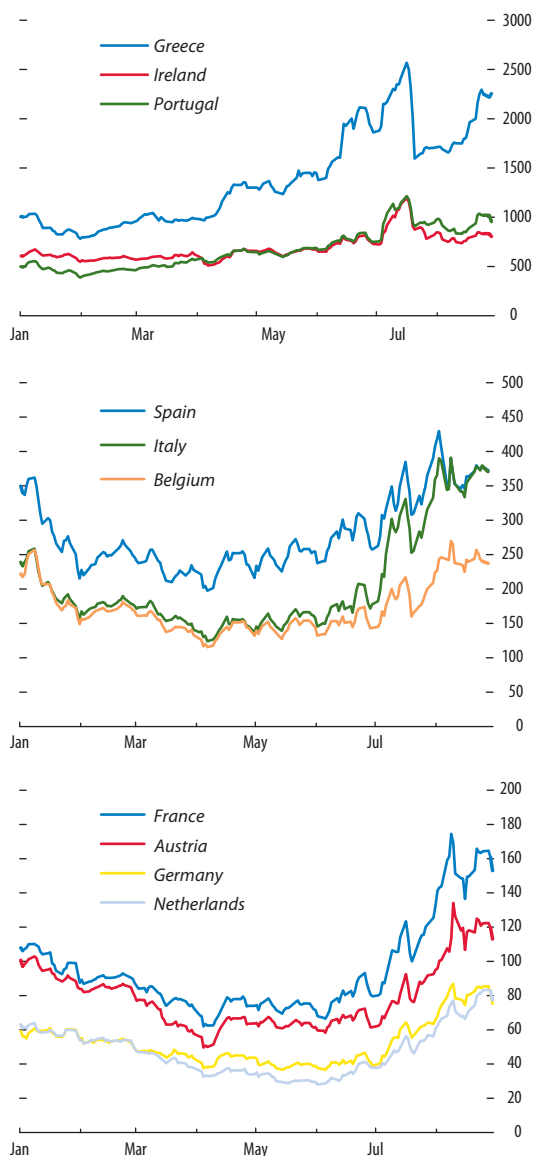


Sources: Bloomberg L.P.; Haver Analytics; and IMF staff estimates.

Parts of the euro area remain vulnerable to contagion and weakening fundamentals and to the risk of multiple equilibria.

The vulnerabilities highlighted earlier have been a key focus in euro area sovereign bond markets in the past six months. Spreads have climbed to record levels (Figure 1.8) as political differences *within* economies undergoing adjustment and *among* economies providing support have complicated the task of achieving a durable solution. Investors fear that the voluntary private sector participation in debt restructuring that is now envisaged in Greece could set a precedent for other program countries. Difficult political dynamics and increasing concerns about the growth outlook have also raised uncertainty about broader fiscal adjustment in

Figure 1.8. Developments in Sovereign Credit Default Swap Spreads, 2011
(Five-year tenors, basis points)



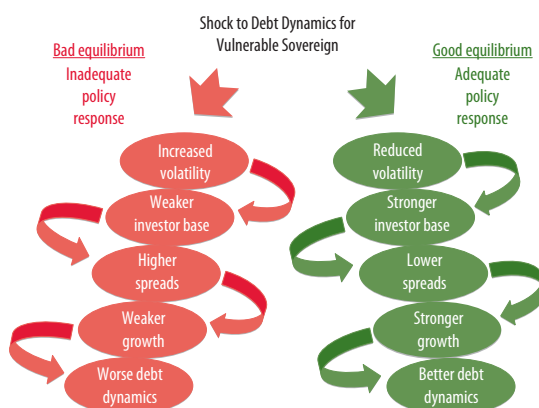
Source: Bloomberg L.P.

Italy. Given the systemic size of the bond markets in Italy and the sovereign funding needs there, these risks have become key drivers of market conditions, increasing the potential for spillovers across different asset markets.

With fragile balance sheets and debt sustainability influenced heavily by expectations, debt markets can become subject to multiple equilibria. Sovereigns with major vulnerabilities are prone to a sudden loss of investor confidence in their debt sustainability if fundamentals deteriorate sharply. This can result in higher volatility, which would erode the demand for their bonds and weaken their investor base, driving up funding costs for themselves and their banks and potentially choking off economic activity (Figure 1.9). Sovereigns that are unable to mount a credible policy response in the face of such challenges can become mired in a bad equilibrium of steadily deteriorating debt dynamics.

The recent turmoil has been concentrated in European sovereign debt markets. While the euro area greatly benefits its members by broadening and deepening the degree of financial integration across the region, the extensive cross-border bank and fund holdings of sovereign debt in the euro area have facilitated the rapid transmission of shocks across financial markets. The threshold for cross-border asset reallocations is also lowered because domestic savers can now choose from a large stock of high-quality assets in other parts of the area without incurring exchange rate risk.

Figure 1.9. Debt Dynamics

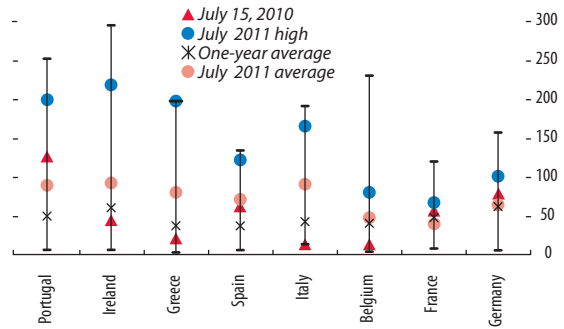


Recent developments in the wider euro area government bond market underscore investor sensitivities.

The stability of the investor base has been a particularly critical determinant of the recent debt dynamics in the euro area. For the program countries, the hollowing out of the investor base has been a significant factor in the eventual cutoff from funding markets (Figure 1.10). Over the past year, foreign banks have reduced their share of Italy’s and Spain’s total government debt outstanding, although foreign nonbanks have remained net buyers in Italy. The latter’s high rollover funding needs for its sovereign debt make it vulnerable to a pullback in demand by domestic banks and institutional investors, who already have significantly more domestic sovereign exposure than their euro area counterparts.

The dramatic price action in sovereign debt markets during July 2011 demonstrated how shocks to fundamentals and market sentiment in vulnerable sovereigns can create a corrosive dynamic that spills over to broader debt markets. Sovereign bond spreads for the peripheral euro area countries rose to record levels with extreme volatility and spillovers to Italy and Spain (Figure 1.11). Previously, Italy’s 10-year spread over German bunds had been relatively stable, around 150 basis points during 2011, as investors had taken comfort from the relatively low level of private sector debt in Italy, the well-developed domestic investor base for government bonds, and the bonds’ high degree of liquidity. These factors

Figure 1.11. Bond Market Volatility
(Realized volatility of two-year government bond yields in basis points)

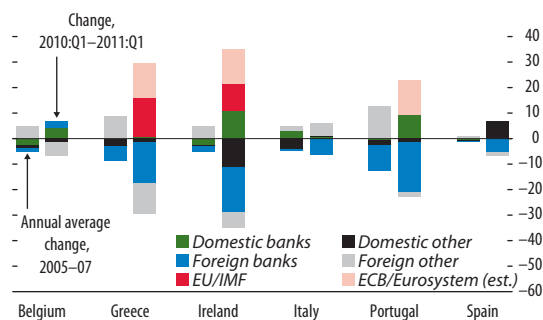


Sources: Bloomberg L.P.; and IMF staff estimates.
Note: Vertical lines represent the range of realized volatility for the period.

resulted in many investors in euro area sovereign bonds holding long-Italy positions against their benchmarks to compensate for short positions in program countries, leaving the market vulnerable to a sharp correction.

Like the debt path of many advanced economy sovereigns, Italy’s remains highly sensitive to a rise in funding costs (Figure 1.12).⁶ In such circumstances, a change in fundamentals (such as expected growth or fiscal adjustment) can cause a substantial shift in expectations about debt sustainability. This can make normally liquid bond markets more vulnerable if marketmakers and investors pull back from risk when volatility rises.⁷ The turmoil in the trading for Italy’s debt in July and August illustrates how such bouts of volatility, if left unchecked, has the potential to erode a sovereign’s investor base and lead to a permanent repricing of debt.

Figure 1.10. Changes in the Sovereign Investor Base
(In percent)

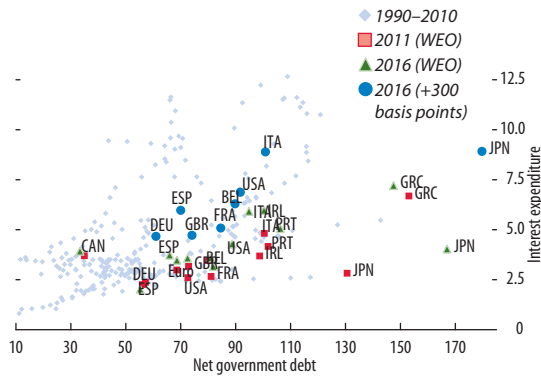


Sources: BIS Banking Statistics; European Central Bank; European Union; Eurostat; IMF-World Bank Quarterly External Debt Statistics; national central banks; and IMF staff estimates.

⁶See the September 2011 *Fiscal Monitor*, Appendix A.4, for additional illustrations of the sensitivity of advanced economies to interest rate shocks.

⁷Investors in longer-term sovereign bonds are generally seeking stable nominal returns. When their holdings of such bonds become subject to higher and more volatile yields involving credit risk, they will often shift their exposures to safer instruments. In Italy, the relative paucity of stock lending by domestic institutions, plus measures to address settlement failures in June 2011 (see European Repo Council, Update, March 2011), may also have reduced the ability of marketmakers to cover short positions, thereby exacerbating market volatility and spread widening.

Figure 1.12. Financing Sensitivity to an Interest Rate Shock
(In percent of GDP)



Sources: Bloomberg L.P.; IMF, World Economic Outlook database; and IMF staff estimates.
 Note: WEO projections for 2011 and 2016. In addition, we calculate interest rate expenditures for 2016 when the sovereign refinances 300 basis points above current market forward rates, taking the detailed profile of future funding needs into account and assuming a constant maturity structure of issuance. The baseline in our forward-rate-based methodology differs from that in WEO projections. Assumptions on assets do not deviate from the baseline WEO scenario. For Greece, gross government debt.

Sovereign strains have spilled over to the EU banking system, increasing systemic risks.

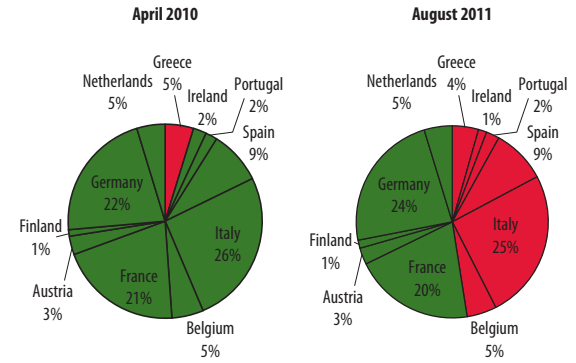
Sovereign risks have spilled over to the banking system, and these spillovers have grown as the sovereign crisis has spread from Greece to Ireland and Portugal, and then to Spain, Belgium, and Italy. Nearly half of the €6.5 trillion stock of government debt issued by euro area governments is showing signs of heightened credit risk (Figure 1.13).

As a result, banks that have substantial amounts of more risky and volatile sovereign debt have faced considerable strains in markets.⁸ Figure 1.14 shows that high-spread euro area bank credit default swaps have widened by around 400 basis points since January 2010, in line with the increase in sovereign credit default swap spreads. At the same time, the equity market capitalization of EU banks has declined by more than 40 percent. These market pressures have intensified in recent weeks.

⁸As discussed in previous GFSRs, there has also been a feedback from some banking sectors to their governments through an increase in the sovereigns' contingent liabilities. Box 1.2 in the October 2010 GFSR describes a model, based on a contingent claims analysis, for assessing such risk transmission between sovereigns and banks.

Figure 1.13. Size of High-Spread Euro Area Government Bond Markets
(In percent of total euro area government debt)

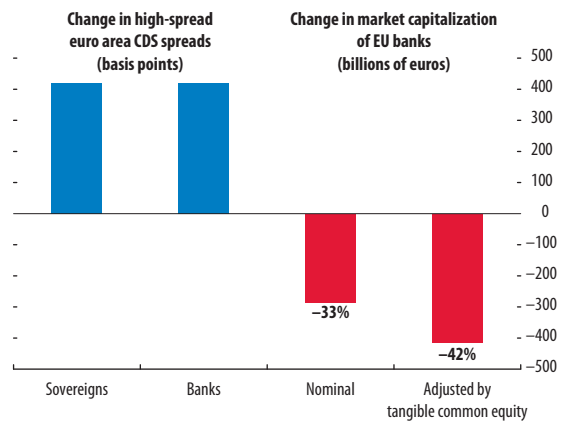
Sovereign credit default swap spreads:
■ Greater than 200 basis points
■ Less than 200 basis points



Sources: Bank for International Settlements; Bloomberg L.P.; and IMF staff estimates.
 Note: The size of the euro area government debt market was €6.5 trillion as of end-2010. Components may not sum to 100 because of rounding.

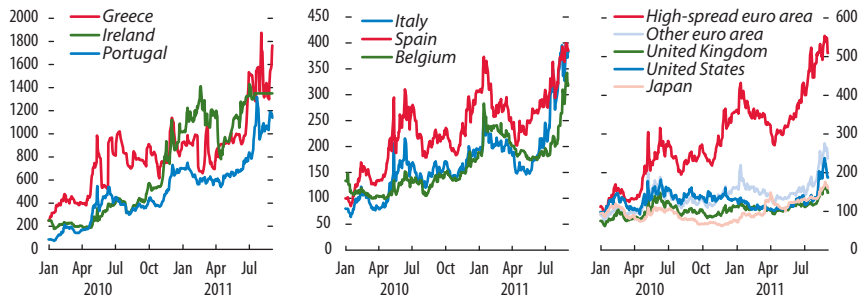
Spillovers from high-spread euro area sovereigns have affected local banking systems but have also spread to institutions in other countries with operations in the high-spread euro area and with cross-border asset holdings. In addition to these direct exposures, banks have taken on sovereign risk indirectly by lending to banks that hold risky

Figure 1.14. European Credit Risks and Market Capitalization
(Change since January 2010)



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

Figure 1.15. Spreads on Bank Five-Year Credit Default Swaps
(In basis points)



Sources: Bloomberg L.P.; and IMF staff estimates.
Note: End-2010 asset-weighted spreads for a sample of banks in each economy. High-spread euro area countries are Belgium, Greece, Ireland, Italy, Portugal, and Spain.

sovereigns. Banks are also affected by sovereign risks on the liabilities side of their balance sheet as implicit government guarantees have been eroded, the value of government bonds used as collateral has fallen, margin calls have risen, and bank ratings downgrades have followed cuts to sovereign ratings.

All of this has increased the riskiness of exposures to banks in the high-spread euro area. Because banks lend to banks, the system is highly interconnected, both within and across borders. Consequently, the banking system can amplify the size of the original sovereign shock through funding markets. Indeed, sovereign spillovers have also had an impact on bank funding markets. This can be illustrated by the sharp widening in credit default swap spreads for banks in the high-spread euro area countries (Figure 1.15);⁹ the continued reliance of banks in Greece, Ireland, and Portugal on central bank liquidity support; and the difficulties that some banks in these countries have had in issuing debt (Figure 1.16).¹⁰

This GFSR seeks to explain why bank equity and funding markets are under strain. It measures the size of credit-related strains emanating from a widening group of euro area sovereign bond markets

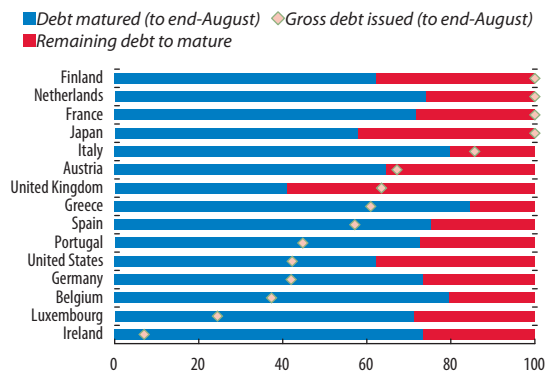
⁹The importance of bank funding costs has been recognized in the stability analysis carried out as part of the recent Financial Sector Assessment Program Updates for the United Kingdom and Germany, as documented in the respective Financial System Stability Assessments (IMF, 2011a and 2011c).

¹⁰In some countries banking sector deleveraging has reduced the amount of debt that needs to be issued this year relative to the amount maturing. This would be reflected by a low percentage of gross debt issuance shown in Figure 1.16.

that have come under pressures and their spillover to banks. It measures the impact of this increase in credit risk since the end of 2009 on bank exposures to selected sovereigns and banks (an integral part of sovereign spillovers). These sovereign credit strains are a signal of vulnerability, as they have become substantial in magnitude and have continued to mount (see Box 1.3).

However, it is important to note that the exercise is not a calculation of the capital needs of banks (that could be different from the size of spillovers in this report). Determining capital needs would call for a full-fledged stress test that seeks to identify the full range of stresses and offsets covering all balance

Figure 1.16. Bank Debt Issuance as a Percent of Maturing Debt, 2011



Sources: Dealogic; and IMF staff estimates.
Note: For presentational purposes, the chart maximum is set to 100.

Box 1.3. Quantifying Spillovers from High-Spread Euro Area Sovereigns to the European Union Banking Sector

European banks have become vulnerable to perceived increases in sovereign risk. In order to help explain the significant market pressures that some banks are facing in funding and equity markets, the analysis in this chapter aims to quantify the spillovers from high-spread euro area sovereigns to the European banking sector. This box discusses the choices made in methodology and their implications.

Since the outbreak of the sovereign crisis in 2010, sovereign bonds in several euro area countries are no longer perceived by markets as “risk free.” This exercise seeks to measure the impact of this increase in credit risk on bank exposures to selected sovereigns and interbank exposures (an integral part of sovereign spillovers). These estimated sovereign credit risks serve as a vulnerability indicator, as they have become substantial in magnitude and have continued to mount. This box also reviews accounting and regulatory practices and discusses the extent of recognition of sovereign strains. This exercise is not aimed at calculating the net impact of gains and losses on sovereign debt, nor is it intended to determine the size of bank capital needs, which would call for a full-fledged stress test.

Methodological Choices

In undertaking this exercise, several key methodological choices have been made—specifically: (i) the countries included as a source of sovereign strains; (ii) the class of assets included—exposures to sovereigns and interbank exposures; (iii) the market price/instrument used to measure credit strains; and (iv) the extent of balance sheet coverage. Since these choices have important implications for the resulting estimates, it is necessary to clarify the economic rationale behind them and the sensitivity of the results.

*Country coverage:*¹ The analysis is based on the six high-spread euro area countries. This group

Note: Prepared by Sergei Antoshin and William Kerry.

