CHAPTER 1

GLOBAL PROSPECTS AND POLICIES

Slowing Global Activity

Activity has weakened significantly (Figure 1.1), following a number of quarters of growth broadly in line with *World Economic Outlook* (WEO) projections. The slowdown reflects both anticipated and unanticipated developments. The strong cyclical rebound in global industrial production and trade in 2010 was never expected to persist. However, in crisis-hit advanced economies, especially the United States, the handover from public to private demand is taking more time than anticipated. In addition, sovereign debt and banking sector problems in the euro area have proven much more tenacious than expected. Furthermore, the disruptions resulting from the Great East Japan earthquake and tsunami, as well as the spreading unrest in the Middle East and North Africa (MENA) region and the related surge in oil prices, were major surprises.

The shocks to Japan and the oil supply have had a temporary effect on global growth, which is beginning to unwind. Various considerations suggest that they may have lowered output in advanced economies by ½ percentage point, mostly in the second quarter of 2011.

- According to some estimates, the number of cars manufactured worldwide may have dropped by up to 30 percent in the two months following the Japanese earthquake and tsunami because of supply-chain disruptions. For the United States, some estimates put losses on the order of 1 percentage point of GDP in the second quarter of 2011;[1] others report smaller effects of about ½ percentage point of GDP.[2]
- During the second quarter of 2011, oil prices briefly rose more than 25 percent above the levels that prevailed in January 2011. It is hard to determine the extent to which prices were driven up by stronger demand or by lower supply (for example, from Libya). Assuming that a significant share of the price increase reflected lower supply, it may have reduced output in advanced economies by ¼ to ½ percentage point of GDP.

At the same time, emerging and developing economies performed broadly as forecast, with considerable variation across regions. Activity began to rebound fairly strongly in the crisis-hit economies of central and eastern Europe (CEE) and the Commonwealth of Independent States (CIS), helped in the latter by buoyant commodity prices. Surging commodity prices also propelled Latin America to high growth rates. Activity in developing Asia weakened modestly in response to global supply-chain disruptions and destocking in the face of more uncertain demand from advanced economies. Sub-Saharan Africa (SSA) continued to expand at a robust pace. By contrast, economic activity in the MENA region suffered from political and social conflict, although strong revenues boosted the economies of oil exporters. The net result of the various developments in advanced and emerging market economies was unexpectedly weak global activity during the second quarter (Figure 1.1, bottom panel).

Renewed Financial Instability

Recently, financial volatility has again increased drastically, driven by concerns about developments in the euro area and the strength of global activity, especially in the United States. Policy indecision has exacerbated uncertainty and added to financial strains, feeding back into the real economy. The September 2011 *Global Financial Stability Report* observes that renewed doubts about the prospects for addressing the problems in the euro area resurfaced in spring 2011 and have since deepened, notwithstanding the strong measures agreed at the July 21, 2011, EU summit. It is worrisome that investors have significantly pushed up sovereign risk premiums for Belgium, Italy, and Spain, and—to a much lesser extent—France (Figure

[1]See Macroeconomic Advisers (2011). Based on manufacturers' announced plans, they argue that rising car assembly could add 1¼ percentage points to GDP in the third quarter.

[2]See IMF (2011).

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

(Percent change unless noted otherwise)

	Year over Year						Q4 over Q4		
			Projections		Difference from June 2011 WEO Projections		Estimates	Projections	
	2009	2010	2011	2012	2011	2012	2010	2011	2012
World Output[1]	**–0.7**	**5.1**	**4.0**	**4.0**	**–0.3**	**–0.5**	**4.8**	**3.6**	**4.1**
Advanced Economies	**–3.7**	**3.1**	**1.6**	**1.9**	**–0.6**	**–0.7**	**2.9**	**1.4**	**2.2**
United States	–3.5	3.0	1.5	1.8	–1.0	–0.9	3.1	1.1	2.0
Euro Area	–4.3	1.8	1.6	1.1	–0.4	–0.6	2.0	1.1	1.6
Germany	–5.1	3.6	2.7	1.3	–0.5	–0.7	3.8	1.6	2.0
France	–2.6	1.4	1.7	1.4	–0.4	–0.5	1.4	1.4	1.7
Italy	–5.2	1.3	0.6	0.3	–0.4	–1.0	1.5	0.4	0.4
Spain	–3.7	–0.1	0.8	1.1	0.0	–0.5	0.6	0.7	1.7
Japan	–6.3	4.0	–0.5	2.3	0.2	–0.6	2.5	0.5	2.0
United Kingdom	–4.9	1.4	1.1	1.6	–0.4	–0.7	1.5	1.5	1.7
Canada	–2.8	3.2	2.1	1.9	–0.8	–0.7	3.3	1.4	2.5
Other Advanced Economies[2]	–1.1	5.8	3.6	3.7	–0.4	–0.1	4.8	3.8	3.9
Newly Industrialized Asian Economies	–0.7	8.4	4.7	4.5	–0.4	0.0	6.0	5.2	4.7
Emerging and Developing Economies[3]	**2.8**	**7.3**	**6.4**	**6.1**	**–0.2**	**–0.3**	**7.4**	**6.4**	**6.4**
Central and Eastern Europe	–3.6	4.5	4.3	2.7	–1.0	–0.5	5.3	2.9	2.7
Commonwealth of Independent States	–6.4	4.6	4.6	4.4	–0.5	–0.3	4.6	3.8	3.9
Russia	–7.8	4.0	4.3	4.1	–0.5	–0.4	4.4	4.0	3.6
Excluding Russia	–3.0	6.0	5.3	5.1	–0.3	0.0	. . .	. . .	. . .
Developing Asia	7.2	9.5	8.2	8.0	–0.2	–0.4	9.0	8.1	8.1
China	9.2	10.3	9.5	9.0	–0.1	–0.5	9.8	9.3	9.1
India	6.8	10.1	7.8	7.5	–0.4	–0.3	9.2	7.0	7.5
ASEAN-5[4]	1.7	6.9	5.3	5.6	–0.1	–0.1	6.0	5.4	5.6
Latin America and the Caribbean	–1.7	6.1	4.5	4.0	–0.1	–0.1	5.4	4.1	3.9
Brazil	–0.6	7.5	3.8	3.6	–0.3	0.0	5.0	3.8	3.8
Mexico	–6.2	5.4	3.8	3.6	–0.9	–0.4	4.2	3.7	3.2
Middle East and North Africa	2.6	4.4	4.0	3.6	–0.2	–0.8	. . .	. . .	. . .
Sub-Saharan Africa	2.8	5.4	5.2	5.8	–0.3	–0.1	. . .	. . .	. . .
Memorandum									
European Union	–4.2	1.8	1.7	1.4	–0.3	–0.7	2.1	1.3	1.9
World Growth Based on Market Exchange Rates	–2.3	4.0	3.0	3.2	–0.4	–0.5	. . .	. . .	. . .
World Trade Volume (goods and services)	**–10.7**	**12.8**	**7.5**	**5.8**	**–0.7**	**–0.9**	**. . .**	**. . .**	**. . .**
Imports									
Advanced Economies	–12.4	11.7	5.9	4.0	–0.1	–1.1	. . .	. . .	. . .
Emerging and Developing Economies	–8.0	14.9	11.1	8.1	–1.0	–0.9	. . .	. . .	. . .
Exports									
Advanced Economies	–11.9	12.3	6.2	5.2	–0.6	–0.9	. . .	. . .	. . .
Emerging and Developing Economies	–7.7	13.6	9.4	7.8	–1.8	–0.5	. . .	. . .	. . .
Commodity Prices (U.S. dollars)									
Oil[5]	–36.3	27.9	30.6	–3.1	–3.9	–2.1	. . .	. . .	. . .
Nonfuel (average based on world commodity export weights)	–15.7	26.3	21.2	–4.7	–0.4	–1.4	. . .	. . .	. . .
Consumer Prices									
Advanced Economies	0.1	1.6	2.6	1.4	0.0	–0.3	1.6	2.5	1.3
Emerging and Developing Economies[3]	5.2	6.1	7.5	5.9	0.6	0.3	6.2	6.9	5.1
London Interbank Offered Rate (percent)[6]									
On U.S. Dollar Deposits	1.1	0.5	0.4	0.5	–0.2	–0.3	. . .	. . .	. . .
On Euro Deposits	1.2	0.8	1.3	1.2	–0.4	–1.4	. . .	. . .	. . .
On Japanese Yen Deposits	0.7	0.4	0.5	0.3	0.0	0.1	. . .	. . .	. . .

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during July 18–August 15, 2011. 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 (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 and developing economies.

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

[5]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 $79.03 in 2010; the assumed price based on futures markets is $103.20 in 2011 and $100.00 in 2012.

[6]Six-month rate for the United States and Japan. Three-month rate for the Euro Area.

1.2, top panels); and that Cyprus has come under major pressure. Interbank markets are again under strain, and some banks reportedly are finding it difficult to continue to obtain funding (Figure 1.2, center-right panel). With accumulating signs of weakness in key advanced economies, notably bad news about the U.S. economy over the past couple of months, equity markets have fallen sharply and equity price volatility has jumped up (Figure 1.3, top panels); also, prices for strong sovereign bonds and gold have risen—all signs that investors have become much more cautious about the prospects for the major advanced economies.

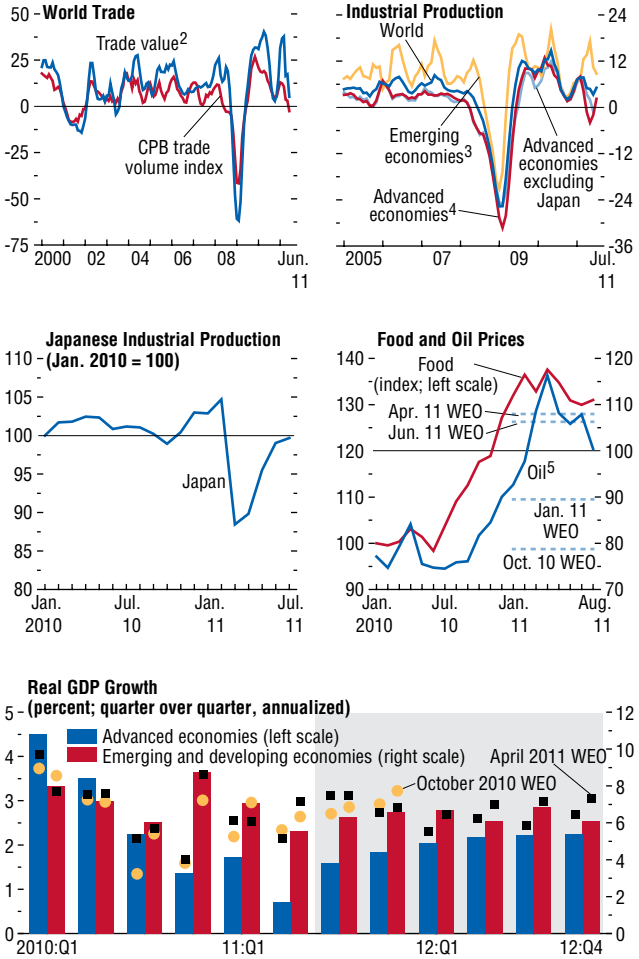
More Uneven Expansion

Worryingly, various consumer and business confidence indicators in advanced economies have retreated sharply, rather than strengthened as might have been expected in the presence of mostly temporary shocks that are unwinding. Accordingly, the IMF's Growth Tracker (Figure 1.4, top panel) points to low growth over the near term. WEO projections assume that policymakers keep their commitments and the financial turmoil does not run beyond their control, allowing confidence to return as conditions stabilize. The return to stronger activity in advanced economies will then be delayed rather than derailed by the turmoil. Projections thus point to a modest pickup of activity in advanced economies and robust growth in emerging and developing economies during 2011–12 (Figure 1.5; Table 1.1). Global growth is expected to be about 4 percent. Real GDP growth in the major advanced economies—the United States, euro area, and Japan—is forecast to rise modestly, from about ¾ percent in the first half of 2011 to about 1½ percent in 2012, as the effects of temporary disturbances abate and the fundamental drivers of expansion slowly reassert themselves. Activity will be more robust in a number of other advanced economies, especially in those with close ties to emerging Asia. In emerging and developing economies, capacity constraints, policy tightening, and slowing foreign demand are expected to dampen growth to varying extents across countries. As a result, growth in these economies will drop from about 7 percent in the first half of 2011 to about 6 percent in 2012. Risks are mainly to the downside over the near term.

Figure 1.1. Global Indicators[1]

(Annualized percent change of three-month moving average over previous three-month moving average unless noted otherwise)

Global trade and industrial production lost momentum during the second quarter of 2011, partly because an earthquake and tsunami in Japan disrupted global supply chains and high oil prices slowed consumption in advanced economies. As a result, global growth turned out weaker than expected, mainly in advanced economies.



Sources: Bureau of Economic Analysis; U.S. Treasury; European Central Bank; Haver Analytics; Netherlands Bureau for Economic Policy Analysis for CPB trade volume index; and IMF staff estimates.

[1]Not all economies are included in the regional aggregations. For some economies, monthly data are interpolated from quarterly series.

[2]In SDR terms.

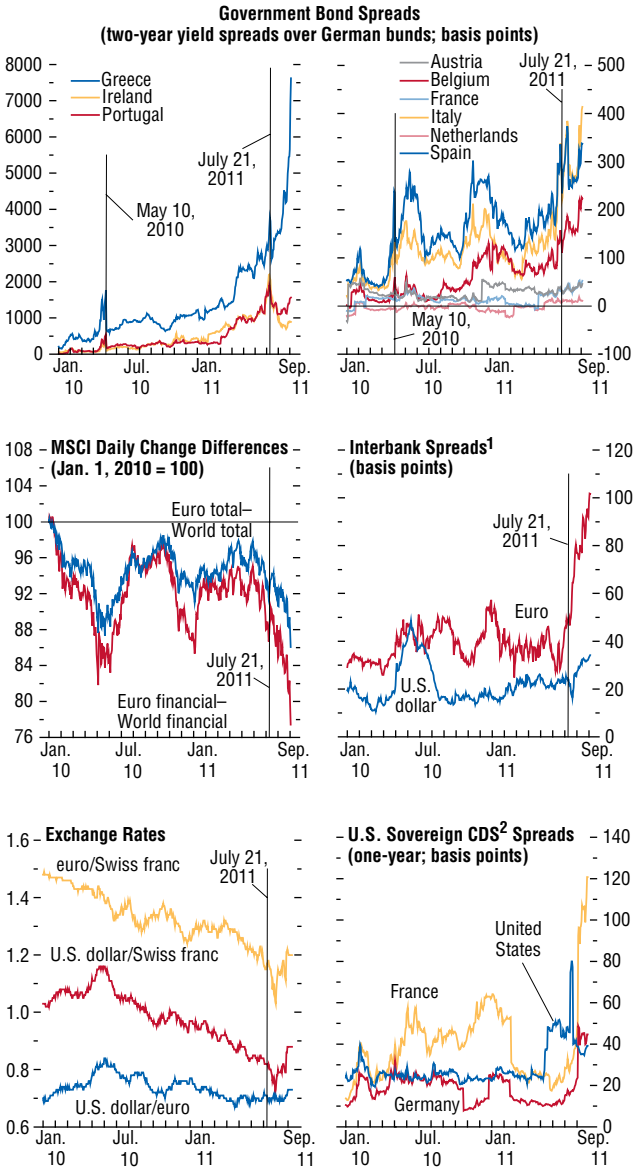
[3]Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, and Venezuela.

[4]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.

[5]U.S. dollars a barrel; right scale; simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil.

Figure 1.2. Financial Strains in Europe and the United States

The crisis in the euro area has deepened and broadened. Spreads on sovereign bonds of economies in the periphery have reached new highs. Concurrently, spreads of several other economies have also widened to varying degrees. Stock prices have suffered sharp corrections, dragged down by concerns about weak activity and financial sectors in advanced economies. Strains have resurfaced in interbank markets. At the same time, credit default swap (CDS) spreads on U.S. government bonds have moved up. This contrasts with the decline in U.S. bond rates. Both the euro and U.S. dollar depreciated against the Swiss franc until recently.



Sources: Bloomberg Financial Markets; and IMF staff calculations.
[1]Three-month London interbank offered rate minus three-month government bill rate.
[2]CDS = credit default swap.

Some expansionary forces are expected to return

Key drivers of stronger activity over the near term include the rebound of activity in Japan, the drop in oil and food prices (Appendix 1.1), and solid demand growth in key emerging market economies.

- Reports from Japan confirm a rapid recovery in both output and domestic spending. Industrial production is now growing rapidly, business sentiment is improving sharply, and household spending is recovering quickly. Although electricity shortages will likely weigh on production throughout the summer, and the government's rebuilding program could suffer further delays, a V-shaped short-term rebound seems to be under way.
- Oil prices are back where they were at the dawn of unrest in the MENA region (Appendix 1.1). They ended the second quarter at about $105 a barrel, after peaking at about $120 by the end of April, helped partly by more supply from other members of the Organization of Petroleum Exporting Countries (OPEC) and the release of crude oil and petroleum stocks from strategic emergency reserves by International Energy Agency (IEA) members. The IMF base metal price index declined by about 9 percent from its first-quarter peak in February. However, the decline in food prices has been much more limited, amounting to about 4 percent, mainly because food crops are now expected to be below earlier estimates.

Activity is likely to receive further support from several sources. The pace of inventory reduction should slow with the repair of global supply chains (Figure 1.6, middle-right panel). Investment in machinery and equipment has been expanding at a fairly solid pace in both advanced and emerging market economies (Figure 1.6, bottom-right panel) and is forecast to continue to do so, helped by strong corporate profitability and relatively healthy corporate balance sheets.

But consumption in major advanced economies is expected to lag behind

Consumption in emerging market economies has been going strong for some time, propelled by rapidly expanding employment and incomes. But

consumption in advanced economies is likely to remain anemic for these key reasons:

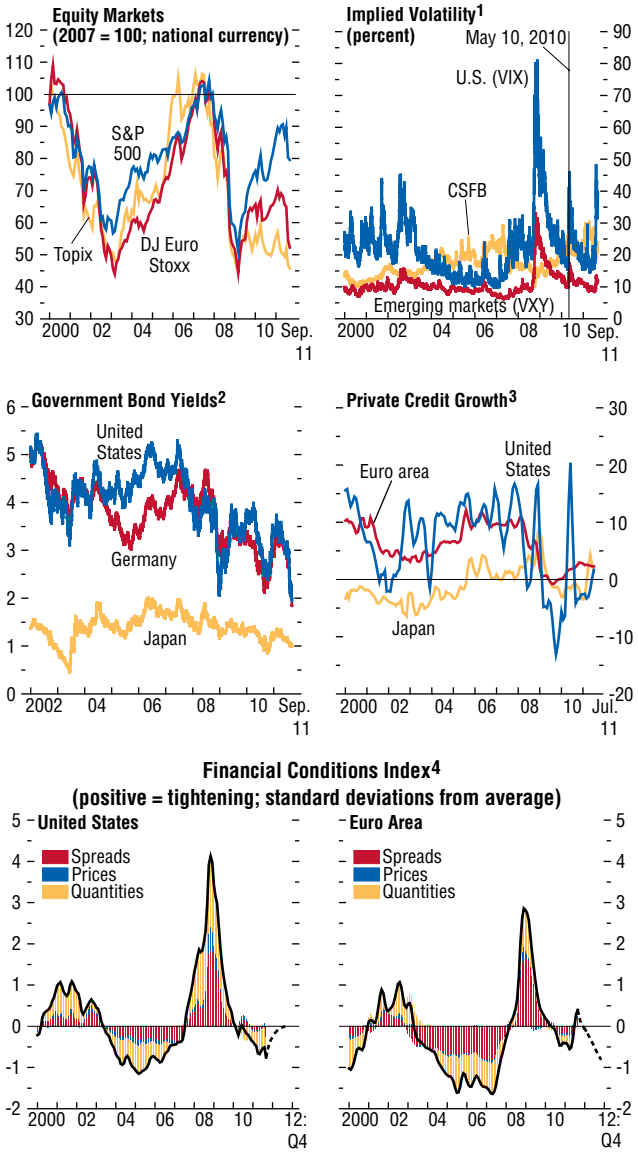
- Unemployment is likely to stay high for some time. Employment may well exhibit more weakness during much of the summer, even if purchasing managers' index (PMI) survey indicators for employment have so far shown greater resilience than those for production (Figure 1.6, top panels). Neither a significant acceleration nor a large drop in employment seems in the offing.
- Sluggish wages and low funding costs have boosted corporate profits, but this is not directly benefiting households with a high propensity to consume. Concerns about income prospects are particularly elevated in the United States, where an extraordinarily large loss of jobs has added to an ongoing trend decline in the pace of employment creation (see below). Meanwhile, the share of corporate profits in income has returned to about 10 percent, which is close to the high precrisis levels. A similar conclusion about jobs and incomes emerges from an analysis of sectoral output and employment (Box 1.1).
- House prices show no signs of stabilizing in key crisis-hit economies such as the United States and Spain (Figure 1.7, bottom-left panel). A large overhang of unsold properties with underwater mortgages continues to present a major downside risk to consumption in the United States. House prices are rising again in other advanced economies, such as France and Germany, and remain high in Canada. However, households everywhere have recently suffered significant losses in stock market wealth.

Financial volatility could hold back activity

As discussed in the September 2011 *Global Financial Stability Report,* financial stability risks have once again increased dramatically. The IMF staff's financial conditions indices, which consider developments in equity and bond prices, spreads, and bank lending volume in the United States and the euro area, have tightened noticeably lately (see Figure 1.3, bottom panel), reflecting mainly lower stock prices and tighter spreads. How financial markets will evolve—and how they will affect real sectors in advanced economies—is still unclear.

Figure 1.3. Recent Financial Market Developments

Equity markets have retreated, and volatility has been on the rise. Investors have taken flight in government bonds of perceived "safe-haven" countries. There were signs that credit was bottoming until recently. Financial conditions indices have tightened lately, but projections assume gradual easing.



Sources: Bank of America/Merrill Lynch; Bank of Japan; Bloomberg Financial Markets; European Central Bank; Federal Reserve; Haver Analytics; Thomson Datastream; and IMF staff calculations.

[1]VIX = Chicago Board Options Exchange Market Volatility Index; VXY = JPMorgan Emerging Market Volatility Index; CSFB = Credit Suisse Fear Barometer.

