GLOBAL PROSPECTS AND POLICIES

The global economy has deteriorated further since the release of the July 2012 *WEO Update,* and growth projections have been marked down (Table 1.1). Downside risks are now judged to be more elevated than in the April 2012 and September 2011 *World Economic Outlook* (WEO) reports. A key issue is whether the global economy is just hitting another bout of turbulence in what was always expected to be a slow and bumpy recovery or whether the current slowdown has a more lasting component. The answer depends on whether European and U.S. policymakers deal proactively with their major short-term economic challenges. The WEO forecast assumes that they do, and thus global activity is projected to reaccelerate in the course of 2012; if they do not, the forecast will likely be disappointed once again. For the medium term, important questions remain about how the global economy will operate in a world of high government debt and whether emerging market economies can maintain their strong expansion while shifting further from external to domestic sources of growth. The problem of high public debt existed before the Great Recession, because of population aging and growth in entitlement spending, but the crisis brought the need to address it forward from the long to the medium term.

Recent Developments

Indicators of activity and unemployment show increasing and broad-based economic sluggishness in the first half of 2012 and no significant improvement in the third quarter (Figure 1.1). Global manufacturing has slowed sharply. The euro area periphery has seen a marked decline in activity (Figure 1.2, panel 1), driven by financial difficulties evident in a sharp increase in sovereign rate spreads (Figure 1.2, panel 2). Activity has disappointed in other economies too, notably the United States and United Kingdom. Spillovers from advanced economies and homegrown difficulties have held

back activity in emerging market and developing economies. These spillovers have lowered commodity prices and weighed on activity in many commodity exporters (see the Special Feature).

The result of these developments is that growth has once again been weaker than projected, in significant part because the intensity of the euro area crisis has not abated as assumed in previous WEO projections. Other causes of disappointing growth include weak financial institutions and inadequate policies in key advanced economies. Furthermore, a significant part of the lower growth in emerging market and developing economies is related to domestic factors, notably constraints on the sustainability of the high pace of growth in these economies and building financial imbalances. In addition, IMF staff research suggests that fiscal cutbacks had larger-than-expected negative short-term multiplier effects on output, which may explain part of the growth shortfalls (Box 1.1).

The Crisis in the Euro Area Intensified

Notwithstanding policy action aimed at resolving it, the euro area crisis has deepened and new interventions have been necessary to prevent matters from deteriorating rapidly. As discussed in the October 2012 *Global Financial Stability Report* (GFSR), banks, insurers, and firms have swept spare liquidity from the periphery to the core of the euro area, causing Spanish sovereign spreads to hit record highs and Italian spreads to move up sharply too (Figure 1.2, panel 2). This was triggered by continued doubts about the capacity of countries in the periphery to deliver the required fiscal and structural adjustments, questions about the readiness of national institutions to implement euro-area-wide policies adequate to combat the crisis, and concerns about the readiness of the European Central Bank (ECB) and the European Financial Stability Facility/European Stability Mechanism (EFSF/ESM) to respond if worst-case scenarios materialize.

Table 1.1. Overview of the *World Economic Outlook* Projections

(Percent change unless noted otherwise)

			Year over Year				Q4 over Q4		
			Projections		Difference from July 2012 WEO Update		Estimates	Projections	
	2010	2011	2012	2013	2012	2013	2011	2012	2013
World Output[1]	**5.1**	**3.8**	**3.3**	**3.6**	**−0.2**	**−0.3**	**3.2**	**3.0**	**4.0**
Advanced Economies	**3.0**	**1.6**	**1.3**	**1.5**	**−0.1**	**−0.3**	**1.3**	**1.1**	**2.1**
United States	2.4	1.8	2.2	2.1	0.1	−0.1	2.0	1.7	2.5
Euro Area	2.0	1.4	−0.4	0.2	−0.1	−0.5	0.7	−0.5	0.8
Germany	4.0	3.1	0.9	0.9	0.0	−0.5	1.9	0.9	1.4
France	1.7	1.7	0.1	0.4	−0.2	−0.5	1.2	0.0	0.8
Italy	1.8	0.4	−2.3	−0.7	−0.4	−0.4	−0.5	−2.3	0.0
Spain	−0.3	0.4	−1.5	−1.3	−0.1	−0.7	0.0	−2.3	0.2
Japan	4.5	−0.8	2.2	1.2	−0.2	−0.3	−0.6	1.6	2.1
United Kingdom	1.8	0.8	−0.4	1.1	−0.6	−0.3	0.6	0.0	1.2
Canada	3.2	2.4	1.9	2.0	−0.2	−0.2	2.2	1.7	2.2
Other Advanced Economies[2]	5.9	3.2	2.1	3.0	−0.4	−0.4	2.4	2.3	3.6
Newly Industrialized Asian Economies	8.5	4.0	2.1	3.6	−0.6	−0.6	3.0	3.2	3.5
Emerging Market and Developing Economies[3]	**7.4**	**6.2**	**5.3**	**5.6**	**−0.3**	**−0.2**	**5.7**	**5.5**	**6.2**
Central and Eastern Europe	4.6	5.3	2.0	2.6	0.1	−0.2	3.6	1.9	3.3
Commonwealth of Independent States	4.8	4.9	4.0	4.1	−0.1	0.0	4.3	2.9	4.8
Russia	4.3	4.3	3.7	3.8	−0.3	−0.1	4.6	2.5	4.8
Excluding Russia	6.0	6.2	4.7	4.8	0.2	0.2	. . .	. . .	. . .
Developing Asia	9.5	7.8	6.7	7.2	−0.4	−0.3	6.9	7.2	7.4
China	10.4	9.2	7.8	8.2	−0.2	−0.2	8.9	7.9	8.1
India	10.1	6.8	4.9	6.0	−1.3	−0.6	5.0	5.5	5.9
ASEAN-5[4]	7.0	4.5	5.4	5.8	0.0	−0.3	2.8	7.2	6.6
Latin America and the Caribbean	6.2	4.5	3.2	3.9	−0.2	−0.3	3.7	3.0	4.6
Brazil	7.5	2.7	1.5	4.0	−1.0	−0.7	1.4	2.9	3.8
Mexico	5.6	3.9	3.8	3.5	−0.1	−0.2	3.9	3.2	4.1
Middle East and North Africa	5.0	3.3	5.3	3.6	−0.2	0.0	. . .	. . .	. . .
Sub-Saharan Africa[5]	5.3	5.1	5.0	5.7	−0.1	0.0	. . .	. . .	. . .
South Africa	2.9	3.1	2.6	3.0	0.0	−0.3	2.6	2.7	3.3
Memorandum									
European Union	2.1	1.6	−0.2	0.5	−0.2	−0.5	0.8	−0.2	1.2
World Growth Based on Market Exchange Rates	4.1	2.8	2.6	2.9	−0.1	−0.3	2.3	2.2	3.3
World Trade Volume (goods and services)	**12.6**	**5.8**	**3.2**	**4.5**	**−0.6**	**−0.7**	. . .	. . .	. . .
Imports									
Advanced Economies	11.4	4.4	1.7	3.3	−0.2	−0.9	. . .	. . .	. . .
Emerging Market and Developing Economies	14.9	8.8	7.0	6.6	−0.8	−0.4	. . .	. . .	. . .
Exports									
Advanced Economies	12.0	5.3	2.2	3.6	−0.1	−0.7	. . .	. . .	. . .
Emerging Market and Developing Economies	13.7	6.5	4.0	5.7	−1.7	−0.5	. . .	. . .	. . .
Commodity Prices (U.S. dollars)									
Oil[6]	27.9	31.6	2.1	−1.0	4.2	6.5	20.8	3.7	−3.3
Nonfuel (average based on world commodity export weights)	26.3	17.8	−9.5	−2.9	2.6	1.4	−6.4	1.9	−5.4
Consumer Prices									
Advanced Economies	1.5	2.7	1.9	1.6	−0.1	0.0	2.8	1.7	1.7
Emerging Market and Developing Economies[3]	6.1	7.2	6.1	5.8	−0.2	0.2	6.5	5.6	5.3
London Interbank Offered Rate (percent)[7]									
On U.S. Dollar Deposits	0.5	0.5	0.7	0.6	−0.1	−0.2	. . .	. . .	. . .
On Euro Deposits	0.8	1.4	0.6	0.2	−0.1	−0.3	. . .	. . .	. . .
On Japanese Yen Deposits	0.4	0.3	0.4	0.3	0.0	−0.1	. . .	. . .	. . .

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during July 30–August 27, 2012. When economies are not listed alphabetically, they are ordered on the basis of economic size. The aggregated quarterly data are seasonally adjusted.

[1]The quarterly estimates and projections account for 90 percent of the world purchasing-power-parity weights.

[2]Excludes the G7 economies (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[3]The quarterly estimates and projections account for approximately 80 percent of the emerging market and developing economies.

[4]Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

[5]The current WEO projections include South Sudan. However, for sub-Saharan Africa, the forecast comparison with the July 2012 *WEO Update* does not include South Sudan because South Sudan was not included in the July projections. The World and Emerging Market and Developing Economies aggregates also are not directly comparable with the July 2012 *WEO Update* for the same reason, but South Sudan's weight in these aggregates is very small.

[6]Simple average of prices of U.K. Brent, Dubai, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was $104.01 in 2011; the assumed price based on futures markets is $106.18 in 2012 and $105.10 in 2013.

[7]Six-month rate for the United States and Japan. Three-month rate for the euro area.

These concerns culminated in questions about the viability of the euro area and prompted a variety of actions from euro area policymakers. At the June 29, 2012, summit, euro area leaders committed to reconsidering the issue of the seniority of the ESM with respect to lending to Spain. In response to escalating problems, Spain subsequently agreed on a program with its European partners to support the restructuring of its banking sector, with financing of up to €100 billion. Also, leaders launched work on a banking union, which was followed up recently with a proposal by the European Commission to establish a single supervisory mechanism. Leaders agreed that, once established, such a mechanism would open the possibility for the ESM to take direct equity stakes in banks. This is critical because it will help break the adverse feedback loops between sovereigns and banks. Moreover, in early September, the ECB announced that it will consider (without ex ante limits) Outright Monetary Transactions (OMTs) under a macroeconomic adjustment or precautionary program with the EFSF/ESM. The transactions will cover government securities purchases, focused on the shorter part of the yield curve. Importantly, the ECB will accept the same treatment as private or other creditors with respect to bonds purchased through the OMT program.

The anticipation of these initiatives and their subsequent deployment set off a relief rally in financial markets, and the euro appreciated against the U.S. dollar and other major currencies. However, recent activity indicators have continued to languish, suggesting that weakness is spreading from the periphery to the whole of the euro area (Figure 1.3, panel 2). Even Germany has not been immune.

Output and Employment Weakened Again in the United States

The U.S. economy also has slowed. Revised national accounts data suggest that it came into 2012 with more momentum than initially estimated. However, real GDP growth then slowed to 1.7 percent in the second quarter, below the April WEO and July *WEO Update* projections. The labor market and consumption have failed to garner much strength. The persistent weakness has prompted another round

Figure 1.1. Global Indicators

The global manufacturing cycle has turned down again. Industrial production has slowed sharply in advanced and emerging market and developing economies and so has world trade. The deterioration is broad based. Unemployment in advanced economies remains appreciably above precrisis levels and is elevated in eastern Europe and the Middle East and North Africa.
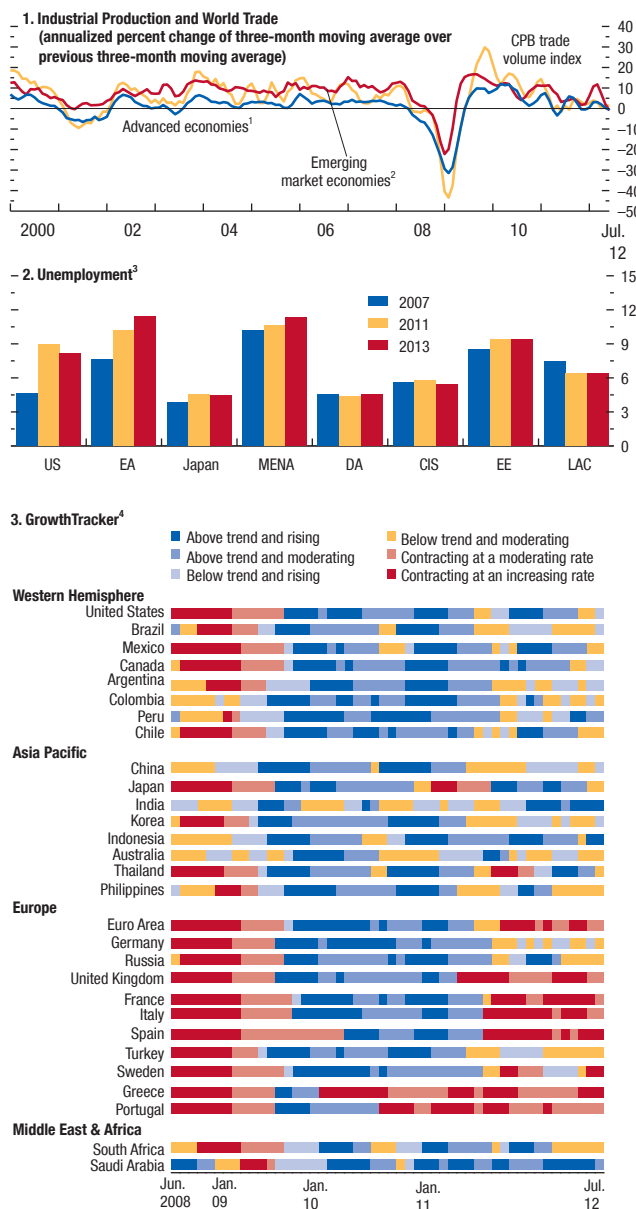
Source: IMF staff estimates.
Note: US = United States; EA = euro area; CIS = Commonwealth of Independent States; DA = developing Asia; EE = emerging Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa.
[1]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.
[2]Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Latvia, Lithuania Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, and Venezuela.
[3]Sub-Saharan Africa (SSA) is omitted due to data limitations.
[4]The Growth Tracker is described in Matheson (2011). Within regions, countries are listed by economic size.

Figure 1.2. Euro Area Developments

The crisis in the euro area has deepened. Activity is contracting, mainly due to deep cutbacks in production in the periphery economies, because financial and fiscal conditions are very tight. Sovereign issuers and banks in the periphery are struggling to attract foreign investors. Their sovereign debt spreads have risen appreciably, and their banks rely increasingly on the European Central Bank (ECB) for funding. As a result, they have cut back domestic credit.
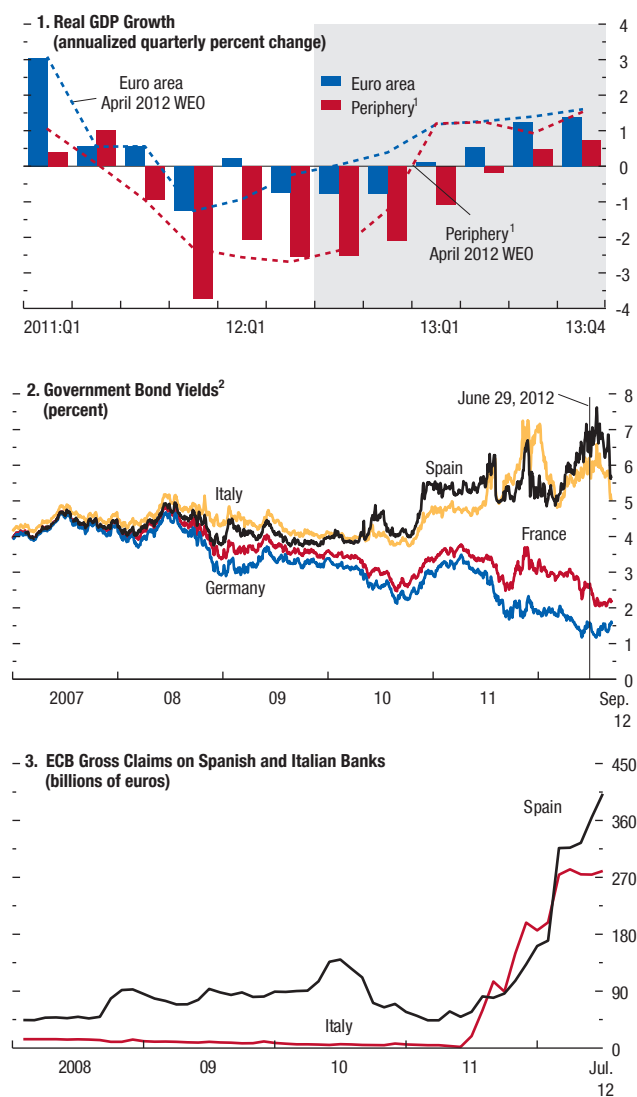
Sources: Bloomberg Financial Markets; national central banks; and IMF staff estimates.
[1]Greece, Ireland, Italy, Portugal, and Spain.
[2]Ten-year government bonds.

of policy stimulus by the Federal Reserve. Because of ongoing political gridlock, the fiscal cliff will not be addressed before the November elections. On the positive side, the housing market may be stabilizing, albeit at depressed levels, and private credit has continued to expand despite retrenchment in the U.S. market by EU banks.

Domestic Demand Continued to Lose Momentum in Key Emerging Market Economies

Policy tightening in response to capacity constraints and concerns about the potential for deteriorating bank loan portfolios, weaker demand from advanced economies, and country-specific factors slowed GDP growth in emerging market and developing economies from about 9 percent in late 2009 to about 5¼ percent recently. Indicators of manufacturing activity have been retreating for some time (Figure 1.3, panel 1). The IMF staff's Global Projection Model suggests that more than half of the downward revisions to real GDP growth in 2012 are rooted in domestic developments.

- Growth is estimated to have weakened appreciably in developing Asia, to less than 7 percent in the first half of 2012, as activity in China slowed sharply, owing to a tightening in credit conditions (in response to threats of a real estate bubble), a return to a more sustainable pace of public investment, and weaker external demand. India's activity suffered from waning business confidence amid slow approvals for new projects, sluggish structural reforms, policy rate hikes designed to rein in inflation, and flagging external demand.
- Real GDP growth also decelerated in Latin America to about 3 percent in the first half of 2012, largely due to Brazil. This reflects the impact of past policy tightening to contain inflation pressure and steps to moderate credit growth in some market segments—with increased drag recently from global factors.
- Emerging European economies, following a strong rebound from their credit crisis, have now been hit hard by slowing exports to the euro area, with real GDP growth coming close to a halt. In Turkey, the slowdown has been driven by domestic demand, on the heels of policy tightening and

a decline in confidence. Unlike in 2008, however, generalized risk aversion toward the region is no longer a factor. Activity in Russia, which has benefited various economies in the region, has also lost some momentum recently.

Prospects Are for Sluggish and Bumpy Growth

Looking ahead, no significant improvement appears in the offing. The WEO forecast includes only a modest reacceleration of activity, which would be helped along by some reduction in uncertainty related to assumed policy reactions in the euro area and the United States, continued monetary accommodation, and gradually easier financial conditions. Healthy nonfinancial corporate balance sheets and steady or slowing deleveraging by banks and households will encourage the rebuilding of the capital stock and a gradual strengthening of durables consumption. In emerging market and developing economies, monetary and fiscal policy easing will strengthen output growth. However, if either of two critical assumptions about policy reactions fails to hold, global activity could deteriorate very sharply.

- The first assumption is that, consistent with the October 2012 GFSR *baseline scenario*, European policymakers take additional action to advance adjustment at national levels and integration at the euro area level (including timely establishment of a single supervisory mechanism). As a result, policy credibility and confidence improve gradually while strains remain from elevated funding costs and capital flight from the periphery to the core countries. If these policy actions are not taken, the WEO forecast may be disappointed once again and the area could slide into the GFSR's *weak policies* scenario, which is described in further detail below.
- The second assumption is that U.S. policymakers avoid the fiscal cliff and raise the debt ceiling, while making good progress toward a comprehensive plan to restore fiscal sustainability.

Fiscal Adjustment Will Continue but Not in Many Emerging Market Economies

Fiscal adjustment has been detracting from activity in various parts of the world and will continue

Figure 1.3. Current and Forward-Looking Growth Indicators

Purchasing managers' indices for the manufacturing sector do not yet point to a significant reacceleration of activity—they remain below the level of 50, indicating falling output. The deterioration is particularly pronounced in the periphery of the euro area. Investment in machinery and equipment has also weakened, especially in the euro area. Furthermore, the pace of stock building has moved into a lower gear. Consumption has shown greater resilience, especially in emerging market and developing economies. Somewhat lower oil prices may support consumption in the advanced economies. However, higher food prices will harm many households, especially in emerging market and developing economies.
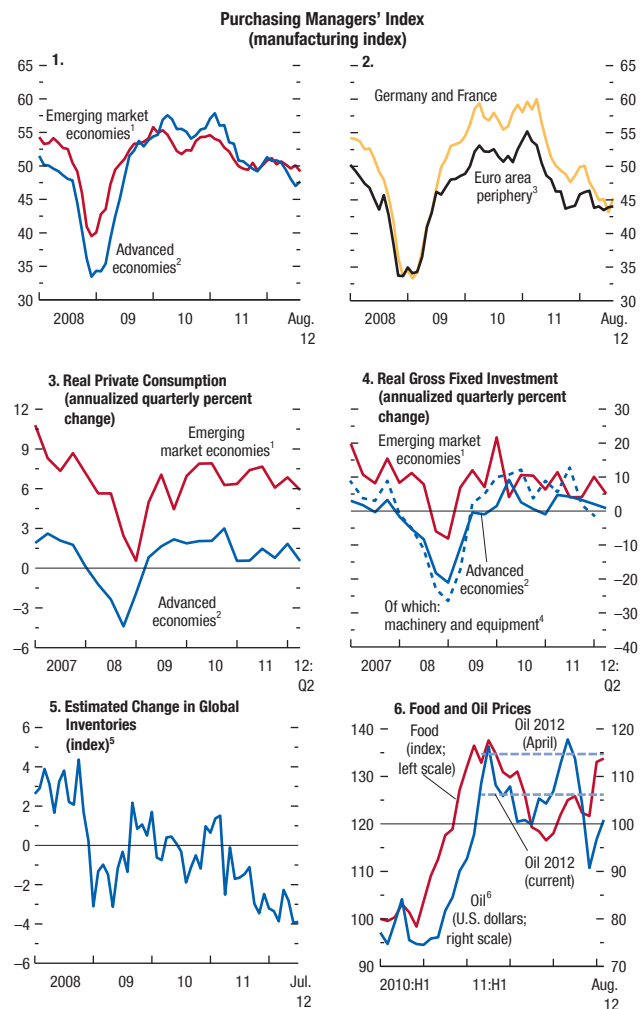
Sources: Haver Analytics; and IMF staff calculations.
Note: Not all economies are included in the regional aggregations. For some economies, monthly data are interpolated from quarterly series.
[1]Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, and Venezuela.
[2]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.
[3]Greece, Ireland, Italy, and Spain.
[4]Purchasing-power-parity-weighted averages of metal products and machinery for the euro area, plants and equipment for Japan, plants and machinery for the United Kingdom, and equipment and software for the United States.
[5]Based on deviations from an estimated (cointegral) relationship between global industrial production and retail sales.
[6]U.S. dollars a barrel: simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil. The dashed lines indicate projected oil price in April 2012 WEO and current WEO.

Figure 1.4. Fiscal Policies

In 2012, fiscal policy became more contractionary in the advanced economies. It became much less contractionary in the emerging market and developing economies, where the fiscal deficit is expected to be about 1½ percent of GDP—much lower than the 6 percent of GDP level projected for the advanced economies. However, before the crisis, emerging market and developing economies were running surpluses. Over the medium term, many should strengthen their fiscal positions to rebuild room for policy maneuvering. The main challenges with respect to deficit reduction lie, however, in the advanced economies, where public debt is in excess of 100 percent of GDP and rising.

1. Fiscal Impulse
(change in structural balance as percent of GDP)

Advanced economies
Emerging market and developing economies
April 2012 WEO

2. Fiscal Balance
(percent of GDP)

Emerging market and developing economies

World

Advanced economies

3. Public Debt
(percent of GDP)

G7[1]

Advanced economies

World

Emerging market and developing economies
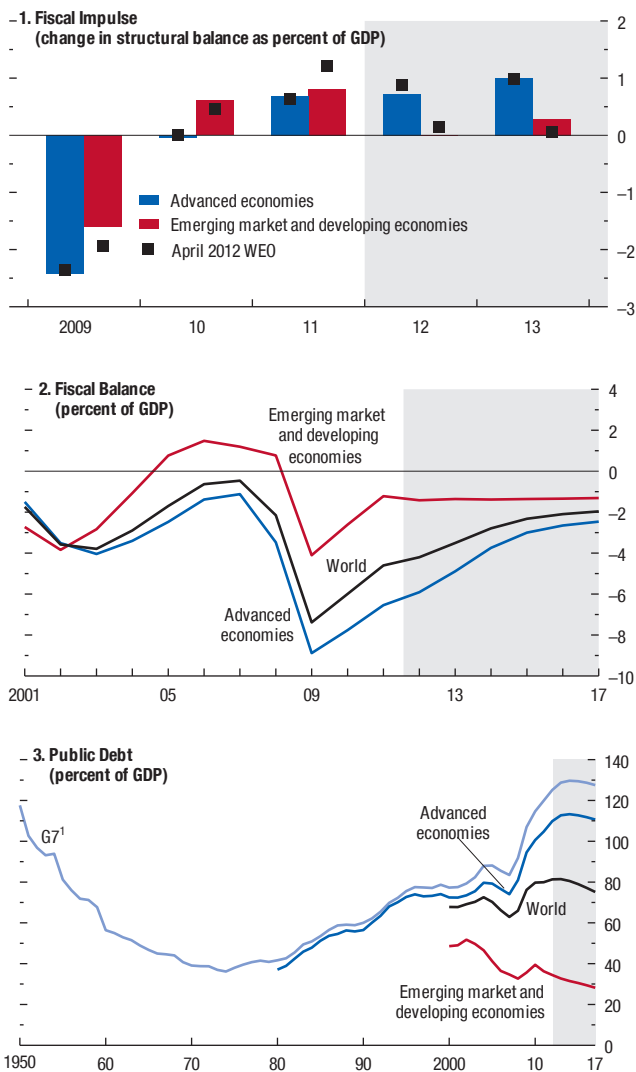
Source: IMF staff estimates.
[1]G7 comprises Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

to do so over the forecast horizon in the advanced economies but not in the emerging market and developing economies. The October 2012 *Fiscal Monitor* discusses the trends.

In major advanced economies, general government structural balances are on course to tighten by about ¾ percent of GDP in 2012, which is about the same as in 2011 and in line with the April 2012 WEO projections (Figure 1.4, panel 1). In 2013, the tightening is projected to increase modestly to about 1 percent of GDP, but its composition across countries will be different (see Table A8 in the Statistical Appendix). In the euro area, much adjustment has already been implemented and the pace of tightening will diminish somewhat. In the United States, the budget outlook for 2013 is highly uncertain, given the large number of expiring tax provisions and the threat of automatic spending cuts and in the context of highly polarized politics. The fiscal cliff implies a tightening of more than 4 percent of GDP, but the WEO projection assumes that the outcome would be only a 1¼ percent of GDP reduction in the structural deficit, which is slightly more than in 2012, mainly on account of expiring stimulus measures, such as the payroll tax cut, and a decline in war-related spending. The budget outlook has also become uncertain in Japan, where a political impasse has delayed approval of budget funding for the remainder of the fiscal year ending in March 2013. Earthquake-related spending has lent support to growth in 2012 but will decline sharply in 2013. As a result, there will be a fiscal withdrawal of about ½ percent of GDP. This withdrawal could be much larger if the political impasse is not resolved soon.

In emerging market and developing economies, no significant fiscal consolidation is on tap for 2012–13, following a 1 percent of GDP improvement in structural balances during 2011 (Figure 1.4, panel 1). The general government deficit in these economies is expected to remain below 1½ percent of GDP, and public debt levels are expected to decline as a share of GDP, toward 30 percent. Fiscal prospects, however, vary across economies. Policy will be broadly neutral in China, India, and Turkey in 2012 and 2013. In Brazil, policy will be broadly neutral in 2012 and tighten somewhat in 2013. In Mexico, there will be a roughly 1 percent of GDP

fiscal tightening in 2012, followed by a modest further fiscal withdrawal in 2013. Russia is loosening noticeably in 2012, but its stance is projected to become broadly neutral in 2013.

## Monetary Policy Is Expected to Support Activity

Monetary policy has been easing and will remain very accommodative, according to market expectations (Figure 1.5, panel 1). The ECB recently launched its OMT program (see above) and broadened collateral requirements. The Federal Reserve recently announced that it would purchase mortgage-backed securities at a pace of $40 billion a month, consider additional asset purchases, and employ its other policy tools until economic conditions improve. It also extended its low-interest-rate guidance from late 2014 to mid-2015. Earlier, the Bank of England had expanded its quantitative easing program. Various advanced economies recently cut policy rates (Australia, Czech Republic, Israel, Korea) or postponed rate hikes. The Bank of Japan expects a roughly 5 percent of GDP monetary expansion during the coming year on account of its Asset Purchase Program and estimates that this would suffice to push inflation up to its 1 percent goal. It recently eased its monetary policy further by expanding its asset purchase program ceiling for government bonds.

The Bank of England launched some innovative measures. Under its Funding for Lending Scheme (FLS), banks and building societies will be able to borrow U.K. Treasury bills in exchange for less liquid collateral. Banks may borrow bills in an amount equal to 5 percent of their June 2012 stock of loans to the U.K. nonfinancial sector, plus any expansion of lending from that date until the end of 2013. Swap fees will be lower for banks that maintain or expand rather than cut their lending. These measures should encourage bank lending and ease access to wholesale credit by improving the quality of assets held by banks.