¹The analysis is conducted for 20 banking systems in the European Union as well as for the sample of banks in the European Banking Authority’s (EBA) 2011 stress test. Spillovers are quantified by applying an estimate of the increase in credit risk to the latest available balance sheet data on a consolidated basis. The exercise includes exposures to sovereigns and banks in the high-spread euro area. For the banking system exercise, domestic exposures—such as Greek bank exposures to the Greek sovereign—are estimated from

includes the three program countries—Greece, Ireland, and Portugal—and the three countries that have more recently experienced market strains and widening financing spreads—Belgium, Italy, and Spain. As shown in Figure 1.13, this group accounts for about half of the euro area government bond market. The decision to limit the analysis to high-spread countries is motivated by the desire to better isolate the source of current market strains. Arguably, credit strains have increased somewhat in other euro area countries, and if the analysis were to be extended to all euro area sovereigns, the estimated impact of sovereign credit risk—measured by CDS spreads—would be higher.

Assets: In addition to banks’ sovereign exposures, we include bank exposures to banks located in the high-spread euro area.² Interbank exposures are an integral part of sovereign spillovers because of contemporaneous linkages between sovereign and bank credit risks, complex interconnectedness of the banking system, and substantial holdings of interbank debt. Banks located in the high-spread euro area are directly affected by sovereign credit risks through both the asset and liability sides of the balance sheet, as evidenced by close correlation of sovereign and bank credit spreads.³

Credit risk measure—bond yields or bond spreads? Credit risks are commonly assessed using credit

data published with the EBA 2011 stress test. These data are adjusted to the banking system level using information on the coverage of the EBA stress test. International exposures are from the Bank for International Settlements (BIS) dataset. For some banking systems, data on cross-border exposures are not available from the BIS data, so cross-border exposures from the EBA dataset are used. Exposures for the individual bank exercise are taken from the EBA dataset.

²The exercise uses latest available balance sheet data, so some of the exposures—such as securities held in the trading and available-for-sale portfolios—may be recorded at fair value. In the EBA dataset, around 12 percent of government exposures are in the trading book and a further 49 percent are held as available for sale. As we apply changes in credit spreads to these marked-down exposures, we may underestimate total spillovers for the period since end-2009.

³Interbank exposures are reduced by adjusting for repos using the data available. Nevertheless, interbank deposits may still include some collateralized exposures, which may experience less deterioration in credit quality than that implied by CDS spreads.

Box 1.3 (continued)

spreads for a wide range of risky assets—including bank debt, corporate debt, and emerging market government and corporate debt—although the market may overshoot during periods of market strain. Credit spreads or bond spreads—rather than bond yields—are used to isolate the credit risk component and to remove the effect of the risk-free rate. For this reason we choose to use sovereign CDS spreads.⁴ The change in credit risk is calculated from the end of 2009, before the escalation of the sovereign crisis, to September 2011. Similarly, this analysis could have been done using bond spreads to German bunds and is shown to give very similar results (see first table). For comparison purposes, if government bond yields were used instead of CDS spreads, the total impact from the high-spread euro area would be 31 percent lower for sovereign exposures (see first table), largely reflecting the decline in the risk-free rate.⁵

Should safe-haven gains be included? The increase in sovereign credit risk and the widening of spreads have been accompanied by flows into “safe havens” such as German bunds, which have risen in price, creating a capital gain for banks that are holding these bonds. One might argue that these gains offset some of the potential losses from holdings of riskier sovereign debt. However, this exercise is focused on measuring the vulnerability of banks to rising sovereign risks. Netting the gains from safe-haven bonds would mask the overall size of

⁴Changes in credit risk are estimated from CDS spreads (S) by converting them into synthetic prices (P) using $P_t = \exp(-S_t T)$. The calculation uses a weighted average maturity (T) and a matching CDS spread. For sovereign exposures, the weighted average maturity is calculated from the EBA dataset. For interbank exposures, weighted average maturities are estimated using information on maturities of bank bonds issued by institutions from the high-spread euro area countries and on an assumed three-month maturity of interbank lending.

⁵There are other reasons for not choosing bond yields. Downward shifts in the yield curve and its flattening generally have an adverse impact on bank income margins that would have to be taken into account. In high-spread euro area countries, rising bank credit spreads also have an impact on net interest income, as funding costs increase and often become prohibitive, while the extent of the pass-through to customers is limited, especially for retail loans. This has so far been mitigated in part by the increased recourse to central bank funding.

Spillovers from High-Spread Euro Area Sovereigns to the European Banking System

(In billions of euros)

Spillovers from exposures to sovereigns in:	Basis of Spillover Calculation		
	CDS spreads	Bond spreads	Bond yields
Greece	56	55	53
Ireland	7	7	5
Portugal	17	18	16
Belgium	9	9	2
Italy	71	70	41
Spain	44	43	23
Total	204	202	142

Source: IMF staff estimates.

Note: Based on changes in market prices from the end of 2009 to September 2011.

the problem, and could not be a panacea for the sovereign crisis. In addition, the distribution of gains from holdings of highest quality government bonds within the banking system is uneven—with banks in the high-spread euro area holding relatively fewer—resulting in increased segmentation of funding markets in the euro area. Importantly, if safe-haven gains are included, the exercise ought to be broadened to a stress test that would include the full range of banks’ assets affected by the crisis. This would include other risky assets, such as holdings of bank equities, corporate bonds and loans, and other assets originated in the high-spread euro area. Including other private sector exposures would be expected to generate an additional sizeable impact, as corporate credit spreads are often significantly correlated with sovereign credit spreads.

Recognition of Sovereign Strains in Bank Capital

This exercise is not intended to measure the losses and gains that arise from the change in bond prices, some of which is due to increased sovereign risk. Nonetheless, increased losses owing to increased default risk or declines in market value are partly taken into capital.

Loss recognition and its impact on capital are determined by accounting and regulatory standards and how those standards are put into practice, which can vary from bank to bank and country to

Box 1.3 (continued)**European Banks: Loss Recognition on Sovereign Exposures**

	Percent of Total Exposures ¹	Accounting Standards		Accounting Practices	Regulatory Standards	Regulatory Practices
		Impact	Valuation method	Impact on regulatory capital		
Trading book	12	Realized loss/gain in profit and loss account	Fair value	Generally MTM. Mark-to-model if the market is inactive. At some banks, internal models for “illiquid” assets are used.	Yes	Yes
Available for sale	49	Unrealized loss/gain, impact on equity	Fair value	Generally MTM. Mark-to-model if the market is inactive. At some banks, internal models for “illiquid” assets are used.	Basel II is silent; under Basel III, yes, in the future	Varies: in many cases, losses are added back to capital
Held to maturity	39	Provisions in profit and loss account	Amortized cost, net of any impairment provision, based on “incurred loss”	Provisions mostly taken on eligible Greek government debt.	Yes	Yes

¹Based on the European Banking Authority's data on banks' exposures to high-spread euro area sovereigns. Held-to-maturity value is calculated as the residual. MTM = mark to market.

country. The points below summarize the current state of play (see also second table).

Trading book. Securities held in the trading book are mostly marked to market, so losses go through profit and loss accounts and are recognized in equity capital. However, accounting standards allow the use of internal models in the event of an inactive market. Around 12 percent of sovereign exposures (based on the EBA dataset) are held in the trading book and their fair value should be fully reflected in both accounting and regulatory capital measures.

Available for sale. Accounting rules state that the available-for-sale (AFS) portfolio should be marked to market and recorded in tangible common equity. Recent criticisms expressed by the International Accounting Standards Board (IASB) concerning the treatment of Greek government debt suggest that banks have recognized losses in an inconsistent fashion, sometimes reclassifying government debt as illiquid and in some cases using internal valuation models instead of market prices. From a regulatory perspective, Basel II is silent on the treatment of unrealized AFS losses, resulting in diverging practices across countries. Unrealized losses (as

well as unrealized gains) on the AFS portfolio have not always been incorporated in regulatory capital calculations.⁶

Held to maturity. There are several issues with the implication of the accounting rules determining the provisions associated with sovereign exposures in the held-to-maturity (HTM) portfolio. The calculation process (which is based on internal models) underestimates the effect of credit risk deterioration and therefore will produce lower provisions than marking to market. This is partly because the current approach is based on “incurred loss”; thus, risks—unless materialized—cannot be quantified.⁷ As a result, provisioning has been predominantly on the sovereign debt of Greece eligible for the ongoing debt exchange process, in some cases amounting to 21 percent of face value.

⁶This will change under Basel III, as institutions will be required to take unrealized AFS losses into account in their regulatory capital calculations; and the BCBS will continue to review the appropriate treatment of unrealized gains.

⁷The IASB is currently finalizing a new approach based on “expected loss” that will replace the existing IAS 39 arrangements. These are due for release shortly.

Box 1.3 (continued)

In sum, although losses are likely to have been recognized in the trading book, loss recognition has been slow and inconsistent in the banking book. To improve transparency, more clarity in the accounting standards is required for the application of mark-to-market valuation for thinly traded govern-

ment bond markets and the method of provisioning in HTM should be revisited. In addition, more consistency is needed in the recognition of AFS losses in regulatory capital across jurisdictions (see the discussion in the “Policy Priorities” section of the main text).

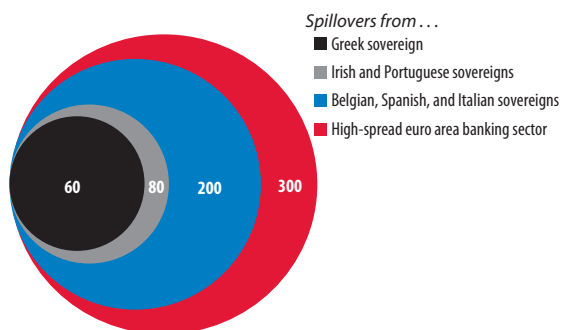
sheet assets, liabilities, and income/losses on banks. A typical stress test would have several components that are beyond the scope of this exercise. For example, it would include an economic scenario that would result in rising losses on bank’s loan books, a marking to market of securities, including corporate bonds, and a projection of new income and how this would be affected by funding strains. In addition, it would include the size of capital buffers and provisions available to cushion increased losses, and from there it would derive a capital need.

The epicenter of sovereign risk has been Greece, which generated the first of four waves of spillover to European banks. The analysis suggests that, first, spillovers on European bank exposures to the Greek sovereign have amounted to almost €60 billion (Figure 1.17). Second, as sovereign risks spread to

other governments, the spillovers to banks have mounted. If the sovereign stresses in Ireland and Portugal are included, the total spillover rises to €80 billion. Third, the governments in Belgium, Italy, and Spain have also come under market pressure; incorporating credit risks from these sovereigns into the analysis further raises the total estimated spillover, to about €200 billion. Fourth, bank asset prices in the high-spread euro area have fallen in concert with sovereign stresses, leading to a rise in the credit risk of interbank exposures; including those exposures increases the total estimated spillover to €300 billion overall. Although these numbers are based on market assessments of credit risk, which may reflect a degree of overshooting, the underlying problems that they highlight are real.

Banking systems in the high-spread euro area are likely to be most affected.

Figure 1.17. Cumulative Spillovers from High-Spread Euro Area Sovereigns to the European Union Banking System
(Billions of euros)



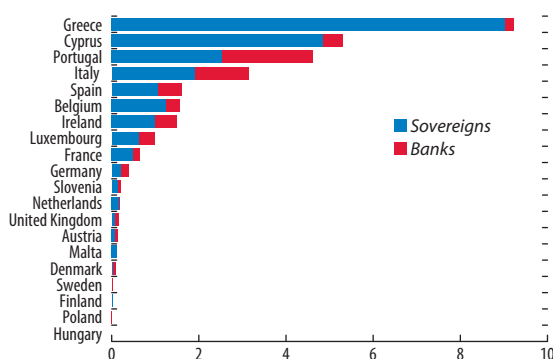
Source: IMF staff estimates.

Note: The size of the circles is proportional to the size of the spillover. Includes banking systems in 20 European Union countries. The high-spread euro area countries are Belgium, Greece, Ireland, Italy, Portugal, and Spain. Figures are rounded to the nearest 10 billion euros.

This aggregate picture masks a heterogeneous range of spillovers on country banking systems (Figure 1.18). High-spread euro area systems have faced the most severe spillovers from their local sovereigns. The key exception to this is Cyprus, which has high spillovers from bank exposures to the Greek sovereign. A number of other banking systems such as those of Luxembourg, France, and Germany have experienced spillovers from the high-spread euro area to their foreign operations or cross-border exposures, but these represent a smaller percentage of assets. Finally, several European banking systems have had little or no spillover from high-spread euro area sovereigns.

Conducting the analysis on individual bank balance sheets confirms the results of the aggregate

Figure 1.18. Spillovers from High-Spread Euro Area Sovereigns to Country Banking Systems
(In percent of assets)

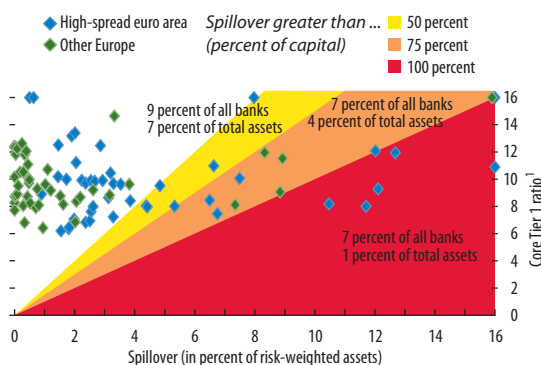


Source: IMF staff estimates.
Note: The high-spread euro area countries are Belgium, Greece, Ireland, Italy, Portugal, and Spain.

exercise.¹¹ Banks from the high-spread euro area have had the greatest spillovers (Figure 1.19). But even within banks in these countries, the spillovers have been uneven. There are also a few banks from other countries where spillovers have been large.

Overall, only a small number of banks in the sample fall in the red zone of Figure 1.19. These

Figure 1.19. Distribution of Spillovers from High-Spread Euro Area Sovereigns to European Banks



Source: IMF staff estimates.
Note: For presentational purposes, the cutoff points for capital ratios and spillovers are 16 percent. The high-spread euro area countries are Belgium, Greece, Ireland, Italy, Portugal, and Spain. Data are based on the sample of 90 EU banks in the EBA 2011 stress test.

¹¹Includes core Tier 1 capital at end-2010, actual equity raising in January–April 2011, and commitments for equity raisings made by April 2011.

¹²The individual bank exercise was applied to the sample of banks in the European Banking Authority stress test.

banks represent about 1 percent of assets in the sample, while 22 percent of banks in the sample, representing 12 percent of assets, fall in the red, orange, and yellow zones, where spillovers represent more than half the level of core Tier 1 capital. Some of these spillovers will have been recognized by banks, but the full extent to which losses on government bonds have been recognized in bank accounts is unclear (see Box 1.3).

Spillovers could spread to other financial institutions.

Insurance companies have also been affected by sovereign credit risk spillovers through their direct holdings of both sovereign and bank debt. The spillovers to insurance companies were assessed in a manner similar to that for banks.

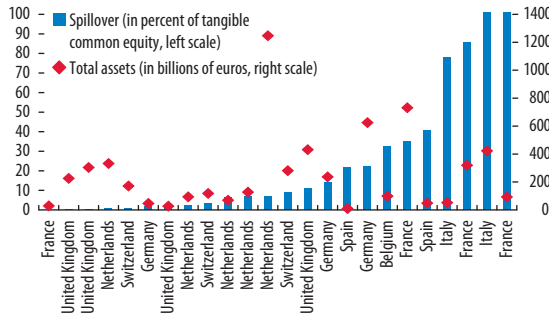
Disclosure of the insurance sector’s exposures to the high-spread euro area, however, remains limited and mostly voluntary,¹² so the analysis could be applied only to selected large insurers from data they have published on sovereign exposures. Nevertheless, spillovers are significant at a number of large insurers, particularly in France and Italy (Figure 1.20). All told, spillovers amounted to more than 20 percent of tangible common equity for about 38 percent of large insurers (representing 39 percent of total assets in the sample).¹³ These results, however, may overestimate the ultimate impact of sovereign risks on insurers as, in contrast to banks, insurers can mitigate their spillovers by passing on costs to policyholders.

For other financial institutions—such as pension funds and sovereign wealth funds—exposures to high-spread euro area sovereign credit risk are even less clear, but these entities are less likely to have a significant impact on the financial system, as their positions are largely held in unleveraged portfolios.

¹²The disclosures of insurance companies and other nonbank financial institutions (NBFIs) could be improved. Information on NBFIs is one of the main themes of the G-20 Data Gaps Initiative. The IMF, in collaboration with the Financial Stability Board, is working to improve the information on NBFIs as well as on G-SIFIs (global systemically important financial institutions) and to expand the number of countries reporting Financial Soundness Indicators for NBFIs. See www.imf.org/external/np/g20/pdf/063011.pdf.

¹³The sample comprises 24 large insurers registered or with a significant share of operations in Europe.

Figure 1.20. Spillovers from High-Spread Euro Area Sovereigns to Insurers
(Based on gross exposures)



Source: IMF staff estimates.

The potential exists for funding market disruption to intensify.

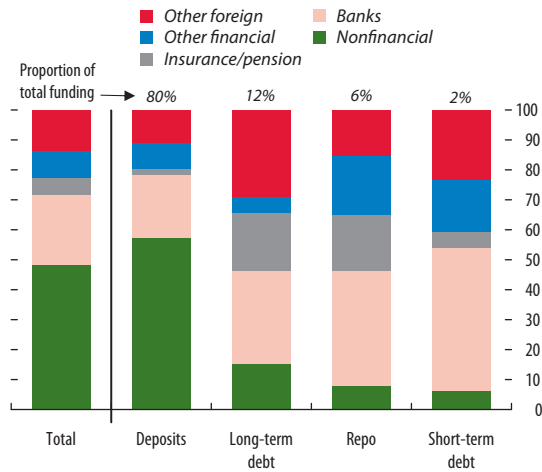
A number of factors could cause the disruption to funding markets to spread and intensify. Banks affected by sovereign spillovers might decide to pull back funding to other banks to reduce credit risk or even to preserve liquidity in anticipation of future funding problems. That could be significant given the highly interconnected nature of the global banking system: interbank funding represents about one-fourth of total financing for the banking sector (Figure 1.21).¹⁴

Also, banking groups that operate across national borders pose risks to banking systems. Banks facing funding pressures could reduce or withdraw intragroup financing from foreign branches to help preserve liquidity, thereby transmitting the funding shortages from one country to another. This is particularly an issue for those emerging market banking systems with a large foreign presence and considerable intragroup financing.

Other financial institutions—such as insurance companies, pension funds, and money market funds—are the source for nearly one-fifth of banking financing (see Figure 1.21). The role of these institutions in debt and repo markets is much greater, so any cutback in funding could significantly disrupt wholesale funding markets.

¹⁴The recent Financial Sector Assessment Program Updates for Sweden and the United Kingdom note vulnerability to liquidity stress due to heavy reliance on short-term wholesale funding (IMF, 2011b and 2011c).