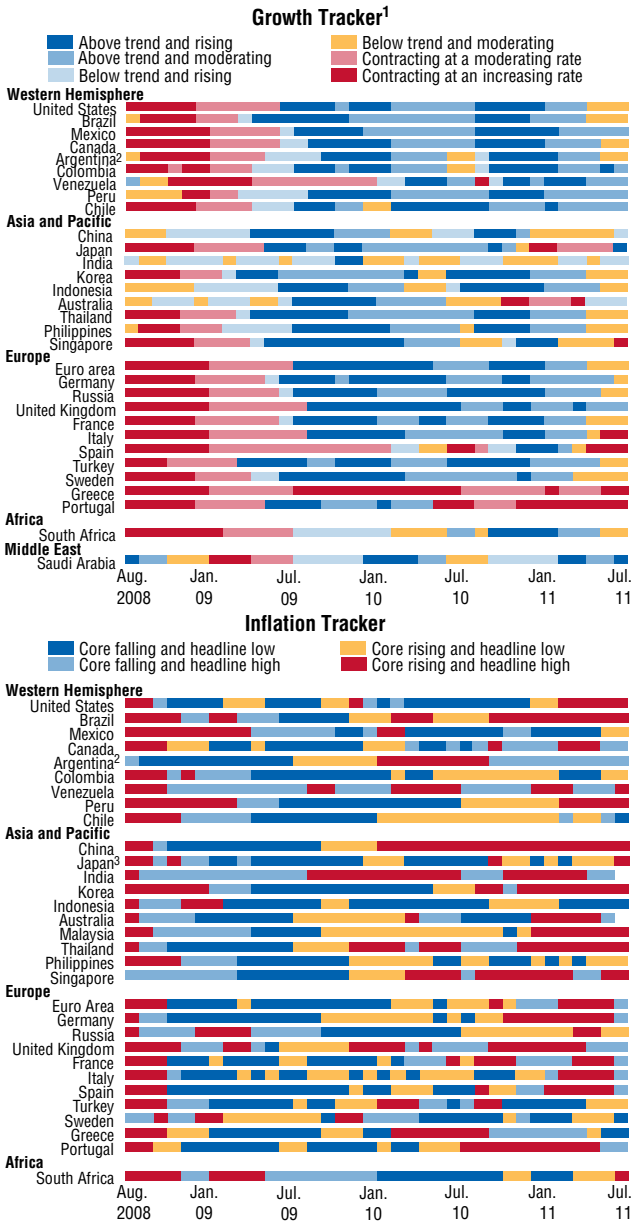
[2]Ten-year government bonds.

[3]Annualized percent change of three-month moving average over previous three-month moving average. After January 2009, loans adjusted for sales and securitization are used for the euro area. Spike for the United States in late 2010 is due to securitized credit card assets that banks owned, which were brought onto their balance sheets in 2010.

[4]Historical data are monthly, and forecasts (dashed lines) are quarterly.

Figure 1.4. Prospects for Near-Term Activity

The IMF staff's Growth Tracker points to moderating growth in the very near term, while the Inflation Tracker suggests still elevated price pressure in several emerging market economies. This reflects both high commodity prices and rising core inflation.



Sources: Haver Analytics; and IMF staff estimates.

[1]The Growth Tracker is described in Matheson (2011). Within regions, countries are listed by economic size.

[2]Figures are based on the official GDP and consumer price index (CPI) data. The authorities have committed to improve the quality of Argentina's official GDP and CPI, so as to bring them into compliance with their obligations under the IMF's Articles of Agreement. Until the quality of data reporting has improved, IMF staff will also use alternative measures of GDP growth and inflation for macroeconomic surveillance, including estimates by: private analysts which have been, on average, significantly lower than official GDP growth from 2008 onward, and provincial statistical offices and private analysts, which have shown inflation considerably higher than the official inflation rate from 2007 onward.

[3]The method gauges inflation pressure relative to historical trends. In Japan, inflation is higher than recent trends but still very low.

WEO forecasts assume that the latest bout of volatility will not lead to large increases in saving rates and that it will delay, rather than derail, the normalization of lending conditions. Spreads on corporate lending in capital markets and on emerging market sovereigns are still relatively low. IMF staff projections assume that banks can do without a sharp and sustained tightening of lending conditions, in some cases thanks to liquidity support from central banks. However, weaker growth prospects pose threats to public and private balance sheets and significantly increase the challenge of coping with heavy debt burdens.

Financial conditions remain supportive of growth in emerging and developing economies, notwithstanding higher volatility (Figure 1.8). In most of these economies, bank credit is still going strong (Figure 1.9, top panels). Search for yield is spurring capital inflows and magnifying already ample domestic liquidity. But flows are volatile (Figure 1.8, bottom panels). WEO forecasts see net private capital flows to most regions rising further, assuming policymakers in advanced economies forestall a cycle of deteriorating sovereign and financial sector prospects. The effect of strong growth and tighter monetary conditions in emerging market economies would then outweigh the effect of more elevated risk aversion among investors. However, as noted in the *Global Financial Stability Report,* with global downside risks rising, emerging markets could also face a sharp reduction in demand, a reversal in capital flows, and a rise in funding costs that could impact the financial soundness of domestic banks.

Monetary policy will continue to support activity

Monetary policy remains highly accommodative in many advanced economies (Figure 1.10, top panels), notwithstanding the end of the second round of quantitative easing (QE2) in the United States and rate hikes in a number of advanced economies, including the euro area. The financial turmoil has already affected monetary policymaking. The central banks of Japan and Switzerland have recently taken steps to further ease monetary conditions, amid rising deflation pressure on account of appreciating

currencies. The Federal Reserve has indicated that it expects economic conditions to warrant exceptionally low policy rates at least through mid-2013. The European Central Bank (ECB) has expanded its liquidity operations and stepped up its Securities Market Program. More generally, markets have been pushing out their expectations for rate hikes much further into the future. Despite monetary tightening by many central banks in emerging market economies and other measures to slow credit growth, real interest rates are still low and credit is growing strongly in a number of these economies (Figure 1.10, bottom panels).

But fiscal consolidation will dampen short-term growth

Fiscal consolidation will weigh increasingly on activity (Figure 1.11, middle-left panel). In advanced economies, fiscal policy was neutral in 2010, with loosening in Canada, Germany, Japan, and the United States broadly offset by tightening elsewhere. In many economies, there was significant progress toward fiscal adjustment: policy tightened further in the first half of 2011, and the pace of consolidation is now estimated to be appreciably above earlier estimates. In particular, the structural fiscal balance of the United States is now expected to improve by about ½ percent of GDP in 2011, implying a 1 percentage point of GDP fiscal withdrawal relative to the April 2011 WEO projection. Fiscal policy will tighten further in 2012, mainly on account of tightening in the United States, but also because of sizable consolidation in various euro area economies. IMF staff analysis suggests that the switch from fiscal stimulus to consolidation will dampen short-term activity.[3]

Expansionary forces are expected to offset contractionary forces

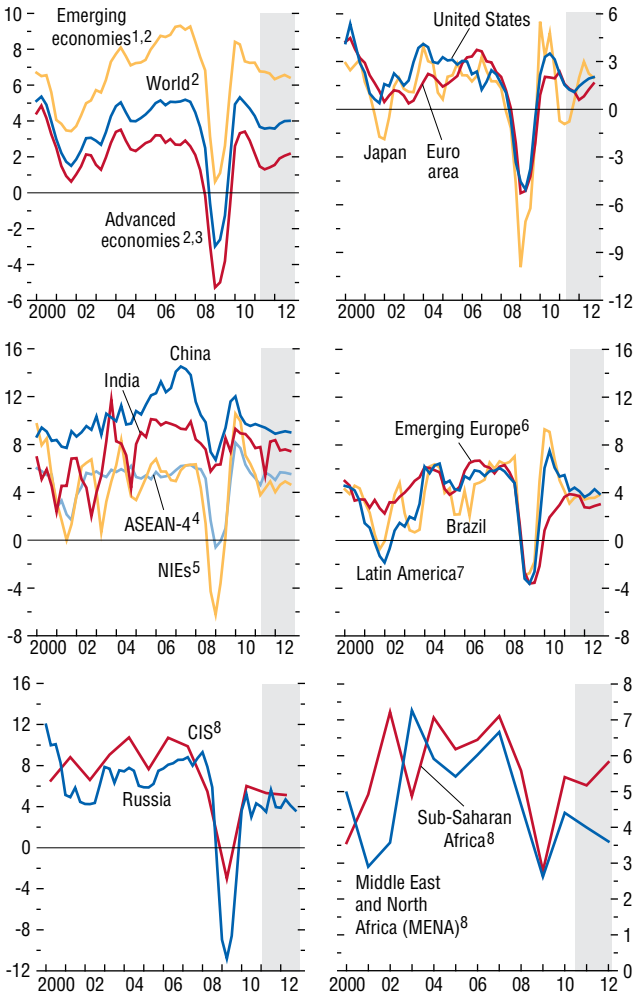
On balance, the evidence points to continued, uneven growth. Relative to the June 2011 *WEO Update*, the most noteworthy revision is the reduction in the real GDP growth forecast for the

[3]See Chapter 3 of the October 2010 *World Economic Outlook*.

Figure 1.5. Global Outlook

(Real GDP; quarterly percent change from one year earlier unless noted otherwise)

Global growth is forecast to regain some momentum during the second half of 2011. Real GDP growth in the advanced economies is expected to gradually return to about 2 percent. Activity in emerging and developing economies is expected to decelerate in the face of capacity constraints and tightening policies, settling at a still high rate of about 6 percent in 2012. Growth is expected to remain very elevated in emerging Asia, notably in China and India, followed by sub-Saharan Africa.

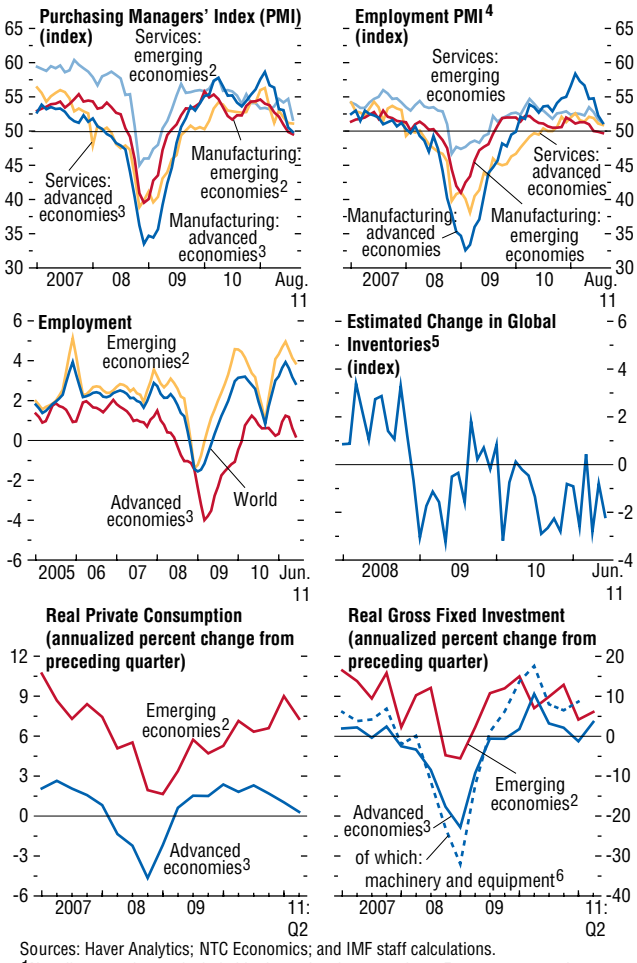


Sources: Haver Analytics; and World Economic Outlook database.
[1]Comprises China, India, Russia, South Africa, Turkey, and economies listed in footnotes 4, 6, and 7.
[2]Includes only economies that report quarterly data.
[3]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.
[4]Indonesia, Malaysia, Philippines, and Thailand.
[5]Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.
[6]Bulgaria, Hungary, Latvia, Lithuania, and Poland.
[7]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.
[8]CIS = Commonwealth of Independent States. Annual percent change from one year earlier. MENA data exclude Libya for the forecast years due to the uncertain political situation.

Figure 1.6. Current and Forward-Looking Growth Indicators[1]

(Annualized percent change of three-month moving average over previous three-month moving average unless noted otherwise)

Manufacturing and Services PMI indicators still stand above 50 and thus point to continued expansion in the near term but at a slower pace than in 2010. The indicators also suggest that cutbacks in payrolls are not expected. Data on retail sales and industrial production suggest that inventories have not been rebuilt to a major extent thus far. Further support from accelerated inventory building could be in the offing once uncertainty about prospects diminishes again. Private consumption has been strong in emerging economies and sluggish in advanced economies. Investment has grown fairly strongly, except in construction in advanced economies.



Sources: Haver Analytics; NTC Economics; and IMF staff calculations.

[1]Not all economies are included in the regional aggregations. For some economies, monthly data are interpolated from quarterly series.

[2]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.

[3]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.

[4]Aggregated from available advanced and emerging economies' manufacturing employment PMI and services employment PMI data.

[5]Based on deviations from an estimated (cointegration) relationship between global industrial production and retail sales.

[6]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.

United States, by 1 percentage point over 2011 and 2012. Other revisions for advanced economies generally range between ½ and 1 percentage point. The markdowns to most emerging and developing economies amount to about ½ percentage point. Growth will remain relatively robust in these economies because they can counter weaker foreign demand with less policy tightening. The forecast for CEE growth in 2011 has been lowered because of less buoyant (but still strong) growth in Turkey. In addition, prospects for the MENA region have been marked down further, by about ¾ percentage point for 2012.

- Among the advanced economies, real GDP growth in the United States is projected to pick up very gradually from about 1 percent in the second quarter of 2011 to about 2 percent later in 2012. Special factors that boosted activity in the euro area (notably in Germany) during the first quarter have already abated. Moreover, less foreign demand and tensions from the financial turmoil will weigh on investment and consumption, keeping real GDP growth at about ¼ percent during the remainder of 2011, before it rises gradually to about 1 percent during 2012. This assumes that national and euro area policies remain sufficiently strong to keep financial turmoil under control. The Japanese economy is set to expand vigorously during the second half of 2011 and, to a lesser extent, in the first half of 2012, as the economy recovers from the earthquake and tsunami.
- Real GDP growth in emerging and developing economies during the second half of 2011 is expected to be about 6¼ percent, down from about 7 percent during the first half of the year. Emerging Asia is forecast to continue to post strong growth of about 8 percent, propelled by China and India. In Latin America, growth is expected to moderate to 4 percent in 2012, from about 6 percent in 2010, as external demand slows and tighter macroeconomic policies begin to rein in strong domestic demand. With the rebound in the CEE and CIS regions losing some vigor in 2012, particularly in Turkey, real GDP growth in emerging and developing economies is expected to settle at about 6 percent.

Economic Slack alongside Signs of Overheating

The continued expansion of the global economy has come with increasing cyclical diversity. The picture is one of excess capacity in advanced economies and signs of overheating in emerging and developing economies. However, within each group there is significant diversity.

Despite permanent output losses, output gaps remain in advanced economies

By the end of the first half of 2011, many economies had returned to close to precrisis output levels (Figure 1.12, top-left panel). This includes a number of advanced and emerging economies that were hit severely by the crisis (for example, CEE and CIS economies). However, Italy and Spain continue to lag, and output in Japan was severely disrupted by the earthquake and tsunami. Other advanced economies in Asia, in contrast, are already far above precrisis output levels, as are many other emerging and developing economies.

Although the recession has ended, many economies continue to operate far below precrisis trends (Figure 1.12, top-right panel). Output losses relative to trends are largest for economies that were at the epicenter of the crisis, such as the United States and the United Kingdom, as well as for many CEE and CIS economies, notably Russia. In these economies output is some 10 percent below precrisis trends. Losses also persist in economies with very close economic linkages to crisis-hit economies, such as Canada and Mexico, which have close trade ties with the United States.

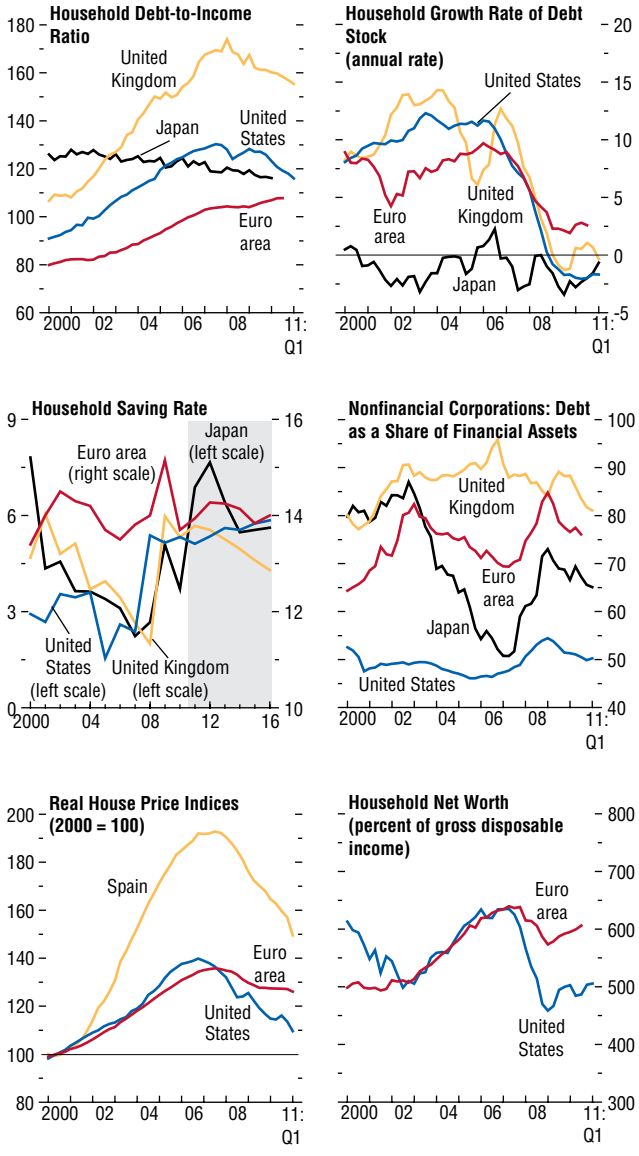
WEO estimates and forecasts suggest that crisis-related output losses will be long-lasting, even though output gaps remain (Figure 1.12, bottom-left panel).[4] For the United States, the gap is estimated at about 5½ percent of potential GDP in 2011; output is some 10 percent below precrisis trends. With the exception of Japan, output gaps in other major advanced economies are much lower, generally ranging between 2 and 3 percent. Incoming data confirm

[4]This is consistent with evidence on recoveries from financial crises in Chapter 4 of the October 2009 *World Economic Outlook*.

Figure 1.7. Balance Sheets and Saving Rates

(Percent unless noted otherwise)

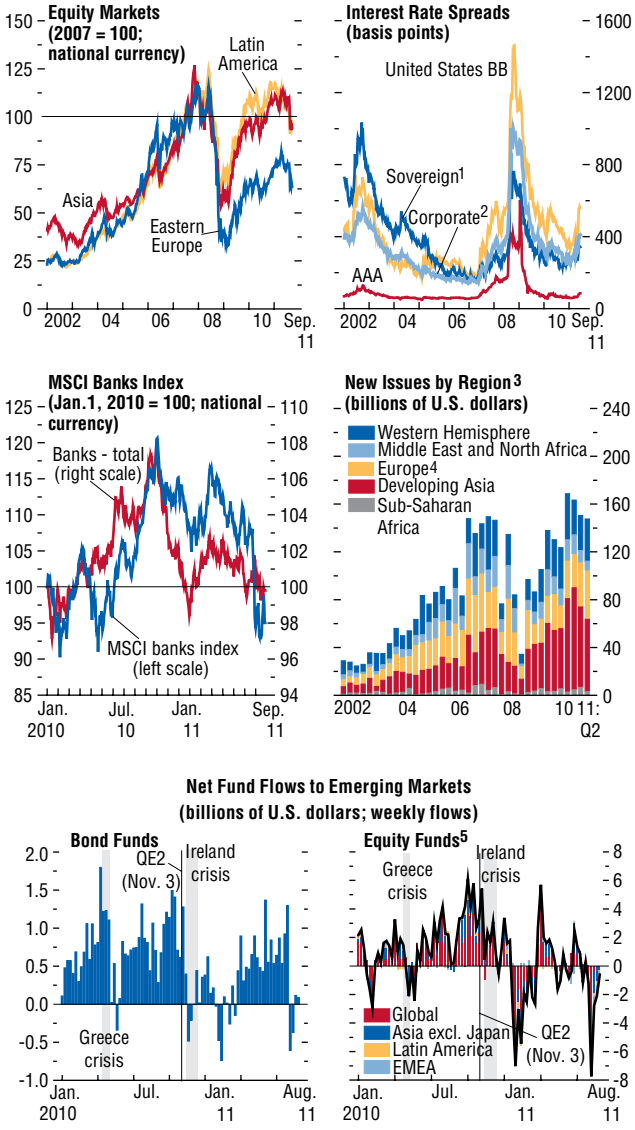
The accumulation of household debt has been slowing, but there are now signs that this development is bottoming out. Although household debt is still contracting in Japan and the United States, the pace is stabilizing or diminishing. Household saving rates are forecast to move sideways, implying that disposable income growth will translate fully into consumption growth. Although household wealth has received a boost from the recovery of financial markets since 2009, house prices continue to decline in crisis-hit economies.



Sources: Haver Analytics; Organization for Economic Cooperation and Development; and IMF staff estimates.

Figure 1.8. Emerging Market Conditions

Equity prices in emerging markets have also retreated but are generally not far below precrisis levels. Interest rate spreads have moved up modestly lately. Flows into equities and bonds, however, have retreated noticeably of late.



Sources: Bloomberg Financial Markets; Capital Data; EPFR Global; and IMF staff calculations.
[1]JPMorgan EMBI Global Index spread.
[2]JPMorgan CEMBI Broad Index spread.
[3]Total of equity, syndicated loans, and international bond issues.
[4]Central and eastern Europe and Commonwealth of Independent States.
[5]Black line = total. EMEA = Europe, Middle East, and Africa.

that most of the output lost in the euro area and the United States during the crisis will not be recovered (Figure 1.13). Emerging market economies that have been hit hard by the crisis appear to be suffering qualitatively similar output losses. Unemployment rates are higher than the typical rates during the 2002–08 expansion in only a few economies—these include the United Kingdom and the United States (Figure 1.12, bottom-right panel).