Emerging market and developing economies launched a variety of easing measures in response to softening activity and inflation. Many postponed anticipated tightening, and some cut policy rates, including Brazil, China, Colombia, Hungary, the
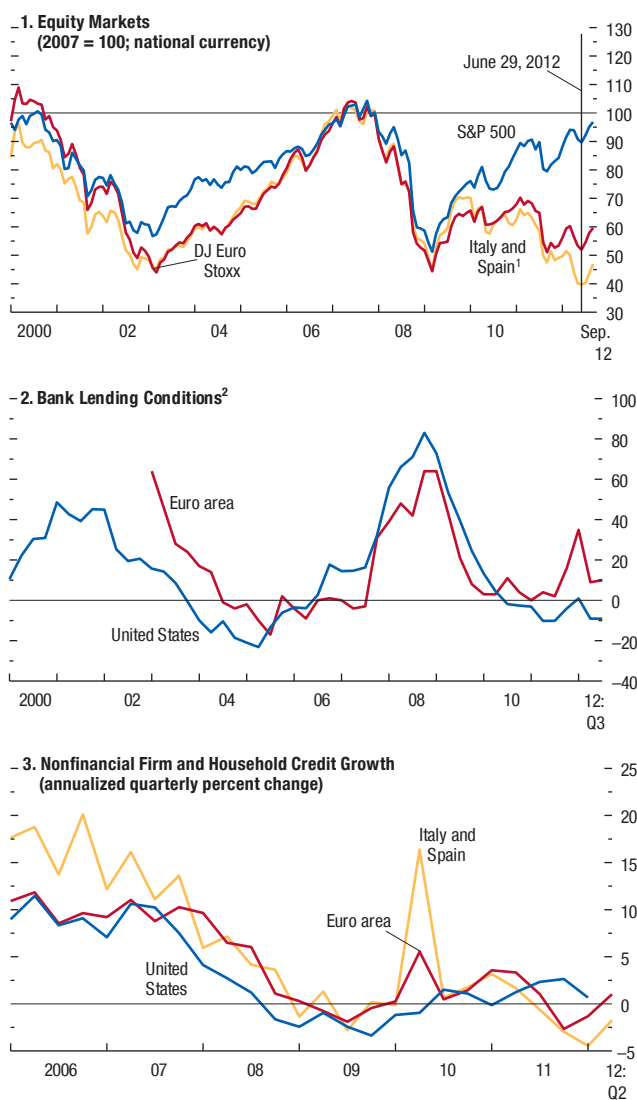
Figure 1.5. Monetary Policies

Expectations are for very accommodative monetary policies in the major advanced economies. Real interest rates are also low in many emerging market and developing economies, and several economies have cut their policy rates in the past six months. However, only a few economies implemented large cuts. Over the medium term, policy rates will have to be raised, but considering the downside risks to the outlook, many central banks can afford to hold steady now or ease further. In advanced economies, central bank balance sheets have expanded appreciably, but their size is not unusual compared with those of various emerging market economies.
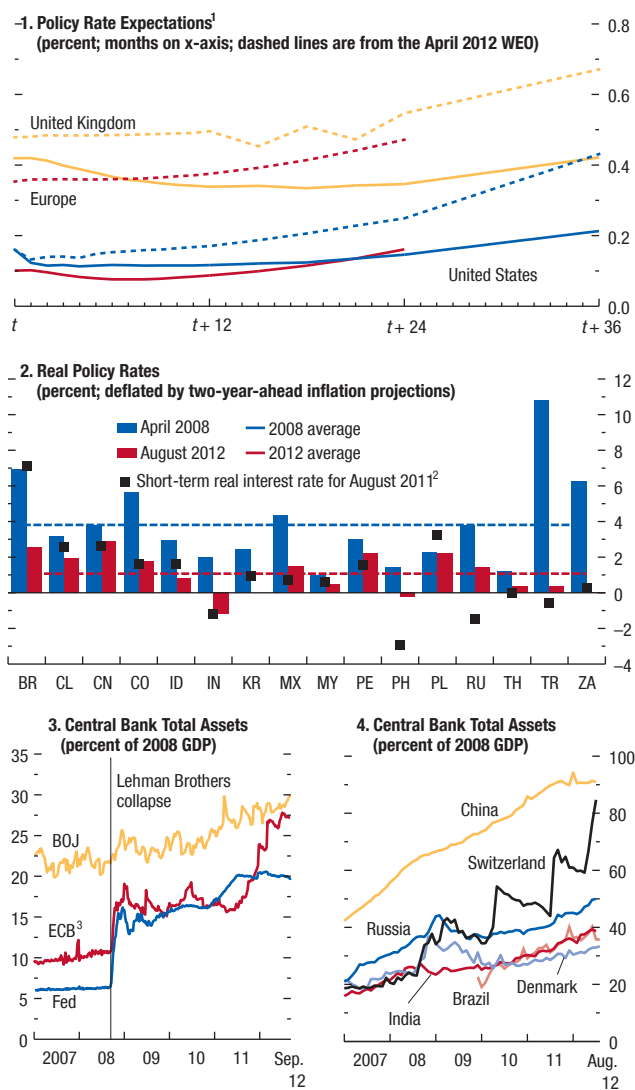
Sources: Bloomberg Financial Markets; and IMF staff estimates.
Note: BR = Brazil; CL = Chile; CN = China; CO = Colombia; ID = Indonesia; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PE = Peru; PH = Philippines; PL = Poland; RU = Russia; TH = Thailand; TR = Turkey; ZA = South Africa. BOJ = Bank of Japan; ECB = European Central Bank; Fed = Federal Reserve.
[1]Expectations are based on the federal funds rate for the United States, the sterling overnight interbank average rate for the United Kingdom, and the euro interbank offered forward rates for Europe; updated September 13, 2012.
[2]Bank Indonesia rate for Indonesia; the Central Bank of the Republic of Turkey's effective marginal funding cost estimated by IMF staff for Turkey.
[3]ECB calculations based on the Eurosystem's weekly financial statement.

Figure 1.6. Recent Financial Market Developments

Equity markets recently registered large losses and have been very volatile. Policy pronouncements have had large effects. Bank lending conditions are gradually easing from very tight levels in the United States but are continuing to tighten in the euro area. U.S. credit to households and nonfinancial firms is growing again; euro area credit remains in the doldrums, amid cutbacks in the periphery.

1. Equity Markets
(2007 = 100; national currency)

June 29, 2012

S&P 500

DJ Euro Stoxx

Italy and Spain[1]

2. Bank Lending Conditions[2]

Euro area

United States

3. Nonfinancial Firm and Household Credit Growth
(annualized quarterly percent change)

Italy and Spain

Euro area

United States

Sources: Bank of America/Merrill Lynch; Bloomberg Financial Markets; Haver Analytics; and IMF staff estimates.
[1]Weighted average of the Spanish IBEX and Italian FTSEMIB using September 13, 2012, market capitalizations.
[2]Percent of respondents describing lending standards as tightening "considerably" or "somewhat" minus those indicating standards as easing "considerably" or "somewhat" over the previous three months. Survey of changes to credit standards for loans or lines of credit to firms for the euro area; average of surveys on changes in credit standards for commercial and industrial and commercial real estate lending for the United States; diffusion index of "accommodative" minus "severe," Tankan (survey of lending attitudes of financial institutions) for Japan.

Philippines, and South Africa (Figure 1.5, panel 2). However, only Brazil cut aggressively, also easing macroprudential measures to further encourage lending. On the whole, real interest rates in many emerging market and developing economies are still relatively low and credit growth is high. For these reasons, many central banks have chosen to hold steady.

Financial Conditions Will Remain Very Fragile

Despite the summer 2012 market rally, financial vulnerabilities are higher than in the spring, according to the October 2012 GFSR. Confidence in the global financial system remains exceptionally fragile. Bank lending has remained sluggish across advanced economies (Figure 1.6, panels 2 and 3). U.S. credit standards have been easing modestly for some time, although not yet for residential real estate. In the euro area, by contrast, lending surveys point to a further tightening of standards and falling loan demand. Bank credit has contracted sharply in the periphery, and credit growth slowed to a crawl in the core economies amid large increases in periphery credit spreads.

Increased risk aversion has dampened capital flows to emerging markets (Figure 1.7, panel 1), although local-currency debt has continued to attract inflows throughout the euro area crisis. Concerns center on slowing domestic growth and heightened financial vulnerabilities. Sovereign and corporate spreads edged up (Figure 1.7, panel 2). Emerging market banks have been tightening lending standards in the face of rising nonperforming loans and worsening funding conditions (Figure 1.7, panel 4). Survey responses suggest that tightness in global funding markets played a major role in this regard. Indicators for loan demand are still expansionary in all major regions (Figure 1.7, panel 5). Credit growth itself fell off its very high pace but remains elevated in many economies.

Financial conditions are likely to remain very fragile over the near term because implementing a solution to the euro area crisis will take time and the U.S. debt ceiling and fiscal cliff raise concerns about the U.S. recovery. Bank lending in the advanced economies is expected to stay sluggish—much more so in the euro area, where the periphery will

suffer further reductions in lending. Most emerging markets will likely experience volatile capital flows. In economies where credit growth has already slowed appreciably, such as China, credit is likely to rebound further as project approvals are fast-tracked; elsewhere, growth rates are likely to move sideways or decline. External funding conditions are likely to have a larger impact on credit developments in emerging Europe than in other emerging market economies.

Activity Is Forecast to Remain Tepid in Many Economies

The recovery is forecast to limp along in the major advanced economies, with growth remaining at a fairly healthy level in many emerging market and developing economies. Leading indicators do not point to a significant acceleration of activity, but financial conditions have recently improved in response to euro area policymakers' actions and easing by the Federal Reserve.

- In the euro area, real GDP is projected to decline by about ¾ percent (on an annualized basis) during the second half of 2012 (Figure 1.8, panel 2). With diminishing fiscal withdrawal and domestic and euro-area-wide policies supporting a further improvement in financial conditions later in 2013, real GDP is projected to stay flat in the first half of 2013 and expand by about 1 percent in the second half. The core economies are expected to see low but positive growth throughout 2012–13. Most periphery economies are likely to suffer a sharp contraction in 2012, constrained by tight fiscal policies and financial conditions, and to begin to recover only in 2013.
- In the United States, real GDP is projected to expand by about 1½ percent during the second half of 2012, rising to 2¾ percent later in 2013 (Figure 1.8, panel 1). Weak household balance sheets and confidence, relatively tight financial conditions, and continued fiscal consolidation stand in the way of stronger growth. In the very short term, the drought will also detract from output.
- In Japan, the pace of growth will diminish noticeably as post-earthquake reconstruction winds down.

Figure 1.7. Emerging Market Conditions

Emerging markets suffered capital outflows until recently, their equity markets declined, and their risk spreads widened somewhat. Banks are tightening credit standards in the face of credit and asset price booms and reduced external funding. However, demand for loans continues to expand.
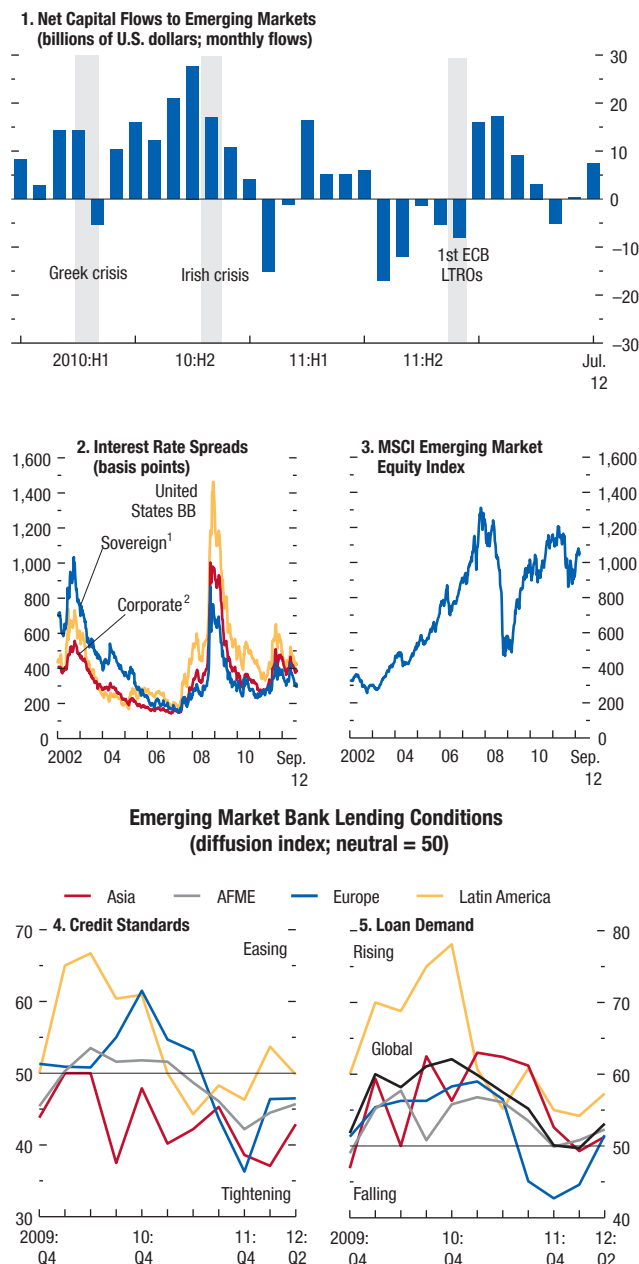
Sources: Bloomberg Financial Markets; Capital Data; EPFR Global; Haver Analytics; IIF Emerging Markets Bank Lending Survey; and IMF staff calculations.
Note: ECB = European Central Bank; LTROs = Longer-term refinancing operations; AFME = Africa and Middle East.
[1]JPMorgan EMBI Global Index spread.
[2]JPMorgan CEMBI Broad Index spread.

Figure 1.8. GDP Growth
(Half-over-half annualized percent change)

Real GDP growth is projected to move sideways or accelerate modestly in 2012. Activity is expected to continue to contract during 2013 in the periphery economies of the euro area. In emerging Asia and Latin America, the projected acceleration is mainly driven by China and Brazil, which have been easing their macroeconomic policies in response to weakening activity.
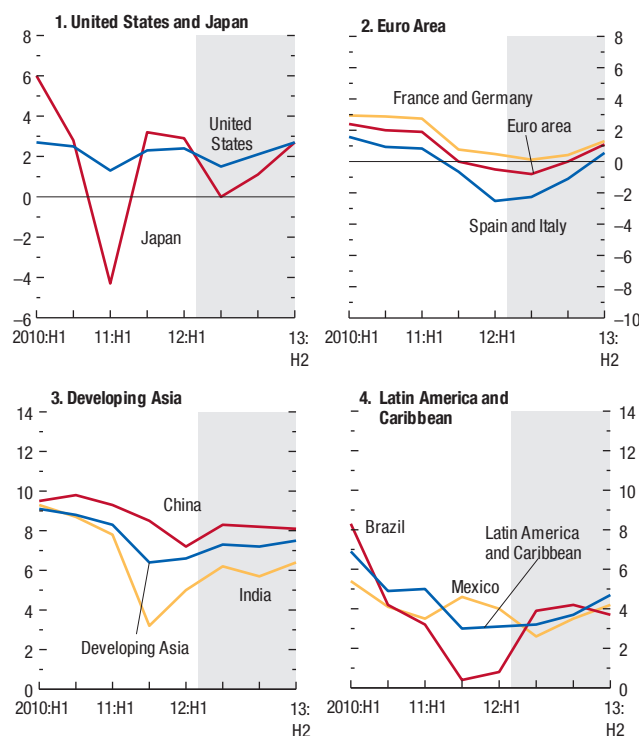
Source: IMF staff estimates.

Real GDP is forecast to stagnate in the second half of 2012 and grow by about 1 percent in the first half of 2013. Thereafter, growth is expected to accelerate further (Figure 1.8, panel 1).

Fundamentals remain strong in many economies that have not suffered a financial crisis, notably in many emerging market and developing economies. In these economies, high employment growth and solid consumption (Figure 1.3, panel 3) should continue to propel demand and, together with macroeconomic policy easing, support healthy investment and growth. However, growth rates are not projected to return to precrisis levels.

- In developing Asia, real GDP is forecast to accelerate to a 7¼ percent pace in the second half of 2012 (Figure 1.8, panel 3). The main driver will be China, where activity is expected to receive a boost from accelerated approval of public infrastructure projects. The outlook for India is unusually uncertain: For 2012, with weak growth in the first half and a continued investment slowdown, real GDP growth is projected to be 5 percent, but improvements in external conditions and confidence—helped by a variety of reforms announced very recently—are projected to raise real GDP growth to about 6 percent in 2013.

- In Latin America, real GDP growth is projected to be about 3¼ percent for the second half of 2012. It is then expected to accelerate to 4¾ percent in the course of the second half of 2013 (Figure 1.8, panel 4). The projected acceleration is strong for Brazil because of targeted fiscal measures aimed at boosting demand in the near term and monetary policy easing, including policy rate cuts equivalent to 500 basis points since August 2011. The pace of activity elsewhere is not forecast to pick up appreciably.

- In the central and eastern European (CEE) economies, improving financial conditions in the crisis-hit economies, somewhat stronger demand from the euro area, and the end of a boom-bust cycle in Turkey are expected to raise growth back to 4 percent later in 2013.

- Growth is projected to stay above 5 percent in sub-Saharan Africa (SSA) and above 4 percent in the Commonwealth of Independent States (see

Table 1.1). In both regions, still-high commodity prices and related projects are helping.

- In the Middle East and North Africa (MENA), activity in the oil importers will likely be held back by continued uncertainty associated with political and economic transition in the aftermath of the Arab Spring and weak terms of trade—real GDP growth is likely to slow to about 1¼ percent in 2012 and rebound moderately in 2013. Due largely to the recovery in Libya, the pace of overall growth among oil exporters will rise sharply in 2012, to above 6½ percent, and then return to about 3¾ percent in 2013.

Cyclical Indicators Point to Slack in Advanced Economies

Cyclical indicators point to ample slack in many advanced economies but to capacity constraints in a number of emerging market economies (Figure 1.9). WEO output gaps in the major advanced economies are large, varying from about 2½ percent of GDP in the euro area and Japan to 4 percent in the United States for 2012 (see Table A8 in the Statistical Appendix). These gaps are consistent with weak demand due to tight financial conditions and fiscal consolidation. By contrast, most emerging market and developing economies that were not hit by the crisis continue to operate above precrisis trends. However, their potential growth rates in recent years are judged to have been higher than indicated by the 1996–2006 precrisis average, and therefore WEO output gap estimates do not signal much overheating.

Amid sharply differing developments across advanced and emerging market and developing economies, the world unemployment rate is estimated to remain flat during 2012–13, near 6¼ percent (Figure 1.1, panel 2). Unemployment rates have on average declined below precrisis levels in emerging market and developing economies, but they remain elevated in advanced economies and are not expected to fall significantly during 2012–13.

- In the United States, the unemployment rate dropped from close to 10 percent in 2010 to about 8 percent lately, where it is expected to remain through 2013. However, a large part of

the decline is due to sluggish labor force expansion through 2011. In addition, more than 40 percent of those unemployed have been out of work for more than six months. In Europe, more than 1 in 10 labor force participants are projected to be unemployed through 2013; in Greece and Spain the ratio is 1 in 4 workers. More generally, almost half of all young labor force participants are without jobs in the periphery of the euro area. As in the United States, the number of long-term unemployed has also risen starkly, increasing the risk of hysteresis and skills atrophy.
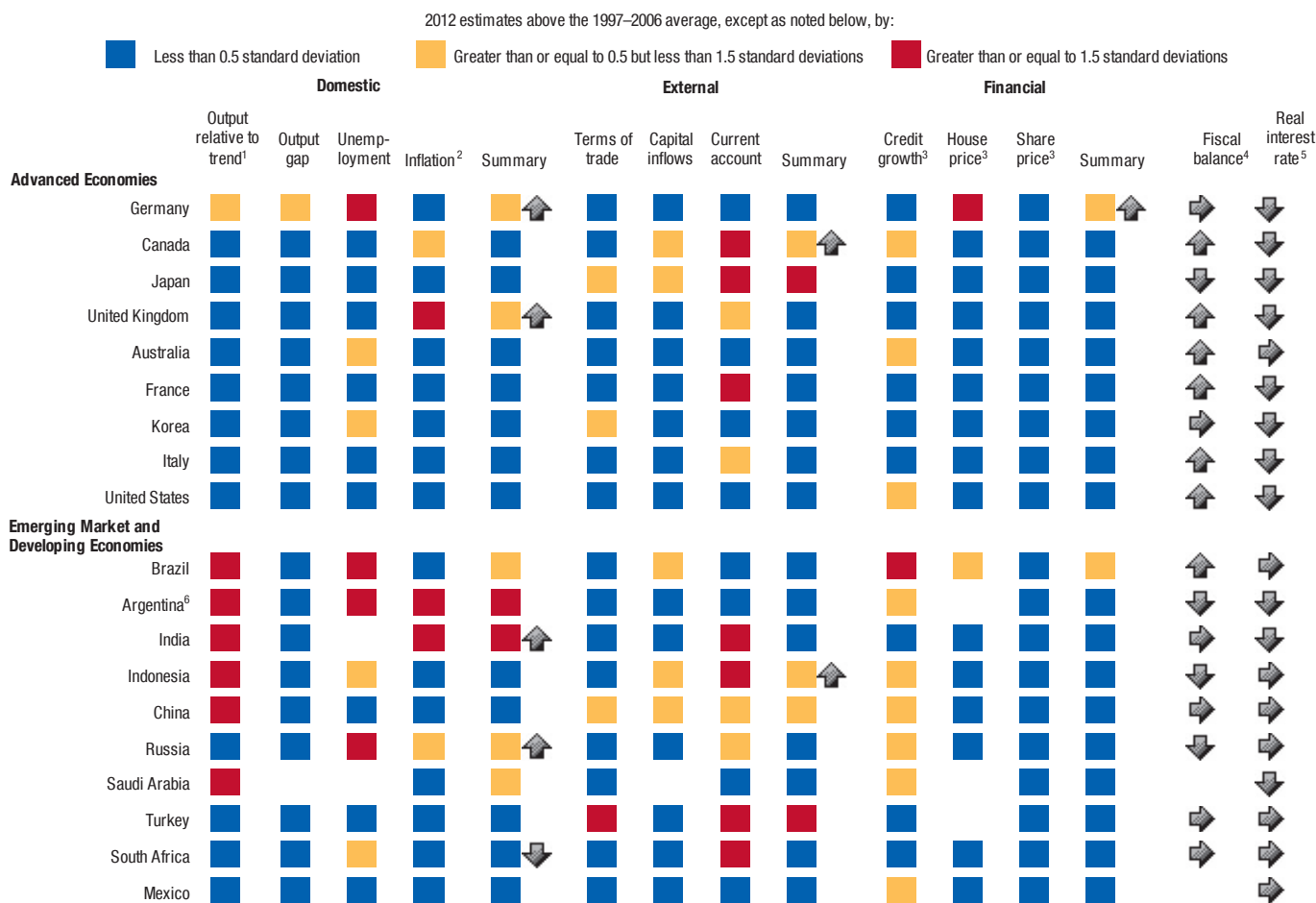
- In emerging market and developing economies, the unemployment record varies widely. Rates are very high in economies that were hit by the crisis, such as in many of the CEE and a few CIS economies, but relatively low in most parts of developing Asia and Latin America. Unemployment rates are projected to remain high in the MENA region, mainly among the oil importers. These economies face a number of challenges, ranging from major political changes, to social needs related to rapidly expanding populations, to decreased revenues from tourism—all of which are weighing on employment prospects in the short term.

The slowdown in global activity and ample slack in many advanced economies have meant that inflation has fallen (Figure 1.10, panels 1 and 2). In advanced economies, lower commodity prices reduced headline inflation to about 1½ percent as of July 2012, down from more than 3 percent in late 2011. Core inflation has been steady at about 1½ percent. In emerging market and developing economies, headline inflation has declined by almost 2 percentage points, to slightly under 5½ percent, in the second quarter of 2012; core inflation too has declined, although to a lesser extent. The forecast is for further easing of inflation pressure in the advanced economies, with headline inflation moving to about 1¾ percent in 2013; in emerging market and developing economies, headline inflation is projected to move broadly sideways.

This inflation forecast assumes broadly unchanged commodity prices, but sharply rising food prices raise increasing concern (see the Special Feature and Box 1.5). Thus far, price pressures do not encompass all

Figure 1.9. Overheating Indicators for the G20 Economies

Domestic overheating indicators point to ample slack in the advanced economies—most indicators flash blue. By contrast, a number of yellow and red indicators for the emerging market and developing economies point to capacity constraints. External overheating indicators flash yellow or red for Japan and China—rather thanraising concerns, these are symptoms of an internal demand rebalancing process that has helped bring down global current account imbalances. However, in China, the rebalancing is overly reliant oninvestment. In Germany, which is the world's other major surplus economy, the rebalancing process is lagging. The red indicators for Turkey point to external vulnerabilities.Credit indicators point to excesses in many emerging market and developingeconomies. Other financial indicators are mostly reassuring about overheating, except for Brazil.

2012 estimates above the 1997–2006 average, except as noted below, by:

Less than 0.5 standard deviation   Greater than or equal to 0.5 but less than 1.5 standard deviations   Greater than or equal to 1.5 standard deviations

	Domestic					External				Financial					
	Output relative to trend[1]	Output gap	Unemp-loyment	Inflation[2]	Summary	Terms of trade	Capital inflows	Current account	Summary	Credit growth[3]	House price[3]	Share price[3]	Summary	Fiscal balance[4]	Real interest rate[5]
Advanced Economies															
Germany															
Canada															
Japan															
United Kingdom															
Australia															
France															
Korea															
Italy															
United States															
Emerging Market and Developing Economies															
Brazil															
Argentina[6]															
India															
Indonesia															
China															
Russia															
Saudi Arabia															
Turkey															
South Africa															
Mexico															

Sources: Australia Bureau of Statistics; Bank for International Settlements; CEIC China Database; Global Property Guide; Haver Analytics; IMF, Balance of Payments Statistics Database; IMF, International Financial Statistics Database; Organization for Economic Cooperation and Development; and IMF staff estimates.

Note: For each indicator, except as noted below, economies are assigned colors based on projected 2012values relative to theirprecrisis (1997–2006) average. Each indicator is scored as red = 2, yellow= 1, and blue = 0; summary scores are calculated as the sum of selected component scores divided by the maximum possible sum of those scores. Summary blocks are assigned red if thesummaryscore is greater than or equal to 0.66, yellow if greater than or equal to 0.33 but less than 0.66, and blue if less than 0.33. When data are missing, no color is assigned. Arrows up (down) indicate hotter (colder) conditions compared with the April 2012 WEO predicted values for 2012.

[1]Output more than 2.5 percent above the precrisis trend is indicated by red. Output less than 2.5percent below the trend is indicated by blue. Output within ±2.5 percent from the precrisis trend is indicated by yellow.

[2]For the following inflation-targeting economies, the target inflation rate was used instead of the 1997–2006 average in the calculation of the inflation indicator: Australia, Brazil, Canada, Indonesia, Korea, Mexico, South Africa, Turkey, United Kingdom. For the non-inflation-targeting economies, red was assigned if inflation is approximately 10 percent or higher, yellow if inflation is approximately 5 to 9 percent, and blue if inflation is less than 5 percent.

[3]The indicators for credit growth, house price growth, and share price growth refer to the latest2012 values relative to the 1997–2006 average of output growth.

[4]Arrows in the fiscal balance column represent the forecast change in the structural balance as apercent of GDP over the period 2011–12. An improvement of more than 0.5 percent of GDP is indicatedby an up arrow; a deterioration of more than 0.5 percent of GDP is indicated by a down arrow.

[5]Real policy interest rates below zero are identified by a down arrow; real interest rates above 3 percent are identified by an up arrow. Real policy interest rates are deflated by two-year-ahead inflation projections.

[6]Calculations are based on Argentina's official GDP data. The IMF has called on Argentina to adopt remedial measures to address the quality of the official GDP data. The IMF staff is also using alternative measures of GDP growth for macroeconomic surveillance, including data produced by private analysts, which have shown significantly lower real GDP growth than the official datasince 2008. The IMF staff's estimate of average provincial inflation is used as a measure of inflation and to deflate nominal variables.

major food crops, unlike in 2007–08. As discussed further below, monetary policy should not react to food-price-driven increases in headline inflation unless there are significant risks for second-round effects on wages. Governments may need to scale up targeted social safety net measures and implement other fiscal measures (such as reducing food taxes) where there is fiscal space to do so. Also, countries should avoid any restrictions on exports, which would exacerbate price increases and supply disruptions. Over the longer term, broader policy reforms are necessary to reduce global food price volatility.

The Outlook Has Become More Uncertain

Risks to the WEO forecast have risen appreciably and now appear more elevated than in the April 2012 and September 2011 WEO reports, whose policy assumptions and hence growth projections for advanced economies proved overly optimistic. Although standard risk metrics suggest that downside risks are much higher now than only a few months ago, upside risks appear higher too, although to a lesser extent. This may be a reflection of the fact that many market participants have a bimodal view of global prospects: the recovery could be set back if European and U.S. policymakers fail to live up to expectations, but it could also be stronger if they deliver on their commitments. The most pertinent near-term risks—escalation of the euro area crisis and fiscal policy failures in the United States—are quantified and discussed with the help of scenarios. In addition, this section considers a variety of medium- and long-term risks and scenarios.

Risks for a Serious Global Slowdown Are Alarmingly High

The WEO's standard fan chart suggests that uncertainty about the outlook has increased markedly (Figure 1.11, panel 1).[1] The WEO growth forecast is now 3.3 and 3.6 percent for 2012 and 2013, respectively, which is somewhat lower than in

[1]For details about the construction of the fan chart, including a discussion of the role of the risk factors, see Elekdag and Kannan (2009).