Figure 1.21. Advanced Economy Bank Funding by Source, 2011:Q1
(In percent)

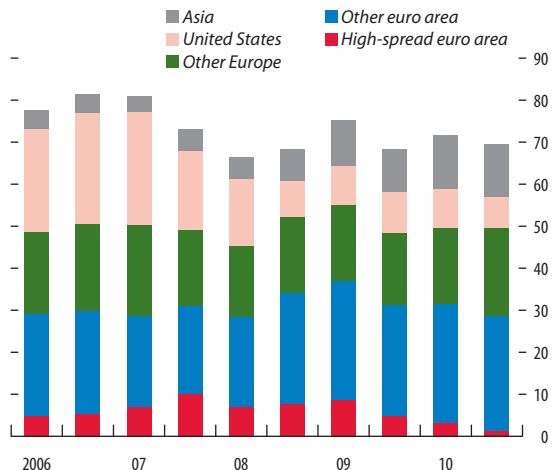


Sources: Bank for International Settlements; national authorities; and IMF staff estimates.

Note: Aggregate funding of banks located in the euro area, Japan, the United Kingdom, and the United States. "Banks" includes institutions in the domestic economy and rest of the world.

Indeed, U.S. money market funds have reduced their funding of euro area banks, particularly institutions in high-spread countries (Figure 1.22). As Box 1.4 discusses, this has already created some pressures in dollar funding markets. If investors

Figure 1.22. U.S. Prime Money Market Fund Exposures to Banks
(Percent of total assets)



Source: Fitch.

Note: The high-spread euro area consists of Belgium, Greece, Ireland, Italy, Portugal, and Spain.

Box 1.4. Why Do U.S. Money Market Funds Hold So Much European Bank Debt?

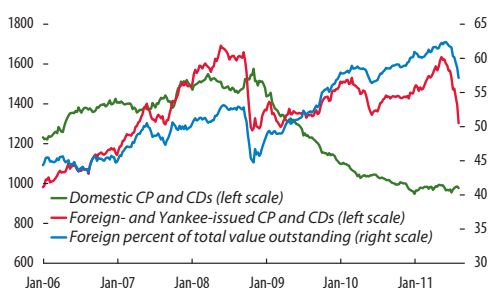
Given their sizable holdings of European bank paper, U.S. money market mutual funds are a potential transmission channel of the European sovereign debt crisis. Why have the money funds built up such a large exposure, and what are the implications if they significantly reduce it?

With \$2.7 trillion in assets, U.S. money market mutual funds (MMMFs, or money funds) are systemically important institutions. Prime MMMFs account for the largest share of the market, representing \$1.6 trillion, or around 60 percent, of total MMMF assets. The remaining 40 percent is in government and tax-free money funds.¹

A number of factors have reduced the supply of dollar-denominated money market instruments in recent years, from a peak of about \$12 trillion in 2008 to about \$9.1 trillion currently.² First, the collapse in the ABCP conduit model during the crisis shrank the stock of investible ABCP paper.³

Outstanding Dollar-Denominated Commercial Paper and Time Deposits, by Issuer

(In billions of U.S. dollars except as noted)



Sources: Federal Reserve; and IMF staff estimates.

Note: CD = certificate of deposit; CP = commercial paper.

Note: Prepared by Rebecca McCaughrin.

¹Prime MMMFs invest in high-quality, short-term credit instruments—primarily certificates of deposit (CDs), repurchase agreements (repos), commercial paper (CP), asset-backed CP (ABCP), short-term corporate notes, and other money funds. Government and tax-free funds invest mainly in Treasuries, agency debt, and municipal bonds.

²This figure includes the outstanding stock of repurchase agreements, Treasury bills, commercial paper, banker's acceptance paper, large time deposits, and other instruments.

³The stock of ABCP fell from a precrisis level of \$1.2 trillion to about \$380 billion. ABCP conduits are bankruptcy-

Second, the supply of Treasury bills was curtailed by flight-to-quality flows and the mid-2011 end of the U.S. Treasury's Supplementary Financing Program.⁴ Third, the supply of CP declined as U.S. nonfinancial corporations built up large cash positions. Fourth, the supply of agency notes declined as Fannie Mae and Freddie Mac were wound down. Fifth, banks' reduced dependence on wholesale funding cut the supply of bank CDs.

In response to the decrease in the supply of domestic dollar-denominated instruments, MMMFs increased their holdings of dollar-denominated foreign debt and so-called Yankee paper (the latter being dollar-denominated debt issued in the United States by foreign entities), especially by European banks with a small deposit base seeking to finance their large dollar-denominated assets. Until recently, the stock of dollar-denominated foreign- and Yankee-issued CP and CDs had grown to more than 60 percent of the outstanding stock of financial and nonfinancial CP and CDs, up from 45 percent in 2008 (first figure). As a result of sovereign stress, money funds gradually reduced their exposure to euro area banks in early 2010, paring exposures further in mid-2011 to 23 percent of total assets (table).

Any change in MMMF willingness to hold European bank paper is likely to affect the cost and availability of dollar funding. The MMMFs have provided a convenient way for U.S. branches and subsidiaries of foreign banks to build up precautionary dollar reserves (second figure).⁵ Ample

remote special-purpose vehicles that issue short-term paper backed by the cash flows from physical assets. Before the financial crisis, banks relied on ABCP conduits as a short-term funding vehicle backed mostly by mortgage-related assets. Deterioration in the underlying assets and the inability of conduits to roll over their paper eventually led to the contraction in the ABCP market.

⁴The Treasury program temporarily added as much as \$200 billion to the supply of Treasury bills.

⁵U.S. branches and subsidiaries of foreign banks sometimes channel dollar funding to their overseas parent offices. Beginning April 1, 2011, the Federal Deposit Insurance Corporation (FDIC) started to assess domestic banks a fee based on their total assets, but branches and subsidiaries of foreign banks that are not insured by the FDIC are exempt. This risk-free arbitrage for foreign banks has likely led to excess liquidity being channeled to their U.S. offices because they are still

Box 1.4 (continued)

Prime Money Fund Exposure to Short-Term Bank Credit, as of End-June 2011

(In billions of U.S. dollars except as noted)

	ABCP/CP/CD	Repo	Total	Percent of Total Prime Assets
Europe	547	128	675	41.2%
Euro area	331	46	377	23.0%
Austria	1	-	1	0.1%
Belgium	1	-	1	0.1%
France	182	18	200	12.2%
Germany	48	23	71	4.3%
Ireland	-	-	-	0.0%
Italy	8	-	8	0.5%
Luxembourg	1	-	1	0.1%
Netherlands	85	5	90	5.5%
Spain	5	-	5	0.3%
Other Europe	216	82	298	18.2%
Denmark	10	-	10	0.6%
Norway	12	-	12	0.7%
Sweden	46	-	46	2.8%
Switzerland	37	28	65	4.0%
United Kingdom	111	54	165	10.1%

Sources: Investment Company Institute; and JPMorgan Chase.

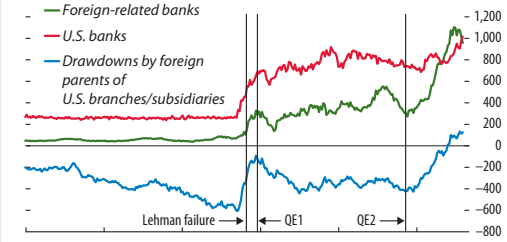
Note: Monthly portfolio holdings of top 18 money market funds.

ABCP = asset-backed commercial paper; CD = certificates of deposit; CP = commercial paper.

funding had also helped to contain pressures in dollar funding markets despite intensifying sovereign risk. That is no longer the case: Offshore dollar-denominated issuance by European banks and dollar-denominated foreign issuance has begun to decline, as money funds are reluctant to increase exposure to European banks and pressures in dollar funding markets have risen (third figure). The cushion of reserves built up by U.S.

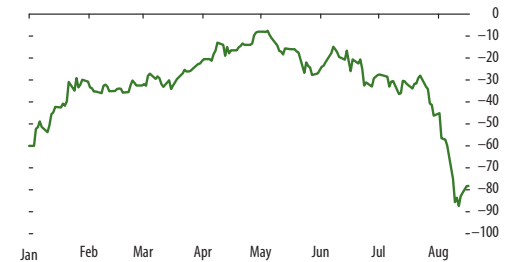
eligible to hold reserves at the Federal Reserve for 25 basis points. The FDIC exemption, as well as excess dollar liquidity created by the Federal Reserve's second round of quantitative easing and the increase in offshore dollar funding by foreign parent banks, has led to an accumulation of cash in U.S.

Reserves of U.S. Banks and U.S. Offices of Foreign Banks
(In billions of U.S. dollars)



Sources: Federal Reserve; and IMF staff estimates.
Note: A more negative drawdown implies increased funding provided by U.S. offices of foreign banks to parent offices, while a less negative drawdown implies foreign parents are draining less liquidity from their U.S. operations. QE1 and QE2 are announcements of quantitative easing.

Three-Month Euro–Dollar FX Swap Basis, 2011
(In basis points)



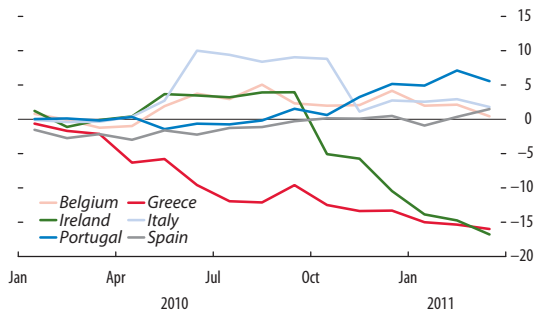
Source: Bloomberg L.P.

branches of European banks helps to buy time, but the cushion is at risk of being depleted if a pullback by the money funds is accompanied by a generalized rise in risk aversion among other lenders. This could lead to further pressures in bank funding markets.⁶

offices of foreign banks. If needed, these reserves could be funneled to foreign parents.

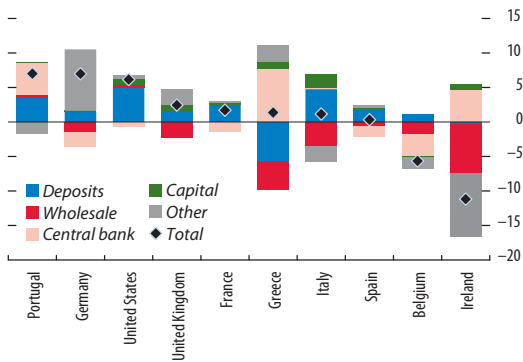
⁶A more general pullback by money market funds could also lead to higher funding costs and difficulties in rolling over funding at municipalities and other issuers. Tax-exempt mutual funds currently hold \$300 billion in municipal paper, which is helping to fund roughly 12 percent of state and local government liabilities.

Figure 1.23. Deposit Growth in High-Spread Euro Area Countries
(Cumulative percent change since end-2009)



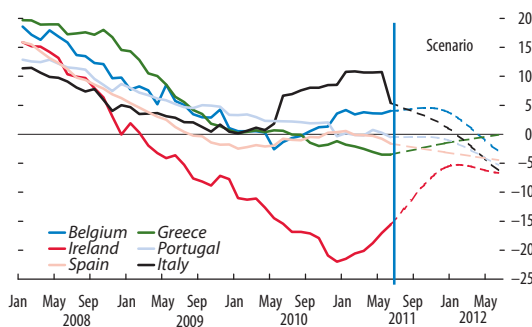
Source: Haver Analytics.

Figure 1.24. Contributions to Change in Bank Balance Sheets since End-2009
(In percentage points)



Sources: European Central Bank; Haver Analytics; and IMF staff estimates.
Note: "Other" includes liabilities to nonresidents (which, for euro area banking systems, are residents outside the euro area).

Figure 1.25. Deleveraging Scenario: Change in High-Spread Euro Area Bank Credit to the Nonfinancial Private Sector
(In percent, year-on-year)



Sources: Bloomberg L.P.; Haver Analytics; and IMF staff estimates.
Note: The dotted lines are estimates based on the assumption that banks are unable to obtain funding in markets.

in money market funds become concerned about potential losses from euro area banks and seek to redeem their money, money market funds might pull back further from bank funding.

The disruption in euro area wholesale funding markets could also spread to depositor funding. At banks in Greece and Ireland, both wholesale and customer deposits have fallen since the end of 2009 (Figure 1.23). It is essential to prevent these withdrawals from moving into a more virulent phase, as has happened in past emerging market crises.

A worsened funding market would pressure banks to deleverage.

Funding strains are likely to increase deleveraging pressures on banks. Indeed, there have been significant reductions in wholesale and nonresident funding in several European countries since the end of 2009 (Figure 1.24). In some cases, this has been associated with planned deleveraging of banking systems. But in other countries, such as Greece, deleveraging has been prevented only by an increase in central bank liquidity support. The important recent decision by the European Central Bank to offer six-month liquidity is, therefore, likely to help address pressures in bank funding markets. But the scale of support that may be needed to tackle the full consequences of sovereign spillovers could well be large. In the long run, such support would be neither healthy nor sustainable for the banking system.

These deleveraging pressures, if not effectively countered, risk pushing down credit growth to levels even lower than the current anemic rates in many high-spread euro area countries (Figure 1.25). The September 2011 *World Economic Outlook* discusses the impact of lower credit growth on economic activity. It is projected that banks will respond to a fall in capital by raising interest rates on their loans and restricting lending to the economy. As a result, it is estimated that, in a downside scenario, growth in the euro area and the United States could decline relative to the WEO baseline by 3.5 percentage points and 2.2 percentage points, respectively.

Spillovers could also spread to derivatives and other financial markets.

Sovereign risks could also spill over to credit derivatives markets. Some investors have bought credit default swaps on sovereign debt to hedge their direct exposures to sovereigns, while other investors have used the market to express a view on a country. There is some risk that a credit event that triggered sovereign credit default swaps could place strains on institutions that have sold credit protection; however, these risks appear contained given the relatively small size of outstanding credit default swap markets for the countries with the widest spreads (Figure 1.26).

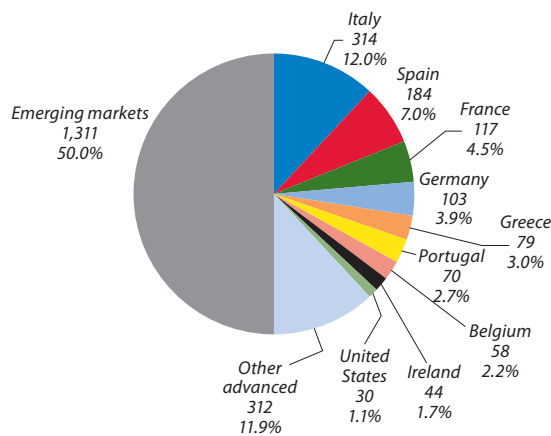
Also, the contagion to financial markets could widen if investor risk appetite is weakened by sovereign stress, especially if the current crisis spreads and intensifies. This could create a second round of impacts on financial institutions, including banks and insurance companies, particularly if they are forced to sell assets at low prices, for example if they face a rationing of funding market liquidity.

Comprehensive, coherent policies are needed to resolve sovereign risks, increase the resilience of the European banking sector, and prevent contagion risks.

Appropriate fiscal action, combined with measures to strengthen banks through balance sheet repair and adequate levels of capital, can help to break the link between sovereigns and banks. If a country’s fiscal measures are successful in restoring the long-term sustainability of public finances, its sovereign risk premium will be reduced, putting public debt on a “good equilibrium” path. This will go a long way toward reducing pressures on banks. Nevertheless, in view of the heightened risks and uncertainty—and the need to convince markets—a number of banks, especially those exposed to strained public debt (directly or through cross-border holdings) and most of those dependent on wholesale financing, may also need more capital. Additionally, the amount of new capital needed would also depend, in part, on the credibility of the macroeconomic policies pursued to address the roots of sovereign risk.

The various channels of propagation from sovereign risk into the wider economy carry an enormous potential for contagion. First, some European banks urgently need to bolster their capital levels to mitigate the risks posed by these spillovers and to help restore funding market confidence. This conclusion echoes the call from the European Banking Authority (EBA) for strengthening the capital positions both at failing institutions and at those that passed the 2011 stress test but which were nonetheless close to the minimum capital threshold and were carrying significant sovereign exposures.¹⁵ In current market conditions, however, this may not always be possible, so public backstops first at the national level and ultimately through the European

Figure 1.26. Sovereign Credit Default Swaps: Gross Outstanding Amount
(In billions of U.S. dollars and percent of total)



Source: The Depository Trust & Clearing Corporation.
Note: Global total was \$2.6 trillion at week ending August 5, 2011.

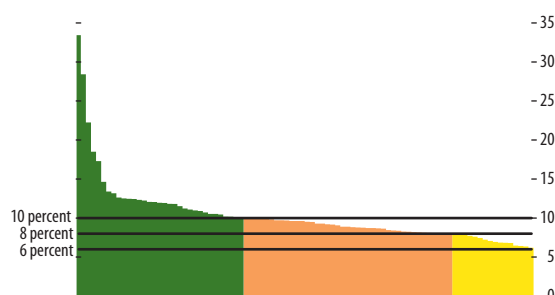
¹⁵The European Banking Authority’s 2011 stress tests found that, at the end of 2010, 20 banks would fall below the 5 percent core Tier 1 ratio threshold over the two-year horizon of the exercise. Taking into account capital raising actions implemented by end-April 2011, 8 banks in the aggregate were €2.5 billion below the capital threshold. A further 16 banks had a core Tier 1 ratio of between 5 and 6 percent at the end of the stress test. The stress test results were published along with very detailed information about bank balance sheets. Adoption of this elevated level of transparency for bank disclosure at the national level would represent further progress.

Financial Stability Facility should be used to provide capital to banks as needed.

Second, capital is also required by weaker institutions with high leverage and remaining exposures to poorly performing assets. These banks need to be restructured and, where necessary, resolved in order to reduce overcapacity in the system as well as to improve the profitability and resilience of the remaining institutions. Banks have started to raise equity and have plans to increase capitalization further through issuance or government support. But even after these plans have been accounted for, banks representing nearly one-fifth of total assets of institutions in the EBA 2011 stress test would have core Tier 1 capital below 8 percent (Figure 1.27).

Third, lower leverage is required by investors to cope with uncertainty over economic prospects and sovereign risks in the euro area. This is particularly the case in Europe, where banks have a relatively high reliance on wholesale funding and are more vulnerable to funding shocks. The more uncertain operating environment is prompting creditors to require capital buffers that are above regulatory minima to continue to lend to banks. Having adequate capital is necessary to avoid banks being pushed to deleverage through asset sales as well as by restricting new credit and cutting contingent credit lines, thereby exacerbating the economic slowdown.

Figure 1.27. European Bank Core Tier 1 Ratios
(In percent of risk-weighted assets)



Sources: European Banking Authority; and IMF staff estimates.
Note: Includes core Tier 1 capital at end-2010, actual equity raising from January to April 2011, and commitments for equity raisings and government support made by April 2011.

Is the Search for Yield Leading to Credit Excesses?

The combination of low interest rates and tight credit spreads is generating a search for yield that could jeopardize financial stability. In advanced economies, safeguarding stability calls for greater emphasis on balance sheet repair so as to avoid credit cycle excesses. Being further along in the credit cycle, emerging markets need policies to guard against a buildup of financial imbalances and to strengthen the resilience of their financial systems.

The April 2011 GFSR emphasized that policymakers must shift their focus from maintaining accommodative macroeconomic policies to strengthening balance sheets and reducing debt burdens through structural approaches. Although necessary under current conditions, low rates threaten financial stability if they are prolonged and are not accompanied by balance sheet repair and prudential oversight. In particular, maintaining low real risk-free yields at a time when some credit cycles are shifting into the expansion phase could set the stage for credit excesses while leaving balance sheets vulnerable to a downturn. Although recent economic fragilities may reduce the propensity to take risk, they are also likely to lead to a weakening in credit fundamentals. Finally, with bank balance sheets still in need of repair, low rates may divert credit creation into more opaque channels, such as the shadow banking system.

