

Global Debt Overhang and Stability Challenges

Large debt burdens threaten financial stability across advanced economies.

Since the onset of the global financial crisis more than five years ago, markets have struggled with a sharp repricing of credit risk. From its origins in the U.S. subprime market to its current epicenter of bank and sovereign funding markets in the euro area, the crisis has engulfed a widening number of private and public borrowers. Weaknesses in borrower balance sheets remain at the forefront of investors' concerns, as high debt burdens weigh on economic performance while creating the risk of a confidence-driven deterioration in market dynamics (Table 2.1).

However, not all highly indebted borrowers are facing a credit squeeze. As discussed later in the chapter, the sovereign debt markets in Japan and the United States are the most striking counterexamples, as they continue to rank as prime safe-haven destinations despite daunting fiscal challenges. But the absence of market strains today must not lead to complacency—addressing these challenges over the medium term is critical (see Box 1.1 in Chapter 1).

Note: This chapter was written by Peter Dattels and Matthew Jones (team leaders), Sergei Antoshin, Nicholas Arregui, Serkan Arslanalp, Sophia Avramova, Adolfo Barajas, Ana Carvajal, Eugenio Cerutti, Su Hoong Chang, Ken Chikada, Nehad Chowdhury, Kay Chung, Sean Craig, Era Dabla-Norris, Reinout De Bock, Martin Edmonds, Jennifer Elliott, Michaela Erbenova, Ellen Gaston, Jeanne Gobat, Tom Gole, Kristian Hartelius, Sanjay Hazarika, Changchun Hua, Anna Ilyina, Patrick Imam, Marcel Kasumovich, William Kerry, Oksana Khadarina, John Kiff, Michael Kleeman, Alexandre Kohlhas, Peter Lindner, Tommaso Mancini Griffoli, Rebecca McCaughrin, André Meier, Fabiana Melo, Paul Mills, Srobona Mitra, Gianni de Nicolò, S. Erik Oppers, Nada Oulidi, Evan Papageorgiou, Jaime Puig, Lev Ratnovski, André Santos, Jochen Schmittmann, Katharine Seal, Stephen Smith, Tao Sun, Jay Surti, Narayan Suryakumar, Takahiro Tsuda, Nico Valckx, Constant Verkoren, Chris Walker, Rodolfo Wehrhahn, Christopher Wilson, Xiaoyong Wu, Mamoru Yanase, Lei Ye, Luisa Zanforlin, and Jianping Zhou.

In the euro area, an incomplete architecture for the currency union adds additional vulnerabilities.

Nonetheless, the stability and resilience of government bond markets in Japan and the United States put into sharp relief an important aspect of the euro area crisis, which is the inherent vulnerability of an incomplete architecture for the currency union. Within a common monetary policy setting, inadequate policies at the national level and a lack of bond market discipline allowed large imbalances to emerge during the first 10 years of the euro's existence. The subsequent adjustment, in turn, has been complicated by the fact that euro area members cannot rely on an independent monetary policy or a floating exchange rate as a shock absorber. This constraint concentrates and amplifies the pressure on credit markets, especially since borrowers no longer benefit from a captive domestic investor base in their own currency. Unless there is a safety valve, such pressures can reach systemic proportions, as evidenced by the full-blown crisis now in its third year.

To be sure, by stipulating the principle of individual liability and no bailout, the architects of the euro envisaged default as an implicit safety valve. As recent developments have painfully shown, however, even the perception of sovereign default risk has major adverse consequences for financial stability throughout the currency union. Thus, additional safety valves—notably a deepening of financial and fiscal integration with elements of risk sharing—are essential to restore stability and shore up the single currency (see Chapter 1). Despite many important steps already taken by policymakers, this agenda remains critically incomplete, exposing the euro area to a downward spiral of capital flight, breakup fears, and economic decline.

Indeed, *fragmentation* in financial markets across the euro area has increased as banks, businesses, and even some households increasingly try to limit uncovered exposures to the most vulnerable countries in the euro area periphery. As discussed

Table 2.1. Indebtedness and Leverage in Selected Advanced Economies¹*(In percent of 2012 GDP, unless noted otherwise)*

	General Government			Households		Nonfinancial Firms		Financial Institutions			External Liabilities			
	Gross debt ²	Net debt ^{2,3}	Primary balance ²	Gross debt ⁴	Net debt ^{4,5}	Gross debt ⁴	Debt over equity (percent)	Gross debt ⁴	Bank leverage ⁶	Bank claims on public sector ⁴	Gross ^{4,7}	Net ^{4,7}	Government debt held abroad ⁸	
Euro area	Greece	171	n.a.	-1.7	69	-58	73	235	40	n.a.	13	204	96	95
	Ireland	118	103	-4.4	117	-74	289	109	706	8.3	28	1,750	99	71
	Italy	126	103	2.6	51	-174	114	138	105	5.2	38	146	24	46
	Portugal	119	113	-0.7	104	-125	158	154	59	4.5	24	285	108	64
	Spain	91	79	-4.5	87	-74	186	143	115	4.9	35	225	92	25
	Belgium	99	83	0.1	55	-202	186	52	123	n.a.	24	404	-65	57
	France	90	84	-2.2	67	-134	134	68	172	2.5	18	296	16	58
	Germany	83	58	1.4	58	-122	64	96	97	2.2	23	219	-38	51
	Euro area	94	73	-0.5	71	-130	138	107	145	n.a.	n.a.	194	12	26
	Rest of the world	United Kingdom	89	84	-5.6	99	-185	116	85	232	4.2	8	692	9	28
United States		107	84	-6.5	86	-235	89	83	88	7.1	8	161	26	32
Canada		88	36	-3.2	91	-154	54	44	59	3.3	15	103	12	18
Japan		237	135	-9.0	76	-241	145	176	188	2.8	83	73	-57	18

Sources: Bank for International Settlements (BIS); Bloomberg L.P.; EU Consolidated Banking Data; Federal Deposit Insurance Corporation; IMF: International Financial Statistics Database, Monetary and Financial Statistics Database, World Economic Outlook Database; BIS-IMF-Organization for Economic Cooperation and Development-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 from 1990 through 2010 (or longest sample available). Green shading indicates values in the bottom 50 percent, yellow in the 50th to 75th percentile. For bank leverage, shading is explained in Table 2.2.

²World Economic Outlook (WEO) projections for 2012.

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 2012). Nonfinancial firms' gross debt figures include 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.

⁶Leverage ratio is tangible common equity/tangible assets in percent.

⁷Calculated from assets and liabilities reported in a country's international investment position; includes data on international financial services centers.

⁸Most recent data for externally held general government debt (from the JEDH) divided by 2012 GDP from the WEO. Debt data from the JEDH are not comparable to WEO debt data when at market value.

in the next section, the resulting financial strains have interacted with weak balance sheets in one or several sectors to generate a dangerous vicious cycle of credit crunch and economic recession. Banks play a key role in propagating stress, as they continue to face very tight funding markets, worsening asset quality, and intense deleveraging pressures (Table 2.2). As European banks have reduced their cross-border exposures, other large banks, notably in Asia, have stepped in to fill in the gap. This, in turn, has increased the reliance of these banks on the dollar funding market and hence their susceptibility to potential strains in that market (see Box 2.1).

In the euro area periphery and Japan, domestic banks continue to function as a major source of demand for sovereign bonds (Table 2.3). With banks holding large lots of sovereign bonds, governments may find it hard to act as a financial sector backstop, as fiscal strains are quickly reflected on bank balance sheets. Relative to European

banks, U.S. banks pose less risk to their sovereign, in large measure because of their restructuring following periods of financial crisis. In the case of Japan, there is some concern that regional banks may face unacceptable risks in coming years from the long duration of their sovereign holdings. More broadly, Japanese bank purchases as a share of new issuance have been increasing; this could increase the likelihood that they may need assistance, but it could also restrict their ability to absorb more government bonds.

Stresses in major advanced economies are likely to spill over to emerging markets, in some cases adding to home-grown vulnerabilities.

The euro area crisis raises concerns about possible global spillovers. Earlier IMF studies concluded that as long as the euro area crisis remains contained within the periphery, global spillovers would be

Table 2.2. Banking Financial Stability Indicators¹

		Capital		Asset Quality	Funding		Earnings	Market Valuation	
		Tier 1 capital ratio (percent) ²	Leverage ratio (percent) ³	Gross NPL ratio (percent) ⁴	Loan-to-deposit ratio (percent)	Short-term funding ratio (percent) ⁵	U.S. dollar traded debt as percent of wholesale funding ⁶	Return on assets (percent)	Price-to-book ratio
Euro area	Greece	1.5	...	20.2	154	42	3.7	-0.4	0.38
	Ireland	16.2	8.3	19.1	155	24	1.1	-0.8	...
	Italy	9.5	5.2	10.7	176	25	1.5	0.4	0.32
	Portugal	9.1	4.5	4.1	132	18	2.4	0.3	0.37
	Spain	10.5	4.9	5.6	142	14	5.0	0.2	0.53
	Austria	9.9	4.9	8.5	119	19	0.3	0.4	0.50
	France	11.5	2.5	5.2	116	32	2.4	0.2	0.39
	Germany	11.9	2.2	3.5	98	10	8.7	0.2	0.79
	Netherlands	14.3	4.0	2.7	99	8	4.5	0.4	0.42
	Europe (non-euro area)	United Kingdom	12.6	4.2	7.5	100	6	10.5	0.0	0.51
Denmark		19.7	3.5	5.8	220	16	0.8	0.1	0.74
Switzerland		17.6	2.9	0.8	77	4	7.1	0.2	0.69
Sweden		16.7	3.8	1.8	195	9	7.3	0.6	1.22
Western Hemisphere	United States	13.4	7.1	4.8	71	20	...	0.8	0.88
	Canada	12.7	3.3	0.9	76	11	...	0.8	1.83
Asia	Korea	10.2	7.2	1.7	110	7	7.1	0.8	0.73
	Australia	10.2	4.4	1.3	113	11	12.6	0.9	1.76
	Singapore	13.6	6.8	1.4	90	11	5.8	1.0	1.30
	Japan	12.3	2.8	2.2	73	21	3.0	0.5	0.52
	Hong Kong SAR	10.4	7.6	0.5	69	4	4.0	1.1	1.31

Sources: Bloomberg L.P.; SNL Financial; and company reports.

¹The ratios reported in the table are unweighted averages computed for a sample of large banks representing 50–85 percent of total assets of banks domiciled in each jurisdiction. These numbers, therefore, may be different from the system-level financial stability indicators (FSIs) presented elsewhere. All ratios are based on the latest available bank balance sheet data (for European and Asian banks, 2012:Q1 or the latest available; for U.S. banks, 2012:Q2 or the latest available). The price-to-book ratios are as of August 10, 2012. Red shading indicates a value in the worst quartile of a pooled sample of all countries shown in the table from 2000 to 2011 (or the longest sample available); values in the next-to-worst quartile are shaded in yellow and the rest in green. In addition, for some indicators, the following benchmarks are used: green shading does not apply to the Tier 1 capital ratios of less than 10 percent, loan-to-deposit ratios of greater than 100 percent, and price-to-book ratios of less than 1.

²Tier 1 capital ratio is Tier 1 capital/risk-weighted assets.

³Leverage ratio is tangible common equity/tangible assets.

⁴Gross NPL ratio is gross nonperforming loans/total loans.

⁵Short-term funding ratio is short-term borrowing due within one year, including repos, short-term portion of long-term borrowing, and current obligations under capital leases/total liabilities.

⁶U.S. dollar traded debt/wholesale funding is based on bank-level data on U.S. dollar bonds and loans outstanding from Bloomberg (numerator) and bank-level wholesale funding defined as total liabilities net of equity, customer deposits, and derivatives liabilities. The shading for this indicator is based on cross-section only.

limited.¹ The updated bank deleveraging simulations presented in the next section suggest, however, that increasing pressures on euro area periphery banks may have a large impact on some countries outside the euro area, most notably in emerging Europe and possibly in Latin America. Several countries in emerging Europe, moreover, feature certain similari-

¹See, for example, the IMF's 2011 euro area spillover report (IMF, 2011).

ties to the euro area periphery in that they combine high external indebtedness with limited policy space. Although Asia and Latin America are generally more resilient, several regional economies are in the late stages of the credit cycle, and long-running property market booms may have peaked; therefore, because economic activity has started to slow, these economies face the risks that come from worsening credit quality. The final section of the chapter explores these themes in detail.

Table 2.3. Sovereign Market and Vulnerability Indicators
(Percent of 2012 projected GDP, unless otherwise indicated)

	Fiscal and Debt Fundamentals ¹			Financing Needs ⁵		External Funding		Banking System Linkages			Sovereign Credit	
	Gross general government debt ²	Net general government debt ³	Primary balance ⁴	2012	2013	General government debt held abroad ⁶	Domestic depository institutions' claims on general government ⁷	(percent of consolidated depository institutions' assets)	BIS reporting consolidated international claims on public sector ⁸	Rating/outlook (notches above speculative grade/ outlook) (as of 06/30/12) ⁹	Five-year (basis points) (as of 06/30/12)	Sovereign Credit Default Swaps
Greece	171	n.a.	-1.7	29	18	95	13	6	8.1	-8	Stable	17,280
Ireland	118	103	-4.4	16	14	71	28	4	4.3	2	Negative	514
Italy	126	103	2.6	30	25	46	38	14	8.7	3	Negative	485
Portugal	119	113	-0.7	27	22	64	24	7	8.5	-2	Negative	813
Spain	91	79	-4.5	23	21	25	35	10	4.7	2	Negative	530
Austria	74	54	-0.7	9	8	62	16	5	12.0	9	Negative	121
Belgium	99	83	0.1	19	20	57	24	8	12.5	7	Negative	177
Finland	53	-51	-1.7	9	8	48	6	2	17.1	10	Negative	56
France	90	84	-2.2	19	19	58	18	4	7.2	9	Negative	159
Germany	83	58	1.4	8	8	51	23	7	9.5	10	Negative	70
Netherlands	68	35	-2.4	14	14	38	16	4	11.7	10	Negative	83
United Kingdom	89	84	-5.6	15	15	28	8	2	2.5	10	Negative	56
Denmark	47	4	-3.5	12	10	20	15	3	4.1	10	Stable	87
Norway	50	-169	11.2	-9	-7	13	n.a.	n.a.	3.6	10	Stable	30
Sweden	37	-17	-1.2	5	3	17	9	3	3.7	10	Stable	47
United States	107	84	-6.5	26	27	32	8	6	4.1	9	Negative	48
Canada	88	36	-3.2	16	18	18	15	7	3.1	10	Stable	n.a.
Australia	27	12	-2.4	5	4	14	2	1	2.8	10	Stable	67
Japan	237	135	-9.0	59	60	18	83	25	1.6	6	Negative	92
Korea	33	32	0.9	1	1	5	5	4	3.7	5	Stable	118
New Zealand	39	12	-4.0	9	13	22	8	4	3.7	8	Stable	82

Sources: Bank for International Settlements (BIS); Bloomberg L.P.; IMF: International Financial Statistics Database, Monetary and Financial Statistics Database, World Economic Outlook (WEO) Database; BIS-IMF-Organization for Economic Cooperation and Development-World Bank Joint External Debt Hub (JEDH); and IMF staff estimates.

Note: Debt data from the JEDH are not comparable to WEO data when they are at market value. Based on projections for 2012 and 2013 from the 2012 *World Economic Outlook* (WEO). See the WEO for a summary of the policy assumptions.

¹As a percent of GDP projected for 2012. For New Zealand the coverage of fiscal data is for the central government.

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

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

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

⁵As a proportion of WEO projected GDP for the year.

⁶Most recent data for externally held general government debt from the JEDH divided by projected 2012 GDP. Note that depending on the country, the JEDH reports debt at market or nominal values. Data for New Zealand are from the Reserve Bank of New Zealand.

⁷Includes all claims of depository institutions (excluding the central bank) on general government. Figures for New Zealand are for claims on the central government. Figures for the United Kingdom are for claims on the public sector. Data are for 2012:Q1 or latest available.

⁸BIS reporting banks' international claims on the public sector on an immediate borrower basis as of March 2012, as a percentage of projected 2012 GDP.

⁹Based on the 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.

Box 2.1. Systemic Risk in International Dollar Credit

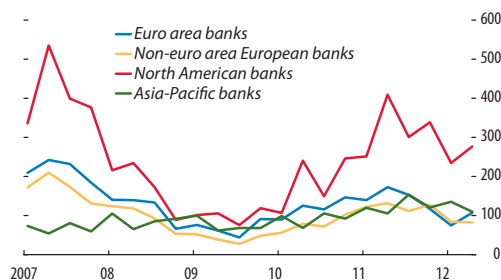
International forms of credit—trade finance, syndicated lending, and project finance, denominated mostly in dollars or euros—are usually provided by the large, global European and U.S. banks. But as many European banks have come under deleveraging pressures, the availability of international credit has become more volatile. Local banks are stepping in; but when they lack a dollar or euro deposit base, they must rely on global wholesale funding markets, which makes them vulnerable to dollar liquidity shocks and raises systemic risk. This shift to local banks is perhaps most advanced in Asia, where a wide range of critical activities—regional supply chains, commodities trade, and mining and power projects—are denominated in dollars. If they coordinate internationally, policymakers can limit the systemic risk by providing dollar liquidity insurance through a variety of mechanisms that require cross-border cooperation.

International credit in foreign currency is large and volatile. It peaked at \$820 billion in the second quarter of 2011 and then collapsed by one-third over the next three quarters. The role of this credit is often overlooked, as it is not separately identified in national credit and balance of payments statistics and must instead be constructed by aggregating private sector data on individual loan contracts. Large, global, euro area and U.S. banks have traditionally dominated this lending, but in the second half of 2011 the euro area banks came under deleveraging pressure, creating room for local banks to step in (Figure 2.1.1). This shift to local banks is strongest in Asia, particularly in the more specialized, long-term areas of finance (i.e., project, aircraft, and shipping finance) (Figure 2.1.2).

International credit is mostly denominated in dollars (except in Europe), and banks that lack a dollar deposit base must therefore fund this credit largely in global wholesale and derivatives markets. This makes it vulnerable to reductions in dollar liquidity, as demonstrated in the global financial crisis (Figure 2.1.3). For local banks entering this credit market, the increased reliance on external dollar funding creates new risks. This shift was most rapid in Asia, where local banks are relatively strong and thus had good access to dollar liquidity and were able to

Note: Prepared by Sean Craig and Changchun Hua.

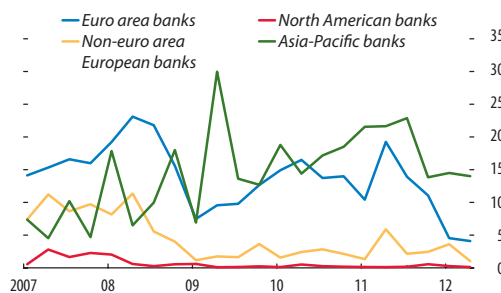
Figure 2.1.1. International Credit: Breakdown by Region of Lending Bank
(In billions of U.S. dollars)



Sources: Dealogic; and IMF staff estimates.

Note: Based on top 50 mandated lead arrangers' reports on trade finance, project finance, and general corporate finance, among others. Loan amounts are distributed equally among participating banks.

Figure 2.1.2. Global Project Finance
(In billions of U.S. dollars)



Sources: Dealogic; and IMF staff estimates.

Note: Based on top 50 mandated lead arrangers' reports on project, aircraft, and shipping finance. Loan amounts are distributed equally among participating banks.

step in and help finance the expansion in regional supply chains, trade in commodities and mining, and power and infrastructure projects. However, in the second quarter of 2011, dollar funding of Asian banks tightened, and now international credit is turning down (Figure 2.1.4).

The dependence of international credit on dollar liquidity in global wholesale funding markets adds a layer of systemic risk to that posed by excessive growth in domestic credit and asset price bubbles. Policy can limit the effect of shocks to dollar liquidity by providing liquidity insurance, but doing so needs to be coordinated internationally. Coordination

Box 2.1 (continued)

Figure 2.1.3. International Credit and External Bank Funding, Global Total

(In billions of U.S. dollars, quarterly flows as a four-quarter moving average)



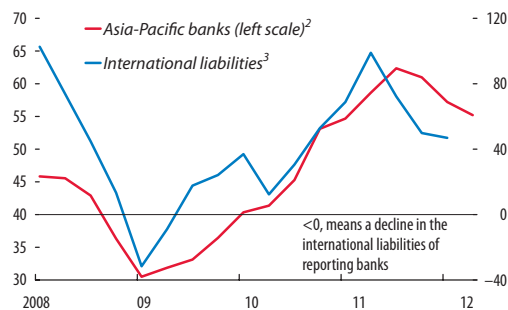
Sources: Bank for International Settlements (BIS) Locational Banking Statistics; Dealogic; and IMF staff estimates.

¹Gross credit, based on top 50 mandated lead arrangers' reports in Dealogic. Loan amounts are distributed equally among participating banks.

²Change in international liabilities by nationality of ownership of BIS reporting banks, excluding liabilities to related foreign offices.

Figure 2.1.4. International Credit in Asia and External Funding of Asia-Pacific Banks¹

(In trillions of U.S. dollars, quarterly flows as a four-quarter moving average)



Sources: Bank for International Settlements (BIS) Locational Banking Statistics; Dealogic; and IMF staff estimates.

¹Excluding Japan.

²Gross credit, based on top 50 mandated lead arrangers' reports in Dealogic. Loan amounts are distributed equally among participating banks.

³Change in international liabilities by nationality of ownership of BIS reporting banks, excluding liabilities to related foreign offices.

dination would help to ensure that the available resources—foreign exchange reserves, central bank swap facilities, regional reserve pooling arrangements (e.g., the Chiang Mai Initiative), national and international liquidity facilities, and regulatory

policy—are deployed in a cooperative fashion. Over the longer run, the dependence of international credit on dollar liquidity should be reduced.

Euro Area Crisis—Reversing Financial Fragmentation

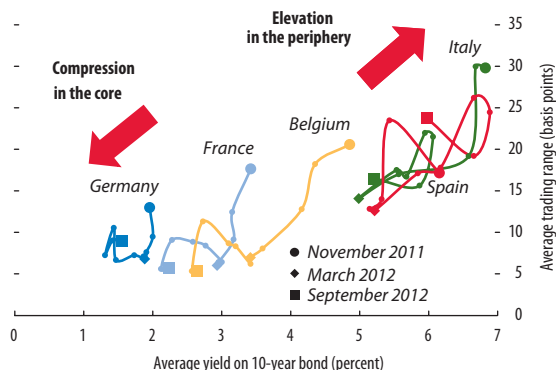
The euro area crisis remains the key threat to global financial stability. European policymakers are taking significant new steps, but confidence has not yet been sufficiently restored, and concerns about financial stability in the euro area remain elevated. The tail risk concerns surrounding currency redenomination continue to fuel both a flight to notionally safe assets and a retrenchment of cross-border capital. The resulting forces of fragmentation undermine the very foundations of the union: integrated markets and an effective common monetary policy. Liquidity-oriented policies can buy time, but they cannot fully resolve the crisis or reverse the ongoing financial fragmentation. What is required is a leap to the “complete policies” scenario to forge a stronger union.

The euro area crisis reintensified after the beneficial effects of the European Central

Bank’s (ECB’s) three-year liquidity operations faded and capital flight accelerated.

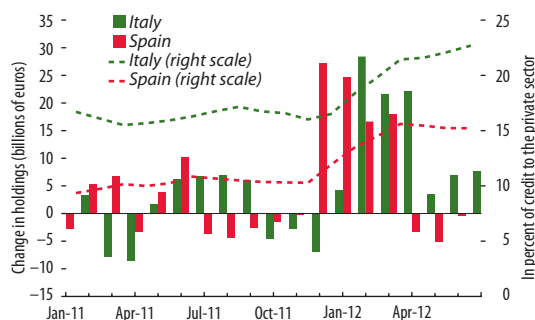
Sovereign debt markets fell into renewed turmoil in the second quarter of 2012 as strains in the euro area periphery spilled over to broader debt markets. The boost from bank purchases of domestic government bonds facilitated by the ECB’s three-year LTROs (longer-term refinancing operations) began to fade, causing volatility to rise (Figure 2.1). Spanish and Italian bank purchases of government bonds declined sharply after their exposures had reached new highs (Figure 2.2). Banks’ increased holdings of government bonds exposed them to large mark-to-market losses as yields spiked, reinforcing the link between sovereigns and weak banking systems (Figure 2.3). Spanish government bond yields rose particularly sharply to record levels as investors became increasingly concerned about the mounting cost of recapitalizing banks, the risks to fiscal consolidation from subnational budgetary

Figure 2.1. Government Bond Yields and Volatility



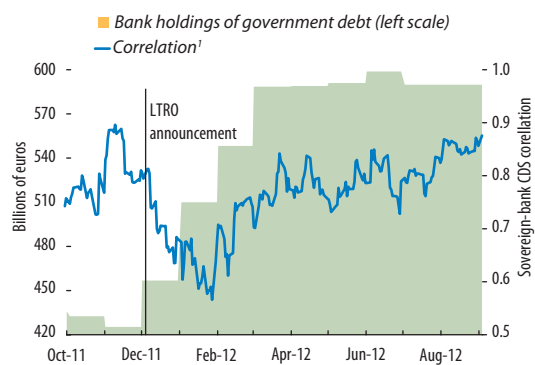
Source: Bloomberg L.P.

Figure 2.2. Bank Holdings of Government Bonds in Spain and Italy



Source: European Central Bank.