Figure 1.10. Global Inflation
(Twelve-month change in the consumer price index unless noted otherwise)
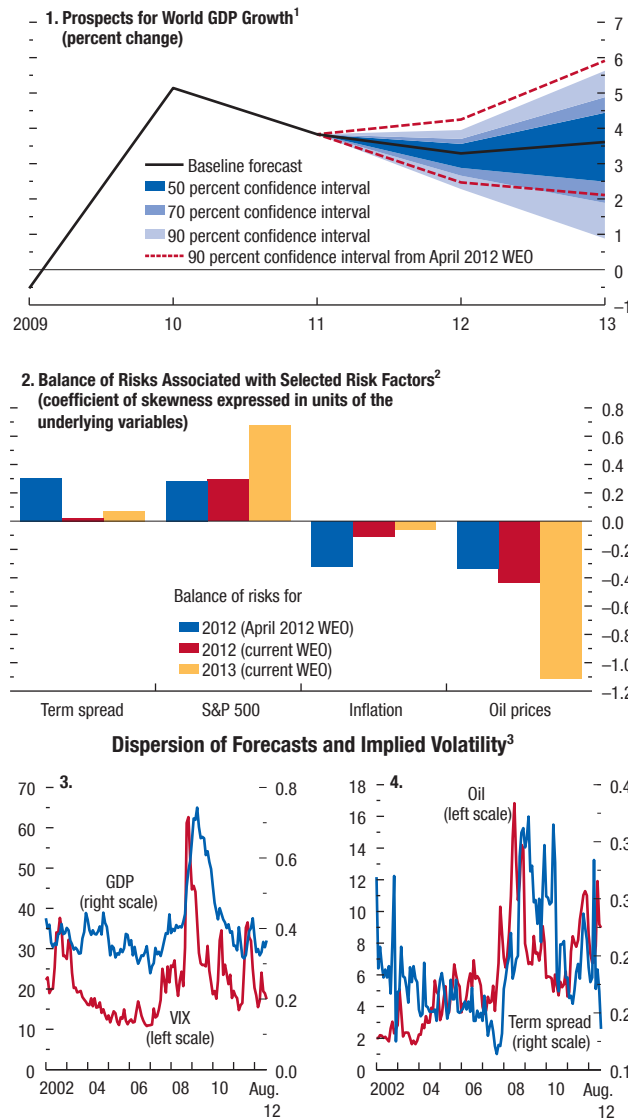
Headline inflation has declined everywhere, helped by lower commodity prices. In the emerging market and developing economies, core inflation has declined too. In advanced economies, it has remained stable around 1½ percent. House price developments increasingly diverge across economies. In various smaller advanced and a number of emerging market and developing economies, upward pressure remains, notwithstanding already high prices.
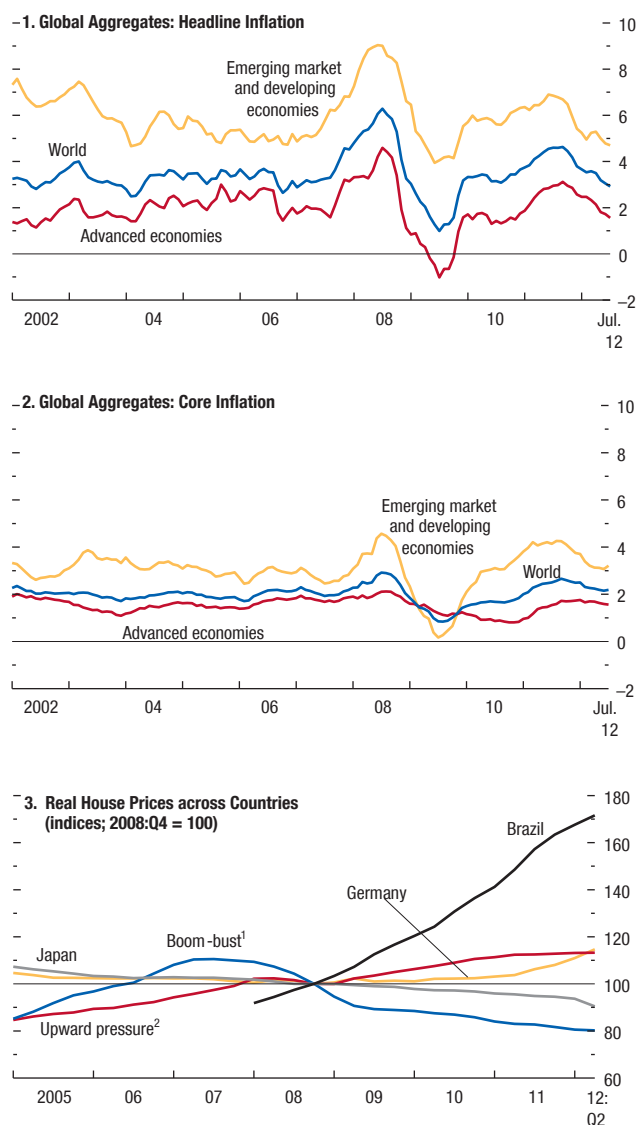
Sources: Haver Analytics; and IMF staff calculations.
[1]Boom-bust countries: Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, New Zealand, Poland, Russia, Slovak Republic, Slovenia, South Africa, Spain, Turkey, Ukraine, United Kingdom, United States.
[2]Upward pressure countries: Australia, Austria, Belgium, Canada, Colombia, China, Hong Kong SAR, Hungary, India, Israel, Malaysia, Norway, Philippines, Switzerland, Singapore, Serbia, Sweden, Uruguay.

Figure 1.11. Risks to the Global Outlook

Risks around the WEO projections have risen, consistent with market indicators, and remain tilted to the downside. The oil price and inflation indicators point to downside risks to growth, while S&P 500 options prices and the term spread suggest some upside risk.

1. Prospects for World GDP Growth[1]
(percent change)

— Baseline forecast
■ 50 percent confidence interval
■ 70 percent confidence interval
■ 90 percent confidence interval
--- 90 percent confidence interval from April 2012 WEO

2. Balance of Risks Associated with Selected Risk Factors[2]
(coefficient of skewness expressed in units of the underlying variables)

Balance of risks for
■ 2012 (April 2012 WEO)
■ 2012 (current WEO)
■ 2013 (current WEO)

Term spread   S&P 500   Inflation   Oil prices

Dispersion of Forecasts and Implied Volatility[3]

3.
GDP (right scale)
VIX (left scale)

4.
Oil (left scale)
Term spread (right scale)

Sources: Bloomberg Financial Markets; Chicago Board Options Exchange; Consensus Economics; and IMF staff estimates.
[1]The fan chart shows the uncertainty around the WEO central forecast with 50, 70, and 90 percent confidence intervals. As shown, the 70 percent confidence interval includes the 50 percent interval, and the 90 percent confidence interval includes the 50 and 70 percent intervals. See Appendix 1.2 in the April 2009 *World Economic Outlook* for details.
[2]The values for inflation and oil price risks enter with the opposite sign, because they represent downside risks to growth.
[3]GDP measures the dispersion of GDP forecasts for the G7 economies (Canada, France, Germany, Italy, Japan, United Kingdom, United States), Brazil, China, India, and Mexico. VIX = Chicago Board Options Exchange S&P 500 Implied Volatility Index. Term spread measures the dispersion of term spreads implicit in interest rate forecasts for Germany, Japan, United Kingdom, and United States. Oil measures the dispersion of one-year-ahead oil price forecasts for West Texas Intermediate. Forecasts are from Consensus Economics surveys.

April 2012. The probability of global growth falling below 2 percent in 2013—which would be consistent with recession in advanced economies and a serious slowdown in emerging market and developing economies—has risen to about 17 percent, up from about 4 percent in April 2012 and 10 percent (for the one-year-ahead forecast) during the very uncertain setting of the September 2011 WEO.

The IMF staff's Global Projection Model (GPM) uses an entirely different methodology to gauge risk but confirms that risks for recession in advanced economies (entailing a serious slowdown in emerging market and developing economies) are alarmingly high (Figure 1.12, panel 1). For 2013, the GPM estimates suggest that recession probabilities are about 15 percent in the United States, above 25 percent in Japan, and above 80 percent in the euro area.

Risk Scenarios for the Short Term

As emphasized, immediate risks relate to the assumptions about the sovereign debt crisis in the euro area and about the U.S. budget, both of which could negatively affect growth prospects. Furthermore, oil prices could again provide a shock.

A further deepening of the euro area crisis

The euro area crisis could reintensify again. The OMT program will reduce risks from self-fulfilling market doubts related to the viability of the Economic and Monetary Union (EMU) most effectively if it is implemented decisively. However, serious risks remain outside this safety net—posed, for example, by rising social tensions and adjustment fatigue that raise doubts about adjustment in the periphery or by doubts about the commitment of others to more integration.

The downside scenario developed here uses the IMF staff's Global Integrated Monetary and Fiscal Model (GIMF) to consider the implications of an intensification of euro area sovereign and banking stress. Unlike in the WEO forecast and GFSR *baseline scenario*, European policymakers in this scenario do not strengthen their policies, as discussed in further detail in the *weak policies* scenario in the October 2012 GFSR. In this scenario, the forces of financial fragmentation increase and

become entrenched, capital holes in banking systems expand, and the intra-euro-area capital account crisis increasingly spills outward. Within the GIMF, this scenario features the following shocks relative to the WEO forecast (Figure 1.13): lower credit, mainly in the periphery; higher sovereign risk premiums for the periphery; modestly lower premiums for the core sovereigns, which benefit from a flight to safety; an even larger fiscal consolidation in the periphery; and increases in corporate risk premiums for all (including non-European) advanced and emerging market economies. Capital flight from the euro area and emerging markets is assumed to benefit the United States, and its sovereign risk premium falls. Monetary policy is constrained at the zero interest rate floor in the advanced economies, and the assumption is that they do not proceed with additional unconventional easing. Emerging market economies, by contrast, are assumed to ease as growth and inflation fall, which considerably reduces the impact of the external shock on their economies.
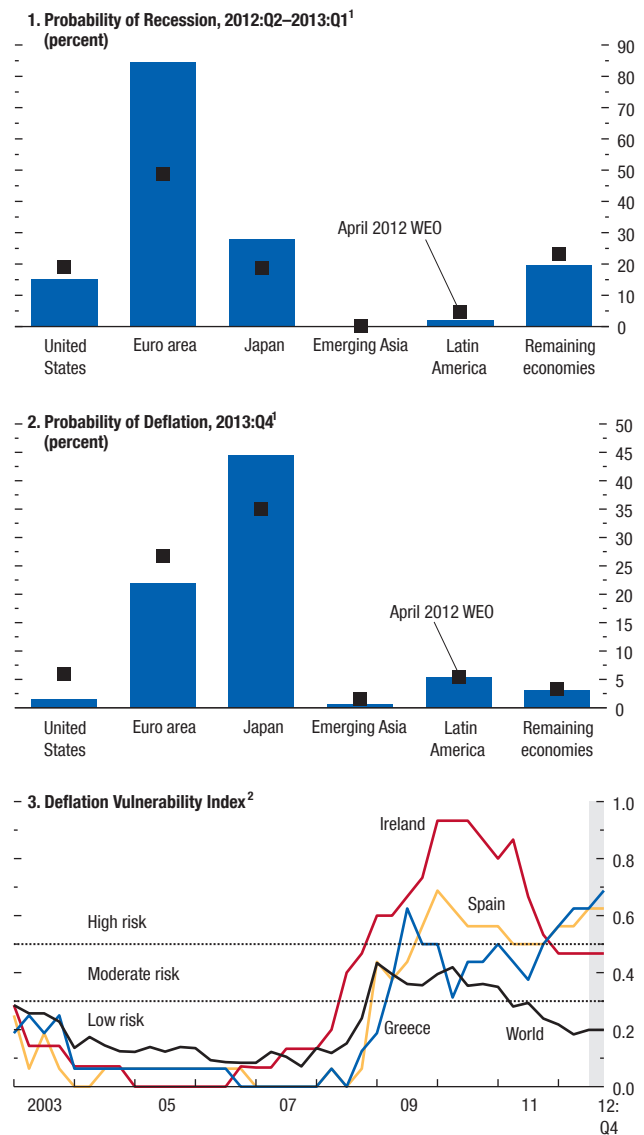
In this scenario, output in the euro area core would fall by about 1¾ percent relative to the WEO projections within one year; in the periphery, the decline would be about 6 percent. Output losses in non-European economies would be about 1 to 1½ percent. Chapter 2 provides further details for the various regions.

Stronger-than-expected euro area policies

This second GIMF scenario assumes that national policymakers follow up the latest ECB actions with a more proactive approach toward domestic adjustment and EMU reforms. The details are discussed in the *complete policies* scenario in the October 2012 GFSR. This scenario requires regaining credibility through an unflinching commitment to implementing already agreed plans. Policymakers need to build political support for the necessary pooling of sovereignty that a more complete currency union entails. It envisages that they quickly introduce a road map for banking union and fiscal integration and deliver a major down payment. Examples of possible action include implementation of a bank resolution mechanism with common backstops or a pan-European deposit insurance guarantee plan (for both, concrete proposals still need to be spelled out) and concrete measures

Figure 1.12. Recessions and Deflation Risks

Risks for a prolonged recession and for sustained deflation are elevated in the euro area, notably in periphery economies. The risk of deflation continues to be a problem in Japan. In other areas, the risks are minimal.
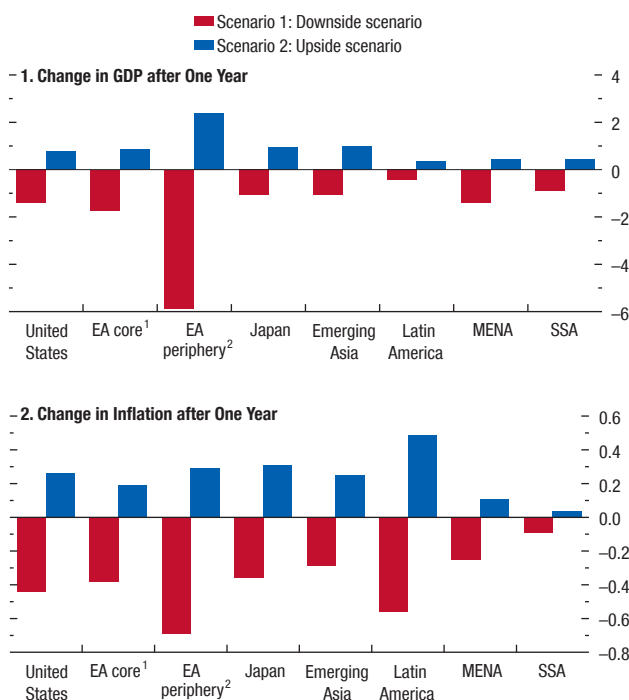

1. Probability of Recession, 2012:Q2–2013:Q1[1] (percent)

2. Probability of Deflation, 2013:Q4[1] (percent)

3. Deflation Vulnerability Index[2]

Source: IMF staff estimates.
[1]Emerging Asia: China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand; Latin America: Brazil, Chile, Colombia, Mexico, and Peru; remaining economies: Argentina, Australia, Bulgaria, Canada, Czech Republic, Denmark, Estonia, Israel, New Zealand, Norway, Russia, South Africa, Sweden, Switzerland, Turkey, United Kingdom, and Venezuela.
[2]For details on the construction of this indicator, see Kumar (2003) and Decressin and Laxton (2009). The indicator is expanded to include house prices.

Figure 1.13. Upside and Downside Scenarios
(Percent or percentage point deviation from WEO baseline)

The Global Integrated Monetary and Fiscal Model (GIMF) is used to consider a scenario in which policy is initially unable to prevent the intensification of euro area sovereign and banking stress as well as a scenario in which policy action quickly alleviates the current level of stress. The model contains two blocks of euro area countries, those with acute fiscal sustainability issues (referred to as "periphery") and those with less acute fiscal sustainability issues (referred to as "core").

The intensification-of-stress scenario (red bars) assumes that policymakers delay taking sufficient action to prevent a sharp intensification of financial stress. Consequently, deleveraging by euro area banks leads to a sharp credit contraction in periphery countries but milder contraction elsewhere. Credit in periphery countries falls €475 billion below the WEO baseline in 2013, while that in the core countries falls by €50 billion. Concerns about fiscal sustainability raise periphery sovereign spreads 350 basis points in 2013; however, subsequent policy action results in spreads falling thereafter and returning fully to baseline by 2016. The core countries' sovereign risk premium is assumed to decline by 50 basis points in 2013 as a flight to quality within the euro area occurs. Sovereigns in the periphery are forced into more front-loaded fiscal consolidation, averaging an additional 2 percentage points of GDP in 2013. Risk concerns are also assumed to spill over to all other regions, with corporate risk premiums rising by 50 basis points in advanced economies and 150 basis points in emerging market and developing economies in 2013. The capital flight is assumed to benefit the U.S. sovereign, with the risk premium falling by 50 basis points in 2013. Monetary policy is constrained at the zero interest rate floor in the G3 countries (euro area, Japan, United States), whereas elsewhere monetary policy eases to help offset the impact on market interest rates of rising risk premiums.

In the scenario in which policy is able to alleviate the stress (blue bars), credit in the euro area expands relative to the baseline and sovereign spreads decline. In the periphery countries, credit expands by roughly €225 billion relative to the baseline, and sovereign spreads decline by roughly 200 basis points in 2013. In other advanced economies, corporate spreads fall by 50 basis points in 2013, and in emerging markets, the decline is 100 basis points.

■ Scenario 1: Downside scenario
■ Scenario 2: Upside scenario

1. Change in GDP after One Year

2. Change in Inflation after One Year

Source: GIMF simulations.
Note: EA = euro area; MENA = Middle East and North Africa; SSA = sub-Saharan Africa.
[1]Core countries are Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Luxembourg, Malta, Netherlands, Slovak Republic, and Slovenia.
[2]Periphery countries are Greece, Ireland, Italy, Portugal, and Spain.

toward fiscal integration. Under this scenario (Figure 1.13), the euro area begins to reintegrate as policy credibility is restored and capital flight reverses. Relative to the WEO forecast and the GFSR *baseline scenario*, credit expands by roughly €225 billion and sovereign spreads decline by about 200 basis points in 2013 in the periphery of the euro area. Economic growth resumes in the periphery and picks up in the core. In other advanced economies, corporate spreads fall by 50 basis points; in emerging market economies, by 100 basis points. Output would then be roughly ½ to 1 percent higher within one year in most other parts of the world.

The U.S. debt ceiling and fiscal cliff

The U.S. fiscal cliff could entail significantly more fiscal tightening (by about 3 percent of GDP) than assumed in the WEO projections. A recent *Spillover Report* (IMF, 2012e) finds that if this risk materializes and the sharp fiscal contraction is sustained, the U.S. economy could fall into a full-fledged recession. The global spillovers would be amplified through negative confidence effects, including, for example, a global drop in stock prices. The impact of hitting the debt ceiling is more difficult to model. Political delays before the previous deadline, in summer 2011, led credit rating agencies to downgrade the United States, and major market turmoil ensued. At this stage, markets appear to consider the fiscal cliff a tail risk, given that Congress has in the past eventually reached a compromise to resolve similar high-stakes situations. However, this implies that, should this risk actually materialize, there would be a great shock to confidence that would quickly spill over to financial markets in the rest of the world. Notice that risks for a sudden fiscal withdrawal are also present in Japan: however, if they materialize, they will probably have spillovers that are not as large as those from the U.S. fiscal cliff.

A renewed spike in oil prices

If either the euro area or U.S. downside scenario were to materialize, oil prices would likely fall substantially. But there is also an important risk that intensified geopolitical tensions could boost oil prices. The April 2012 WEO included a scenario featuring oil supply disruptions that showed that a 50 percent

increase in oil prices due to less supply would lead to a 1 to 1½ percent decline in output in many parts of the world. The latest distribution of options prices for oil—which is skewed to the upside, implying a downside skew for the distribution of global growth—suggests that this scenario remains relevant for the global economy (Figure 1.11, panel 2).

Risk Scenarios for the Medium Term

A large number of risks and scenarios can be envisaged for the medium term. This section focuses on two specific risk scenarios and one general risk scenario that appear pertinent for policymakers at this juncture. The specific risk scenarios relate to large central bank balance sheets and high public debt—they are directly relevant for monetary and fiscal policy in the advanced economies. The general risk scenario is for globally lower growth over the medium term. This is akin to the experience following the shocks of the 1970s, but this time rooted in other shocks and policy failures—and, for the advanced economies, similar to the experience of Japan after the mid-1990s.

Risks related to swollen central bank balance sheets

The concern is that the vast acquisition of assets by central banks will ultimately mean a rise in the money supply and thus inflation (Figure 1.5, panel 3). However, as discussed in previous WEO reports, no technical reason indicates this would be inevitable. Central banks have more than enough tools to absorb the liquidity they create, including selling the assets they have bought, reverting to traditionally short maturities for refinancing, raising their deposit rates, and selling their own paper. Furthermore, in principle, central bank losses do not matter: their creditors are currency holders and reserve-holding banks; neither can demand to be paid with some other form of money.[2] The reality, however, may well be different. A national legislature may see such losses as a symptom that the central bank is operating outside its mandate,

which could be of concern if it led to efforts to limit the central bank's operational independence. A related concern is that economic agents may begin to doubt the capacity of central banks to fight inflation. Two scenarios come to mind:

- Public deficits and debt may run out of control, causing governments to lean on central banks to pursue more expansionary policies with a view to eroding the real value of the debt via inflation. Similarly, losses on holdings of euro area, Japanese, and U.S. (G3) government securities may cause emerging market economies' central banks or sovereign wealth funds to buy fewer G3 government assets, investing instead in better opportunities at home and triggering large depreciations of G3 currencies.
- Policymakers may falsely perceive central bank balance sheet losses to be damaging to their economies. Such perceptions may make central banks more hesitant to raise interest rates, because doing so would decrease the market value of their asset holdings. The mere appearance of such hesitation may lead private agents to expect an increase in inflation.

Risks related to high public debt levels

Public debt has reached very high levels, and if past experience is any guide, it will take many years to appreciably reduce it (see Chapter 3). Risks related to public debt have several aspects. First, when global output is at or above potential, high public debt may raise global real interest rates, crowding out capital and lowering output in the long term.[3] Second, the cost of debt service may lead to tax increases or cutbacks in infrastructure investment that lower supply. Third, high public debt in individual countries may raise their sovereign risk premiums, with a variety of consequences—from limited scope for countercyclical fiscal policies (as evidenced by the current problems in the euro area periphery) to high inflation or outright default in the case of very large increases in risk premiums.

Simulations with the GIMF suggest that an increase in public debt in the G3 economies of

---

[2]Central bank capital is, in many ways, an arbitrary number, as is well illustrated by the large balance sheets of central banks that intervene in foreign exchange markets (Figure 1.5, panel 4).

[3]See, for example, Elmendorf and Mankiw (1999) for a review of the literature and Kumar and Woo (2010) for some recent evidence.

about 40 percentage points of GDP raises real interest rates almost 40 basis points in the long term (Box 1.2). This simulation and discussion necessarily abstracts from the potential long-term benefits of fiscal stimulus. The 2009 stimulus, for example, was likely instrumental in averting a potential deflationary spiral and protracted period of exceedingly high unemployment, macroeconomic conditions that general equilibrium models such as the GIMF are not well suited to capture. Bearing this in mind, the simulation suggests that in the long term the higher debt lowers real GDP by about ¾ percent relative to a baseline without any increase in public debt. This is because of the direct effect of higher interest rates on investment and the indirect effect via higher taxes or lower government investment. The GIMF simulations indicate that within the G3 the negative effects would be larger, with output 1 percent below baseline projections. The loss of output over the medium term would be even larger if, for example, savings were to drop more than expected because of aging populations in the advanced economies or if the consumption patterns of emerging market economies with very high saving rates align more quickly than expected with those of advanced economies.

Scenarios that involve very high levels of debt and high real interest rates may not only result in lower growth but may also involve a higher risk of default when fiscal dynamics are perceived to be unstable. This combination of high debt and high real interest rates can lead to bad equilibriums, when doubt about the sustainability of fiscal positions drives interest rates to unsustainable levels.

Disappointing potential output and growing risk aversion

Looking beyond the near term, a concern is that output growth may disappoint in both advanced and emerging market economies, albeit for different reasons, and will precipitate a general flight to safety. As noted, growth outcomes have already disappointed repeatedly, including relative to the September 2011 and April 2012 WEO projections. These disappointments could be symptomatic of medium-term problems.

- In advanced economies that suffered from the financial crisis, prospects for employment remain dim, and many workers may ultimately drop out of the labor force. Banks are in the middle of an arduous process of lowering their leverage and strengthening their funding models. High public debt and, for some economies, external liabilities could mean new bouts of instability and generally low growth. Projections for these economies already incorporate marked-down estimates for potential output relative to precrisis trends, typically by 10 percent or more (Figure 1.14, panel 1). However, output could be lower still over the medium term.

- In response to forecast errors and policy changes, estimates for the medium-term output levels of emerging market economies have been marked down (relative to September 2011 estimates)—by about 3 percent for Brazil, 5 percent for China, and 10 percent for India, for example—and there may be more to come (Figure 1.14, panel 4). The April 2012 WEO already featured a downside scenario with weaker potential output in emerging Asian economies. Given recent disappointments elsewhere, this scenario is broadened to other emerging market economies. In fact, many emerging Asian and Latin American economies have seen growth above the 10-year precrisis average, and the IMF staff sees further scope for such high growth, as evidenced by WEO output gap estimates that point to slack (Figure 1.14, panel 1). The findings of Chapter 4 justify this optimism to some extent: there are indications of growing resilience on the part of emerging market and developing economies, mainly reflecting stronger policies. However, the chapter's findings suggest that less frequent adverse funding and terms-of-trade shocks have also played a role in these economies' recent strong performance, and the frequency of such shocks could increase again. Moreover, strong credit growth, which likely supported demand, cannot continue at the present pace without raising concerns about financial stability in many of these economies (Figure 1.14, panels 2 and 3). In short, there may be less cyclical slack and scope to grow over the medium term than suggested by IMF staff projections.

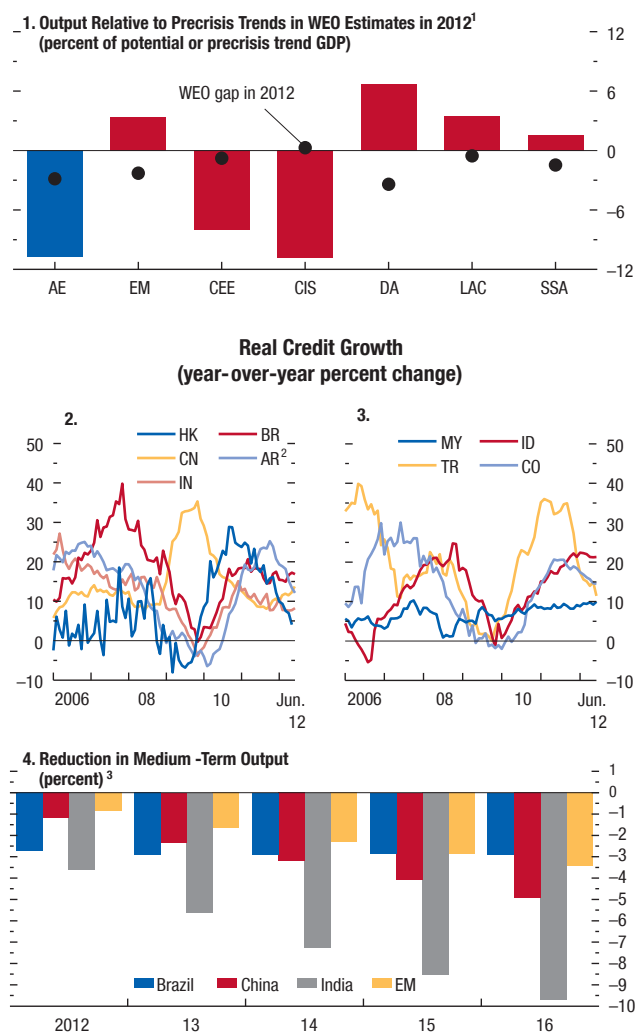The scenario used to model lower potential output and the global macroeconomic implications

is the IMF staff's Global Economy Model. Figure 1.15 shows the impact of downward revisions to medium-term output growth by about ½ percent in the United States, the euro area, and Latin America and by about 1 percent in Asia. Along the transition path to lower equilibrium output is a flight into the most liquid and safest assets—mainly cash—because of growing concern about prospects, and private and public risk premiums increase temporarily. In this scenario, global growth for 2013–16 is only about 2 to 3 percent, or 1½ to 2 percentage points below the baseline WEO forecast. The euro area and Japan would experience several years of stagnation or recession, whereas the United States would see positive but very modest growth. Eventually, advanced economies have some scope to ease monetary policy as the zero bound no longer binds, which helps support growth toward the very end of the WEO horizon and bring inflation back toward the baseline. Growth in emerging Asia would be closer to 5 to 6 percent, rather than 7 to 8 percent; in Latin America, it would be about 2½ percent rather than 4 percent as weaker global growth translates into significantly weaker demand for commodities. The price of oil falls by roughly 30 percent after three years, with prices for non-oil commodities falling by roughly 20 percent. These drops, in turn, lower growth in Africa and the Middle East. Developments in the real world could easily be much worse than the model suggests. The reason is that the model does not consider the social and political ramifications of rising unemployment; nor can it do justice to the adverse feedback loops between activity, banks, and sovereigns that can be triggered by unusually large shocks.

Policy Requirements

Five years after the onset of the Great Recession, the recovery remains tepid and bumpy, and prospects remain very uncertain. Unemployment is unacceptably high in most advanced economies, and workers in emerging market and developing economies face a chronic struggle to find formal employment. Aside from the legacies of the crisis, uncertainty itself is likely to weigh on output (Box 1.3).

Figure 1.14. Output in Emerging Market and Developing Economies

Output in emerging market and developing economies in Asia and Latin America is above precrisis trends, but WEO output gap estimates still see some slack. Amid disappointment relative to output projections, estimates for medium-term output have been lowered. For China and India, the reduction amounts to 5 to 10 percentage points by 2016; for all emerging market and developing economies, the reduction amounts to about 3½ percentage points. Buoyant activity in many emerging market and developing economies has been driven partly by better policies and partly by high credit growth and favorable terms-of-trade shocks. In many economies, the high credit growth will be difficult to sustain at present rates without weakening bank balance sheets. Also, future improvements in the terms of trade may be more limited. Thus, there are risks that medium-term output could surprise further on the downside.
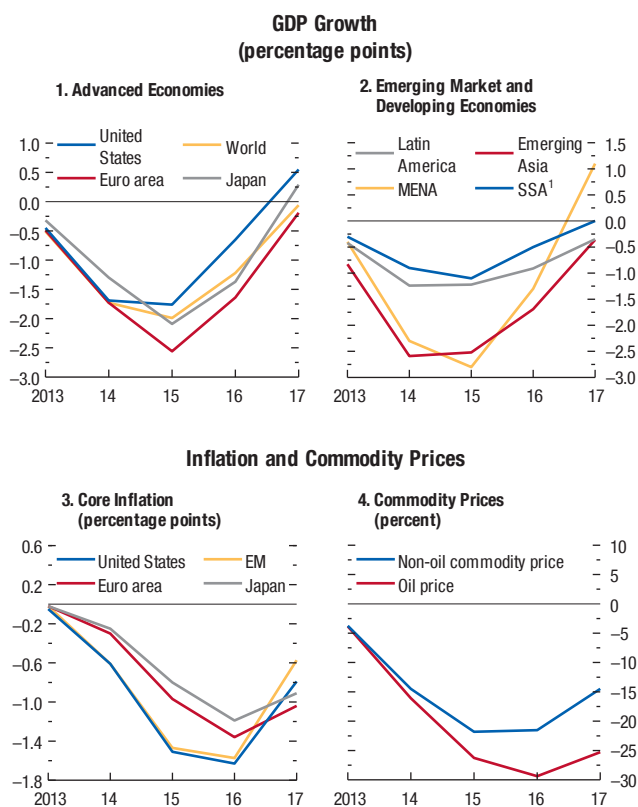

1. Output Relative to Precrisis Trends in WEO Estimates in 2012[1] (percent of potential or precrisis trend GDP)

Real Credit Growth (year-over-year percent change)

2.

3.