The flow of capital away from the low interest rates in advanced economies and toward the brighter growth prospects elsewhere is intensifying the expansion of domestic liquidity, credit, balance sheet leverage, and asset prices in emerging market economies. Combined with stimulative domestic policies, these pressures raise the risk of overheating and a buildup of financial imbalances that could erode asset quality even if demand and credit conditions normalize. We model such a scenario in this section. At the same time, with the increase in global stability risks, emerging markets may face an external shock in the form of a sharp reduction in global growth and a reversal in capital flows, and emerging market banks could be weakened by a rise in funding costs. We model the implications for the

capital strength of emerging market banks under such a scenario.

Where are we in the credit cycle?

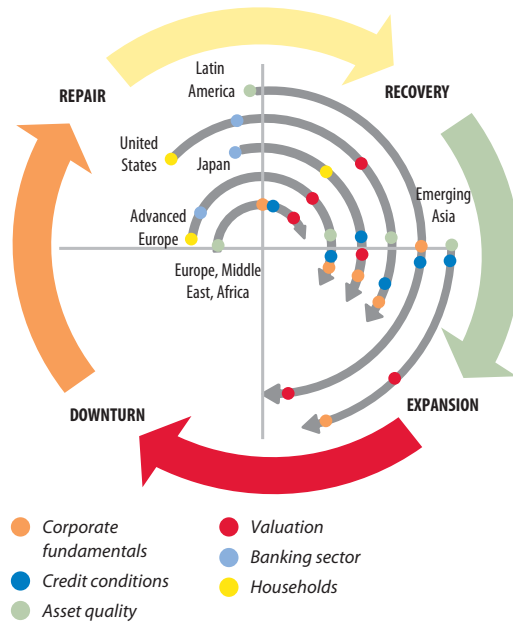
Unless an economy is operating under financial and monetary policies appropriate to its stage of the credit cycle, imbalances can occur. The traditional credit cycle goes through four distinct phases in sequence: *repair* (cleansing balance sheets); *recovery* (restructuring, increasing margins, falling leverage); *expansion* (rising leverage, increasing volatility, increased speculation); and *downturn* (falling asset prices, increased defaults). We assessed the trend of various credit metrics in several countries and regions to pinpoint their current location in the credit cycle.¹⁶ Generally speaking, the global financial crisis has left advanced economies at an earlier phase in the credit cycle and allowed emerging markets to move further along it (Figure 1.28).

- The United States straddles the recovery and expansion phases of the credit cycle. This reflects a bifurcation among sectors: on the one hand, households and banks are still repairing balance sheets. Household leverage remains elevated, and a large shadow inventory of houses continues to dampen housing prices and exacerbate negative equity, in turn posing risks to bank balance sheets (Figure 1.29).¹⁷ A weaker economic trajectory and mounting legal pressures on U.S. banks with large mortgage-related exposures are likely to further exaggerate these risks. On the other hand, large nonfinancial corporations are moving closer to the expansionary phase: Profits have returned to

¹⁶The metrics include credit growth, lending conditions, leverage, interest coverage, free cash flow, capital expenditures, EBITDA (earnings before interest, taxes, depreciation, and amortization) margins, bond yields, housing prices, default rates, nonperforming loans, price-to-book ratio, gross debt, foreclosures, delinquencies, and capital flows. Our assumption that the repair and recovery phases of the cycle roughly mirror the expansion and downturn phases produces a cycle of quartiles. The current value of each credit metric was compared to the range of values in each phase and placed accordingly. Data availability varies across regions. For the euro area, some variables include the entire region and others only selected countries.

¹⁷See the discussion of mortgage principal reductions in the April 2011 GFSR, pp. 28–35.

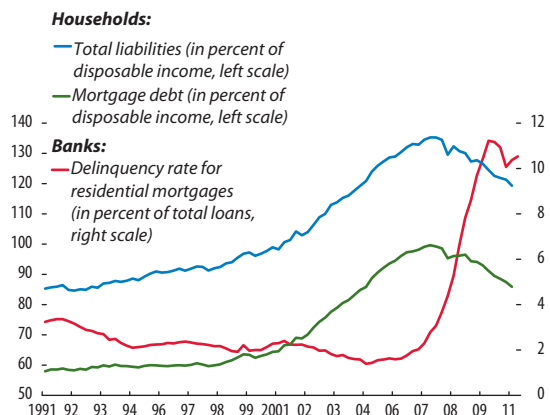
Figure 1.28. Phases of the Credit Cycle



Source: IMF staff estimates.

precrisis levels, cash balances are still at record highs, funding pressures are limited (as firms took advantage of lower rates mostly to refinance rather than fund capital expenditures), default rates are low (and are expected to remain contained

Figure 1.29. U.S. Household Debt and Mortgage Delinquencies



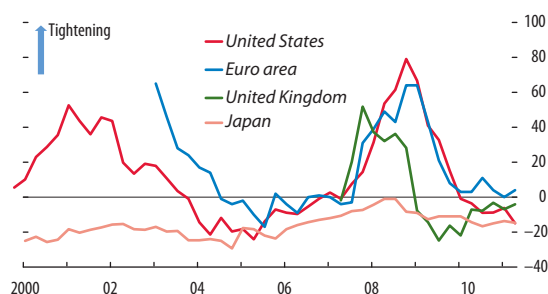
Sources: Federal Reserve; Haver Analytics; and IMF staff estimates.

because the funding gap is low), and bank lending conditions and capital market financing remain easy.¹⁸ Until the recent bout of economic weakness, there were signs that corporate credit metrics had reached an inflection point: organic growth was weakening, and share repurchases, mergers and acquisitions, and leveraged buyout (LBO) activity were gaining momentum.

- The euro area remains at an earlier stage of the credit cycle, in part because the economic cycle is lagging and the repair of bank balance sheets has lagged that in the United States (see the April 2011 GFSR). Household leverage is still too high (especially in the euro area periphery), while some banks continue to struggle with funding pressures, deteriorating asset quality, and an insufficient capital base. Firms continue to deleverage, and corporate downgrades continue to exceed upgrades. Credit conditions (Figure 1.30) remain difficult, and near-term funding pressures are still high.
- Japan is somewhere between recovery and expansion. Corporate leverage is at precrisis levels, bank lending conditions are fairly loose, and, despite the strong yen, corporate earnings have rebounded sharply, as they have in the United Kingdom and the United States.

Figure 1.30. Bank Lending Conditions for Nonfinancial Corporations

(Net percentage of respondents reporting tightening loan standards)



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

Note: For Japan and the United States, a simple average of responses from small, medium-size, and large firms.

¹⁸Smaller firms, which are weighed down by still-weak demand and inconsistent access to credit, continue to lag the rest of the sector.

- Except in the Europe, Middle East, and Africa (EMEA) region, emerging markets are the furthest along in the credit cycle, as they were hit less hard by the global financial crisis and their growth remains strong. Credit growth has continued to expand at a fast clip—especially compared with that in advanced economies—while strong demand for their assets is contributing to releveraging of corporate balance sheets, particularly in Asia and Latin America. The EMEA region is still in the recovery phase except for Turkey, where credit grew rapidly until June 2011 as households and smaller enterprises leveraged. The combination of releveraging and rapid credit growth is stretching valuations. Underwriting standards may be weakening, and due diligence is becoming more lax amid increased lending to weaker credits.

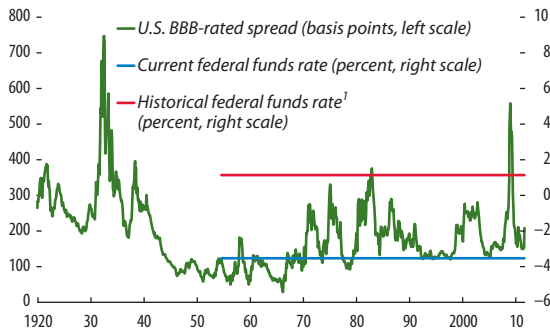
Low interest rates and abundant liquidity have spurred the search for yield...

In the advanced economies, real interest rates are much lower and liquidity is more abundant than is normal for this point in the cycle. For example, the real federal funds rate has historically been at around 1 percent—well above the current rate—whenever spreads on investment-grade corporate bonds (a proxy for the credit cycle) reached current levels (Figure 1.31). A similar situation is evident in other advanced economies, where countercyclical policy stimulus resulted in ultralow policy rates, quantitative easing, and large-scale refinancing operations. With low or negative real interest rates, yields on a wide range of asset classes are too low to meet the return targets for many pension funds and insurance companies or to maintain positive portfolio returns for asset managers.

...leading to a compression in spreads that may not be fully justified by fundamentals...

While the cyclical pattern has not changed, this credit cycle has been faster and more pronounced than in the past because of rapid central bank easing. From as long ago as the 1930s, no other cycle has seen corporate credit spreads narrow from such elevated levels in such a short period. Only in the

Figure 1.31. U.S. BBB-Rated Corporate Credit Spreads versus Real Federal Funds Rate



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

¹Prevailing federal funds rate when credit spreads were historically within 50 basis points of current levels.

1930s credit cycle were spreads as elevated as they were in this one, but then it took nearly twice as much time for spreads to normalize.

Credit spreads have also narrowed sharply in Europe and Asia, although not to the same extent as in the United States. Other credit metrics exhibit a similar pace and magnitude of change: earnings, the credit rating upgrade-to-downgrade ratio, and default rates have all improved sharply. The global default

cycle has been shorter than in earlier cycles in which defaults had reached similar peaks. Low rates have enabled issuers to quickly refinance into longer-dated debt, swap unsecured debt for secured financing, and refinance debt to more manageable repayment levels.

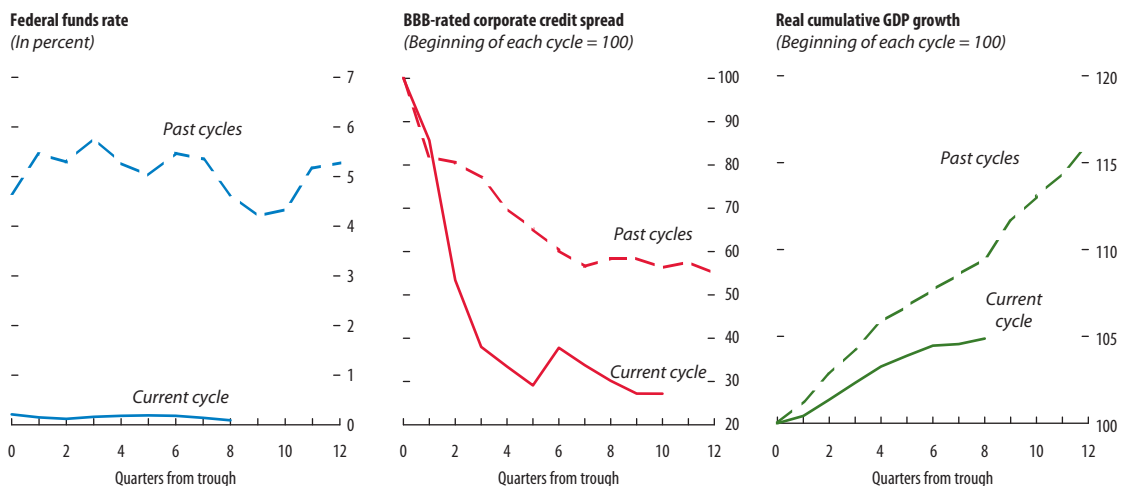
...especially when viewed against the anemic economic recovery.

The overall tightening of corporate credit spreads is occurring against a backdrop of a relatively tepid economic recovery. The current economic cycle is lagging the trajectory of the last 14 cycles, going back to 1929, yet investment-grade spreads have narrowed more sharply and more quickly than during prior cycles as large liquidity injections spread into credit markets and other risky assets (Figure 1.32). A rapid snap-back in spreads could impose losses, thereby undermining corporate as well as funding market confidence.

And as spreads narrow, investors have started to increase leverage to enhance yield, including through the shadow banking system.

Investors have continued to exercise discipline, as lessons from the crisis remain fresh and as concerns about a growth slowdown have returned. However,

Figure 1.32. Current versus Past U.S. Credit and Economic Cycles: Nominal Federal Funds Rate, BBB-Rated Corporate Spread, and Real Cumulative GDP Growth



Sources: Deutsche Bank; Haver Analytics; National Bureau of Economic Research (NBER); and IMF staff estimates.

Note: Economic cycles based on quarterly data for real GDP since 1929; estimates for 1929–1947 interpolated from annual data.

at the margin, the sustained period of low yields has prompted some investors (especially those with return targets) to take on more credit, liquidity, structural, and duration risk or to increase leverage to enhance returns.¹⁹ While welcome as an indication that credit flows remain largely unimpeded, this trend may have stability implications if it gains momentum.

At the start of the year, the strategies employed by investors to increase yield included extending duration and purchasing less liquid and lower quality assets. As spreads continued to narrow, financial leverage began to rise, as manifested by (i) greater use of leverage (e.g., hedge fund leverage ratios have risen since the start of the year, and in general the use of total return swaps has increased); (ii) more issuance of products with embedded leverage (e.g., structured notes; Figure 1.33);²⁰ and (iii) increased provision of leverage (e.g., by some prime brokers, though levels are not yet excessive). Overall leverage is not particularly high by historical standards—and in fact there have been some recent reversals—but such trends bear close monitoring.

There are also signs of “style drift,” or increased cross-over investment, which is consistent with the search for yield.

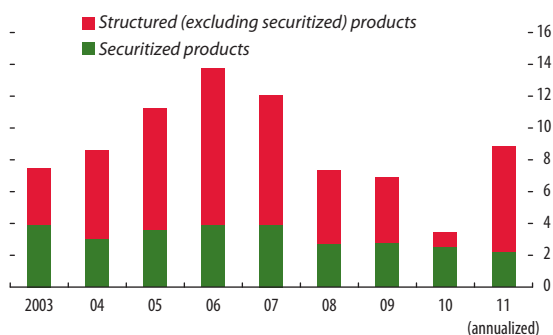
To compensate for low returns on traditional products, new investor classes are gravitating to unorthodox market sectors. For instance, high-yield funds are shifting into equity tranches and alternative assets, nonspecialized investors are gravitating to structured products (e.g., collateralized loan obligations and mortgage-related credit), and retail investors are increasingly seeking out leveraged loan mutual funds and complex types of exchange traded funds (ETFs).

¹⁹As Chapter 2 documents, pension funds and insurance companies have increased their allocations to commodities, real estate, private equity, and other alternative assets to maintain yield.

²⁰Securitized markets have been slower to recover, with private residential mortgage markets mostly closed. Structured products include medium-term notes, constant-maturity swaps and constant-maturity Treasury notes, various types of range accrual notes, inverse floaters, various types of step-up notes, and various types of linked notes. Securitized products include asset-backed securities, residential mortgage-backed securities, commercial mortgage-backed securities, collateralized debt obligations, collateralized loan obligations, collateralized mortgage obligations, and other structured credit products.

Figure 1.33. Global Securitized and Structured Products Issuance

(In trillions of U.S. dollars)



Sources: Association for Financial Markets in Europe; Bloomberg L.P.; Securities Industry and Financial Markets Association; and IMF staff estimates.

Note: For definition of products, see text note 20.

The trend toward riskier investments has been underscored by an increase in alternative investment vehicles. At \$1.8 trillion, the assets of global hedge funds are up 25 percent since the trough in late 2009 (Figure 1.34). New private equity transactions as well as refinancings of existing LBOs are also on the rise. Having stayed on the sidelines for some time, private equity funds have sizable cash levels and are increasing leverage.²¹ While the shift into such investment vehicles may help reduce direct risks to the banking system, their greater opacity and potentially riskier investment strategies create additional challenges.

More broadly, with bank balance sheets still in need of repair, credit is increasingly being intermediated through nonbank channels.

The current credit cycle has been distinguished in the United States and, to a lesser extent, in Europe by a shift from banks to the capital markets as the preferred source of corporate financing (Figure 1.35), even though bank lending conditions have eased. The shift reflects the fact that asset markets have been normalizing more rapidly than banking systems. Nonfinancial corporations are determined not to

²¹At 5-times, leverage ratios are slightly above the historical average but still below the 11- to 12-times level at the peak of the crisis.

be beholden to banks, given the uncertainty about future commitments. As the source of funding has shifted from banks to markets, the bifurcation between small and large firms has deepened. Small and medium-sized enterprises (SMEs)—which tend to be almost exclusively reliant on bank financing—are getting left behind, while larger firms have easy access to cheap credit.²²

Pockets of leverage could become excessive in some segments.

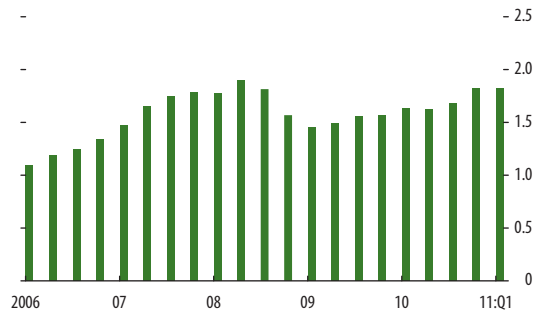
The high-yield bond market and the leveraged loan market have been especially affected by the search for yield. Issuance has risen (Figure 1.36), while strong demand has enabled issuers to extract more favorable terms, leading to spread compression, weaker covenants, and a greater degree of leverage. Furthermore, compared with more traditional institutional investors that are locked in, retail investors have expanded into the leveraged loan segment through mutual funds and ETFs, whose liquidity could become strained in the event of a pullback.

These conditions increase the potential for a sharper and more powerful turn in the cycle.

The trade-off between macroeconomic and financial stability risks needs to be carefully considered. Stability risks are still in their infancy, but with interest rates lower than they usually are at this point in the cycle, there is a potential for a greater deterioration in credit quality down the road. Moreover, because yields have narrowed during a relatively weak economic recovery, there is less of a buffer once the cycle finally turns. The shift away from bank financing exposes corporate issuers to the fickleness of capital markets. Furthermore, the shift into weaker-quality credits, combined with leverage, can be risky if not properly managed. While dimmer prospects for economic growth may temporarily slow this momentum, safeguarding stability calls for greater emphasis on balance sheet repair so that interest rates can be normalized and credit cycle

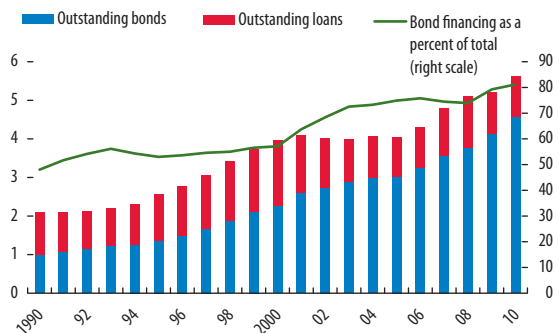
²²Credit conditions continue to normalize for SMEs, but credit extension is inconsistent, and the cost of credit is still elevated.