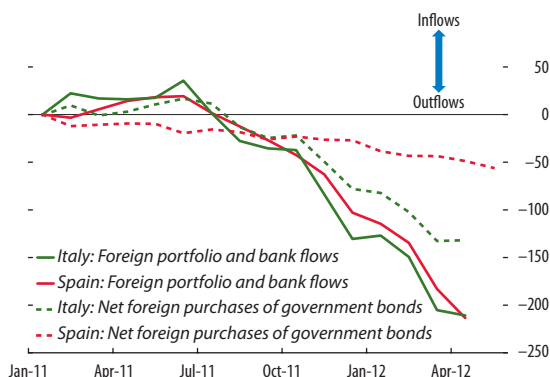
Figure 2.3. Sovereign–Bank Nexus for Italy and Spain



Sources: European Central Bank; Thomson Reuters Datastream; and IMF staff estimates. Note: LTROs = longer-term refinancing operations.

¹Thirty day rolling correlations between sovereign bond CDS (credit default swap) spreads and bank CDS spreads.

Figure 2.4. Portfolio Outflows from Italy and Spain (In billions of euros)



Sources: Haver Analytics; and IMF staff estimates.

performance, and the deepening economic contraction (Box 2.2). Although financial market conditions have improved in recent weeks on policy action from the ECB, bond yields in the euro area periphery remain elevated, while core euro area yields remain close to historic lows, signaling still-elevated concerns about financial stability in the euro area.²

Intensification of the crisis has manifested itself in capital outflows from the periphery to the core at a pace typically associated with currency crises or sudden

²On July 26, ECB President Mario Draghi said that the ECB is prepared to do “whatever it takes” to save the euro; and on September 6 the ECB announced its Outright Monetary Transactions program. Between end-July and mid-September, Spanish and Italian 10-year government bond spreads fell by about 130 basis points, the euro appreciated 7 percent against the U.S. dollar, and periphery equities rose 30–35 percent.

stops. Both Spain and Italy have suffered large-scale capital outflows in the 12 months to June—on the order of €296 billion (27 percent of 2011 GDP) for Spain and €235 billion (15 percent of GDP) for Italy.³ Foreign investors retreating from periphery bond markets drove a large share of these flows, especially in Italy (Figure 2.4). In Spain, the outflows have been broader-based; a significant part has been in corporate bonds, as sovereign rating actions have been followed by downgrades of Spanish corporations. The erosion of the foreign investor base in the periphery highlights the external financing challenges faced by these countries.

The departure of foreign investors from periphery sovereign debt markets over the past year has also spilled over to banks, which have seen a material

³Outflows are calculated by adjusting the financial account for changes in payment system (TARGET2) balances.

Box 2.2. Why Are Euro Area Periphery Sovereign Spreads So High?

Long-run statistical models based on macroeconomic fundamentals are generally unable to explain the dramatic moves in periphery bond spreads over the past two and a half years. However, a high-frequency model using indicators of banking sector stress and euro area market fragmentation as explanatory variables is able to account for much of the recent movement in spreads, signaling the close connection between the sovereign crisis and banking and external strains.

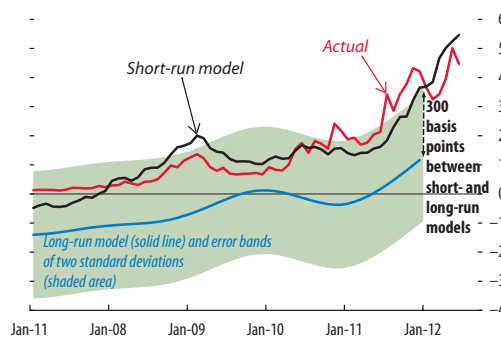
Since the beginning of the European debt crisis, spreads on the debt of sovereigns in the euro area periphery have departed substantially from most calculations of “fair value.” This difference shows up clearly in a long-run statistical model that predicts spreads based on determinants such as sovereign credit and solvency. Here, 10-year yields of Spain and Italy are more than 200 basis points, or two standard deviations, above fair value, while yields for the euro area program countries are well beyond this (Figure 2.2.1). Given the persistence of this divergence, it appears that other factors are driving these spreads. In periphery bond markets, the most likely candidates for explaining this gap include loss of confidence in policymakers, tight bank-sovereign linkages, and the retreat of cross-border investors.

To account for the size of the gap and to explore the role of these additional factors, a second, high-frequency, model was estimated, with these and other factors as explanatory variables. The high-frequency model employs a panel regression with country fixed effects, controlling for IMF/EU support programs. Overall, the model provides a reasonably good fit, explaining up to 86 percent of the variation in bond spreads. Results are robust to alternative specifications, including pooled ordinary least squares regressions and variations in the sample size.

As anticipated, the high-frequency model provides considerable insight into the source of the divergence. Model estimates suggest that (1) the health of the banking system, (2) euro area market fragmentation as proxied by the accumulation of cross-border TARGET2 liabilities, and (3) the economic outlook account for much of the gap left unexplained by the model based on macro fundamentals alone (Figure

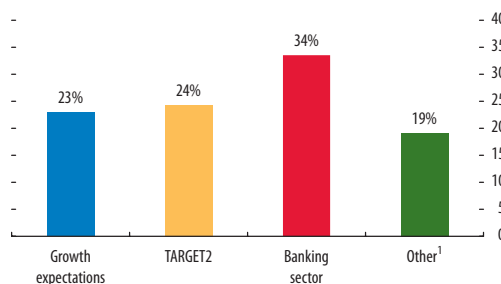
Note: Prepared by Chris Walker and Alexandre Kohlhas.

Figure 2.2.1. Italy and Spain: Actual Spread of 10-Year Sovereign Yield and Fitted Spreads from Long-Run and Short-Run Models
(Percent)



Source: IMF staff estimates.
Note: Arithmetic averages of values for Italy and Spain. Spread is over 10-year German bunds.

Figure 2.2.2. Factors Contributing to Sovereign Euro Area Spreads
(Percent of total variation)

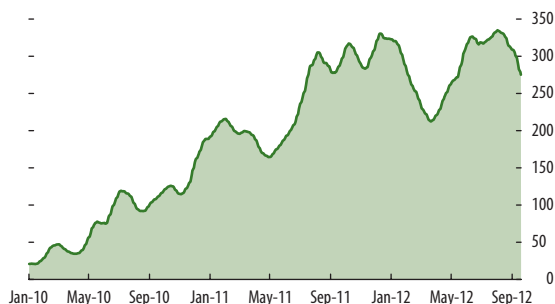


Source: IMF staff estimates.
Note: Arithmetic averages of values for Ireland, Italy, Portugal, and Spain.
¹Other: unobserved, time-invariant, country-specific factors.

2.2.2).¹ Accordingly, while it is reasonable to expect spreads to eventually return to the levels forecast by the long-run model, the high-frequency model indicates that it is not likely to happen until the challenges from the banking sector and from one-sided cross-border capital flows are resolved.

¹A Gram-Schmidt decomposition was applied to the independent variables to eliminate collinearity. However, endogeneity of the independent variables remains a possibility; thus, care should be taken in drawing causal inferences from the regression.

Figure 2.5. Periphery Minus Core Bank Credit Default Swap Spreads
(In basis points)



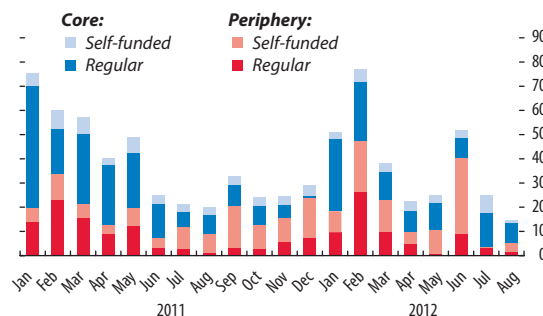
Sources: Bloomberg L.P.; and IMF staff estimates.
Note: The credit default swap data are weighted by bank assets. The figure shows a 20-day moving average.

decline in the willingness of nonresidents to provide funding. Credit default swap spreads of euro area periphery banks have widened relative to those of core euro area banks; and although this spread has come down recently, following the ECB’s Outright Monetary Transactions (OMTs) announcement, it remains at high levels (Figure 2.5). Although many core euro area banks are able to issue debt, and issuance has picked up in recent weeks, broader funding market conditions are still challenging for weaker periphery banks (Figure 2.6). Indeed, the bulk of issuance by periphery banks since mid-2011 has been taken up by the banks themselves (so-called self-funded issues) to be used as collateral.⁴

Adding to strains are the continued deposit outflows from periphery banks (Figure 2.7), which reflect a combination of waning confidence and economic contraction. The withdrawals have been most severe in Greece, where deposits are 30 percent below their peak, but there have also been deposit outflows in banks located in other periphery countries, notably Ireland and Spain (Figure 2.8). In addition to the overall decline in deposits, some countries have seen a flight to stronger institutions within their banking systems. Pressures on bank funding have continued to build as rating downgrades have resulted in higher collateral requirements, though the recent ECB deci-

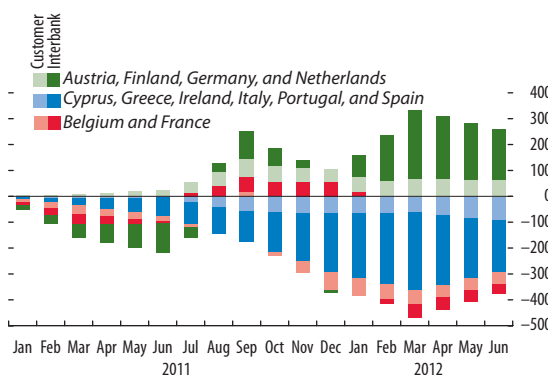
⁴In Dealogic, deals are identified as “self-funded” when the issuer is the sole underwriter. During 2011–12, just over half of the €340 billion of debt issued by periphery banks was self-funded.

Figure 2.6. Euro Area Bank Debt Issuance
(In billions of euros)



Source: Dealogic.
Note: In self-funded deals, the issuer is the sole underwriter. Core = Austria, Belgium, France, Finland, Germany, and the Netherlands; periphery = Cyprus, Greece, Ireland, Italy, Portugal, and Spain.

Figure 2.7. Bank Deposit Flows in the Euro Area
(In billions of euros, cumulative change since December 2010)



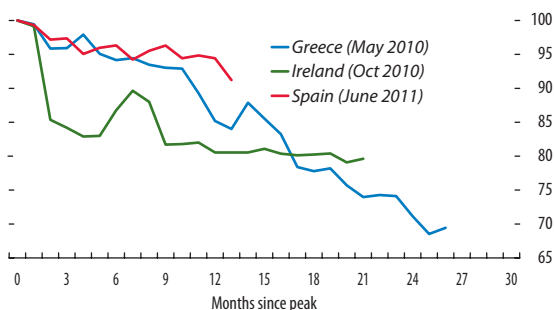
Sources: Haver Analytics; and IMF staff estimates.
Note: Based on banks located in each country and shows domestic and nonresident deposits, except for the light red and light green bars, which are for nonresident customer deposits only. Monthly figures are interpolated from quarterly data. Customer deposits exclude repos and deposits from other financial intermediaries with a maturity over two years.

sion to ease collateral rules should help banks in any country eligible for OMTs.

European banks have made a significant effort to boost their capital cushions, which has helped to strengthen their balance sheets and prevent a larger reduction in assets.⁵ From end-2011:Q3 to end-2012:Q2, total assets (excluding intangibles and

⁵In December 2011, the European Banking Authority (EBA) recommended that 27 large euro area banks increase their capital by €76 billion to reach a 9 percent core Tier 1 target and provide a sovereign buffer by end-June 2012. Bank-by-bank results are not yet available, but the EBA recently reported that banks in aggregate have taken a total of €94.4 billion in measures, exceeding the identified shortfall.

Figure 2.8. Bank Customer Deposit Trends
(Index: Peak = 100)



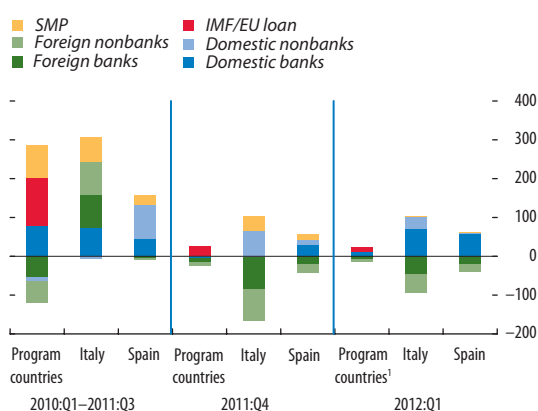
Sources: Haver Analytics; and IMF staff estimates.
Note: The date of the peak is shown in parentheses. The figure is based on banks located in each country and shows customer deposits from residents and nonresidents, excluding repos and deposits of greater than two years in maturity from other financial institutions. The data for Spain are also adjusted for the increase in retail debt from October 2011.

derivatives) of the largest EU banks fell by about \$600 billion, or 2 percent of total bank assets (see Box 2.3). This compares to the estimated \$2.6 trillion decline in total assets from the same start date to end-2013 in the base case (*current policies*) scenario of the April 2012 GFSR. Although the overall pace of deleveraging slowed in the first quarter of 2012 in the wake of the LTROs, increased market fragmentation is now causing renewed pressures, particularly in the euro area periphery. Indeed, Box 2.3 shows that bank credit in the euro area periphery has fallen more sharply than in the base case scenario of the April GFSR.

Foreign investor flight from periphery debt markets exacerbates funding challenges and heightens pressures on domestic banks to increase their holdings of sovereign bonds.

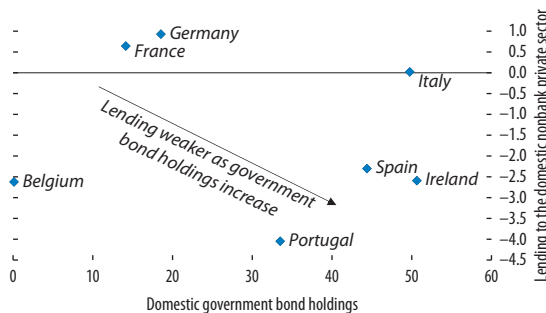
The continued erosion of the foreign investor base since 2010 represents a significant challenge for the euro area periphery (Figure 2.9). If foreign investors continue to reduce their exposures, several governments could face serious funding problems over the period ahead. Domestic banks might be able to step in to a certain extent, but this entails the risk of crowding out lending to the private sector while further tightening the link between sovereigns and banks. Highlighting this risk, the pullback of foreign investors from some periphery sovereign bond markets since end-2011:Q3 has been mirrored by

Figure 2.9. Changes in the Sovereign Investor Base
(In billions of euros)



Source: IMF staff estimates.
Note: Program countries are recipients of IMF loans: Greece, Ireland, and Portugal. SMP = Securities Market Programme of the European Central Bank.
¹Excluding Greece, which had a private sector initiative operation in this period.

Figure 2.10. Bank Credit to Domestic Governments and the Private Sector, Selected Euro Area Countries
(In percent, November 2011 to July 2012)



Sources: Haver Analytics; national central banks; and IMF staff estimates.
Note: Based on banks located in each country. Lending does not include off balance sheet securitized loans. Data through July 2012 or latest available.

falling credit to the private sector and a simultaneous significant increase in local banks' holdings of local government bonds (Figure 2.10). A further increase in funding pressures on the periphery sovereigns could translate into greater pressures on local banks to buy more sovereign debt, thereby increasing the risk of crowding out private sector credit.

Financial fragmentation is driving a wedge between the core euro area and the periphery.

The currency union is becoming increasingly fragmented between the periphery and the core. Core

Box 2.3. European Bank Deleveraging: An Update

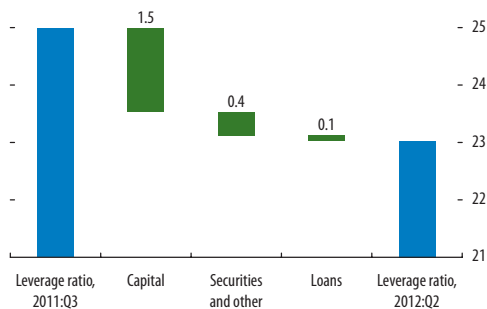
The April 2012 GFSR estimated that a sample of 58 large EU banks would reduce assets (excluding intangibles and derivatives) by \$2.2 trillion to \$3.8 trillion over the period from 2011:Q3 to 2013:Q4. Assets of these sample banks have fallen by more than \$600 billion in the period from 2011:Q3 to 2012:Q2, with much of the decline occurring in 2011:Q4. Since then, following efforts by the European Central Bank (ECB) to relieve funding pressures on euro area banks, the pace of deleveraging has slowed.

Much of the deleveraging is attributable to what was identified in the April 2012 GFSR as being a key driver of asset reductions: banks with plans to scale back the size of their balance sheets by \$2.1 trillion overall. U.K. banks have made progress through continued divesting and by cutting back noncore activities. French banks reduced U.S. dollar-denominated assets, including structured products and trading portfolios. Dutch banks sold subsidiaries in the United States and Latin America and remain committed to separating banking from insurance. One medium-sized Austrian bank sold eastern European subsidiaries in early 2012.

To date, the decline in bank leverage has been mainly due to capital measures and asset disposals; cutbacks in bank loans have played a smaller role (Figure 2.3.1). This deleveraging pattern is

Note: Prepared by Sergei Antoshin, Eugenio Cerutti, Anna Ilyina, William Kerry, and Nada Oulidi.

Figure 2.3.1. Contributions to Change in Leverage at European Banks
(In percentage points)



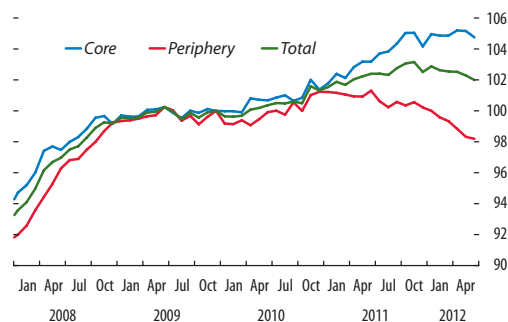
Sources: SNL Financial; and IMF staff estimates.
Note: Leverage is tangible assets less derivatives as a percentage of core Tier 1 capital. Based on a sample of 58 large EU banks.

Figure 2.3.2. Change in Foreign Claims of European Banks
(In percent)



Sources: Bank for International Settlements (BIS); and IMF staff estimates.
Note: Figure shows consolidated exposures of BIS reporting banks in the EU. The data have been adjusted for exchange rate changes and for selected breaks in series.

Figure 2.3.3. Euro Area Bank Credit to the Nonbank Private Sector
(Index, December 2009 = 100)

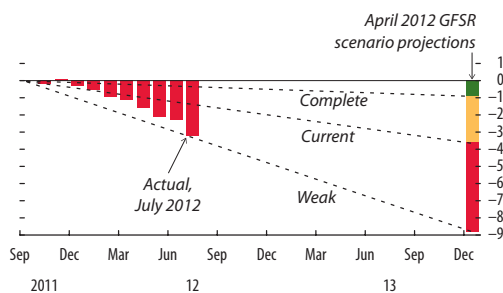


Sources: IMF, International Financial Statistics database; and IMF staff estimates.
Note: Core = Austria, Belgium, Finland, France, Germany, and the Netherlands; periphery = Greece, Ireland, Italy, Portugal, and Spain.

broadly similar to that estimated in the April 2012 GFSR. Within loans, banks' foreign claims on most borrowers have declined in the two quarters to March 2012 (Figure 2.3.2). Although the impact on emerging Europe seems to have been more muted than expected, there has been a significant impact in the euro area periphery. There is now a clear divergence within the euro area, with bank credit in the core continuing to rise, while lending in the periphery is falling back sharply (Figure 2.3.3).

Box 2.3 (continued)

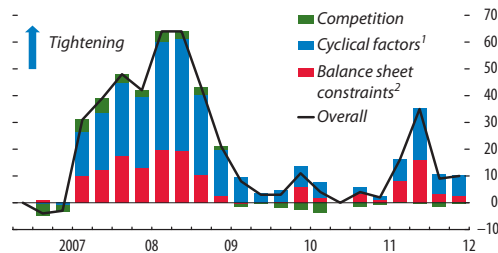
Figure 2.3.4. Euro Area Periphery Bank Credit, Actual and under April 2012 GFSR Policy Scenarios
(In percent, cumulative since 2011:Q3)



Sources: IMF, International Financial Statistics database; and IMF staff estimates.
Note: Credit is to the nonfinancial private sector. The dotted lines show glide paths for the three April 2012 GFSR scenarios assuming that credit falls at a constant rate over the scenario period. Periphery = Ireland, Italy, Portugal, and Spain.

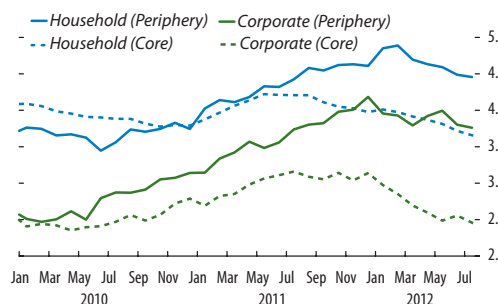
Indeed, credit in the periphery has fallen more than expected, broadly tracking the pace in the *weak policies* scenario outlined in the April 2012 GFSR (Figure 2.3.4). Although the rapid pace may reflect the uncertainties around the credit estimates, it is also likely due to the rise in new pressures on bank balance sheets, which in turn have increased deleveraging pressures. The fall in credit is also due, in part, to demand conditions. Demand has been weak, but survey data suggest that euro area bank lending standards for corporate loans have also remained tight since the second quarter of 2011 (Figure 2.3.5). Furthermore, rising interest rates on bank loans in the periphery provide evidence that reductions in credit supply may be constraining lending (Figure 2.3.6).

Figure 2.3.5. Contributions to Changes in Euro Area Bank Credit Standards for Loans to Business
(In percent)



Sources: European Central Bank (ECB); Haver Analytics; and IMF staff estimates.
Note: The overall value is the net percentage of banks responding to the ECB's quarterly *Euro Area Bank Lending Survey* that reported a tightening of credit standards for loans to nonfinancial firms in the preceding quarter. Each bar segment shows the average percentage of respondents citing that factor. The sum of the bars has been adjusted to equal the corresponding overall value.
¹Cyclical factors include general economic activity, industry outlook, and collateral needs.
²Balance sheet constraints include capital, access to financing, and liquidity position.

Figure 2.3.6. Interest Rates on New Bank Loans in the Euro Area Core and Periphery
(In percent)



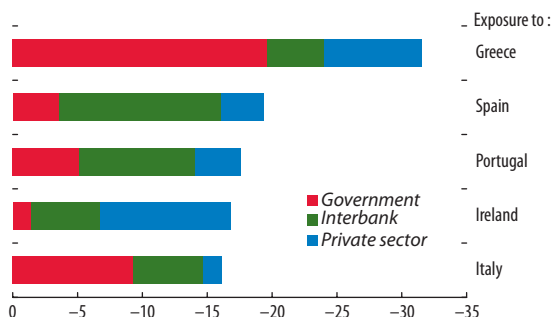
Sources: European Central Bank; and IMF staff estimates.
Note: Data are weighted by the level of loans. Core = Austria, Belgium, Finland, France, Germany, and the Netherlands; periphery = Cyprus, Greece, Ireland, Italy, Portugal, and Spain.

euro area banks have already significantly scaled back their exposures to periphery countries (Figure 2.11). At the same time, the interest rates charged by periphery banks on new corporate and household loans have increased—by about 65 basis points on average since December 2010—compared with a 20 basis point decline in average interest rates charged by banks in

the core countries (Figure 2.12). Thus, pressure on periphery economies continues to mount.

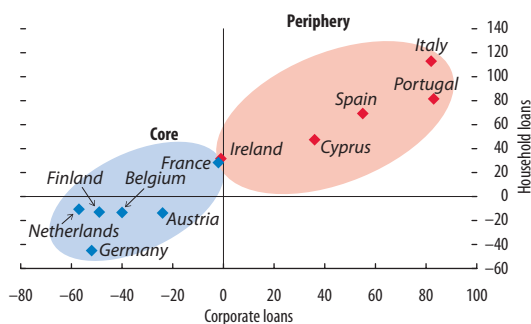
Redenomination risk—the possibility that a euro area country will revert to using local currency—has become a driving force behind fragmentation. The ECB's OMT has helped to ease some of these concerns, as reflected in market prices. But it is too early

Figure 2.11. Change in Euro Area Bank Cross-Border Exposures
(In percent, since December 2010)



Sources: Bank for International Settlements; and IMF staff estimates.
Note: The data have been adjusted for changes in the U.S. dollar-euro exchange rate and the private sector initiative in Greece.

Figure 2.12. Change in Interest Rate on New Bank Loans
(In basis points, December 2010 to July 2012)



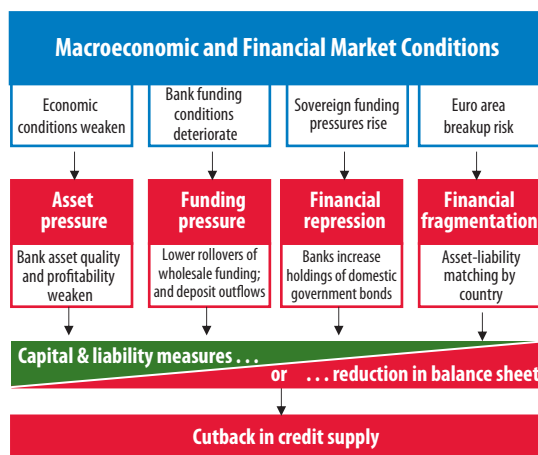
Sources: European Central Bank; and IMF staff estimates.
Note: Household data are a weighted average of interest rates on consumer, housing, and other loans.

to tell whether this will eliminate all redenomination risks. To hedge against the low-probability but high-impact risk of redenomination in a euro area country, some European cross-border banking groups have been matching their assets and liabilities on a country-by-country basis, at least in the periphery.⁶ Several large EU banks have already used subsidiaries in the euro area periphery to obtain LTRO funding, and some cross-border banks with operations in the periphery are using periphery sovereign bonds to obtain liquidity from local central banks via their local affiliates.⁷ This

⁶For example, French banks recently announced their policy to match assets and liabilities by geographic location and make their subsidiaries' operations in the euro area periphery less reliant on funding from parent banks.