Underlying inflation pressure remains relatively elevated in emerging and developing economies

Headline and core inflation have been on the rise in many parts of the world until recently. The IMF's Inflation Tracker confirms that inflation pressure is still relatively elevated, especially in emerging and developing economies (Figure 1.4, bottom panel; and Figure 1.14). In the major advanced economies, however, headline and core inflation appear to be losing some momentum. Three factors will determine the path of inflation over the coming year:

- *Energy and food prices:* These were adding to inflation but have recently receded. Specifically, energy prices are currently far below their 2011 peaks. Food prices, which are particularly important for inflation in emerging and developing economies, have fallen to a much lesser extent. Forecasts assume a stabilization of energy and food prices at present levels. However, prospects are very uncertain, and previous forecasts based on futures markets have not proven accurate. Risks for prices are still tilted toward the upside. Emerging and developing economies are more likely to experience second-round effects on wages from past food and energy price hikes, because these account for a larger share of their consumption baskets (Chapter 3).
- *Output gaps:* In general, these are not exceptionally large. Two notable exceptions are Japan and the United States. However, even in the euro area, wage growth may well remain subdued for some time because employment is lagging the expansion of output. Evidence of labor market tightness is clearer for a number of smaller advanced economies and for many emerging and developing economies.

- *Policy and the credibility of policymakers:* Central bank credibility is well established in advanced economies but less so in many emerging and developing economies, and this is likely to amplify the second-round effects of external price increases (Chapter 3). In anticipation of such pressures, many central banks have begun to raise policy interest rates toward less accommodative levels.

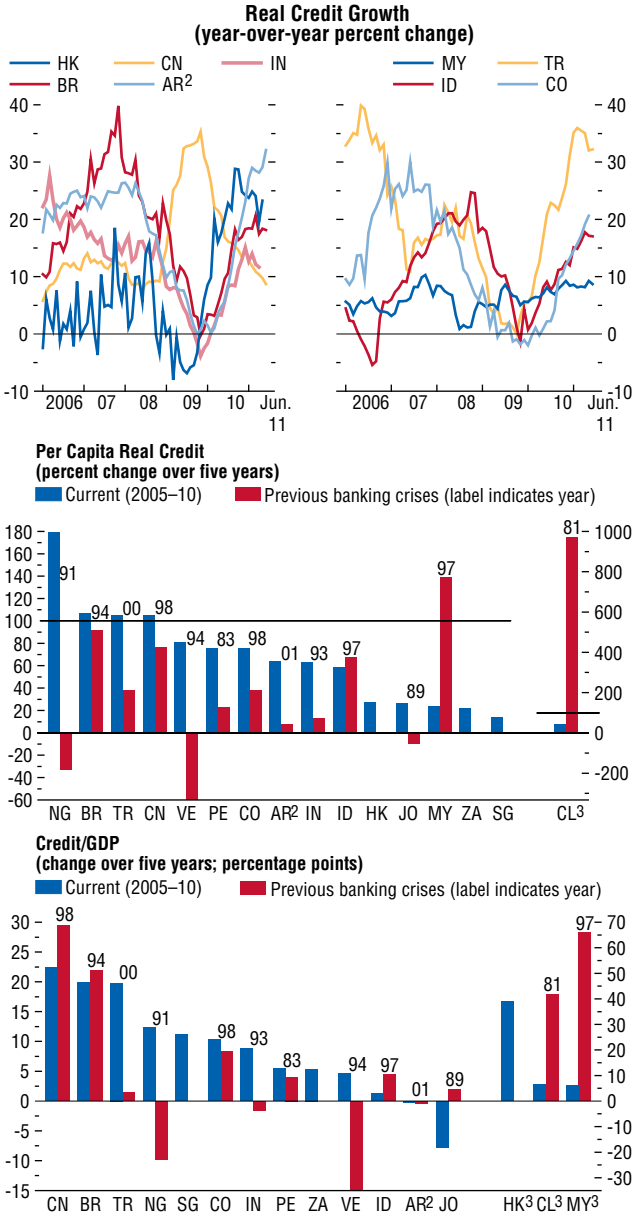
Although headline inflation is projected to recede as food and energy prices moderate, underlying inflation pressure may well rise further, mainly in emerging and developing economies. In advanced economies, headline inflation is forecast to be about 2½ percent in 2011 but then to recede to close to 1½ percent in 2012, assuming that energy and food prices evolve as the markets expect. In emerging and developing economies, headline inflation is expected to settle at about 6 percent in 2012, down from over 7½ percent in 2011, as energy and food prices stabilize but demand pressures raise core inflation. Inflation is expected to stay high through 2011–12 in the CIS, MENA, and SSA regions, averaging 7 to 10 percent. Within the broad trends, some economies are seeing noticeably higher inflation than are their regional peers (for example, Argentina, India, Paraguay, Venezuela, and Vietnam).

Risks Are Clearly to the Downside

Downside risks to activity have increased noticeably since the June 2011 *WEO Update*. Four types of risk deserve particular attention and revolve around (1) weak sovereigns and banks in a number of advanced economies, (2) insufficiently strong policies to address the legacy of the crisis in the major advanced economies, (3) vulnerabilities in a number of emerging market economies, and (4) volatile commodity prices and geopolitical tensions. Various market indicators confirm the qualitative assessment that downside risks are now much higher than in June or April 2011. A downside scenario illustrates how the major advanced economies could fall back into recession and what damage this could inflict on emerging and developing economies.

Figure 1.9. Emerging Market Economies with Strong Credit Expansion[1]

Bank credit growth is high in a number of emerging market economies. In per capita terms, credit close to doubled in real terms during 2005–10. Credit has also grown much faster than nominal GDP in a number of economies. On the one hand, this indicates financial deepening, which is desirable. On the other hand, it raises concern, because the growth rates are so high that they are likely to come at the expense of deteriorating credit quality. Furthermore, high credit growth coincides with rapid increases in real estate prices in many emerging economies. These conditions are reminiscent of those experienced ahead of previous banking crises.

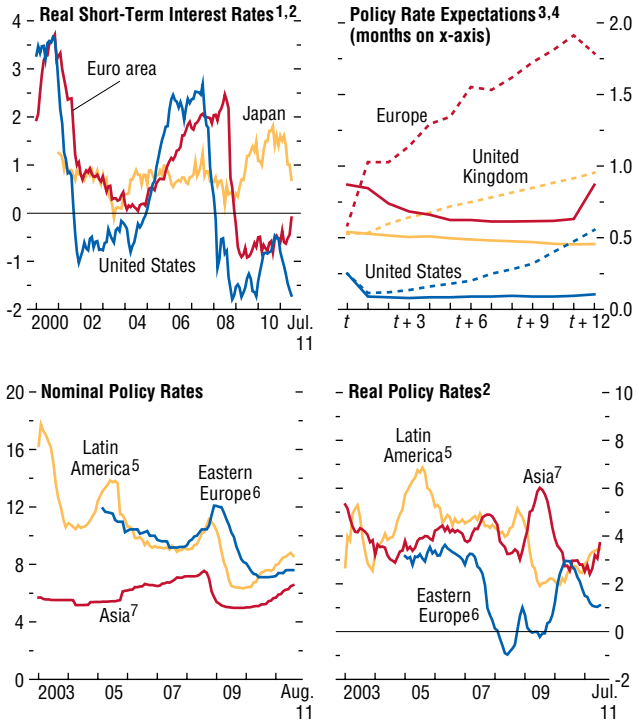


Sources: IMF, *International Financial Statistics;* and IMF staff calculations.
[1]AR: Argentina; BR: Brazil; CL: Chile; CN: China; CO: Colombia; HK: Hong Kong SAR; ID: Indonesia; IN: India; JO: Jordan; MY: Malaysia; NG: Nigeria; PE: Peru; SG: Singapore; TR: Turkey; VE: Venezuela; ZA: South Africa. Figure shows bank credit to the private sector.
[2]For Argentina, calculations are based on official GDP and CPI data.
[3]Right scale.

Figure 1.10. Measures of Monetary Policy and Liquidity in Selected Advanced and Emerging Market Economies

(Percent unless noted otherwise)

Policy rate hikes since the crisis have been limited thus far, except in Latin America, where in a number of countries capacity constraints appear tighter than elsewhere in the world. Nonetheless, short-term interest rates generally remain low in real terms, appreciably below precrisis levels, with the exception of Japan because of deflation. Expectations are for broadly stable policy rates in the advanced economies over the coming year.



Sources: Bloomberg Financial Markets; Consensus Economics; Eurostat; Haver Analytics; and IMF staff calculations.

[1]Three-month treasury bill.

[2]Relative to core inflation (except for Argentina and Colombia, where headline inflation is used because of unavailable data on core inflation).

[3]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 7, 2011.

[4]Dashed lines are from the April 2011 *World Economic Outlook*.

[5]Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

[6]Bulgaria, Hungary, Poland, Romania, and Russia.

[7]China, India, Indonesia, Malaysia, Philippines, and Thailand.

Weak sovereign and banking sector balance sheets

The risks concerning weak sovereigns and their interaction with fragile banking systems and the real economy are discussed in depth in the September 2011 *Global Financial Stability Report*. Specifically, markets remain concerned about the euro area. With fragile balance sheets and debt sustainability influenced heavily by expectations, debt markets can become subject to multiple equilibriums. Vulnerable sovereigns are prone to a sudden loss of investor confidence in their debt sustainability if fundamentals deteriorate sharply. European banks are heavily exposed to economies that have recently seen sharply wider sovereign spreads. In this regard, a concern is that capitalization of euro area banks is relatively low, and they rely heavily on wholesale funding, which is prone to freezing during financial turmoil. Trouble in a few sovereigns could thus quickly spread across Europe. From there it could move to the United States—by way of U.S. institutional investors' holdings of European assets—and to the rest of the world.

Weak policy responses to the crisis

Additional risks surround weak policies in the euro area, Japan, and the United States. These give rise to two concerns, including the potential for (1) sudden investor flight from the public debt of systemically important economies and (2) brute force fiscal adjustment or loss of confidence because of a perceived lack of policy room. Under either scenario, major declines in consumer and business confidence are likely, leading to sharp increases in saving rates that undercut activity.

Investors could take flight from government debt of key sovereigns

There are few signs of flight from U.S. or Japanese sovereign debt thus far, and few substitute investments are available. Although sovereign credit default swap (CDS) spreads on U.S. debt have moved up lately and U.S. government debt experienced one rating downgrade, the impact on long-term interest rates of the end of the Federal Reserve's QE2 has been offset by inflows into Treasury securities. Interest rates on Japan's public debt remain very low, despite

adverse shocks to the public finances resulting from the earthquake and tsunami. Nonetheless, without more ambitious fiscal consolidation, a sudden rise in government bond yields remains a distinct possibility as long as public debt ratios are projected to rise over the medium term. Long-term rates on the debt of France, Germany, and a few other economies are also very low. However, this could change if commitments at the national or euro area level are not met. The risks could play out in various ways:

- Investors could increasingly reallocate their portfolios to corporate or emerging market debt: This would be the least disruptive scenario, because it could spur demand, although not without potentially raising problems related to absorptive capacity.
- The term premium could rise as investors turn to short-term public debt: This would make the global economy more susceptible to funding shocks.
- Rates could move higher across the yield curve, with depreciation of the U.S. dollar or the Japanese yen (mild credit risk): This might materialize in the context of a broader sovereign rating downgrade that does not upset the status of the United States as the major provider of low-risk assets or an accelerated reduction in the home bias of Japanese investors.
- A strong increase in credit risk could quickly morph into a liquidity shock, as global investors take flight into precious metals and cash: This could occur if there were major political deadlock on how to move forward with consolidation in the United States or if the euro area crisis were to take a dramatic turn for the worse. The global repercussions of such shocks would likely be very severe.

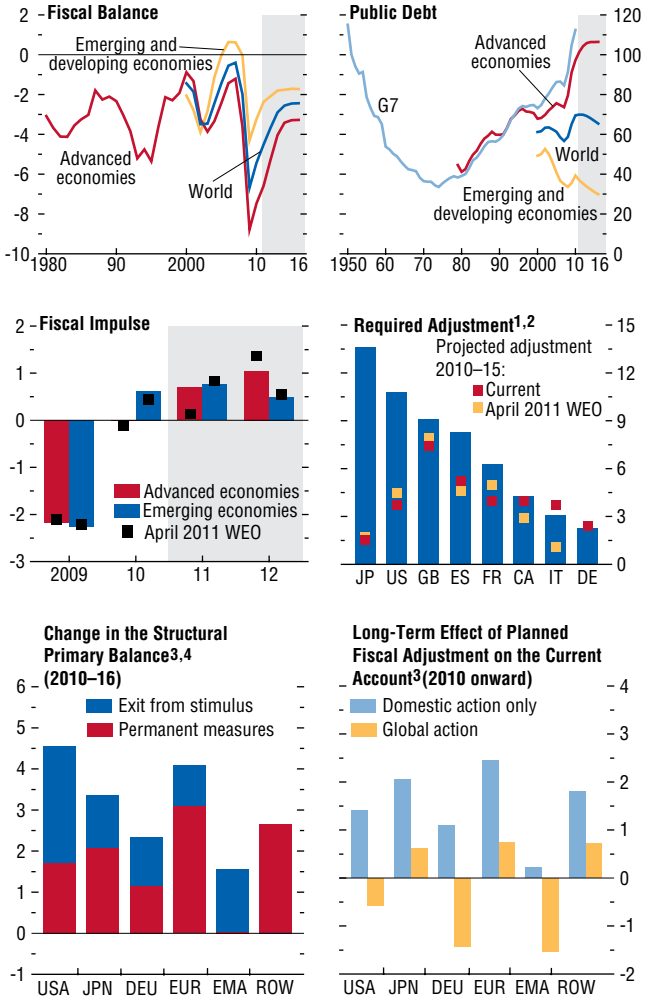
Hasty fiscal adjustment and the absence of policy room could harm growth

In the systemically important advanced economies, activity and confidence are still fragile, and a sudden increase in household saving rates remains a distinct possibility. If fiscal consolidation were suddenly stepped up further at the expense of the disposable income of people with a high marginal propensity to consume, these economies could be thrown back into stagnation. For example, if (contrary to WEO assumptions) payroll tax relief and

Figure 1.11. General Government Fiscal Balances and Public Debt

(Percent of GDP unless noted otherwise)

Public deficits and debt rose sharply during the crisis, especially in advanced economies. Major adjustment is required, especially in Japan and the United States, to bring debt back down to prudent levels. Fiscal policy will turn increasingly contractionary in the advanced economies during 2012–13. Because of the low share of permanent consolidation measures in the United States relative to other countries, fiscal policy will do little to alleviate global current account imbalances. However, differences in fiscal policy stances will help reduce imbalances within the euro area.



Sources: IMF, *Fiscal Monitor;* and IMF staff estimates.

[1]CA: Canada; DE: Germany; ES: Spain; FR: France; GB: United Kingdom; IT: Italy; JP: Japan; US: United States.

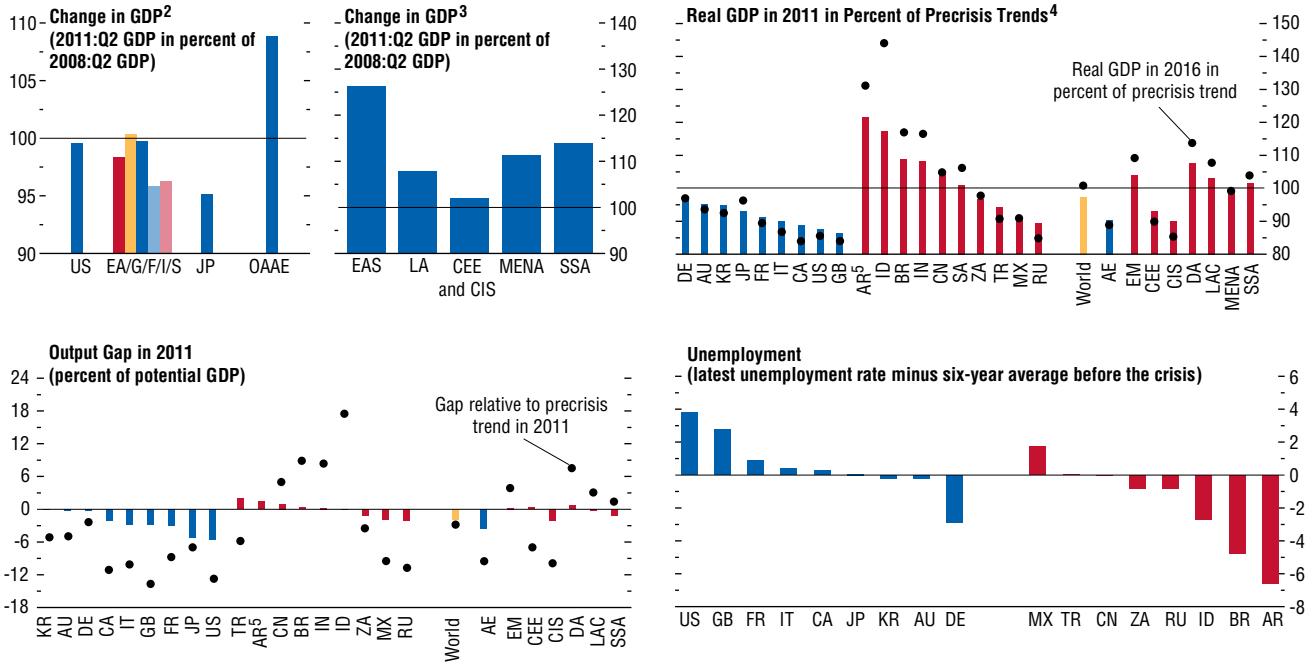
[2]Cyclically adjusted primary balance adjustment needed to bring the debt ratio to 60 percent of GDP by 2030. For Canada and Japan, the scenario assumes net debt targets (for Japan, a reduction in net debt to 80 percent of GDP, corresponding to a gross debt target of about 200 percent of GDP).

[3]Cumulative effect in percent of GDP during 2010–16; DEU: Germany; EMA: emerging Asia; EUR: euro area excluding Germany; JPN: Japan; ROW: rest of the world; USA: United States.

[4]The U.S. permanent measures shown in the figure are those planned in the president's February budget proposal.

Figure 1.12. Cyclical Conditions[1]

Output in major advanced economies has returned close to or above precrisis levels, with some notable exceptions. In emerging and developing economies, it is already well above precrisis levels, except in the CEE and CIS economies, which were hit hard by the financial crisis. Output in most advanced and CEE and CIS economies is still well below precrisis trends. However, much of the loss relative to trends is not expected to be recovered over the medium term. Accordingly, output gaps are generally much lower than losses relative to precrisis trends would suggest. Consistent with a view of generally limited output gaps, unemployment rates in most of the world are not much higher than precrisis averages—notable exceptions include the United States and the United Kingdom, which were at the epicenter of the crisis.



Source: IMF staff estimates.

[1]AR: Argentina; AE: advanced economies; AU: Australia; BR: Brazil; CA: Canada; CEE: central and eastern Europe; CIS: Commonwealth of Independent States; CN: China; DA: developing Asia; DE: Germany; EM: emerging economies; FR: France; GB: United Kingdom; ID: Indonesia; IN: India; IT: Italy; JP: Japan; KR: Korea; LAC: Latin America and the Caribbean; MENA: Middle East and North Africa; MX: Mexico; RU: Russia; SA: Saudi Arabia; SSA: sub-Saharan Africa; TR: Turkey; US: United States; ZA: South Africa.

[2]EA/G/F/I/S: euro area/Germany/France/Italy/Spain; OAAE: other advanced Asian economies.

[3]EAS: emerging Asia; LA: Latin America; CEE and CIS: central and eastern Europe and Commonwealth of Independent States; MENA: Middle East and North Africa; SSA: sub-Saharan Africa. Due to data limitations, annual data are used for MENA and SSA.

[4]Precrisis trend obtained by extrapolating 1996–2006 real GDP growth.

[5]Figures are based on official GDP data.

help for the unemployed in the United States are not prolonged, U.S. growth could be significantly lower. By the same token, if sound medium-term consolidation plans are not implemented, households and businesses may take an increasingly dim view of future prospects and drastically raise their saving rates. The result could be a lost decade for growth. Concerns among U.S. households about future income prospects could be a symptom of such risks. Also, the September 2011 *Global Financial Stability Report* relates the latest bout of financial volatility to concerns in markets about policymakers' ability to rally support for strengthening public and banking sector balance sheets and growth-enhancing reforms. Moreover, as discussed in the September 2011 *Fiscal Monitor,* even with

the plans currently in place, most major advanced economies will not achieve a large reduction in public debt over the medium term, which severely limits the ability of fiscal policy to stabilize output and employment in the future.

Vulnerabilities in emerging market economies

Overheating risks have become more differentiated since the April 2011 *World Economic Outlook*. These risks relate mainly to rapid credit growth and financial vulnerabilities. In a few cases, external vulnerabilities have begun to move into the foreground.

High credit and asset price growth could undermine financial stability

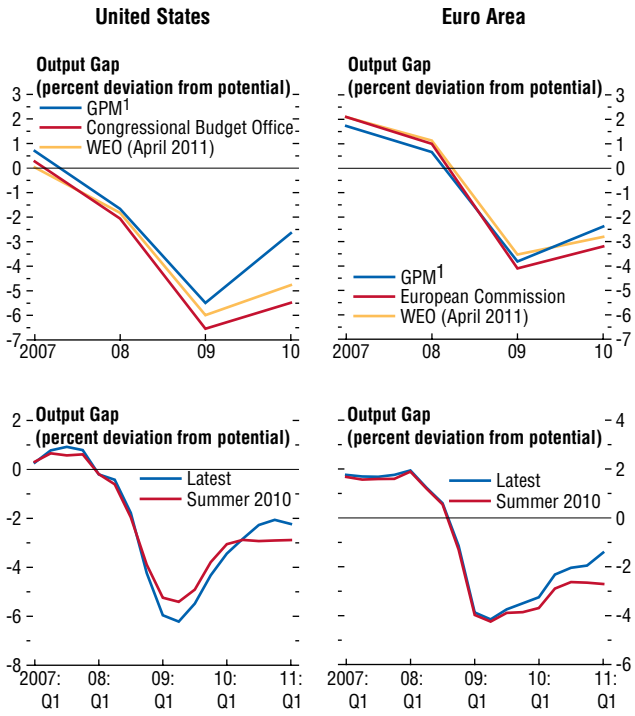
A number of major emerging and developing economies, and advanced economies with very close ties to them, continue to see buoyant credit and asset price growth (see Figure 1.9). Credit growth has been high in Brazil, Colombia, Hong Kong SAR, India, Indonesia, Peru, and Turkey. In China, however, real credit growth has continued to recede, to about 10 percent at an annual rate: housing market transactions and prices have fallen from exceptionally high levels, although construction is still going strong. Prices keep climbing rapidly in Hong Kong SAR and continue to rise in Brazil and Singapore. In India and Indonesia, by contrast, house price increases have been more contained, because credit is flowing mainly into infrastructure and industry. Financial stability risks in all these economies must be monitored for some time, given the sheer volume of credit growth over the past five years (see Figure 1.9, middle and bottom panels).