Figure 1.34. Hedge Fund Assets under Management
(In trillions of U.S. dollars)



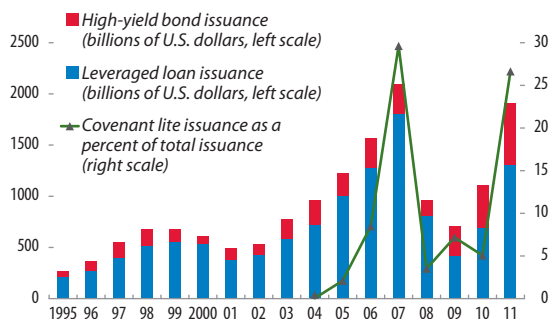
Source: Hedge Fund Research; and IMF staff estimates.

Figure 1.35. Financing by U.S. Nonfinancial Corporations
(In trillions of U.S. dollars except as noted)



Sources: Federal Reserve; Haver Analytics; and IMF staff estimates.

Figure 1.36. High-Yield Gross Issuance and Leveraged Loan Covenants



Sources: Bank of America Merrill Lynch; and Bloomberg L.P.
Note: Issuance data for 2011 annualized; covenant lite 2011 data as of Q2.

excesses avoided in mature markets. These risks are even more apparent in emerging markets.

Low rates and unfinished balance sheet repair in advanced economies have helped spur flows into emerging markets...

Net capital flows to emerging markets remained relatively strong—although volatile—during the first half of 2011 (Figure 1.37), reflecting higher nominal interest rates, the perception that currencies will appreciate, and relatively strong fundamentals. In turn, the elevated inflows, surging credit growth, and rising debt issuance are supporting a releveraging of balance sheets.

Net capital inflows to emerging markets have not been excessively strong by historical standards. However, portfolio and bank-related (other) inflows have dominated inflows, particularly in EMEA and Asia (Figure 1.38). The volatile nature of portfolio flows means that they could reverse rapidly if investors take fright or valuations are perceived as too stretched.

...as the search for yield directs flows into emerging market corporate debt securities...

Over the past year, flows into emerging market corporate external debt have surpassed flows into U.S. high-yield debt on an asset-weighted basis. Gross issuance accounted for nearly half of all new

private credit in some regions (e.g., Latin America). This is part of a cyclical and structural trend, with emerging market corporate debt increasingly viewed as a substitute for U.S. high-yield debt (Figure 1.39).

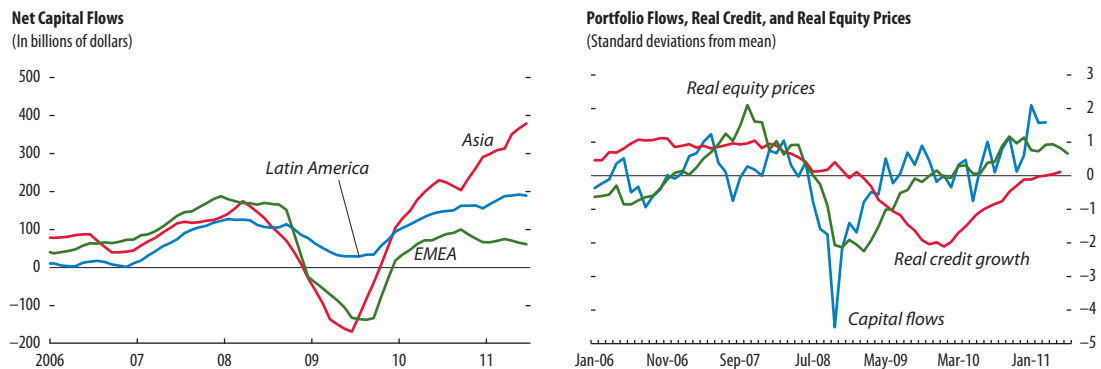
...which may lead to a mispricing of credit risk and a weakening of due diligence.

The issuance of emerging market corporate debt is on track to reach another record high this year, with firms in Latin America and Asia leading the expansion. High issuance can represent a healthy development to the extent that some previously credit-constrained companies gain access to capital markets; but the risk is that large capital flows may be moving too quickly into this asset class, potentially leading to mispricing and a sudden reversal. Reports of accounting scandals and fraudulent practices suggest that due diligence is slackening, and investors have continued to move down the credit spectrum (Figure 1.40).

Emerging market credit risk is being “exported” to international investors.

In response to tightened prudential regulations and, for some sectors, less accommodative domestic credit conditions, emerging market corporations have shifted into international debt issuance, effectively

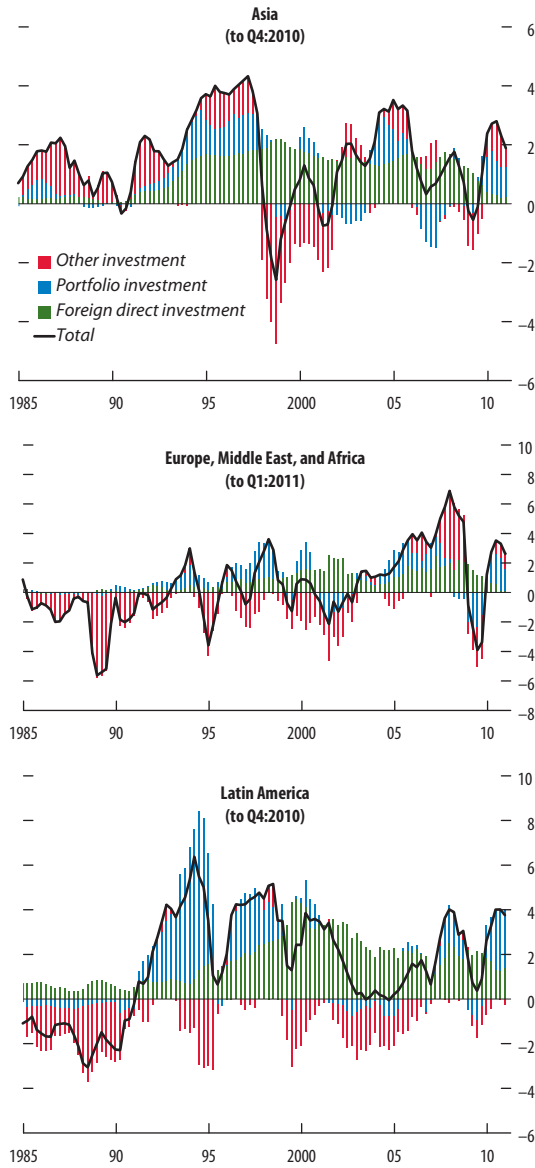
Figure 1.37. Emerging Markets: Capital Flows, Credit, and Equity Prices



Sources: Bloomberg L.P.; CEIC; and IMF staff estimates.
 Note: Twelve-month moving sums. Asia = China, Indonesia, India, Korea, Malaysia, and Thailand. Latin America = Brazil, Chile, Colombia, Mexico, and Peru. EMEA = Hungary, Poland, Russia, Turkey, and South Africa.

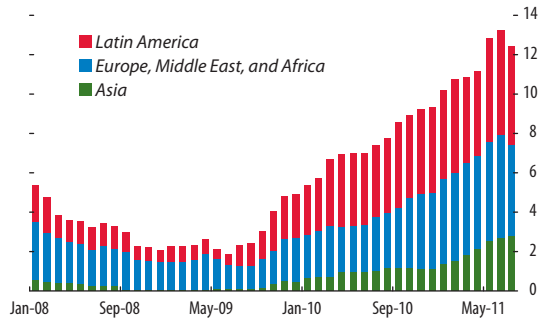
Sources: CEIC; IMF, International Financial Statistics database; and IMF staff estimates.

Figure 1.38. Net Capital Flows by Region
(Percent of aggregate GDP, four-quarter moving average)



Sources: Haver Analytics; IMF, International Financial Statistics database; and IMF staff estimates.
 Note: Asia = China, India, Indonesia, Korea, Malaysia, Philippines, Taiwan Province of China, and Thailand; Europe, Middle East, and Africa = Egypt, Hungary, Israel, Poland, Russia, South Africa, and Turkey; Latin America = Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

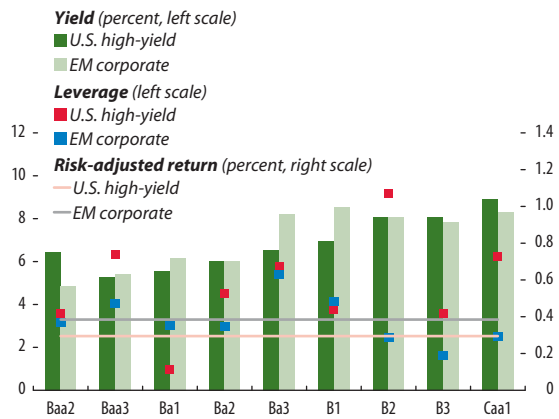
Figure 1.39. Emerging Market Corporate External Issuance
(In billions of U.S. dollars, 12-month moving average)



Sources: Dealogic; and IMF staff estimates.

exporting credit risk overseas (Figure 1.41). For example, offshore debt issuance by Chinese firms has surged as credit has been tightened onshore. Chinese companies are also motivated to borrow in dollars to benefit from lower interest rates, ample foreign demand, and expected appreciation of the renminbi. Large property developers have been among the most active external issuers, as their access to mainland credit has been curtailed by official measures to cool the property market.

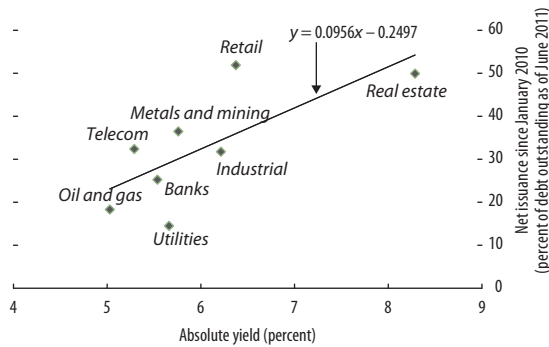
Figure 1.40. Emerging Market Corporate versus U.S. High-Yield Debt: Yields, Leverage, Returns



Sources: Bank of America Merrill Lynch; JPMorgan Chase & Co.; and IMF staff estimates.

Note: Leverages calculated as total debt/EBITDA. Returns are estimated for the six months through June 2011.

Figure 1.41. Emerging Markets External Corporate Issuance, by Sector



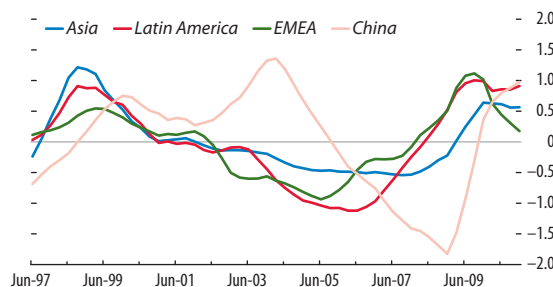
Sources: Bank of America Merrill Lynch; JPMorgan Chase & Co.; and IMF staff estimates.

At the same time, rapid growth of domestic credit may weaken the quality of bank assets.

Rapid credit growth in many emerging markets raises the risk of deteriorating credit quality. During credit booms, strong balance sheets tend to generate excessive lending against inflated collateral values (Figure 1.42), while the herd behavior of bank managers tends to cause a deterioration in credit quality. China is arguably at an advanced stage of the credit cycle, reflecting the legacy of its policy-induced lending boom of 2009–10, which has already brought asset quality concerns to the fore (Box 1.5). In other emerging markets, including Brazil and Turkey, credit

Figure 1.42. Emerging Markets: Total Credit to the Nonbanking Sector

(Deviation from 1996–2010 trend, in Z-scores)



Sources: Bank for International Settlements; IMF, International Financial Statistics database; and IMF staff estimates.

Note: Total credit is scaled by GDP and includes total domestic credit by banks, external loans to nonbank sector, and nonfinancial corporate external and domestic debt issuance. Four-quarter moving average of deviation from a 1996–2010 trend. EMEA = Europe, Middle East, and Africa. Z-score = standard deviations from mean.

quality appears strong on the surface, but rapid growth in domestic credit—particularly to the household sector—poses a key challenge to future stability.

As the credit cycle advances, some markets for high-end real estate are showing signs of bubble dynamics. Although this is most evident in Hong Kong SAR and Singapore—prices there have been fueled by negative real interest rates, demand from wealthy mainland investors, and the booming financial sector—several other major cities have also seen large price gains. For now, low leverage in this market segment appears to be limiting the risks to financial stability. However, if price corrections spread to lower-income segments and other markets where leverage is higher, there could be broader effects on economic activity and financial stability. It is reassuring, therefore, that recent tightening measures in Hong Kong SAR and Singapore appear to have had some effect in slowing speculative activity and that increased property supply is seen as a powerful tool to combat price increases (Box 1.6).

Historical experience suggests that bank asset quality in many emerging markets is likely to deteriorate in coming years...

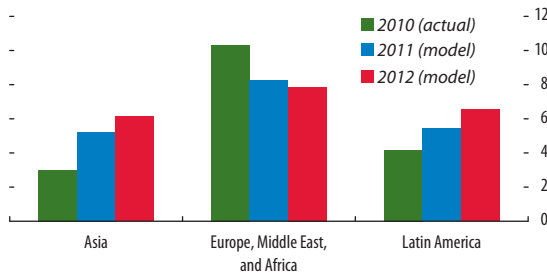
Econometric analysis indicates that sizable capital inflows, favorable terms of trade, and strong real growth have all contributed to credit creation in emerging markets.²³ Our model predicts that nonperforming loan (NPL) ratios will rise in many emerging markets, even in a baseline scenario in which external and domestic variables normalize gradually as the expansion phase of the credit cycle reaches its end (Figure 1.43). The predicted increase is largest in Asia, where strong credit growth has been supported by accommodative monetary policy, and NPL ratios are at recent lows. In central and eastern Europe, on the other hand, the model does not project a deterioration in credit quality under the base case, as credit growth has been muted in recent years.

...and emerging markets remain vulnerable to external shocks...

Sovereign risks in the euro area, or fiscal strains elsewhere, could spill over to global markets,

²³See Annex 1.1 for technical details. The macroeconomic scenarios underlying the analysis were built using a panel VAR approach.

Figure 1.43. Model Prediction for NPL Ratios in 2011 and 2012 Based on 2010 Values
(In percent; no shock)



Sources: Bankscope; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
Note: Forecasts based on a panel VAR with ratio of private credit to GDP, NPL ratio, ratio of net capital flows to GDP, and growth rates of terms of trade and real GDP. NPL = nonperforming loan. See Annex 1.1.

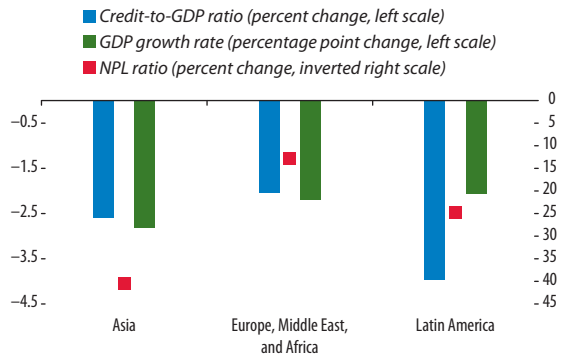
resulting in risk retrenchment, a reversal of capital inflows, and a decline in commodity prices. Our analysis indicates that vulnerabilities to a sudden stop currently are less elevated in EMEA than in Asia and Latin America, which are at more advanced phases of the credit cycle and have had sharper recent increases in foreign currency liabilities than EMEA. The analysis also indicates that a negative terms-of-trade shock would have the largest impact in Latin America, which has benefited from favorable terms-of-trade shifts in recent years (Figures 1.44 and 1.45).

... which could pressure emerging market banks.

The vulnerability of growing loan books to macroeconomic shocks means that emerging market policymakers need to carefully monitor the strength of bank balance sheets. An analysis using economic capitalization measures indicates that the capital adequacy of banks in all emerging market regions could be considerably impacted by shocks in GDP growth, terms of trade, and funding costs (Table 1.3). Banks in Latin America would suffer a larger impact from terms-of-trade shocks, while banks in Asia and EMEA would be somewhat more sensitive to a 300 basis point increase in funding costs, as they operate in an environment of lower interest rates.²⁴ In an

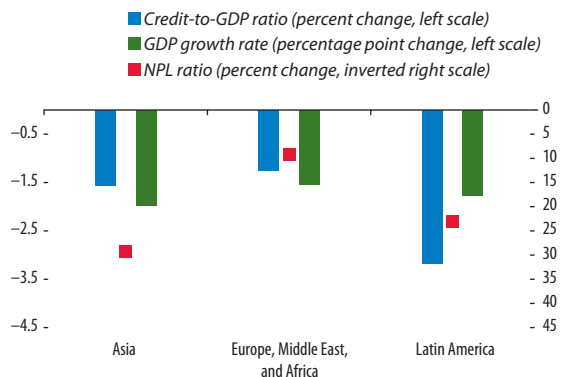
²⁴Economic capitalization measures are based on the use of risk weightings adjusted for changes in credit risk using parameters underlying the Basel II internal ratings based (IRB) method. Such

Figure 1.44. Impact when Net Capital Flows Decline



Sources: Bankscope; Haver Analytics; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
Note: Response to decline in net capital flows of two standard deviations (8.7 percentage points, calculated from pooled sample). Shown are responses relative to the baseline in a panel VAR with ratio of private credit to GDP, NPL ratio, ratio of net capital flows to GDP, and growth rates of terms of trade and real GDP. See Annex 1.1.
NPL = nonperforming loan.

Figure 1.45. Impact when Terms of Trade Decline



Sources: Bankscope; Haver Analytics; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
Note: Response to terms-of-trade deterioration of two standard deviations (15.8 percentage points, estimated from pooled sample). Shown are responses relative to the baseline in a panel VAR with ratio of private credit to GDP, NPL ratio, ratio of net capital flows to GDP, and growth rates of terms of trade and real GDP. See Annex 1.1.
NPL = nonperforming loan.

weightings usually differ from regulatory capital adequacy weightings based on Basel I. Emerging market banks usually do not use economic capitalization measures to report balance sheet strength and therefore tend to overstate the capital cushion available under stress. The IRB/Basel II approach results in lower capital adequacy ratios and higher risk-weighted assets than does the Basel I approach, as it adjusts for credit risk on the entire loan book, not just on rated securities. The negative GDP growth shock corresponds to around 1.3 standard deviations for each region.

Table 1.3. Emerging Market Banks: Sensitivity to Macroeconomic and Funding Shocks
(Percentage point deviations from baseline capital adequacy ratios in 2013)

	GDP Growth Shock (5 percentage points lower than WEO)	Terms-of-Trade Shock (two standard deviations)	Funding Shock (300 basis points)	Combined Shock
Europe, Middle East, and Africa	-3.4	-1.1	-1.2	-5.1
Latin America	-4.5	-1.5	-0.8	-5.7
Asia	-1.3	-0.7	-1.3	-2.5

Sources: Bankscope; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.