⁷Data (available on Bloomberg) reveal that French, German, and Spanish banks have used subsidiaries in periphery countries to obtain LTRO funding.

Figure 2.13. Pressure on Euro Area Banks



behavior may also be driven by regulatory ring-fencing aimed at protecting local depositors or limiting potential deposit insurance liabilities. For example, some host country regulators are reportedly preventing periphery banks from using their affiliates to raise funding in other countries. In combination, all of these developments are likely to further reduce the flow of funds from the core euro area to the periphery.

The protracted nature of the crisis has thus given momentum to several destructive forces, including financial fragmentation and a potential financial repression (see definition in Table 2.4), that may increase deleveraging pressures on banks, with adverse implications for the economy (Figure 2.13). Building on earlier work presented in the April 2012 GFSR, we assess the impact of these forces under three scenarios—*baseline policies*, *weak policies*, and *complete policies*—detailed in Chapter 1.⁸ To illustrate the implications of these strains, it is assumed that liquidity support is not used beyond current levels. The key features of the exercise are described in Table 2.4 (detailed assumptions are in Annex 2.1).

Unless confidence in the euro area is restored, fragmentation forces are likely to intensify bank deleveraging, restrict lending, add to the economic woes of the periphery, and spill over to the core.

⁸In the April 2012 GFSR, the central scenario (here called *baseline policies*) was called *current policies*.

Table 2.4. Key Features of Sovereign Funding and Bank Deleveraging Scenarios

Factors	Description
Sovereign funding pressures	<p>Under <i>baseline policies</i>, foreign investors' share of the total debt stock is assumed to continue to decline at the same pace as seen during 2009–11. For periphery countries, the share of foreign debt holdings is assumed to move halfway toward pre-euro era levels. The assumptions on sovereign spreads reflect positive market developments following the announcements by the European Central Bank on July 26 and September 6 launching the Outright Monetary Transactions program. Periphery sovereign spreads are assumed to stabilize and/or gradually decline by end-2013 (see Annex 2.1).</p> <p>Under <i>weak policies</i>, the withdrawal of foreign investors accelerates to twice the pace seen since 2009. Periphery spreads widen by about one standard deviation above the baseline.</p> <p>Under <i>complete policies</i>, by contrast, confidence returns and foreign investors increase their share of the total debt stock as funds flow back to the periphery. Periphery spreads tighten by one to two standard deviations below the baseline.</p>
Financial repression	<p>“Financial repression” refers to the assumption that local banks are required or encouraged to purchase part of their domestic government's bonds that are sold or not rolled over by foreign investors and, as a result, have to reduce other assets in order to meet their deleveraging targets. The amount of bonds purchased by local banks is determined by the scenario assumptions in Table 2.11 in Annex 2.1. Local banks are assumed to purchase bonds in proportion to their current holdings of bonds along with other local investors (e.g. pension funds and asset managers), taking into account the coverage of the sample relative to the financial system.</p>
Bank funding pressures/funding gaps	<p>Under <i>baseline policies</i>, bank wholesale funding is assumed to roll over at current rates, with periphery deposits falling at their current pace in 2012 and stabilizing in 2013.</p> <p>Under the <i>weak policies</i> scenario, wholesale funding conditions deteriorate further, while in the periphery deposits continue to fall at their current pace throughout 2012–13.</p> <p>In the <i>complete policies</i> scenario, current funding pressures gradually ease to enable banks to roll over liabilities in markets going forward; deposits remain at their current level, taking into account the outflows that have been experienced to date.</p>
Financial fragmentation	<p>“Financial fragmentation” is modeled as a behavioral assumption for banks, whereby banks aim to match loans and deposits of their subsidiaries in selected countries (depending on the scenarios) and give priority to reducing other periphery exposures that are not funded locally. Under <i>baseline policies</i>, loan-to-deposit ratios of foreign banks' subsidiaries in the periphery are reduced to 110 percent. Under <i>weak policies</i>, loan-to-deposit ratios of foreign banks' subsidiaries in the entire euro area are reduced to 100 percent. There is no financial fragmentation under the <i>complete policies</i> scenario.</p>
Weak economic growth and pressures on bank capital	<p>Under baseline and weak policies, weaker earnings and higher asset impairments result in a capital shortfall for some banks relative to the 9 percent core Tier 1 hurdle ratio at end-2013, due to weaker growth and higher risk premiums. Under <i>complete policies</i>, banks are assumed to have no capital shortfall, as they are able to raise private equity or receive official support.</p>

Source: IMF staff.

Note: See Annex 2.1 for more details on deleveraging targets and assumptions. The bank sample (58 large EU banks) and time horizon (end-2011:Q3 to end-2013) are the same as in the April 2012 GFSR deleveraging exercise.

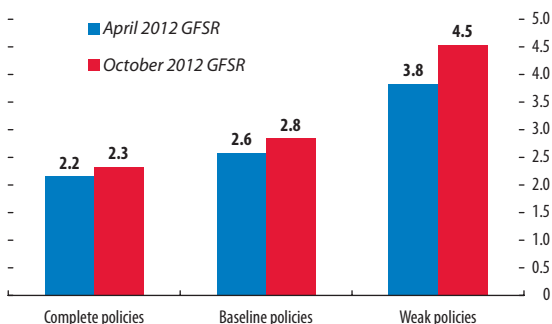
For each of the three scenarios, we present simulation results for the potential decline of aggregate assets of large EU banks as well as the implications for credit supply and growth of the euro area countries.⁹ The results underscore the fact that the slow progress in addressing the euro area's structural weaknesses has already pushed up the economic and financial costs of the crisis:

- *The expected amount of bank deleveraging is now higher than it was in the April 2012 GFSR under all*

⁹The analysis focuses on the same sample of banks (58 large EU banks) and the same time frame (between end-2011:Q3 and end-2013:Q4) as in the April 2012 GFSR.

three scenarios because of lower expected earnings, higher losses linked to worsened economic conditions, and greater funding pressures on banks. The expected amount of asset reduction by all sample banks is \$2.8 trillion (7.3 percent of bank assets) in the *baseline policies* scenario (versus \$2.6 trillion in the April 2012 GFSR) and \$4.5 trillion (12 percent of bank assets) in the *weak policies* scenario (versus \$3.8 trillion in the April 2012 GFSR) (Figure 2.14). Recent ECB action has helped to improve confidence. If this momentum is maintained through further policy measures, as in the *complete policies* scenario, bank asset reductions would amount to about \$2.3 trillion (6 percent of bank assets).

Figure 2.14. Total Deleveraging by Sample Banks
(2011:Q3–2013:Q4, in trillions of U.S. dollars)



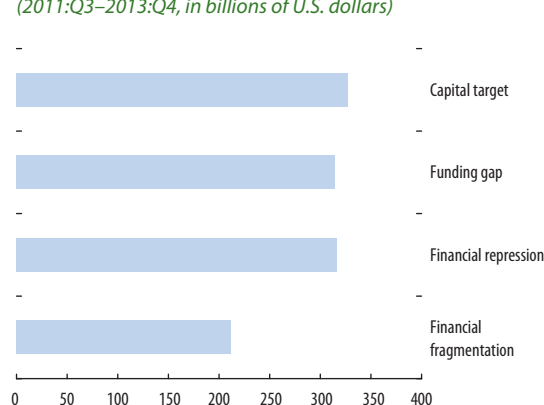
Source: IMF staff estimates.

Note: Total deleveraging is obtained by aggregating projected asset reduction of all sample banks. For each bank, the required amount of asset reduction is such that it allows a bank to meet all deleveraging targets, after taking into account capital measures (the same approach as used in the April 2012 GFSR).

- *The deterioration in financial and economic conditions entails greater pressure on bank asset quality and capital.* The scarcity and higher costs of bank funding, sovereign stress, and a weaker economy are adding to the pressure on bank profits, while weakening economic conditions have led to a deterioration in the quality of bank loans, as indicated by a rise in nonperforming loan (NPL) ratios.¹⁰ Among the four factors analyzed here—capital, funding, financial repression, and financial fragmentation—capital emerges as one of the key factors, particularly for weaker periphery banks (Figure 2.15). This means, for example, that even if funding gaps are closed, bank deleveraging pressures will remain.
- *The periphery bears the brunt of shrinking credit supply.* The cutbacks in the supply of credit to the periphery countries are much larger than in the core euro area (Figure 2.16). The supply of total credit in the periphery (including cross-border lending) is expected to decline 9 percent under the *baseline policies* scenario and almost 18 percent under the *weak policies* scenario.
- *EU banks cut back the supply of credit outside the euro area as well,* notably in emerging Europe, Latin America, and the United States. In some

¹⁰Increasing loan loss provisions and other asset impairments have led several banks to report large losses in 2011. To date, the quality of commercial real estate exposures has been the key concern, but the weakness now affecting periphery firms could become more widespread (see Box 2.4).

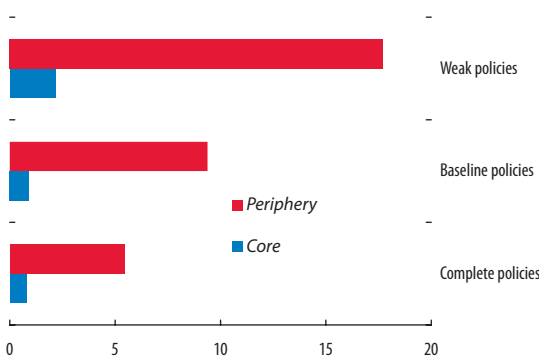
Figure 2.15. Total Deleveraging Due to Selected Stand-Alone Factors
(2011:Q3–2013:Q4, in billions of U.S. dollars)



Source: IMF staff estimates.

Note: Figure shows total deleveraging due to each of the factors when all other factors/deleveraging targets are set to zero.

Figure 2.16. Reduction in Supply of Credit to Euro Area: Core versus Periphery
(Cumulative for 2011:Q3–2013:Q4, in percent of total credit)



Source: IMF staff estimates.

Note: Total credit includes cross-border lending. Core = Austria, Belgium, Finland, France, Germany, and the Netherlands; periphery = Greece, Ireland, Italy, Portugal, and Spain.

- cases, however, domestic banks and foreign banks operating in these three regions are expected to step in and offset the impact that the EU banks' pull-back will have on credit supply (Figure 2.17). For example, recent European asset sales in the United States and Latin America have so far been orderly.
- *A rapid move to the complete policies scenario would avoid additional economic damage to periphery economies due to the credit supply shock* (Figures 2.18 and 2.19). The estimated impact on euro area credit supply under the *baseline policies*

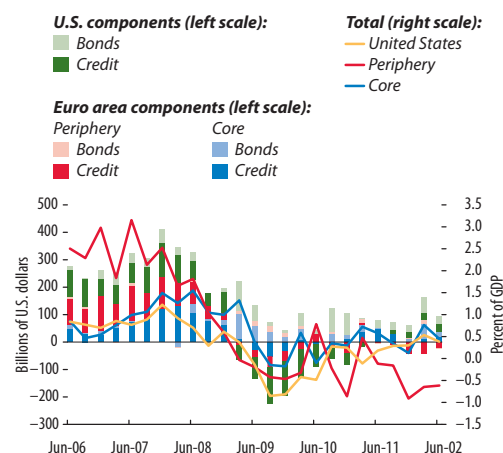
Box 2.4. Corporate Sector Fundamentals, Funding Conditions, and Credit Risks

Corporate fundamentals and funding conditions remain strong in advanced economies outside the euro area periphery. Although earnings growth is slowing sharply in all countries amid a generalized economic slowdown, funding conditions and the debt servicing capacity of businesses in most countries remain strong. This financial strength is a reflection mainly of the moderate nature of the last credit cycle in the corporate sector; it also reflects the benefits of accommodative monetary policies to support deleveraging in other sectors more affected by the crisis. In contrast, corporations in the euro area periphery have made only limited progress in reducing the large leverage built up in the run-up to the crisis. Those firms now pose severe credit risks to their banks as the effects of the recession and difficult funding conditions continue to play out.

The analysis of corporate fundamentals of investment-grade companies shows a significant divergence between, on the one hand, U.K., U.S., and core euro area firms and, on the other, firms in the euro area periphery (Table 2.4.1). Debt servicing capacity (interest coverage) remains favorable for the former group of countries despite the recent decline in profit growth (as measured by EBITDA)¹ in a slowing economy. These readings reflect relatively low corporate leverage throughout the latest credit cycle (net leverage) as well as easy monetary policies that have succeeded in keeping corporate financing costs low.

Given their relative balance sheet strength and the contrasting record low yields on high-quality govern-

Figure 2.4.1. Change in Euro Area and U.S. Corporate Bank Credit and Outstanding Corporate Bonds



Sources: Dealogic; Haver Analytics; and IMF staff estimates.
 Note: Core = Austria, Belgium, Finland, France, Germany, and the Netherlands; periphery = Greece, Ireland, Italy, Portugal, and Spain.

ment debt, firms in these core euro area countries continue to benefit from strong investor demand for their bonds, which are perceived to provide better risk-adjusted returns than sovereigns. Corporate bond issuance was close to record highs in recent quarters, especially in the aftermath of the European Central Bank's (ECB's) two longer-term refinancing operations, which allowed renewed corporate balance sheet expansion in the core euro area despite the modest growth in bank credit (Figure 2.4.1).

In contrast, corporate leverage remains high in Italy and Spain, where a large proportion of firms are in the real estate and utility industries. The debt servicing capacity of Italian and Spanish businesses

Note: Prepared by Nada Oulidi and Jaume Puig.
¹Earnings before interest, taxes, depreciation, and amortization.

Table 2.4.1. Investment-Grade Corporate Sector Fundamentals

	Spain	Italy	France	United States	United Kingdom	Germany
Interest coverage	-1.4	-0.5	1.7	1.9	0.8	1.2
EBITDA year-over-year	-1.1	-0.9	-0.5	0.0	-0.4	-1.1
Net leverage	1.6	1.5	-0.8	0.1	-1.0	-0.9
Free cash flow/debt	-1.5	-0.9	-0.4	1.1	1.0	0.7
Dividends to debt	-0.1	-0.4	0.4	-1.4	2.0	2.3
Capital expenditure year-over-year	-1.2	-0.1	0.1	0.9	0.2	0.8

Sources: Morgan Stanley; and IMF staff estimates.

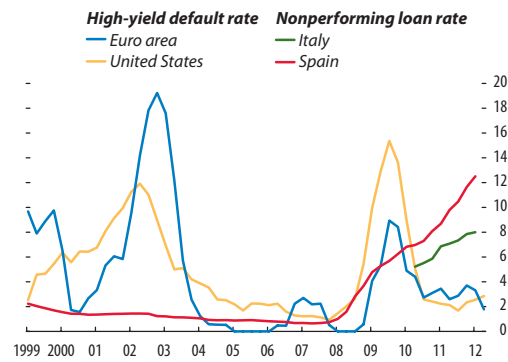
Note: Figures in the table are based on March 2012 values for each of the metrics listed, measured in number of standard deviations from average values of each metric for all countries in the table from 1999:Q4. Red cells indicate the most recent, highest stress levels of each indicator relative to the sample, and dark green indicates countries with the healthiest readings for each indicator. Countries are ordered in columns according to the average of all metrics used, from the most stressed average readings to the least stressed. EBITDA = earnings before interest, taxes, depreciation, and amortization.

Box 2.4 (continued)

has benefited to some extent from injections of central bank liquidity, given the adverse developments in the normal credit transmission channel. While the recent announcement of the ECB's Outright Monetary Transactions (OMT) program has allowed some large periphery firms to reenter the capital markets, spreads remain very elevated relative to those in the core. Furthermore, indicators of financial flexibility (Table 2.4.1) suggest that firms in the periphery would face great challenges in raising liquidity internally, as illustrated by their lower levels of free cash flow and dividends. In this context, the risk remains that cuts in capital expenditures continue to add to the downward pressures on growth from deleveraging by the sovereigns and the banks.

The sharp rise in nonperforming corporate loans in Italy and Spain (much of which is in the real estate sector) demonstrates the effects of weaker corporate fundamentals amid challenging funding and economic conditions. The deterioration in those countries contrasts starkly with much more favorable trends in the United States, even at the weaker end of the credit spectrum, and in broader euro area

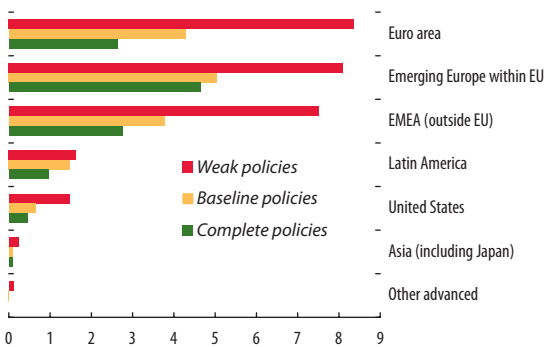
Figure 2.4.2. Corporate Sector Credit Risk in the Euro Area and United States
(In percent)



Sources: Bank of America Merrill Lynch; national central banks; and IMF staff estimates.

bond markets (Figure 2.4.2). Market-based forward-looking indicators of credit risk—such as Moody's KMV expected default frequencies, which have spiked recently—also suggest a significant additional buildup of stresses on bank balance sheets from their corporate exposures in Italy and Spain.

Figure 2.17. Reduction in Credit Supply: Global Spillovers
(Cumulative for 2011:Q3–2013:Q4, in percent of total credit)



Source: IMF staff estimates.
Note: EMEA = Europe, the Middle East, and Africa. Total credit includes cross-border lending.

scenario is broadly in line with the WEO baseline. Under the *weak policies* scenario, the credit supply shock from the EU bank deleveraging would lower periphery euro area GDP by more than 4 percentage points relative to the WEO baseline

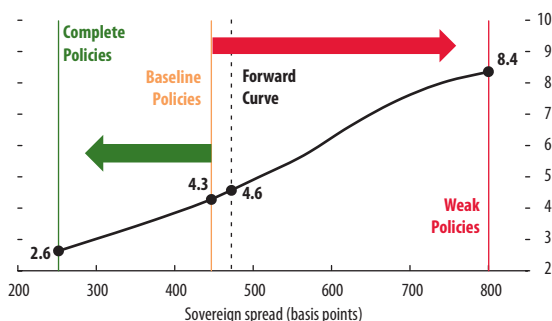
Figure 2.18. Impact of EU Bank Deleveraging on GDP, 2013 Projection
(Percentage point deviation from WEO baseline)



Source: IMF staff estimates.

in 2013. In the core euro area, GDP would contract much less, in line with the relatively moderate impact on credit, but still significantly—by 1.5 percentage points relative to the WEO baseline. In the *complete policies* scenario, GDP at

Figure 2.19. Reduction in Credit Supply to Euro Area: Sensitivity to Periphery Sovereign Spreads under Alternative Policy Scenarios
(In percent of total credit)



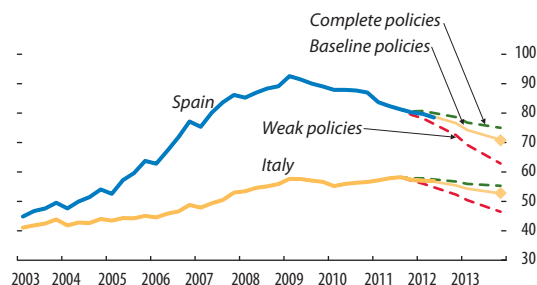
Source: IMF staff estimates.
Note: Total credit includes cross-border lending. Periphery sovereign spreads are GDP-weighted average spreads of Greece, Ireland, Italy, Portugal, and Spain.

end-2013 relative to the *baseline policies* scenario would be two-thirds of a percentage point higher in the core, and almost 2 percentage points higher in the periphery.

Spillovers of sovereign stress and bank deleveraging will have a systemic impact on the corporate sector, potentially triggering a downward spiral of downgrades.

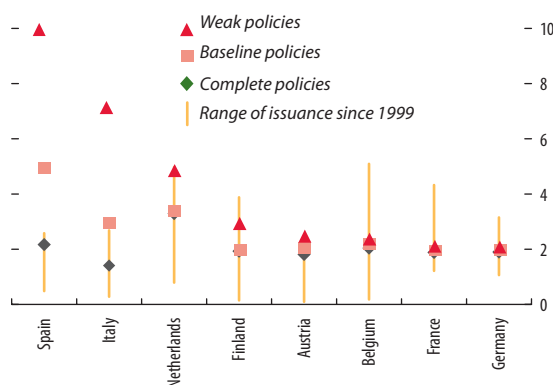
Firms in the euro area periphery are likely to undergo a protracted period of deleveraging, as capital markets that have traditionally played a limited role in these countries cannot fill the gap left by banks. Figure 2.20 shows that the recent fall in bank credit to nonfinancial firms in Italy and Spain is broadly consistent with a path of deleveraging that would bring credit-to-GDP ratios back to 2003–04 levels by 2017. Bank credit in all these economies could fall much faster under the *weak policies* scenario. Figure 2.21 shows that the volume of bond issuance by periphery firms needed to meet their refinancing needs under the *weak policies* scenario would have to be three to four times larger than their historical maximum annual bond issuance since 1999. Record high bond issuance by some large Spanish and Italian firms immediately following the announcement of the ECB’s new OMT program suggests that some firms could substitute bank financing for capital market financing if the

Figure 2.20. Bank Credit to Nonfinancial Firms in Italy and Spain
(In percent of GDP)



Sources: Haver Analytics; and IMF staff estimates.
Note: Thick solid lines show actual credit paths up to June 2012. Thin solid lines show the predicted credit paths under a baseline scenario with baseline policies; dashed lines show the predicted paths under the upside and downside scenarios, with complete and weaker policies, respectively; diamonds show the end-2013 credit levels consistent with a path of deleveraging that would bring credit-to-GDP ratios back to 2003–04 levels by end-2017.

Figure 2.21. Corporate Bond Issuance Needs through End-2013 under Alternative Deleveraging Scenarios
(In percent of GDP, annualized)

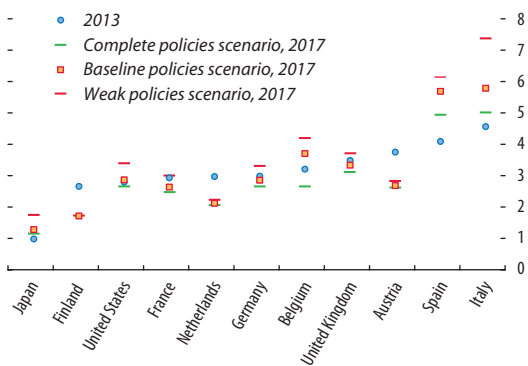


Sources: Dealogic; Haver Analytics; and IMF staff estimates.
Note: The deleveraging sample is 58 large EU banks, and the deleveraging period is end-2011:Q3 to end-2013.

benefits from the OMT program are sustained, but the majority of firms traditionally reliant on bank financing are unlikely to benefit to a similar extent.

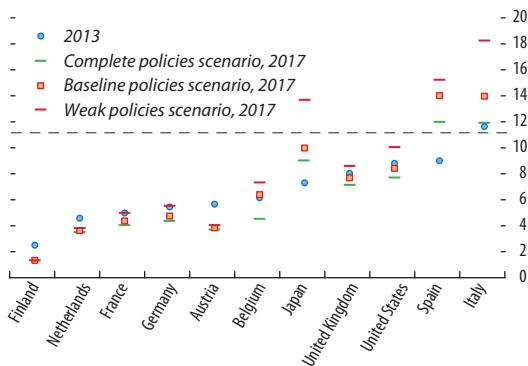
Higher spreads and deteriorating ratios of interest cost to revenue could lead to further sovereign downgrades. Rating agencies have cited challenging funding conditions as justification for earlier sovereign downgrades and are maintaining a negative outlook or negative watch on most euro area sovereign ratings. Even if spreads were to remain at current

Figure 2.22. Projected Average Interest Rates on Outstanding Sovereign Debt (In percent)



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

Figure 2.23. Projected Sovereign Interest Expense as a Proportion of Revenue (In percent)

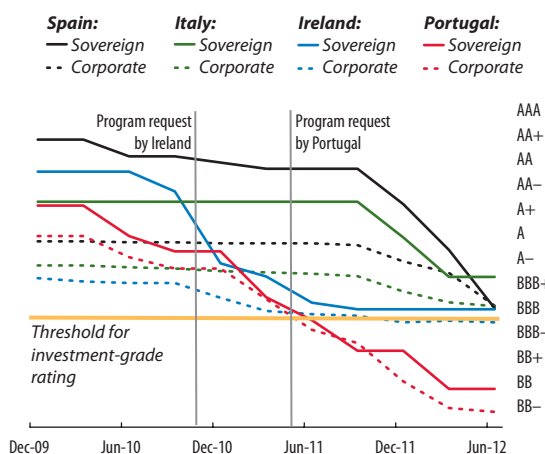


Sources: IMF, World Economic Outlook database; and IMF staff estimates.

levels, sovereigns are facing a rising burden of interest payments on their national debt (Figures 2.22 and 2.23).¹¹ The *baseline policies* scenario implies that in Italy and Spain, the government interest bill rises to about 14 percent of revenue by 2017. The *weak policies* scenario presents an even more challenging prospect, as an assumed further increase in spreads for Italy (of 300 basis points) and Spain (of 330 basis points) would push up their interest-to-

¹¹Projections are based on (1) current market forward rates for the sovereign German, Japanese, U.K., and U.S. yield curves; (2) IMF forecasts of spreads for Austria, Belgium, Finland, France, Italy, the Netherlands, and Spain; and (3) WEO fiscal and GDP forecasts. For a description of the methodology, see the April 2011 GFSR.