External vulnerabilities could cause an abrupt slowdown of capital inflows

So far, buoyant credit and asset price growth in emerging and developing economies has not led to a sharp acceleration in domestic demand or a precarious widening of current account imbalances. However, vulnerability is beginning to build, especially in economies where credit is spurred by capi-

Figure 1.13. Global Projection Model Estimates of the Output Gap

The recent financial crisis had a significant impact on the productive capacity of the economies at the epicenter: the United States and the euro area. Estimates of this unobservable variable are critical for policymakers, indicating the degree of economic slack and hence the appropriate policy stance. The top panels show the latest estimates of the output gap from the GPM[1] multivariate technique relative to those of the Congressional Budget Office, the European Commission, and the April 2011 *World Economic Outlook* (WEO), which also considers judgmental factors. New data and revisions to historical data have contributed to revisions in our estimate of the U.S. output gap. Revisions to historical GDP data have led to an increase in the estimate of excess supply at the trough of the recession. New data on inflation and capacity utilization have led to a reduction in the estimate of excess supply at the end of 2011:Q2 compared with our forecast of a year ago. For the euro area, faster than previously forecast growth is the primary source of the revision to our estimate of the amount of excess supply at the end of 2011:Q2.

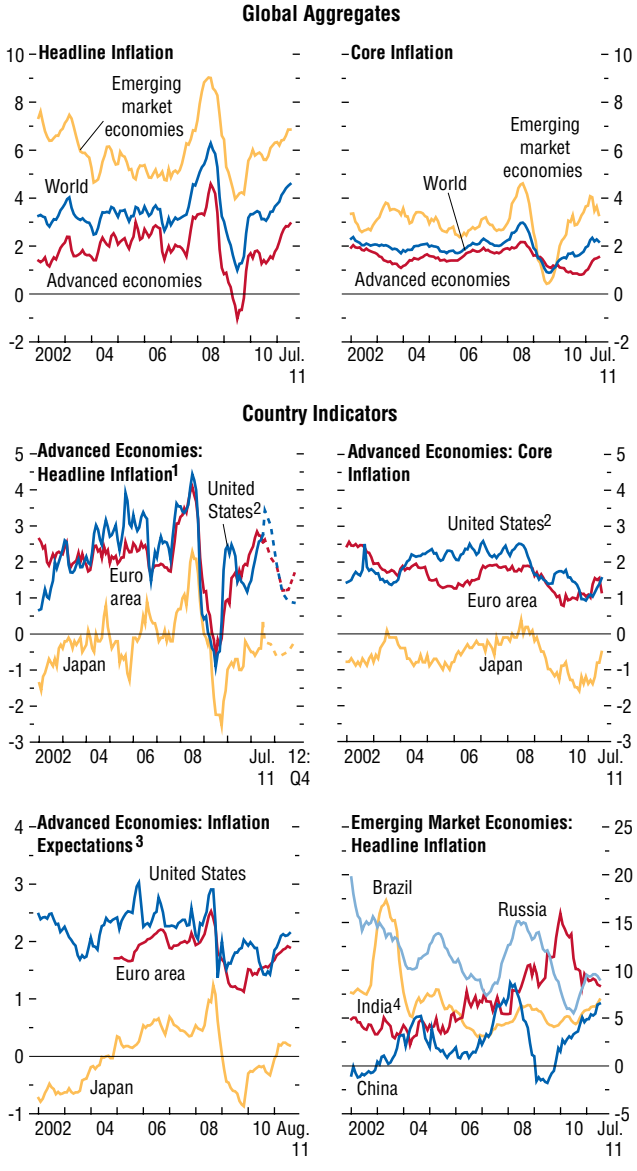


Source: IMF staff calculations.
[1]GPM = Global Projection Model.

Figure 1.14. Global Inflation

(Twelve-month change in the consumer price index unless noted otherwise)

Inflation has been moving up, reflecting the sharp recovery of commodity prices and emerging capacity constraints. However, core inflation remains low in the major advanced economies. In emerging market economies, by contrast, it has risen significantly but now shows signs of moderating. With commodity prices forecast to stabilize or retreat, headline inflation can be expected to decline. In emerging market economies, underlying inflation pressure is likely to continue to stay relatively elevated because of strong activity and relatively low unemployment.



Sources: Consensus Economics; Haver Analytics; and IMF staff calculations.
[1]Historical data are monthly, and forecasts (dashed lines) are quarterly.
[2]Personal consumption expenditure deflator.
[3]One-year-ahead *Consensus Forecasts*. The December values are the average of the surrounding November and January values.
[4]Consumer price index for industrial workers.

tal inflows (Box 1.2). A key reason for the limited increase in current account deficits is the recovery in commodity prices. In fact, the current account surpluses of emerging and developing economies have been rising during the recovery, from 1½ percent of GDP in 2009 to 2½ percent in 2011. Energy-exporting MENA economies account for the bulk of this widening, followed by CIS economies, with SSA economies contributing to a small extent. By contrast, the Latin American economies have seen a widening of deficits, from ½ percent to 1½ percent of GDP. Against the backdrop of large terms-of-trade gains over this period, this development testifies to strong domestic demand pressures. The deficits are too low to present immediate stability concerns, but they could rapidly escalate if commodity prices fall significantly, potentially raising the threat of sudden stops. CEE economies also have seen some widening of their current account deficits as the sudden stop of capital inflows has gradually let up, which is a welcome development. However, in Turkey the deficit has reached disconcerting levels, and its funding is mostly short term.

Supply shocks in commodity markets could dent household real incomes

With tight demand-supply balances, commodity markets continue to present significant sources of downside risk to global activity. Disruptions to the global oil supply could seriously affect activity in advanced economies by cutting into the already sluggish real growth of household incomes. Rising food prices would do the same, with particularly deleterious consequences for developing economies. On both fronts, however, pressures have eased lately because prices have moderated.

Various quantitative indicators paint a deteriorating picture of risks (Figure 1.15). The Chicago Board Options Exchange Market Volatility Index (VIX) has recently reached very high levels again. Over the past year, the risk of a serious global slowdown—that is, global growth falling below 2 percent—was less than 5 percent, according to the IMF staff's fan chart. But now, according to the IMF staff's usual methodology, the probability of growth below 2 percent is substantially higher—more than

10 percent. Regarding the four risk factors underlying the fan chart computed with the usual methodology, three point to downside risks for growth and one points to upside risks for 2012 (Figure 1.15, middle panel):

- *Term spread:* There is now a significant risk that the yield curve flattens in 2012, indicating downside risks to growth. For 2011, the risks are roughly balanced, as they were in the April 2011 *World Economic Outlook.*[5]
- *Oil market:* Oil-related risks through 2012 remain to the upside for prices and thus to the downside for global growth, as in April.
- *Inflation:* Following significant upward revisions in inflation forecasts for 2011, inflation risks for the year are modestly to the downside, implying modest upside risks for growth. For 2012, there is now a downside risk to growth from higher inflation, unlike in April 2011,[6] possibly reflecting downward revisions to inflation forecasts.
- *S&P 500:* This risk factor still points to the upside for output for both 2011 and 2012.

New shocks could undercut the expansion

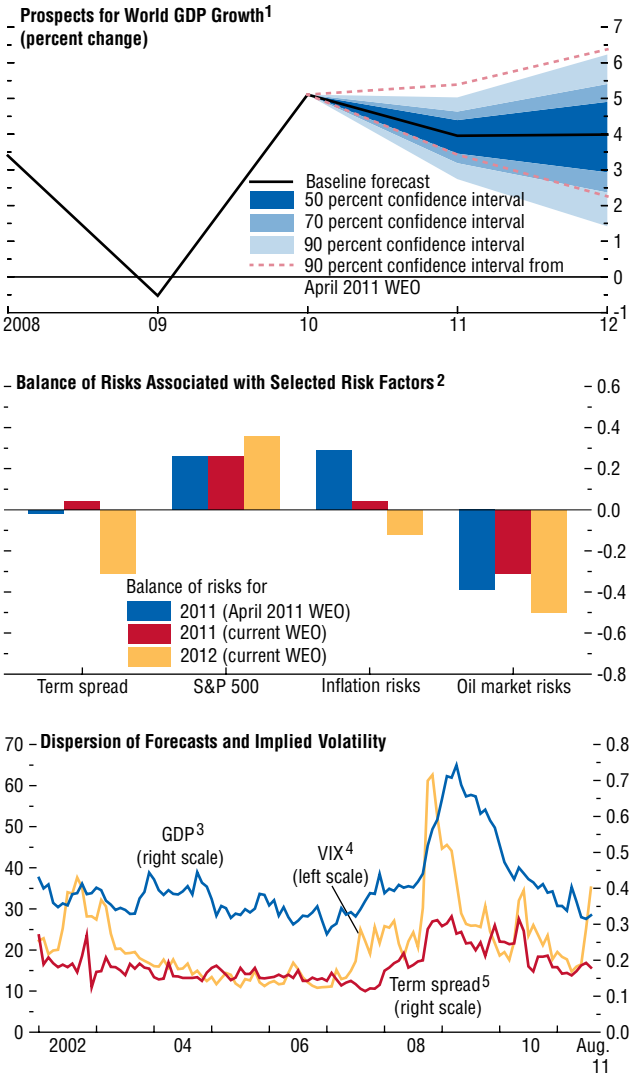
A downside scenario shows the repercussions of major financial turbulence in the euro area, combined with a downscaling of expectations for U.S. medium-term growth prospects and real-estate-related financial stress in emerging Asia (Figure 1.16). This scenario assumes that euro area banks need to suddenly absorb mark-to-market losses to such an extent that their bank capital falls by 10 percent, and that this triggers a new round of deleveraging. At the same time, markets revise medium-term growth prospects for the United States downward, while Asia experiences an increase in real-estate-lending-related losses.

[5]In this framework, a steepening yield curve is associated with higher growth prospects. Generally, the term spread captures the spread between long-term and short-term interest rates and is interpreted as reflecting growth prospects. It can also reflect sovereign default risks. The results are based on the simple average of Germany, Japan, the United Kingdom, and the United States. For further details on the construction of the fan chart, see Elekdag and Kannan (2009).

[6]An upside surprise in inflation would warrant higher interest rates and thus would entail lower growth. The results are based on market forecasts for inflation in the G7 economies as well as in Brazil, China, India, Mexico, and Russia.

Figure 1.15. Risks to the Global Outlook

Risks to the outlook remain large, and downside risks dominate upside risks. The probability of global growth below 2 percent is appreciably higher than in the April 2011 *World Economic Outlook* (WEO).



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]Bars depict the coefficient of skewness expressed in units of the underlying variables. The values for inflation risks and oil market risks are entered with the opposite sign, because they represent downside risks to growth.

[3]The series measures the dispersion of GDP forecasts for the G7 economies (Canada, France, Germany, Italy, Japan, United Kingdom, United States), Brazil, China, India, and Mexico.

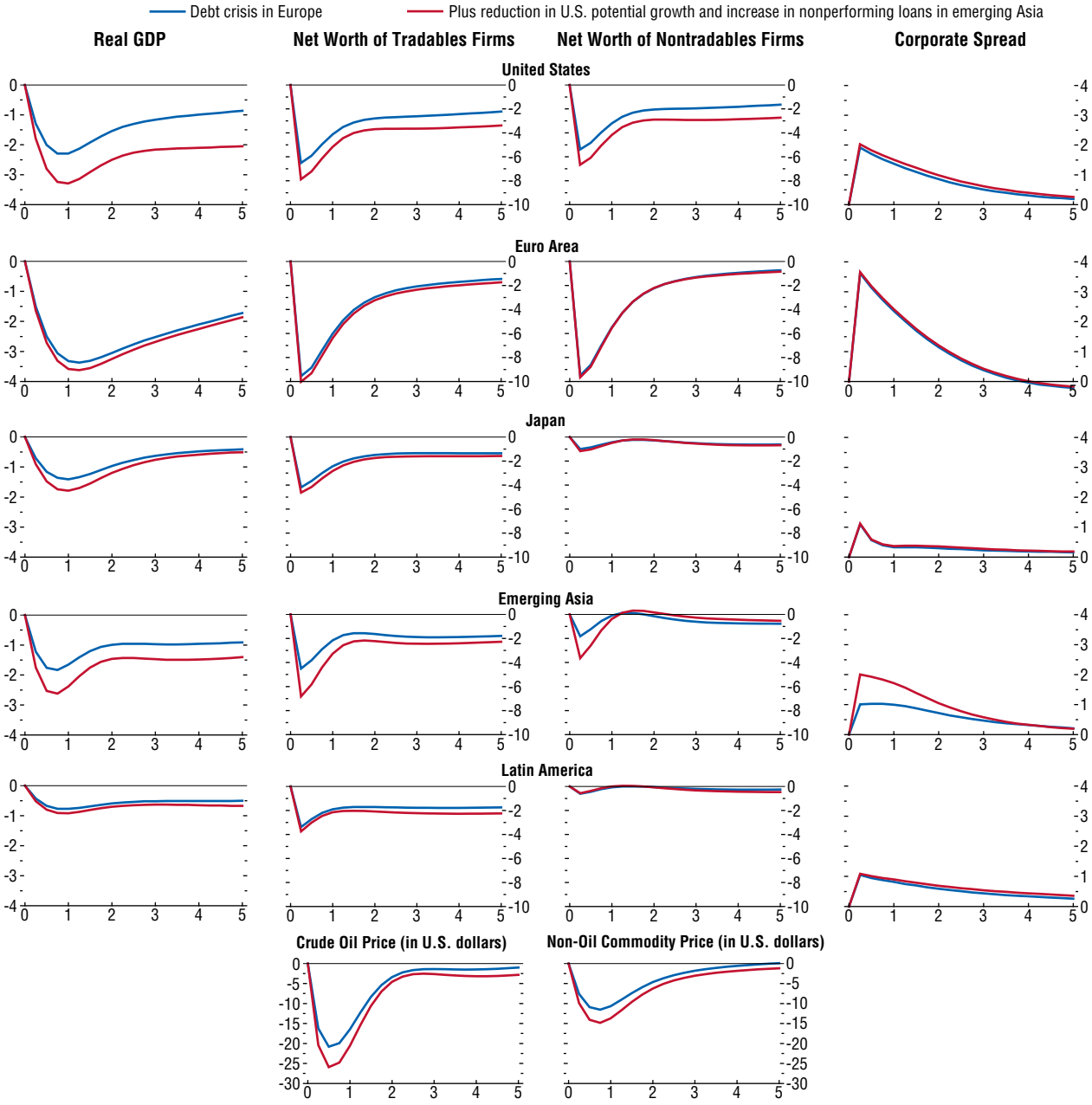
[4]VIX: Chicago Board Options Exchange Market Volatility Index.

[5]The series measures the dispersion of term spreads implicit in interest rate forecasts for Germany, Japan, the United Kingdom, and the United States.

Figure 1.16. WEO Downside Scenario

(Deviation from control; years on x-axis)

This downside scenario uses a six-region version of the Global Economy Model (GEM) calibrated to represent the United States, Japan, the euro area, emerging Asia, Latin America, and the rest of the world. The scenario features shocks arising in three regions: the euro area, the United States, and emerging Asia. In the euro area, the shock is to bank capital, reflecting primarily recognition of losses on holdings of public debt but also of other losses on loans arising from the macroeconomic fallout. In the United States, the shock has two components. The first is slower potential output growth and the second is the resulting increase in loan losses (e.g., on the mortgage portfolio). The shock in emerging Asia is loan losses, reflecting poor lending decisions in the past. Furthermore, corporate risk premiums in emerging Asia, Japan, and Latin America are assumed to be correlated with the rise in risk premiums in the euro area and the United States, in a manner broadly consistent with what was observed during the collapse of Lehman Brothers. As a result of the large shock to global output, especially in the euro area and the United States, commodity prices plummet, dragging down activity in commodity exporters. The accompanying charts trace out the implications for GDP, firm net worth (in both the tradables and nontradables sectors), the effective interest rate faced by firms in the various regions, and commodity prices.



Source: GEM simulations.

Under such a scenario, global risk aversion would rise sharply, and funding rates for banks and nonfinancial corporations would shoot up to varying degrees. Emerging market economies would suffer from slumping commodity prices and a sudden reversal in capital flows. Given the limited room for monetary and fiscal policy in advanced economies to respond vigorously, a serious global slowdown would ensue, which would undo much of the progress since the end of the Great Recession. The United States and the euro area would fall back into recession, with output in 2012 more than 3 percent below WEO projections. Output in Japan would be some 1½ percent below the WEO projection; in emerging Asia it would be 2½ percent lower. Latin America would suffer higher risk premiums and lower commodity prices, which would drag output down almost 1 percent relative to the baseline.

Separately, in the advanced economies of the G7, recent falls in equity prices also point to a deterioration in growth prospects. As shown in Box 1.3, there is some evidence that drops in equity prices are associated with a greater chance of a new recession in a number of economies. Specifically, using the behavior of equity prices over the past quarter, a simple probabilistic model for these economies predicts an increased risk of a new recession from the third quarter of 2011 for the United States, and to a lesser extent for France and the United Kingdom.

Policy Challenges

With increasingly diverse cyclical and financial conditions, national policy requirements have increasingly diverged. In qualitative terms, requirements remain similar to those in recent issues of the *World Economic Outlook*. But on key fronts the difficulties are now greater, and even where there has been a policy response more needs to be done. This is perhaps most urgent in the euro area. In the meantime, global demand rebalancing, commodity markets, and financial system reform pose multilateral challenges.

Addressing the crisis in the euro area

The crisis in the euro area continues to deepen. The measures approved at the July 21, 2011, EU summit represent significant progress, but further efforts are urgently needed. Once implemented, the measures imply that funding under the European Financial Stability Fund (EFSF) can also pay for debt buybacks or bank recapitalization, can be used on a precautionary basis, and will have much longer maturities and lower interest rates. There are three remaining challenges. The first is to quickly adopt the summit's decisions at the national level while sending a clear signal that euro area members will continue to do whatever it takes to preserve confidence in the euro. In the meantime, the ECB will need to continue to intervene forcefully (with suitable sovereign safeguards) to support orderly markets in sovereign debt. The second challenge involves advancing programs with economies in the periphery that strike the right balance between fiscal consolidation and structural reform on the one hand and external support on the other. The third challenge is to promptly finalize EU governance reforms. These probably will have to be strengthened over the medium term to ensure that the shared responsibility of all EU members for national macroeconomic policies is commensurate with increased risk sharing.

National Perspectives on Policy Challenges

Releasing the brakes on lagging economies

In many advanced economies, the priority remains fixing the financial system and, over the medium term, greatly reducing high public deficits. Repairing financial systems by strengthening incentives to build capital, including through public intervention, is essential to reestablishing trust and facilitating better pass-through of easy monetary conditions to economic activity—thereby unlocking a key brake on growth. In addition, a number of economies must deploy structural reforms that improve their macroeconomic performance. Such reforms may not boost growth in the short term, but they can help build confidence and improve medium-term prospects.

Continued monetary accommodation

Monetary policy can remain accommodative in many advanced economies. Given increasing risks to U.S. growth, the Federal Reserve should stand ready to deploy new unconventional support for

the economy, provided inflation expectations stay subdued. Given declining inflation pressure and heightened financial and sovereign tensions, the ECB should lower its policy rate if downside risks to growth and inflation persist. Unconventional policies should continue until there is a durable reduction in financial stress, including resolution of the sovereign debt crisis. In Japan, rates can stay at their present levels, and unconventional policy support in the form of private asset purchases could be stepped up further to help accelerate the exit from deflation. Many other advanced economies have tightened to greater degrees already, because they are experiencing higher inflation pressure. They may have to do more but can stay on hold as long as downside risks are unusually high.

Strong fiscal consolidation and reform

Given still tepid activity in many advanced economies, immediate cutbacks to spending and tax increases should ideally be small while strong entitlement and tax reforms are being implemented that cut future deficits. Because major progress in cutting future spending has proved hard to achieve, however, postponing near-term consolidation is not an option in most advanced economies. But economies with relatively strong public balance sheets and strong medium-term plans could slow the pace of near-term adjustment if downside risks threaten to materialize. In crisis economies, gradual adjustment is not in the cards. Similarly, in economies that investors perceive to be vulnerable, it seems appropriate to err on the side of consolidation. In all economies, stronger fiscal rules and institutions can help rebuild credibility. The specific recommendations are discussed in the September 2011 *Fiscal Monitor*.

The key fiscal priority for major advanced economies—especially the United States and Japan—is to implement credible and well-paced medium-term consolidation programs focused on long-term debt sustainability. Addressing this is of paramount importance to regain room for more policy maneuvering.

- For the United States, the main priority is to soon launch a medium-term deficit reduction plan—including entitlement reform and tax reforms that gradually raise revenues—so as to stabilize the debt ratio by mid-decade and gradually reduces it thereafter under realistic macroeconomic assumptions. This would allow for a short-term fiscal policy stance that is more attuned to the cycle—for example, through the adoption of measures targeted to labor and housing markets, state and local governments, and infrastructure spending. In this respect, the American Jobs Act would provide needed short-term support to the economy, but it must be flanked with a strong medium-term fiscal consolidation plan that raises revenues and contains the growth of entitlement spending. With a less ambitious medium-term fiscal strategy in place, fiscal consolidation should start in 2012, but its pace should reflect the need to sustain a weak recovery, and it should include the extension of unemployment insurance and payroll tax relief, with a fiscal withdrawal of 1 to 1½ percent of GDP.
- Similarly, for Japan a more ambitious fiscal strategy is needed—equivalent to a front-loaded 10 percent of GDP fiscal adjustment over 10 years—that brings the public debt ratio down decisively by the middle of the decade. Given the limited scope for cutting expenditures, fiscal adjustment will have to rely mainly on new revenue sources, limits on spending growth, and entitlement reform. Specifically, the strategy should be centered on a gradual increase in the consumption tax to 15 percent.
- The major euro area economies have made good progress in adopting and implementing strong medium-term consolidation plans. They are committed to reducing deficits to below 3 percent of GDP by 2013 and to stabilizing the level of public debt by 2015. Based on WEO macroeconomic projections, Spain still needs to identify new measures to achieve its objectives. France may have to do the same from 2013 onward, given the announcement in August of additional deficit-reduction measures for 2011–12. Italy has recently greatly strengthened its medium-term fiscal plan and is now expected to come fairly close to a structurally balanced budget in 2013. Adjustment in Germany during 2011–16 (at about ½ percent a year) is appropriately lower than elsewhere in the euro area—on present plans, the general government would be close to balance in 2014.