Note: Red cells indicate the largest deviation for the indicated shock, yellow cells the smallest. Capital adequacy ratios calculated as regulatory capital divided by risk-weighted assets using economic (Basel II internal ratings based) risk weights. See Annex 1.1.

exceptionally severe case, in which all three types of shocks occur simultaneously, simulations suggest that the absolute changes to capital adequacy ratios would be similar across regions, whereas Asian capital buffers would be somewhat slower to recover in the absence of capital injections, given the weaker outlook for asset quality in Asia over the medium term (Figure 1.46).²⁵

A balanced policy response is needed to safeguard against overheating risks and to strengthen financial resilience.

Although the intensity of capital inflows in emerging markets has abated somewhat, and policymakers have generally tightened monetary policies, risks of overheating and asset price bubbles persist in some countries (Table 1.4). Structural fiscal deficits are still large; inflation, credit growth, and corporate leverage have continued to rise; and debt and equity valuations appear stretched.

Emerging market policymakers need to guard against a buildup of financial imbalances, making use of both conventional and macroprudential measures. The rapid growth in credit raises risks of deteriorating asset quality, and policymakers need to closely monitor the health of bank balance sheets, preferably using economic capitalization measures when testing for resilience to adverse shocks. Corporate leverage is also rising, and weaker

²⁵However, it should be noted that governments in Asia arguably have the strongest ability to inject capital into their banking systems if needed.

Figure 1.46. Change in Capital Adequacy Ratios under Combined Macro Shocks
(In percentage points, using Basel II IRB risk weights)



Sources: Bankscope; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
Note: IRB = internal ratings based. See Annex 1.1.

firms are increasingly accessing capital markets. This could make corporate balance sheets more vulnerable to external shocks. With strong domestic demand pressures, especially in Asia and Latin America, tighter macroeconomic policies are needed to avoid overheating and prevent an accumulation of financial risks. Macroprudential tools and, in some cases, a limited use of capital controls, can play a supportive role in managing capital flows and their effects. However, they cannot substitute for appropriate macroeconomic policies. Moreover, the analysis shows that in the face of sharply higher global risks, emerging markets would not escape financial distress, suggesting that in some countries, an increase in bank capital would be warranted to buffer against global shocks.

Table 1.4. Macroeconomic and Financial Indicators for Selected Economies*(Shaded cells represent five economies with highest values for each indicator)¹*

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
	Net portfolio inflows ²		Inflation			External and domestic policies			Credit			Corporate leverage ¹²		Asset valuations ¹³		Non-FDI external financing needs ¹⁴
	Equities	Debt	Level ³	Change ³	Output gap ⁴	Official reserves ⁵	Real interest rate ⁶	Structural fiscal balance ⁷	Credit to private sector ⁸		Bank loans to deposit ratio ¹¹	Debt/equity		Equities	Debt	
									Level ⁹	Change ¹⁰		Nonfinancial	Financial			
Europe, Middle East, and Africa																
Egypt	n.a.	n.a.	-0.1	-0.1	n.a.	-3.9	-3.6	n.a.	-1.9	5.8	0.5	-0.7	0.3	n.a.	n.a.	1.3
Hungary	-0.1	-0.1	-1.2	-0.9	-2.4	8.1	2.0	-4.8	-0.4	-2.0	1.5	1.0	0.4	-1.0	-0.8	-0.6
Poland	1.9	0.6	0.7	1.9	0.4	4.9	0.3	-6.1	1.5	7.9	1.1	-0.5	-0.9	-0.9	-1.1	3.2
Russia	0.2	-0.1	-0.7	3.5	-2.1	3.4	0.2	-0.3	0.6	10.0	1.1	1.2	0.3	-0.5	-1.2	-5.8
Israel	-2.1	2.8	0.6	1.6	0.7	6.6	-0.3	-3.1	-2.1	8.2	1.0	1.0	1.5	-0.7	-0.2	0.1
South Africa	-0.2	0.6	-0.1	1.6	-1.3	1.9	0.7	-3.7	0.2	4.5	1.2	0.0	0.4	-0.1	-1.4	1.2
Turkey	0.1	2.2	-1.2	-1.3	2.0	3.1	-0.2	-2.1	1.9	27.8	0.8	0.2	-0.3	-0.4	0.3	8.6
Asia																
China	-0.1	0.2	1.4	3.2	n.a.	12.7	1.3	-1.8	1.6	21.7	0.8	0.6	0.2	0.2	n.a.	-7.0
India	2.4	n.a.	1.0	-1.1	0.2	2.2	0.1	-8.3	1.0	26.3	0.8	2.6	-0.6	0.5	-1.1	1.4
Indonesia	-0.4	1.4	-0.8	-1.6	-0.0	6.0	1.0	-1.7	0.9	19.4	0.8	-0.5	-0.4	0.8	0.4	-1.6
Korea	0.4	0.9	1.6	2.2	-0.1	3.5	-0.9	2.1	-0.0	7.5	1.4	-0.7	-0.4	-0.1	1.2	0.1
Malaysia	n.a.	n.a.	0.5	1.6	0.4	16.5	-0.3	-5.7	1.2	9.0	0.9	-0.1	-0.7	0.1	0.3	-9.5
Philippines	-0.8	1.5	-0.3	0.8	n.a.	9.8	-0.6	n.a.	1.2	13.3	0.6	3.8	-0.3	0.1	n.a.	-2.3
Taiwan	-2.0	-2.0	-0.1	0.0	n.a.	n.a.	-0.0	-4.2	-2.8	8.1	0.7	-0.5	-0.9	-0.5	0.5	-9.2
Province of China																
Thailand	-0.6	1.8	0.4	0.6	0.5	11.1	-0.4	-2.3	1.5	10.7	1.0	-0.5	-0.5	0.6	1.0	-5.3
Latin America																
Brazil	2.0	-0.0	1.2	2.3	n.a.	3.9	5.8	-2.9	1.9	25.5	0.8	0.3	1.7	0.3	0.4	-0.3
Chile	-0.4	0.9	-0.2	0.7	0.1	4.8	1.5	-1.7	-0.8	1.4	1.4	-0.2	-0.7	1.2	-0.7	-4.3
Colombia	n.a.	0.1	-0.9	1.1	0.1	1.6	1.1	-3.1	1.7	16.6	1.7	0.3	-0.1	1.4	n.a.	1.2
Mexico	-0.6	1.8	-0.9	-0.1	n.a.	2.3	0.9	n.a.	0.8	9.7	0.7	-0.6	n.a.	0.6	-1.4	-0.9
Peru	0.1	1.7	0.3	1.5	0.2	7.4	0.8	-0.2	1.1	15.5	0.8	-1.0	0.7	0.6	-0.7	-1.7

Sources: Bank for International Settlements (BIS); Worldscope; Bloomberg, LP; Consensus Economics; Haver; IBES; IMF: International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.

Note: FDI = foreign direct investment; EMEA = Europe, the Middle East, and Africa. In the following notes, Z-score = number of standard deviations from the mean.

¹In each column except VII and VIII, red cells signal two highest values and yellow cells signal next three highest values; in columns VII and VIII, colors signal lower values.²In percent of GDP, 4Q moving average, in Z-scores. Mostly up to March 2011.³July 2011 levels in Z-scores relative to 2004–11 period, and change in year-on-year inflation in July 2011. For the Philippines, June 2011 data; for India, the wholesale price index.⁴In percent of potential GDP, 2011 (September 2011 WEO).⁵Gross international reserves minus gold, year-on-year changes in June 2011; for Egypt and Peru, updated to May 2011 as a percent of 2010 GDP.⁶Policy rate as of end-August 2011 minus 2011 inflation expectations, in percent.⁷Estimates of 2011 structural balance, in percent of potential GDP.⁸Total credit to households and businesses obtained from domestic and international banks and capital markets.⁹Deviations from 1996–2010 trend, in Z-scores in December 2010.¹⁰In percent, annual change to December 2010.¹¹Calculation is based on the International Financial Statistics database, mostly updated to 2011:Q1. For China, loans are banking sector claims on other sectors; and deposits are calculated as the sum of time, savings, and demand deposits.¹²In Z-scores, up to December 2010.¹³Z-scores of valuation ratios for equities (average of price-to-book ratio and dividend yield) at May 2011 and of deviations from estimated equilibrium values for local government bond yields at March 2011 (see April 2010 GFSR, Annex 1.9).¹⁴Current account balance plus net FDI inflows (reverse signs) in percent of GDP, 2011 (September 2011 WEO). Positive number represents financing need.

Box 1.5. Gauging Financial Stability Risks in China

China’s post-2008 credit boom has left a legacy of doubtful loans, especially to local government entities. China experienced one of the highest rates of credit expansion in the world during 2009–10 as the authorities boosted bank-financed investment spending (first figure). Many of those investment projects are thought to lack longer-term commercial viability, putting the repayment of the underlying debt in doubt. As a result, analysts are projecting significant write-downs on exposures to the local government sector, whose actual and contingent liabilities amounted to 27 percent of GDP at end-2010.

Recent policy tightening has slowed headline loan growth, but other forms of credit have surged. Policy tightening has relied to a large extent on credit ceilings. As such, the effect has been asymmetric: while favored borrowers (e.g., those with particularly strong credit profiles or operating in priority sectors) continue to obtain loans at very low real interest rates, other companies are rationed out of the market. Moreover, the tighter supply of bank loans has fueled rapid growth in alternative forms of credit (second figure). These include:

- bank acceptance bills and trust loans, now also regulated more tightly;
- intercorporate lending and credit from small loan companies; and
- funding from banks based in Hong Kong SAR and offshore bond markets.

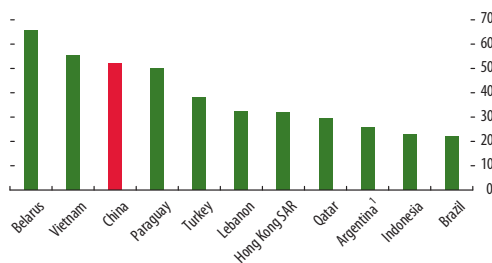
As a result, China has an unusually high level of gross debt. Based on the authorities’ “total social financing” (TSF) data, the stock of domestic loans reached 173 percent of GDP at end-June.¹ This places China well above the levels of credit typically observed among countries at the same income level, although private-sector leverage has remained moderate (third figure).

A long-running real estate boom in China adds another layer of risk. According to official data, property prices have risen 60 percent since end-2006. Private-sector estimates suggest an even

Note: Prepared by André Meier.

¹Computed as the sum of total bank loans and the cumulative flow of net new credit since 2002 from similar TSF components (trust loans, bank acceptance bills, and entrusted loans).

Cumulative Real Growth of Bank Credit, 2009–10
(In percent)

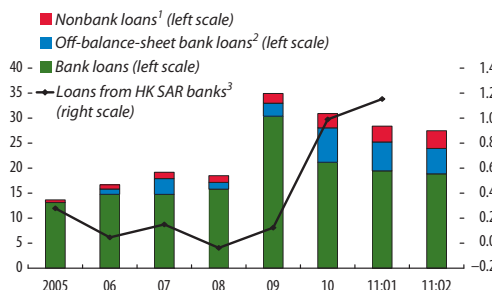


Sources: IMF, International Financial Statistics and World Economic Outlook databases.

Note: Nominal growth in domestic bank credit between end-2008 and end-2010, deflated by CPI inflation.

¹Calculations are based on official CPI data. The authorities have committed to improving the quality of Argentina’s official CPI to bring it into compliance with the obligations under the IMF’s Articles of Agreement. Until the quality of data reporting has improved, IMF staff will use alternative measures of inflation for macroeconomic surveillance, including estimates by provincial statistical offices and private analysts, which have been considerably higher than official inflation since 2007.

China: Contributions to Net New Credit
(Percentage points of GDP)



Sources: Hong Kong Monetary Authority; People’s Bank of China; and IMF staff estimates.

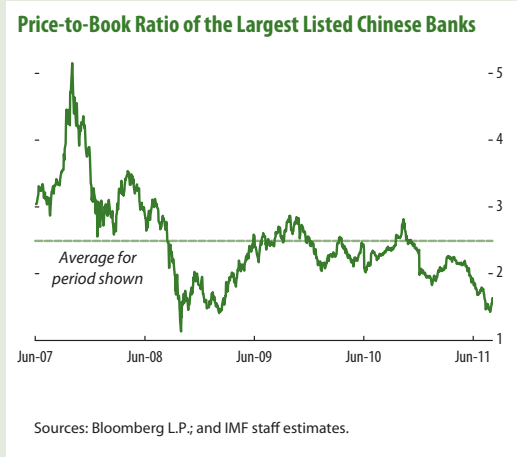
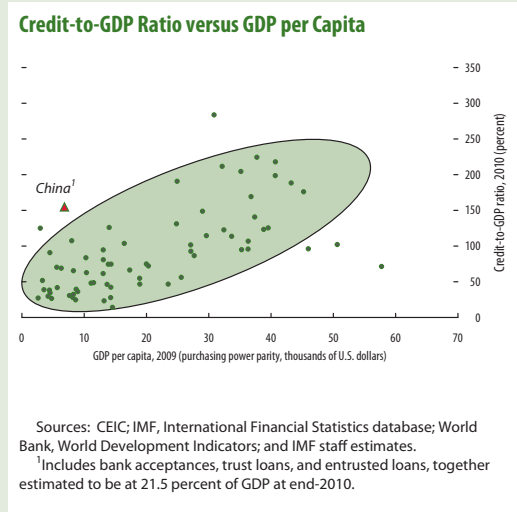
¹Entrusted loans, i.e., brokered loans provided by nonbanks.

²Bank acceptance bills and trust loans.

³Computed as total net lending to the mainland by banks based in Hong Kong SAR minus change in renminbi deposits in the Hong Kong SAR banking system.

greater run-up in prices in some areas. Meanwhile, there is anecdotal evidence that many newly built units remain unoccupied, with investors focused exclusively on expected price gains. In this environment, the authorities’ current efforts to cool the market might induce a sharper-than-expected correction in prices, depressing collateral values. A weaker property market could also put further pres-

Box 1.5 (continued)



sure on local governments, which rely heavily on revenue from land sales.

Against this backdrop, financial markets have recently signaled growing concerns. Although investors have maintained a generally favorable outlook for the Chinese economy, many worry that the ongoing policy tightening might expose vulnerabilities related to the property and credit booms. One indication of such concerns is the slump in bank equities (fourth figure). From a recent peak of 2.8 times book value in late 2010, the median valuation of the largest listed banks has fallen to 1.6. Meanwhile, many property developers have seen their funding costs rise as high as 16 percent in the offshore dollar bond market. Aside from sector-specific woes, this repricing reflects general investor concern over corporate governance fol-

lowing a string of allegations concerning fraud and misreporting. Lastly, some investors have sought protection against broader risks associated with macroeconomic-financial linkages by buying sovereign credit default swaps or renminbi put options.

Still, while they believe it will be costly, most analysts consider that the likely fallout from China's credit boom will be manageable. One key source of confidence is China's strong fiscal position, including a large stock of public-sector assets and low central government debt. Nevertheless, even those buffers do not preclude significant bouts of uncertainty as to how losses will ultimately be allocated among the banks' private investors and local and central governments. To the extent that the government needs to step in, the consequence could be a substantial worsening of China's public debt metrics and a narrower scope for future fiscal stimulus.

Box 1.6. Can Macroprudential Policies Contain the Property Boom?

Property price increases are most pronounced in large cities in Asia and Latin America (first figure). Many of these locations are financial centers where the expansion of foreign banks and companies, along with rising local incomes, boosts demand for high-end property. Emerging market price increases since 2009 have been largest in Hong Kong SAR, which has taken the lead in using macroprudential policies to dampen real estate speculation and cool the market. Authorities in Hong Kong SAR have directly targeted the property market through increases in supply, hikes in property transaction taxes, and cuts in maximum loan-to-value (LTV) ratios.

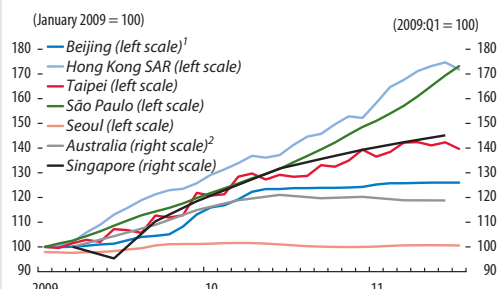
According to a model of property prices in Hong Kong SAR that we developed (table), increases in land supply and real interest rates have lasting impacts on prices, while a tightening of the LTV limits has a temporary impact.¹ A hike in the property tax rate has a very short and not statistically significant effect on price, but the rate declines the longer a property is held, and it appears to have discouraged speculative activity.

- A 1 percent increase in land supply drives property prices down by 0.8 percent but with a significant lag.
- A 1 percentage point increase in the real interest rate is associated with a price decline of around 1.6 percent.
- A 10 percentage point cut in the maximum LTV ratio slows property price inflation by a cumulative 6.8 percentage points, while a hike in the property transaction tax has no discernible effect.

Note: Prepared by R. Sean Craig, Estelle Xue Liu, and Changchun Hua.

¹Our model of property prices in Hong Kong SAR implements the Engle-Granger error-correction methodology and consists of two equations, one long term and one short term (table). The first equation estimates, in levels, the long-run cointegration relationship between aggregate property prices and a set of independent variables. The second equation estimates the dynamic short-run relationship between the change in the property price, changes in the independent variables, and the LTV ratio and transaction tax, which are stationary variables. It contains the error-correction term, which shows how quickly the actual price, p , converges to the “equilibrium” property price, p^* , determined by the long-run equation.

Property Price Indices in Selected Large Cities



Sources: CEIC; Haver Analytics; and IMF staff estimates.
¹Old and new data series for Beijing are combined using month-on-month change.
²Eight capital cities.

Also according to the model, the rapid rise in Hong Kong property prices is due to very favorable macroeconomic conditions (the actual observed property price remains within two standard devia-

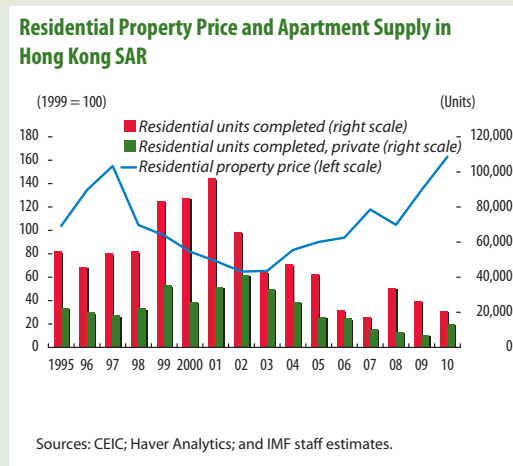
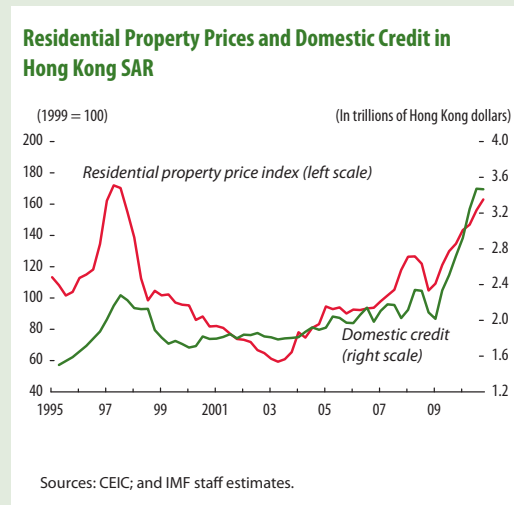
Econometric Model of Hong Kong SAR Residential Property Price

	Long-Run Equation: Log of Real Property Price (levels)	Short-Run Equation: Change in Log of Real Property Price
Real interest rate	-0.016**	-0.007
Log of real GDP per capita	1.468***	2.304***
Log of real domestic credit	0.291**	0.098
Log of land supply (lagged)	-0.794***	-0.414
Log of construction cost index	0.488***	0.254*
Loan-to-value ratio		0.644***
Property transaction tax rate (percent)		0.003
Error correction term (deviation of actual price from equilibrium price estimated in long-run equation)		-0.666***

Source: IMF staff estimates.