Figure 2.24. Sovereign and Corporate Credit Ratings in the Euro Area Periphery



Source: Citigroup.
Note: Ratings are the average of ratings by Moody's Investor Services, Standard & Poor's, and Fitch.

revenue ratios to 18 percent and 15 percent, respectively. Historically, a ratio of 10 percent has been viewed as a threshold for AAA-rated sovereigns, and ratios of 20 percent and higher might raise serious concerns about sustainability.

Notwithstanding the recovery of market access for businesses in the periphery following the ECB's OMTs announcement, the risk of additional downgrades of sovereign credit ratings continues to weigh on the corporate sector. Since sovereign ratings typically act as a ceiling on corporate ratings, such downgrades could trigger the migration of ratings for periphery firms to below investment grade. For instance, the gap between the average rating of the Spanish corporate sector and the Spanish sovereign has already disappeared after successive sovereign downgrades, implying that the sovereign credit ceiling is becoming increasingly binding (Figure 2.24). Since funding costs remain elevated, corporate fundamentals could deteriorate further (see Box 2.4) and add to the negative ratings outlook, especially in Spain. In turn, losses on corporate loans and security purchases could spark further negative repercussions for banks.

A massive downgrade of Spanish and Italian corporate bonds to below investment grade would overwhelm the capacity of investors in the euro area high-yield market to absorb the resulting supply.

At 20 percent of the euro area's investment-grade market, the combined outstandings of Spanish and Italian investment-grade corporate bonds exceed the size of the entire euro area high-yield bond market. As a result, refinancing risk would rise for the entire euro area high-yield corporate sector.

The “firewall” and supporting policies should be deployed to assist in capping financial stress, but their effectiveness can be assured only by more convincing progress toward integration.

The bank deleveraging simulations could provide a barometer for the types of pressure that emerge and for the extent and effectiveness of the euro area firewall facilities—the European Financial Stability Facility and European Stability Mechanism (EFSF/ESM) and OMTs. As an illustration, under the *baseline policies* scenario (Figure 2.19), various strains can be mapped into policy instruments that could be used to mitigate their impact. For instance, the sovereign funding gap could be met by using the firewall to support sovereign financing. Bank deleveraging as a result of capital strains could be reduced or averted through national and ESM capital injections to viable banks. A banking union with a deposit guarantee scheme could avoid deposit flight. ECB lending could close bank funding gaps.

Euro area periphery banks have already substantially increased their reliance on funding from the Eurosystem. While the ECB's LTROs have allowed many banks to prefund some of their maturing term debt, there is a risk that these funds may be insufficient to cope with the subsequent loss of short-term wholesale and deposit funding. At the same time, some periphery banks are reportedly experiencing collateral shortages and therefore may be at risk of not being able to use central bank liquidity facilities to cover lost private funding. While the recent ECB move to ease collateral requirements on asset-backed securities could provide some relief to these institutions, it may prove to be temporary, particularly if banks are downgraded further.

Figure 2.19 shows that more proactive policies can significantly mitigate some of the deleveraging pressures. For example, under the assumption that

periphery sovereign spreads throughout 2012–13 remain at the levels observed in mid-July (before the ECB president's statement), the estimated cutback of total euro area credit would be more than 2 percentage points larger than under the *baseline policies* scenario. Figure 2.19 also highlights the nonlinearity of the impact of sovereign and other stresses on bank deleveraging and credit cutbacks.

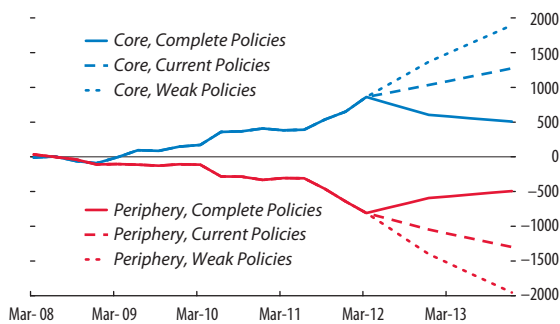
A leap to the complete policies scenario is needed to restore confidence, reverse capital flight, and reintegrate the euro area.

The analysis in this GFSR underscores the shortcoming of any strategy that would rely solely on liquidity measures to resolve the euro area crisis. While the ECB's liquidity support is essential, it is not sufficient to stem the forces of fragmentation that threaten to undermine the integrated markets and effective common monetary policy that are the foundation of the union.¹² A continuation of incremental and reactive policymaking will not restore confidence and carries negative consequences for the euro area and the global financial system. What is needed is a leap to the *complete policies* scenario to stabilize funding markets, arrest capital flight, and begin the process of reintegrating the euro area.

The ongoing financial fragmentation of the euro area can be reversed only through far-reaching action by euro area policymakers along the lines proposed in Chapter 1. Stressed balance sheets need to be repaired and placed on a more sustainable footing; emergency financing can provide only a temporary bridge across the current turbulence as the foundations of a durable union are laid. The main elements are (1) addressing high legacy debt burdens; (2) severing the sovereign-bank linkage, including through bank resolution and recapitalization; and (3) making credible down payments on fiscal and banking union. Unless policymakers deliver credible and comprehensive measures to resolve the crisis, the recent improvement in market sentiment is unlikely to last.

¹²As discussed in the IMF's Staff Report on euro area policies (IMF, 2012a).

Figure 2.25. TARGET2 Projections
(In billions of euros)



Source: IMF staff estimates.

Note: Figures through March 2012 represent accumulated balances in the TARGET2 payment system within the European Monetary Union. The scenario-dependent projections for TARGET2 balances reflect the bank deleveraging and sovereign bond net sales projected in each of the three scenarios. Projections for the other components of capital flows within the European Monetary Union that affect TARGET2 balances are based on recent trends. Core = Austria, Belgium, Finland, France, Germany, and the Netherlands; periphery = Greece, Ireland, Italy, Portugal, and Spain.

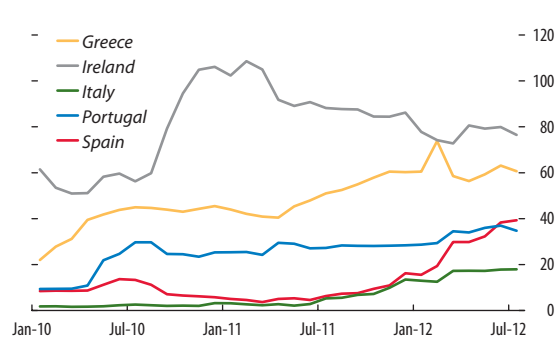
Contingent liabilities are rising as incremental policymaking pushes up the ultimate cost of resolving the crisis.

The slow pace of crisis resolution has pushed up the size of contingent liabilities for economies in the core of the euro area. Contingent liabilities reflect the size of potential ultimate fiscal transfers, or the costs of potential defaults in the periphery under a breakup scenario, should the crisis deepen. Under the assumption that the ECB provides unlimited support to fill in the funding gap left by capital flight from the periphery, one measure of the size of contingent liabilities is given by the estimated size of payment system (TARGET2) balances, the commitments on bilateral loans, and support for domestic banks with exposure to the periphery.

Under the assumption of unlimited support from the Eurosystem, TARGET2 liabilities could be expected to continue to rise for the periphery (Figures 2.25 and 2.26).¹³ In the *baseline policies*

¹³TARGET2, the main payment system within the European Monetary Union (EMU), works through the individual national central banks (NCBs) of each of the euro area countries. The settlement of cross-border payment flows between euro area countries in TARGET2 results in claims and liabilities for each NCB. For example, when a Spanish importer pays for goods bought from a German exporter, the transaction normally results in a debit from the reserves of a Spanish commercial bank with the Bank of Spain, and a credit to the reserves of a German commercial bank with the Bundesbank. Correspondingly, the Bank

Figure 2.26. Borrowing from Central Banks
(In percent of 2011 GDP)



Sources: Haver Analytics; IMF, World Economic Outlook database; and IMF staff estimates.

Note: The figure includes estimates of Emergency Liquidity Assistance in Greece and Ireland.

scenario, capital flows from the periphery to the core would continue, marked by further financial fragmentation and consolidation of bank balance sheets within national borders. The *weak policies* scenario would result in stronger outflows from the periphery and net outflows from the euro area as investors seek to evade the impact of a potential breakup of the euro area. Roll-offs by foreign investors would climb, the pace of overall outflows would rise further still, and the euro would likely come under substantial depreciation pressure. Under the *complete policies* scenario, confidence returns and foreign investors increase their share of outstanding debt.

Even though the yields on German bunds have declined as bond investors demand liquidity and safety, credit default spreads remain non-negligible in part because of concerns about contingent liabilities. In an environment of great sovereign stress, political risks come into play. For market participants, concerns about the political hurdles to financial and fiscal adjustments are the background against which indications of discord or policy confusion could lead to another round of spread widening.

In contrast, with confidence restored under the *complete policies* scenario, capital flight stops and

of Spain's TARGET2 account is debited, resulting in a liability to the ECB, and the Bundesbank's account is credited, producing a claim against the ECB. TARGET2 is a closed system in which balances are generally equivalent to the transfer of foreign reserves in a fixed exchange rate system—except in this case the “reserves” transferred are euros created by the NCBs.

reverses, and the euro area reintegrates as the interest rate spread between the periphery and the core normalizes and growth prospects strengthen.

The United States: Stability or Complacency?

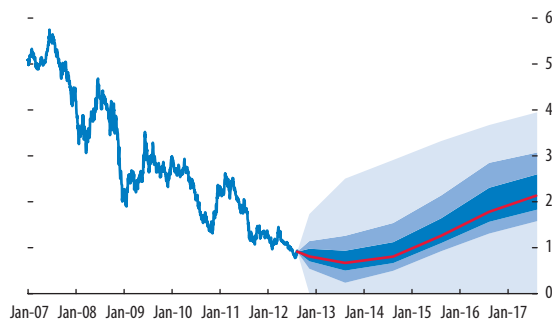
Safe-haven flows, central bank bond purchases, and balance sheet de-risking have contributed to a substantial compression of credit risk premiums and longer-term bond yields. Fiscal imbalances are largely medium-term challenges, but the suppression of credit risks is unlikely to persist. A disorderly or rapid rise of credit risks could present financial stability risks to the United States and the global financial system. These risks are largely asymmetric, or “one way,” because yields near record lows are likely to adjust only upward in the years ahead. This suggests that there is little room for policy complacency: The key lesson of the euro area and U.S. subprime crises is that waiting for market signals will lead to harsher economic outcomes with unintended financial risks.

Near- and medium-term policy challenges are generally well acknowledged.

The uncertain path of fiscal adjustment is both a near- and medium-term risk—an excessively sharp fiscal contraction owing to “fiscal cliff” effects, and financial risk from the breach of the debt ceiling, looms in the near term, and insufficient fiscal adjustment remains a medium-term risk. Simply put, fiscal adjustment may go too far in the near term and not far enough in the medium term. The required balancing act is a difficult one: A measured pace of deficit reduction is needed, given the persistent weakness in economic activity; yet the near-term adoption of a credible fiscal consolidation framework is crucial for stable medium-term growth.

At the same time, the U.S. authorities are implementing a financial reform program in line with the Dodd-Frank Act and the international regulatory agenda. The aim is to ensure the benefits of deep and liquid capital markets while increasing the system’s resilience. The challenge is to transition in an orderly manner as financial markets undergo reform, market structures change (including over-the-counter

Figure 2.27. U.S. Five-Year Swap Rate and Implied Probability Distribution
(In percent)



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

Note: Dark, medium, and light blue shaded areas correspond to the 50, 75, and 100 percent confidence intervals, respectively, as defined by risk-neutral option-implied probabilities.

markets), and financial intermediaries adjust business models to account for the decline in leverage and potential trading revenues (Box 2.5).

There is little room for complacency in tackling these policy issues, even if markets do not signal concern. The focus should be on proactive policies to avoid near-term risks, address medium-term sustainability, and forestall the buildup of vulnerabilities. A key lesson of the euro area crisis, or indeed the U.S. subprime crisis, is that waiting for market signals will lead to harsher economic outcomes, with unintended financial risks.

Yields are at historic lows while liquidity and risk premiums appear to be suppressed.

By all accounts, U.S. interest rates are low. Long-term nominal interest rates are the lowest since the 1950s and real yields on inflation-indexed government securities are negative over staggeringly long horizons. The five-year swap rate starting five years from now—a proxy for medium-term interest-rate expectations void of shorter-term cyclical factors—is only 2.8 percent. Markets also see little chance of a substantive increase in future interest rates (Figure 2.27). To put this in perspective, it took Japan 10 years after the peak of its asset boom to see a similar level of medium-term rate expectations.

As was the case in Japan, various metrics suggest that U.S. bond yields are too low. For instance,

Box 2.5. Key Challenges for the Dealer Operations of U.S. Banks

The global financial crisis produced a radical transformation of the trading and investment banking operations of financial institutions in the United States. The significant industry consolidation that followed has resulted in the five largest players now being part of bank holding companies (BHCs), which are part of the regulated banking system. Although the difficulties related to high leverage and wholesale funding have abated somewhat for the dealer banking operations of these five BHCs, they face many other challenges, including reduced profitability because of regulatory changes. These factors raise fundamental questions about the future direction of the industry.

The dealer operations of five major U.S. BHCs dominate both the U.S. and global capital markets.¹ Their combined assets account for 64 percent of all commercial banking assets in the United States; they command more than 50 percent of global revenue in fixed income and equity trading; and they account for 48 percent of the global revenue in investment banking. The dealer banking operations of these five BHCs are particularly important in the U.S. derivatives markets, where they hold 96 percent of outstanding derivatives contracts.

Leverage levels have declined markedly, and dealer operations remain in a state of transition, as firms continue to try to improve their returns by reshaping their business models. Net leverage ratios for the two BHCs with a higher share of earnings derived from dealer activities (Goldman Sachs and Morgan Stanley) continue to remain well below the historical average of 18, meaning that they are no longer able to use high leverage to drive returns. Overall, the drop in leverage reduced the average return on equity of the five BHCs to 6 percent in 2011—below their cost of equity—from more than 20 percent in years preceding the crisis (Figure 2.5.1).

Note: Prepared by Stephen Smith.

¹The five (in order of BHC asset size as of June 30) are JPMorgan Chase, Bank of America, Citigroup, Goldman Sachs, and Morgan Stanley. The Federal Reserve (which regulates and supervises BHCs) defines a BHC as “a company that owns and/or controls one or more U.S. banks or one that owns, or has controlling interest in, one or more banks” (Federal Reserve System, National Information Center, www.ffiec.gov/nicpubweb/Content/HELP/Institution%20Type%20Description.htm).

Figure 2.5.1. Leverage Levels of U.S. Dealer-Banks

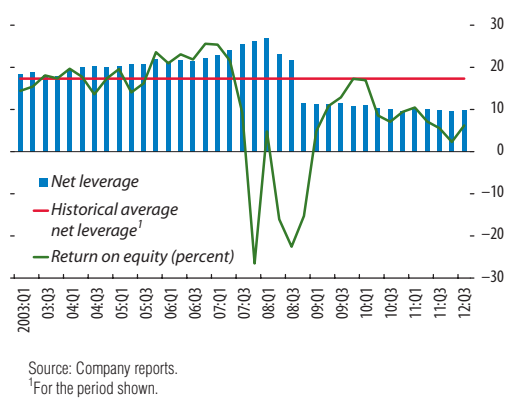
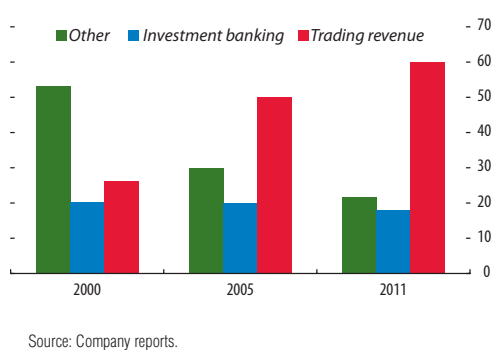


Figure 2.5.2. Growth in Trading Revenue at U.S. Dealer-Banks (In percent)



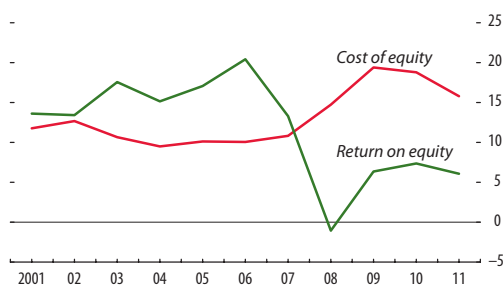
Business models for the five BHCs with the largest dealer operations have evolved significantly over the past several years, with trading operations now the greatest factor in revenues. The share of trading revenues grew from about 26 percent of total capital market revenue in 2000 to more than 60 percent at the end of 2011. The components of trading income have also shifted dramatically (Figure 2.5.2).²

Regulatory changes are expected to reduce operating margins, financial leverage, and asset turnover,

²This includes the growing weight of fixed income, currencies, and commodities trading as a component of revenue, especially the higher-margin derivatives activities. The structure of equity trading revenue has also changed, away from commissions toward higher-risk client execution and equity derivatives trading.

Box 2.5 (continued)

Figure 2.5.3. Return on Equity versus Cost of Equity for All U.S. Dealer-Banks
(In percent)



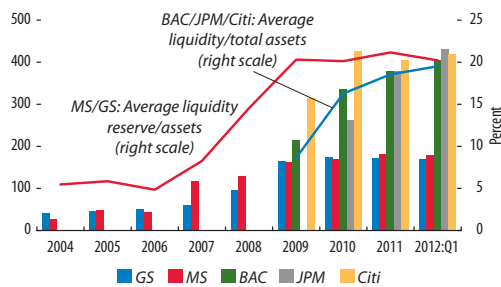
Sources: Bloomberg L.P.; and SNL Financial.

all of which will mean lower profitability. The wide-ranging remit of the Dodd-Frank Act is expected to reduce margins on over-the-counter derivatives as these products move onto central counterparty clearing platforms, thereby increasing transparency; and the part of the act called the Volcker rule (still to be finalized) would eliminate proprietary trading. The enhanced liquidity and capital requirements of Basel III will also be a drag on earnings by reducing leverage and asset turnover. Taken together, these factors spell an end to the era in which U.S. dealer banks earned in excess of 20 percent on equity. Figure 2.5.3 illustrates the significant challenges faced by the dealer bank business model, as BHCs on average continue to generate returns significantly below the cost of equity.

Despite structural improvements in liquidity and funding profiles, the dealer bank funding model remains a concern, especially given recent market stresses. Since the crisis, the major dealer BHCs have significantly reduced their reliance on short-term wholesale funding and have virtually eliminated their reliance on commercial paper. Goldman Sachs and Morgan Stanley have also made deposits a more meaningful part of their funding mix and have worked to build liquidity reserves.³ Figure 2.5.4

³Liquidity reserves carry different titles depending on the entity; however, they generally consist of pools of unencumbered, highly liquid securities and cash designed to meet cash outflows and collateral requirements in the event that the firm loses access to funding markets.

Figure 2.5.4. Excess Liquidity Levels at the Largest U.S. Dealer-Banks
(In billions of U.S. dollars)



Source: Company reports.
Note: BAC = Bank of America; Citi = Citigroup; GS = Goldman Sachs; JPM = JPMorgan Chase; MS = Morgan Stanley.

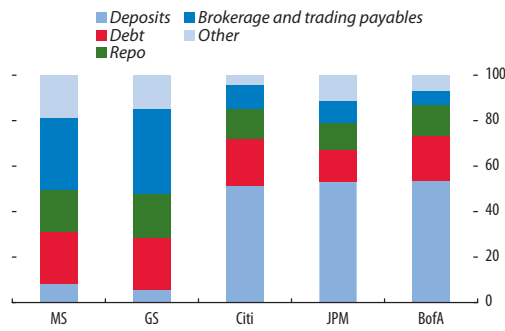
shows that in the two BHCs that focus on dealer activities, average excess liquidity as a share of assets has increased from less than 5 percent in 2004 to 20 percent as of the first quarter of 2012. Although these measures have helped to reduce the potential impact of a liquidity and funding shock, the cost of carrying this portfolio of liquid assets is a significant drag on earnings.

At the end of fiscal year 2011, deposits accounted for an average of 53 percent of balance sheet liabilities for the three BHCs that are universal banks with large retail and commercial banking operations (JPMorgan Chase, Bank of America, and Citigroup) but averaged only 8 percent for the more narrowly focused dealers Goldman Sachs and Morgan Stanley (Figure 2.5.5). With their lower level of deposits, Goldman Sachs and Morgan Stanley relied more on collateralized funding, mainly through reverse repo transactions (about 17 percent of liabilities), than did the other three BHCs, where such funding was at 11 percent of liabilities. A lower share of deposits in total funding tends to increase funding risks during periods of market instability, given the higher reliance on confidence-sensitive wholesale funding.

What do all these structural changes mean for the industry and what will the future landscape look like? Although BHCs have improved their leverage, liquidity, and capital levels, the dealer operations of large BHCs remain vulnerable to the confidence-sensitive nature of customers, continue to rely on

Box 2.5 (continued)

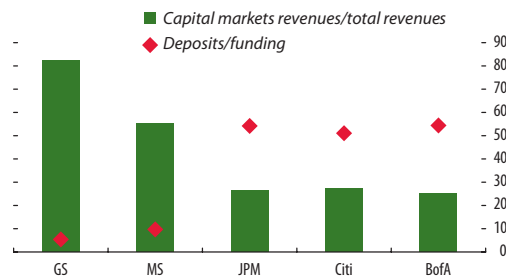
Figure 2.5.5. U.S. Bank Holding Companies' Balance Sheet Liabilities at End-2011
(In percent)



Source: SNL Financial.
Note: BHCs = bank holding companies. BofA = Bank of America; Citi = Citigroup; GS = Goldman Sachs; JPM = JPMorgan Chase; MS = Morgan Stanley.

wholesale funding, and face an earnings outlook weakened by regulatory changes (Figure 2.5.6). All of these factors combined raise existential questions about future business models, especially for the BHCs that rely more on earnings from dealer activities and lack the earnings or funding diversification of the universal banks.

Figure 2.5.6. Reliance of U.S. Dealer-Banks on Capital Markets Revenue and Wholesale Funding
(In percent)



Sources: Company reports; and IMF staff estimates.
Note: BHCs = bank holding companies. BofA = Bank of America; Citi = Citigroup; GS = Goldman Sachs; JPM = JPMorgan Chase; MS = Morgan Stanley.

This could potentially lead to the breakup of BHCs as they seek to escape aspects of regulatory oversight. Although recent regulatory changes are designed to improve the stability and oversight of capital markets, regulators must remain cognizant of potential unintended consequences of rule making, especially as the BHCs may push their dealer operations toward heightened risk taking to improve returns.

econometric models show that 10-year Treasury yields are well below where they should be based on medium-term fundamentals.¹⁴ Why?

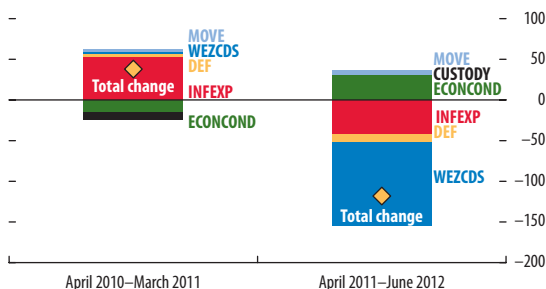
- *Global safe-haven flows.* The market for U.S. Treasury securities—one of the deepest, most liquid global debt markets—has benefited from safe-haven inflows. Some of the deviation between fair value and actual yields is the result of these flight-to-safety flows. To measure that influence, we incorporated euro area spreads on credit default swaps (CDS) into our core fair value model as

¹⁴Our fair value model uses monthly data to assess the current level of 10-year U.S. Treasury yields according to the following specification: $ust10yr_t = \beta_1 + \beta_2 E_t[y_{t+h}] + \beta_3 E_t[\pi_{t+h}] + \beta_4 b_t + \beta_5 cus_t + \beta_6 ez_t + \beta_7 unc_t + e_t$, where $ust10yr_t$ is the 10-year U.S. Treasury yield; $E_t[y_{t+h}]$ expected growth h periods ahead; $E_t[\pi_{t+h}]$ expected inflation h periods ahead; b_t the overall government balance; cus_t foreign central bank custody holdings; ez_t a proxy for euro area stress; and unc_t general economic uncertainty.

a proxy for recent risk aversion and found that global strains account for a substantial amount of yield compression (Figure 2.28). There have also been spillovers to corporate credit markets. Corporate borrowing costs have declined alongside portfolio shifts favoring debt over equities, which has been accommodated by a surge in corporate issuance (see Chapter 1).

- *Domestic balance sheet repair and deleveraging is raising demand for Treasuries.* Internal deleveraging pressures, as households de-risk and repair their balance sheets, have boosted the demand for Treasury bonds, contributing to downward pressure on longer-term interest rates. The U.S. private sector is running a large financial surplus, and the experience of past boom-bust asset cycles suggests this will be lasting (Figure 2.29). The free-cash flow is being allocated to

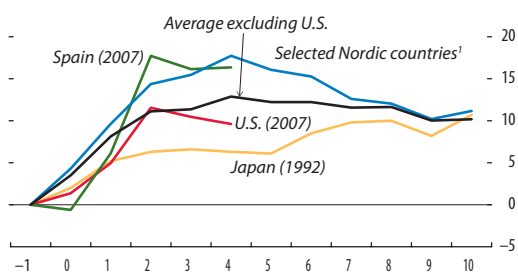
Figure 2.28. Contributions to Change in Fitted 10-Year Nominal Treasury Yield
(In basis points)



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

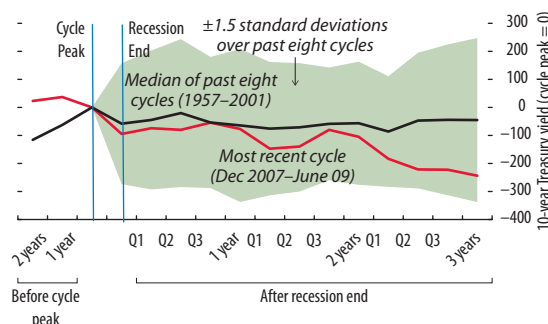
Note: Contributions to the fitted yield from changes in: a GDP-weighted euro area sovereign credit default swap index (WEZCDS); custody holdings of U.S. Treasuries (CUSTODY); inflation expectations (INFEXP); budget deficit (DEF); expected business conditions (ECONCOND); and implied volatility on U.S. Treasuries (MOVE).