- Importantly, in all these economies adjustment will need to continue for some time, with a view to reaching surpluses that help bring down high public debt ahead of accelerated population aging. This will also be necessary to provide sufficient fiscal policy room to support balance sheet repair and growth and job creation.

More financial repair

As discussed in the September 2011 *Global Financial Stability Report*, financial repair is essential along two dimensions: injecting new capital and restructuring weak but viable banks while closing others, and repairing wholesale funding markets. Progress along both fronts has been slow, especially in Europe. In general, European banks tend to be less strongly capitalized and more reliant on wholesale funding than are their peers elsewhere. The stress in sovereign and interbank markets underscores the urgent need to address weakly capitalized banks. Symptoms of their difficulties include falling deposits or "deposit wars," in which banks aggressively bid up deposit rates; exclusion from wholesale markets; heavy reliance on ECB funding; and sluggish credit growth and tight lending conditions. Prudential authorities now need to foster private injections of capital in banks (as was done for some Spanish *cajas*) and promote consolidation and cross-border investment (as recently seen in Ireland). Absent these measures, they must make the case either for injecting public funds into weak banks or for closing them. They will need to ensure that these banks do not "gamble for resurrection" by offering very high deposit rates or engaging in very risky lending. Given prevailing balance sheet uncertainties, capital requirements should be set ambitiously high and be met well ahead of the Basel III timetable.

Facilitating gradual adjustment in housing markets

In the United States, the large number of underwater mortgages poses a risk for a downward spiral of falling house prices and distress sales that further undermines consumption and labor mobility. The challenge for policymakers is to facilitate gradual adjustment. Administrative complexity, capacity constraints, and conflicting incentives among banks, loan servicers, and bond investors have thus far hindered potentially efficient loan modifications that would forestall at least some costly foreclosures. Taken together, these factors can provide justification for further policy action to mitigate distress sales, such as allowing mortgages to be modified in courts, expanding state programs that assist unemployed homeowners, and encouraging government-sponsored enterprises to participate in principal write-downs.

Putting the brakes on overheating economies

Since the April 2011 *World Economic Outlook,* many emerging and developing economies have implemented policy rate hikes or other measures to reduce credit growth. With a few exceptions, the overheating signals are mainly flashing yellow rather than red (Figure 1.17). Vulnerabilities related to strong credit expansion and, in some cases, buoyant domestic demand are still a concern.

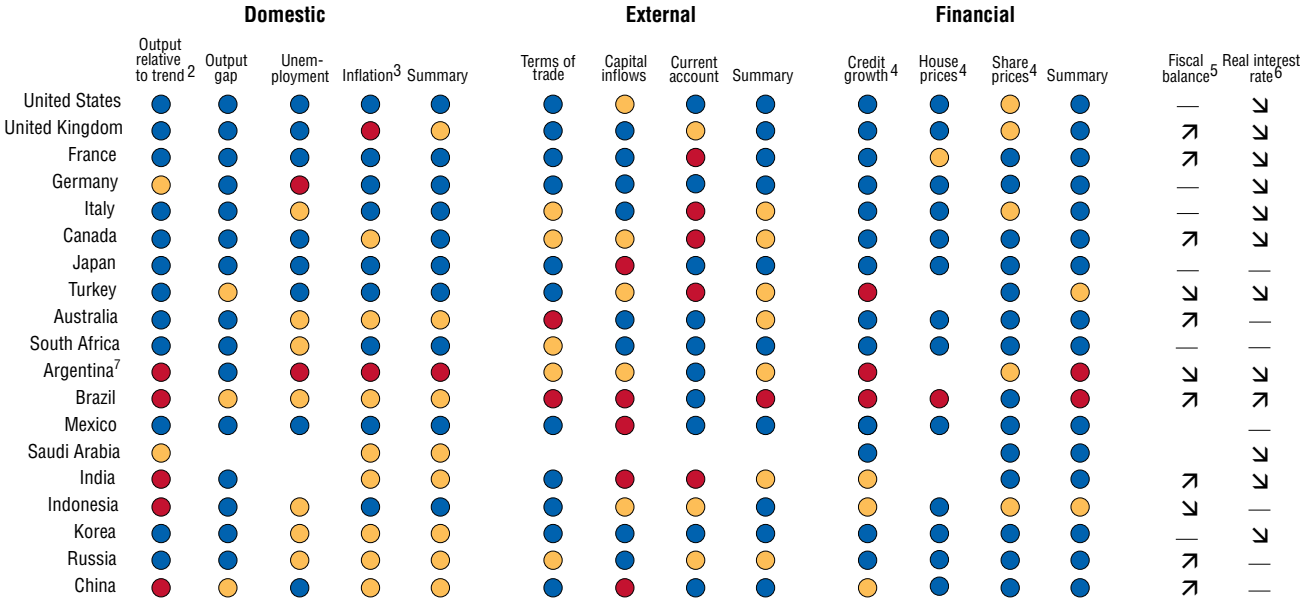
- In economies with large capital inflows and appreciated exchange rates, such as in Latin America, fiscal tightening is urgently needed to roll back deficits that expanded during the crisis and to alleviate the burden of adjustment on monetary policy. Such tightening appears less warranted, however, in the emerging Asian economies with large external surpluses and relatively low fiscal deficits. In these economies, more exchange rate appreciation could help contain inflation pressure, while fiscal consolidation could be slowed with a view to supporting domestic consumption, should downside risks threaten to materialize.
- Regarding monetary policy, real interest rates remain low relative to precrisis levels in a number of economies, and more monetary tightening will be needed under WEO projections. However, requirements vary across countries, and some can afford to pause their rate hike cycle for as long as uncertainty remains exceptionally high.

More monetary tightening

The IMF staff's Global Projection Model (GPM) points to a need for rate increases of zero to 2 percentage points on average in Latin America and emerging Asia (Figure 1.18, top-left panel). However, requirements vary appreciably across countries. Simple Taylor rules, which are based on IMF

Figure 1.17. Overheating Indicators for the G20 Economies[1]

Among G20 economies, a number of emerging market economies are seeing buoyant activity, low unemployment, and relatively high inflation in comparison with precrisis norms. Output gap estimates of IMF country desks paint a more reassuring picture than the other indicators of internal balance. Indicators of external balance send mixed signals: terms of trade are very favorable for some emerging market economies, limiting the deterioration of current account balances in response to strong domestic demand. In others, domestic demand is not running far ahead of output. In a few, current account deficits have reached historically high levels. Indicators of financial developments raise concerns mainly due to high credit growth.



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

[1]For each indicator, except as noted below, economies are assigned colors based on current predicted 2011 values relative to their precrisis (1997–2006) average. Blue indicates less than 0.5 standard deviation above the 1997–2006 average; yellow indicates greater than or equal to 0.5 but less than 1.5 standard deviations above the 1997–2006 average; red indicates greater than or equal to 1.5 standard deviations above the 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 colors are assigned red if the summary score 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.

[2]Output more than 2.5 percent above the precrisis trend is indicated by red. Output less than 2.5 percent below the trend is indicated by blue.

[3]For the following inflation-targeting countries, 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 countries, red is 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.

[4]The indicators for credit growth, house price growth, and share price growth are calculated relative to the 1997–2006 average of output growth.

[5]Arrows in the fiscal balance column represent the forecast change in the structural balance as a percent of GDP over the period 2010–11. An increase of more than 0.5 percent of GDP is indicated by an up arrow; a decrease of more than 0.5 percent of GDP is indicated by a down arrow.

[6]Real policy interest rates below zero are identified by a down arrow; real interest rates above 3 percent are identified by an up arrow.

[7]Figures are based on official GDP and CPI data.

staff forecasts for inflation in 2013 and output gap estimates for 2011, suggest that a few G20 economies would require larger rate hikes than suggested by GPM estimates (for example, Argentina, India, Russia); others need to tighten less or can afford to postpone further moves, given growing uncertainty.[7] However, even in economies in which interest rates are already relatively high, the monetary authorities will need to be vigilant.

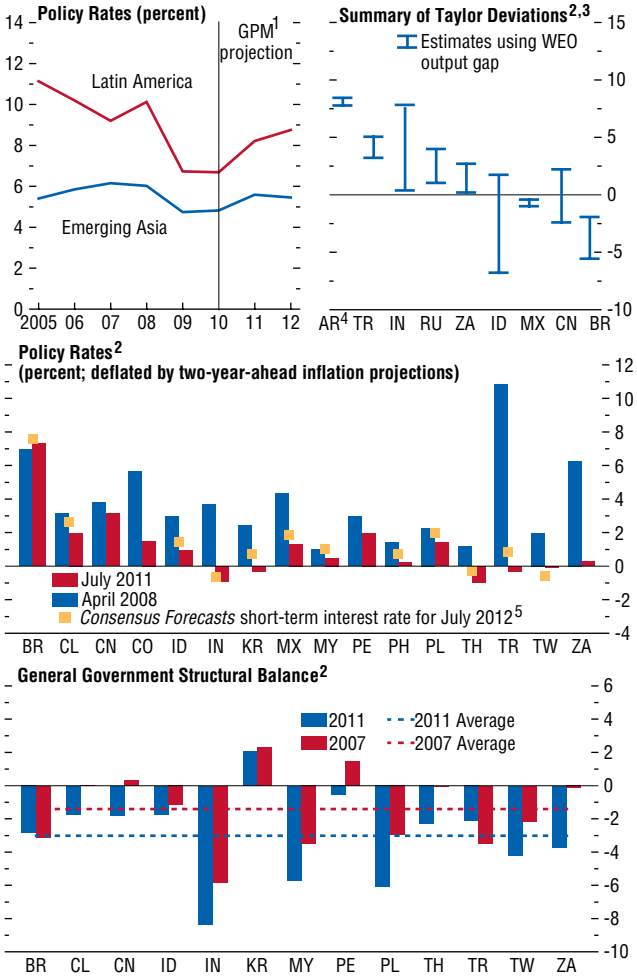
- In emerging and developing economies where the credibility of monetary policy is less well established, high headline inflation could fuel greater than expected wage inflation. In fact, simple Taylor rules that use current headline inflation recommend more tightening than those that use IMF staff forecasts for inflation. Risks for commodity prices are tilted to the upside, and commodity price inflation may well be more persistent than expected. Thus, inflation forecasts for 2013 are subject to upside risk.
- Output gap estimates are notoriously unreliable, whether for advanced or for emerging and developing economies. They frequently overestimate the extent of slack following periods of strong growth, such as many emerging and developing economies have recently enjoyed. Replacing IMF staff output gap estimates with deviations of output from precrisis (1996–2006) trends reveals a need for much greater tightening, according to Taylor rules.[8]
- In a number of emerging and developing economies, credit growth and asset prices are still very buoyant. Related financial stability risks are best addressed with prudential measures. However, if such measures do not prove effective, monetary policy may need to be tighter than warranted from the perspective of inflation.

[7]Importantly, the quantitative indications of these simple rules should not be taken literally because they cannot do justice to country-specific factors, such as different objectives for inflation.

[8]Three notable exceptions are Mexico, Russia, and Turkey. However, Mexico and Russia are considered to have suffered some permanent output losses relative to trends: Mexico on account of close trade relations with the United States and Russia on account of financial turmoil. Precrisis output trends in Turkey were generally not sustainable.

Figure 1.18. Policy Requirements in Emerging Market Economies

Estimates obtained from the Global Projection Model (GPM) point to the need for further policy rate hikes in Latin America and emerging Asia. The GPM estimates assume that a number of emerging market economies in Asia also adopt other measures to tighten monetary conditions, such as controls on credit growth. Requirements differ across economies. Simple Taylor rules point to a need for major tightening in Argentina, India, Russia, and Turkey. In other economies, much less tightening may be needed or tightening can pause while uncertainty stays high. Also, in most economies structural fiscal balances should be brought back up to levels prevailing before the crisis.



Sources: Bloomberg Financial Markets; Consensus Economics; Haver Analytics; and IMF staff calculations.

[1]GPM = Global Projection Model.

[2]AR: Argentina; 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; TW: Taiwan Province of China; ZA: South Africa.

[3]Taylor rule in the form of $i = infl + r^* + 0.5(infl - infl^*) + 0.5(ygap)$, where i is the policy rate (prescribed); *infl* is actual inflation, core inflation, and two-year WEO projected inflation; r^* is the equilibrium real rate = 2; $infl^*$ is 2 percent for advanced economies and 4 percent for emerging economies; *ygap* is the output gap (WEO) and output relative to the precrisis trend in percent.

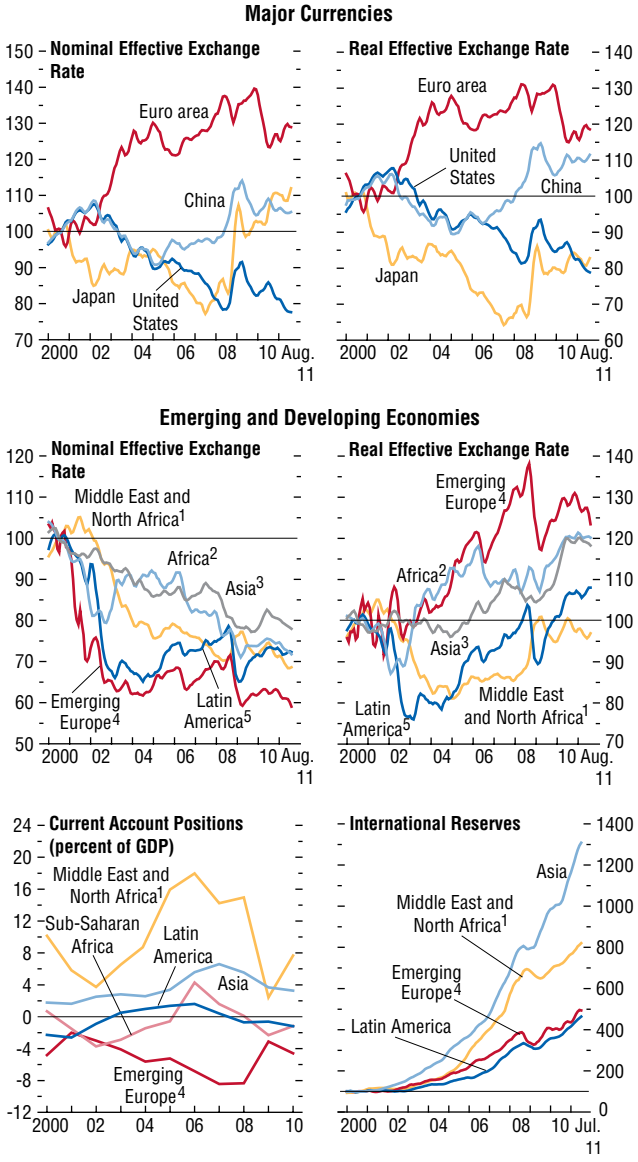
[4]Figures are based on official GDP and CPI data. The policy rate is proxied by the short-term interbank lending rate.

[5]As of July 2011; overnight interbank rate for Turkey.

Figure 1.19. External Developments

(Index, 2000 = 100; three-month moving average unless noted otherwise)

Real effective exchange rates of major economies and regions have not moved much over the past six months; global current account imbalances appear to be widening again; and the buildup of international reserves continues unabated. However, some currencies are experiencing more pressure than others.



Sources: IMF, *International Financial Statistics;* and IMF staff calculations.
[1]Bahrain, Djibouti, Egypt, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Emirates, and Republic of Yemen.
[2]Botswana, Burkina Faso, Cameroon, Chad, Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, and Zambia.
[3]Asia excluding China.
[4]Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, and Turkey.
[5]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

More fiscal tightening

As discussed in more detail in the September 2011 *Fiscal Monitor*, public deficits must be rolled back to rebuild fiscal policy room and—in some cases—alleviate strong domestic demand pressure. Fiscal balances in emerging and developing economies are still some 2 percent of GDP below precrisis levels and are projected to stay there over the medium term (see Figure 1.11, top-left panel; Figure 1.18, bottom panel). Among G20 economies, the structural deficit is very large in India and appreciable in South Africa. Rolling back deficits in these economies and elsewhere (for example, Brazil, Poland, Turkey) is a major priority not only for alleviating upward pressure on inflation or the real exchange rate (and thus the burden on monetary policy) but also for rebuilding room for fiscal policy maneuvering. The experience of advanced economies shows how much policy room may be needed in the event the credit cycle suddenly turns. Elsewhere in emerging Asia, deficits and debt are less of a concern. In China, higher public spending has helped rebalance the economy toward more internal demand, and more can be done if downside risks materialize. Deficits and debt are high in many MENA economies. Although spending has been increased to address pressing social concerns, notably those raised by high food prices, ultimately the needs must be met by broadening the tax base or cutting back on low-priority expenditures.

Adjusting real effective exchange rates

Exchange rate misalignment relative to medium-term fundamentals persists, with little change over the past six months (Figure 1.19; Figure 1.20, middle-right panel). Also, reserves accumulation by emerging market economies has continued unabated (Figure 1.19, bottom-right panel).

- The euro and yen have appreciated somewhat in real effective terms since the April 2011 *World Economic Outlook,* but remain broadly in line with medium-term fundamentals. The Japanese authorities recently decided to intervene in the currency market to address excessive fluctuations and disorderly movements in the market. The Swiss

authorities have adopted a minimum exchange rate target in response to strong appreciation pressures given its "safe haven" status. The U.S. dollar has weakened in recent months but still remains on the strong side of fundamentals; some further depreciation would contribute to global rebalancing and support the recovery.

- There has been no significant change for the various currencies of Asian economies with large external surpluses (for example, China), and they have continued to build up their foreign currency reserves. The renminbi still appears substantially undervalued. China's current account surplus is set to expand again. For Brazil and South Africa, the extent of overvaluation has remained broadly unchanged.

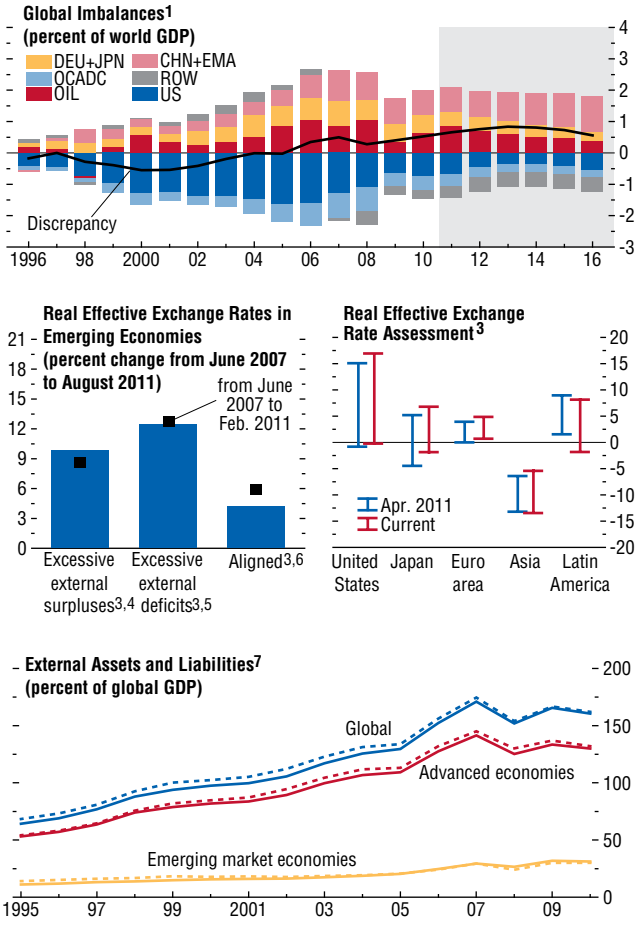
In various economies, domestic and external policy requirements point in the same direction. Further appreciation in the emerging surplus economies of Asia would help bring down both inflation and large current account surpluses. In other emerging market economies, however, monetary policy tightening could exacerbate overvaluation pressure. Economies with high fiscal and external deficits should alleviate domestic demand pressure by tightening fiscal policy. Whether this will significantly lower the pressure for their exchange rates to appreciate is unclear, but at least it will help create more room for fiscal policy to mitigate the repercussions of a sudden drop in capital inflows. Some have introduced measures designed specifically to manage capital inflows, such as taxes on certain inflows, minimum holding periods, and currency-specific reserve requirements. Recourse to such measures has been motivated by concerns about export competitiveness, financial stability, sterilization costs, and political constraints on fiscal policy. However, such measures should not be used as substitutes for macroeconomic tightening.

Implementing macrocritical structural reforms

Many economies are facing structural and social challenges. Crisis-hit economies need to reallocate labor away from construction and other struggling sectors. At the same time, they face declining

Figure 1.20. Global Imbalances

Emerging Asia is forecast to account for a rising proportion of global current account imbalances over the medium term, reflecting mainly a large increase in the surplus of China. Relative to precrisis levels, emerging market currencies have appreciated, and this seems appropriate, given their relatively better growth prospects. However, the appreciation has been distributed unevenly, worsening imbalances across emerging market economies. The real effective exchange rates of the yen and the euro remain broadly in line with fundamentals; the U.S. dollar is on the strong side of fundamentals; while Asian currencies (besides the yen) are undervalued (reflecting mainly the currencies of China and Korea).



Sources: U.S. Federal Reserve; and IMF staff estimates.

[1]CHN+EMA: China, Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand; DEU+JPN: Germany and Japan; 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.

[2]Emerging Consultative Group on Exchange Rate Issues (CGER) economies only.

[3]Based on the IMF staff's CGER. CGER countries include Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Czech Republic, euro area, Hungary, India, Indonesia, Israel, Japan, Korea, Malaysia, Mexico, Pakistan, Poland, Russia, South Africa, Sweden, Switzerland, Thailand, Turkey, United Kingdom, and United States. For a detailed discussion of the methodology for the calculation of exchange rates' over- or undervaluation, see Lee and others (2008).

[4]These economies account for 18.5 percent of global GDP.