4. Reduction in Medium-Term Output (percent)[3]

Sources: IMF, *International Financial Statistics;* and IMF staff estimates.
Note: AE = advanced economies; AR = Argentina; BR = Brazil; CEE = central and eastern Europe; CIS = Commonwealth of Independent States; CN = China; CO = Colombia; DA = developing Asia; EM = emerging market economies; HK = Hong Kong SAR; ID = Indonesia; IN = India; LAC = Latin America and the Caribbean; MY = Malaysia; SSA = sub-Saharan Africa; TR = Turkey.
[1]Precrisis trend is defined as the geometric average of real GDP level growth between 1996 and 2006.
[2]Nominal credit is deflated using the IMF staff's estimate of average provincial inflation.
[3]Relative to September 2011 WEO.

Figure 1.15. Lower Global Growth Scenario
(Percent or percentage point deviation from baseline)

This scenario uses the IMF's Global Economy Model to trace the global macroeconomic implications of slower potential growth and temporarily higher risk premiums. For the United States and the euro area, this scenario assumes that annual potential output growth is ½ percentage point below baseline over the WEO horizon, whereas for Japan, growth is ¼ percentage point below baseline. In emerging Asia, potential growth is assumed to be 1 percentage point lower than baseline. For Latin American and all remaining countries, it is assumed that potential growth is ½ percentage point below baseline. It takes until mid-2015 before it becomes clear that potential growth will be lower until end-2017. For advanced economies, this raises debt-sustainability concerns, and sovereign risk premiums rise by 50 basis points by 2016 before gradually returning to baseline. As sovereign risk premiums rise, advanced economies gradually tighten fiscal policy. The fiscal balance improves by 1 percent of GDP by 2016, and then gradually returns to baseline once the debt-to-GDP ratio declines and risk premiums moderate. In emerging market and developing economies, lower growth prospects raise concerns about the viability of some private investment, and corporate risk premiums rise, particularly in the tradable sector. In this sector, corporate risk premiums peak roughly 200 basis points above baseline in 2016 in emerging Asia and about 150 basis points above baseline in Latin America. In the G3 (euro area, Japan, United States), monetary policy is constrained by the zero bound on nominal policy interest rates. For the first few years, interest rates cannot ease at all relative to the baseline, and beyond that, there is only limited scope for easing.

GDP growth in all regions is well below the WEO baseline between 2013 and 2016, with global growth roughly 2 percentage points lower in 2015. Eventually, advanced economies have scope to ease monetary policy, which helps support growth toward the end of the WEO horizon and bring inflation back toward the baseline. Lower global growth translates into weaker demand for commodities, and the price of oil falls by roughly 30 percent after three years, with non-oil commodities falling by roughly 20 percent.

GDP Growth
(percentage points)

1. Advanced Economies

2. Emerging Market and Developing Economies

Inflation and Commodity Prices

3. Core Inflation
(percentage points)

4. Commodity Prices
(percent)

Source: IMF staff estimates.
Note: EM = emerging market and developing economies; MENA = Middle East and North Africa; SSA = sub-Saharan Africa.
[1]Excluding South Africa.

A basic challenge for policymakers is thus to move away from an incremental approach to policymaking and address the many downside risks to global activity with strong medium-term fiscal and structural reform programs in order to rebuild confidence. In the euro area, action is also needed to address the current crisis and, over the medium term, to complete the EMU. Only after substantial progress is made on these various fronts will confidence and demand strengthen durably in the major advanced economies. Investors will be reassured that public debt is a safe investment and that advanced economy central banks have scope to use monetary policy to maintain low inflation and forestall renewed bouts of financial instability. Policymakers in emerging market and developing economies will need to balance two priorities: rebuilding policy buffers so as to maintain hard-won increases in the resilience of their economies to shocks and supporting domestic activity in response to growing downside risks to external demand.

Addressing the Euro Area Crisis

Despite policy progress, the euro area crisis has deepened. Unless recent ECB actions are followed up with more proactive policies by others, the WEO forecast and GFSR *baseline scenario* may once again prove overly optimistic and the euro area could slide into the *weak policies* scenario, with deleterious consequences for the rest of the world.

Ensuring market confidence in the viability of the EMU will require robust action on multiple fronts. Sovereigns under stress must continue to adjust, and support for these countries and their banks needs to be provided via the EFSF and the ESM to relieve funding pressures and break the adverse feedback loops between sovereigns and banks. Meanwhile, the ECB's commitment to act on secondary markets via the OMT program is very important to address elevated risk premiums due to convertibility concerns, and monetary policy should be very accommodative to support demand. Anticrisis measures must be anchored by the vision of—as well as reasonably fast and tangible progress toward—a more complete monetary union.

- EU partners should support countries making adequate adjustment efforts but still subject to market pressure. While economies in the periphery must continue to adjust their fiscal balances at a pace they can bear, it is essential to ensure their access to funding at reasonable cost. Common resources can be channeled via the EFSF or the ESM—and countries in need should request those resources, with the goal of preserving or regaining market access.

- Direct equity injections into banks are key to cutting bank-sovereign loops in the near term. For this to happen, the ESM needs to be made operational as soon as possible, and a single supervisory mechanism—a precondition for the ESM to take a stake in banks—should be established quickly, following up on the European Commission's proposals to that effect. Viable banks should be recapitalized, but those that are nonviable should be resolved, in part to minimize fiscal costs.

- An integrated regulatory and supervisory structure—a banking union—is indispensable for the smooth functioning of integrated financial markets in the EMU. Such a union should rest on four pillars: common supervision, harmonized regulation, a pan-European deposit guarantee scheme, and a pan-European resolution mechanism with common backstops. The last two building blocks are critical, and proposals for them still need to be spelled out.

Fiscal integration would provide critical tools to support a banking union, improve fiscal discipline, and enhance adjustment to idiosyncratic shocks while preventing them from becoming systemic. The immediate priority is to establish a common fiscal backstop for a banking union anchored on a single supervisory mechanism. More generally, fiscal risk sharing is an integral component of common currency areas. However, mutual support needs to be complemented by stricter and more robustly enforced rules and greater coordination of national policies—including through swift approval and sensible implementation of the Fiscal Compact (at the country level). There are different ways to achieve ex ante risk sharing, but all approaches would benefit from a clear road map.

Rebuilding Room for Fiscal Policy Maneuvering

Fiscal adjustment has become necessary in many cases to strengthen confidence in sovereign balance sheets and in many other cases because the prospects for future potential output—and hence revenue growth—are substantially less promising than they were before 2008. Unless governments spell out how they intend to effect the necessary adjustment over the medium term, a cloud of uncertainty will continue to hang over the international economy, with downside risks for output and employment in the short term.

Fiscal adjustment should be gradual and sustained, where possible, supported by structural changes, as, inevitably, it weighs on weak demand. Developments suggest that short-term fiscal multipliers may have been larger than expected at the time of fiscal planning (Box 1.1). Research reported in previous issues of the WEO finds that fiscal multipliers have been close to 1 in a world in which many countries adjust together; the analysis here suggests that multipliers may recently have been larger than 1 (Box 1.1).[4] There are other reasons for avoiding abrupt adjustments: fiscal problems can be rooted in structural problems that take time to address, and sharp expenditure cutbacks or tax increases can set off vicious cycles of falling activity and rising debt ratios, ultimately undercutting political support for adjustment. The historical record for public debt reduction suggests that a gradual, sustained approach supported by structural changes offers the best chance for success within today's constraints (Chapter 3).

To build credibility, governments should commit to measures and medium-term targets that are actually under their control. They must clearly explain how they will react to such setbacks as unexpected slowdowns in activity or increases in funding costs. Except in economies facing acute financing constraints, automatic stabilizers should be allowed to operate freely. Budget forecasts must be based on realistic assumptions about the negative short-term impact of adjustment on output and employment. Similarly, projections for the evolution of debt

---

[4]See for example, chapter 3 of the October 2010 *World Economic Outlook.*

ratios should be based on realistic, not optimistic, assumptions about the growth of potential output and interest rates. In short, fiscal policy must be transparent, realistic, and predictable, and although geared toward medium-term objectives, it should be a stabilizing factor against short-term downturns or booms. Clear analogies can be drawn with the practice of successful monetary policy.

Among the advanced economies, planned fiscal adjustment is sizable over the near term. The main policy shortfalls, discussed in more detail in the October 2012 *Fiscal Monitor*, relate to the need for stronger commitment to a sound fiscal framework:

- To anchor market expectations, policymakers need to specify adequately detailed medium-term plans for lowering debt ratios, which must be backed by binding legislation or fiscal frameworks. Among large advanced economies, the United States lacks such a plan, and Japan's medium-term plan needs to be strengthened, notwithstanding the welcome legislative passage of the doubling of the consumption tax. U.S. authorities must now urgently deal with the debt ceiling and the fiscal cliff, which would severely affect growth in the short term; the Japanese authorities also need to quickly approve funding for this year's budget.
- Countries should go much further in reducing the growth of aging-related expenditures—an issue that they cannot avoid forever—because such reductions can greatly improve debt dynamics without detracting severely from demand in the short term.
- More countries need to define targets in structural or cyclically adjusted terms and prepare contingency plans for coping with shocks. The first line of defense against shocks should be automatic stabilizers and monetary policy, including unconventional support and measures to improve the transmission of already low policy rates to demand. But these efforts might not suffice. Should growth fall significantly short of WEO projections, countries with room to maneuver should smooth their planned adjustment over 2013 and beyond.
- Emerging market and developing economies typically have much lower public debt than do advanced economies and therefore less urgent need for fiscal adjustment, but they still should

rebuild room for policy maneuvering. Deficits are appreciably larger than before 2008, even in countries that were not hit by the crisis. These countries have typically experienced a relatively quick recovery and are operating above precrisis trends. Therefore, now is an appropriate time for them to adopt fiscal consolidation to fully restore their flexibility to deal with unexpected adverse contingencies. They should leave the task of supporting demand in response to greater-than-expected external weakness to monetary policy.

Among the major emerging market economies, more effort is needed in India, Russia, and, over the medium term, Turkey. China, also slowing, is different for two reasons: first, the authorities are trying to rebalance economic growth toward consumption, which will require expanding social support programs, and second, less scope is available for credit growth because the economy is still digesting a large expansion of credit released in response to the Great Recession. Similarly, the major oil exporters are also increasing spending to address social challenges, which is helping to rebalance global demand. Over the medium term, however, these economies will need to bring spending growth down to more sustainable levels.

Supporting Adjustment with Liquidity

In many advanced economies, ample liquidity provision continues to be essential given the weakness of demand and the very protracted implementation periods for fiscal, financial, and structural adjustment. Prudential authorities must ensure that they control the risks that may be created by the extended period of low yields and exceptionally easy access to central bank funding. Easy credit provides incentives for excessive risk taking and also gives banks easy options for postponing desirable restructuring. Over time, very low interest rates may distort the efficient investment of savings, which is an underlying function of the financial system. Credible medium-term fiscal adjustment programs and banking system restructuring are extremely valuable supports to the monetary policy objective of keeping inflation expectations firmly anchored at a low rate while maintaining financial stability.

A widespread concern is that monetary stimulus is not reaching all markets evenly. Households and small companies struggle to obtain bank loans, whereas large corporations are paying record low rates in bond markets. In the euro area, bank lending is slumping in the periphery but still growing in Germany. Changes in borrower risk premiums in response to changes in economic conditions and tighter bank lending policies in response to strained capital and funding are playing important roles. However, large differences in financing conditions do not mean that monetary policy is not working. The actions taken by central banks have forestalled worse outcomes. In some euro area economies, such as France and Italy, credit has thus far fared better during the current recovery than during the post-1993 recovery, despite a much larger drop in output (Figure 1.16, panels 3–6). The same holds in comparison with U.S. credit after 1989 (Figure 1.16, panels 1 and 2). More generally, liquidity provision has prevented a collapse of the banking systems in the periphery economies.

Specific monetary policy requirements vary across economies. In many advanced economies, the stance should remain very accommodative, given that inflation expectations are well anchored, headline and core inflation are receding, and activity is typically well below potential. Policymakers should continue to help reduce risk premiums and improve the transmission of monetary policy to the real economy, with direct interventions in key asset markets or with measures to strengthen banks' incentives to lend, such as the Bank of England's FLS. The specific policy requirements for the major economies are the following:

- The Federal Reserve has recently adopted strong measures to ease monetary and financial conditions, consistent with high unemployment and headline inflation that is projected to drop below 2 percent. The traction of these and previous unconventional measures would be greatly enhanced if more progress were made in mortgage debt relief for overly burdened households and in the reform of the housing market.
- In the euro area, underlying inflation pressure is low—core inflation has been running about 1½ percent for some time, with tax and administrative price hikes contributing about ¼ to ½

Figure 1.16. Crisis Comparisons
(Index; years from crisis on x-axis)

Credit appears to be doing better after the Great Recession than after previous recessions associated with credit crises. For example, domestic credit in the United States has held up better than after 1989, notwithstanding a much sharper drop in output. The same holds for credit in France and Italy when compared with the European exchange rate mechanism (ERM) crisis, although real credit is now falling in Italy. In Spain, credit is doing less well, consistent with a larger drop in output. Overall, these output and credit developments suggest that low policy rates and unconventional measures have, thus far, helped avert a much deeper credit crunch. However, more action is needed to sustain and improve credit, especially in the euro area periphery.
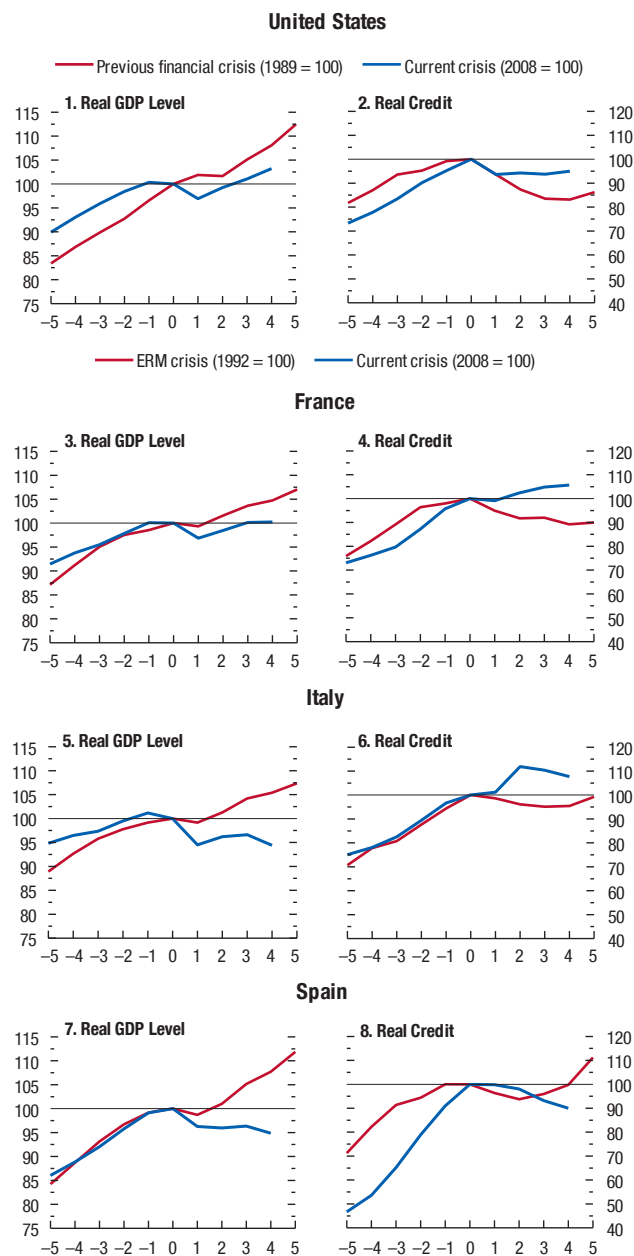
Sources: IMF, *International Financial Statistics*; and IMF staff calculations.
Note: Latest 2012 credit data are based on June 2012 levels.

percentage point. Headline inflation is forecast to decline to about 1½ percent during the course of 2013, and risks from domestic wages and profits are to the downside—the IMF staff's Global Projection Model suggests that the probability of falling prices is unusually high, reaching almost 25 percent (Figure 1.12, panel 2). This projection gives the ECB ample justification for keeping policy rates very low or cutting them further.

- In Japan, inflation is forecast to remain near zero in 2012 and 2013. The easing of monetary policy announced in September is welcome and should help support economic growth and an exit from deflation. However, further easing of monetary policy may be needed to accelerate achievement of the Bank of Japan's (BoJ's) inflation goal of 1 percent, supported by enhanced communication of the policy stance and framework. Any further easing by the BoJ could include purchasing Japanese government bonds with longer maturities, as well as selected private paper.

Among emerging market and developing economies, policy requirements differ, but many can afford to wait and see or to ease policy further because of downside risks to activity. Headline and core inflation are generally declining. The main reason for caution is that although credit growth rates have recently come down, they remain at fairly elevated levels (Figure 1.14, panels 2 and 3). Supervisory and macroprudential measures should be employed to counter any emerging credit bubbles, such as in real estate.

- In emerging Asia, headline and core inflation rates have been low or declining. In many economies, inflation is forecast to be close to 3 percent over the medium term. Credit has expanded rapidly in a number of these economies (China, India) and is still expanding quickly in some (Indonesia and, to a lesser extent, Malaysia); several have also seen booming real estate prices. Various economies' currencies are undervalued relative to medium-term fundamentals (China, Malaysia, Thailand). Considering this credit and exchange rate picture, these countries should wait and see or consider modest further easing of monetary policy stances and rely mainly on fiscal policy to support demand. Those with less fiscal space could proceed to more monetary easing, provided macroprudential measures keep credit growth in check. Those with high inflation (India, Vietnam) cannot afford to loosen monetary policy unless they slow down domestic demand with more fiscal adjustment.

- In Latin America, many economies are forecast to operate with inflation near or below 5 percent in 2013, which is appreciably less than in 2011. High credit growth rates bear watching. Considering the downside risks to the global growth outlook, many central banks can afford to hold steady; if these risks materialize, they can reduce policy rates. High or rising real estate prices or growing household debt burdens, notably in Brazil, call for continued vigilence by policymakers. Central banks in economies with relatively high inflation (Argentina, Venezuela) will need to tighten further.

- Inflation rates are low or forecast to decline noticeably in many emerging European economies, typically to about 3 percent. There is therefore room for easing in various economies in response to very high unemployment rates and sluggish activity. Much higher and more volatile inflation in the CIS stands in the way of lower policy rates. The same holds for a number of economies in the MENA region and SSA.

Sharp increases in food prices present significant challenges for policymakers on many fronts (see the Special Feature). Regarding monetary policy, the concern is that the heavy weight of food in the consumption baskets of poorer households could trigger a push for higher wages and thus second-round effects on inflation. In this setting, monetary policymakers need to communicate that they will tighten policy if threats of second-round effects build. Until they do, however, central banks should not react to food prices, which would destabilize output and inflation over the medium term.[5]

Advancing Global Demand Rebalancing

The slowdown in global trade and activity has been accompanied by a marked narrowing of global

---

[5]For a detailed discussion, see Chapter 3 of the September 2011 *World Economic Outlook*.

imbalances, and this is projected to persist (Figure 1.17, panel 1).[6] As discussed in the April 2012 WEO and a recent IMF *Pilot External Sector Report* (IMF, 2012d), most of this narrowing reflects weaker domestic demand from crisis-stricken, external-deficit economies rather than stronger demand from external-surplus economies. But healthier adjustments have taken place—improvements in fiscal balances in external-deficit economies, resilient domestic demand in China, and more social spending by oil exporters—which are bringing down their large surpluses.

In the euro area, imbalances have narrowed but mainly because of lower demand in the deficit economies of the periphery; labor costs have adjusted relative to the core but this process has much further to go (Figure 1.18, panels 1–3). Adjustments in surplus economies toward stronger, domestic-demand-driven growth are at an early stage. External indicators for Germany, the main surplus country, suggest that its internal demand rebalancing process is less advanced than that of Japan or China (see Figure 1.9). Furthermore, major adjustment is still needed in the deficit economies, notably Greece and Portugal, to reduce their net foreign liabilities to 35 percent of GDP, the indicative guideline under the European Commission's Macroeconomic Imbalance Procedure (Figure 1.18, panel 4).

Despite recent improvements, global imbalances and the associated vulnerabilities are likely to remain well above desirable levels unless governments take additional, decisive action (IMF, 2012d). The current account positions of the G3 economies are all estimated to be weaker and their real effective exchange rates stronger than desirable because of unduly large fiscal deficits (Figure 1.17, panel 3). By contrast, in many Asian economies, including China, Korea, Malaysia, Singapore, and Thailand, current account positions are stronger and currencies weaker than they would be with a more desirable set of policies. Several of these economies have accumulated very high levels of official reserves or have internal distortions that hold back consumption (Figure 1.17, panel 4). Among the large economies of the euro area, policies

[6]Imbalances are current accounts that differ from those warranted by fundamentals and desirable policies.

Figure 1.17. Global Imbalances

Global current account balances narrowed sharply during the Great Recession and are not projected to widen again, except for the contribution of emerging Asia. Exchange rate developments since the onset of the crisis have been consistent with global demand rebalancing. However, the appreciation of external surplus currencies has stopped during the past eight months. IMF staff assessments suggest that current account balances remain larger than desirable in emerging Asia and weaker elsewhere. Sustained accumulation of international reserves in these economies is contributing to global current account imbalances and associated vulnerabilities that are larger than desirable.
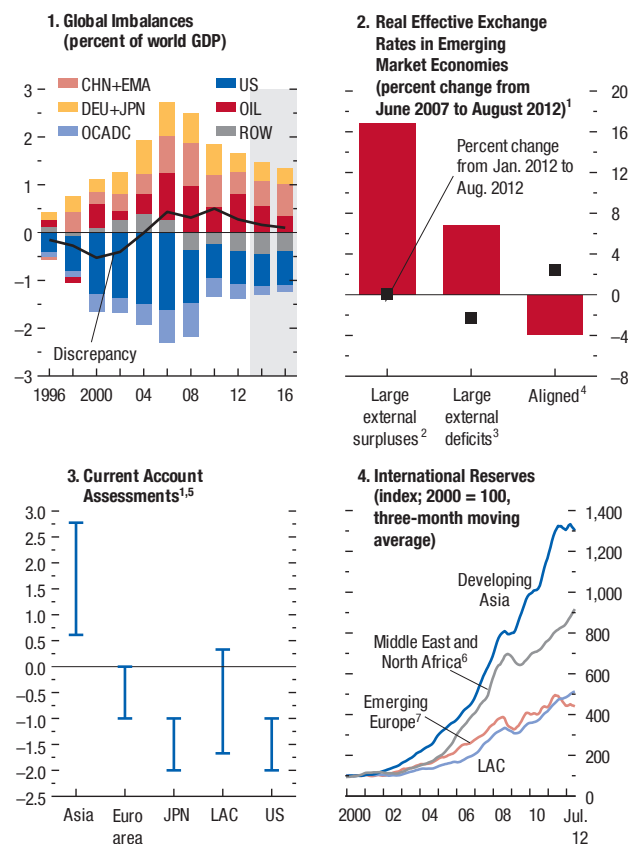
Sources: IMF, *International Financial Statistics;* and IMF staff estimates.
Note: CHN+EMA: China, Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand; DEU+ JPN: Germany and Japan; LAC: Latin America and the Caribbean; OCADC: Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Ireland, Latvia, Lithuania, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Turkey, and United Kingdom; OIL: oil exporters; ROW: rest of the world; US: United States.
[1]Classifications are based on the IMF staff's *Pilot External Sector Report* (2012d), which covers Australia, Belgium, Brazil, Canada, China, euro area, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, Poland, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, and United States.
[2]These economies account for 12.3 percent of global GDP.
[3]These economies account for 7.3 percent of global GDP.
[4]These economies account for 4.8 percent of global GDP.
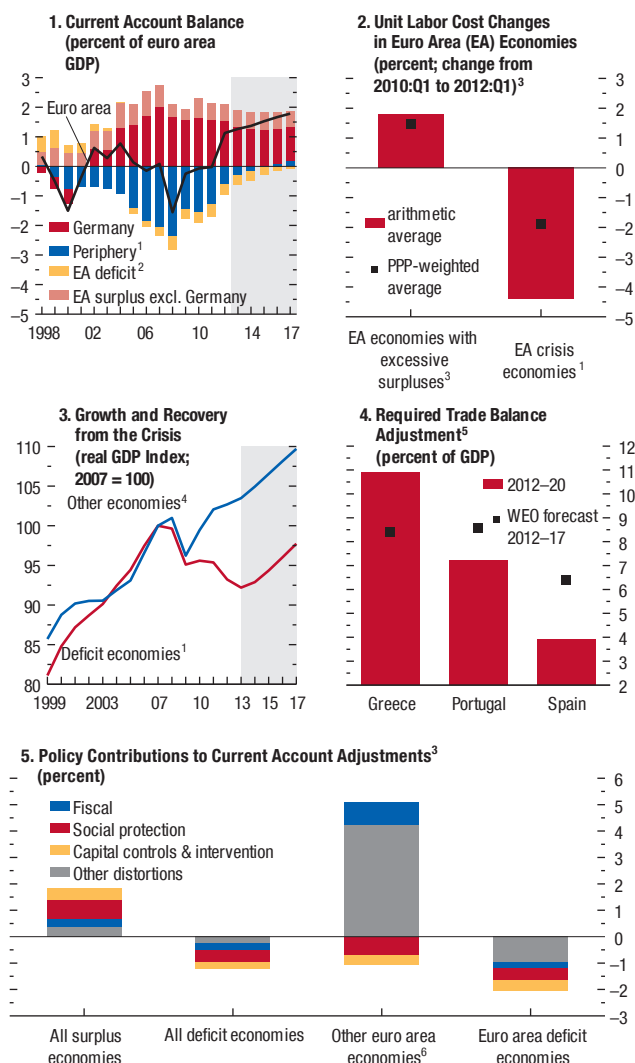[5]Estimated differences between cyclically adjusted current accounts and those consistent with fundamentals and desirable policies (percent of GDP).
[6]Bahrain, Djibouti, Egypt, Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates, and Yemen.
[7]Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, and Turkey.

Figure 1.18. Euro Area Imbalances

Current account imbalances have also narrowed within the euro area, reflecting mainly a collapse of demand in the deficit economies in the periphery rather than stronger demand in surplus economies, such as Germany and the Netherlands. Since the onset of the crisis, unit labor costs have grown less in the deficit economies than in the surplus economies, but more adjustment will be needed. Reducing global and euro area current account imbalances will also require further policy changes. In external-deficit economies, these include reducing large fiscal deficits, slowing entitlement spending, and, within the euro area, reforming labor and product markets. In external-surplus economies, policies should improve social protection and remove a variety of distortions.

1. Current Account Balance (percent of euro area GDP)

Euro area
Germany
Periphery[1]
EA deficit[2]
EA surplus excl. Germany

2. Unit Labor Cost Changes in Euro Area (EA) Economies (percent; change from 2010:Q1 to 2012:Q1)[3]

arithmetic average
PPP-weighted average

EA economies with excessive surpluses[3]
EA crisis economies[1]

3. Growth and Recovery from the Crisis (real GDP Index; 2007 = 100)

Other economies[4]
Deficit economies[1]

4. Required Trade Balance Adjustment[5] (percent of GDP)

2012–20
WEO forecast 2012–17

Greece
Portugal
Spain

5. Policy Contributions to Current Account Adjustments[3] (percent)

Fiscal
Social protection
Capital controls & intervention
Other distortions

All surplus economies
All deficit economies
Other euro area economies[6]
Euro area deficit economies

Sources: Eurostat; and IMF staff estimates.
Note: PPP = purchasing power parity.
[1]Greece, Ireland, Italy, Portugal, Spain.
[2]Excludes five periphery economies.
[3]Classifications based on the IMF Staff's *Pilot External Sector Report* (2012d), which covers Australia, Belgium, Brazil, Canada, China, euro area, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, Poland, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, and United States.
[4]Austria, Belgium, Finland, Germany, Luxembourg, and Netherlands.
[5]Required adjustment of the trade balance between 2012 and 2020 to lower net foreign liabilities to 35 percent of GDP by 2030, assuming that the nominal external interest rate is 3 percent and that the nominal GDP growth rate stays at the level projected for 2017.
[6]Germany, Netherlands.

that would result in stronger domestic demand for Germany and stronger competitiveness for France, Italy, and Spain would be beneficial.

It must be emphasized that the policies that would most effectively lower global imbalances and related vulnerabilities serve the self-interests of the countries concerned, even when considered purely from a domestic viewpoint (Figure 1.18, panel 5). Many external-deficit economies need strong medium-term fiscal adjustment programs—the need is urgent for the United States. In the euro area, much of the planned adjustment in the periphery economies would be warranted regardless of their external positions, and such fiscal efforts must be complemented with structural reforms to labor and product markets that help rebuild competitiveness. The requirements for emerging market economies with external surpluses and undervalued currencies are to cut back official reserve accumulation, adopt more market-determined exchange systems, and implement structural reforms, for example, to broaden the social safety net.

Improving Growth Prospects with Structural Policies

Structural problems shape much of the legacy of the Great Recession. They also contribute to wide global current account imbalances, which have exacerbated the crisis in the euro area. The impact on growth of reforms to alleviate these structural problems can be significant. In an upside policy scenario produced by the IMF staff for the G20 Mutual Assessment Process, most of the 2½ percent increase in global output is generated by reforms to labor and product markets and the beneficial spillovers via international trade (IMF, 2012e). Through confidence and wealth effects and by facilitating relative price adjustments, structural reforms can promote aggregate demand, particularly investment, over time. But these benefits are unlikely to accrue unless such reforms are supported with macroeconomic policies that lower uncertainty and improve confidence among investors.

Structural policies in crisis-hit economies

Household debt and bank restructuring: Although only a few countries have adopted effective house-

hold debt restructuring programs, others should consider following their lead. Programs in the United States got off to a sluggish start, but the recent expansion of the modification and refinancing programs is welcome. Further steps would help support a recovery of the housing market. These could include participation by government-sponsored enterprises in the principal reduction program, implementation of the administration's proposal to further expand refinancing, timely expansion of the program aimed at fostering conversion of foreclosed properties into rental units, and permitting mortgages to be modified in bankruptcy courts. Other economies suffering from housing market slumps may also benefit from policies to directly alleviate household debt.[7]

Progress in financial sector reform, which is critical to building a safer global economy, has been patchy. Chapter 3 of the October 2012 GFSR observes that a host of regulatory reforms are under way but that the structure of financial intermediation remains largely unchanged and vulnerable. Areas that require further attention from policymakers include a global-level discussion of the pros and cons of direct restrictions on business models, monitoring and a set of prudential standards for non-bank financial institutions that pose systemic risks, incentives for the use of simpler financial products, further progress on recovery and resolution planning for large institutions, and cross-border resolution. Crucially, none of the current or prospective reforms will be effective in the absence of enhanced supervision, incentives for the private sector to follow the reforms, and the political will to deliver progress.