Figure 2.29. Private Sector Financial Balance Relative to Year before Outbreak of Financial Crisis, Selected Advanced Economies
(In percent of GDP)



Sources: IMF, International Financial Statistics database; and IMF staff estimates.
Note: Financial balance is net saving for the business and household sectors. Year in parentheses is the first year of the selected financial crisis (year 0).
¹Finland (1991), Norway (1987), and Sweden (1991).

Figure 2.30. Change in 10-Year U.S. Treasury Yield in Recent Business Cycles
(In basis points relative to cycle peak)



Sources: Haver Analytics; and IMF staff estimates.

lower-risk securities, like government bonds. Table 2.5 shows that the combination of flows and portfolio adjustments has resulted in a major reallocation of funds to government bonds by all major sectors, especially households, over the past three years.

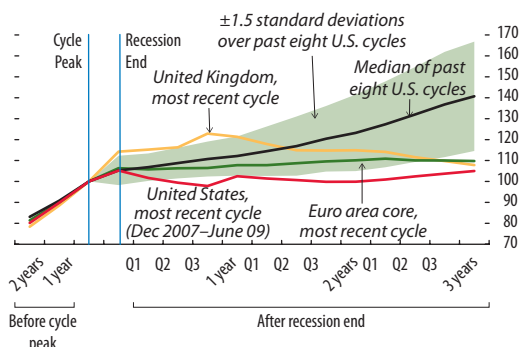
- *Monetary policy easing has sought to counter a tepid recovery.* One of the objectives of monetary policy has been to reduce risk-free rates in order to indirectly generate a rebalancing of portfolios toward risk assets. These actions have largely been effective in reducing the term premium on Treasury yields. Indeed, despite a lower starting point, the decline in longer-term bond yields has been even greater than in prior business cycles (Figure 2.30). However, the credit transmission mechanism has been weaker than the norms for the past eight cycles (Figure 2.31), as more tentative lending

Table 2.5. Holdings of Treasury Securities, by Sector

	2008:Q4 (billions of U.S. dollars)	2012:Q1 (billions of U.S. dollars)	Change (percent)	Current Holdings to Assets (percent)
Households	257	1,308	410	2
Mutual funds	796	916	15	8
Foreign institutions	3,253	4,761	46	26
Commercial banks and brokerages	257	410	60	3
Private pension funds	185	448	142	7
Insurance companies	171	254	48	4
Federal Reserve	476	1,661	249	58
Total stock of Treasuries	6,338	10,827	71	
Global foreign exchange reserves	7,414	10,889	47	

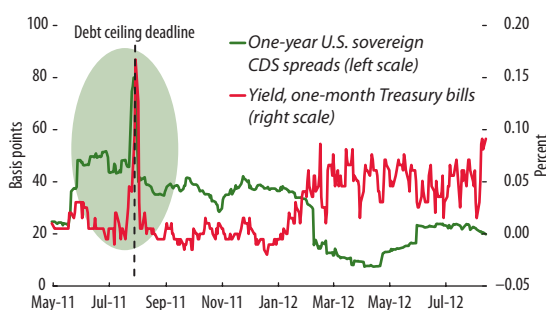
Sources: Federal Reserve; and IMF staff estimates.

Figure 2.31. Bank Credit in Past and Current Credit Cycles
(Cycle peak = 100)



Sources: Haver Analytics; and IMF staff estimates.
Note: Core = Austria, Belgium, Finland, France, Germany, and the Netherlands.

Figure 2.32. Market Reaction: Heightened Uncertainty and Policy



Sources: Bloomberg L.P.; and IMF staff estimates.
Note: CDS = credit default swap.

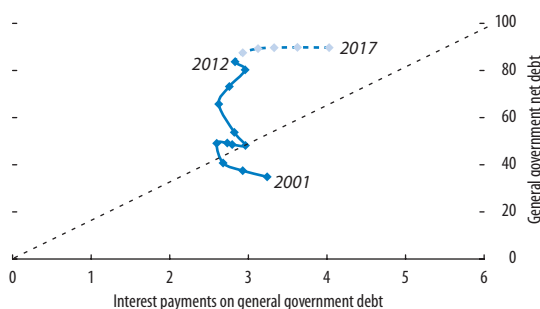
conditions and rigidities in the mortgage market have stymied credit growth.¹⁵

Low rates and suppressed risk premiums could lull markets and policymakers into complacency, leading to a buildup of stability risks.

Although perceptions could change, market pricing currently suggests that the U.S. government will overcome political differences and implement convincing policies on a timely basis. The risk is that the political process will become drawn out into a costly delay of policy action. As noted in Box

¹⁵Compared to a smaller sample, domestic credit in the United States has held up better relative to the credit contraction during the early 1990s recession. See the October 2012 *World Economic Outlook*.

Figure 2.33. U.S. Government Debt and Interest Payments
(Percent of fiscal year GDP)



Source: IMF, *World Economic Outlook*, October 2012.
Note: Dashed line represents projections for 2012–17.

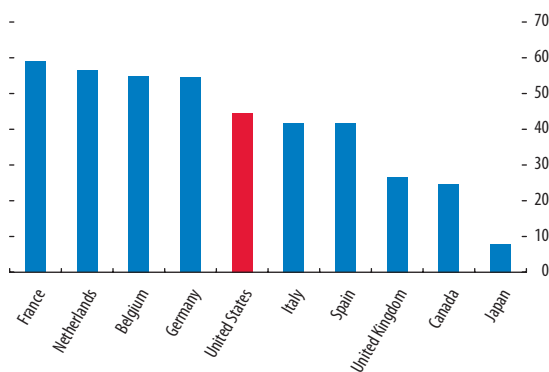
1.1 and Figure 2.32, short-term credit default swap spreads, volatility markets, and other sovereign-risk implied market indicators are not signaling much concern about fiscal cliff or debt ceiling risks. This could give rise to a repeat of market instability, such as that seen during the political brinkmanship over raising the U.S. debt ceiling in August 2011.

Low rates can also delay action on needed medium-term debt consolidation plans. Figure 2.33 shows that despite the sharp run-up in U.S. public debt in 2009–12 (solid line) with the crisis, debt servicing costs have not risen as a share of expenditures. But as interest rates normalize over the medium term (dashed line), debt servicing costs should begin to rise appreciably along with the burden of servicing a much higher stock of debt. The message is clear: Policymakers cannot rely on low rates indefinitely.

Lack of progress on a credible fiscal consolidation plan risks triggering additional sovereign credit rating downgrades. Multinotch downgrades or downgrades by more than one agency could, in turn, prompt changes in asset manager benchmarks and lead to reduced demand for dollar assets, increased term premiums, lower liquidity, impaired markets for repurchase agreements, and potentially some erosion of the dollar’s reserve currency status.

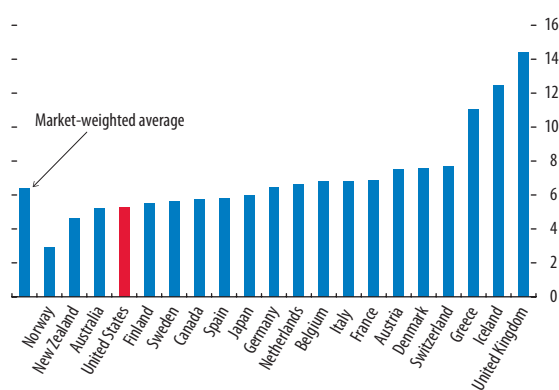
To gauge the impact of an erosion in reserve currency status, we simulated a portfolio rebalancing in which central bank reserve managers reduce their current holdings of U.S. Treasuries by 5 percentage points, from 62 percent of global (allocated) foreign exchange reserves to 57 percent. This would push 10-year Treasury yields nearly 50 basis points higher.

Figure 2.34. Foreign Investors' Share of Outstanding Sovereign Debt, as of End-2011 (Percent)



Sources: National government sources; and IMF staff estimates.
Note: U.S. data exclude municipal bonds.

Figure 2.35. Rollover Risk: Weighted Average Maturity of Sovereign Bonds (In years)

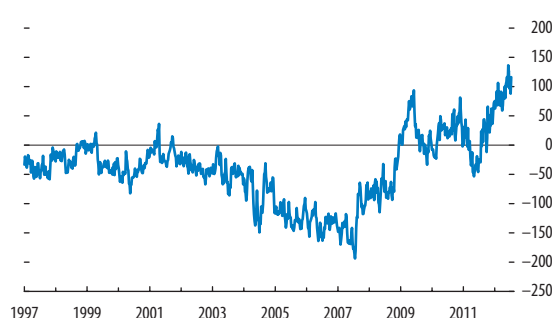


Sources: Bloomberg L.P.; and IMF staff estimates.

More generally, high public debt, large external exposure, a short debt maturity profile, and extended investor positioning would combine to increase the vulnerability to, and transmission of, a rise in rates (Figures 2.34, 2.35, and 2.36).

If the demand for U.S. corporate bonds dries up, the market's capacity for adjustment could be tested. Box 2.6 highlights the underlying liquidity conditions in U.S. corporate bond markets, which have weakened owing to changes in market structure and reduced warehousing by dealer banks. In an adverse credit cycle, illiquidity would likely compound the effects of higher funding costs, reducing credit inter-

Figure 2.36. Primary Dealers' Positioning in U.S. Treasury Securities (In billions of U.S. dollars)



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

mediation and tightening financial conditions more than would otherwise be the case.

Low rates may be masking the vulnerabilities being built up by excessive risk taking in the more lightly regulated nonbanking financial sectors. While activity in the overall shadow banking system remains depressed, that is not the case in all segments. An example is the rapid expansion in specialized vehicles for secondary mortgage securities—real estate investment trusts (REITs). REITs have nearly doubled their assets (to nearly \$500 billion) since 2010, in part because of the extended decline in bond yields, slower mortgage prepayment speeds, and reduced competition from banks and the government-sponsored enterprises Fannie Mae and Freddie Mac. An increase in bond yields or volatility poses a threat to the thin layer of equity capital supporting the assets of these specialized vehicles, given their substantial deployment of leverage.

Policymakers need to avoid the pitfalls of complacency and tackle the challenges ahead to preserve growth and financial resiliency.

Vulnerabilities are unlikely to be realized in the near term. Policymakers have the opportunity to evaluate strategic policy options that preempt negative market developments, rather than just reacting to them. The three key lines of policy action are correcting macro-fiscal imbalances, accelerating private sector deleveraging, and monitoring nonbank institutions as banks adjust business models to a lower risk profile.

Box 2.6. How Impaired Is Liquidity in the U.S. Corporate Bond Trading Market?

Liquidity in the secondary market for U.S. corporate bonds fell sharply at the start of the global financial crisis and never fully recovered. This box discusses the main factors for the decline and their implications. A shortage of liquidity may limit market participation while imposing higher funding costs on issuers, which could constrain still-weak credit channels.

Market liquidity—the ability to trade an asset without causing a large movement in its price—is critical. Without sufficient market liquidity, market participants face “gapping risk” (the possibility of a large drop in price from one trade to the next), reduced price discovery, information asymmetry, and market fragmentation, while issuers face higher funding costs.

Most measures show that liquidity in the U.S. corporate bond market has declined since the start of the global financial crisis and has not returned to precrisis levels (Table 2.6.1). For instance, the ratio of trading volume (\$17 billion) to the value of outstanding corporate bonds (\$5 trillion) is just 0.33 percent, one

Note: Prepared by Martin Edmonds, Sanjay Hazarika, and Rebecca McCaughrin.

of the lowest ratios among key U.S. assets, and lower than it was before the crisis. Other liquidity measures have also deteriorated relative to precrisis levels: Market turnover ratios have declined and bid-ask spreads are generally wider, especially on larger-size trades and off-the-run issues. The distribution of liquidity has also grown more top-heavy, with trading activity more concentrated in a smaller number of issuers.¹

Thus far, however, there is no evidence that reduced liquidity has increased corporate borrowing costs or hindered the ability to issue. On the contrary, investor inflows to corporate bond mutual funds have accelerated, costs have fallen, and corporate issuance has risen (Figures 2.6.1, 2.6.2, and 2.6.3). In part, this reflects currently favorable dynamics—excess liquidity, lack of alternative risk assets, and strong corporate fundamentals. However, an adverse credit cycle would likely intensify liquidity pressures and compound the negative effects on corporate borrowing costs and credit growth.

The market structure is prone to liquidity shocks owing to certain characteristics. The corporate bond

¹About 40 issuers account for roughly half of trading volumes on investment-grade corporate bonds.

Table 2.6.1. Corporate Bond Market Liquidity Measures

	Precrisis	Crisis Period	Latest Month	Percent Change: Latest Month vs. Precrisis		
	(Daily/monthly averages over period)					
Investment grade						
Number of trades	2,879	2,765	4,100	42%	↑	
Daily trading volume (billions of U.S. dollars)	8.8	9.3	11.8	34%	↑	
Trading volumes (percent of market)	0.9	0.2	0.3	-67%	↓	
Turnover	3.5	0.5	2.7	-24%	↓	
Bid-ask spreads (basis points)	5.5	23.5	12.0	118%	↓	
LCS (percent)	0.8	2.4	1.2	58%	↓	
Financials - LCS (percent)	0.8	2.9	1.1	37%	↓	
Nonfinancials - LCS (percent)	0.8	2.4	1.3	61%	↓	
High yield						
Number of trades	1,421	1,012	1,292	-9%	↓	
Daily trading volume (billions of U.S. dollars)	4.8	4.3	5.2	8%	↑	
Trading volumes (percent of market)	0.9	0.4	0.6	-33%	↓	
LCS (percent)	1.6	6.3	1.8	8%	↓	
Miscellaneous						
Investment-grade Sharpe ratio	2.0	0.1	8.1	314%	↑	
High-yield Sharpe ratio	4.3	(0.3)	15.5	257%	↑	
Primary dealer corporate bond inventory (billions of U.S. dollars)	278.0	100.0	66.0	-76%	↓	
Primary dealer corporate bond inventory (percent of market)	6.0	2.7	0.9	-84%	↓	

Sources: Barclays; Bloomberg L.P.; Federal Reserve; JPMorgan Chase; Securities Industry and Financial Markets Association; and IMF staff estimates.

Note: LCS = liquidity cost score, which is akin to a bid-ask spread, and effectively represents the roundtrip cost of trading a bond divided by the bond's duration. The precrisis period covers January 1, 2005 to September 14, 2008; the crisis period covers September 15, 2008 to May 31, 2009; latest month reflects July or August. Red downward arrows indicate weaker liquidity compared to the precrisis period; green upward arrows connote stronger liquidity.

Box 2.6 (continued)

Figure 2.6.1. Assets under Management of U.S. Corporate Bond Funds
(In billions of U.S. dollars)

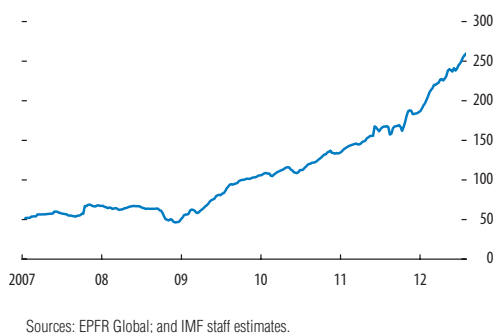


Figure 2.6.2. U.S. Corporate Bond Spreads
(In basis points)

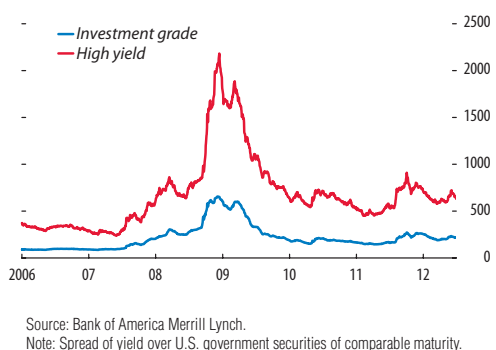
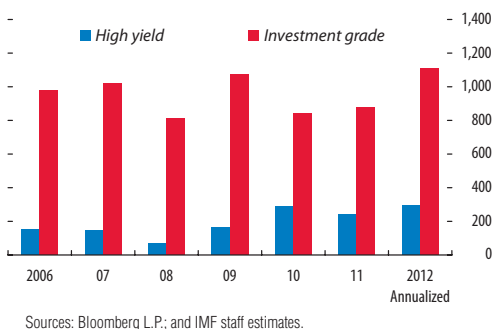


Figure 2.6.3. U.S. Gross Corporate Bond Issuance
(In billions of U.S. dollars)



market has traditionally suffered from lower liquidity relative to other asset markets (Table 2.6.2), making it more prone to liquidity shocks. This weakness is due in part to a relatively archaic market microstructure: Because of the large number of outstanding corporate bond issues (as of end-2011 there were more than 40,000 issues versus just 300 in the U.S. Treasury market), corporate bond trading is a quote-driven market, with prices on platforms such as Bloomberg functioning as indicative—rather than executable—prices. Most large transactions are still conducted by phone to preserve anonymity for both dealer and investor and improve execution by the dealer.

The decline in liquidity in the secondary corporate bond market is due to a combination of cyclical and secular forces. Three are most notable:

1. *Changes in dealer-banks' business models and greater global uncertainty.* Structural changes affecting dealer-banks' business models (see Box 2.5) and a compression in balance sheets have reduced the willingness of dealer banks to undertake the risk of warehousing a large amount of bonds. As such, balances at primary dealers (original issues bought for resale) have not kept pace with growth in the corporate bond market (Figure 2.6.4). Preventive actions on the part of market-makers in anticipation of regulatory developments may have reinforced the trend, though such changes do not appear to have been the main driver.² The decline in dealer inventories started well before the Dodd-Frank Act and Basel III were fully fleshed out.
2. *Trading has shifted to exchange-traded funds (ETFs), corporate derivatives, and other alternatives to trading corporate bonds directly (the cash market).* Both bond ETFs and corporate credit default swap products have grown in importance, with market capitalizations rising steadily and the

²The Volcker rule in the Dodd-Frank Act bans proprietary trading in corporate bonds, equities, and derivative securities tied to interest rates, credit, foreign exchange, equities, and commodities; and it prevents traders from “engaging as principal for the trading account of the covered banking entity in any purchase or sale of one or more covered financial positions” unless such trades involve genuine market-making, risk mitigation, or hedging. Basel III will potentially increase some risk-weights on risk assets used to determine how much capital banks need to set aside to backstop their asset portfolios.

Box 2.6 (continued)

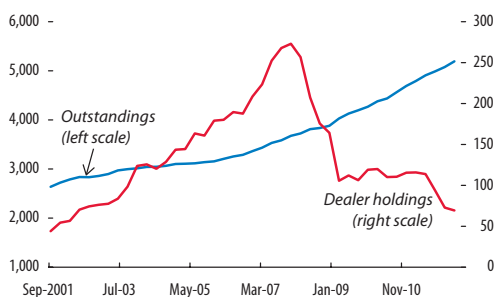
Table 2.6.2. U.S. Asset Class Liquidity Comparators

	Number of CUSIPs	Total Outstanding (trillions of U.S. dollars)	Average Daily Trading Volume (billions of U.S. dollars)	Ratio of Trading Volume to Outstanding (percent)	Annual Turnover Ratio (times)
Agency debt	12,000	2.7	72	2.67	6.6
Agency MBS	50,000	6.9	321	4.65	11.8
Firms	40,000	4.7	17	0.33	0.5
Equities	5,000	23.3	114	0.49	1.2
Municipalities	15,000	3.8	13	0.34	0.9
Treasuries	300	9.4	528	5.62	14.2

Sources: Barclays; Bloomberg L.P.; Federal Reserve; Oliver Wyman; and Securities Industry and Financial Markets Association.

Note: MBS = mortgage-backed securities.

Figure 2.6.4. Primary Dealer Balances and Outstanding Stock of Corporate Bonds
(In billions of U.S. dollars)



Source: Federal Reserve; and IMF staff estimates.

investor base broadening, especially relative to the high-yield corporate cash bond market.

3. *Changes in the investor base are also affecting trading conditions.* Traditional buy-side institutions, including pension funds, insurance companies, and asset managers, have not only expanded their market share, they have also increased the holding time of risk assets, owing to the lack of yield and the dearth of alternative credit instruments.

In response to reduced liquidity, a new model is beginning to emerge—one that emphasizes an agent-dominant system and direct matching of buy orders to sell orders. Some dealer banks are seeking to reinvent themselves as agents in such a system, that is, acting as brokers instead of taking positions. In addition, specialized credit-focused broker-dealers have increased their market share. Some investors have also emerged as agents using their own portfolios to match buyers and sellers.

Trading volumes on these alternative platforms have risen, but overall amounts that can be executed are still minute. Some of these platforms cannot accommodate large trades, and some investors are reluctant to trade in large volume, given the lack of anonymity in such trades.³ Moreover, most alternative trading platforms are active only in trading investment-grade bonds, so they would do little to alleviate illiquidity in the high-yield market. Another constraining factor is the lack of so-called bundling opportunities sometimes offered by dealer banks (wherein trade executions are made contingent on inclusion of other core banking products). The inability to bundle could reduce participation in the market.

A return to the prior structure seems unlikely given changes in bank business incentives. Nor is sustaining the conventional trading structure necessarily desirable, as it suffers from fragmented liquidity and an inefficient network of dealer-banks and interdealer brokers. As the agent-dominated market becomes more standardized and electronic trading evolves, liquidity pools may consolidate, and the cost of liquidity and market risk should shift further to sectors in which failures have more limited implications for taxpayers. However, in the interim, funding rates may rise for high-yield or smaller issuers, as market makers will likely be willing to provide liquidity to only the largest, most liquid issuers. Higher funding costs, in turn, would reduce the supply of lending and tighten credit conditions.

³Average daily trade volumes executed on the electronic trading platform, MarketAxess, are around \$2.5 billion, whereas the average for individual broker-dealer and buy-side electronic platforms—most of which are in trial phase—are no larger than about \$200 million. In contrast, the average daily trading volume for the corporate cash bond market as a whole is \$17 billion.

First, while fiscal policy can still counter a slowdown in economic growth, debt levels are elevated and the monetary policy transmission mechanism remains clogged. The main challenge is to use the limited policy space available effectively to support the recovery in the near term, taking a balanced approach to medium-term fiscal consolidation and completing financial sector reforms. As highlighted in the October 2012 *Fiscal Monitor*, fiscal authorities need to clarify future objectives and actions and obtain requisite political backing for medium-term adjustment.

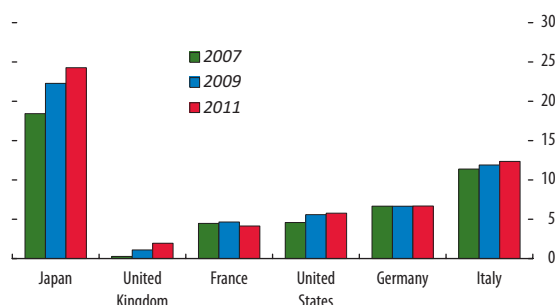
Second, the efficacy of monetary and financial policies can be improved. The Federal Reserve's latest monetary policy decision—to extend its forward rate guidance and commit to purchase agency mortgage-backed securities (MBS) until it sees a substantial improvement in the labor market—reinforces its intention to provide highly accommodative monetary policy for a considerable period. However, additional measures may be needed to unclog the transmission mechanism and accelerate balance sheet repair, particularly in the mortgage market. Aiming policy action at the cohort in which deleveraging is progressing most slowly could speed the cycle. The effectiveness of purchasing MBS and of other forms of credit easing would be enhanced if policymakers were successful in facilitating housing market adjustment, including expanding access to mortgage refinancing and encouraging mortgage write-downs.

Third, market surveillance is all the more important, given the plethora of regulations being implemented. The direct effects of changes in the business models of dealer-banks are risk reducing. But the indirect effects could be quite relevant for future risks in the nonbank financial sector, where regulations are less onerous. The effects on financial market liquidity and the transfer of risk to nonbank entities deserve careful consideration (see Chapters 3 and 4).

Japan: How Safe a Safe Haven?

Japan has been a beneficiary of safe-haven inflows from Europe and elsewhere, with yields on Japanese government bonds (JGBs) reaching record lows. However, the problems of high sovereign debt and a concentration of government bond risk in the banking system are as characteristic of Japan as they are of euro area sovereigns currently under market pressure. Moreover,

Figure 2.37. Bank Holdings of Government Debt in Selected Advanced Economies
(In percent of bank assets)



Source: IMF, International Financial Statistics database.
Note: Includes all claims of domestic institutions (excluding the central bank) on general government. U.K. figures are for claims on the public sector.

the concentration of bond risk within the banking system is expected to increase over the medium term, particularly for smaller, regional banks. To address these concerns, Japan needs a comprehensive strategy to rein in fiscal imbalances and reduce the risk that the bond market will destabilize the domestic banking system.

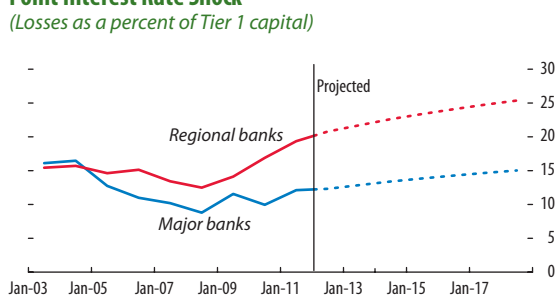
The sovereign-banking nexus has been a reality in Japan for some time.