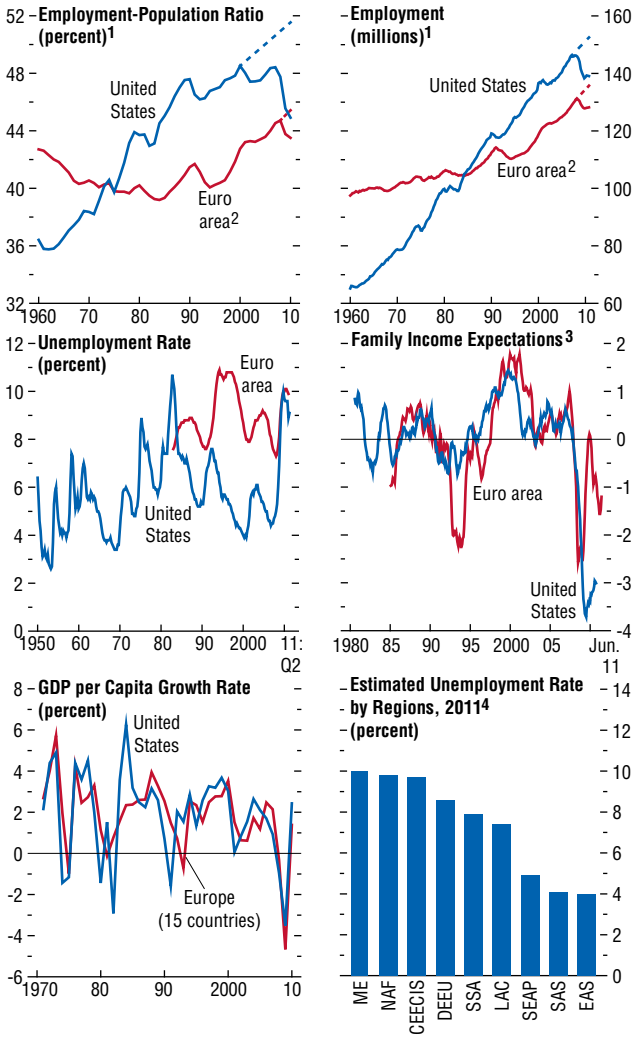
[5]These economies account for 27.4 percent of global GDP.

[6]These economies account for 39.2 percent of global GDP.

[7]Solid lines are for assets and dashed lines are for liabilities.

Figure 1.21. Employment and Unemployment

The United States and the euro area face major employment challenges, but they differ appreciably. In the United States, the loss of jobs relative to long-term trends has been unprecedented and has also been much larger than in the euro area. Furthermore, it has added to a trend break in the employment-population ratio that seems to have occurred during the decade before the crisis. By contrast, that ratio was on the rise in the euro area during the same period. As a result, families' income expectations have hit an unprecedented low in the United States, unlike in the euro area. Labor market challenges loom large not only in the advanced economies but also in a number of emerging and developing economies, notably in the Middle East, North Africa, and the CEE and CIS.



Sources: U.S. Bureau of Labor Statistics; European Commission; Haver Analytics; International Labor Organization; *OECD Economic Outlook;* Reuters; and IMF staff calculations.

[1]Dashed lines indicate trends.

[2]Euro area countries include Belgium, Finland, France, Germany, Italy, Netherlands, Portugal, and Spain.

[3]U.S. data are from Reuters/University of Michigan Surveys of Consumers and represent the difference between the percentage of people who think family income will go up and those who think it will go down. EU data are from the family financial situation index in the European Commission Business and Consumer Surveys. Both series are smoothed and harmonized.

[4]CEECIS: central and eastern Europe (non-EU) and Commonwealth of Independent States; DEEU: developed economies and European Union; EAS: east Asia; LAC: Latin America and the Caribbean; ME: Middle East; NAF: north Africa; SAS: south Asia; SEAP: southeast Asia and the Pacific; SSA: sub-Saharan Africa.

population growth or labor force participation rates, which exacerbates their fiscal problems.

- In the euro area periphery, reforms should reduce the growing gap between protected and unprotected workers, while improving employment prospects for the young, including through better education and vocational training. In addition, reforms should seek to eliminate wage-setting rigidity, which has caused sustained losses in competitiveness in the face of low productivity growth. More generally, the integration of euro area labor, goods, and services markets must continue, and obstacles to the free flow of equity capital must be eliminated. Progress on these fronts would facilitate financial restructuring and the transfer of skills and technology. This, in turn, would help raise productivity.
- In the United States, exceptionally high job losses during the crisis overlay lackluster employment generation during the previous decade. This left many households much more worried about future income prospects than during previous periods with similarly high unemployment rates (Figure 1.21). Persistently high unemployment (with more than 40 percent of the unemployed out of work for six months or more) may result in a permanent loss of work skills. Active labor market policies could help stem the rise in such structural unemployment, as could measures to expedite the adjustment in housing markets, given that weak housing market conditions can interact negatively with skill mismatches to raise unemployment. In many ways, however, the problem is so large that it warrants a sea change in macroeconomic policy: major entitlement and tax reform with a view to allowing less fiscal policy tightening.
- In many emerging and developing economies, rising food and commodity prices have exacerbated social problems posed by underemployment or high unemployment, especially among the young. Social safety nets need to be strengthened, and access to education and its quality need to be improved. In other economies, regulatory reforms would help ensure that capital inflows are used for productive, as opposed to speculative, investments. In China, a strengthened social safety net and a reorientation of the financial sector in favor

of households would provide much-needed support to global demand rebalancing.

Multilateral Perspectives on Policy Challenges

Food and oil prices and policy spillovers

Food prices have risen for both temporary and more lasting reasons. Among the temporary reasons, which have begun to unwind with the new crop season, are poor harvests due to bad weather and low inventories. Among the more lasting reasons are high fossil fuel prices, which are driving up fertilizer costs. Over the medium term, high food prices can be expected to significantly increase agricultural output. Regarding oil, medium-term prospects appear more problematic. On the one hand, supply growth is expected to moderate to an annual pace of 1.3 percent during 2011–15, down from 1.8 percent during 1981–2005, according to IEA estimates. This is due to drag from maturing fields and a long period of reduced exploration.[9] On the other hand, at current prices and based on WEO growth forecasts, demand might expand at an annual pace anywhere between 1.3 and 3.0 percent, depending on whether estimates for short-term or long-term elasticity are used.[10] The extent to which futures prices reflect this is unclear. Tensions in oil markets are thus likely to remain elevated, notwithstanding the return of Libyan output. Over the medium term, more rapid than expected expansion of production in Iraq appears to be the only major downside factor for the price of oil, aside from lower global growth. Over the long term, other downside factors could come into play, such as technological innovation that reduces the production costs of alternative sources of energy or lowers energy consumption.

The current high and volatile level of commodity prices raises the risk of problems for global macroeconomic conditions, income inequality, and food security. Regarding the latter, direct interventions aimed at limiting price fluctuations, such as curbs on financial investment or trade restrictions, may be tempting, but such measures address symptoms rather than causes and are often ineffective if not harmful in the longer term. Instead, policymakers should focus on protecting the poor through targeted social safety nets. Over time, measures to strengthen the effectiveness of price signals and to enhance price discovery may result in more stable markets. In this regard, initiatives to improve the gathering of information on food and fuel markets need to be carried forward.

The influence of financial factors on commodity prices has come under close scrutiny. Low policy rates in advanced economies and a search for yield are seen in some quarters as having spurred large inflows into commodity derivative assets, raising concern about speculatively driven commodity price misalignments—that is, prices that are out of line with supply and demand fundamentals. The empirical evidence to date, however, points to limited, and mostly temporary, effects of "financialization" (Box 1.4). In particular, the main effects have not been on commodity price levels, or volatility, but rather on the pricing of risk in commodity markets. With the emergence of commodities as an asset class, markets increasingly price only systemic, rather than idiosyncratic, risks for individual commodities. Matters may change if this new asset class attracts a large proportion of uninformed traders, but any resulting problems would have to be addressed as part of the broader initiatives under way to improve investor education and protection.

Contrary to some claims, basing monetary policy on commodity prices would likely worsen, not improve, economic stability. As Chapter 3 explains, narrowly targeting headline inflation is likely to lead to policy errors, precisely because headline inflation is subject to some of the volatility in commodity prices. Instead, central banks should follow policy frameworks that seek to stabilize the rates of consumer price increases over the medium term, with due allowance for the lagged effect of monetary policy. This does not necessarily entail moving from targeting headline inflation to core (or, more precisely, value-added) inflation. Although clearly desirable on the basis of principle and simplicity, such a move could raise significant technical and communication challenges. Instead, central banks should explain clearly what economic agents should expect

[9]See Chapter 3 of the April 2011 *World Economic Outlook* for further details. Reduced exploration reflected relatively low demand during the 1990s—when the CEE and CIS economies collapsed and emerging Asia faced a major financial crisis—and restrictions on oil investment.

[10]See Chapter 3 of the April 2011 *World Economic Outlook* for further details.

(for example, stabilization of domestic inflation over a horizon of a couple of years) and what they should not expect (for example, monetary policy that responds directly to commodity price changes). Central banks should spell out the path of headline inflation to the desired rate over the forecasting horizon. If central banks are concerned that such a policy would raise inflation to unacceptable levels for their constituencies, they can offset the effect of long-term trends in the relative price of oil on the headline inflation rate by adjusting the operational targets for core inflation. If their constituents place a very high value on stabilizing fuel or food prices, central banks need to explain that this would come at the expense of more instability in output and employment.

Spillovers from low policy rates in advanced economies

The issue of distortions flowing from low interest rates in advanced economies is complex. Low interest rates can foster more risk taking, postpone needed balance sheet adjustment, and delay fiscal consolidation. In times of recession and financial turbulence, these distortions are welcome because they facilitate gradual adjustment. However, as economic expansion takes hold, policy efforts need to focus increasingly on raising capital buffers and fiscal consolidation. On both fronts, progress has been lacking to varying degrees across the major advanced economies. Although it is difficult to state with confidence, policy rates in these economies may therefore be lower than necessary because of the absence of strong bank capital or fiscal consolidation that strikes a good balance between near- and long-term consolidation (for example, by emphasizing major entitlement reforms). In addition, as discussed in the September 2011 *Global Financial Stability Report,* investors appear to be increasing their exposure to risk through such products as high-yield corporate bonds and emerging market assets. Low policy rates may be playing a role in this increased risk tolerance and thus may complicate the tasks of policymakers in some emerging market economies.

Are the adverse spillovers from low policy rates so large that they harm global output? All economies would probably be better off if advanced economies had implemented stronger financial and fiscal policies. Absent such policies, would many emerging and developing economies be better off if policy rates were higher and activity in advanced economies commensurately lower? Several emerging market economies have certainly had difficulty coping with large capital inflows, suggesting that the answer might be affirmative. But there are also reasons to reach the opposite conclusion. First, capital inflows are not exceptionally strong for the vast majority of emerging and developing economies (see Figure 1.8, lower panels). Only a few economies are experiencing strong enough pressure to keep their exchange rates in overvaluation territory (for example, Brazil, South Africa). Second, capital inflows are overwhelmingly a function of national rather than international factors, such as U.S. or euro area policy rates: evidence in Chapter 4 of the April 2011 *World Economic Outlook* suggests that the share of national factors in explaining the variability in net inflows into emerging market economies has been about 70 percent during the 2000s. Third, most of the theoretical and empirical evidence suggests that, as long as monetary policy successfully stabilizes macroeconomic conditions in advanced economies, overall spillovers to emerging and developing economies are not detrimental.[11] Fourth, with the exception of Japan, the world's major net exporters of capital have for many years been emerging market economies.

The best response to financial stability challenges posed by low interest rates lies in a sound framework of regulation and supervision. It is in each country's national interest to strengthen its domestic financial stability framework to control incentives for excessive risk taking by lenders and borrowers alike, including those that may arise on account of low policy rates. In addition, policymakers could look for ways to accelerate balance sheet restructuring, such as by improving insolvency frameworks, introducing new instruments for deleveraging (such as household debt-equity swaps), and direct intervention in undercapitalized institutions. Emerging and developing economies with appropriate macroeconomic

[11]This is summarized in Box 1.3 of the April 2011 *World Economic Outlook.*

policies that still struggle with speculative inflows can respond with supervisory, regulatory, or other measures. Others that are exporting large amounts of capital stand to benefit from policies that lower domestic saving and thereby help solve the underlying problem of global demand imbalances.[12]

Spillovers from global demand rebalancing

Emerging and developing economies are increasingly seen as the drivers of global growth. For the purpose of assessing their role in global demand rebalancing, domestic consumption provides a good gauge of global impact—consumption has an advantage over GDP for this purpose, in that the latter includes exports and therefore may overstate the extent to which an economy offers an outlet for other economies' exports.[13] To assess the contribution of each economy to the growth of the global market, it is appropriate to measure national aggregates in a common currency. The relative levels of consumption, measured for convenience in U.S. dollars, suggest that the effect of emerging and developing economies' growth on global demand rebalancing has been limited by their low share in global consumption (Figure 1.22, bottom-left panel). The contribution of consumption to growth in emerging market economies from 2011 through 2016 is smaller than before the crisis; for China it is about the same.[14] In short, these economies do not make up for the lower consumption contribution of advanced economies. Although the rebalancing journey may have started, based on announced policies it will likely take a long time to complete.

Current fiscal policy is unlikely to provide much help for global demand rebalancing. Chapter 4 finds that the lack of more permanent consolidation

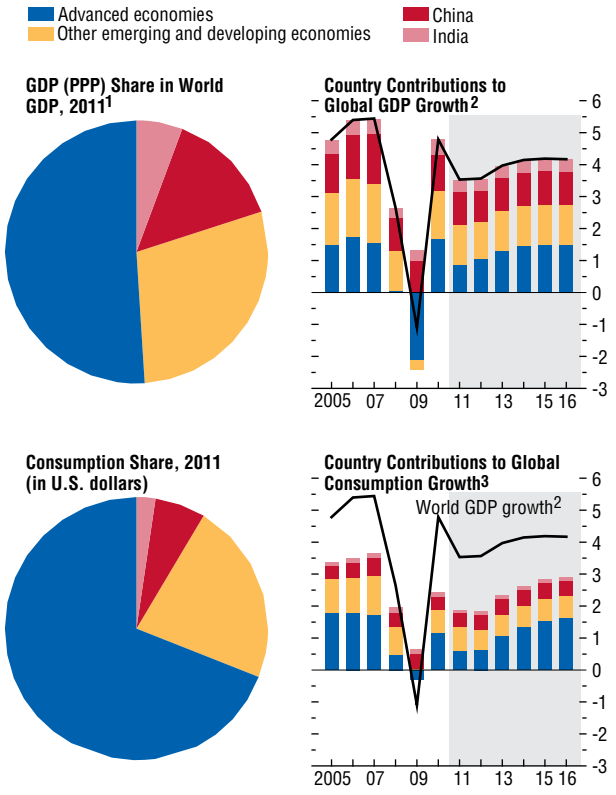
[12]This advice does not necessarily apply to economies that are reinvesting proceeds from exports of exhaustible natural resources.

[13]Consumption in U.S. dollar terms offers the largest contrast to GDP in purchasing-power-parity terms. The conclusions are qualitatively quite similar for the sum of consumption and investment, as opposed to consumption alone. Notice that part of investment is geared toward exports.

[14]China's consumption in 2009 would have had to have been some 17 percent higher to fully make up for the lower contribution of U.S. consumption during 2008–09 relative to 2005–07. This would have required a drop in the savings-to-GDP ratio from about 54 percent to 45 percent.

Figure 1.22. Drivers of Global Growth and Rebalancing

Emerging and developing economies account for about half of global output and two-thirds of global growth in purchasing-power-parity (PPP) terms, much of which is accounted for by China and India. However, for purposes of demand rebalancing, the more relevant measure is not in PPP terms but, for example, in constant U.S. dollars. Furthermore, for demand rebalancing, consumption might be a better variable than GDP, considering that it is less related to exports. As shown, emerging and developing economies account for a much lower share of global consumption and consumption growth in U.S. dollar terms. Also, their contribution to global consumption growth fell during the crisis and is not expected to exceed precrisis levels because of large losses in the central and eastern European and Commonwealth of Independent States economies and few gains elsewhere, including in China.



Source: IMF staff estimates.
[1]Shaded areas indicate IMF staff projections. Aggregates are computed on the basis of PPP weights.
[2]Based on 2007 PPP weights.
[3]Based on GDP at 2007 market exchange rates.

measures in the United States relative to elsewhere means that fiscal policy will contribute little to bringing down the U.S. external deficit (see Figure 1.11, bottom panels). This stands in contrast to what can be expected in the euro area, where large consolidation measures in other euro area economies relative to those adopted in Germany will help reduce imbalances within the region. However, unless demand picks up elsewhere, more consolidation in the United States would entail lower global activity. In sum, the challenges with respect to global demand rebalancing remain broadly unchanged: there is still a need for more ambitious medium-term fiscal consolidation in the United States and a boost in domestic demand in large emerging market surplus economies. Achieving the latter would be facilitated by nominal exchange rate appreciation, but it also requires further measures to boost social protection and to reform corporate governance and financial markets.

Vulnerabilities in the global financial system and the implications for spillovers

Some vulnerabilities in the global financial system are being addressed, but many others still are cause for concern. These issues are discussed in more depth in the September 2011 *Global Financial Stability Report*. First among these are institutions deemed too important to fail. Stronger prudential requirements for so-called systemically important financial institutions, including "living wills," would deter the pursuit of size solely for the sake of size and would foster more prudent behavior. The second vulnerability is the role of the shadow banking system. And third are the challenges presented by wholesale funding in the international money markets, which has grown rapidly over the past decade. The hope is that stronger capital and liquidity requirements, more transparency by moving over-the-counter activities to exchanges, and better incentives through "skin in the game" will help rebuild these markets and make them more stable. How successful such measures will be remains unclear. Recurring instability was a feature of financial systems until the advent of deposit insurance, and it is likely to be a feature of wholesale funding markets. During the financial crisis, central banks had to resort to extraordinary mechanisms to provide liquidity to wholesale funding markets. There are no such mechanisms at the international level.

The challenges presented by wholesale funding have a major international dimension, implying that problems in some regions of the world can very quickly spill over to other regions. This international dimension also makes it very hard to address the underlying problems. In the decade ahead of the crisis, cross-border exposures grew very rapidly between advanced economies (see Figure 1.20, bottom panel). Large international short-term net financial liabilities play a major role in debt crises (Box 1.5), and they are a distinguishing feature of economies that have suffered severe financial stress in the euro area. Indeed, the euro area may well be a bellwether for problems that could arise if financial globalization continues apace. More generally, a number of fundamentally strong advanced economies have had to tap Federal Reserve swap lines as wholesale funding has dried up. Whether this is a sustainable solution is an open question. The stresses made apparent during the crisis illustrate that there is an urgent need to beef up the size and scope of international risk-sharing mechanisms, which have fallen far behind the growth of the international financial markets.

Reforming the global trade system

Trade has been an important driver of the global recovery. From its crisis-induced trough at the beginning of 2009, the volume of global trade has grown by 25 percent and recently surpassed precrisis peaks. To ensure that trade can continue to boost growth, it is vital that policymakers continue to keep protectionist pressures at bay. Just as important, one of the best ways to enhance and guarantee security in trade relationships, as well as safeguard the multilateral approach for trade negotiations, would be to conclude the long-running World Trade Organization (WTO) Doha Round of trade talks. Failure of the round would put at risk significant agreements reached during 10 years of negotiations, including on new market access in major markets, global farm trade reform, and recent unilateral trade liberalization. Moreover, failure could precipitate moves toward fragmentation of the global trading system,

with further acceleration of bilateral preferential trade agreements, which would weaken both the WTO and multilateralism in general. In a worst-case scenario, a 19th-century-style Great Powers trade system could reemerge, and the poorest economies could lose their ability to negotiate on equal footing.

The negotiations for the Doha Round are at a pivotal juncture. In an attempt to break the persistent stalemate in talks, the focus shifted this year toward forging agreement soon on a partial package—at a minimum, aimed at helping the poorest or least developed countries (LDCs)—as a down payment for a more comprehensive package. However, momentum on the so-called LDC-plus package has stalled, largely because of disagreement over which "plus" (or non-LDC-specific) elements should be included. It is now vital that political leaders muster the will and high-level attention to move the negotiations forward, including by showing flexibility and making compromises. Leaders should also strongly communicate Doha's benefits to the public by arguing that trade liberalization is not a concession but instead spurs growth and is in a country's own best interest.

Appendix 1.1. Commodity Market Developments and Prospects

The authors of this appendix are Thomas Helbling, Shaun Roache, Joong Shik Kang, Marina Rousset, and David Reichsfeld.

Overview of Recent Developments and Prospects

After rising through April, prices of major commodities abruptly eased in two waves, first in May and June of 2011 and then again in August. The overall IMF commodity price index declined by 5 percent between April and July and another 5 percent in August. The index remains at high levels, from both a cyclical and a longer-term perspective. In August, it was about 9 percent above the level recorded in December 2010 and only about 14 percent below its most recent peak value in July 2008 (Figure 1.23, top-right panel).

The broad easing of commodity prices largely reflects common macroeconomic and financial factors that have led to a less favorable near-term outlook for the global economy and commodity demand. Incoming data suggest a stronger than expected slowing of global economic activity in the second quarter of 2011 and a gradual downgrade of near-term prospects, as discussed in detail in the main text of Chapter 1. Of particular relevance for global commodity markets was the policy response to rising inflation and surging housing prices in emerging market economies, in particular China, which accounts for about 40 percent of global metal consumption and 18 percent of energy consumption. The policy measures put in place since fall 2010 have reduced credit growth and succeeded in stabilizing economic growth at a more sustainable pace. Against this backdrop, China's import growth for many commodities—which is frequently considered a bellwether of global commodity demand conditions—has decelerated, which has reduced pressure on global demand-supply balances for some major commodities, notably base metals.

The increases in risk aversion in global financial markets, owing to renewed concerns about sovereign debt risks in the euro area periphery, and the related appreciation of the U.S. dollar likely also contributed to the broad decline in commodity prices. As usual, the effects of these financial factors on commodity prices are difficult to distinguish from those related to global economic prospects, both because all these factors are partly driven by the same underlying forces and because the direction of their effects on prices is the same. Nevertheless, increases in risk aversion can have direct effects on commodity spot prices: inventory holdings become relatively less attractive unless there is an offset from higher expected future returns resulting from a decline in current spot prices.

The easing of commodity prices was associated with noticeable declines in net futures positions of noncommercial investors, including in the case of crude oil (Figure 1.23, middle-left panel). More generally, commodity assets under management declined by about 9 percent during May and June—reflecting lower prices and net outflows—ending the quarter at $410 billion (Figure 1.23, middle-right panel). Net outflows took place across all commodity groups, with agriculture and energy each accounting for about 34 percent of the overall decline and precious metals for about 27 percent. These net outflows of investor funds for the commodity asset class as a whole were larger than those during the Great Recession of 2008–09 (Figure 1.23, bottom-left panel).