Bank restructuring has advanced on a broader front. Many countries have adopted programs to strengthen bank balance sheets and to tide banks over during temporary liquidity difficulties. Capital bases have been strengthened: between 2008 and 2011, for example, large European and U.S. banks raised common-equity-to-asset ratios by about one-fifth and one-third, respectively. They also reduced their reliance on wholesale funding, although such

---

[7]For a more in-depth discussion of issues related to household debt restructuring, see Chapter 3 of the April 2012 *World Economic Outlook.*

funding remains extensive in Europe. However, the worsening euro area crisis and weak global economy are posing increasingly severe banking difficulties. Prudential authorities must continue to push balance sheet repair and, where necessary, impose losses on bank stakeholders and force recapitalization. This may require the injection of public funds or the winding-up of weak institutions. In the periphery economies of the euro area, external support in the form of equity injections is critical to breaking the vicious feedback loops between deteriorating sovereigns and weakening banks.

Labor and product market reform: Progress has been uneven. A number of countries, especially in the euro area, are beginning to take action to improve the functioning of their labor markets, but there has been less action to tackle stubborn long-term unemployment or to reform the markets for products and, especially, for services.

Labor market reforms can boost employment in various ways. Reforms can lower hiring and firing costs or reduce minimum wages when they are high enough to undercut employment of the young or the less skilled. Such reforms are under way in Italy and Spain. Trilateral agreements between unions, employers, and their governments can be an important element of reform efforts by helping coordinate relative labor cost adjustment, which is essential for realigning competitiveness between deficit and surplus economies in the euro area. Unions and employers can also develop more flexible collective wage bargaining agreements, as they have done with much success in Germany. To the extent that large-scale wage cuts occur in deficit economies, households may need help to cope with their debt burdens, underscoring the significance of effective household debt restructuring programs. Active labor market policies can have very positive effects on employment by promoting better job matching and supporting education and vocational training for workers displaced by sector-specific shocks, such as the collapse of construction activity in Spain and the United States. Labor force participation can be buoyed by subsidies for jobs filled by the long-term unemployed or jobs created by small and medium-size firms, many of which are finding it hard to obtain credit.

In various economies, especially in Europe, reform of the services sector should be accelerated, not least to help generate more employment over the medium term. Stronger competition and lower barriers to entry would help ensure that lower wages result in more job creation rather than higher profits for firms. The business environment in various euro area economies also needs to be improved by reducing procedures and costs that weigh on entrepreneurship and by streamlining bankruptcy proceedings to better defend property rights and facilitate exit of inefficient firms (Barkbu and others, 2012).

Structural reforms to facilitate global demand rebalancing

Structural reforms will be important in boosting growth and fostering global demand rebalancing while reducing associated vulnerabilities. In surplus countries such as China and Germany, reforms are needed to boost domestic demand; in deficit countries such as Brazil and India, they are needed to improve supply.

- In Germany, structural reforms will be needed to boost the relatively low level of investment and, more generally, increase potential growth from domestic sources. In the near term, the underlying strength in the labor market should foster a pickup in wages, inflation, and asset prices, and this should be seen as part of a natural rebalancing process within a currency union. By way of example, inflation in Germany and the Netherlands, the other major surplus economy in the euro area, would have to be about 3 to 4 percent to keep euro area inflation close to the ECB's target of "below but close to 2 percent," if inflation in Greece, Ireland, Italy, Portugal, and Spain were kept around zero to 1 percent and inflation elsewhere remained in line with the ECB target. This underscores the importance of wage and spending adjustments in the surplus economies for the proper functioning of the EMU.

- Previous reports for China have stressed the need for better pension and health care support to lower precautionary saving and boost consumption. Progress is being made on these fronts, but the measures will take time to exert their effects on demand. Meanwhile, support for demand continues to come mainly from measures that support more investment. An obvious risk is that the quality of bank lending could be further lowered, adding to already ample capacity in the export sector or boosting already-high real estate prices.

- In India, there is an urgent need to reaccelerate infrastructure investment, especially in the energy sector, and to launch a new set of structural reforms, with a view to boosting business investment and removing supply bottlenecks. Structural reform also includes tax and spending reforms, in particular, reducing or eliminating subsidies, while protecting the poor. In this regard, the recent announcements with respect to easing restrictions on foreign direct investment in some sectors, privatizations, and lowering fuel subsidies are very welcome.

- Brazil's consumption boom has been a large component of its strong growth performance, and domestic saving and investment remain relatively low. Reforms could usefully focus on further developing the defined-contribution pillar of the pension system, streamlining the tax system, and developing long-term financial instruments.

Special Feature: Commodity Market Review

The first section of this special feature discusses developments in commodity prices, and the second confirms that fluctuations in demand have played a key role in the drop in prices during the second quarter of 2012. The important complementary role of supply developments is discussed for energy markets in the third section and for food markets in the fourth, as these contributed to sharp price increases during the third quarter of 2012. The special feature concludes with the outlook for commodity markets.

## Price Developments during 2012

Broad developments

After a robust recovery during 2009–10, the IMF's Primary Commodities Price Index (PCPI) stayed essentially flat during 2011 and then fell during the second quarter of 2012, only to stage a comeback in the third quarter (Figure 1.SF.1). The PCPI is a weighted average of prices for 51 primary commodities, grouped into three main clusters—energy, industrial inputs (mainly base metals), and edibles (of which food is the main component—Table 1.SF.1). Among the three clusters, energy and base metal prices declined during the second quarter by nearly 30 and 20 percent, respectively, from their first quarter peaks. Although metal prices have leveled off during the third quarter, energy prices increased sharply once again, by about 13 percent (through August). Food prices remained broadly flat until mid-June, but have increased since then, by about 10 percent.

Energy prices

The prices of petroleum, natural gas, and coal together have a weight of nearly two-thirds in the PCPI; petroleum alone accounts for more than half of the index. The average petroleum spot price (APSP)—a simple average of the Brent, Dubai, and West Texas

Figure 1.SF.1. IMF Commodity Price Index
(2005 = 100)
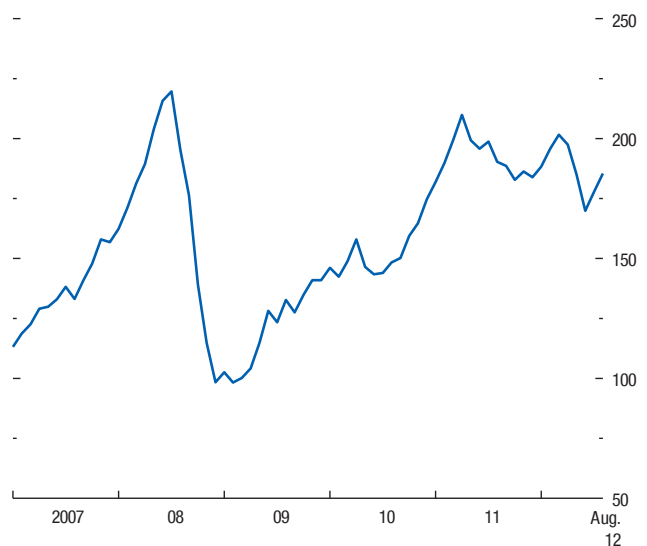
Source: IMF, Primary Commodity Price System.

Table 1.SF.1. Indices of Market Prices for Nonfuel and Fuel Commodities, 2009–12

(2005 = 100, in U.S. dollar terms)[1]

Commodities	Weights	2009	2010	2011	2011:Q3	2011:Q4	2012:Q1	2012:Q2
Nonfuel Commodities	36.9	127.4	161.0	189.6	190.7	168.0	172.8	170.2
Food	16.7	134.0	149.4	178.8	179.1	163.8	168.8	171.0
Cereals	3.6	162.4	166.5	231.2	236.2	216.6	216.6	215.7
Wheat	1.7	146.6	146.7	207.4	207.0	183.5	182.9	176.4
Maize	1.0	168.2	189.0	296.5	307.3	273.5	282.2	274.4
Rice	0.6	204.8	180.9	191.7	201.4	207.6	192.9	209.0
Barley	0.3	135.0	166.6	217.9	221.8	221.7	226.7	247.1
Vegetable Oils and Protein Meals	4.4	154.0	170.4	209.1	209.6	189.7	202.5	216.7
Soybeans	1.2	169.7	172.5	217.0	223.2	193.4	209.1	234.9
Soybean Meal	0.8	174.6	161.0	184.1	188.7	161.6	181.0	221.0
Soybean Oil	0.4	158.8	186.6	245.2	247.9	225.1	235.2	233.0
Palm Oil	0.7	175.2	233.9	292.8	278.9	260.1	287.7	282.5
Fish Meal	0.2	168.7	233.7	204.1	191.3	184.7	176.0	204.6
Sunflower Oil	0.2	91.0	103.6	141.7	146.1	135.6	129.2	125.9
Olive Oil	0.3	63.6	57.5	55.6	55.6	54.4	52.5	51.8
Groundnuts	0.2	129.3	161.1	224.2	231.5	240.3	240.6	238.3
Rapeseed Oil	0.3	118.8	140.3	189.6	187.8	175.4	177.5	172.1
Meat	3.7	98.0	117.2	134.5	136.4	134.2	136.2	133.4
Beef	1.4	100.8	128.4	154.3	150.1	154.7	162.7	158.1
Lamb	0.3	91.3	90.5	92.7	94.0	88.0	77.7	62.0
Pork	1.1	82.4	110.0	131.6	142.1	129.1	125.7	123.5
Poultry	0.9	115.9	116.2	118.2	119.3	120.9	123.7	127.1
Seafood	3.2	113.7	135.9	132.8	119.6	102.9	109.8	111.8
Fish	2.5	121.2	151.3	145.5	128.4	107.3	116.4	119.2
Shrimp	0.7	84.7	75.9	83.4	85.4	85.9	83.9	82.9
Sugar	0.9	151.8	172.0	210.8	225.4	200.3	192.5	172.7
Free Markets	0.6	180.2	207.5	260.5	281.3	245.7	235.8	208.0
United States	0.1	115.5	147.4	178.3	184.8	178.6	162.7	144.3
European Union	0.2	86.0	85.0	88.1	88.4	86.5	86.3	87.0
Bananas	0.4	147.0	152.8	169.2	165.9	165.4	181.4	170.0
Oranges	0.5	107.9	122.1	105.8	123.3	97.9	91.5	100.2
Beverages	1.8	154.4	176.2	205.5	207.9	184.6	175.2	162.7
Coffee	0.9	131.5	165.4	231.0	231.1	212.3	200.0	179.7
Other Milds	0.5	123.8	170.0	239.0	238.6	216.1	194.8	160.2
Robusta	0.3	144.5	157.6	217.3	218.3	205.9	208.8	213.0
Cocoa Beans	0.7	187.4	202.7	192.8	196.5	159.9	151.6	143.4
Tea	0.3	145.1	146.4	160.0	165.8	160.5	157.0	157.6
Agricultural Raw Materials[2]	7.7	94.1	125.4	153.8	153.2	135.1	135.8	136.9
Timber[2]	3.4	101.5	101.6	111.4	116.4	111.4	105.4	109.6
Hardwood	1.2	128.9	132.7	159.1	169.9	158.9	150.5	148.7
Logs[2]	0.4	141.4	137.6	193.2	220.0	202.3	184.6	178.6
Sawed[2]	0.8	123.5	130.6	144.5	148.5	140.2	135.8	135.9
Softwood	2.2	86.4	84.5	85.0	86.8	85.2	80.4	88.0
Logs[2]	0.4	75.3	77.9	82.6	80.9	79.2	79.8	77.6
Sawed[2]	1.8	88.6	85.8	85.5	88.0	86.4	80.5	90.1
Cotton	0.7	113.7	187.7	280.2	229.6	187.8	182.1	163.6
Wool	0.5	115.1	152.9	234.2	243.2	212.9	240.5	218.7
Fine	0.2	114.9	151.0	241.7	247.7	213.2	226.5	200.0
Coarse	0.3	115.2	154.6	227.9	239.4	212.6	252.2	234.3
Rubber	0.5	128.0	243.3	320.8	309.9	240.1	256.5	239.1
Hides	2.6	68.4	109.6	125.0	130.8	115.1	117.8	128.0
Metals	10.7	136.5	202.3	229.7	233.1	195.4	205.4	194.2
Copper	2.8	140.5	205.0	240.0	244.3	204.3	226.4	214.1
Aluminum	3.9	87.8	114.3	126.3	126.3	110.2	114.8	104.1

SPECIAL FEATURE

Table 1.SF.1. *(concluded)*

Commodities	Weights	2009	2010	2011	2011:Q3	2011:Q4	2012:Q1	2012:Q2
Iron Ore	1.3	284.6	521.9	596.9	625.7	500.9	504.5	496.3
Tin	0.2	184.2	275.8	352.7	333.9	282.3	310.6	278.3
Nickel	1.1	99.3	147.6	155.0	149.1	124.4	133.0	116.1
Zinc	0.6	120.1	156.5	159.0	161.1	138.1	146.9	139.7
Lead	0.2	176.5	220.5	246.4	251.8	204.5	214.8	202.7
Uranium	0.5	167.1	164.6	201.3	185.5	188.2	185.8	183.8
Energy	63.1	116.8	147.1	193.8	193.6	193.9	208.3	192.3
Spot Crude[3]	53.6	116.2	148.5	195.9	194.3	194.4	211.9	193.9
Natural Gas	6.9	109.6	113.3	154.3	165.4	172.6	170.9	178.0
Russian in Germany	3.2	149.7	139.0	179.1	188.3	204.2	208.8	212.5
Indonesian in Japan	1.9	106.5	133.4	221.2	245.4	253.8	249.3	271.5
U.S., Domestic Market	1.9	44.5	49.5	45.1	46.5	37.6	27.7	25.7
Coal	2.6	148.8	206.0	253.7	253.3	238.2	233.8	198.3
Australian, Export Markets	2.1	151.0	207.8	254.0	253.3	239.7	235.3	197.2
South African, Export Markets	0.5	140.2	198.5	252.5	253.4	232.0	228.0	202.9

Source: IMF, Primary Commodity Price System.

[1]Weights are based on 2002–04 average world export earnings.

[2]Provisional.

[3]Average petroleum spot price. Average of U.K. Brent, Dubai Fateh, and West Texas Intermediate, equally weighted.

Intermediate (WTI) crude oil varieties—increased from a low of $35 a barrel in late 2008 to a high of $120 a barrel in March 2012. Since then, oil prices declined during the second quarter only to climb back during the third, albeit with some volatility. Implied volatility remained moderate when compared with the spikes after the Libyan revolution in 2011 but picked up during the summer months (Figure 1.SF.2).

Metal and food prices

These two components comprise the remaining third of the PCPI, each receiving a similar weight. After a strong rally earlier in 2012, base metal prices declined in tandem with petroleum prices—albeit less sharply—during the second quarter and have leveled off somewhat during the third quarter (Figure 1.SF.3). After remaining broadly flat for much of the year, food prices started to pick up strongly in mid-June. Grain and soybean prices rose, offsetting the weakness in seafood, sugar, and vegetable oil prices. Implied volatility also rose significantly (Figure 1.SF.4).

Economic Activity and Commodity Prices

A tight link with demand

Fluctuations in economic activity and in the outlook are the primary determinants of short-term commodity price movements, with some caveats.
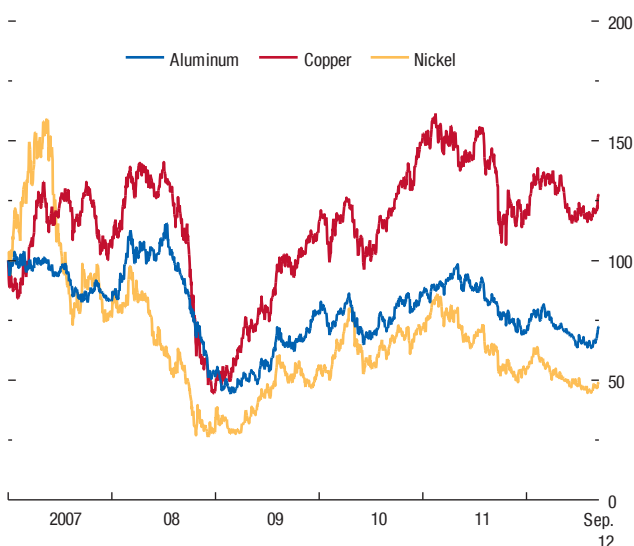
Figure 1.SF.2. Oil Prices and Volatility

1. Daily Crude Oil Spot Prices (U.S. dollars a barrel)

2. CBOE Oil Volatility Index (OVX)[2]
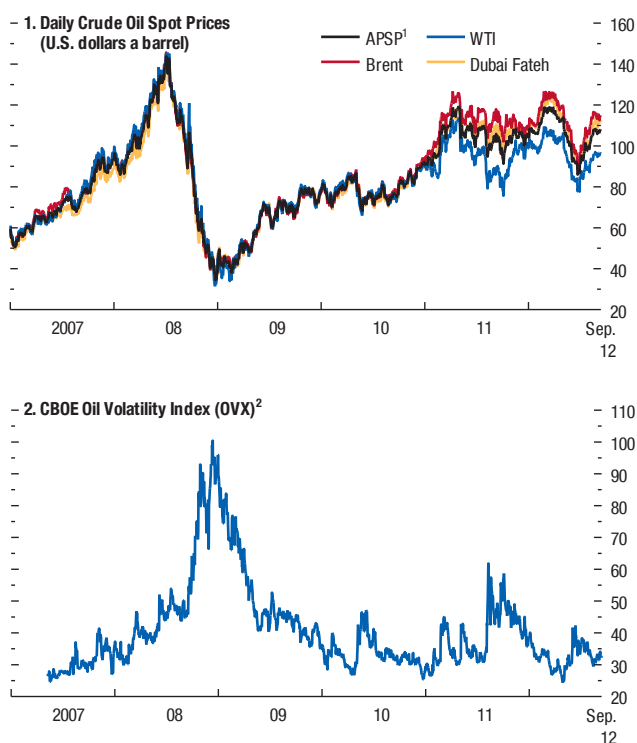
Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: As of September 11, 2012.
[1]Average petroleum spot price (APSP) is a simple average of Brent, Dubai Fateh, and West Texas Intermediate (WTI) spot prices.
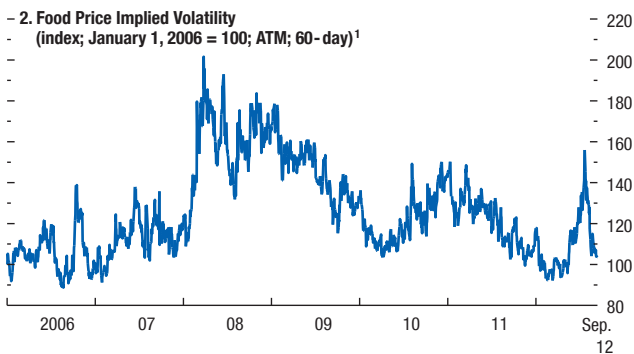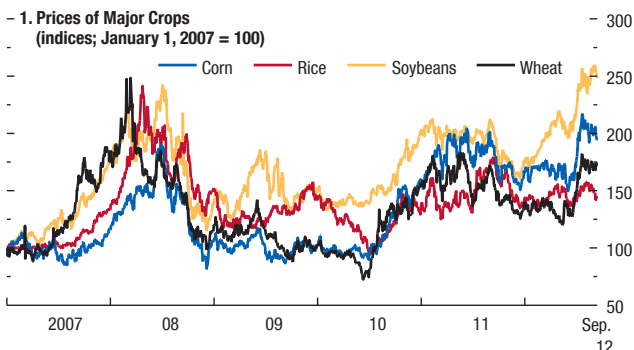[2]CBOE = Chicago Board Options Exchange.

SPECIAL FEATURE

Figure 1.SF.3. Base Metal Spot Prices
(Indices; January 1, 2007 = 100)

Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: As of September 11, 2012.

Figure 1.SF.4. Food Prices and Volatility

1. Prices of Major Crops
(indices; January 1, 2007 = 100)

2. Food Price Implied Volatility
(index; January 1, 2006 = 100; ATM; 60-day)[1]

Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: As of September 11, 2012.
[1]ATM = at the money.

First, on occasion, causality goes the other way: supply disruptions can sometimes lead to price spikes and declines in economic activity (Hamilton, 2008). Second, developments on the supply side or concerns about supply depletion can be important enough to break the tight connection between economic activity and commodity prices even if they are not significant enough to derail economic activity (see Benes and others, 2012, for the case of oil prices). Third, concerns that speculative commodity trading has decoupled price movements from economic activity have been a constant refrain during the past few years despite the lack of conclusive supporting evidence.[1]

These caveats notwithstanding, a tight link between economic activity and commodity price fluctuations is evident in the data, and this appears to be the leading factor behind the broad commodity price declines during the second quarter. Commodity markets rallied somewhat in early 2012 on the back of recovering market confidence in response to the European Central Bank's longer-term refinancing operations as well as better-than-expected global growth in the first quarter. However, with renewed setbacks to the global recovery in the beginning of the second quarter, leading indicators pointed to a synchronized slowing in the momentum of global activity. In particular, growth in a number of major emerging market economies, notably China, has slowed significantly. These common macroeconomic factors affect commodity prices through changes in current and prospective demand and the cost of carrying inventories.

Principal components analysis

The influence of common macroeconomic factors on commodity markets can be examined using principal component analysis, which extracts key factors that account for most of the variance in the observed variables. Individual commodity prices are affected by both commodity-wide and commodity-specific factors. The first principal component of commodity prices captures price movements driven by commodity-wide factors. The strong correla-

[1]See Box 1.4 of the September 2011 *World Economic Outlook* for a detailed discussion.

SPECIAL FEATURE

tion between this first principal component and actual commodity prices across the board—more than 0.85 for all major commodity groups, including crude oil, food, and base metals—implies that individual commodity prices have been significantly affected by commodity-wide factors (Figure 1.SF.5, panel 1). Similarly, the first principal component from industrial production indices (IPs), purchasing managers' indices (PMIs), and equity returns (using MSCI)—which are good proxies for global economic activity, economic sentiment, and broad asset market performance, respectively—capture the underlying common macroeconomic factors (Figure 1.SF.5, panel 2).

The strong correlations between the first principal components for commodity prices and aggregate economic activity suggest that commodity-wide factors have mainly reflected common macroeconomic developments. Especially during the second quarter, the first principal component of commodity prices has shown a declining trend in line with the first principal component of IPs, PMIs, and equity returns, implying that the recent declines in commodity prices over this period were largely driven by global economic conditions (Figure 1.SF.6).

Metal prices and Chinese activity

The link between prices and activity is also apparent for base metal prices. The slow recovery of advanced economies continued to exert a drag on base metal consumption, but it was the significant slowdown in major emerging market economies, notably China, that led to a sharp decline in global base metal consumption. In China, growth has been steadily moderating as the authorities have pursued policies aimed at slowing the economy to a more sustainable pace. Reflecting these policies, growth in industrial production fell to single digits after April for the first time since mid-2009, and real estate investment also slowed in recent months. China's base metal consumption, which has been steadily increasing and now accounts for more than 40 percent of global consumption (Figure 1.SF.7, panel 1), slowed sharply in the second quarter. As a result, growth in global consumption of base metals slowed significantly in the second quarter (Figure 1.SF.7, panel 2). In line with this trend, base metal

Figure 1.SF.5. Influence of Common Factors: Pairwise Correlations with First Principal Components
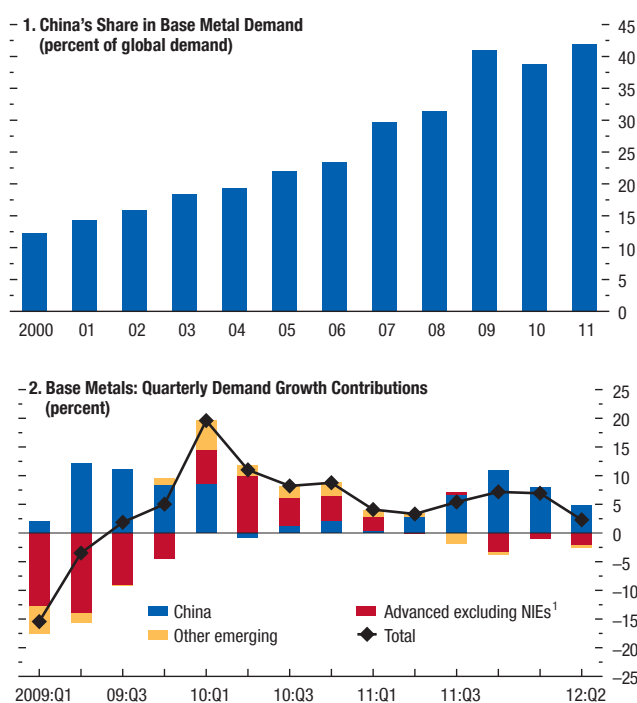

1. Commodity Price Indices

2. Economic and Financial Indicators
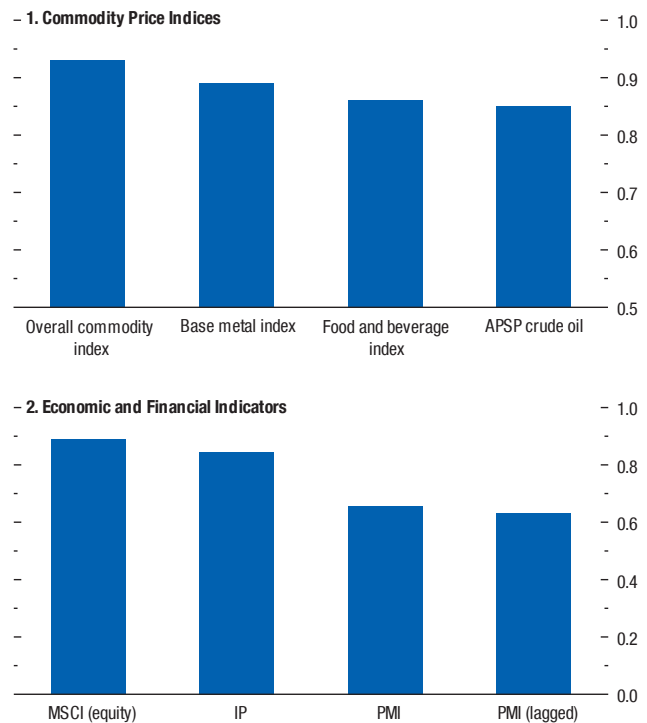
Source: IMF staff calculations.
Note: APSP = average petroleum spot price; IP = industrial production index; PMI = purchasing managers' index.

Figure 1.SF.6. Commodity Prices and Economic Activity: First Principal Components
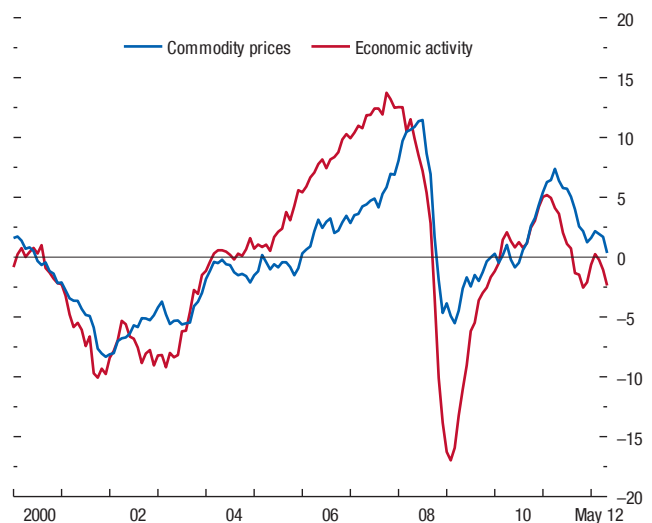
Source: IMF staff calculations.

prices declined the most among major commodities, despite some supply response to lower prices.

Demand factors play a critical role by driving commodity-wide movements in prices, but the role of commodity-specific factors—which generally reflect specific developments on the supply side—is important as well. In petroleum markets, production decisions by producers, supply disruptions, and geo-political concerns are often decisive in determining the course of prices, particularly when inventories are low. For food prices, weather is the predominant commodity-specific factor. The next two sections discuss the supply-demand balance in oil and food markets, respectively.

Supply-Demand Balance in Oil Markets

Supply surge

Oil supply expanded at an annual rate of 3.2 percent during the first half of 2012—on average by 2.4 million barrels a day (mbd)—more than double the growth rate during 2011 (Table 1.SF.2). Since then, supply has moderated.

- *Organization of Petroleum Exporting Countries (OPEC):* As of the end of June, increased supply reflected an eight-month ramp-up in OPEC production (an increase of 2.1 mbd), well above the cartel's production quota ceiling of 30 mbd for crude oil. The OPEC crude oil production quota is only a guideline, however, and actual production was considerably higher (by 1.9 mbd) during the first half of 2012 (Figure 1.SF.8, panel 1), largely attributed to the recovery in Libyan production and increased Saudi output. While still above quota, OPEC production moderated (by 0.5 mbd) during the third quarter.[2]

Figure 1.SF.7. Demand for Base Metals

1. China's Share in Base Metal Demand
(percent of global demand)

2. Base Metals: Quarterly Demand Growth Contributions
(percent)

■ China   ■ Advanced excluding NIEs[1]
■ Other emerging   ◆ Total

Sources: World Bureau of Metal Statistics; and IMF staff calculations.
Note: Weighted sum of aluminum, copper, lead, nickel, tin, and zinc.
[1]NIEs = newly industrialized Asian economies.

---

[2]Before the full effects of the sanctions and oil embargo kicked in, Iranian crude oil during the second quarter was at half of peak production (in 1974, at more than 6 mbd), hovering at an average of 3.2 to 3.3 mbd between April and June 2012, only to fall to below 2.9 mbd in August (according to the International Energy Agency, IEA). Given the use of flagging out and floating storage, the IEA suggests caution when interpreting the data, especially pre-July data. The EU oil embargo also barred European insurance companies from insuring Iranian oil-related transactions. As the insurance market for Iranian oil disappeared, Japan decided to provide its own insurance and Iran offered to provide insurance coverage to tankers carrying Iranian oil.