In Japan, medium-term fiscal risks are evident, but the sovereign continues to enjoy market confidence, as reflected in low sovereign CDS spreads and low yields on JGBs. Bond investors note that Japan enjoys several advantages generally not available to euro area sovereigns under stress. It has room to raise taxes,¹⁶ it has a stable domestic investor base that effectively channels private savings to the sovereign, and it issues all of its debt in a currency that it controls. JGB yields are now about 100 basis points below fair value estimates—largely because of strong support from domestic banks, which, in part because of weak loan demand, have shifted their portfolios away from loans and toward government bonds. Government debt holdings now make up 24 percent of the assets of Japanese depository institutions, a very high level for a major advanced economy (Figure 2.37).

Recently conducted stress tests indicate that, at current levels of exposure, Japan's financial system would

¹⁶In August the Diet passed a bill to double the effective consumption tax rate, from 5 to 10 percent, by 2015.

Figure 2.38. Sensitivity of Japanese Banks to a 100 Basis Point Interest Rate Shock
(Losses as a percent of Tier 1 capital)



Sources: Bank of Japan; and IMF staff estimates.
Note: Mark-to-market losses in bond holdings due to a 100 basis point parallel rise in material yields. Projections for 2012–17 assume that banks cover the same share of government funding as in 2008–11, keep the duration of their bond holdings constant, and bank assets and Tier 1 capital grow in line with nominal GDP.

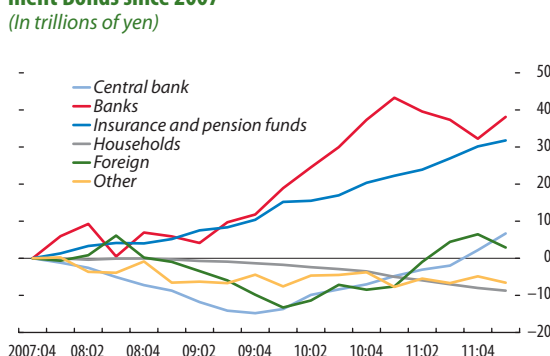
be resilient to severe economic distress and moderate market shocks.¹⁷ According to estimates by the Bank of Japan (BOJ), a 100 basis point increase in interest rates across the yield curve would lead to mark-to-market losses of 20 percent of Tier 1 capital for regional banks, and of 10 percent for the major banks (Figure 2.38). Several regional banks are afflicted by low core profitability, relatively thin capital positions, and large duration gaps, making them particularly vulnerable to slow growth and market yield shocks. The vulnerability is especially pronounced in the case of small regional banks, which make up 6 percent of the Japanese banking sector, while large regional banks account for 23 percent of the sector.

Risks to financial stability from bank holdings of sovereign bonds are expected to rise.

In the postcrisis period, domestic banks have become the dominant buyers of Japanese government debt, as some traditional investors have begun to divest JGB holdings (Figure 2.39). With this trend expected to continue, the IMF staff estimates that domestic banks will raise their holdings of government debt from 24 percent of assets in 2011 to 30 percent by 2017 (Figure 2.40).¹⁸ The increase in exposure to

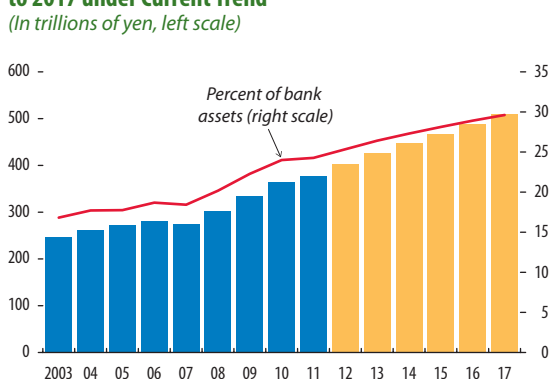
¹⁷See the IMF’s 2012 Financial Sector Assessment Program (FSAP) report for Japan (IMF, 2012b).
¹⁸The estimate is based on the IMF staff’s fiscal forecasts for net new government debt issuance over 2012–17; absorption of this

Figure 2.39. Cumulative Purchases of Japanese Government Bonds since 2007
(In trillions of yen)



Source: Bank of Japan, flow of funds accounts.

Figure 2.40. Japanese Bank Holdings of Government Debt to 2017 under Current Trend
(In trillions of yen, left scale)

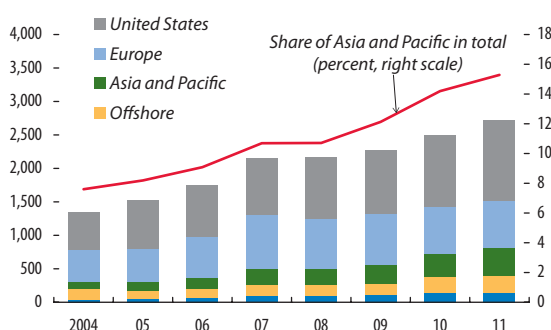


Sources: IMF, International Financial Statistics and World Economic Outlook databases; and IMF staff estimates.
Note: Calculation of projected holdings (yellow bars) assumes that banks cover the same share of government funding as in 2008–11 and that bank assets grow with nominal GDP.

government bonds would make bank capital even more susceptible to a major interest rate shock in the future, particularly in the case of regional banks. A 100 basis point shock in 2017 would result in mark-to-market losses of 26 percent of regional banks’ Tier 1 capital if bank balance sheets evolve as projected (Figure 2.41). In addition, should there be some other shock to the banking system, the government would find it hard to act as a backstop owing to the effects of its own fiscal position on bank balance sheets.

issuance by domestic banks is estimated on the basis of the banks’ purchase of new debt issuance over the most recent three-year period (2008–11).

Figure 2.41. Foreign Claims of Japanese Banks
(In billions of U.S. dollars, left scale)



Source: Bank of Japan, Consolidated International Banking Statistics.

At the same time, overexposure of banks to the sovereign may hurt growth, as banks move away from their traditional role of credit intermediation to the private sector. These considerations illustrate the risk of maintaining too close a tie between the sovereign and the domestic banking system. The case of the euro area periphery underscores how large bank holdings of domestic sovereign debt can lead to a very problematic interdependence between the sovereign and domestic banks.

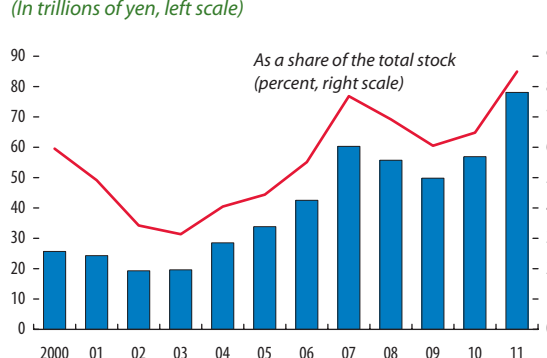
In an alternative to our projections, foreigners' appetite for JGBs—currently still limited—may grow. But for this to take place, domestic interest rates would likely need to rise to attract overseas buyers. This, in turn, would stress the balance sheets of weaker banks, jeopardizing financial stability.

Japan has thus far been a beneficiary of safe-haven flows prompted by the euro area debt crisis, but an escalation of that crisis could eventually undermine financial stability.

With the supply of global sovereign safe assets rapidly dwindling, international investors who had avoided JGBs in the past have increasingly been drawn to this asset class, particularly at the short end (Figure 2.42), even as Japanese investors have brought some capital home.¹⁹ Japanese financial institutions have also been boosting their overseas

¹⁹Safe-haven flows have also subjected the yen to strong appreciation pressures, dampening demand for domestic output and compressing domestic credit demand.

Figure 2.42. Foreign Holdings of Japanese Government Securities
(In trillions of yen, left scale)



Source: Bank of Japan, flow of funds accounts.
Note: Japanese government bonds and Treasury discount bills.

exposure, especially in Asia (e.g., in syndicated loans), where European banks have retrenched. Overall, this is a welcome development, as overseas exposures of Japanese banks are still relatively low compared with other G7 countries. Given the low profitability environment at home, Japanese banks could benefit from more internationalization while playing a stabilizing role in global financial markets as European banks divest assets.

At the same time, an escalation in the European crisis could affect Japan through various channels. The indirect impact of a shock from Europe may be substantial, if U.S. and U.K. banks are hit, or if claims on the nonfinancial sector in core Europe are affected.²⁰ European troubles could also influence Japan through mutual trading partners in emerging markets, compounding the direct effect from Europe on Japanese corporations (see the October 2012 *World Economic Outlook*). Finally, a general rise in global risk premiums could have significant consequences for the Japanese economy through higher JGB yields (see IMF, 2012b), particularly if investors come to focus more on similarities between Japan's circumstances and those of stressed European sovereigns. If severe enough, such a shock could derail the sustainability of Japan's public debt and create sizable losses for banks, especially regional banks.

²⁰In a network analysis, the Japan FSAP (IMF, 2012b) illustrated that Tier 1 capital of Japanese banks would be substantially impaired by a sizable credit and funding shock of 100 percent of loss given default and a 50 percent discount on liquidation of assets—an admittedly tail risk scenario.

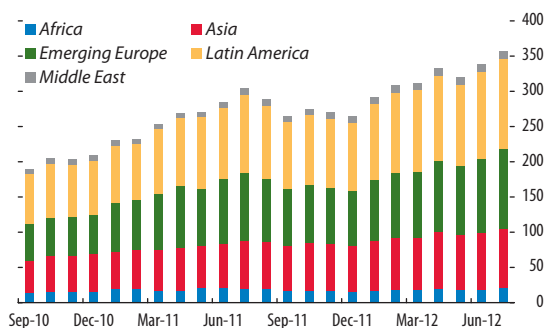
How can Japan manage its sovereign-banking nexus?

The rising concentration of government bond risk in the domestic banking system is a central financial stability concern in Japan. Measures to induce banks to take greater account of the risks inherent in large JGB holdings may be of great use in controlling this risk, particularly in the case of regional or smaller banks. Mechanisms for systemic and macroprudential oversight could be enhanced by conducting regular thematic risk assessments and bottom-up stress tests for macroprudential purposes. To provide larger risk buffers, minimum capital ratios for domestically active banks can be raised closer to those required of internationally active banks, and capital requirements can be more aligned with the materiality of risks. Moreover, systemic risks may be mitigated through a strategy to establish a stronger regional and cooperative bank sector, including through private-sector-led consolidation. Complementing such measures should be efforts to encourage banks to find ways to cushion the impact of sharp interest rate increases, including through the use of market instruments to manage interest rate risk.

Emerging Markets and Other Economies: Navigating Domestic and Global Risks

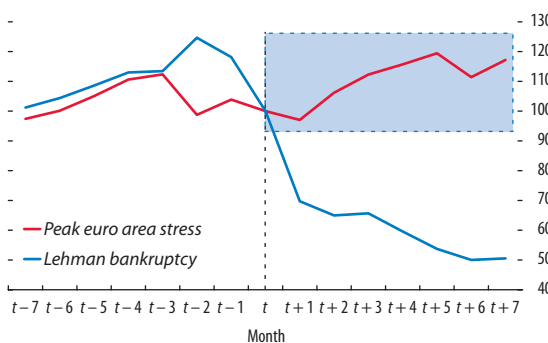
Emerging markets need to guard against potential further shockwaves from the euro area while managing a slowdown in growth that could expose home-grown financial stability risks. So far, inflows to local bond markets have continued even as sovereign fears in the euro area have escalated. However, markets could come under strain if a bout of acute global stress precipitated large-scale capital outflows. Overall, vulnerabilities are most pronounced in many central and eastern European economies because of their high direct exposures to the euro area and some similarities with the euro area periphery. Asia and Latin America generally appear more resilient, but several key economies in those regions are prone to late-cycle credit risks in the wake of an extended period of rising debt and property prices. Meanwhile, the scope to provide fresh policy stimulus is somewhat constrained in several economies. Policymakers

Figure 2.43. Emerging Market Bond Fund Assets under Management, by Geographic Location
(In billions of U.S. dollars)



Source: EPFR Global.

Figure 2.44. Resilience of Inflows into Emerging Market Local-Currency Bond Funds Despite Euro Area Stress
(Assets under management, $t = 100$)



Sources: EPFR Global; and IMF staff estimates.
Note: Peak of stress (month = t) for euro area stress is November 2011; for Lehman bankruptcy it is September 2008.

therefore need to deftly navigate country-specific challenges to safeguard financial stability.

Continued portfolio inflows underscore investors' perceptions of selected emerging market economies as relatively safe havens.

Investor flows into emerging market fixed-income assets, including local currency instruments, have accumulated rapidly during the euro area crisis (Figure 2.43), with reversals proving to be short-lived, in sharp contrast to behavior at the height of the Lehman crisis (Figure 2.44). Inflows in many emerging market economies have been supported by favorable macroeconomic and credit fundamentals. Indeed,

investors' quest to diversify out of troubled advanced economy markets has prompted structurally higher allocations toward emerging market funds. Other supportive factors include accommodative global liquidity conditions and the resulting search for yield.

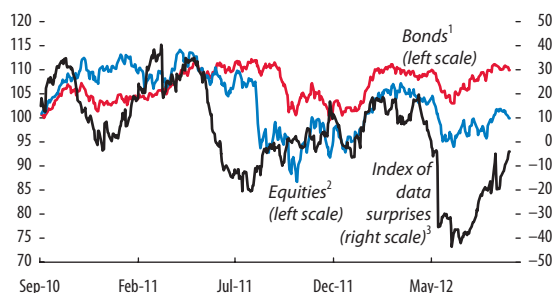
The environment in emerging markets has turned more challenging, as the euro area crisis sends renewed ripples through a fragile global economy.

Headwinds have stiffened since the April 2012 GFSR amid persistent tensions in euro area financial markets. The deterioration of economic conditions in Europe, along with specific local factors, has also reinforced a slowdown in activity across emerging market economies, including Brazil, China, and India. Weaker growth prospects have weighed on emerging market equities and currencies, even as bond markets have performed well (Figure 2.45).

Credit risk premiums in emerging market economies have also been affected to varying degrees by volatile sovereign spreads in the euro area. The effect has been especially pronounced in central and eastern Europe, which remains the most vulnerable of emerging market regions (Figure 2.46).²¹ In comparison,

²¹Market liquidity conditions may also affect the correlation between credit default swap spreads across countries.

Figure 2.45. Performance of Emerging Market Equities and Bonds vs. Economic Surprise Index
(Price index, September 2010 = 100, left scale)

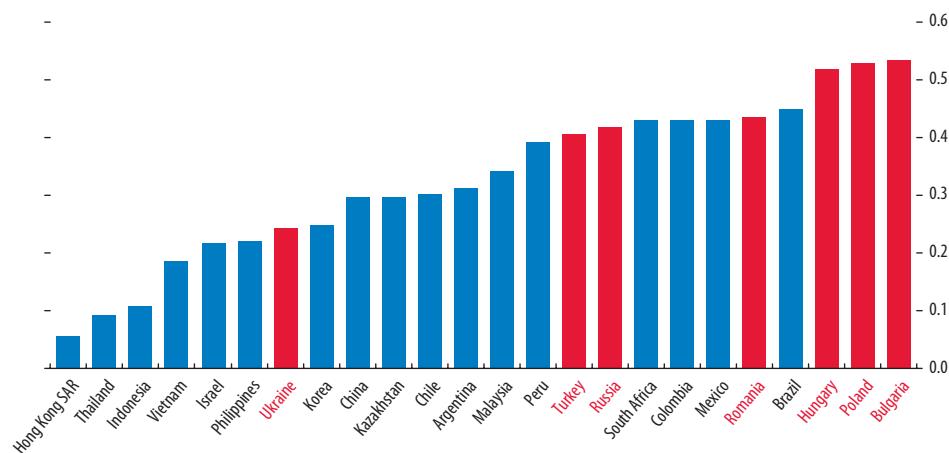


Sources: Bloomberg L.P.; and IMF staff calculations.
¹Markit iBoxx Global Emerging Markets Local Currency Bond Index.
²MSCI Emerging Markets Local Currency Equity Index.
³Citigroup Emerging Market Surprise Index. Values less than zero indicate negative data surprises.

most sovereigns in Latin America and especially in emerging Asia exhibit a fairly low sensitivity to euro area stress, which points to their better fundamentals and their perceived role as (relatively) safe havens.

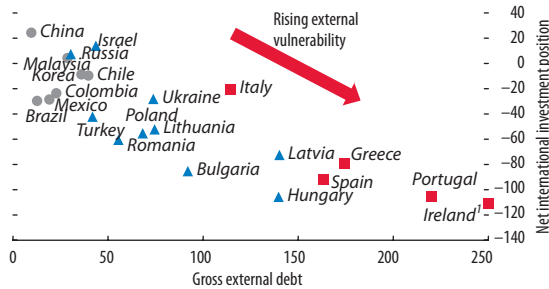
Central and eastern Europe stands out as the most vulnerable of emerging market regions, as it has the greatest direct exposures to the euro area as well as certain similarities to the troubled euro area periphery.

Figure 2.46. Sensitivity of Selected Sovereign CDS to CDS of Euro Area Periphery, 2011–12



Sources: Bloomberg L.P.; and IMF staff estimates.
 Note: For economies shown, the data show the percentage change in their credit default swap (CDS) spread associated with a 1 percent change in the average CDS spread of Ireland, Italy, Portugal, and Spain; computed from weekly observations beginning in January 2011. Data in red are for countries in central and eastern Europe.

Figure 2.47. Net International Investment Position versus Gross External Debt, Selected Economies, 2011
(In percent of GDP)



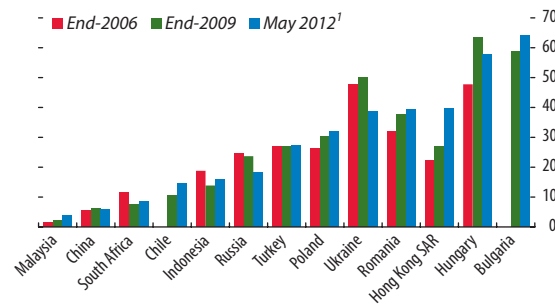
Sources: Haver Analytics; and IMF staff calculations.
¹For Ireland, gross external debt was 1,063 percent of GDP at end-2011 (truncated in the figure); net international investment position excludes its International Financial Center.

Several countries in central and eastern Europe exhibit some of the same financial vulnerabilities that have come to the fore in the euro area crisis. Fueled by rampant credit and asset price booms, their external indebtedness surged during the early 2000s at a rate that was second only to that in the euro area periphery (Figure 2.47). To be sure, many countries in central and eastern Europe have flexible exchange rates, which facilitates the necessary adjustment of their economies. In some cases, however, this function is constrained by the high share of bank loans denominated in foreign currency (Figure 2.48). Comparatively modest official reserve holdings further limit the capacity in central and eastern Europe to deal with external shocks.²² Compounding these challenges are direct exposures to the euro area via trade and banking channels that significantly exceed the exposures of other emerging market regions.

As outlined in Box 2.3, the gradual retreat of euro area banks from central and eastern Europe will likely generate headwinds for some time. Although the significant measures taken by the ECB have provided some much-needed respite, parent banks are still targeting lower loan-to-deposit ratios and less cross-border funding, which keep up the pressure to trim loan books. As a result, near-term credit growth is likely to remain flat or negative in many central

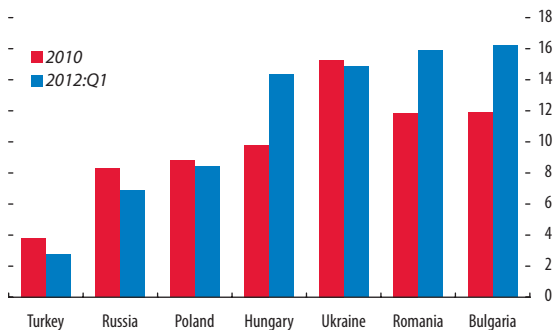
²²Unlike in Asia and Latin America, the level of official reserves in many countries in central and eastern Europe is well below 100 percent of short-term external debt.

Figure 2.48. Share of Foreign-Currency-Denominated Bank Loans in Total Loans
(In percent)



Sources: CEIC; Haver Analytics; national authorities; and IMF staff estimates.
¹Except for Russia and South Africa (March 2012) and Bulgaria and Ukraine (April 2012).

Figure 2.49. Ratio of Nonperforming Loans to Total Loans
(In percent)

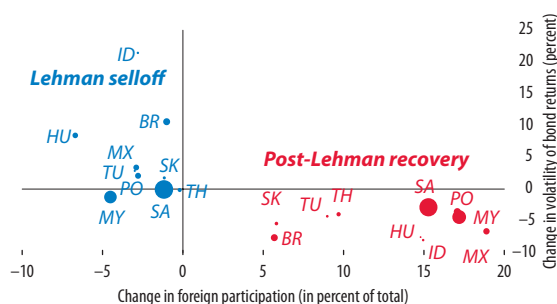


Sources: National authorities; and IMF staff estimates.

and eastern European countries, notably Bulgaria, Hungary, and Romania.

In this environment, bank asset quality has continued to worsen in many countries in the region, reflecting a deterioration in the repayment capacity of borrowers, and increased recognition of NPLs from the 2008–09 crisis that were initially “ever-greened.” Thus, NPL ratios have risen from already high levels in several countries in the region (Figure 2.49). There is now a clear risk that asset quality problems will increase: Bank deleveraging continues, economic activity remains sluggish, and currency depreciation could hurt households and businesses that have debts denominated in foreign currencies. Any further intensification of the euro area crisis would exacerbate these dynamics.

Figure 2.50. Change in Volatility of Local Bond Returns Relative to Foreign Participation and Domestic Investor Base



Sources: Bloomberg L.P.; national authorities; Organization for Economic Cooperation and Development; and IMF staff calculations.

Note: Data as of May 2012. Lehman selloff refers to September-October 2008, and post-Lehman recovery refers to the period since the post-Lehman trough (see Table 2.6 for details). Size of bubbles is proportional to the size of domestic pension fund assets under management relative to GDP. BR = Brazil; ID = Indonesia; MY = Malaysia; PL = Poland; SK = Republic of Korea; TH = Thailand; TR = Turkey.

Global shocks and foreign flows in recent years have been a key influence on local bond market volatility of emerging market economies.

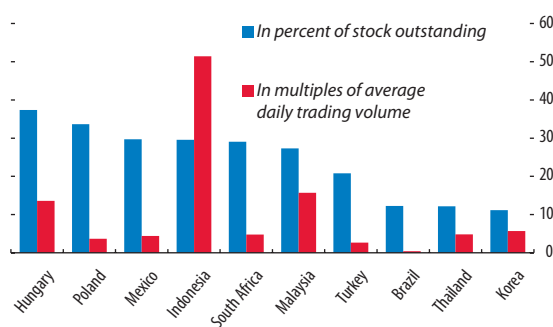
The period around the collapse of Lehman Brothers substantially boosted the volatility of emerging market local bonds as foreign investors reduced their exposures to risky assets (Figure 2.50). Brazilian, Hungarian, and Indonesian bonds sold off substantially, increasing the volatility of total returns by up to 22 percent. Since that episode, local bond markets have received sustained new inflows of foreign funds; in several emerging market economies the inflows have pushed nonresident holdings of local debt to historically high levels (Figure 2.51). This trend has been accompanied by a reduction in the volatility of bond returns (Figure 2.50). Nonetheless, a new sudden reversal of capital flows cannot be ruled out.

The size of the domestic investor base affects the ability of local markets to cope with sudden, large outflows.

Markets with high foreign bond holdings, relatively small local long-term investors, and low trading liquidity are likely to be most disrupted by outflows.²³

²³In addition to these characteristics, foreign exchange flexibility has been found to influence the effect of capital flow shocks.

Figure 2.51. Nonresident Holdings of Government Debt and Market Liquidity



Sources: Asian Bonds Online; CEIC; national authorities; and IMF staff calculations.

Note: Data are as of end-March 2012, except for Brazil and Mexico (May 2012), Hungary and Poland (July 2012), and Turkey (August 2012).

Indeed, earlier periods of large capital inflows and outflows suggest that markets with sizable domestic pension fund assets, such as Malaysia, Poland, and South Africa, tend to suffer smaller swings in bond prices and better withstand external shocks (Figure 2.50). By contrast, the absence of a significant local investor base in Hungary and Indonesia has meant that the substantial ebb and flow of nonresident investments has contributed to larger changes in market volatility. Low average market turnover, as observed especially in Indonesia, may exacerbate bond price action in periods of large outflows.²⁴

A sudden reversal of flows could be disruptive, especially where local asset managers have a limited capacity to absorb the resulting supply, forcing banks to further expand their holdings of government bonds.

To illustrate the potential ramifications of a severe new shock, we consider a hypothetical reversal of all cumulative net foreign inflows into local currency bonds since the post-Lehman trough for a set of nine economies (Table 2.6). The size of outflows as a share of total debt outstanding ranges from 7 percent (for Korea) to 23 percent (for Mexico). The resulting bond sales are assumed to be partly absorbed by domestic pension funds and other asset managers. In particular, the amount bought by pension funds is

²⁴Reflecting such concerns, the Indonesian authorities launched a bond stabilization fund last year, following the example of Korea.