Note: ***, **, * indicate significance at the 1, 5, and 10 percent levels respectively. Not shown: constant, dummies for 2003 SARS crisis and 2008 global financial crisis.

Box 1.6 (continued)



tions of the model’s “fitted” price). The price rise is well explained by strong GDP growth, a declining real interest rate (partly owing to a rise in inflation), and the surge in domestic credit, which may be proxying for the favorable financial environment (second figure). A cutback in land supply and, in turn, a drop in new apartment supply was exacerbated by the global financial crisis and put significant upward pressure on property prices (third figure).

The Hong Kong SAR experience suggests that narrowly targeted measures, such as cuts in LTV

ratios, can temporarily slow the rate of increase in property prices, but to achieve lasting effects, policies must focus on the fundamental determinants of property prices. Increases in housing supply, in particular, could exert strong downward pressure on property prices in Hong Kong. Macroprudential policies affecting the macroeconomic determinants can also play a role. For example, efforts by the Hong Kong authorities to tighten bank liquidity to enhance financial stability, together with increased loan demand, have pushed up lending rates.

Policy Priorities

Time is running out to address existing vulnerabilities. The set of policy choices that are both economically viable and politically feasible is shrinking as the crisis shifts into a new, more political phase. Negative surprises and the intensification of risks have raised the urgency of prompt policy action to strengthen the global financial system. The need for a more robust financial framework is heightened by the limited room to deploy further fiscal and monetary policy stimulus. In the advanced economies, the priorities are to repair public balance sheets (in the United States, Europe, and Japan) and private balance sheets that are clearly overstretched (U.S. households, European banks). In addition, global financial regulatory reforms need to be

concluded as soon as possible and implemented internationally. Emerging market policymakers face a contrasting challenge of limiting the buildup of financial imbalances, often in the midst of expansionary conditions, while continuing to build a robust financial framework.

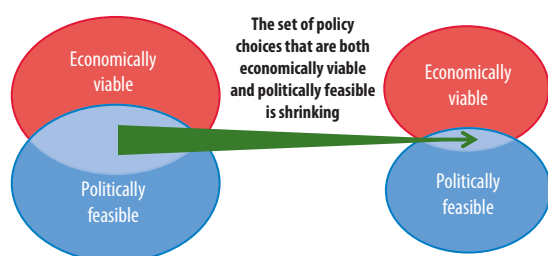
In the context of weaker growth prospects, the global financial system has experienced a range of shocks that have set back progress toward financial stability. One source of the shocks is the periphery of the euro area, where turbulence has spilled over to global financial markets. A second source is the ongoing U.S. fiscal policy impasse and the related downgrading of U.S. debt. A third source is uneven progress in repairing

bank balance sheets and in shoring up their capital positions. As a result, some sectors in many advanced economies appear trapped in the repair-and-recovery phase of the credit cycle even as low policy rates carry the risk that some segments will become overleveraged. In contrast, emerging markets are at a later stage in the credit cycle. Some face risks of overheating, and the financial systems of many are vulnerable to a possible global growth slowdown and reversal in capital flows.

The crisis has entered a new and more complex political phase.

The weakening outlook for growth, coupled with heavy debt burdens on both private and sovereign balance sheets, presents heightened risks to global financial stability. With the crisis now entering its fifth year, and with sovereign and central bank balance sheets already heavily extended, the range of policy options has become much more limited (Figure 1.47). Fiscal space is limited in many advanced economies, and immediate fiscal consolidation is needed in economies under market pressure. On the monetary front, policy rates across the advanced economies are at, or near, the zero boundary. Such an accommodative stance provides scope for balance sheet repair for banks and households but only limited repairs have occurred so far. Markets perceive major political economy difficulties as policymakers struggle to raise support for painful adjustment measures selected from a rapidly shrinking set of feasible choices. Policymakers have only limited time to reinforce credibility and build defenses against potential systemic shocks. As a result, with the limited resources still available, policymakers' focus should be on "curing" overstretched balance sheets through raising bank capital buffers or household debt write-downs.

Figure 1.47. Available Set of Policy Choices Is Shrinking



Comprehensive and coherent policy solutions are needed to effectively address sovereign risks and prevent contagion.

In the United States, policymakers need to further address the legacy of overstretched household balance sheets. Targeted policies to reduce debt would lower the likelihood of a sustained period of low demand as households attempt to return to financial solvency. In particular, a more ambitious program of mortgage modifications involving principal write-downs (potentially offset by granting lenders options on house price increases) would help address problems associated with household negative equity. Transforming unsold foreclosed residential housing stock into viable rental units would also reduce the supply overhang while boosting construction employment relatively quickly. Restoring confidence in the stability of the U.S. housing market is the key to bolstering the prospects for U.S. banks dented of late by the growth slowdown and legacy legal liabilities.

The important decisions by the euro area summit of July 21 and subsequent announcements by the ECB added to the enhanced crisis management tools of the euro area (see Box 1.7). The new framework improves the debt sustainability of program countries—in part by aligning official lending support with market incentives—and expands the flexibility of the European Financial Stability Facility (EFSF). Notably, the EFSF's ability to buy back bonds in the secondary market should help reduce the volatility of yields and spreads; and providing loans to sovereigns to strengthen capital buffers of the banking system will address contagion between sovereigns and banks. The net effect of the changes will be to improve the policy options available for preemptive action against market volatility. Meanwhile, continued ECB interventions into the larger sovereign debt markets under the Securities Markets Programme will help to stabilize markets, lower funding costs, and reduce the likelihood that vulnerable sovereigns will be pushed toward destabilizing debt dynamics.

However, investor confidence will likely depend on how swiftly those changes are adopted and whether the size of the EFSF is viewed as sufficient to match its expanded role. The recent widening of spreads

Box 1.7. Euro Area Developments in Crisis Management

Over the past year, the sovereign crisis in the euro area has substantially deepened, drifting in the direction of a self-fulfilling negative spiral. Fully aware of the need to halt these adverse dynamics, policymakers have pledged to do whatever it takes to safeguard the stability of the euro area. This has translated into successive packages of measures to support this commitment.

While implementation of the crisis management measures still needs to be completed, and further measures are likely to be necessary, the steps undertaken thus far are necessary building blocks of a definite solution of the crisis. They took place in a challenging environment, including legal (treaty) prohibitions of collective support among euro area member states, a public hostile to financial markets following taxpayer funded bailouts, and a long-term focus on the restoration of market discipline through private sector bail-ins.

Recognizing the need for a comprehensive approach, policymakers worked along four broad dimensions: national policy actions to ensure sound fiscal fundamentals and restore competitiveness; unconventional central bank support; creation of a safety net for euro area members losing access to market-based financing; and strengthening the economic governance of the euro area to prevent a recurrence of present tensions. While it is clear that national action to secure fiscal sustainability and restore growth are essential, the existence of a monetary union required action also at the euro area level. In addition, the banking authorities of the European Union have conducted rounds of coordinated EU-wide stress tests with high levels of transparency and disclosure.

Central Bank Support

The European Central Bank has been providing the first line of defense against financial instability. Liquidity provision to the banking system, first made necessary by the global financial crisis, has remained in place and has been adjusted as needed to mitigate tensions in the financial system. Refinancing operations are being conducted with

fixed-rate tender procedures with full allotment, currently with maturities of up to six months, against very broad collateral that includes the sovereign securities of countries receiving financial assistance. Since May 2010, the ECB has also been operating a Securities Markets Programme (SMP) under which it has been buying sovereign securities in the secondary market to help establish orderly sovereign debt markets, thus preserving the effectiveness of the transmission mechanism of monetary policy. In August 2011, the ECB stepped up this program, also intervening in the markets for the sovereign debt of Italy and Spain. Total SMP purchases through September 2, 2011, amount to €130 billion.

A Euro Area Safety Net

National authorities have been working on a safety net to assist countries facing difficulties in accessing markets in the context of adjustment programs under strict conditionality. In May 2010, euro area member states put together a package of bilateral loans to assist Greece. The European Council set up a European Financial Stabilization Mechanism and a European Financial Stability Facility (EFSF). These facilities have subsequently been used to assist Ireland and Portugal. In December 2010, the Council approved a limited treaty change to establish a permanent crisis management mechanism—the European Stability Mechanism (ESM). In March 2011, it clarified key operational parameters of the ESM. It was decided to raise the effective size of the EFSF to €440 billion and allow it to intervene in primary debt markets. Finally, in July 2011, euro area heads of state and government made several key decisions. They lengthened the maturity and lowered the interest rate on EFSF loans to member states; and they significantly broadened the mandate of the EFSF/ESM to include the provision of precautionary arrangements, the provision of loans to sovereigns not in a program for the purpose of restoring capital buffers, and the ability to purchase sovereign bonds in secondary markets. The July decisions are going through the process of national parliamentary approval.

Note: Prepared by Luc Everaert

Box 1.7 (continued)***Strengthened Economic Governance***

Efforts are under way to significantly improve governance of fiscal policy and other policies that have contributed to the imbalances at the root of the current crisis. Most notable is the so-called six-pack of legislative proposals currently before the EU parliament. These initiatives seek to strengthen the preventive and corrective arms of the Stability and Growth Pact, better enforce budgetary surveillance, upgrade national budgetary frameworks, and introduce and enforce an excess-

sive imbalances procedure to prevent and correct broader macroeconomic imbalances. In March 2011, the Euro Plus Pact was endorsed by all euro area member countries (and by a few countries outside the euro area) to strengthen competitiveness and increase the quality of economic policy coordination. Euro area member states have also adopted the European Semester, which establishes a peer review of national budget plans before they are finalized and is being implemented for the 2012 budget year.

on the sovereign debt of Belgium, Italy, and Spain indicates that the proposals have yet to resolve the financing risks for these countries, in spite of the relevant domestic measures recently adopted by them. In particular, markets indicate doubt regarding the flexibility of the new approach and the adequacy of the new funding that it makes available. The dependence of the EFSF's current AAA rating on the AAA ratings of its sovereign guarantors adds a further possible contagion link. At the same time, an expansion in the EFSF balance sheet may provoke investor concerns over the potential supply of EFSF paper and the robustness of the facility's AAA rating. These concerns reinforce the need for sustained balance sheet repair for weaker sovereigns.

Well-timed and credible fiscal adjustment plans are needed to anchor expectations around sustainable debt paths and bolster confidence in banks by reducing sovereign credit spreads. Thus far, only a few vulnerable sovereigns have taken meaningful steps to allay financial concerns about their solvency or liquidity. Many still need to develop plans for fiscal consolidation based on conservative assumptions for revenue and growth and incorporating transparency regarding unfunded and contingent liabilities. Market credibility can also be bolstered through appropriate institutional constraints on the path of the deficit, provided that they allow for countercyclical fiscal policy. Euro area sovereign issuers could reduce their potential vulnerability to liquidity concerns by seeking to extend average maturities while maintaining higher cash buffers.

Comprehensive and coherent policy solutions are also needed to increase the resilience of the European banking sector.

While there have been improvements in financial sector balance sheets, progress on banking system repair needs to further advance in Europe. Successive stress tests have provided welcome transparency but a number of banks still need to reach adequate levels of capital, and others still have to be restructured or resolved. Now that banks and other investors are agreeing to incur losses on some of their holdings of Greece's government bonds, European bank regulators and auditors urgently need to establish a uniform basis for valuing—and taking write-downs on—sovereign bonds held in banks' "available for sale" and "hold to maturity" books.

Banks continue to face funding challenges as analysts and creditors adjust nominal capital levels for potential losses on sovereign bonds, and some banks in countries on the euro area periphery remain heavily dependent on the ECB for liquidity support. Many banks are vulnerable to a further tightening in funding conditions.

Together with policy action to bolster the long-term sustainability of public finances, credible efforts to strengthen the resilience of the financial system are urgently needed. A number of banks must raise capital to help ensure the confidence of their creditors and depositors. Without additional capital buffers, problems in accessing funding are likely to create deleveraging pressures at banks, which will force them to cut credit to the real economy. Where

Box 1.8. The Status of Regulatory Reform

The April 2011 GFSR took stock of the effort to convert the G-20 financial reform agenda into international standards and national regulation. Since then, significant progress has been made in developing an approach to deal with systemically important financial institutions (SIFIs):

- Agreement has been reached on the methodology for identifying global systemically important banks (G-SIBs) and the additional capital that they should hold to reflect the systemic risk that they pose. Under this arrangement (BCBS, 2011), globally active banks are ranked according to five indicators (size, cross-jurisdictional activity, substitutability, complexity, and interconnectedness), which can be supplemented with supervisory judgment. Currently, 28 globally active banks have been identified as G-SIBs that must meet an additional capital requirement of between 1 percentage point and 2.5 percentage points of risk-weighted assets, depending on their systemic importance. A steeper surcharge of 3.5 percentage points has been created to serve as a disincentive for any bank to materially increase its systemic importance.
- Only common equity can be used to meet the capital requirement, although contingent capital could be used to meet any additional national requirements. This cautious approach to contingent capital is prudent, given that it remains untested in stress situations. Failure to meet the requirement will entail the same consequences as a breach of the capital conservation buffer, i.e., restrictions on dividends and stock buybacks.
- The list of G-SIBs will be reviewed every year; the methodology and threshold scores will be reviewed every three to five years. Implementation will begin in 2016, along with a capital conservation buffer. The review of the list of G-SIBs will be carried out by an international Peer Review Council of bank supervisors. Whether to disclose the names of G-SIBs remains an unsettled issue: although there are many merits to disclosure, avoiding the impression that the named banks are being officially classified as “too important to fail” is a challenge.

Note: Prepared by Aditya Narain and Michaela Erbenova.

More work is needed to extend the G-SIB framework to other sectors, such as insurance, and to institutions that are systemically important at a national level.

An important component of dealing with global SIFIs (G-SIFIs) is international consistency and compatibility in resolution approaches to avoid ad hoc policy responses. The July 2011 release of a consultation package on the resolution of G-SIFIs (FSB, 2011a) was an important milestone. The consultation package included establishing national resolution authorities; a resolution toolkit that facilitates preservation of essential financial functions; recommendations on cross-border resolution based on cooperation agreements and alignment of home-host strategies; adjusting the way firms are organized to enhance resolvability; and a mechanism for assessing implementation. Many of the proposed measures break new ground and will require reconciliation with national legal systems. The proposed timeline envisages that by December 2012 the home authorities of G-SIFIs will have entered into cooperation agreements with key host authorities and will have completed their recovery and resolution planning as well as resolvability assessments.

With measures now well in train to address the buildup of risks in banks, any shifting of risk to less regulated “shadow banks” must be closely monitored. As a first step in thus extending the regulatory perimeter, the Financial Stability Board agreed on a broad definition of the shadow banking system (FSB, 2011b), reflecting the fact that many different kinds of entities qualify in different jurisdictions. Next steps involve an enhanced process for monitoring the risks in the shadow banking system—including in money market funds and other shadow banking entities, in securitization, and in securities lending and repos—and the ties of these entities and activities to the banking sector. Given the heterogeneity of institutions and the wide ranging differences in their importance (“materiality”) in national systems, achieving agreement and moving to implementation could be a drawn-out process.

The key issue underlying all the regulatory reform proposals is ensuring their effective imple-

Box 1.8 (continued)

mentation, both nationally and internationally. Concern over that issue has been voiced in many advanced economies. In the United States, the Dodd-Frank legislation takes a position on some of the areas still under discussion, but the slow implementation of Basel II in the United States has raised questions about U.S. implementation of Basel III. The prompt initiation by the European Commission of the process to implement Basel III with the proposed Capital Requirements Directive (CRD4) is welcome. However, the maximum harmonization espoused in the proposals, along with

some differences from Basel III to tailor it to the European context, has raised concerns that reforms may lose some of their effectiveness, especially in the light of prevailing balance sheet uncertainties. It may lead to initiatives by other jurisdictions to also tailor the regulations, departing from the objective of achieving a common set of international standards. The role of the international institutions charged with surveillance of national financial systems will remain key to ensuring that consistency in implementation keeps the international playing field level.

possible, this capital should be raised privately. But in the current environment, public injections may be necessary for banks unable to raise sufficient private capital. In this regard, national backstops should be used wherever the fiscal space exists, while the decision to allow the EFSF to support such measures if necessary is welcome. Adequate capitalization and, where required, restructuring of viable institutions, need to be combined with a reduction in excess capacity, in order to raise profitability within some banking markets. In addition, building capital buffers would help support lending to the private sector.

The U.S. debt ceiling debate highlighted the distance between the political parties in addressing the country's fiscal crisis.

The debate over the debt ceiling highlighted the importance of U.S. creditworthiness for global financial stability. To reinforce that creditworthiness, the United States should act urgently to place its debt on a credible downward trajectory over the medium term through reform of both its entitlement and tax systems to reduce long-term commitments and raise structural revenues. If this is achieved, the U.S. Congress should consider amending the federal debt ceiling as a control device, as it can raise near-term concerns over a technical default while inducing artificial liability management operations by the U.S. Treasury. Similarly, Japan needs to formulate a credible plan to address its long-term fiscal deficit and debt problems before domestic investors lose

confidence in the ability of future taxpayers to shoulder the burden—especially at higher interest rates—as the aging population runs down its savings.

Major progress at the international level has allowed the focus of financial reform to shift to implementation.

Policy actions aimed at repairing public and private balance sheets need to be complemented with the continued pursuit of the regulatory reform agenda (Box 1.8). Recent recommendations from the Basel Committee on Banking Supervision and the Financial Stability Board represent significant progress in enhancing capital requirements for bank and nonbank financial institutions. At the national level, regulators should act to introduce the higher capital and liquidity requirements of the Basel Committee's Basel III standards as soon as feasible. In particular, it is now all the more imperative that regulators act to reduce the potential for contagion from weakly capitalized and unprofitable banks. This is key to avoid deleveraging via credit contraction. Coordination among regulators is important to prevent risks from migrating to jurisdictions with weak regulations. Capital surcharges may help address some of the moral hazard advantages that accrue to large, systemically important financial institutions (SIFIs), although their status as such reinforces SIFIs' perceived creditworthiness. Hence, as currently planned, authorities need to complement capital surcharges with credible measures to enable

swift resolution of such institutions through so-called living wills and adequate national and cross-border resolution regimes, aided by an international registry of legal entities. All such measures should be implemented in a coordinated fashion by national authorities and in a manner that limits the risk of cross-border spillovers.