SPECIAL FEATURE

Table 1.SF.2. Global Oil Supply and Demand by Region
(Million barrels a day)

	2010	2011	2012 Proj.	2011 H2	2012 H1	Year-over-Year Percent Change							
						2005–07 Avg.	2008	2009	2010	2011	2012 Proj.	2011 H2	2012 H1
World Production	**87.3**	**88.4**	**89.8**	**88.9**	**90.8**	**0.9**	**1.2**	**−1.5**	**2.1**	**1.3**	**1.5**	**1.2**	**3.2**
OPEC (current composition)[1,2]	34.6	35.7	36.6	35.9	37.6	1.7	3.3	−5.9	1.8	3.0	2.6	2.8	6.3
Of Which:													
Saudi Arabia	9.7	10.8	. . .	11.1	11.4	−0.2	4.9	−9.5	2.2	11.6	. . .	13.2	8.7
Iran	4.2	4.2	. . .	4.1	3.8	1.7	−1.5	−1.9	−0.0	−1.7	. . .	−2.5	−10.2
Nigeria	2.5	2.6	. . .	2.6	2.6	−1.9	−7.6	−0.4	15.7	3.9	. . .	−0.3	−1.7
Venezuela	2.7	2.7	. . .	2.6	2.7	1.8	0.8	−3.6	−4.6	−1.2	. . .	−4.0	−2.7
Iraq	2.4	2.7	. . .	2.7	2.9	2.0	14.3	2.7	−2.0	12.9	. . .	12.3	5.4
Libya	1.7	0.5	. . .	0.3	1.4	4.3	0.8	−9.7	0.0	−70.8	. . .	−81.1	116.2
Kuwait	2.2	2.4	. . .	2.6	2.7	1.9	8.0	−11.3	1.6	9.8	. . .	15.3	14.8
Non-OPEC[2]	52.6	52.8	53.2	53.0	53.2	0.4	−0.2	1.5	2.4	0.3	0.8	0.1	1.1
Of Which:													
North America	14.1	14.6	15.7	14.9	15.6	−1.2	−3.4	1.8	3.6	3.5	7.8	4.5	8.8
United States	7.8	8.1	8.9	8.3	8.9	−1.8	−1.2	6.5	4.7	4.6	10.0	5.6	11.5
Canada	3.4	3.5	3.9	3.6	3.8	2.6	−2.2	−0.8	4.8	4.5	10.5	6.5	11.4
North Sea	3.8	3.4	3.1	3.3	3.3	−7.0	−4.7	−5.3	−8.6	−9.8	−8.0	−8.8	−5.8
Russia	10.5	10.6	10.7	10.6	10.7	2.5	−0.7	2.0	2.4	1.4	1.0	1.4	1.4
Other Former Soviet Union[3]	3.1	3.0	2.9	2.9	3.0	9.8	3.1	8.7	0.6	−3.0	−1.5	−5.6	−2.4
Other Non-OPEC	21.3	21.2	20.7	21.3	20.6	1.4	3.0	1.6	4.0	−0.2	−2.3	−1.1	−2.6
Of Which:													
Brazil	2.1	2.2	2.2	2.2	2.2	6.2	3.4	6.8	5.6	2.6	0.7	2.6	0.6
World Demand	**88.1**	**88.9**	**89.8**	**89.7**	**89.1**	**1.5**	**−0.7**	**−1.2**	**3.1**	**1.0**	**0.9**	**0.5**	**1.0**
Advanced Economies	45.9	45.4	45.0	45.6	44.7	−0.1	−3.6	−3.9	1.8	−1.2	−0.8	−1.7	−0.9
Of Which:													
United States	19.5	19.3	19.1	19.3	18.9	−0.1	−5.9	−3.7	2.2	−0.9	−0.9	−1.7	−2.1
Euro Area	10.5	10.2	9.9	10.3	9.8	−0.4	−0.4	−5.6	−0.3	−3.3	−3.1	−4.3	−3.8
Japan	4.4	4.5	4.6	4.6	4.8	−1.8	−4.8	−8.1	0.7	0.6	4.0	2.8	9.6
Newly Industrialized Asian Economies	5.0	4.9	4.9	4.9	4.8	2.4	−2.6	3.5	5.5	−2.4	−0.0	−1.8	−0.2
Emerging Market and Developing Economies	42.1	43.6	44.7	44.0	44.4	3.8	3.0	2.1	4.5	3.4	2.7	2.9	3.0
Of Which:													
Commonwealth of Independent States	4.2	4.4	4.6	4.6	4.5	2.2	6.1	−4.7	3.2	6.7	3.6	7.4	4.1
Developing Asia	25.1	26.0	26.9	25.9	27.0	3.7	1.6	3.8	7.2	3.9	3.2	2.8	3.0
China	8.8	9.2	9.5	9.2	9.4	5.5	1.9	3.3	10.7	5.0	2.6	2.2	1.8
India	3.4	3.5	3.6	3.4	3.7	4.9	4.0	1.1	7.1	4.1	3.8	4.7	3.7
Middle East and North Africa	9.1	9.0	9.2	9.2	9.1	4.5	5.2	5.7	2.5	−1.3	2.8	−0.9	3.0
Western Hemisphere	5.9	6.2	6.4	6.3	6.3	3.6	6.4	0.5	4.9	4.4	2.4	4.3	3.1
Net Demand[4]	**0.8**	**0.5**	**. . .**	**0.8**	**−1.7**	**0.4**	**−0.4**	**0.0**	**0.9**	**0.6**	**. . .**	**0.9**	**−1.9**

Sources: International Energy Agency, *Oil Market Report,* September 2012; and IMF staff calculations.

[1]OPEC = Organization of Petroleum Exporting Countries. Includes Angola (subject to quotas since January 2007) and Ecuador, which rejoined OPEC in November 2007 after suspending its membership from December 1992 to October 2007.

[2]Totals refer to a total of crude oil, condensates, natural gas liquids, and oil from unconventional sources. Individual OPEC country production is for crude oil only.

[3]Other Former Soviet Union includes Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

[4]Difference between demand and production. In the percent change columns, the figures are in percent of world demand.

- *Non-OPEC:* Non-OPEC production growth was centered in the Americas—namely, Canada and the United States, which added on average 1 mbd. This increase was largely attributable to the development of unconventional oil production in the United States with hydraulic fracturing technology (Box 1.4).The increase in the Americas offsets non-OPEC declines elsewhere—for example, in Sudan, Syria, and Yemen—and trend declines in other Organization for Economic Cooperation and Development (OECD) country supplies (United Kingdom), resulting in a net non-OPEC supply increase of 0.4
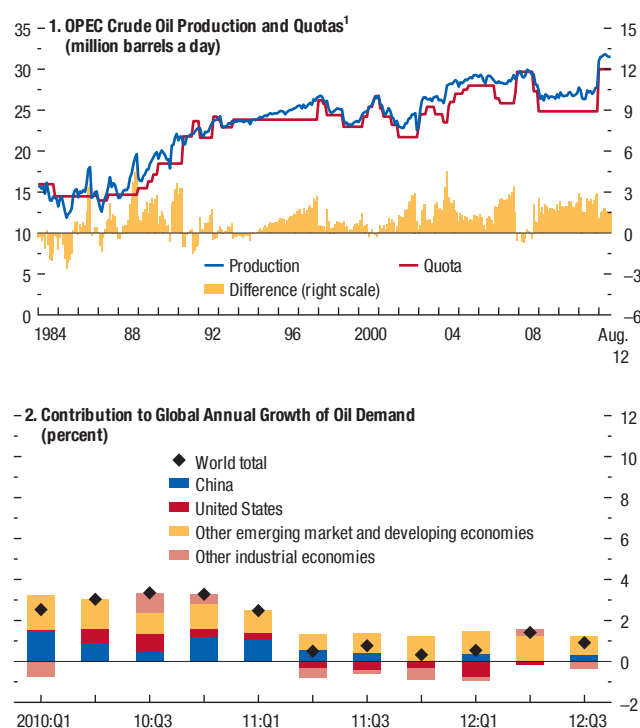
SPECIAL FEATURE

mbd during the first half of the year (Table 1.SF.2). Unplanned outages in Norway and those related to Hurricane Isaac in the United States, among others, led to some moderation (by about 1 mbd) in non-OPEC production during the third quarter.

Anemic demand

Demand growth was flat during the first half of 2012 relative to the 2011 average, at 89.1 mbd, thus contributing to the easing in crude oil prices, particularly toward the end of the second quarter. Year-over-year demand was up during the second quarter of 2012 (by about 1.2 mbd), but largely from Asia and the Pacific—namely, China, India, and Japan—and the Middle East; there was a slowdown relative to the last quarter of 2011 in other advanced economies (Figure 1.SF.8, panel 2; Table 1.SF.2). This slowdown is a continuation of the trend decline in OECD demand (except in Japan) owing to lower oil intensity. Much of China's demand increase was reportedly to add to the country's strategic petroleum reserve and, to a lesser extent, to support the still-expanding vehicle usage and growth in petrochemical demand. India's strong demand intensified initially from irrigation needs given a weak monsoon and then from electricity blackouts and power shortages during the third quarter. Increased Japanese demand reflects the use of oil for power generation after nuclear production was halted in the wake of the Fukushima disaster. Japanese demand is expected to remain high despite the restart of two nuclear plants during July 2012, given the country's recent decision to phase out nuclear power by 2040.

Reflecting these supply and demand developments, there was a replenishment of inventories among OECD countries. Inventory levels were close to their five-year averages in July 2012, while spare capacity in OPEC countries hovered at 2.5 mbd (Figure 1.SF.9).[3]

Figure 1.SF.8. Oil Supply and Demand

1. OPEC Crude Oil Production and Quotas[1]
(million barrels a day)

2. Contribution to Global Annual Growth of Oil Demand
(percent)

Sources: Bloomberg, L.P.; International Energy Agency; and IMF staff calculations.
[1]Excludes Iraq through December 2011.

[3]Reliable data on inventory accumulation from non-OECD economies are scarce. However, industry analysts report some buildup in forward demand (particularly in Asia), but this remains well below the OECD average (55 days) for many large emerging market economies (for example, India and Indonesia).

SPECIAL FEATURE

Supply Concerns in Food Markets

Supply setbacks

The prices of major crops—corn, soybeans, and wheat—have risen strongly amid concern about weather-related supply disruptions worldwide. Earlier in the year, the La Niña weather pattern contributed to drought in South America, which significantly hurt corn and soybean crops in Argentina, Brazil, and Paraguay. Since mid-June, other supply concerns have emerged as hot and dry weather in the U.S. Midwest lowered corn and soybean yields. At the same time, wheat crop estimates have been downgraded in the Black Sea region (Kazakhstan, Russia, Ukraine) and in China because of adverse weather conditions.

Robust demand

Food demand remained robust in 2012 despite the slowdown in global economic activity. Most of the demand growth for major crops—corn, wheat, soybeans, and rice—is expected to come from emerging market and developing economies this year, with China being the single largest contributor. Among individual food commodities, wheat accounts for more than half the global consumption growth for major crops.

Declining stocks

Global food markets are vulnerable to supply setbacks because of low buffers. Stock-to-use ratios remain below their long-term historical average levels for corn and rice and have been declining for wheat and soybeans. Compared with the 2007–08 food crisis, global stock-to-use ratios have improved significantly for rice and wheat but deteriorated most notably for soybeans and to a lesser extent for corn and other grains and oilseeds. (Figure 1.SF.10, panel 1). In the absence of adequate food reserves, threats of production shortages caused an immediate price response in grains, which has significant spillovers to other food commodities. Rising corn prices in particular have important spillover effects in meat and ethanol markets. The share of the U.S. corn crop going to fuel use declined noticeably with the expiration of government support for the ethanol industry through tariffs and tax credits to gasoline refiners. This year, all the growth in U.S. corn consumption is expected to come
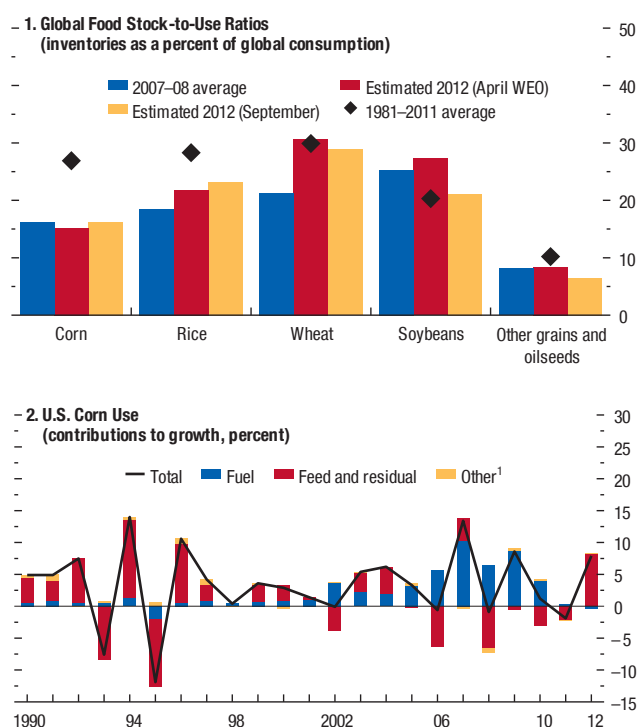
Figure 1.SF.9. Oil Inventories and Spare Capacity
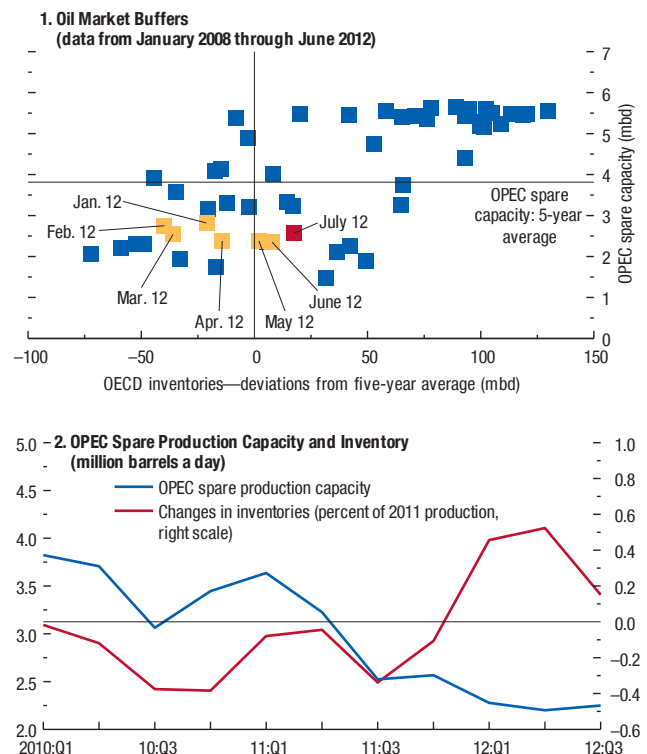
Sources: International Energy Agency; U.S. Energy Information Administration; and IMF staff calculations.
Note: mbd = million barrels a day; OECD = Organization for Economic Cooperation and Development; OPEC = Organization of Petroleum Exporting Countries.

Figure 1.SF.10. Inventory Buffers for Food

1. Global Food Stock-to-Use Ratios
(inventories as a percent of global consumption)

- 2007–08 average
- Estimated 2012 (September)
- Estimated 2012 (April WEO)
- ◆ 1981–2011 average

Corn   Rice   Wheat   Soybeans   Other grains and oilseeds

2. U.S. Corn Use
(contributions to growth, percent)

— Total   ■ Fuel   ■ Feed and residual   ■ Other[1]

1990   94   98   2002   06   10   12

Sources: U.S. Department of Agriculture; and IMF staff estimates.
[1]Includes use for cereal and other food products, seed, starch, high-fructose corn syrup, glucose and dextrose, and alcohol for beverages and manufacturing.

from its use as animal feed (Figure 1.SF.10, panel 2). Although other grains can be substituted for corn in animal feedstock, corn remains the primary feed grain in the United States. Another key grain, rice, posted only a marginal price change since mid-June because markets are well supplied, despite some concern about the Indian harvest from a weaker monsoon season, but global rice output is projected to reach record levels next year. Substitution on the supply and demand sides between rice and other grains is also less prevalent, and the rice market is more segmented.

Macroeconomic impact

The current food price shock is less severe than the shock in 2007–08 because it has not affected all key crops uniformly and has not been aggravated by trade restrictions and high energy input costs (Box 1.5). However rising food prices could have a number of macroeconomic implications. First, rising prices translate into higher headline inflation, which erodes consumers' buying power. This erosion is felt particularly sharply in low- and middle-income countries, where the share of food in the consumption basket is higher and the pass-through from international to domestic prices is larger than in advanced economies. Second, they erode the fiscal balance through higher government subsidies and safety net measures for affected households. And finally, rising food prices have a negative effect on the trade balances of food-importing countries. Rising food prices also have political economy dimensions: they contribute to widespread discontent, thus destabilizing fragile post-conflict political systems. Therefore, countries should avoid protective trade policies such as export bans and export taxes and quotas, which further drive up food prices and volatility, and instead should adopt appropriate policies to maintain macroeconomic stability while protecting the poor.[4]

In the near term, countries should expect rising inflation and balance of payments pressures. During the 2007–08 food price surge, low- and middle-income countries bore the brunt of the inflationary impact, because volatile items such as food and fuel

[4]So far this year, there is no evidence of widespread export restrictions on food commodities or panic buying by importers, as seen during 2007–08.

SPECIAL FEATURE

account for a large share in the consumption basket. Recent IMF research suggests that, despite a variety of appropriate monetary policy tools to combat rising inflation across countries, commodity importers are better off targeting underlying inflation rather than headline inflation, which includes volatile food and fuel, thus improving central bank credibility by stabilizing both output and inflation volatility.[5] In this context, near-term macroeconomic policies should also include scaling up well-targeted social safety nets and other fiscal transfers where space is available, allowing the real exchange rate to move flexibly for net importers, and accessing multilateral finance to support balance of payments needs.

Outlook for Commodity Markets

For all their faults, futures prices remain the most favored way to gauge the outlook for spot prices (Chinn and Coibion, 2009). The predictions by futures markets for the main commodities are shown in Figure 1.SF.11, and market assessments of the balance of risks from the prices of futures options are shown in Figure 1.SF.12.[6]

- *Oil:* With the decline in inventory buffers and their return in May to five-year averages, futures curves for the Brent crude oil variety—the predominant price benchmark outside the North American market—continue to exhibit backwardation, implying a gradual decline in oil prices to less than $100 in the medium term. However, reflecting physical market (for example, North Sea) disruptions, ongoing geopolitical risks and concern about associated potential supply disruptions, and expectations of stimulus in China, the United States, and Europe, the risk to oil prices is tilted to the upside. In contrast, futures curves for WTI are still sloping upward at the front end, reflecting localized pockets of excess supply in the landlocked

Figure 1.SF.11. Futures Prices
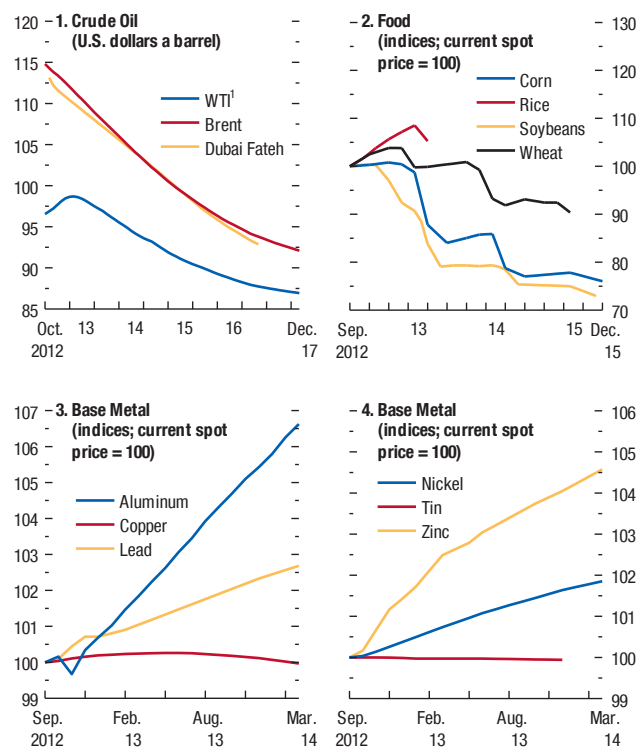
Sources: Bloomberg, L.P.; IMF, Primary Commodity Price System; and IMF staff calculations.
Note: As of September 11, 2012.
[1]WTI = West Texas Intermediate.

[5]See Chapter 3 of the September 2011 *World Economic Outlook* for a detailed discussion.

[6]The time duration of the fan chart depends on the depth of available futures options. Options for many commodities are either unavailable or, as for aluminum, are not liquid enough to construct a fan chart.

Figure 1.SF.12. Price Prospects for Selected Commodities
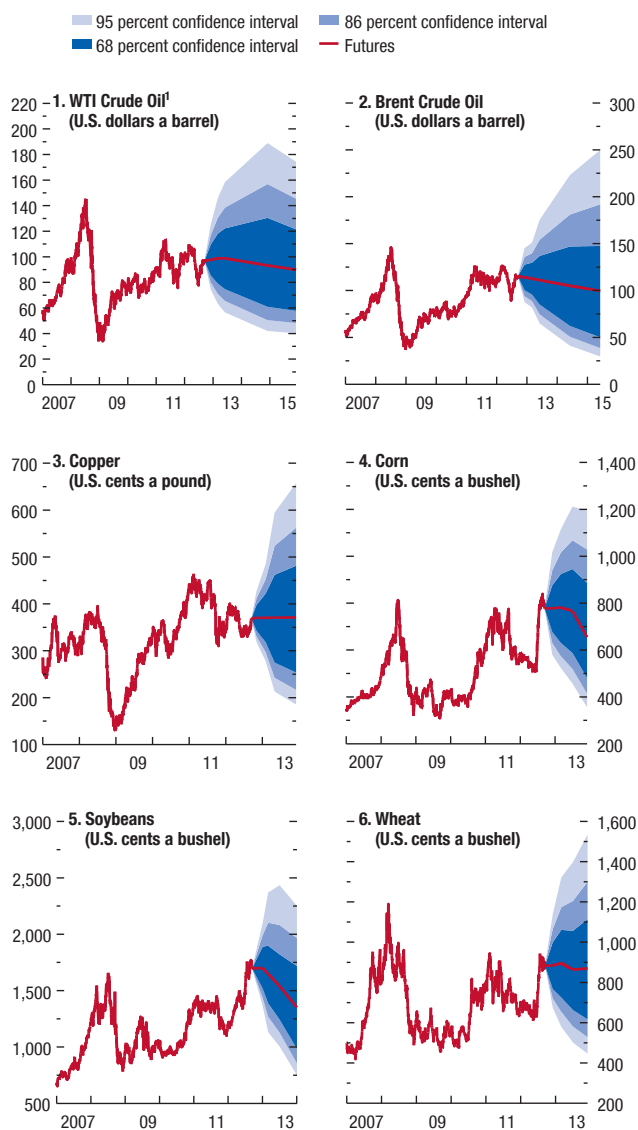
Sources: Bloomberg, L.P.; and IMF staff estimates.
Note: Derived from prices of futures options on September 11, 2012.
[1]WTI = West Texas Intermediate.

areas of the North American oil supply system.[7] However, because still-limited transportation capacity constrains the scope for arbitrage to reduce price differentials, and given that these constraints are expected to persist, current futures prices imply that markets expect WTI to be priced at a discount to Brent through 2015. Overall, risks around the APSP baseline are more balanced than at the time of the April 2012 *World Economic Outlook,* although upside risks are wide and thus cannot be easily dismissed (see Figure 1.SF.12).

- *Food:* Although short-term supply constraints are likely to keep food prices elevated, in the medium term the current food price spike should subside in the absence of major additional disruptions to supply and resulting trade restrictions. Futures price curves indicate that markets expect the prices of key food crops to moderate by the end of 2013.
- *Metals:* Markets are expecting some rebound after the sharp price declines in recent quarters. This could reflect anticipation of a pickup in economic activity beginning in the fourth quarter of 2012 and the impact of possible stimulus measures in China.

[7]With above-average temperatures in the United States during June and July coinciding with the summer driving season, oil spot prices rose in response to strong refinery runs, reduced imports, and falling stocks. The upward-sloping WTI futures curve at the front end, however, reflects still-large stocks in the mid-continent—from increased light tight oil in the United States and heavy crude oil from Canada—and a lack of pipeline capacity to ship crude oil to Gulf Coast refineries. The buildup in landlocked crude oil has driven the price of WTI below that of Brent, in part as a reflection of the higher cost of moving surplus crude oil to market by rail, barge, and truck. The ahead-of-schedule reversal of the direction of the Seaway pipeline, which now delivers heavy crude oil from Cushing, Oklahoma, to Gulf Coast refineries, helped alleviate at the margin some congestion this spring at Cushing—where stockpiles had been at an all-time high—but not enough to remove the surplus. The WTI-Brent spread is likely to persist until new pipelines to the Gulf Coast are built, existing pipelines expanded, and new refining capacity comes online to handle the increase in heavy crude: the first large-scale refining facility is scheduled to open in Indiana in mid-2013. The expected narrowing of the WTI-Brent spread is reflected in the middle and back end of both futures curves: both slope downward, reflecting expectations of future lower prices.

SPECIAL FEATURE

Box 1.1. Are We Underestimating Short-Term Fiscal Multipliers?

With many economies in fiscal consolidation mode, a debate has been raging about the size of fiscal multipliers. The smaller the multipliers, the less costly the fiscal consolidation. At the same time, activity has disappointed in a number of economies undertaking fiscal consolidation. So a natural question is whether the negative short-term effects of fiscal cutbacks have been larger than expected because fiscal multipliers were underestimated.

This box sheds light on these issues using international evidence. The main finding, based on data for 28 economies, is that the multipliers used in generating growth forecasts have been systematically too low since the start of the Great Recession, by 0.4 to 1.2, depending on the forecast source and the specifics of the estimation approach. Informal evidence suggests that the multipliers implicitly used to generate these forecasts are about 0.5. So actual multipliers may be higher, in the range of 0.9 to 1.7.

Forecast Errors and Fiscal Multipliers

Our basic approach is the following: focusing on the recent episode of widespread fiscal consolidation, we regress the forecast error for real GDP growth during 2010–11 on forecasts of fiscal consolidation for 2010–11 that were made in early 2010. Under rational expectations, and assuming that the correct forecast model has been used, the coefficient on planned fiscal consolidation should be zero. The equation estimated is

$$\text{forecast error of growth} = \alpha + \beta \text{ forecast of fiscal consolidation} + \varepsilon. \quad (1.1.1)$$

The forecast error of growth is equal to actual cumulative real GDP growth during 2010–11 minus the forecast of growth in the April 2010 *World Economic Outlook*. The forecast of fiscal consolidation is the forecast of the change in the structural fiscal balance as a percentage of potential GDP during 2010–11 as of the April 2010 WEO. We also investigate forecasts other than the WEO. If the fiscal multipliers used for forecasting are accurate, the slope coefficient, β, should be zero. Our baseline sample consists of 28 economies: the major advanced economies included in the G20 and the member countries of the EU for which forecasts are available.

The authors of this box are Olivier Blanchard and Daniel Leigh.

What Do the Data Show?

We find the coefficient on planned fiscal consolidation to be large, negative, and significant. The baseline estimate suggests that a planned fiscal consolidation of 1 percent of GDP is associated with a growth forecast error of about 1 percentage point (Table 1.1.1 and Figure 1.1.1, panel 1). This result indicates that the multipliers underlying growth projections have been too low by about 1. The systematic relationship between fiscal consolidation and growth holds up to a battery of robustness tests. Overall, depending on the forecast source and the specification, our estimation results for the unexpected output loss associated with a 1 percent of GDP fiscal consolidation are in the range of 0.4 to 1.2 percentage points. First, we establish that the baseline result is not driven by crisis economies—those that had IMF programs—or other outliers (Table 1.1.1).[1]

Next, we check whether the results are robust to controlling for additional variables that could plausibly have triggered both planned fiscal consolidation and lower-than-expected growth. The omission of such variables could bias the analysis toward finding that fiscal multipliers were larger than assumed. We consider two groups of variables: those that were known when the growth forecasts were made and those that were not (Table 1.1.1).

- *Variables known at the time the forecasts were made:* We start by considering the role of sovereign debt problems. Are the baseline results picking up greater-than-expected effects of sovereign debt problems rather than the effects of fiscal consolidation? Reassuringly, the results are robust to controlling for the initial (end-2009) government-debt-to-GDP ratio and for initial sovereign credit default swap (CDS) spreads. Controlling for the possible role of banking crises—based on the data set of systemic banking crises of Laeven and Valencia (2012)—yields similar results. The baseline finding also holds up to controlling for the fiscal consolidation of trading partners. To the extent that fiscal consolidations were synchronized, fiscal consolidation by

[1]Similarly, the results are unchanged when other (non-EU) advanced economies are included (Iceland, Israel, Norway, Switzerland, Taiwan Province of China).

Box 1.1. *(continued)*

Table 1.1.1. Growth Forecast Errors and Fiscal Consolidation

(Forecast error of growth = α + β forecast of fiscal consolidation + γX + ε)

Additional Control	β		γ		Obs	R^2
Baseline	−1.164***	(0.244)			28	0.506
Excluding Possible Outliers						
Exluding IMF Programs	−0.918***	(0.279)			24	0.256
Excluding CEE	−1.054***	(0.267)			22	0.480
Excluding Largest Adjustment	−0.974***	(0.314)			27	0.325
Excluding Cook's D Outliers	−1.058***	(0.240)			23	0.506
Additional Controls in Forecasters' Information Set						
Initial Government Debt	−1.165***	(0.249)	0.000	(0.007)	28	0.506
Initial Sovereign CDS	−0.971***	(0.250)	−0.669	(0.509)	27	0.533
Systemic Banking Crisis	−1.172***	(0.247)	0.192	(0.705)	28	0.508
Initial Growth Forecast	−1.194***	(0.264)	−0.068	(0.113)	28	0.511
Partner Fiscal Consolidation	−1.183***	(0.264)	−0.794	(1.289)	28	0.513
Additional Controls not in Forecasters' Information Set						
Change in Sovereign CDS	−0.938***	(0.315)	−0.092	(0.055)	27	0.540
Revision to Initial Debt	−1.171***	(0.284)	0.820	(10.7)	28	0.507
Unexpected Fiscal Consolidation	−1.146***	(0.230)	−0.142	(0.190)	28	0.513

Sources: Bloomberg, L.P.; Laeven and Valencia (2012); and IMF staff calculations.

Note: *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Obs denotes the number of observations. A constant term (α) is included in the specification but is not reported in the table. Unexpected fiscal consolidation is actual fiscal consolidation minus forecast. Estimation results for the constant term are not reported. IMF Programs denotes Greece, Ireland, Portugal, and Romania. CEE denotes Bulgaria, Czech Republic, Hungary, Poland, Romania, and Slovak Republic. Initial CDS denotes credit default swap spread at end-2009. Change in CDS is from end-2009 to end-2011.

others may be driving the results. However, when we control for trade-weighted fiscal consolidation of other countries (scaled by the share of exports in GDP), the results are virtually unchanged. Finally, to investigate the role of precrisis external imbalances that may have triggered both fiscal consolidation and larger-than-expected headwinds to growth, we try controlling for the precrisis (2007) current-account-deficit-to-GDP ratio and find similar results.[2]

- *Variables not known at the time the forecasts were made:*[3] We consider the role of the sharp increase in sovereign and financial market stress during 2010–11, measured by the change in the sovereign CDS spreads. Controlling for these developments again yields similar results. We also address the possibility that, even if the assumed multipliers were correct, countries with more ambitious consolidation programs may have implemented more fiscal consolidation than originally planned.