Table 2.6. Impact on Domestic Bank Balance Sheets from a Hypothetical Reversal of Foreign Inflows into Local Bond Markets¹
(Billions of U.S. dollars, unless otherwise noted)

	Brazil	Hungary	Indonesia	Korea	Malaysia	Mexico	Poland	South Africa	Turkey
Potential selling by foreign investors									
Size of local bond market	858	46	94	531	179	323	157	99	221
Share of foreign holdings (percent of total)	11.9	35.6	29.6	11.2	27.3	29.7	30.5	29.4	17.5
Foreign holdings	102	16	28	59	49	96	48	29	39
Potential sales by foreigners (= cumulative net foreign purchases since country-specific post-Lehman trough)	62	8	15	36	26	76	32	21	24
As a share of local bond market (percent)	7.2	17.6	16.5	6.8	14.6	23.4	20.1	21.7	10.8
In percent of official foreign exchange reserves	17.0	20.8	15.5	11.9	21.7	48.1	36.8	50.0	28.7
Capacity for absorption by local investors									
Assets under management of local private pension funds and other asset managers	321	21	14	351	148	130	71	368	17
Estimated potential absorption by local private pension funds and other asset managers ²	16.1	1.0	0.7	17.6	7.4	30.0	3.5	18.4	0.8
Potential required absorption by local banks	46.1	7.1	14.8	18.7	18.9	45.7	28.1	3.0	23.0
Impact on domestic banks' balance sheets									
Current holdings of government securities (percent of total assets)	12.4	12.1	4.8	6.0	10.1	2.4	10.3	8.9	18.4
Implied holdings of government securities (percent of total assets) ³	14.7	16.8	7.1	7.2	13.6	7.3	17.0	9.6	21.7
Increase (percent) ³	18.0	38.9	47.2	20.1	34.3	199.6	65.8	8.6	17.8

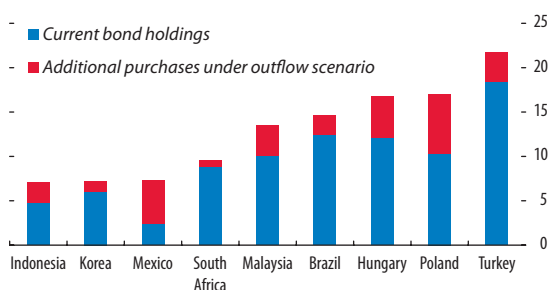
Sources: Asian Development Bank; Bloomberg L.P.; CEIC; national authorities; Organization for Economic Cooperation and Development; and IMF staff estimates.

¹Data are as of December 2011 for South Africa; January 2012 for Brazil; March 2012 for Malaysia, Indonesia, Korea, and Poland; April 2012 for Hungary and Turkey; and May 2012 for Mexico.

²Assumes that pension funds can increase bond holdings by 5 percent of assets under management. For Mexico, absorptive capacity is estimated at US\$30 billion, based on IMF staff estimates.

³Assumes no increase in overall bank assets, i.e., higher government bond holdings substitute for other assets currently on balance sheet.

Figure 2.52. Bank Holdings of Local Currency Government Debt and Additional Purchases under Outflow Scenario
(In percent of total banking system assets)



Sources: Asian Development Bank; Bloomberg L.P.; CEIC; national authorities; Organization for Economic Cooperation and Development; and IMF staff estimates.
Note: See Table 2.6 for details.

assumed to equal as much as 5 percent of their latest assets under management, consistent with a partial reallocation of assets, including cash.

In the above scenario of flow reversal, domestic banks would likely buy the remaining bonds sold by foreigners, as exemplified by the experience of Turkey in 2008–09 (Table 2.6 and Figure 2.52).²⁵ Thus, bank holdings of government debt could rise sharply in many economies. The largest increases would occur in Hungary and Poland, reflecting the large foreign holdings of local bonds together with the limited absorptive capacity of private pension funds, although Polish banks maintain high capital adequacy levels overall.²⁶ The scenario also suggests a marked increase in bond holdings for Mexican banks, albeit from a relatively low initial base. Turkish banks already allocate an unusually high share of their balance sheets to local government paper. Nevertheless, they could arguably acquire more local bonds: Historical holdings have been even higher, bank balance sheets remain fairly liquid, and the outstanding stock of government debt is of short average maturity.

²⁵There is significant uncertainty around domestic asset managers' ability to absorb bonds during a disorderly exit by nonresidents. In some countries, for instance, there might be scope for retail investors to step into the market if yields become sufficiently attractive. Therefore, the calculations provided here should be viewed as illustrative only.

²⁶Hungary is also vulnerable given the large role of foreign banks, which may be reluctant to increase exposures to the local sovereign. This concern also applies, to a lesser extent, to several other countries in central and eastern Europe.

In some countries (Mexico and South Africa in particular), the size of the simulated outflows is also significant relative to the stock of official foreign exchange reserves. This underscores the risk of adverse effects on currency markets. Moreover, an exodus of foreign investors could reinforce negative sovereign-bank feedback loops, leading to an overall weakening of financial sector resilience and potentially crowding out the private sector. Countries with stronger fiscal positions are better placed to cushion such a shock.

Asia and Latin America generally appear more resilient, but several key regional economies are facing home-grown risks related to long-running credit expansions.

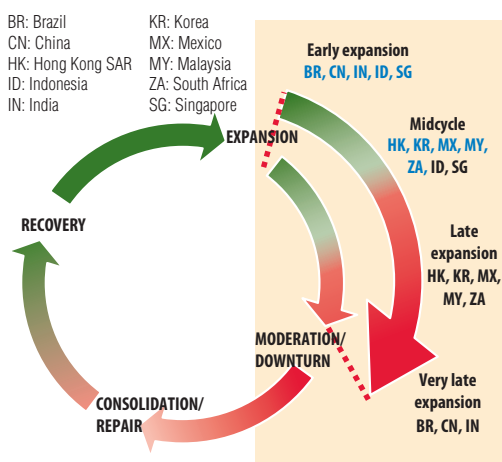
Economies in Asia and Latin America generally compare favorably with their central and eastern European peers in all dimensions of external vulnerability (Figure 2.47). However, they clearly are not immune to the effects of a broad-based global slowdown, let alone a possible systemic shock. In particular, further significant disruptions of euro area banks could have large negative effects on those banks' overseas operations, notably in Latin America, even though local subsidiaries appear somewhat shielded under the *baseline policies* scenario. Latin America is also significantly exposed to the risk of sustained pressure on commodity prices in the event of a protracted global downturn. In addition, a large systemic shock could revive acute tensions in global dollar funding markets.

Aside from such spillover risk, several large economies are vulnerable to late-credit-cycle risks following several years of strong growth in credit and in property prices.²⁷ The October 2011 GFSR pointed out that most emerging market economies (with the notable exception of those in central and eastern Europe) were in the expansionary phase at that time and thus well advanced along the credit cycle.²⁸

²⁷Credit growth in excess of nominal income growth may be a reflection of healthy financial deepening. Nonetheless, international experience shows that excessively rapid credit growth, coupled with lax regulation, can precipitate financial crises even when credit is starting from a low base.

²⁸As discussed in the October 2011 GFSR, the stylized credit cycle graphic progresses through four distinct phases (see also Figure 2.53): consolidation/repair, recovery, expansion, and mod-

Figure 2.53. Credit Cycle Position of Selected Economies: 2006 and 2011



Sources: Bank for International Settlements; banks' annual reports; Bloomberg L.P.; IMF databases; national authorities; and IMF staff estimates.

Note: Countries in black = 2011; in blue = 2006. Countries' positions along the stylized credit cycle are estimated from a composite of indicators, including the ratio of credit to GDP, real house price changes, the price-to-book value of the equity market, banking sector gross nonperforming loan ratio and return on assets, and corporate sector debt-to-equity ratio and return on equity. The cyclical position is initially evaluated for each indicator and then aggregated across indicators, using a simple average of scores. Trends in some indicators and the resulting assessment also reflect policy actions.

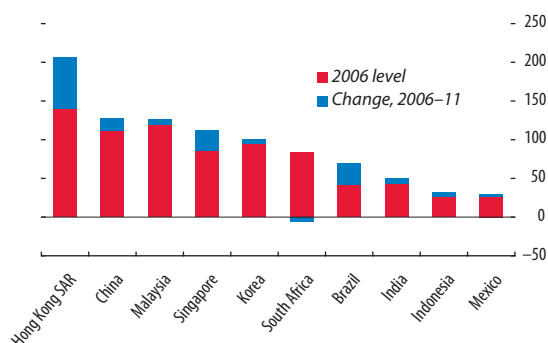
Figure 2.53 illustrates the credit cycle and shows the position of economies in the cycle at end-2006 and end-2011; the positions are assessed on the basis of several key indicators, including credit growth, asset prices, bank earnings and asset quality, and corporate leverage and profitability.

Some key economies have progressed into the later stages of the credit cycle, as shown by elevated debt levels, peaking asset prices, and early indications of worsening loan quality.

As Figure 2.53 makes clear, Brazil, China, and India have moved decisively into the late stage of a cyclical upswing in credit and asset markets, and the

eration/downturn. As economies advance through the credit cycle, leverage builds up and asset prices reach lofty levels. Strong capital inflows tend to reinforce these dynamics. Over time, the quality of assets in the banking system deteriorates. Eventually, these pressure points may culminate in a downturn, the severity of which depends on a series of factors, including the quality of financial regulation and supervision, external shocks, and the scope for countercyclical policies.

Figure 2.54. Change in Private Sector Credit, 2006–11 (In percent of GDP)



Source: IMF, International Financial Statistics database.

Note: Data are as of year-end.

trend extends to almost all Asian and Latin American countries examined here.²⁹

Bank credit has expanded at an average annual rate of more than 15 percent over the past five years across Asia and Latin America, with particularly rapid growth in Brazil, China, Hong Kong SAR, Singapore, and Vietnam (Figure 2.54).³⁰ Sustained increases in real house prices have been a key factor supporting strong loan demand. For example, in the four years since end-2007, inflation-adjusted property prices climbed by nearly 100 percent in Brazil's largest cities (Figure 2.55). Increases in real house prices also reached high double digits in China, Hong Kong SAR, and Singapore.³¹

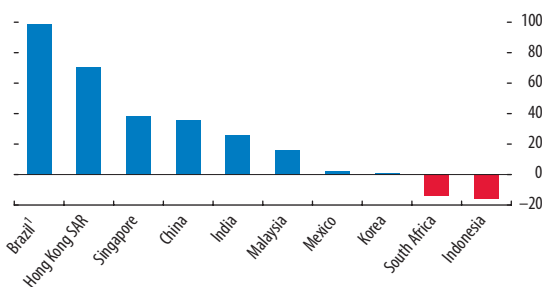
Although credit quality generally remains solid, it is likely to deteriorate in a few countries (Figure 2.56)

²⁹Data constraints limit the credit cycle analysis to the 10 African, Asian, and Latin American emerging market and other economies shown in Figure 2.53.

³⁰While China's credit expansion harks back to a deliberate policy of bank-financed stimulus spending during 2009/10, credit growth elsewhere has typically been driven by household borrowing. Brazil's mortgage and consumer loan boom is a prominent example. China stands out as having a very high stock of credit outstanding, measured against GDP, even before nonbank sources of credit that have also grown strongly are taken into account. By contrast, Latin America's credit expansions generally started from low initial levels.

³¹More recently, prices have eased somewhat (China and Singapore) or at least decelerated (Brazil and India), often amid official efforts to avert bubble risks, but valuations remain elevated in a few economies. One important challenge in gauging these vulnerabilities is the lack of consistently defined and comprehensive data. Further efforts are therefore needed to track developments in the real estate sector across many countries.

Figure 2.55. Change in Real House Prices, 2006–11
(In percent)

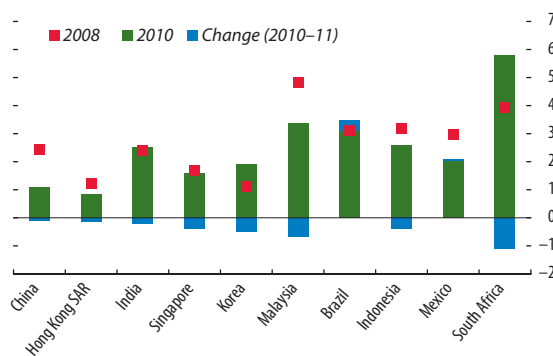


Sources: Bank for International Settlements; CEIC; FIPE ZAP (Rio de Janeiro and São Paulo); Haver; IMF, International Financial Statistics; Knight Frank; National Housing Bank; and IMF staff estimates.

Notes: Prices are country-specific measures of nominal house prices deflated by country-specific consumer price indexes.

¹For São Paulo and Rio de Janeiro only, beginning with 2007.

Figure 2.56. Nonperforming Loans in Selected Economies, 2008, 2010, and 2011
(In percent of total loans outstanding)



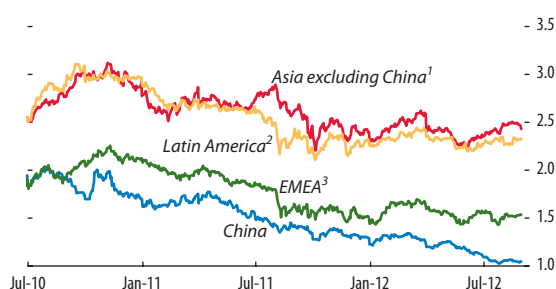
Source: IMF, Financial Soundness Indicators.

Note: Data are as of year-end except in 2011 for India (March) and Korea and Singapore (September).

as economic growth slows and asset prices peak. One notable trend is the relatively rapid increase in the NPL ratio for household loans in Brazil, which reached 7.8 percent in June. Banks in India have also had to take higher write-downs, as the growth of NPLs among the three largest commercial banks has recently outpaced loan growth by a factor of 2.5, and loan restructurings reached 2.6 percent of total gross loans in the first quarter of 2012 alone.³² Chinese banks have continued to report very low NPL ratios, but there are signs of weakening credit quality in certain segments

³²These three banks account for more than 50 percent of total assets of domestic commercial banks.

Figure 2.57. Ratio of Price to Book Value of Banks in Selected Economies, 2010–12



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

Note: Regional values are simple averages of banks from the countries indicated.

EMEA = Europe, Middle East, and Africa.

¹India, Indonesia, Malaysia, and Thailand.

²Brazil, Chile, Colombia, and Mexico.

³Poland, Russia, South Africa, and Turkey.

(notably loans to smaller firms) that may have a disproportionate impact on nonbank lenders (see Box 2.7).

Matching the late-cycle pattern, bank equities have performed poorly, with price-to-book ratios down from 2010 levels in almost all countries (Figure 2.57). Valuations have fallen to particularly low levels in China, as investors worry about the risk of worsening asset quality. Moreover, China's banks are likely to face sustained earnings pressure now that the authorities have begun to liberalize interest rates. Meanwhile, several countries have seen marked increases in corporate leverage. Debt-to-equity ratios now exceed 100 percent in Brazil, India, and Korea.³³ Past episodes of financial crisis clearly indicate that high leverage and declining profitability raise the probability of corporate defaults in a downturn.

Policymakers in emerging market economies have taken steps to alleviate the rising risks to financial stability, but continued vigilance is critical.

Concerns about overheating and financial stability risks caused policymakers in many countries to tighten policies after the initial expansionary response to the global financial crisis. More recently, policy stances have shifted again, as several central banks—including in Brazil, China, Korea, and

³³Based on capital-weighted mean of corporate debt-to-equity ratio (all sectors) from the IMF Research Department's Corporate Vulnerability Utility database.

Box 2.7. Avoiding the Pitfalls of Financial Liberalization in China—Credit Risk, Liquidity Mismatches, and Moral Hazard in Nonbank Intermediation

Financial intermediation outside of the regulated banking system has grown rapidly in China over the past few years, especially since the authorities tightened bank lending conditions in the aftermath of the 2009–10 credit boom. Even during the recent economic slowdown, which has dampened overall loan demand, the importance of nonbank credit has continued to rise (Figure 2.7.1). These developments provide the private sector with a broader range of financial services, but they also pose new challenges to financial stability.

Informal lenders are the least transparent of the actors in China's shadow banking system. Roughly estimated at 6–8 percent of national GDP, informal loan markets are concentrated in a few provinces. Regulated banks mostly serve large, often state-owned companies; in contrast, informal lenders typically cater to small enterprises and so face much higher credit risk, reflected in loan rates of 20 percent or higher. Indeed, as small private companies have been hard hit by the current economic downturn, there is mounting evidence that some lending networks, notably in the industrial hub of Wenzhou, have suffered a sharp rise in nonperforming loans. The effect of individual insolvencies is compounded by the frequent use of loan guarantee structures that are sending ripples through the wider local economy. In this context, the authorities have announced plans to regularize the informal lending industry, starting with a pilot program in Wenzhou.

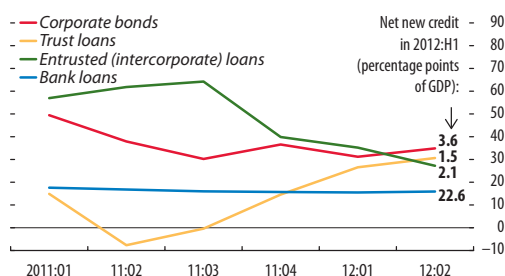
A far more transparent yet still very fast-growing segment is the trust company sector, whose total assets under management reached CNY 5.3 trillion (or 11 percent of GDP) at end-June, up 90 percent in just two years and on course to exceed the size of China's insurance industry. Although trusts engage in a wide range of financial activities, a large part of the sector's aggregate balance sheet represents loans and loan-like claims, typically to higher-risk entities that do not have access to bank credit, such as property developers or local government investment vehicles (Figure 2.7.2).

Elevated credit risk might seem unproblematic insofar as it represents the flip side of the double-

Note: Prepared by André Meier and Sean Craig.

Figure 2.7.1. Growth Rate of Credit in China, by Selected Type

(In percent, year-over-year, except as noted)

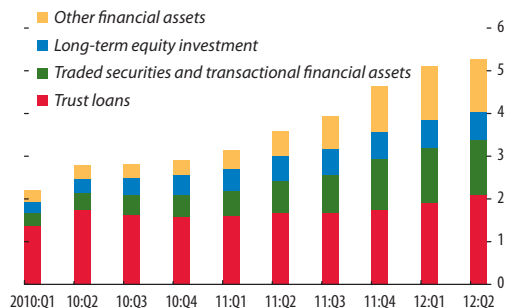


Sources: CEIC; Haver Analytics; and IMF staff estimates.

Note: Official data on trust loans and entrusted loans cover only flows, i.e., net new credit. Stocks are computed by cumulating historical flows from 2002 onward, using end-2001 = 0 as a starting point.

Figure 2.7.2. Trust Companies in China: Assets under Management

(In trillions of yuan)



Sources: CEIC; and IMF staff estimates.

digit returns typically earned by trust investors. Moreover, trust products require minimum investments of CNY 1–3 million, confining exposures to well-off investors. Yet this seemingly benign view ignores the effect of selling practices often described as aggressive, which may lead investors to underestimate risk, especially after many years of strong returns. Heightening such concerns are some signs that the financial risks associated with trust products may be artificially suppressed. In several recent cases, funds reportedly facing potential losses were rescued or restructured by a stakeholder via various meth-

Box 2.7 (continued)

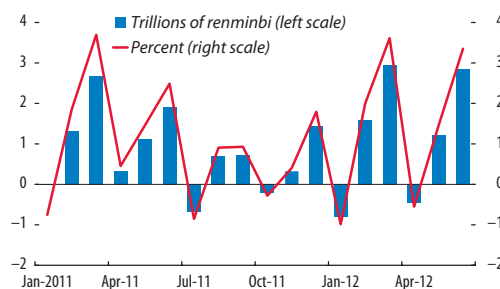
ods, ranging from a rollover into new trust products to buyouts by asset management companies. Such steps may allow stakeholders to avert reputational damage or the loss of a license, but they also create a false sense of safety that induces overinvestment in high-risk financial activities.

Analysts worry that in the event of more severe credit problems in the trust sector, some financial losses might even spill over to banks, which often act as a marketing channel for trust products. A pure marketing function does not give rise to formal liability, but banks may still feel the need to make investors whole for fear of losing long-standing, well-off clients.

A more direct risk for banks relates to wealth management products (WMPs) sold under their own name. Although authoritative figures are not available, the stock of such products is now estimated at CNY 8–9 trillion, or up to 10 percent of deposits. Bank WMPs typically have short maturities and offer returns somewhat above regulated deposit rates. Indeed, their main purpose is to retain bank clients put off by the low yield on those deposits. In a striking pattern apparently intended to window-dress balance sheets, banks typically structure WMPs so that they expire just before the end-quarter reporting date, allowing them to record the customer funds as deposits for that quarter, only to switch them back into higher-yielding WMPs at the beginning of the following month (Figure 2.7.3). Thus, balance sheet data overstate somewhat banks' true deposit base, concealing a secular shift into less transparent funding and investment structures.

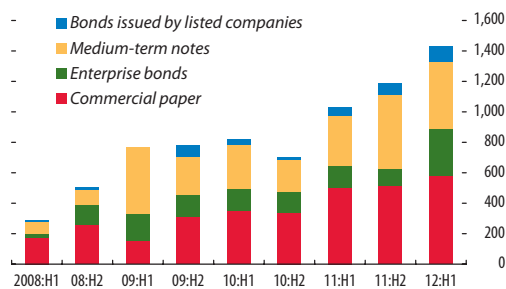
Funds raised via WMPs are used to finance off-balance-sheet assets, including corporate bonds. As detailed information on those assets is not disclosed, it is difficult to gauge the underlying credit risk, which is formally borne by WMP buyers. Even if credit risk is lower than for trust products, a sudden realization of such risk could have significant adverse consequences. In particular, a run on WMPs by anxious bank clients could crystallize liquidity risk arising from asset pooling, whereby banks channel some short-term customer funds into longer-term assets. As in the case of trusts, banks may be reluctant to inflict losses on their custom-

Figure 2.7.3. Monthly Change in System-Wide Renminbi Deposits in China



Sources: CEIC; and IMF staff estimates.

Figure 2.7.4. Gross Issuance of Nonfinancial Corporate Debt in China (Billions of yuan)



Sources: Wind Information Co., Ltd.; and IMF staff estimates.

ers. Consistent with this notion, customer losses on WMPs have been very rare. Proper accounting for banks' contingencies, sufficient capital backing, and strict limits on off-balance-sheet maturity transformation are therefore crucial. More broadly, recent steps toward liberalizing deposit rates should help reduce regulatory arbitrage via WMPs.

The apparent pattern of "higher returns and suppressed default risk" extends, finally, to another fast-growing segment of China's financial system, the corporate bond market. Spurred by regulatory reform, issuance has taken off in recent years (Figure 2.7.4). Underpinning demand is a record of zero bond defaults matched by remarkably high credit

Box 2.7 (continued)

ratings—more than 98 percent of rated bonds are AA or higher.¹

The perception that corporate bonds are risk free may have been reinforced by recent experience, as impending defaults were averted in at least two cases

¹In contrast, since 2009 Chinese businesses selling bonds in the offshore market have defaulted at least 10 times on bonds totaling \$8 billion.

through last-ditch financial operations by interested parties, such as a sponsoring bank or a local government. While beneficial to investors in the short term, wider application of this practice would generate significant moral hazard.

A continued upgrading of prudential oversight and effective market discipline are therefore crucial to avoid an excessive buildup of risk as China's financial system continues to grow and diversify.

South Africa—have cut policy rates to mitigate the downturn in economic activity.

Policymakers are aware that such policy loosening must not undermine earlier efforts to curb exuberant asset and credit markets. Indeed, several Asian and Latin American economies have used macroprudential policies and capital flow management to strengthen banking systems, slow down the pace of capital inflows, or rein in soaring property prices (Table 2.7). Although a conclusive overall judgment is difficult to make, and important risks remain, some of these measures have clearly been effective.³⁴

Continued supervisory vigilance and a preemptive countercyclical stance remain important to preserve the resilience of the financial system. At the current juncture, appropriate steps would include promoting earnings retention to bolster banks' capital base, ensuring sufficient provisioning and swift recognition of loan quality problems, and extending macroprudential tools where exuberance persists.³⁵ These efforts must be underpinned by prudent monetary and fiscal policies, which should provide buffers for more difficult times.

³⁴For instance, the sharp tightening of loan-to-value limits on mortgages in Hong Kong SAR has protected households from overborrowing and contained risks to banks. In China, the broad-based restrictions on housing market activity have dampened demand and caused prices to edge down, although the market has recently shown signs of picking up again. And in Korea, authorities have been successful in reducing external vulnerabilities, notably by discouraging banks' use of short-term debt denominated in foreign currencies. Brazil, in turn, has started to reverse some of its earlier efforts at macroprudential measures and capital flow management as overheating concerns have subsided.

³⁵Some specific advice on how to tackle NPL problems in emerging Europe is available at <http://blog-imfdirect.imf.org/2012/03/29/debt-hangover-nonperforming-loans-in-europes-emerging-economies/>.

In some countries, the policy space to respond to new adverse shocks has become somewhat limited.

Given the heightened risks in the global economic environment, flexibility to deploy different policy tools is particularly valuable. Yet, as Table 2.8 indicates, most emerging market and other economies are judged to be constrained in at least one policy area—fiscal, monetary, or financial. This situation reflects different country-specific concerns, including strained public finances in Hungary, limited monetary policy space in India, and potentially large hidden costs from renewed credit-based stimulus in China. Overall, many countries in central and eastern Europe stand out as having very limited macroeconomic policy space; Chile, Colombia, and Peru have relatively broad room for maneuver, and other economies are somewhere in between.

Especially where policy space is limited, authorities should redouble their *structural* reform efforts to reduce vulnerabilities. Many countries, including India, have scope to improve the environment for private investment, which would boost confidence and reduce funding constraints.³⁶ In several central and eastern European countries, shoring up the financial system remains the priority. One promising element is coordinated loan modification schemes that would help restore sustainable finances

³⁶In India's case, such efforts, together with appropriate fiscal reform, could also counter warnings from rating agencies of a possible sovereign rating downgrade to below investment-grade level. It is therefore encouraging that the government has recently announced a number of significant measures, including a reduction in diesel subsidies and steps to liberalize foreign investment in key sectors of the economy.