Initially, the decline in commodity prices and the outflows from commodity assets, which preceded declines in prices of other assets, were widely perceived as a surprise, symptomatic of the recent financialization of commodity markets. With financialization, sudden shifts in large investor portfolios can cause abrupt changes in pricing that do not appear to have an immediate fundamental trigger. Nevertheless, subsequent incoming global economic and financial data provided the fundamental backdrop for the commodity price declines. And the experience of the past few years suggests that although sudden shifts in investor sentiment and prices are possible, such events do not appear to have long-lasting or destabilizing effects on commodity prices (Box 1.4).

Near-Term Outlook

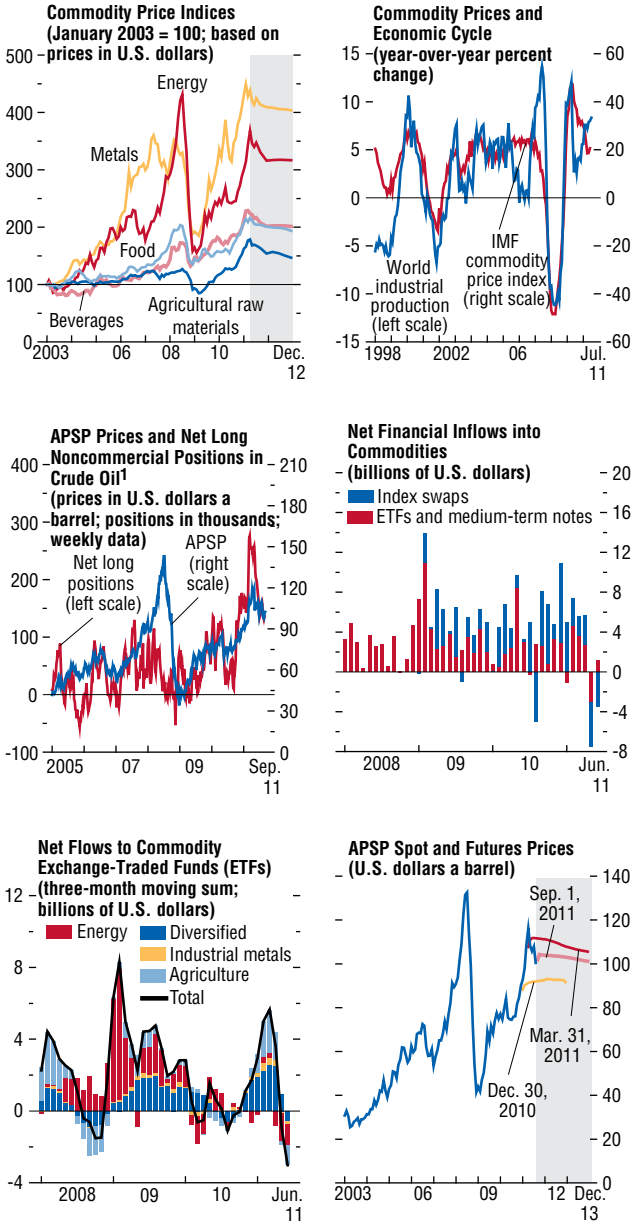
Commodity prices already reflect a weaker near-term global growth outlook. Under the baseline projections in this issue of the *World Economic Outlook,* global growth is expected to rebound slightly in the second half of 2011, when the fundamental

drivers of the expansion will reassert themselves. Nevertheless, this rebound is not expected to come with renewed strong upward pressure on commodity prices because it will be driven largely by a moderate, albeit still weaker than expected, earlier pickup in growth in advanced economies. In contrast, growth in emerging and developing economies, which have accounted for almost all commodity demand increases in recent years, is expected to slow modestly in the second half of 2011 and in 2012, because tightening policies should begin to affect domestic demand and prospects for external demand are less favorable. Much will also depend on commodity-specific demand and supply factors. For a growing number of commodities, upward pressure will likely also be contained by supply responses to higher prices that are estimated to be above long-term marginal cost in real terms—in the near term mainly in agriculture but increasingly also in metals.

The current commodity price forecasts are thus for broadly unchanged prices for 2011 as a whole. The IMF's average petroleum spot price (APSP) is expected to remain close to $100 a barrel for the remainder of 2011 and through 2012 (Figure 1.23, bottom-right panel). The IMF's nonfuel commodity price index is projected to moderate by about 5½ percent in the second half of 2011—largely owing to improved harvests for many food commodities and agricultural raw materials—as well as in 2012, when base metal prices are also expected to decline modestly because of improving supply conditions.

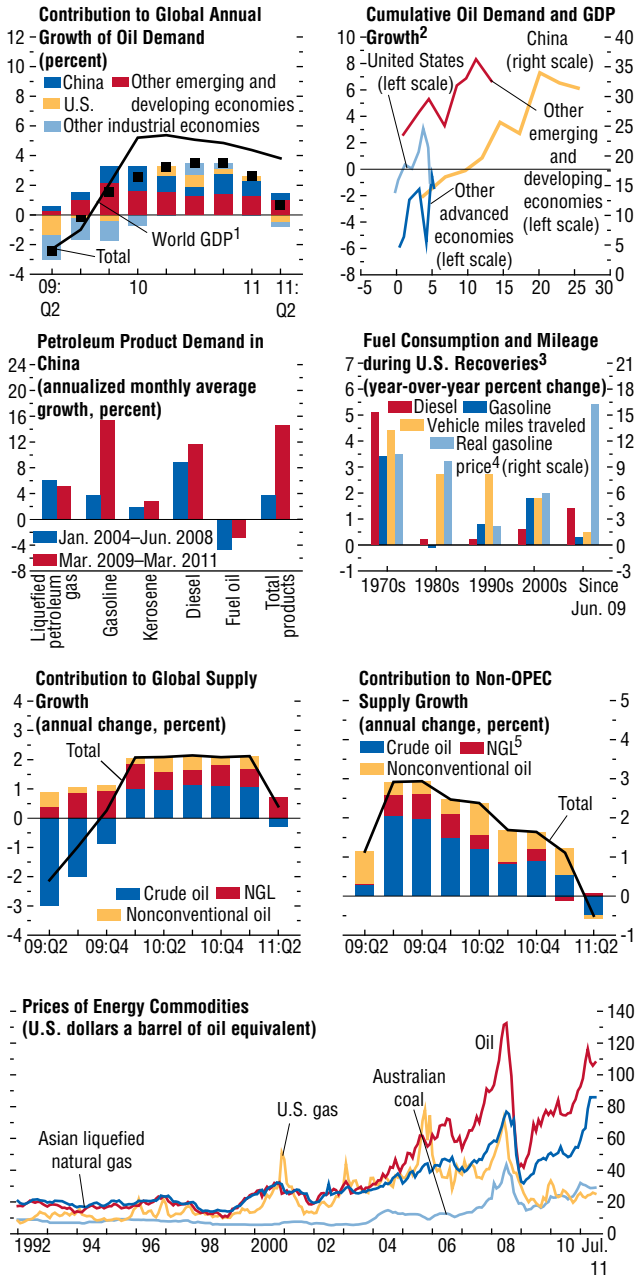
In the near term, broad commodity price risks seem more balanced than at the time of the October 2010 and April 2011 issues of the *World Economic Outlook*, because downside risks to global growth have risen. On the upside, price spikes due to supply factors remain the main concern. The balance of risks varies across commodities, however. Upside price risks remain most pertinent and most prominent for energy and food, the two commodity groups that matter most for global growth and inflation prospects. In oil markets, geopolitical factors are an important dimension of oil supply risks. More broadly, given generally price-inelastic supply in the short and medium term as well as recent declines in spare capacity, relatively small upward surprises to oil demand, such as the surge recorded last year,

Figure 1.23. Commodity Prices



Sources: Barclays Capital; Bloomberg Financial Markets; and IMF staff estimates.
[1]APSP (average petroleum spot price) denotes an equally weighted average of three crude oil spot prices: West Texas Intermediate, Dated Brent, and Dubai Fateh.

Figure 1.24. World Energy Market Developments



Sources: IMF Primary Commodity Price System; International Energy Agency, *Oil Market Report,* August 2011; Joint Oil Data Initiative; and IMF staff calculations.

[1]Annual change, in percent.

[2]Since 2009:Q1. Data are through 2011:Q2 for advanced economies and China; through 2011:Q1 for emerging economies. GDP growth is on x-axis, and oil demand growth is on y-axis, in percent.

[3]Average growth rates during the first 25 months of expansions according to National Bureau of Economic Research recession dates. Data are through May 2011 (23 months) for the expansion starting in June 2009.

[4]In 2011:Q1 U.S. dollars.

[5]NGL = natural gas liquids.

or adverse supply shocks can trigger large price increases. Oil market inflexibility thus continues to present risks to global growth and inflation. Given low global inventory levels for many crops, any significant adverse shocks—including this summer's heat wave in the United States—have the capacity to spike food prices higher.

Energy Market Developments and Prospects

After surging through April, and peaking at $120 a barrel at the end of that month, oil prices eased through the remainder of the second quarter and again in August, trading at about $100 a barrel since mid-August. During easing, the IMF's APSP—a simple average of the Brent, Dubai, and West Texas Intermediate (WTI) crude oil varieties—fell below the $100 threshold for some time and is expected to move sideways at about $100 throughout the projection period. Oil price volatility, as measured by the implied volatility embedded in the Chicago Board Options Exchange Crude Oil Volatility Index, spiked during the brisk price corrections in May and then again in August. On the latter occasion, the expected standard deviation of daily price changes temporarily rose above 50 percent (annualized), above the levels seen in March during the height of the Libya-related oil market disruption.

The easing in crude oil prices was driven primarily by the common macroeconomic and financial factors discussed in the overview of this appendix. These factors have underpinned concerns about oil demand prospects. Although slower global oil demand growth had been expected, given the overshooting in the second half of 2010, the slowing turned out to be stronger than projected in the second quarter of 2011, mirroring developments in global activity (Figure 1.24, top-left panel; Table 1.2). The main commodity-specific factor in the oil demand overshooting in the second half of 2010, the sharp acceleration in diesel demand growth in China due to power outages and cuts, was reversed as expected. Overall, oil demand growth in China has normalized to rates consistent with the past relationships between oil demand and economic activity (Figure 1.24, top-right panel). Nevertheless, gasoline consumption has grown at a higher rate over the past two years than

Table 1.2. Global Oil Demand and Production by Region

(Millions of barrels a day)

						Year-over-Year Percent Change							
	2009	2010	2011 Proj.	2010 H2	2011 H1	2004–06 Avg.	2007	2008	2009	2010	2011 Proj.	2010 H2	2011 H1
Demand													
Advanced Economies	45.0	45.7	45.4	46.2	45.0	0.6	–0.2	–3.5	–4.0	1.5	–0.6	2.7	–0.5
Of Which:													
United States	19.1	19.5	19.3	19.6	19.2	1.1	–0.1	–5.9	–3.7	2.2	–1.0	2.7	–0.4
Euro Area	10.6	10.6	10.4	10.7	10.2	0.1	–1.2	–0.4	–5.6	–0.1	–1.7	2.4	–1.6
Japan	4.4	4.5	4.5	4.5	4.4	–1.4	–3.1	–4.9	–8.2	1.3	1.1	1.7	–1.5
Newly Industrialized Asian Economies	4.6	4.8	4.8	4.8	4.7	2.3	4.4	–2.2	2.7	3.8	–0.1	4.1	–0.7
Emerging and Developing Economies	40.6	42.6	44.1	43.3	43.6	4.6	4.4	2.9	2.2	5.1	3.5	4.4	3.9
Of Which:													
Commonwealth of Independent States	4.2	4.5	4.7	4.6	4.6	1.5	2.1	2.3	–1.0	7.0	4.0	6.5	4.5
Developing Asia	23.4	24.8	26.0	24.9	26.1	4.9	5.1	1.5	4.6	6.0	4.6	3.8	5.3
China	8.1	9.1	9.6	9.3	9.5	9.4	4.6	2.2	4.1	12.5	6.1	10.2	7.5
India	3.3	3.3	3.5	3.3	3.5	3.8	6.7	4.0	4.7	2.4	3.6	2.1	3.5
Middle East and North Africa	9.0	9.2	9.4	9.4	9.3	5.8	4.2	5.1	3.9	3.2	2.1	2.9	2.3
Western Hemisphere	5.6	5.9	6.1	6.1	6.0	4.5	6.1	4.9	0.0	5.3	3.3	5.5	3.3
World	85.5	88.3	89.5	89.4	88.5	2.2	1.8	–0.7	–1.1	3.2	1.4	3.5	1.6
Production													
OPEC (current composition)[1,2]	34.1	34.8	36.5	35.2	35.4	4.6	–0.4	3.3	–5.8	2.2	4.8	2.8	2.7
Of Which:													
Saudi Arabia	9.5	9.8	. . .	9.9	10.4	2.4	–4.8	4.9	–9.5	3.1	. . .	4.6	8.7
Nigeria	2.2	2.5	. . .	2.6	2.6	2.6	–4.6	–7.6	–0.4	15.7	. . .	15.5	8.7
Venezuela	2.9	2.7	. . .	2.7	2.7	6.4	–1.3	0.8	–3.6	–4.8	. . .	–0.7	–1.8
Iraq	2.5	2.4	. . .	2.4	2.7	15.5	9.9	14.3	2.5	–2.2	. . .	–3.3	13.7
Non-OPEC[2]	51.6	52.6	53.0	52.9	52.5	0.6	0.7	–0.3	1.9	2.0	0.8	1.7	0.3
Of Which:													
North America	13.6	14.1	14.2	14.2	14.3	–1.2	–0.4	–3.6	2.1	3.5	0.8	3.5	2.1
North Sea	4.2	3.8	3.6	3.6	3.6	–6.8	–4.9	–5.0	–4.3	–8.7	–4.5	–10.1	–10.2
Russia	10.2	10.5	10.6	10.5	10.5	4.8	2.4	–0.7	2.0	2.4	1.0	1.7	1.2
Other Former Soviet Union[3]	3.1	3.1	3.1	3.1	3.1	8.9	11.6	3.1	8.7	1.3	–0.4	0.1	–0.4
Other Non-OPEC	20.5	21.1	21.5	21.4	21.0	1.3	0.7	3.0	2.1	3.2	1.7	2.9	0.8
World	85.6	87.4	89.5	88.0	87.9	2.2	0.2	1.2	–1.3	2.1	2.3	2.1	1.3
Net Demand[4]	**–0.1**	**0.9**	**0.0**	**1.4**	**0.6**	**–0.2**	**1.5**	**–0.3**	**–0.1**	**1.0**	**. . .**	**1.6**	**0.7**

Sources: International Energy Agency, *Oil Market Report*, August 2011; 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 nonconventional sources.

[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 percent of world demand.

it did during the 2005–08 expansion (Figure 1.24, upper-middle-left panel), suggesting that the growing number of cars per household may have begun to change the slope of the gasoline demand path. In advanced economies, fuel demand turned out weaker than projected, declining in the second quarter. In the United States, fuel demand has been slightly weaker than expected, given the state of the cycle and retail fuel prices (Figure 1.24, upper-middle-right panel). This weakness reflects in part the higher fuel efficiency of newer car models, which appears to be increasing the aggregate fuel efficiency of the U.S. car fleet, which had remained relatively unchanged for years.

Oil supply has expanded at a steady annual rate of about 2 percent since early 2010, although its relative contribution has changed (Figure 1.24, lower-middle-left panel). After expanding rapidly in 2010, supply growth from producers that are not members of the Organization of Petroleum Exporting Countries (OPEC) moderated in the first half of 2011. This

slowdown reflects the end of the base effect of new capacity in the U.S. Gulf of Mexico in 2009 and temporary shutdowns of producing fields for maintenance and capacity expansion. This moderation was offset by increased OPEC production, although it took time for other OPEC producers to ramp up production after the disruption to Libyan production. Only in June did OPEC production reach the levels seen early in the first quarter, largely due to a production increase of about 12 percent in Saudi Arabia compared with the levels of the first quarter of this year (an increase equivalent to 1 percent of global oil supply). Production in all OPEC members except Libya has exceeded the December 2008 production quotas, which are still in effect, for some time, but at their most recent regular meeting in June, OPEC oil ministers failed to agree on quota increases.

Turning to the demand-supply balance, demand growth still exceeded supply growth through the first half of 2011. As in the second half of 2010, market clearing involved a strong draw on inventories. The release of emergency stocks by International Energy Agency members provided only very temporary price relief. By the end of June, Organization for Economic Cooperation and Development member inventories had declined to below-average levels over past cycles (in terms of stock-to-use ratios). With the decline in inventory buffers, futures curves for the Brent crude oil variety, the predominant price benchmark outside the North American market, have returned to the usual state of backwardation (spot prices exceed futures prices). In contrast, futures curves for U.S. WTI are still sloping upward at the front end, reflecting localized pockets of excess supply in landlocked areas of the North American oil supply system, as a result of increased production and still weak demand. Limited transportation capacity constrains the scope for arbitrage to reduce price differentials. These constraints are expected to persist for some time; current futures prices imply that markets expect WTI to be priced at a discount to Brent through 2016. Historically, WTI has traded at a premium, because it is a lighter and sweeter variety of crude oil. If this anomaly continues, use of the WTI price as a price benchmark will increasingly come under scrutiny.

Near-term oil market stability will depend heavily on two factors. First, oil demand growth is expected to moderate further after strong growth through 2010. On the supply side, the call on OPEC will increase further in the second half of 2011 and again in 2012 under the WEO baseline projections, given that non-OPEC supply growth is not expected to recover until late in 2011.[15] Higher OPEC production will thus be required for oil market stability, although some of the increases in the call on OPEC will be seasonal. There are risks on both sides. The extent of the moderation in oil demand growth will depend on whether global activity rebounds as expected. OPEC spare capacity has declined since the disruption to Libyan production, highlighting risks to supply, including for geopolitical reasons.

In the medium term, futures prices indicate that markets expect prices to remain high but also broadly constant in real terms. Such expectations are consistent with the view that at such prices supply can broadly keep up with relatively moderate growth in global oil demand on the order of 1 to 1½ percent a year. The global oil supply growth of about 2 percent observed over the past two years is unlikely to be sustained, because it was made possible by high postrecession spare capacity and other special factors. Nevertheless, the recent supply experience suggests that continued moderate net capacity expansion is possible. Thanks to oil prices of $100 a barrel in real terms, high-cost conventional and nonconventional oil reservoirs continue to be developed (Figure 1.24, lower-middle-right panel). Upstream oil investment in non-OPEC members has remained high, with continued exploration and development. As a result, production in these economies is already some 2½ million barrels a day above the previous peak in 2007, despite continued decline in the North Sea and Mexico. The increases in shale oil production in North Dakota in the United States highlight the scope for and the benefits of techno-

[15]The "call on OPEC" is the difference between global demand and supply from sources other than OPEC crude oil production, including OPEC natural gas liquids (NGL) production. In Table 1.2, the figure for OPEC production in 2011 reflects the call on OPEC and OPEC NGL production.

logical innovation.[16] Moreover, at such prices, efforts at decline management are likely to intensify.[17] Upstream investment in many OPEC members has remained relatively more subdued, although some major members are pursuing ambitious investment programs.

Price differences across fossil fuels continue to be large. Crude oil remains the most expensive fuel per unit of energy produced compared with coal and natural gas, reflecting differences in the extent of supply constraints (Figure 1.24, bottom panel). In the United States, shale gas development and exploration have continued at a broadly unchanged pace. Although costs and returns vary considerably across shale gas plays, many have turned out to be profitable at current gas prices of about $4 per 1,000 cubic feet. With such price differentials, recent energy demand patterns will continue. In particular, the decline in the share of crude oil in total use of fossil fuels and the generation of primary energy observed over the past three decades will continue. Whether the current higher price differentials will lead to faster decline in the share of crude oil is uncertain, however, in some sectors, notably transportation, where the extent of substitution in the short to medium term is limited (even though the technology to run vehicles on natural gas exists). On the other hand, in the U.S. power sector, natural gas has become a more attractive fuel input compared with coal, and its share in primary energy consumption is likely to increase. Natural gas could also play a more prominent role in the energy mix elsewhere, given that large shale gas deposits have also been identified in other regions. Although foreign oil and gas companies have acquired equity in U.S. shale gas producers, preparing the ground for technology transfer, exploration elsewhere has not really started yet.[18] Coal consumption also continued to increase at a rapid rate in the first half of 2011, reflecting lower costs compared with crude oil.

[16]Shale oil production is included in conventional oil in Figure 1.24 and Table 1.2.

[17]See Box 3.1 in the April 2011 *World Economic Outlook*.

[18]Box 3.2 in the April 2011 *World Economic Outlook* analyzes prospects for moving the U.S. shale gas "revolution" to the global stage.