Measures to enhance the resilience of banks should be coupled with an appropriate treatment of risks in the shadow banking sector through adequate monitoring and regulation. This is essential to avoid having tighter bank regulation push additional risky activity into currently unregulated or lightly regulated financial sectors.

Authorities should resist “repression” of financial markets and signals.

With sovereigns under financing stress and economies struggling to deleverage, policymakers may be tempted to suppress or circumvent financial market processes and information. To be sure, such repression can be a legitimate response to extreme financing pressures (such as by maintaining negative real policy rates) or international capital flows. Nevertheless, policies that require private savings to be invested in government bonds are likely to result in the long-term misallocation of capital. Moreover, attempts to suppress adverse indications of sovereign risk (be they credit ratings, CDS positions, or other indicators) may ultimately undermine market liquidity and the credibility of the authorities.²⁶ Similarly, measures to restrict specific market activities, such as limits on the short-selling of stock, may be useful to break adverse market dynamics in the short run, but they are

²⁶Banning “naked” sovereign CDS positions, or imposing private losses without triggering CDS, could easily increase contagion rather than reduce it. The alternatives for counterparties seeking to hedge their sovereign exposures are either to rapidly institute proxy hedges in liquid alternatives (through shorting government bonds, equities of systemic banks, or the currency) or to cut country exposure by rapidly reducing credit lines to nonfinancial businesses and banks.

unlikely to be effective for long and often bring about undesirable consequences.

Policymakers in many emerging market economies must guard against a buildup of financial imbalances.

Not all emerging market economies are undergoing rapid credit expansion, but many—particularly in Asia and Latin America—are still experiencing relatively buoyant conditions. Policymakers in those economies need to be vigilant against excesses that can exacerbate future downswings. Domestic credit growth that is above trend and well above nominal GDP growth is an area of concern, particularly where new credit is directed toward consumption rather than investment. As demonstrated by the analysis above, larger capital cushions for banks in emerging markets—notably EMEA and Asia—could significantly reduce financial system vulnerability to macroeconomic shocks. Conventional monetary and fiscal policy tools can be usefully supplemented in many cases with macroprudential measures such as targeted reserve requirements and increased risk weightings on bank capital. Macroprudential measures can be usefully deployed to help contain risks, while in certain cases capital controls can play a supportive role in managing capital flows and their effects. However, they cannot substitute for appropriate macroeconomic and prudential policies; administrative measures tend to impose significant costs, and their effectiveness typically diminishes over time.

As the global growth outlook softens, emerging markets may be cushioned by still-strong domestic demand, but they are unlikely to be fully insulated. This may especially be the case for major exporters of commodities. Such countries need to prepare for the materialization of “tail risks,” that is, of low-probability but highly destructive global economic crises. They can do so by controlling liquidity and currency mismatches of local borrowers, ensuring that local banks are robustly capitalized, and developing resilient local financial capital markets and infrastructures.

Annex 1.1. Macro-Financial Linkages in Emerging Markets and Impact of Shocks on Bank Capital Adequacy Ratios¹

This annex describes the time series methodology behind the simulation exercise presented in Figures 1.43–1.45. We use a panel VAR to assess the vulnerability of a large group of emerging markets to external shocks such as a sudden reversal in capital flows or a deterioration of the terms of trade.

A closely related model yielding similar results (including net interest income but without net capital flows) is then used to calculate different scenarios for the sensitivity analysis of emerging market banks as presented in the main text in Figure 1.46 and Table 1.3. We employ a new IMF solvency framework and econometric modeling to assess the vulnerability of emerging market banks to macroeconomic and financial shocks.

Estimating Macro-Financial Linkages in Emerging Markets

Data

The dataset contains annual observations for 25 emerging markets from 1996 to 2010 where available. The countries included in the sample are Argentina, Brazil, Bulgaria, Chile, China, Colombia, the Dominican Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, Uruguay, and Venezuela. The NPL ratio (nonperforming loans as a share of total loans) is collected from Bankscope. Real GDP, terms of trade, and price indices are from the World Economic Outlook database. Private credit series are from the IMF's International Financial Statistics (IFS) database or country authorities (through Haver Analytics). Net capital flows are from the IFS database and exclude reserve accumulation.

Modeling and Estimation

To model the relationship between macroeconomic aggregates and financial variables,

¹Prepared by Reinout De Bock and Alexander Demyanets.

we extend the fixed-effects panel VAR model in IMF (2010, Box 1.2, pp. 18–19).² We follow a general-to-specific approach and start with a set of important macroeconomic and financial variables. Our final specification is a model with one lag and five variables: (1) real credit as a share of GDP, (2) the NPL ratio, (3) net capital flows as a share of GDP, (4) changes in terms of trade, and (5) real GDP growth. Models with more lags show widening confidence bands, and are more difficult to interpret economically, leaving the model with one lag as the preferred specification.

Given positive, one standard deviation Choleski shocks, the impulse response functions (Figure 1.48) have expected signs and are statistically significant. Estimating the model in growth rates yields similar results.

Response to External Shocks

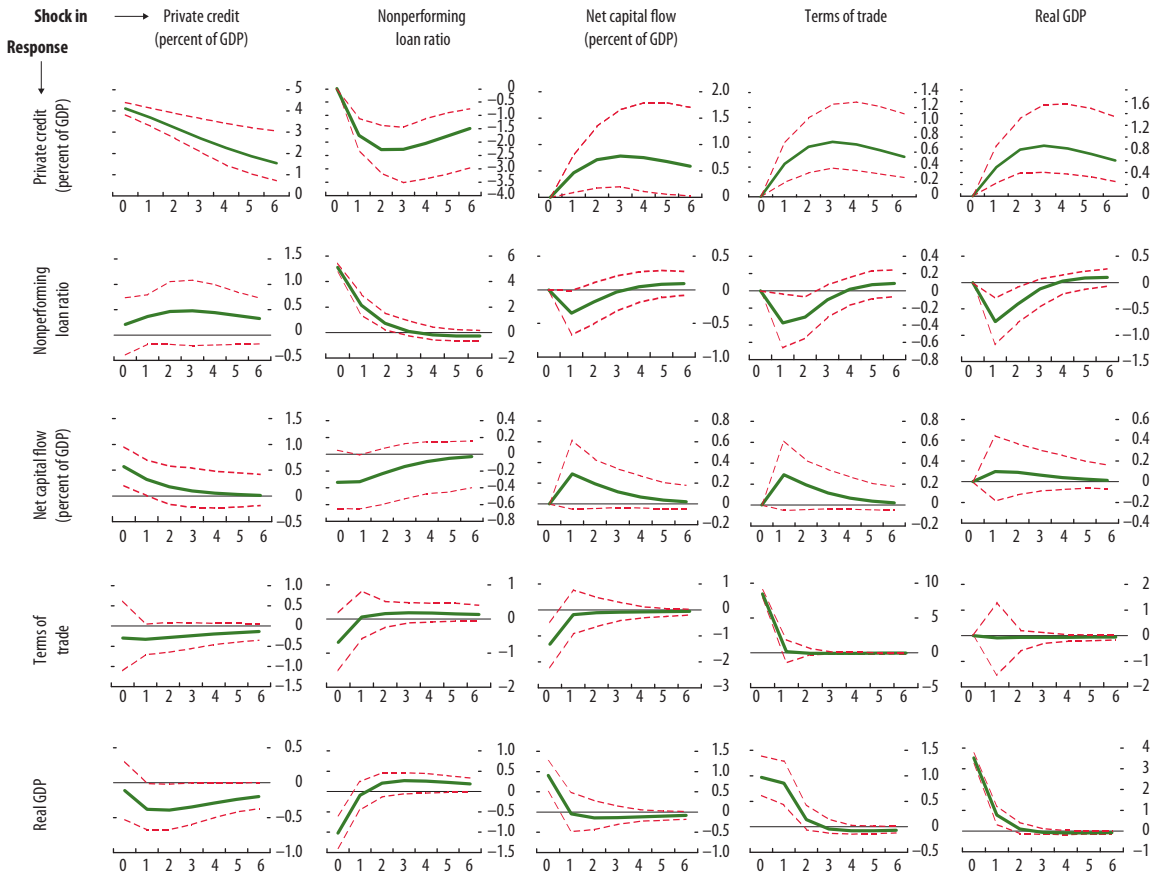
Country fixed effects are used when simulating the model. We feed 2010 values into the model to predict NPL ratios for 2011 and 2012 (Figure 1.43). Figure 1.44 shows model-implied changes in credit (share of GDP), GDP growth, and the NPL ratio when the Choleski innovation corresponding to net capital flows (as a share of GDP) drops 8.7 percent. The shock is calibrated to match a two standard deviation change in net capital flows (as a share of GDP). Figure 1.45, on the other hand, shows model-implied changes when the Choleski innovation on the terms of trade equation falls 15.8 percent (two standard deviations of the pooled sample).

Impact of Shocks on Capital Adequacy Ratios of Emerging Market Banks

We employ a new IMF solvency framework and econometric modeling to assess the vulnerability of emerging market banks to macroeconomic and financial shocks (see Figure 1.46 and Table 1.3). Our sample includes 347 banks in 17 emerging markets.

²The code used to estimate the model and produce impulse response functions was written by Inessa Love, of the World Bank.

Figure 1.48. Impulse Responses: Model Specification 1



Sources: Bankscope; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
 Note: Values on horizontal axis are years after shock. Dashed red lines show 90 percent confidence bands. Cholesky orthogonal shocks of one standard deviation.

Solvency Analysis

We use the balance sheet based solvency analysis framework presented in Schmieder, Pühr, and Hasan (forthcoming). The framework has been developed to enrich the existing tests in terms of risk sensitivity, allowing for an economic rather than regulatory assessment of bank capitalization, and recently applied in several countries as part of the IMF surveillance work. We measure bank capitalization based on total capital adequacy ratios. We adjust risk-weighted assets (RWA) for changes in credit risk using parameters—probability of default (PD), loss-given-default (LGD) ratios, and exposures at default—underlying the Basel II internal ratings based (IRB) method.

In our framework, strained conditions in credit risk affect bank solvency through an increase in expected losses (with a negative impact on net income, income effect) *as well as* an increase in the riskiness of the performing loans portfolio (unexpected losses, risk effect), resulting in higher RWAs and lower capital adequacy ratios (compared with Basel I and the Basel II standardized approach). The reason for the lower capitalization ratios in economic terms is that (i) the risk effect dominates the income effect and (ii) the risk weights computed on the basis of credit risk parameters are higher than under Basel I or the standardized approach (i.e., higher than 100 percent)—driven by higher

levels of the LGD ratio and PD in emerging markets compared with advanced economies.

VAR model and Simulation

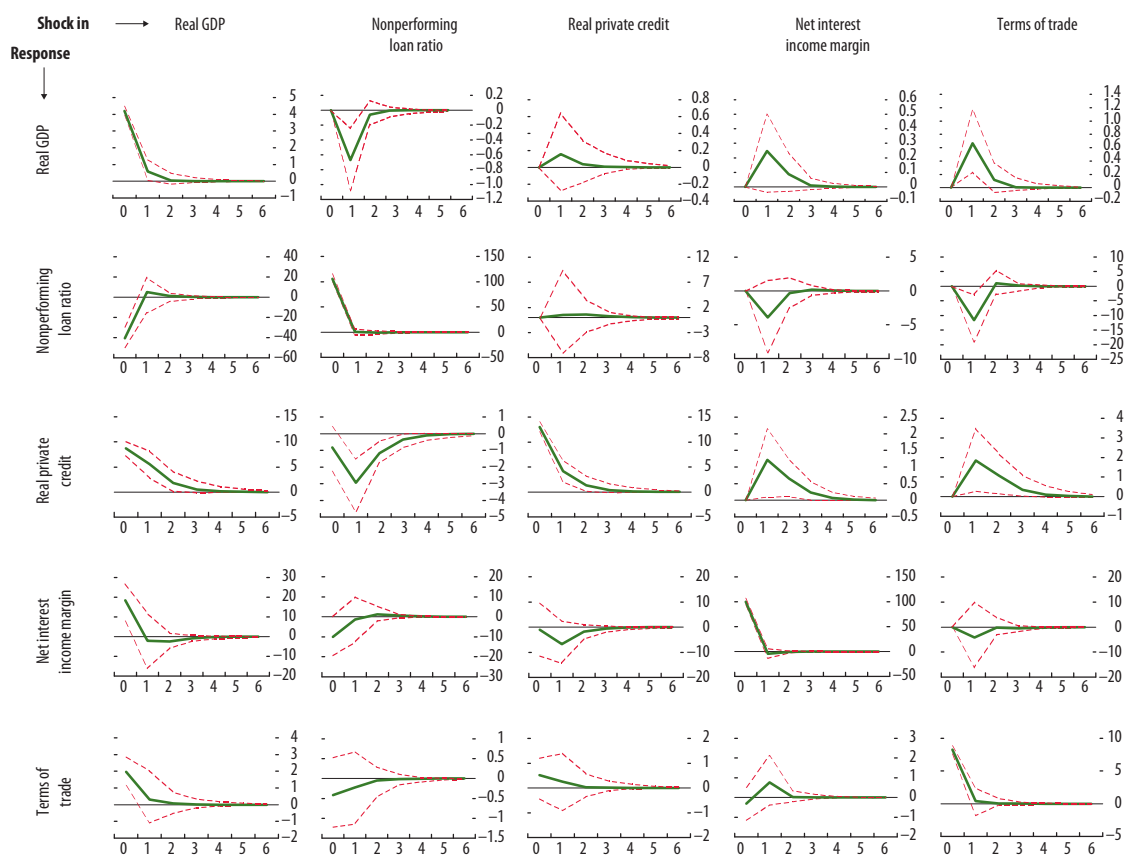
Our final specification for the solvency analysis is a fixed-effects panel VAR estimated on the sample of 25 emerging markets. The VAR includes one lag and five variables: (1) real GDP growth, (2) changes in the terms of trade, (3) changes in the NPL ratio, (4) changes in net interest income margin, and (5) private credit growth deflated by the consumer price index. Again, given positive, one standard deviation Choleski shocks, the impulse response functions (Figure 1.49) have expected signs and are statistically significant.

For the purposes of simulating the model, regional fixed effects are used. The baseline path for the model’s variables is generated under the WEO forecast for real GDP growth and terms of trade. A real GDP shock is introduced into the model by taking the difference between the WEO forecast and the model’s predicted value and scaling it by the standard deviation of the real GDP shock. A terms-of-trade shock is applied in an analogous manner and is orthogonalized to the GDP shock.

Scenario Analysis

To simulate scenarios of a slowdown in growth and a terms-of-trade shock, we subtract 5 percentage

Figure 1.49. Impulse Responses: Model Specification 2



Sources: Bankscope; IMF, International Financial Statistics database, World Economic Outlook database; and IMF staff estimates.
 Note: Values on horizontal axis are years after shock. Dashed red lines show 90 percent confidence bands. Cholesky orthogonal shocks of one standard deviation.

points and two standard deviations from the WEO forecasts for real GDP growth and terms-of-trade in 2011 and 2012, respectively, and the simulated paths for the model variables are generated as in the baseline scenario. The regional model projections are country forecasts weighted by the total assets of the banking sector.

We run four scenarios over a five-year horizon (2011–15): (1) slowdown in growth in 2011 and 2012; (2) deterioration in the terms of trade in 2011 and 2012; (3) increase in funding costs in 2011; and (4) simultaneous shocks to growth, terms of trade, and funding costs.

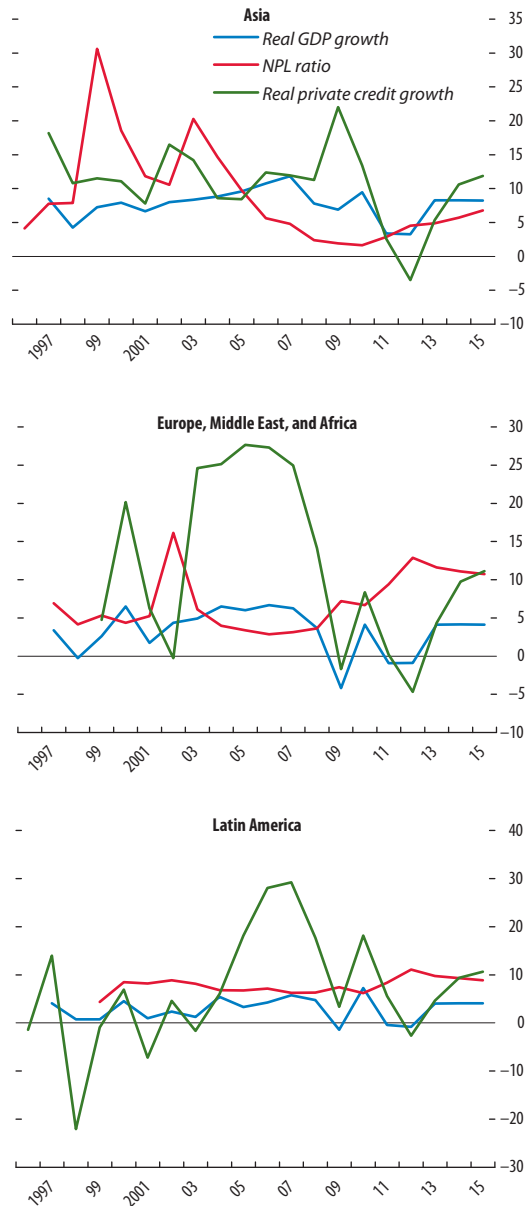
Slowdown in Growth and Terms of Trade

In these scenarios, we estimate the impact of macroeconomic shocks on banks’ capitalization levels. The growth shock is calibrated to a 5 percentage point deviation from the WEO baseline forecast for real GDP growth, whereas we use two standard deviations for the terms of trade. We use the projections for NPLs, credit growth, and net interest margins for 2011–15 derived from the VAR modeling and apply them to portfolios of bank loans to determine unexpected losses and net profit. Because NPL ratios overestimate loss rates in a multi-period simulation, we adjust the projected NPL series by the scaling factor calculated as the product of the ratio of reported loan loss provisions to total loans and country-level LGD estimates.

Funding Cost

In this scenario, we assess the effect of an increase in the cost of banking sector funding on capitalization. We apply a one-time shock of 300 basis points in the first year of the exercise and calculate resulting losses as the product of net interest margin and net interest income on the banks’ loan portfolio. We assume that changes in the cost of funding do not affect the liabilities side of the balance sheet or the value of the investment portfolios. In order to estimate the impact in a manner consistent with WEO economic forecasts, we draw on the baseline projections for NPL, credit growth, and profit rates from our model.

Figure 1.50. Macro Scenarios under Combined Shocks (In percent)



Source: Bankscope; IMF, International Financial Statistics database; and IMF staff estimates.

Combined Macro Shocks

In the combined shocks scenario underlying Figure 1.46, we turn on all shocks at the same time. We simulate variable paths under the joint and consecutive real GDP deviation and terms-of-trade shocks and add on an exogenous increase in the cost of funding. The resulting scenario (Figure 1.50) is broadly calibrated to an emerging market financial crisis whereby concerns about macroeconomic slowdown, government policy, and falling commodity prices lead to sudden stops in capital flows and drive emerging market interest spreads to comparable levels.³

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³In all scenarios, we assume that banks face an effective tax rate of 25 percent and pay out 50 percent of net income as dividends.

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