Table 2.7. Overview of Recent Macroprudential and Capital Flow Measures in Selected Emerging Market and Other Economies

Area of Macrofinancial Concern	Examples of Recent Measures Adopted by Authorities in Emerging Market and Other Economies
Credit growth and banking sector health	<ul style="list-style-type: none"> • Several Asian economies, including Hong Kong SAR, Korea, and Singapore, have been implementing a policy of periodic variation in loan-to-value (LTV) and/or debt-to-income (DTI) limits on bank mortgages to curb excessive borrowing by households and limit risks to the banking system. In a recent move, Korea lowered the LTV limit in May 2012. • In March 2011, Brazil increased the financial tax on consumer credit card purchases abroad to 6.38 percent from 2.38 percent. Brazil also introduced a 1 percent financial transaction tax on increases of short positions in foreign exchange derivatives. • China's authorities have taken several steps over the past two years to mitigate risks from lending to local government financing vehicles (LGFVs). Measures have included a tightening of lending restrictions, as well as higher bank provisioning requirements and capital risk weightings for existing LGFV exposures. • Korea introduced a maximum loan-to-deposit (LTD) ratio of 100 percent in August 2010, with an initial grace period until end-2013 (recently shortened to mid-2012). The authorities also took a series of steps to discourage banks from accumulating excessive external foreign-exchange-denominated debt, via tighter restrictions on foreign exchange forward positions, a macroprudential levy on nondeposit liabilities (with higher rates for short-term funding sources), and regulatory guidance to lengthen the maturity of funding structures and increase foreign exchange liquidity buffers. • Malaysia has tightened restrictions on bank lending to consumers via hire purchase, personal loans, and credit cards. Measures have included stricter income eligibility standards for credit cards as well as higher risk weights for high-LTV housing loans and long-term personal loans. • Indonesia imposed a limit on banks' overseas borrowing at 30 percent of bank capital in 2011. The authorities also introduced an unremunerated 8 percent reserve requirement on banks' total foreign exchange holdings to minimize foreign exchange volatility.
Corporate health	<ul style="list-style-type: none"> • India has instituted an External Commercial Borrowing (ECB) framework to regulate access to foreign funding by corporations and public sector undertakings through specific limits set on overseas borrowings. Up to 50 percent of infrastructure, telecommunications, and greenfield projects can be funded through the ECB. • In April 2011, Brazil extended the 6 percent financial tax on foreign-exchange-denominated loans obtained by domestic corporations abroad with maturities up to 720 days. Previously, this tax was applied to foreign-exchange-denominated loans with maturities up to 360 days.
Asset prices and capital inflow pressures	<ul style="list-style-type: none"> • To mitigate risks associated with foreign capital flows, Korea reintroduced a withholding tax of 14 percent on interest income on foreign holdings of treasuries/monetary stabilization bonds. Similarly, in late 2010 Thailand removed a tax exemption for foreigners on income from domestic bonds. • Since April 2010, China has imposed a series of measures to counter the risk of a bubble in the housing market, including higher down payment requirements, limits on the number of properties that individuals can buy, restrictions on property developer funding, introduction of property taxes in some cities, and stepped-up construction of apartments for low-income earners. • In July 2012, the existing limit for investment in government securities (G-Secs) by foreign institutional investors (FIIs) registered with the Securities and Exchange Board of India (SEBI) was increased by US\$5 billion to US\$20 billion. To broaden the nonresident investor base for G-Secs, long-term investors such as sovereign wealth funds, multilateral agencies, endowment funds, insurance funds, pension funds, and foreign central banks are now allowed to be registered with SEBI as FIIs.

Source: IMF staff.

for overly indebted borrowers. Critically, domestic efforts to protect credit supply must be supported by enhanced cross-border cooperation between host and

home regulators, notably under the Vienna II Initiative, to limit the adverse consequences of home bias. A more detailed discussion is provided in Chapter 1.

Table 2.8. Indicators of Vulnerability and Policy Space For Emerging Market and Other Economies

	External Financing and Capital Flows Vulnerabilities (percent of 2012 reserves)		Banking System		Contagion from Euro Area		Fiscal Vulnerability		Monetary Policy Room ⁶			Room for Credit Expansion ⁷	
	External refinancing needs in 2012 ¹	Debt portfolio liabilities (IIP) ²	Equity portfolio liabilities (IIP) ²	Liabilities to BIS reporting banks (percent of total credit) ³	Sensitivity of sovereign CDS to euro area periphery ⁴	Index ⁵	Nominal policy rate (percent)	2012 projected CPI inflation (percent)	Difference of inflation target (upper bound) and 2012 projected inflation (percentage points)	Position in credit-to-GDP ratio, 2006–11 (percentage points) ⁸	Banking sector: change in gross NPL ratios, 2010–11 (percentage points) ⁹	Banking sector: change in capital/total assets, 2010–11 (percentage points) ¹⁰	
Europe													
Bulgaria	104	8	2	...	53	...	3.50	2.1	...	27.2	1.2	-0.2	
Hungary	105	96	22	56	52	-1.4	6.75	5.4	...	9.6	3.5	0.2	
Poland	110	105	27	30	53	0.3	4.75	3.2	0.3	21.7	-0.6	-0.2	
Romania	112	14	4	63	44	0.4	5.25	3.6	0.4	12.9	2.2	-0.3	
Russia	32	10	50	15	42	-0.7	8.25	6.7	-0.7	15.2	-1.6	-1.4	
Turkey	146	68	73	23	41	0.5	5.75	6.5	0.5	25.1	-0.8	...	
Ukraine	213	66	13	15	24	...	7.50	6.0	...	15.5	-0.5	0.1	
Africa/Middle East													
Egypt	40	95	29	...	...	...	9.25	7.3	...	-20.2	-2.6	0.0
Israel	...	42	77	5	22	1.0	2.25	2.0	1.0	8.9	-0.6	-0.3	
South Africa	71	94	312	9	43	0.7	5.00	5.3	0.7	-5.4	-1.1	0.2	
Asia/Pacific													
China	17	1	6	5	30	...	6.00	2.8	...	16.6	-0.1	0.3	
India	37	...	...	10	...	...	8.00	13.0	...	7.4	-0.2	0.0
Indonesia	43	54	82	19	11	0.5	5.75	5.0	0.5	5.9	-0.4	-0.2	
Korea	...	63	92	15	25	1.8	3.00	2.2	1.8	5.5	-0.5	0.3	
Malaysia	39	47	50	14	34	...	3.00	2.0	...	3.4	-0.7	-0.2	
Philippines	24	41	14	17	22	0.4	3.75	4.6	0.4	3.9	-0.6	0.3	
Thailand	27	9	42	7	9	-1.7	3.00	4.7	-1.7	11.4	-1.0	-0.8	
Vietnam	...	...	...	...	19	...	9.00	4.5	...	40.4	-2.0	0.0
Latin America													
Brazil	21	64	94	7	45	1.5	7.50	5.0	1.5	27.4	0.4	-0.7	
Chile	100	...	...	27	30	1.5	5.00	2.5	1.5	13.6	-0.3	-0.5
Colombia	61	84	15	8	43	1.3	4.75	2.7	1.3	8.2	-0.4	0.1	
Mexico	48	92	103	16	43	0.0	4.50	4.0	0.0	3.3	0.1	-0.5	
Peru	16	...	...	37	39	0.0	4.25	3.0	0.0	9.5	-0.1	0.6
Venezuela	293	451	6	5	...	...	...	22.0	...	4.0	-2.0	0.6

Sources: Bloomberg L.P.; Haver Analytics; IMF: Direction of Trade database; Financial Soundness Indicators (FSI) database, International Financial Statistics (IFS) database, World Economic Outlook (WEO) database; Bank for International Settlements-IMF-Organization for Economic Cooperation and Development-World Bank Joint External Debt Hub (JEDH); and IMF staff estimates.

Note: BIS = Bank for International Settlements; CDS = credit default swaps; CPI = consumer price index; IIP = international investment position; NPL = nonperforming loan.

¹External refinancing need is the sum of short-term debt at initial maturity at end-2011 plus amortization of medium- and long-term government debt during 2012, estimated by IMF staff and scaled by most recent reserves from IFS.

²Calculated from a country's IIP.

³Liabilities to BIS banks are consolidated. Total credit is the sum of credit to the private sector and total public debt.

⁴Calculated using percentage changes in CDS levels; periphery euro area sovereign CDS is the average of Ireland, Italy, Portugal, and Spain CDS; 50 means that the country's CDS tends to widen by 50 percent for a 100 percent widening of periphery CDS.

⁵Fiscal vulnerability index is calculated from fiscal vulnerability indicators presented in Table 7 of the October 2012 *Fiscal Monitor*; red (yellow, green) denotes high (medium, moderate) levels of fiscal vulnerability. For more detail refer to the *Fiscal Monitor*.

⁶For inflation targets, green if the policy rate is at least 4 percent and projected 2012 CPI inflation is at least 1 percentage point lower than the (upper bound of the) inflation target (range), red if the policy rate is lower than 2 percent or projected 2012 inflation is above the (upper end of the) inflation target (range), and yellow otherwise; for noninflation targets (denoted by "..."), green if the policy rate is at least 4 percent and projected 2012 inflation is 3 percent or lower, red if the policy rate is lower than 2 percent or projected 2012 inflation is above 6 percent, and yellow otherwise. Countries operating under currency board regimes are coded as red.

⁷Green indicates modest credit growth over the past five years (increase in credit-to-GDP ratio less than 10 percentage points during 2006–11) along with improving asset quality and capital base in 2011 (proxied by a combination of decline in banking sector gross NPL ratio and increase in capital/asset ratio). Red indicates the least flexibility for banks to expand credit due to high past credit growth (increase in credit-to-GDP ratio above 15 percentage points during 2006–11) or deterioration in asset quality and capital base during 2011. Yellow for all other cases. This measure of credit policy space does not imply a judgment on the stability of the banking system or the scope for medium-term financial deepening.

⁸Credit corresponds to data from IFS on credit to the private sector.

⁹NPL ratio is the ratio of nonperforming loans to total loans from the FSI database.

¹⁰Change in bank capital to assets as calculated in Table 2 in FSI database.

Annex 2.1. Update to the EU Bank Deleveraging Exercise

This annex provides more information on the updated estimates for EU bank deleveraging—defined in this exercise as a reduction in bank assets—presented in the text. In this GFSR, the time frame (end-2011:Q3 to end-2013:Q4) and sample (58 large EU banks) are the same as in the deleveraging exercise in the April 2012 GFSR,³⁷ but the exercise is updated in this report to reflect the key factors affecting European banks: economic downturn, capital flight, financial repression, and growing financial fragmentation of the euro area. In addition to the four targets in the previous exercise, this update includes two new ones (purchases of local government bonds, and asset-liability matching on a country-by-country basis). The exercise in this report also includes new methodological assumptions and updated information. The changes are summarized in Table 2.9 and discussed below.

The scale of deleveraging is assessed under the three scenarios outlined in Chapter 1: *baseline policies*, *weak policies*, and *complete policies*.

Economic Downturn

The impact of the economic downturn on bank deleveraging is modeled through a capital target. In the scenarios, banks target a core Tier 1 capital ratio of 9 percent at end-2013.³⁸ If bank capital is insufficient to meet the target, banks are assumed to reduce assets. In the scenarios, the amount of bank capital changes for two reasons: capital measures and retained earnings.

- For *capital measures* we use the information provided by the European Banking Authority on capital raising, issuance of contingent capital, liability management, risk-weight optimization,

Note: Prepared by Sergei Antoshin, Anna Ilyina, William Kerry, Nada Oulidi, and Chris Walker.

³⁷Annex 2.1 in the April 2012 GFSR explains the methodology behind that deleveraging exercise.

³⁸In the April 2012 GFSR exercise, banks had to meet a capital target comprising a 9 percent core Tier 1 ratio plus a sovereign buffer by June 2012, as recommended by the European Banking Authority.

and other capital measures.³⁹ This includes a total of €9.5 billion in government backstops. We also account for the announced support of up to €100 billion for Spanish banks.

- *Retained earnings* are based on the net income projections and assume full retention of dividends. Net income is modeled using a combination of macro-financial models linking the main net income components—net interest income, commission and fee income, trading income, other income, operating expense, and loan loss provisions and other asset impairments—with macroeconomic and financial variables. The key variables that underpin the projections are real GDP growth rates, other macroeconomic factors, and sovereign bond spreads (see Table 2.10). Sovereign bond spreads affect asset impairments both directly and through their impact on corporate risk premiums.

GDP growth varies across the scenarios and is based on the WEO baseline. GDP growth improves (under the *complete policies* scenario) or deteriorates (under the *weak policies* scenario) in line with the deviations of sovereign spreads from the baseline. In addition, under the *weak policies* scenario, fiscal contraction of 2 percent is assumed for the countries in the euro area periphery, which also affects GDP growth. The effects of sovereign spreads and fiscal contraction on GDP growth are estimated on the basis of elasticities from the IMF Global Integrated Monetary and Fiscal Model.

Capital Flight

As in the April 2012 GFSR, capital flight is modeled through assumptions about the rollover of wholesale funding and outflows of deposits. In this update, however, the assumptions on rollovers differ to reflect current funding pressures on periphery banks and the new scenarios:

- In the *baseline policies* scenario, banks are able to roll over wholesale funding only at current rates;

³⁹See the announcement by the European Banking Authority on July 11, 2012, available at www.eba.europa.eu/cebs/media/aboutus/News%20and%20Communications/EBA-BS-2012-149--recap-report-to-be-published-11-July--FINAL.pdf.

Table 2.9. Summary of Updates to the Deleveraging Exercise

Macro/Financial/Structural Forces	Deleveraging Targets	Changes to Methodology
Economic downturn	Capital	Same target as in the April 2012 GFSR. Nine percent core Tier 1 ratio (in line with the European Banking Authority recommendation). To be met by end-2013. Includes revised projections of banks' retained earnings and updated information on capital measures.
Capital flight	Funding	Same target as in the April 2012 GFSR. Includes new assumptions on the rollover of wholesale funding and deposit outflows (see Table 2.11). Incorporates actual increases in central bank liquidity support.
Financial repression	Purchases of local government bonds	New target. Banks assumed to substitute, along with other domestic investors, for foreign investor flight from sovereigns (see Table 2.12).
Fragmentation of euro area	Asset-liability matching by country	New target. Banks reduce the loan-to-deposit ratios of their subsidiaries in selected countries to 110 or 100 percent, depending on scenarios. Priority is also given to scaling back other exposures (in selected countries).
Longer-term structural	Wholesale funding reliance	Same target as in the April 2012 GFSR. Proxied by a net stable funding ratio of 100 percent.
	Business model	Same target as in the April 2012 GFSR. Proxied by restructuring plans announced by the banks. Updated to reflect new information that became available after April 2012.

Source: IMF staff estimates.

Table 2.10. Assumptions on Key Macro-Financial Variables

	Complete Policies		Baseline Policies		Weak Policies	
	2011:Q3	2013	2013	2013	2013	2013
Sovereign spreads, 10-year, basis points, relative to Germany						
Euro area	198	97	176	328	700	750
Italy	365	250	375	700	750	
Spain	325	250	380	750		
GDP growth, in percentage points, deviations from WEO/GFSR baseline						
	2012	2013	2012	2013	2012	2013
Euro area	0.0	0.3	–	–	0.0	–1.2
Italy	0.0	0.5	–	–	0.0	–1.6
Spain	0.0	0.6	–	–	0.0	–1.9

Source: IMF staff estimates.

customer and interbank deposits at banks in the periphery continue to fall at their current pace through 2012 and then remain at that level.

- In the *weak policies* scenario, conditions worsen, and banks—including some in core countries—are able to roll over less of their wholesale funding. Deposits continue to flow out of periphery banks at their current pace until the end of 2013; deposit levels also fall at other euro area banks,

albeit to a lesser extent, as the crisis spreads to other economies.

- In the *complete policies* scenario, current funding pressures gradually ease to enable banks to roll over liabilities in markets.

In the *baseline policies* and *weak policies* scenarios, the loss of deposits and wholesale funding is assumed to be partially offset by an increase in

Table 2.11. Average Funding Rollover Rates
(Percent)

	Customer Deposits	Interbank Deposits and Repo	Short-Term U.S. Dollar Funding	Other Short-Term Funding	Unsecured Term Funding (due 2012–13)	Covered Bonds (due 2012–13)
Complete policies scenario	100	100	100	100	100	100
Baseline policies scenario	99	100	55	100	85	90
Weak policies scenario	95	95	40	95	65	80

Source: IMF staff estimates.

central bank liquidity support. Looking ahead, it is assumed that the level of central bank support is maintained at its current level, accounting for the fact that the LTRO funding has to be paid back three years after it was granted.

Table 2.11 shows the weighted average rollover rates used in the scenarios. Note that the actual rollover rates used for banks vary, with those institutions under the most pressure facing lower rollover rates and higher deposit outflows than the average.

Financial Repression

Financial repression is modeled in the *baseline policies* and *weak policies* scenarios by assuming local banks need to buy more local government bonds. This assumption then interacts with the funding and the net stable funding ratio (NSFR) targets,⁴⁰ as banks need to shrink assets by more than they would prior to purchasing the bonds. Financial repression does not interact with the capital target, as it is assumed that local banks have a zero risk weight on the holdings of their own government bonds. Similarly, financial repression does not interact with banks' business plans or with the fragmentation target.

The amount of bonds purchased by local banks is determined by the scenario assumptions in Table 2.12. Local banks, along with other local investors (such as pension funds and asset managers), are assumed to purchase bonds in proportion to their current holdings of bonds, taking into account the coverage of the sample relative to the whole banking system.

⁴⁰The scenarios assume that government bonds purchased under financial repression will be held to maturity, attracting an NSFR weight of 1.00 under Required Stable Funding.

Financial Fragmentation

Financial fragmentation of the euro area is incorporated in the *baseline policies* and *weak policies* scenarios; it does not occur in the *complete policies* scenario. In the *baseline policies* scenario, EU banks target loan-to-deposit ratios of 110 percent in their euro area periphery subsidiaries⁴¹ and give priority to scaling back other exposures to periphery countries that are not locally funded.⁴² In the *weak policies* scenario, banks target loan-to-deposit ratios of 100 percent in their foreign subsidiaries in all euro area countries as well as give priority to scaling back other periphery exposures that are not locally funded.

Long-Term Structural Forces

The two longer-term structural targets—reduction in wholesale funding and business plans—are modeled largely as they were in the April 2012 GFSR. The reduction in wholesale funding is proxied by an estimated NSFR, which incorporates the updated data on capital measures and the updated estimates for retained earnings. Business plans are again based on information made available by the banks in the

⁴¹The threshold of 110 percent is chosen as a less stringent target that has recently been recommended by some regulators. For example, the Austrian supervisor introduced the Loan-to-Local-Stable-Funding Ratio as a new monitoring tool in March 2012 and applies a threshold of 110 percent on the stock ratio among other indicators to determine unsustainable lending practices.

⁴²This is motivated by the assumption that banks would like to match assets and liabilities in branches as well. However, available data do not allow us to distinguish between direct cross-border exposures and lending through local branches at the bank level. At the aggregate level, total assets of branches are sizable. Hence, any estimates based only on the subsidiaries data would likely understate the overall impact of financial fragmentation. For example, as of end-2010, the percentage split between total assets of subsidiaries and branches of credit institutions from EU countries was 36/64 for Spain and 47/53 for Italy.

Table 2.12. Amount of Additional Funding Required from Domestic Investors

	Additional Domestic Financing in 2012–13 (billions of euros)			Foreign Investor Share of Total Debt Stock ¹ (percent of total stock)				
	Complete policies	Baseline policies	Weak policies	End-2009	End-2011	Complete policies ²	Baseline policies ³	Weak policies ⁴
Austria	1	9	13	76.2	74.2	75.3	72.2	70.2
Belgium ⁵	–9	31	55	63.1	50.8	55.3	44.6	38.5
Finland	1	–3	–6	82.9	86.0	85.7	89.2	92.3
France	46	93	112	58.8	57.8	59.3	56.8	55.8
Germany	119	–93	–229	49.8	56.1	52.6	62.3	68.6
Greece ⁶	21	43	75	74.8	43.9	41.2	35.3	26.7
Ireland ⁶	5	22	25	71.9	29.1	35.8	27.3	25.5
Italy ⁶	–139	166	290	42.6	34.6	43.9	28.3	22.0
Netherlands ⁵	10	56	85	68.1	55.4	59.2	49.1	42.7
Portugal ⁶	–9	10	12	68.1	31.8	40.6	31.0	30.2
Spain ⁶	12	121	164	50.5	32.9	40.8	28.0	23.0

Source: IMF staff estimates.

Note: Calculated as the share of the overall deficit funded by domestic investors, plus net change in the foreign share of the existing stock. It is possible for a euro area member country to have net outflows from domestic sovereign bonds, while simultaneously being a net overall recipient of capital inflows.

¹Foreign investors exclude holdings in the Securities Market Programme and EU/IMF loans.

²Shares return to June 2011 levels by the end of 2013.

³Share declines over 2012–13 by the same amount as the decrease from end-2009 to end-2011.

⁴Share declines over 2012–13 by twice the amount of the decrease from end-2009 to end-2011.

⁵For Belgium and the Netherlands, the decline in the foreign share in the baseline policies scenario is half the decline from end-2009 to end-2011. In the weak policies scenario it is the same as the decline from end-2009 to end-2011.

⁶For periphery euro area countries, under the weak policies scenario shares decline during 2012–13 to levels existing prior to the formation of the European Monetary Union (as of end-1997). Under baseline policies, the decline occurs at half the rate.

sample. Updated plans are available for 12 banks, with our latest estimate of planned balance sheet reductions from end-2011:Q3 to end-2012:Q4 standing at \$2.1 trillion (from \$2.0 trillion in the April 2012 GFSR).

According to their original business plans, banks have strived to reduce (1) overreliance on short-term wholesale foreign exchange funding, (2) activities related to trading and corporate and investment banking (they attract higher risk weights under Basel 2.5 and Basel III), and (3) noncore assets and activities. Table 2.13 updates on progress in the implementation of these plans. Some examples are:

- *Trading portfolio*—most banks have reduced their securities holdings in derivatives and structured products (including collateralized debt obligations and residential mortgage-backed securities).
- *Corporate and investment banking activities (including legacy assets)*—several banks, notably French banks, are scaling back these activities significantly.
- *Noncore subsidiaries*—banks have made significant progress on several strategic sales of subsid-

aries, including the sale of the U.S. subsidiary ING Direct by ING Group; Dexia's large ongoing and planned divestments of several subsidiaries in Canada, France, Luxembourg, and Turkey for an expected total of €113 billion; and KBC's sales of branches in Ireland, Poland, Romania, and the United Kingdom for a total post-tax income of €868 million, thereby relieving €1.4 billion of capital. The Royal Bank of Scotland has made significant strides in its divestment program by selling subsidiaries in the Netherlands as well as in the United Kingdom, which reduced its noncore assets by £11 billion and its risk-weighted assets by £7 billion in the second quarter of 2012.

- *De-risking the loan portfolio*—the basic strategy followed by banks is loan runoffs for risky segments and clients to reduce credit risk and capital requirements. Some banks, including Unicredit and ING, are planning to reduce their geographic asset-liability asymmetries as well. German banks are significantly reducing exposures to the commercial real estate and public sectors.

Table 2.13. Progress on the Implementation of Business Plans by Selected EU Banks

Country/Bank	Decrease in Assets				Decrease in Funding Gap			Regional Reach					
	Trading portfolio	Corporate and investment banking	Other loans (including CRE and run-offs)	Sale of subsidiaries	Increase deposits	Increase maturities of wholesale funding	Eastern Europe	Asia	Latin America	EU	North America		
Austria													
Erste	Orange	Dark Red	Orange		Orange		Blue						
Belgium													
Dexia	Blue		Blue				Blue			Blue		Blue	
KBC Bank	Blue		Blue		Orange		Orange			Orange			
France													
BNP Paribas	Blue	Blue	Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Crédit Agricole	Blue	Blue	Dark Red		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
BPCE	Blue	Blue			Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Société Générale	Blue	Blue			Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Germany													
DB	Dark Red	Dark Red	Dark Red		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Commerzbank	Orange	Blue	Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Landesbank BW	Orange	Dark Red	Orange		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Bayern LB	Blue		Blue										
Ireland													
AIB	Blue		Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Bank of Ireland	Blue		Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Italy													
Unicredit	Orange	Orange	Orange		Orange		Orange	Orange	Orange	Orange	Orange	Orange	Orange
Netherlands													
ING	Dark Red		Dark Red		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
ABN AMRO BANK	Dark Red		Dark Red		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
Spain													
Santander	Dark Red		Dark Red		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
United Kingdom													
HSBC	Blue	Blue	Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue
RBS	Blue	Blue	Blue		Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue

Sources: Bank websites; and IMF staff estimates

Note: Total number of banks: 58; number of banks with a plan: 24; number of banks with plans relating to the European Banking Authority: 3; number of banks with an update: 12. CRE = commercial real estate.

Significant progress in restructuring plans

Some progress in restructuring plans

Information on progress not available

References

International Monetary Fund, 2011, “Euro Area Policies: Spillover Report for the 2011 Article IV Consultation and Selected Issues,” IMF Country Report No. 11/185 (Washington; July). www.imf.org/external/pubs/ft/scr/2011/cr11185.pdf.

———, 2012a, “Euro Area Policies: 2012 Article IV Consultation,” IMF Country Report No. 12/181 (Washington; July). www.imf.org/external/pubs/ft/scr/2012/cr12181.pdf.

———, 2012b, “Japan: Financial Sector Assessment Program – Technical Note on Financial System Spillovers – An Analysis of Potential Channels,” IMF Country Report No. 12/263 (Washington; September). www.imf.org/external/pubs/cat/longres.aspx?sk=26247.0.