As Table 1.1.1 reports, including unexpected fiscal consolidation does not significantly affect the results, suggesting that the baseline specification is appropriate.[4] In line with this result, we find that there was no systematic tendency for economies with larger initial fiscal consolidation plans to implement larger additional consolidation.

GDP Components, Unemployment, and Different Forecasters

When we decompose GDP, we find the largest coefficient for forecasts of investment and the most statistically significant coefficient for forecasts of consumption (Figure 1.1.1, panel 2). The coefficient associated with forecasts of the unemployment rate is also large and significant.
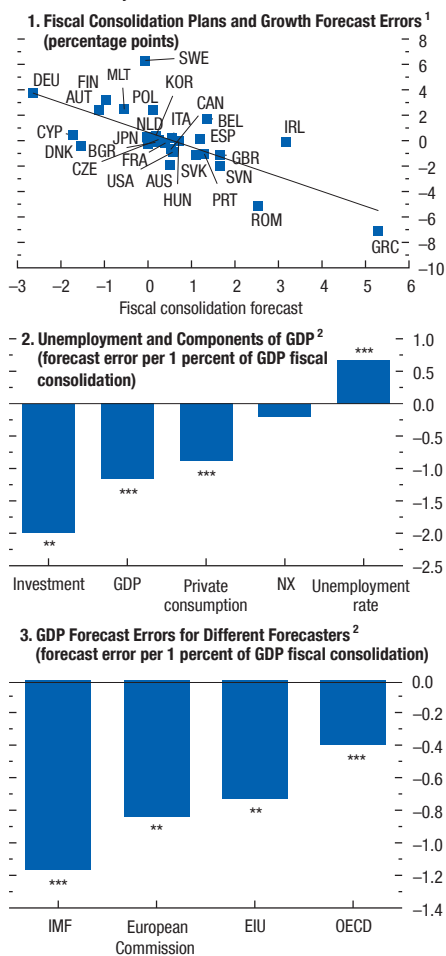
We also consider four different sets of forecasts: those of the WEO, the European Commission (EC), the Organization for Economic Cooperation and Development (OECD), and the Econo-

[2]The baseline results also hold up to additional robustness checks, including controlling for the initial forecast for 2010–11 growth and for initial trade openness and its interaction with planned fiscal consolidation.

[3]It is possible that developments that occurred after the forecasts were made could be partly the *result* of lower-than-expected growth rather than the *cause* of lower growth.

[4]Unexpected consolidation is defined as the actual (ex post) change in the structural fiscal balance minus the forecast—that is, the forecast error of fiscal consolidation. The results also hold up to additional robustness checks, including controlling for the revision to the initial (end-2009) debt-to-GDP ratio, defined as the actual debt ratio in 2009 minus the estimate of the debt ratio published in the April 2010 WEO.

Box 1.1. *(continued)*

Figure 1.1.1. Growth Forecast Errors and Fiscal Consolidation Plans

Activity over the past few years has disappointed more in economies with more aggressive fiscal consolidation plans, suggesting that fiscal multipliers used in making growth forecasts have been systematically too low. This relationship holds for different components of GDP, the unemployment rate, and forecasts made by different institutions.

1. Fiscal Consolidation Plans and Growth Forecast Errors [1]
(percentage points)

2. Unemployment and Components of GDP [2]
(forecast error per 1 percent of GDP fiscal consolidation)

3. GDP Forecast Errors for Different Forecasters [2]
(forecast error per 1 percent of GDP fiscal consolidation)

Source: IMF staff estimates.
Note: Figure identifies economies based on World Bank ISO three-letter codes (http://data.worldbank.org/node/18). NX = net exports contribution to growth. EIU = Economist Intelligence Unit.
[1]Vertical axis displays WEO forecast error for real GDP growth in 2010 and 2011 (actual forecast made in April 2010); horizontal axis displays WEO forecast of change in structural-fiscal-balance-to-GDP ratio in 2010 and 2011 (forecast made in April 2010).
[2] *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

mist Intelligence Unit (EIU—Figure 1.1.1, panel 3).[5] The largest estimated coefficient is associated with the WEO forecasts and the smallest with the OECD forecasts. The coefficient is statistically significant in all cases.

What Does This Say about Actual Fiscal Multipliers?

These results suggest that actual fiscal multipliers were larger than forecasters assumed. But what did forecasters assume about fiscal multipliers? Answering this question is complicated by the fact that not all forecasters make these assumptions explicit. Nevertheless, a number of policy documents, including IMF staff reports, suggest that fiscal multipliers used in the forecasting process are about 0.5. In line with these assumptions, earlier analysis by the IMF staff suggests that, on average, fiscal multipliers were near 0.5 in advanced economies during the three decades leading up to 2009.[6]

If the multipliers underlying the growth forecasts were about 0.5, as this informal evidence suggests, our results indicate that multipliers have actually been in the 0.9 to 1.7 range since the Great Recession. This finding is consistent with research suggesting that in today's environment of substantial economic slack, monetary policy constrained by the zero lower bound, and synchronized fiscal adjustment across numerous economies, multipliers may be well above 1 (Auerbach and Gorodnichenko, 2012; Batini, Callegari, and Melina, 2012; IMF, 2012b; Woodford, 2011; and others). More work on how fiscal multipliers depend on time and economic conditions is warranted.

[5]Data for EC forecasts are from the May 2010 *European Economic Forecast.* Data for OECD forecasts are from the June 2010 *Economic Outlook.* Data for EIU forecasts of real GDP are from the April 2010 *Country Forecast,* and the forecasts of fiscal consolidation are from the April 2010 WEO. (The EIU does not publish forecasts of the structural fiscal balance.)
[6]See Chapter 3 of the October 2010 *World Economic Outlook.*

Box 1.2. The Implications of High Public Debt in Advanced Economies

The analysis presented in this box examines the potential long-term macroeconomic implications of advanced economies' accumulation of large quantities of public debt, as currently forecast in the *World Economic Outlook* baseline scenario. Two models are used to illustrate the implications. The first is the Global Integrated Monetary and Fiscal Model (GIMF),[1] and the second is a small stochastic macroeconomic model that emphasizes uncertainty in fiscal dynamics (FiscalMod). The GIMF is used to illustrate the implications for the baseline of an accumulation of large stocks of debt by advanced economies, while the FiscalMod is used to illustrate the distribution of outcomes around possible baselines in an uncertain world with macroeconomic surprises.

Some Stylized GIMF Simulations

A stylized simulation that incorporates some aspects of recent economic experience in the G3 (euro area, Japan, United States) is used to illustrate the long-term implications for the baseline of higher public debt. In recent years G3 countries' fiscal positions have deteriorated, resulting in a sharp increase in public debt levels. This was driven largely by the financial crisis: public spending was increased to address financial institution problems and help maintain output in the face of diminished private demand. In addition, weak private demand has also led to lower public revenue. The GIMF simulation, represented by the blue line in Figure 1.2.1, replicates this development and shows a rise in G3 debt-to-GDP ratios over roughly a 10-year period by the amounts forecast in the WEO baseline between 2007 and 2017. In the simulation, the weakness in private demand also initially results in low real interest rates. However, once private demand normalizes and public debt converges to a new higher level, the increased demand for savings from G3 economies raises the global real interest rate, which over

the long term rises almost 40 basis points above the baseline. Although the following discussions focus largely on the macroeconomic implications of these higher real interest rates, this simulation analysis necessarily abstracts from the potential long-term benefits of the stimulus. The stimulus was likely instrumental in averting a potential deflationary spiral and protracted period of exceedingly high unemployment, macroeconomic conditions that general equilibrium models such as the GIMF are not well suited to capture.

Higher real interest rates have two important implications for the subsequent level of economic activity. First, higher real interest rates raise the servicing cost of outstanding public debt. To finance those increased debt-service costs, fiscal policy adjustments must occur.

It is assumed that higher labor income taxes and consumption taxes each account for 30 percent of the required funding, with an additional 10 percent coming from higher taxes on capital income and the final 30 percent coming from a reduction in transfers to households. Higher labor and capital income taxes reduce the amount of labor and capital used in production, and hence output, and lower transfers; and higher consumption taxes reduce household demand. The effects jointly lead to a lower level of sustainable output.[2] Second, higher real interest rates raise the cost of capital, further reducing the level of capital stock, firms' labor demand, and ultimately sustainable output. Together these two effects lead to GDP converging to a new long-term level roughly 1 percent below the previous baseline (as shown by the blue line in Figure 1.2.1). (This analysis does not consider the possibility of a simultaneous rise in the sovereign risk premium in these economies with higher public debt. Should that occur, the new long-term level of output would be even lower than simulated here.)

Although the run-up in public debt in G3 economies represents a significant decrease in


The main authors of this box are Ali Alichi, Derek Anderson, Ben Hunt, and Douglas Laxton.

[1] See Kumhof and others (2010) and Anderson and others (forthcoming).

[2] Relying on a different mix of fiscal instruments to generate the improvement in the primary fiscal balance necessary to cover increased debt-service costs would lead to slightly different outcomes for long-term sustainable GDP.

Box 1.2. *(continued)*

Figure 1.2.1. Implications of Higher Debt Levels in Advanced Economies
*(Percent or percentage point deviation from control)*
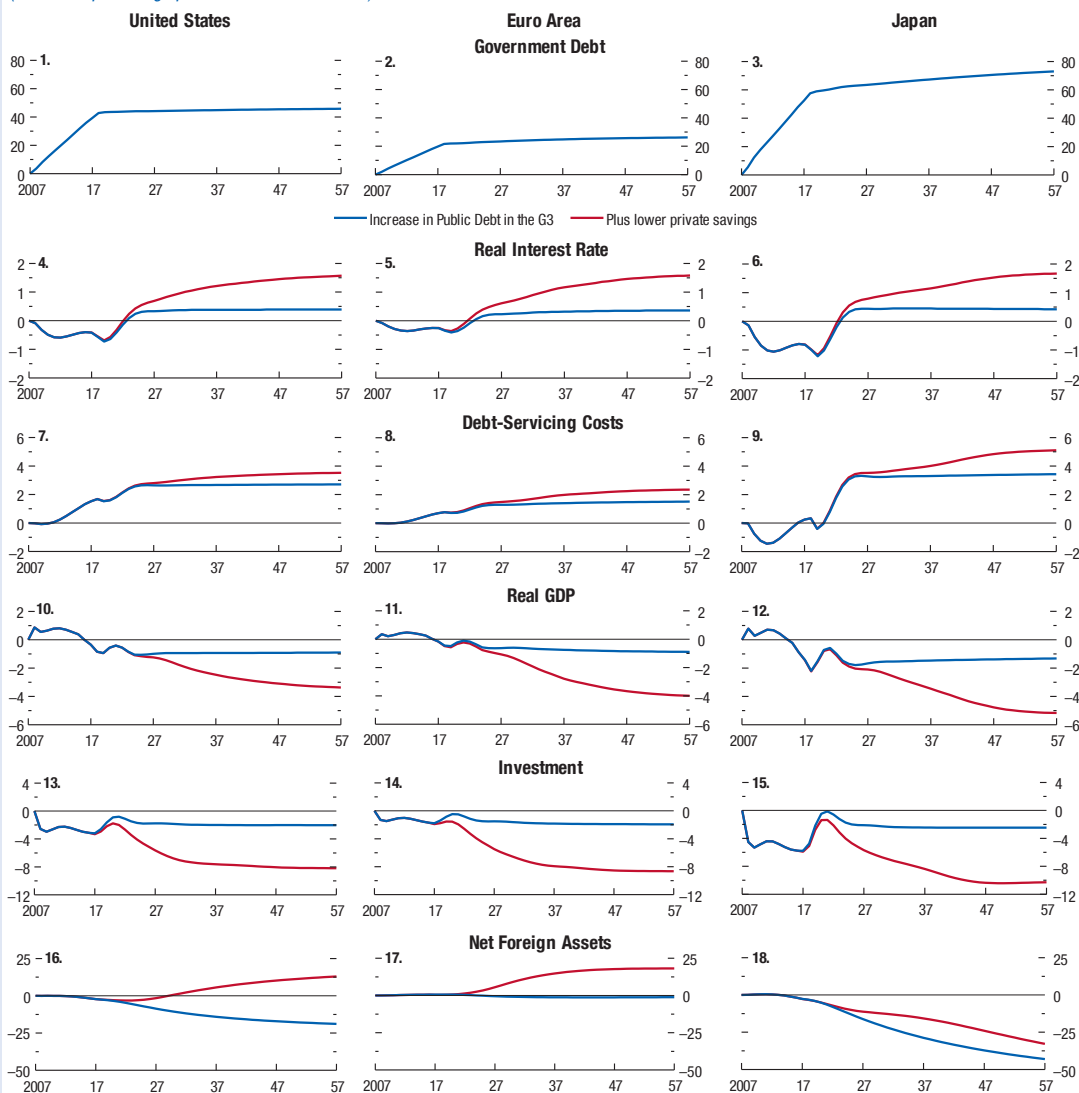
Source: IMF staff estimates.
Note: G3 comprises euro area, Japan, and United States.

public saving, another worry is that private saving rates could also decline. In emerging markets, notably emerging Asia, private saving rates have been very high and are likely to moderate in the future. In G3 economies, aging is likely to have a negative impact on private saving rates. The red line in Figure 1.2.1 represents the macro

implications if, in addition to the reduction in public saving, private saving rates also decline. A reduction in the private saving rate as a share of GDP in emerging market economies of roughly 2 percentage points is considered in this analysis. For the G3 economies, the decline in the saving rate is estimated using the United Nations' low-

Box 1.2. *(continued)*

Figure 1.2.2. Implications of Higher Debt Levels for the Global Economy
(Percent or percentage point deviation from control)
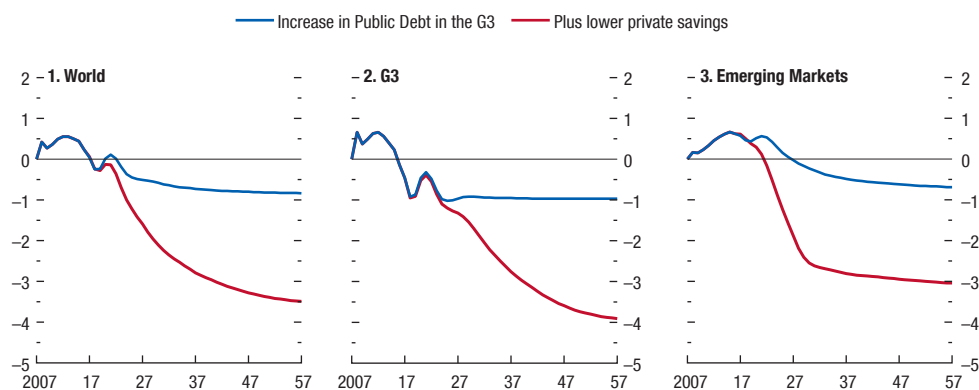
Source: IMF staff estimates.
Note: G3 comprises euro area, Japan, and United States.

working-age population projections. For every 1 percent decline in the working-age population, it is assumed that saving declines by 0.7 percent.[3] The first point to note is that this implies that the real interest rate must rise by an additional 120 basis points. Higher real interest rates then lead to more of the behavior noted above. Tighter fiscal policy to finance increased debt-service costs further reduces the incentive to work, invest, and consume. Higher real interest rates further increase the cost of capital, adding to a decline in the incentive to invest. The net result is that GDP falls even further below the baseline if private saving rates decline along with the projected decline in public saving rates in the G3.

Focusing on relative impacts, Japan becomes worse off compared with the United States and the euro area because it had the highest debt level in the initial control and the largest increase in

the initial scenario. The rising real interest rate adds to debt-service costs in Japan, so the fiscal adjustment to pay those costs is larger, as is the resulting impact on the incentive to work, invest, and consume.

Moreover, higher public debt in advanced economies does not reduce only their potential baseline GDP outcomes: all countries suffer because higher global real interest rates affect everyone. Figure 1.2.2 shows the outcomes for global GDP, GDP in the aggregate of the G3, and GDP in the aggregate of all other countries. Even though the G3 suffer the worst outcomes, all countries are worse off.

The simulated impact on real interest rates and thus on real GDP of higher debt and lower private saving in advanced economies is highly dependent on the rate at which households are willing to substitute consumption at some point in the future for consumption today—the intertemporal elasticity of substitution. The simulations presented in Table 1.2.1 assume an intertemporal elasticity of substitution of 0.5, roughly in the middle of the range of the empirical estimates. However, given the uncertainty

[3]We abstract from the direct impact on output from the decline in the labor force itself and focus purely on the implications for saving. Implicitly, this assumes that the impact of the decline in the labor force on output and all the fiscal implications, such as pension and health care expenditures, are built into the baseline.

Box 1.2. *(continued)*

Table 1.2.1. Importance of the Intertemporal Elasticity of Substitution

	Intertemporal Elasticity of Substitution					
	0.25		0.5		1.0	
	Higher Debt	Plus Lower Savings	Higher Debt	Plus Lower Savings	Higher Debt	Plus Lower Savings
Global Real GDP	−1.75	−7.25	−1.0	−3.50	−0.07	−1.75
Global Real Interest Rate	0.80	3.30	0.40	1.20	0.20	0.80

Source: IMF staff calculations.

about this key parameter, Table 1.2.1 compares the long-term impact on global GDP and real interest rates under three values for the intertemporal elasticity of substitution.

Stochastic Analysis

GIMF simulations are a useful way to trace potential long-term trend outcomes for GDP when G3 countries have high public debt, but in an uncertain world, the distributions around those trend outcomes must be considered, given the potential range of future macroeconomic surprises. To compute the distributions for the outcomes for GDP, public debt, and real interest rates, a small empirical model, FiscalMod, is used. This model is semistructural, with a maturity structure of government debt and a yield curve. The model includes stochastic shocks to output, potential output, deficits, inflation, and interest rate term premiums and is simulated around an extended WEO baseline for a typical advanced economy. Illustrative base-case distributions (showing 90 percent confidence intervals) for the outcomes for GDP, the output gap, public debt, inflation, and real interest rates are presented in Figure 1.2.3.

To illustrate the risks associated with allowing debt to drift upward, Figure 1.2.3 presents a scenario that makes the following two assumptions. First, reduced world private saving rates (for example, due to aging) drive up the world real interest rate. Second, after the WEO horizon (2017) the baseline (median) value of net debt is allowed to increase to more than 100 percent of GDP. The distributions around this baseline are based on a fiscal policy rule allowing it to be easier to increase government deficits during bad economic times than it is to cut deficits during

good economic times—that is, it is assumed that there is a bias toward higher debt ratios even if the macroeconomic shocks are symmetric. Because of this assumption, outcomes around the baseline are asymmetrical: the upward drift in debt, combined with the assumption that high debt leads to higher risk and term premiums, results in positive skewness in real interest rates. Given the negative relationship between real interest rates and GDP, the result is negative skewness in GDP.[4]
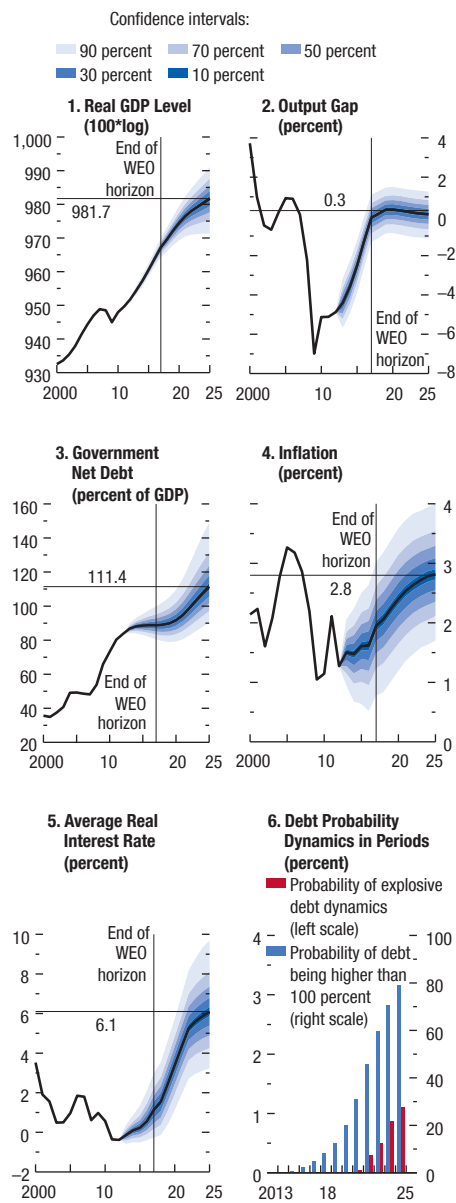
Scenarios that involve very high levels of debt and real interest rates not only result in lower growth, but they imply a higher risk of default when fiscal dynamics are perceived to be unstable. In the model these scenarios would result in explosive dynamics and simulation failures. To illustrate the importance of these disaster scenarios, Figure 1.2.3, panel 6, shows the probability of net debt rising to more than 100 percent of GDP and the proportion of scenarios that fail because of unstable debt dynamics. As the distribution of debt drifts up, the proportion of scenarios with unstable debt dynamics rises because of a larger gap between an economy's real interest rate and real growth rate.

This analysis shows the importance of prudent fiscal policy frameworks that gradually reduce debt over time and prevent debt from drifting up too high. Still, it is important to consider the speed at which debt is reduced, given advanced economies' weakness and constraints on mon-

---

[4]The asymmetry in the distributions also reflects nonlinearity in which incremental increases in real interest rates caused by increases in debt become larger when the baseline value of debt is higher. For empirical evidence on the link between government debt and real interest rates, see Engen and Hubbard (2004); Gale and Orszag (2004); and Laubach (2009).

Box 1.2. *(continued)*

Figure 1.2.3. Illustrative Effects of Allowing Government Debt to Drift Higher

Confidence intervals:
90 percent   70 percent   50 percent
30 percent   10 percent

1. Real GDP Level (100*log)

2. Output Gap (percent)

3. Government Net Debt (percent of GDP)

4. Inflation (percent)

5. Average Real Interest Rate (percent)

6. Debt Probability Dynamics in Periods (percent)
Probability of explosive debt dynamics (left scale)
Probability of debt being higher than 100 percent (right scale)

Source: IMF staff estimates.

etary policy to offset the contractionary effects of fiscal consolidation. As shown in Figure 1.2.3, the WEO baseline assumes a gradual closing of the output gap and little risk of a deflationary spiral (negative inflation and larger output gaps). Although it is not illustrated with an alternative scenario, the same model suggests that an excessively rapid reduction in debt would risk reducing growth and pushing the advanced economies into a deflationary spiral.

Box 1.3. How Does Uncertainty Affect Economic Performance?

Bouts of elevated uncertainty have been one of the defining features of the sluggish recovery from the global financial crisis. In recent quarters, high uncertainty has once again coincided with weakness in the global recovery. Many commentators argue that uncertainty is a major cause of escalating financial stress and recession in the euro area, stalling labor markets in the United States, and slowing growth in emerging market and developing economies.

This box explores the role of uncertainty in driving macroeconomic outcomes. Specifically, it addresses three major questions: How is uncertainty measured? How does it evolve over the business cycle? And what is the impact of uncertainty on growth and business cycles? To address these questions, the box briefly analyzes the main features of various measures of uncertainty and their association with growth and business cycles in advanced economies, and it interprets the evidence in light of findings from recent research.

Uncertainty is shown to have a harmful impact on economic activity. First, the adverse effects are transmitted through multiple channels, with financial market imperfections and institutional constraints often magnifying them, so the effects of uncertainty are likely to vary across sectors and countries. Second, as experienced acutely since the global financial crisis, uncertainty is highly countercyclical. Third, cross-country evidence indicates that high uncertainty is often associated with deeper recessions and weaker recoveries.

How Is Uncertainty Measured?

Economic uncertainty frequently refers to an environment in which little or nothing is known about the future state of the economy. Shocks that lead to economic uncertainty can stem from a variety of sources, including changes in economic and financial policies, dispersion in future growth prospects, productivity movements, wars, acts of terrorism, and natural disasters (Bloom, 2009). Although uncertainty is difficult to quantify because of its latent nature, it can be measured

The authors of this box are M. Ayhan Kose and Marco E. Terrones, with research support from Ezgi O. Ozturk.

indirectly in a number of ways. These measures emphasize distinct aspects of uncertainty facing an economy over time. Some of the measures focus on macroeconomic uncertainty, including the volatility of stock returns, variation in aggregate productivity, dispersion in unemployment forecasts, and the prevalence of terms such as "economic uncertainty" in the media. Others consider uncertainty at the microeconomic level, which is often measured by various indicators of dispersion across sectoral output, firm sales, and stock returns.

Because we are concerned primarily with macroeconomic uncertainty, we concentrate on four measures based on the volatility of stock returns and economic policy. The first is the monthly standard deviation of daily stock returns in each advanced economy in our sample.

The second is the Chicago Board Options Exchange Volatility Index (VXO), which is an indicator of the implied volatility of equity prices calculated from S&P 100 options. The third refers to uncertainty surrounding economic policies.[1] The fourth, which represents uncertainty at the global level, is the estimated dynamic common factor of the first measure using the series of the six major advanced economies with the longest available data.

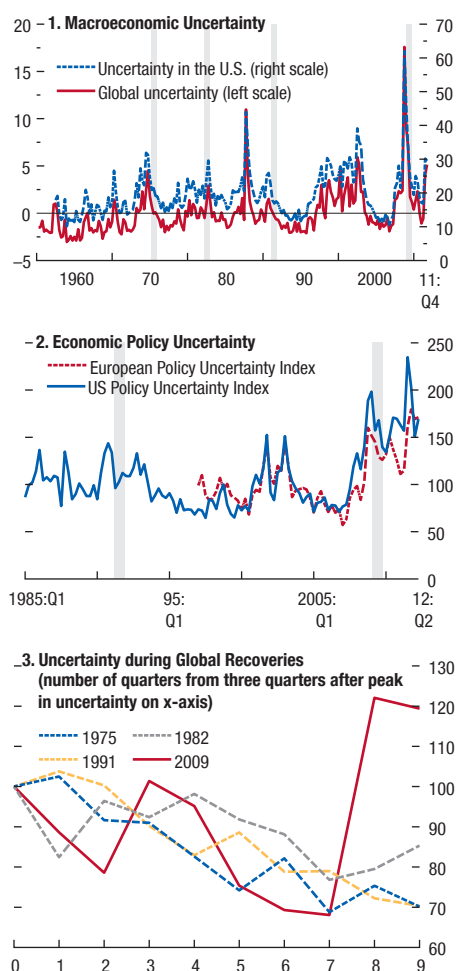### How Does Uncertainty Evolve?

Both macroeconomic and policy measures of uncertainty tend to rise during global recessions (Figure 1.3.1). Policy uncertainty in the United States and the euro area has remained high since the global financial crisis and the recent sovereign debt problems in the euro area. Moreover, during the lethargic global recovery, uncertainty has been unusually high and volatile. This contrasts with the recoveries following the other three global reces-

[1]The economic policy uncertainty measure employed here is from Baker, Bloom, and Davis (2012), who use a weighted average of the following three indicators: the frequency with which terms like "economic policy" and "uncertainty" appear together in the media, the number of tax provisions that will expire in coming years, and the dispersion of forecasts of future government outlays and inflation. Because most of this information refers to outcomes it does not distinguish between uncertainty about policy goals and uncertainty about policy instruments.

Box 1.3. *(continued)*

Figure 1.3.1. Evolution of Uncertainty
(Indices)

1. Macroeconomic Uncertainty

- - - - - Uncertainty in the U.S. (right scale)
———— Global uncertainty (left scale)

2. Economic Policy Uncertainty

- - - - - European Policy Uncertainty Index
———— US Policy Uncertainty Index

3. Uncertainty during Global Recoveries
(number of quarters from three quarters after peak in uncertainty on x-axis)

- - - - - 1975   - - - - - 1982
- - - - - 1991   ———— 2009

Sources: IMF staff calculations; and Baker, Bloom, and Davis (2012).
Note: In panels 1 and 2, shaded areas denote the periods of global recession. These global recessions (1975, 1982, 1991, 2009) are identified following Kose, Loungani, and Terrones (2009). In panel 2, economic policy uncertainty in the United States and the euro area is from Baker, Bloom, and Davis (2012). Since these indicators are based on different measures, their levels are not strictly comparable. In panel 3, each line presents the evolution of uncertainty in the United States starting three quarters after uncertainty reached its peak during the respective global recession.

sions shown in Figure 1.3.1, which were accompanied by steady declines in uncertainty.

Uncertainty is highly countercyclical. Macroeconomic uncertainty varies over different phases of the business cycle: during expansions in advanced economies uncertainty is, on average, much lower than during recessions, regardless of the measure (Table 1.3.1). Microeconomic uncertainty, measured by the volatility of movements in plant-level productivity in the United States, also behaves countercyclically and reached a post-1970 high during the Great Recession (Bloom and others, 2012).

Causality between uncertainty and the business cycle is difficult to establish—does uncertainty drive recessions or do recessions lead to uncertainty? Empirical findings on this question are mixed.[2] However, economic theory, as discussed next, points to clear channels through which uncertainty can have a negative impact on growth. Some uncertainty is likely to be an intrinsic feature of the business cycle: firms and households will learn only over time which sectors of the economy will do better and which will do worse—and for how long—in response to the shocks that cause recessions.

What Is the Impact of Uncertainty on Growth and Business Cycles?

Economic theory suggests that macroeconomic uncertainty can have an adverse impact on output through a variety of channels. On the demand side, for example, when faced with high uncertainty, firms reduce investment demand and delay their projects as they gather new information, because investment is often costly to reverse (Bernanke, 1983; Dixit and Pindyck, 1994). Households' response to high uncertainty is similar to that of

[2]Bachmann and Moscarini (2011) find that the direction of causality runs from recessions to uncertainty. In contrast, Baker and Bloom (2011) offer evidence, using disaster data as instruments, that the causality runs from uncertainty to recessions, and Bloom and others (2012) report that growth does not cause uncertainty. Predictions of theory and findings from empirical studies collectively indicate that uncertainty can play a dual role over the business cycle: it can be an impulse as well as a propagation mechanism.

Box 1.3. *(continued)*

Table 1.3.1. Uncertainty over the Business Cycle

	Country-Specific Uncertainty	Uncertainty in the United States	Economic Policy Uncertainty	Global Uncertainty
Recession	1.29***	24.12***	134.59***	1.61***
	(0.08)	(0.50)	(2.78)	(0.18)
Expansion	0.93***	19.03***	100.56***	−0.24**
	(0.03)	(0.06)	(0.51)	(0.02)
Number of Observations	3,138	4,158	2,268	4,347
Number of Economies	21	21	21	21
R^2 Adjusted	0.77	0.89	0.92	0.07
Test (*p* Values)				
h0: Recession Coefficient = Expansion Coefficient	0.00	0.00	0.00	0.00

Source: IMF staff calculations.

Note: The dependent variable is the level of uncertainty. Recessions and expansions in regressions refer to dummy variables taking the values of 1 and zero when the economy is in recession and expansion, respectively. The periods of recession and expansion are defined following Claessens, Kose, and Terrones (2012). Country-specific uncertainty refers to the monthly standard deviation of daily stock returns in each country. Daily returns are calculated using each country's stock price index. Data series cover the period 1960–2011, but coverage varies across economies. Uncertainty in the United States refers to the Chicago Board Options Exchange VXO index, which is calculated from S&P 100 options. Prior to 1986, this series has been extended following Bloom (2009). The policy uncertainty measure is an index of economic policy uncertainty for the United States from Baker, Bloom, and Davis (2012). It refers to the weighted average of three indicators, including the frequency of the appearance of terms like "economic policy" and "uncertainty" in the media, the number of tax provisions that will expire in coming years, and the dispersion of forecasts of future government outlays and inflation. Global uncertainty is the estimated dynamic common factor of the first measure using the series of France, Italy, Germany, Japan, the United Kingdom, and the United States. (These countries have the longest series of stock market indices.) *** denotes that the coefficients are statistically significant at the 1 percent level. Standard errors are in parentheses.

firms: they reduce their consumption of durable goods as they wait for less uncertain times. On the supply side, firms' hiring plans are also negatively affected by higher uncertainty, reflecting costly adjustment of personnel (Bentolila and Bertola, 1990).

Financial market imperfections can amplify the negative impact of uncertainty on growth. In theory, uncertainty leads to a decline in expected returns on projects financed with debt and makes it harder to assess the value of collateral. Thus, creditors charge higher interest rates and limit lending during uncertain times, which reduces firms' ability to borrow. The decline in borrowing causes investment to contract, especially for credit-constrained firms, and results in slower productivity growth because of reduced spending on research and development. These factors together can translate into a significant reduction in output growth (Gilchrist, Sim, and Zakrajsek, 2010).

The impact of uncertainty differs across sectors and countries. The sectors that produce durable goods—including machinery and equipment, automobiles, houses, and furniture—are often the most affected by increases in uncertainty. The impact of an uncertainty shock on consumption and investment is larger in emerging market economies than in advanced economies, probably because the

former group tends to have less developed financial markets and institutions (Carrière-Swallow and Céspedes, 2011).

Empirical evidence suggests that uncertainty tends to be detrimental to economic growth. The growth rate of output is negatively correlated with macroeconomic uncertainty (Table 1.3.2). A 1 standard deviation increase in uncertainty is associated with a decline in output growth of between 0.4 and 1.25 percentage points depending on the measure of macroeconomic uncertainty. There were indeed multiple episodes during which uncertainty rose by 1 standard deviation or more, including at the onset of the Great Recession and during the recent debt crisis in the euro area. High uncertainty tends to be associated with a larger drop in investment than in output and consumption growth. These findings lend support to the validity of different theoretical channels through which uncertainty adversely affects economic activity. They are also consistent with recent studies documenting a negative relationship between growth and uncertainty.[3]

[3]Empirical evidence based on vector autoregression (VAR) models points to a significant negative impact of uncertainty shocks on output and employment (Bloom, 2009; Hirata and others, 2012). These results also echo the findings in a broader area of research on the negative impact of macroeconomic and policy volatility on economic growth (Ramey and

Box 1.3. *(continued)*

Table 1.3.2. Uncertainty and Growth

	Output				Consumption				Investment			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Country-Specific Uncertainty	−0.65*				−0.23				−1.18			
	(0.37)				(0.38)				(0.99)			
Uncertainty in the U.S.		−0.18***				−0.12***				−0.41***		
		(0.01)				(0.01)				(0.06)		
Economic Policy Uncertainty			−0.01***				−0.01				−0.02**	
			(0.00)				(0.00)				(0.01)	
Global Uncertainty				−0.46***				−0.31***				−0.87***
				(0.03)				(0.04)				(0.164)
Number of Observations	3,117	4,157	2,267	4,283	3,115	4,155	2,265	4,281	3,111	4,041	2,265	4,123
Number of Countries	21	21	21	21	21	21	21	21	21	21	21	21
R^2 Adjusted	0.42	0.38	0.44	0.38	0.09	0.13	0.06	0.13	0.31	0.25	0.35	0.25

Source: IMF staff calculations.

Note: Dependent variable is the year-over-year growth of the respective macroeconomic aggregate. All specifications include country fixed and time effects. See notes to Table 1.3.1 for explanations of uncertainty measures. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Standard errors are in parentheses.

Table 1.3.3. Uncertainty and Business Cycles

	Recessions		Recoveries	
	With High Uncertainty	Others	With High Uncertainty	Others
Output				
Duration	4.00	3.89	4.81	4.54
Amplitude	−3.66**	−1.85	2.31*	3.06
Slope	−0.78*	−0.49	0.66*	0.77
Cumulative Loss	−5.81*	−2.99	. . .	. . .
Consumption	−0.46	−0.37	1.53	2.21
Investment	−9.44	−5.22	−0.48**	3.28
Number of Episodes	28	83	28	82

Source: IMF staff calculations.

Note: A recession is associated with high uncertainty if the level of uncertainty at its trough falls in the top quartile of uncertainty measured at the troughs of all recessions. A recovery is associated with high uncertainty if the average uncertainty during the recovery is in the top quartile of average uncertainty of all recovery episodes. The periods of recession and recovery are defined following Claessens, Kose, and Terrones (2012). All statistics except "Duration" correspond to sample median. For duration, means are shown. For recessions, duration is the number of quarters between peak and trough. Duration for recoveries is the time it takes to attain the level at the previous peak after the trough. The amplitude for recessions is calculated based on the decline in output during the recession and expressed in percent. The amplitude for the recoveries is calculated based on the one-year change in output after the trough and expressed in percent. The slope of the recessions is the amplitude from peak to trough divided by the duration. The slope of recoveries is the amplitude from the trough to the period where output has reached the level at its last peak divided by the duration. Cumulative loss combines information about duration and amplitude to measure the overall cost of a recession and is expressed in percent.** and * denote that features of recessions (recoveries) with high uncertainty differ significantly from those of other recessions (recoveries) at the 5 percent and 10 percent levels, respectively.

Policy-induced uncertainty is also negatively associated with growth. The adverse impact of policy uncertainty on economic growth works mainly through two channels. First, it directly affects the behavior of households and firms as they postpone investment and consumption decisions when uncertainty about future policies is elevated. Second, it breeds macroeconomic uncertainty, which in turn reduces growth. As noted, policy

uncertainty has increased to record levels since the Great Recession. Specifically, the increase in policy uncertainty between 2006 and 2011 was about 5 standard deviations. This sharp increase in policy uncertainty may have stymied growth in advanced economies by 2½ percentage points during this period.[4]

_____

Ramey, 1995; Kose, Prasad, and Terrones, 2006; Fatas and Mihov, forthcoming).

[4]This finding is consistent with results from a recent study by Baker, Bloom, and Davis (2012). They employ a VAR model and report that a jump in policy uncertainty, such as the one observed between 2006 and 2011 in the United

Box 1.3. *(continued)*

The degree of economic uncertainty also appears to be related to the depth of recessions and strength of recoveries. In particular, recessions accompanied by high uncertainty are often deeper, longer, and more severe than other recessions. Moreover, recessions in highly uncertain environments are associated with cumulative output losses roughly two times larger than those during other recessions (Table 1.3.3). Similarly, recoveries coinciding with periods of elevated uncertainty are weaker and slower than other recoveries.[5] Both consumption

and investment tend to grow at a slower pace during recoveries associated with high uncertainty.

Global Recovery in Times of Manifold Uncertainty

Elevated uncertainty historically coincides with periods of lower growth, and the recent pickup in uncertainty raises the specter of another global recession. Policymakers can do little to alleviate the intrinsic uncertainty economies typically face over the business cycle. However, policy uncertainty is unusually high, and it contributes significantly to macroeconomic uncertainty. By implementing bold and timely measures, policymakers can reduce policy-induced uncertainty and help kick-start economic growth. What precisely policymakers need to do is discussed in the main text of Chapter 1.

States, is associated with about a 3 percent decline in real GDP and a 16 percent contraction in private investment.

[5]The unusually high levels of uncertainty the global economy experienced since the 2007–09 financial crisis and the associated episodes of deep recessions and weak recoveries play an important role in explaining these findings. Uncertainty shocks account for about one-third of business cycle variation in advanced economies and up to half of cyclical volatility in emerging market and developing economies, implying that these shocks play a sizable role in driving the dynamics of recessions and expansions (Bloom and others,

2012; Baker and Bloom, 2011). Other relevant research concludes that shocks associated with uncertainty and financial disruptions were the primary factors that led to the Great Recession (Stock and Watson, forthcoming).

Box 1.4. Unconventional Energy in the United States

U.S. natural gas and oil production has increased in recent years, driven largely by the commercialization of horizontal drilling and hydraulic fracturing ("fracking") technology from shale rock.[1,2] The "unconventional energy revolution" began in the natural gas sector during the past decade, and gas production rose 28 percent between 2005 and 2011, and continued to climb in 2012 albeit at diminishing rates.[3] The rise in unconventional gas contributed to the plunge in natural gas prices, and producers have since focused on liquids-rich gas plays or have migrated to pure oil (or tight oil) plays.

Since 2005, application of this technology has put an end to the trend decline in U.S. oil output by increasing oil production from unconventional formations—first by maintaining total U.S. oil production at about 7 million barrels a day (mbd) until 2008 (8 percent of daily global production). More recently, from 2009 to the first half of 2012, oil output rose by about 2 mbd to about 9 mbd (10 percent of daily global oil production). This more recent rise stems largely from tapping unconventional shale deposits in North Dakota and Texas for "tight" oil and other liquid by-products (that is, natural gas liquids) through the use of techniques similar to those pioneered to tap unconventional shale gas (see Table 1.SF.2).

The boom in unconventional energy affects other energy markets as well. The downturn in natural gas prices has led to displacement of coal in the U.S. electric power sector and decoupling of U.S. natural gas from crude oil prices. The displacement of coal is largely attributed to the shift from coal to natural gas by U.S. electric power companies in response to lower natural gas prices. On the one hand, coal displacement in the United States has been beneficial to Europe, where demand has increased because of substitution away from higher-priced fuels—notably (non-U.S.) natural gas, whose price is still linked to that of oil—and from a phaseout of nuclear power. On the other hand, rising unconventional natural gas production has also led to a decoupling of U.S. natural gas prices from crude oil prices; gas prices have fallen to their lowest level in a decade.[4] Rising unconventional oil production has also contributed to the stock buildup in the mid-continent, which led to a large discount in the price of U.S. West Texas Intermediate crude oil compared with internationally traded crude oil varieties—for example, Brent and Dubai Fateh.

The future of unconventional extraction is uncertain given its relative cost: crude oil prices would have to range between $50 and $90 a barrel to guarantee commercial viability (break-even). Hence a drop in crude oil prices to levels seen during the 2008 slump could set back U.S. unconventional oil production. Despite uncertainty, industry analysts suggest that U.S. production could increase by 1 mbd annually until 2015, and possibly beyond. Moreover, because there are large tight oil reserves in other regions of the world, if commercially viable, extraction could offset declining production in maturing conventional fields, thus alleviating concern about oil scarcity. Finally, abundant unconventional energy might not keep oil prices from rising in the short term, but it could have that effect in the

The authors of this box are Samya Beidas-Strom and Akito Matsumoto.

[1] Hydraulic fracturing involves pumping a mix of water, sand, and chemicals into wells at high pressure, thereby cracking the rock containing the liquids. Horizontal drilling enables greater access to pockets of liquids, allowing more to be pumped to the surface. Application of this technique to hydrocarbon liquids (oil) was previously considered too challenging or uneconomic and has raised environmental concerns—notably about possible contamination of aquifers.

[2] "Oil" in this box refers to crude (conventional) oil, condensates, natural gas liquids, and unconventional oil.

[3] Unconventional natural gas is found in locations requiring special extraction technologies such as horizontal drilling and fracking. It includes shale gas, tight gas, and coal-bed methane; this gas is similar to conventional natural gas, with the only difference being that their extraction requires unconventional methods. Unconventional oil, such as shale oil (or tight oil), is recovered from shale using the same unconventional technologies as for shale gas but is conventional oil, similar in quality to light crude oil.

[4] Until the early 1990s, natural gas prices were heavily regulated, with regulators using oil prices as a reference for gas prices. Deregulation and restructuring of the pipeline sector led to a competitive market with direct gas-on-gas competition.

Box 1.4. *(continued)*

long term—because higher energy prices would stimulate unconventional oil development if oil prices remain above $80 a barrel. At the same time, energy substitutability depends on a number of factors: electric power companies switched from coal to natural gas as did the petrochemical sector, but a shift from oil to natural gas in transportation has proved to be much slower.[5]

[5]See Chapter 3 of the April 2011 *World Economic Outlook* for a detailed discussion.

Box 1.5. Food Supply Crunch—Who Is Most Vulnerable?

Food prices are increasing worldwide, raising fears of another food crisis like that in 2007–08. How is 2012 different? Which regions are most vulnerable to the current food price surge?[1] The current food price shock is less severe than that of 2007–08 because it has not affected all key crops uniformly and has not been aggravated by trade restrictions and high energy input costs. However, when focusing on vulnerability, there are significant variations across regions: the African, Central American, Caribbean, and Middle Eastern regions appear to be the most exposed to rising food prices amid low inventory buffers and high dependence on the global market for their food supplies.

The 2007–08 food crisis was exacerbated by various forms of export restrictions by major food exporters;[2] in contrast, no such policies have been implemented by major food exporters during 2012. Since the last food crisis, supply has responded to robust demand and relatively high prices through higher acreage and yields as well as productivity gains. As a result, global inventory buffers, measured by stock-to-use ratios, have improved significantly, especially for rice and wheat.

The author of this box is Marina Rousset.
[1]Regional composition is as defined by the U.S. Department of Agriculture. Note that North America includes Mexico, and Oceania includes Australia and New Zealand. Pacific island nations, which are vulnerable to food price shocks, could not be disaggregated from Oceania due to data limitations.
[2]A survey by the U.N. Food and Agriculture Organization prepared in 2008 showed that of the 77 surveyed countries, roughly one-quarter imposed some form of export restrictions during the food crisis.

Spillovers from energy markets are much more limited in 2012. Energy prices feed into global food prices through two main channels: cost push and demand pull. First, energy-intensive inputs such as ammonia-based nitrogen fertilizers and power provide a transmission mechanism from energy prices into food prices. Second, the diversion of crops from food to fuel production has become an important factor in recent years—corn and sugar have been increasingly used for ethanol production and soybeans and other oilseeds for biodiesel production. Energy prices surged alongside food prices during the 2007–08 food crisis, intensifying the spillover through both channels, but energy prices have recently declined, limiting the spillover to food prices. The expiration of government subsidies to the U.S. ethanol industry in 2011 also helped reduce the use of food crops for energy production. Therefore, the pass-through from energy prices to food prices plays a less important role than in 2007–08.

Nevertheless, countries in Africa, Central America, the Caribbean, and the Middle East are vulnerable to rising food prices. Despite significant heterogeneity, regions with low inventory buffers, high dependence on the global market for their food supply, and a high share of food in final consumption seem to be the most vulnerable to recent food price hikes (Table 1.5.1, Figure 1.5.1).[3]

[3]Compared with 2007–08, the extent of regional exposure to global food price fluctuations has not changed significantly.

Table 1.5.1. Regional Food Vulnerability

	Low Food Inventories (that is, low stock-to-use ratios)	High Dependence on Global Food Imports	High Share of Food in Final Consumption
Caribbean	*	*	*
Central America	*		
East Asia			
European Union			
Former Soviet Union		*	*
Middle East	*	*	*
North Africa		*	*
North America	*		
Oceania			
Other Europe			
South America	*		*
South Asia			*
Southeast Asia			*
Sub-Saharan Africa	*	*	*

Sources: U.S. Department of Agriculture; World Trade Organization; IMF, World Economic Outlook database; and IMF staff calculations.

Box 1.5. *(continued)*

Figure 1.5.1. Regional Food Vulnerabilities
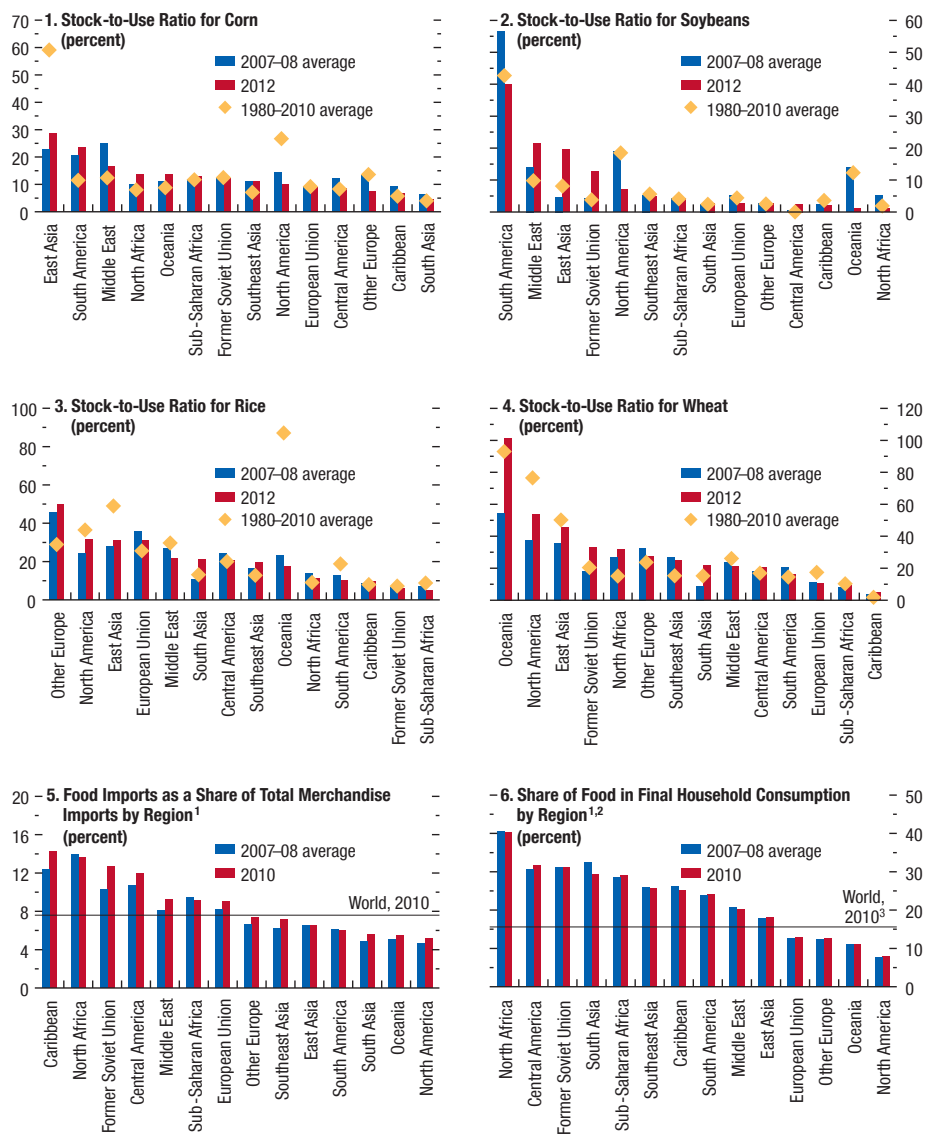
Sources: U.S. Department of Agriculture; World Trade Organization; and IMF staff calculations.
[1]2010 is the latest available estimate. Regional data are aggregated using GDP weights.
[2]Includes food and nonalcoholic beverages consumed at home.
[3]Unweighted share for the 84 countries in the sample.

Box 1.5. *(continued)*

- Naturally, regions that are not self-sustaining in agricultural production, and therefore dependent on the global food market, are the most exposed to the effects of global price instability. These regions include Caribbean and Central American nations, which import three-quarters and one-half of their corn demand, respectively, and have lower inventory buffers than in 2007–08.
- Countries in the Middle East and sub-Saharan Africa, which import more than half of their wheat consumption and whose stock-to-use ratios for wheat and rice are below historical averages, could also be heavily affected if global wheat prices rise further because of lower inventory buffers.
- North Africa, where about 40 percent of final consumption is food, is also vulnerable to high food prices given significant reliance on food imports.

Exposure to global food price volatility for other regions is crop specific. The former Soviet Union region has a high share of imports and household consumption dedicated to food, but, because of interregional trade, its exposure to global markets for wheat—its main consumption and trade crop—is fairly limited. East Asia, in particular China, depends on the global market to satisfy a large portion of its domestic soybean demand but has accumulated substantial inventory buffers. Although inventory buffers in North America, which is a net exporter of major crops, have deteriorated significantly, especially for corn, food expenditures in North America account for a lower share of imports and household income than in other regions, making North America less vulnerable to food price increases.

On the global level, the current stock-to-use ratios for corn and soybeans are lower than they were during 2007–08, but are higher for rice and wheat. Many regions have undertaken self-sufficiency initiatives to reduce their dependence on global food markets, and some regions increased their precautionary demand for key grains to mitigate food price increases while others initiated food and fertilizer subsidies and farm lending programs. However, alleviating the burden of global food price volatility calls for broader policy reforms, including to address agricultural infrastructure improvement, effective safety nets for the poor, and climate change, as well as to encourage additional agricultural food production (and eliminate policies that discourage it).

References

Anderson, D., B. Hunt, M. Kortelainen, D. Muir, and S. Snudden (forthcoming), "Getting to Know the GIMF: The Simulation Properties of the Global Integrated Monetary and Fiscal Model," IMF Working Paper (Washington: International Monetary Fund).

Auerbach, Alan, and Yuriy Gorodnichenko, 2012, "Fiscal Multipliers in Recession and Expansion," in *Fiscal Policy after the Financial Crisis*, ed. by Alberto Alesina and Francesco Giavazzi (Cambridge, Massachusetts: National Bureau of Economic Research).

Bachmann, Rudiger, and Giuseppe Moscarini, 2011, "Business Cycles and Endogenous Uncertainty," University of Michigan Working Paper (Ann Arbor, Michigan).

Baker, Scott, and Nicholas Bloom, 2011, "Does Uncertainty Drive Business Cycles? Using Disasters as a Natural Experiment," Stanford University Working Paper (Stanford, California).

———, and Steven J. Davis, 2012, "Measuring Economic Policy Uncertainty," Stanford University Working Paper (Stanford, California).

Barkbu, Bergljot, Jesmin Rahman, Rodrigo Valdés, and a staff team, 2012, "Fostering Growth in Europe Now," IMF Staff Discussion Note No. 12/07 (Washington: International Monetary Fund). www.imf.org/external/pubs/ft/sdn/2012/sdn1207.pdf.

Batini, Nicoletta, Giovanni Callegari, and Giovanni Melina, 2012, "Successful Austerity in the United States, Europe, and Japan," IMF Working Paper No. 12/190 (Washington: International Monetary Fund).

Benes, Jaromir, Marcelle Chauvet, Ondra Kamenik, Michael Kumhof, Douglas Laxton, Susanna Mursula, and Jack Selody, 2012, "The Future of Oil: Geology versus Technology," IMF Working Paper No. 12/109 (Washington: International Monetary Fund).

Bentolila, Samuel, and Giuseppe Bertola, 1990, "Firing Costs and Labour Demand: How Bad Is Eurosclerosis?" *Review of Economic Studies*, Vol. 57, No. 3, pp. 381–402.

Bernanke, Ben, 1983, "Irreversibility, Uncertainty, and Cyclical Investment," *The Quarterly Journal of Economics*, Vol. 98, No. 1, pp. 85–106.

Bloom, Nicholas, 2009, "The Impact of Uncertainty Shocks," *Econometrica*, Vol. 77, No. 3, pp. 623–85.

———, Max Floetotto, Nir Jaimovich, Itay Saporta-Eksten, and Stephen Terry, 2012, "Really Uncertain Business Cycles," NBER Working Paper No. 18245 (Cambridge, Massachusetts: National Bureau of Economic Research).

Carrière-Swallow, Yan, and Luis Felipe Céspedes, 2011, "The Impact of Uncertainty Shocks in Emerging Economies," Central Bank of Chile Working Paper No. 646 (Santiago).

Chinn, Menzie David, and Olivier Coibion, 2009, "The Predictive Content of Commodity Futures," La Follette School of Public Affairs Working Paper No. 2009–016 (Madison, Wisconsin: University of Wisconsin). http://ssrn.com/abstract=1490043 or http://dx.doi.org/10.2139/ssrn.1490043.

Christiano, Lawrence, Martin Eichenbaum, and Sergio Rebelo, 2011, "When Is the Government Spending Multiplier Large?" *Journal of Political Economy,* Vol. 119, No. 1, pp. 78–121.

Claessens, Stijn, M. Ayhan Kose, and Marco E. Terrones, 2012, "How Do Business and Financial Cycles Interact?" *Journal of International Economics,* Vol. 87, No. 1, pp. 178–90.

Decressin, Jörg, and Douglas Laxton, 2009, "Gauging Risks for Deflation," IMF Staff Position Note No. 09/01 (Washington: International Monetary Fund).

Dixit, Avinash K., and Robert S. Pindyck, 1994, *Investment Under Uncertainty* (Princeton, New Jersey: Princeton University Press).

Elekdag, Selim, and Prakash Kannan, 2009, "Incorporating Market Information into the Construction of the Fan Chart," IMF Working Paper No. 09/178 (Washington: International Monetary Fund).

Elmendorf, Douglas W., and N. Gregory Mankiw, 1999, "Government Debt," in *Handbook of Macroeconomics,* Vol. 1C, ed. by J.B. Taylor and M. Woodford (Amsterdam: North-Holland).

Engen, Eric M., and R. Glenn Hubbard, 2004, "Federal Government Debt and Interest Rates," *NBER Macroeconomics Annual*, Vol. 19 (Cambridge, Massachusetts: National Bureau of Economic Research), pp. 83–138.

European Council (EC), 2012, "Towards a Genuine Economic and Monetary Union," June 26 report by European Council President Herman Van Rompuy (Brussels). http://consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/131201.pdf.

Fatas, Antonio, and Ilian Mihov, forthcoming, "Policy Volatility, Institutions and Economic Growth," *Review of Economics and Statistics*.

Gale, William, and Peter Orszag, 2004, "Budget Deficits, National Saving, and Interest Rates," *Brookings Papers on Economic Activity,* Vol. 2, pp. 101–87.

Gilchrist, Simon, Jae Sim, and Egon Zakrajsek, 2010, "Uncertainty, Financial Frictions, and Investment Dynamics," Boston University Working Paper (Boston, Massachusetts).

Hamilton, James D., 2008, "Oil and the Macroeconomy," in *New Palgrave Dictionary of Economics,* ed. by Steven Durlauf and Lawrence Blume (Houndmills, United Kingdom: Palgrave McMillan, 2nd ed.).

Hirata, Hideaki, M. Ayhan Kose, Christopher Otrok, and Marco E. Terrones, 2012, "Global House Price Fluctuations: Synchronization and Determinants," NBER Working Paper No. 18362 (Cambridge, Massachusetts: National Bureau of Economic Research).

International Monetary Fund (IMF), 2012a, *Euro Area Policies,* IMF Country Report No. 12/181 (Washington). www.imf.org/external/pubs/ft/scr/2012/cr12181.pdf.

———, 2012b, *Fiscal Monitor* (Washington, April).

———, 2012c, *Greece: Staff Report for the 2012 Article IV Consultation*, Country Report No. 12/57 (Washington).

———, 2012d, *Pilot External Sector Report* (Washington). www.imf.org/external/np/pp/eng/2012/070912.pdf.

———, 2012e, *2012 Spillover Report* (Washington). www.imf.org/external/np/pp/eng/2012/070912.pdf.

———, 2012f, *Toward Lasting Stability and Growth: Umbrella Report for the G-20 Mutual Assessment Process* (Washington). www.imf.org/external/np/g20/pdf/062012.pdf.

———, 2012g, *The United Kingdom: Staff Report for the 2012 Article IV Consultation*, IMF Country Report No. 12/190 (Washington).

Kose, M. Ayhan, Eswar Prasad, and Marco E. Terrones, 2006, "How Do Trade and Financial Integration Affect the Relationship between Growth and Volatility," *Journal of International Economics*, Vol. 69 (June), pp. 176–202.

Kose, M. Ayhan, Prakash Loungani, and Marco E. Terrones, 2009, "Out of the Ballpark," *Finance & Development*, Vol. 46 (June), pp. 25–28.

Kumar, Manmohan S., 2003, "Deflation: Determinants, Risks, and Policy Options," IMF Occasional Paper No. 221 (Washington: International Monetary Fund).

———, and Jaejoon Woo, 2010, "Public Debt and Growth," IMF Working Paper No. 10/174 (Washington: International Monetary Fund).

Kumhof, Michael, Douglas Laxton, Dirk Muir, and Susanna Mursula, 2010, "The Global Integrated Monetary and Fiscal Model (GIMF)—Theoretical Structure," IMF Working Paper No. 10/34 (Washington: International Monetary Fund).

Laeven, Luc, and Fabián Valencia, 2012, "Systemic Banking Crises Database: An Update," IMF Working Paper No. 12/163 (Washington: International Monetary Fund).

Laubach, Thomas, 2009, "New Evidence on the Interest Rate Effects of Budget Deficits and Debt," *Journal of the European Economic Association*, Vol. 7, No. 4, pp. 858–85.

Matheson, Troy D., 2011, "New Indicators for Tracking Growth in Real Time," IMF Working Paper No. 11/43 (Washington: International Monetary Fund).

Ramey, Garey, and Valerie Ramey, 1995, "Cross-Country Evidence on the Link between Volatility and Growth," *American Economic Review*, Vol. 85, No. 5, pp. 1138–51.

Stock, James H., and Mark W. Watson, forthcoming, "Disentangling the Channels of the 2007–09 Recession," *Brookings Papers on Economic Activity* (Washington: Brookings Institution).

Woodford, Michael, 2011, "Simple Analytics of the Government Expenditure Multiplier," *American Economic Journal: Macroeconomics,* Vol. 3, No. 1, pp. 1–35.