Metal Market Developments and Prospects

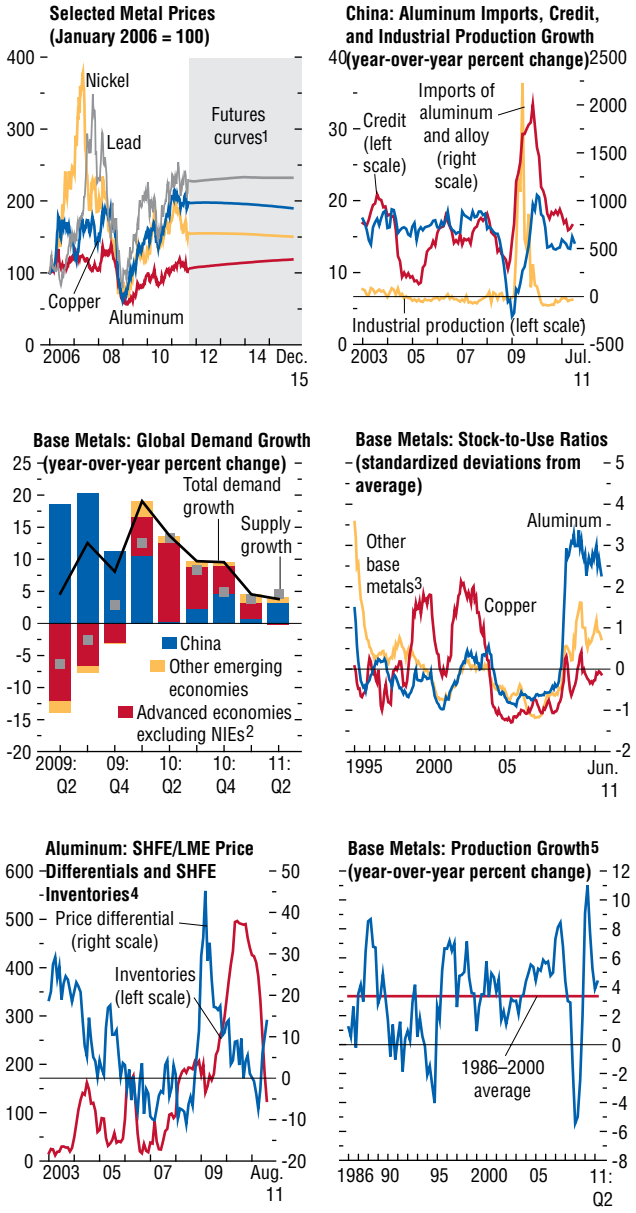
Base metal prices moved broadly sideways in the first half of 2011, with relatively minor ups and downs in sync with other commodity prices. In August, the IMF's base metal price index was down by 0.3 percent compared with December 2010 (Figure 1.25, middle-left panel).[19]

Metal prices started easing earlier than other major commodity group prices. This lead reflects two China-specific factors. First, with a market share of about 40 percent in global base metal markets, domestic demand developments in China are much more important for this commodity group than for others. The key development in this respect has been the Chinese authorities' policy tightening measures in response to rising inflation and surging house prices since the second half of 2010. As a result, activity in metal-intensive sectors has slowed. Fixed investment, which had surged along with policy stimulus and credit growth in 2009 and early 2010, has moderated since then. Although real estate investment has held up well, in part bolstered by ongoing expansion in the construction of housing for lower-income groups, industrial production growth has moderated to below the precrisis average (Figure 1.25, top-right panel). As a result, global base metal consumption growth moderated further in the first half of 2011, with China's contribution falling to unusually low levels compared with the past few years (Figure 1.25, middle-left panel).

The second China-related factor is the country-specific base metal inventory cycle, which had a hand in China's dominant contribution to global metal demand growth in 2009 and early 2010. This inventory cycle has gone from a bullish to a bearish force for metal prices over the past six to nine months. Following the 2009 policy stimulus, metal inventories in China surged in anticipation of higher demand, and local prices rose temporarily above world market prices. In addition, inventories in bonded warehouses started increasing because base metals, notably copper, were increasingly used as collateral for trade credit as policy tightening reduced

[19]The price of gold rose strongly, by about 28 percent, during the first eight months of 2011.

Figure 1.25. Developments in Base Metal Markets



Sources: Bloomberg Financial Markets; London Metal Exchange; Thomson Datastream; World Bureau of Metal Statistics; and IMF staff estimates.

[1]Prices as of September 2, 2011.

[2]NIEs = newly industrialized Asian economies, which include Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

[3]Aggregate of aluminum, copper, lead, nickel, tin, and zinc.

[4]SHFE = Shanghai Futures Exchange; LME = London Metal Exchange. Price differentials are in percent; inventories are in thousands of tons.

[5]Index is composed of aluminum and copper until 1996; after 1996, nickel, tin, zinc, and lead were added. Weights are based on 2005 supply and price.

the supply of regular business credit.[20] Increased imports subsequently led to price equalization. With the slowing in demand and restrictive policies in place in some sectors, inventories have started to decline. This decline added to local supply, and metal import growth began to slow in the first half of 2011. In contrast, global metal inventory holdings (as measured by stock-to-use ratios) remain at high levels considering the stage of the global business cycle (Figure 1.25, middle-right panel).

Metal-specific supply developments have also shaped price behavior, with marked differences across metals, as evidenced in the recent increase in the dispersion of price changes across metals. Copper prices rebounded in June as supply disruptions in major mines due to strikes and adverse weather conditions worsened already tight demand-supply balances. Lead prices rose after one of the world's largest lead mine was closed indefinitely. Aluminum markets remained broadly balanced in the first half of this year, with record-high production levels matched by continued strong global demand. In contrast, nickel prices have stabilized despite tight supply conditions, because the production of nickel pig iron as a substitute for nickel has increased significantly, particularly in China.

Turning to the outlook, base metal consumption growth in China is expected to remain broadly stable at the rates seen in the first half of 2011, given prospects for economic activity overall. Economic growth in China is projected to remain robust, with a slowly increasing balance in contributions from investment and consumption, reaching 9.5 percent for 2011 as a whole and 9.0 percent in 2012 compared with 10.3 percent in 2010. On the other hand, although inventory destocking begun in late 2010 is expected to end, the overall impact on demand should be modest if inventories build up broadly in line with the rebound in consumption. Indeed, copper inventories at the Shanghai Futures Exchange (SHFE) have rebounded since June, and aluminum price differentials between the SHFE and the London Metal

[20]Markets have been concerned about reports of an increase share of copper imports being used as collateral in bank credit (through letters of credit to finance imports with deferred payment), although there are no official data to assess the scope of such deals.

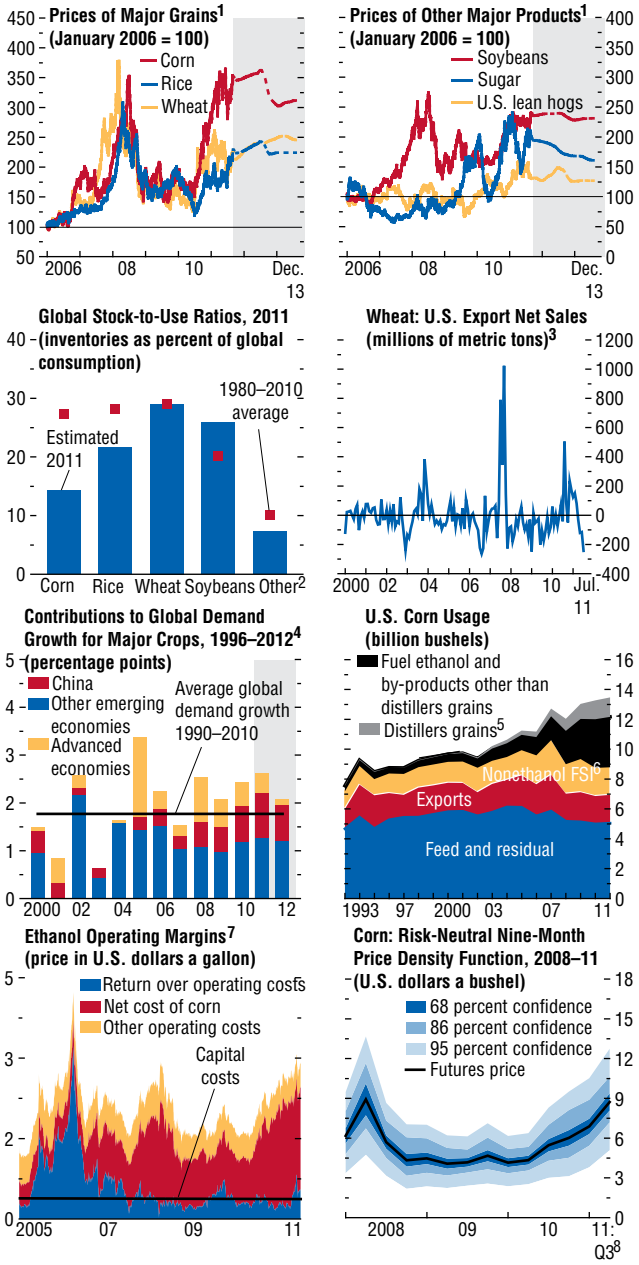
Exchange have widened again, indicating tightening local supply-demand balances and some increases in base metal import growth (Figure 1.25, bottom-left panel).

Base metal prices are expected to remain broadly stable despite the moderate rebound in global economic growth in the second half of 2011. On the demand side, as noted above, base metal demand growth in China is expected to remain broadly stable, while base metal consumption in advanced economies, which was still 12½ percent below its precrisis peak in the second quarter, is expected to recover gradually in the context of subdued economic growth. On the supply side, production, which surged in the first half of 2010 following a sharp decline during the Great Recession, should remain close to its average rate of expansion of about 3½ percent (year over year)—with some variations across metals—making for broadly balanced market conditions at current high prices (Figure 1.25, bottom-right panel). Risks for base metals in general seem more balanced than for oil or food, mainly because overall supply does not seem as tightly constrained as for oil—with copper and lead being notable exceptions—and because of higher inventory levels (relative to consumption) than in food markets. Risks to energy prices also affect metal prices, however, given the high share of energy in the cost of metal refining.

Food Market Developments and Prospects

Food prices have retreated modestly from their peak in recent months, but they remain very high compared with the decade through 2010 (Figure 1.26, top panels). The IMF food price index during the third quarter to date of 2011 is about 20 percent higher than for the same quarter of 2010 and significantly above the average real price over the past 10 years. Grain and oilseed prices are particularly elevated, but prices of other food groups, including meat, are also well above their historical averages. A degree of respite from rising prices has been provided in recent months by improving near-term supply prospects for some important crops. Following the large weather-related supply setbacks during fall 2010, expectations for harvests in 2011 have

Figure 1.26. Recent Developments in Markets for Major Food Crops



Sources: Bloomberg Financial Markets; Chicago Mercantile Exchange; Iowa State University Center for Agriculture and Rural Development; U.S. Department of Agriculture; and IMF staff estimates.

[1]Futures prices for September 2011 through December 2012.
[2]Other grains and oilseeds.
[3]Sales adjusted for seasonal factors and long-term trends.
[4]Projections for 2011 and 2012 are by the U.S. Department of Agriculture.
[5]Distillers grains from dry mill fuel ethanol plants based on an estimated annual share of corn-based ethanol production from dry mills and on an assumption that distillers grains account for 17.5 pounds of each bushel of corn used in dry mill fuel ethanol production.
[6]FSI = food, seed, and industrial products.
[7]Ethanol operating margins are based on nearby futures and Iowa corn prices.
[8]As of September 6, 2011.

stabilized, and there are signs, based on projected acreage, that output growth will be relatively buoyant in 2012.

Food markets remain precariously balanced, however. Inventory buffers are very low for some important crops—notably corn—and this will keep prices very sensitive to changes in the supply and demand outlook (Figure 1.26, upper-middle-left panel). The most immediate risk is that key crops will suffer from another round of weather-related supply shocks. The recent pattern of extreme weather in major crop-growing regions seems to be continuing: following droughts in Europe and China, the United States has experienced a very wet spring followed by severe summer heat, leading to a reduction in projected corn yields. Even modest further downgrades to the supply outlook could trigger a large price response, cross-commodity spillovers, and higher volatility, similar to developments in early 2011. For example, rising supply uncertainty led to surging precautionary demand in physical markets by major food-importing economies during the first quarter of 2011, as reflected in U.S. export sales (Figure 1.26, upper-middle-right panel).

At the same time, demand growth momentum remains strong. Rapid increases in emerging market economy food consumption are showing no signs of moderating, reflecting income growth and a diet shifting toward higher-protein foods, including grain-fed meat (Figure 1.26, lower-middle-left panel). In advanced economies, notably the United States, overall demand growth is modest, but the use of food commodities as a biofuel feedstock continues to surpass expectations, most recently due to higher oil prices during the first half of 2011 and rising ethanol refining margins. Since 2000, ethanol has accounted for three-quarters of the 40 percent increase in the use of domestic corn output, with ethanol by-products accounting for the remainder (Figure 1.26, lower-middle-right panel). Use of soybean oil in the production of biodiesel fuel is also increasing rapidly. High energy prices and policy support are bolstering biofuel production in Europe and other regions as well, but again, limited data availability continues to impede commodity market transparency (Figure 1.26, bottom-left panel). Overall, global demand for major crops during 2011–12 is anticipated to grow by about 2¼ percent, considerably above the 20-year average and almost entirely because of demand from China and other emerging market and low-income economies.

Food prices should decline modestly but remain high in real terms through 2012, assuming a return to more normal weather conditions and stable energy prices, which affect food prices through biofuel and production costs. This scenario is built into the futures prices of some key crops, notably corn, which currently reflect some easing as each new crop is harvested. Supply is responding to higher prices, albeit with a lag. In particular, rising global acreage should offset the medium-term moderation in yield growth due, in part, to emerging constraints in productive land and water. The balance of risks to food prices is still to the upside, however, and this is reflected in derivative market pricing, which shows market participants pricing in a higher-than-average probability of a price spike over the next nine months (Figure 1.26, bottom-right panel). A combination of low inventories, volatile weather, and demand uncertainties related to China and biofuels raises the prospect of further price spikes over the next 12 to 18 months. The renewed imposition of trade restrictions in the face of using prices and tighter demand-supply balances in physical markets—including through export bans by important producers—could exacerbate global supply conditions and heighten world price volatility.

Box 1.1. Slow Recovery to Nowhere? A Sectoral View of Labor Markets in Advanced Economies

Employment took a deep hit in many advanced economies during the Great Recession of 2008–09 and has been slow to recover, reflecting the still weak and uncertain recovery. But even after a cyclical recovery, structural trends that predate the Great Recession could dim labor market prospects. Skill-biased technological change and the increased prevalence of global supply chains have added to national income in advanced economies. But these trends also have been associated with a striking loss of middle-income and manufacturing jobs. This box describes these unequal impacts of technology and trade and their likely impact on potential output growth. The main policy message is that advanced economies need to address the human costs of these structural trends just as they took steps to lower the human costs of the Great Recession (Dao and Loungani, 2010).

Technology and Trade Effects on Employment

Technological change and trade are as old as civilization, but when it comes to their medium-term impacts on the labor market, each time can be different. In the two decades preceding the Great Recession, a salient feature of technological change was that it favored more highly skilled workers. This is not always the case: during some periods in history, technological change has replaced rather than complemented the highly skilled (Goldin and Katz, 2008).

The primary effect of trade on the labor market during these same two decades was an increasing reliance on global supply chains, a process helped by the availability of large pools of workers in emerging markets who previously had been outside the global production system. As Freeman (2007) notes, "almost all at once in the 1990s, China, India, and the ex-Soviet bloc joined the global economy," doubling the size of the global labor pool to nearly 3 billion. The concurrent advances in information and communication technology helped give many global businesses ready access to this expanded pool of labor.

As in the past, these trends in technology and trade have contributed to global welfare: millions have been lifted out of poverty in emerging markets; consumers everywhere have enjoyed the benefits of lower prices; and national income has expanded in advanced economies. But these trends have also increasingly been associated with diminished prospects for large groups of workers in advanced economies. As Spence (2011) notes, "until about a decade ago, the effects of globalization on the distribution of wealth and jobs were largely benign, [but now] it is changing the structures of individual economies in ways that affect different groups within countries differently. In advanced economies, it is redistributing employment opportunities and incomes."

Documenting these effects requires going beyond aggregates and looking at sectoral developments by skill level and industry.

Employment Shifts and Labor Productivity

Acemoglu and Autor (2010) document a shift in employment in the United States from medium-skill to low- and high-skill jobs during 1980–2007. Middle-income jobs declined significantly in other advanced economies between 1993 and 2006, including in the euro area, Japan, and the United Kingdom. Figure 1.1.1 suggests a shift away from middle-income jobs and from industries with high productivity levels and high productivity growth to industries with lower productivity levels and growth rates.

The top-left panel shows the striking hollowing out of medium-skill and middle-income jobs, many of which were lost from the manufacturing sector. In contrast, much of the services sector, which includes community, social, personal, and government services, remains dependent on low-skilled, low-income labor.[1]

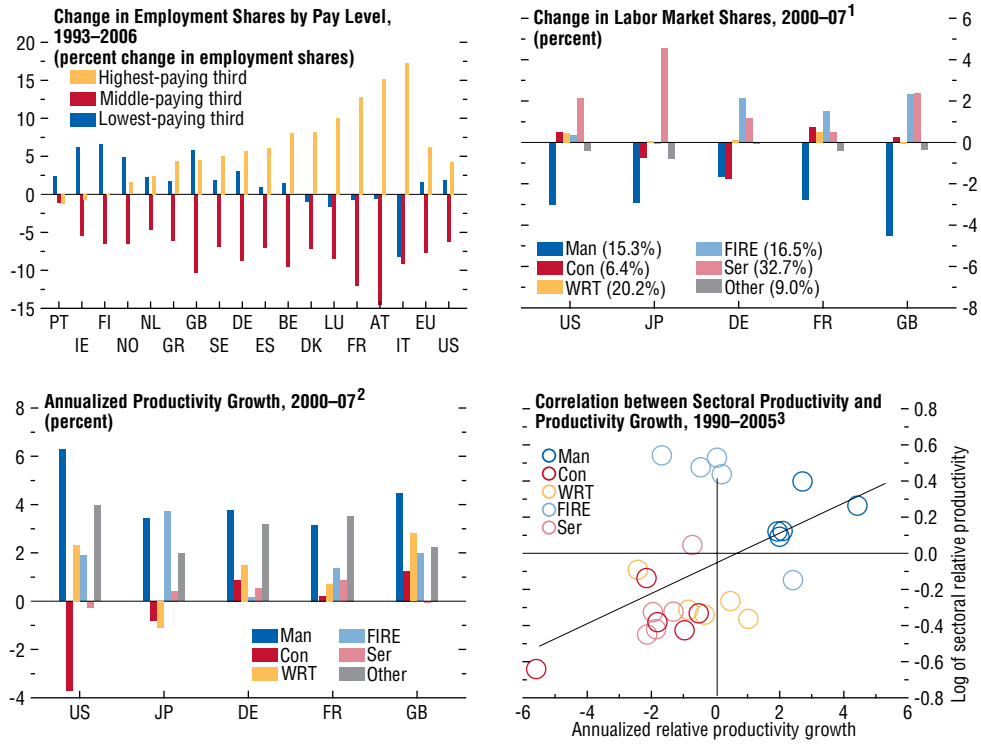
The top-right panel of the figure shows the change in labor market share of various sectors during 2000–07 for selected advanced economies. All five economies experienced a decline in manufacturing and an increase in services. Even in Germany, which has had a trade surplus since 2001,

The main authors of this box are Prakash Loungani, Su Wang, Laura Feiveson, and João Jalles.

[1]For a fuller analysis of productivity developments in services, see Bosworth and Triplett (2007).

Box 1.1 *(continued)*

Figure 1.1.1. Trends in Employment and Labor Productivity



Sources: Autor (2010); Groningen Growth and Development Center (GGDC); Organization for Economic Cooperation and Development (OECD) STAN database; and IMF staff calculations.

Note: AT: Austria; BE: Belgium; DK: Denmark; EU: EU average; FI: Finland; FR: France; DE: Germany; GR: Greece; IE: Ireland; IT: Italy; JP: Japan; LU: Luxembourg; NL: Netherlands; NO: Norway; PT: Portugal; ES: Spain; SE: Sweden; GB: United Kingdom; US: United States. Con: construction; FIRE: finance, insurance, and real estate; Man: manufacturing; Ser: community, social, and personal services; WRT: wholesale and retail trade, hotels, and restaurants.

[1]Japanese data are taken from the GGDC database and are for 1996–2003.

[2]Japanese data are taken from the GGDC database and are for 1996–2003. Productivity is computed by dividing value added by hours worked. For the United Kingdom and Japan, it is computed by dividing value added by number of employees.

[3]The countries included in this panel are France, Germany, Japan, United Kingdom, and United States.

the manufacturing share of employment fell from 22 percent in 2000 to 20½ percent in 2007. The construction sector and the financial services sector (which includes finance, insurance, and real estate) also experienced large employment increases in most of these economies during the housing boom of the precrisis period.

Historically, reallocating labor from low-productivity to high-productivity sectors has been a primary channel through which advanced economies have increased national income (McMillan and Rodrik, 2011). But many observers fear that these economies are now at a stage in their structural transformation at which they could "slow down, stagnate, and decline" as labor is increasingly reallocated from high-productivity manufacturing to lower-productivity services (Duarte and Restuccia, 2010).

The bottom-left panel shows labor productivity growth by sector during 2000–07. Manufacturing was a high-productivity growth sector, whereas services sector productivity barely increased (or even declined) in every country during this period. There

Box 1.1 *(continued)*

was increased employment in construction, which experienced below-average productivity growth, and in financial services, which experienced average productivity growth.

The bottom-right panel shows that relative productivity levels and productivity growth are highly correlated. This occurs because sectoral productivity growth rates have been relatively consistent during the past decades.

Sectoral Productivity and Potential Output Growth

The likely impact of these employment shifts on aggregate productivity growth, and hence on potential output growth, can be illustrated through a simple accounting framework. The labor productivity of country i in year t can be expressed as follows:

$$A_{it} = \sum_j \theta_{ijt} \times P_{ijt}, \qquad (1.1)$$

where θ_{ijt} is the share of labor input in industry j as a fraction of the economy-wide labor supply, P_{ijt} is per unit labor productivity, and the summation is over all industries j. The growth rate of productivity can be expressed as follows:

$$\frac{A^*_{it}}{A_{it}} = \frac{1}{A_{it}}\left(\sum_j \theta^*_{ijt} \times P_{ijt} + \sum_j \theta_{ijt} \times P^*_{ijt}\right). \qquad (1.2)$$

An asterisk next to a variable indicates the change with respect to time.

Taking sectoral productivity growth as exogenous, this equation shows the impact on economy-wide productivity growth as employment starts to shift from an industry with high productivity and high productivity growth rates to a low-productivity (and low productivity growth) industry. During the shift, the first term on the right side of the equation is lower if there is a negative correlation between changes in labor share and productivity levels. This is referred to as a *compositional* or *structural* effect. Moreover, once the shift takes place, the second sum is also smaller, because there is now higher employment in sectors where productivity growth is lower and lower employment in sectors where productivity growth is higher. This is the *within-industry* effect.

Figure 1.1.2 illustrates these effects. The top-left panel shows the relationship between changes in labor share and productivity levels for five advanced European economies from 2000 to 2007. There is a clear negative correlation between relative productivity and the change in the employment share, although the finance sector is an outlier. The top-right panel shows a similar and more striking negative correlation between changes in labor shares and productivity levels in the United States during 2000–07. The size of the bubbles represents the relative size of the sectors.

The bottom-left panel shows both the structural and within-industry effects on U.S. labor productivity growth for three typical years: 1991, 2000, and 2007. Each effect is the cumulative sum for six sectors, so that the sum of all 12 components is equal to the labor productivity growth rate for the year. Sectors differ greatly in the channels through which they contribute to aggregate labor productivity growth. The manufacturing sector has always had a negative structural component, due to its diminishing labor share. In contrast, the services sector has negative within-industry components for all three years, a sign of its sluggish productivity growth.[2]

Thus, shifts away from high-productivity industries have exerted a drag on per capita output growth due to both structural and within-industry effects.

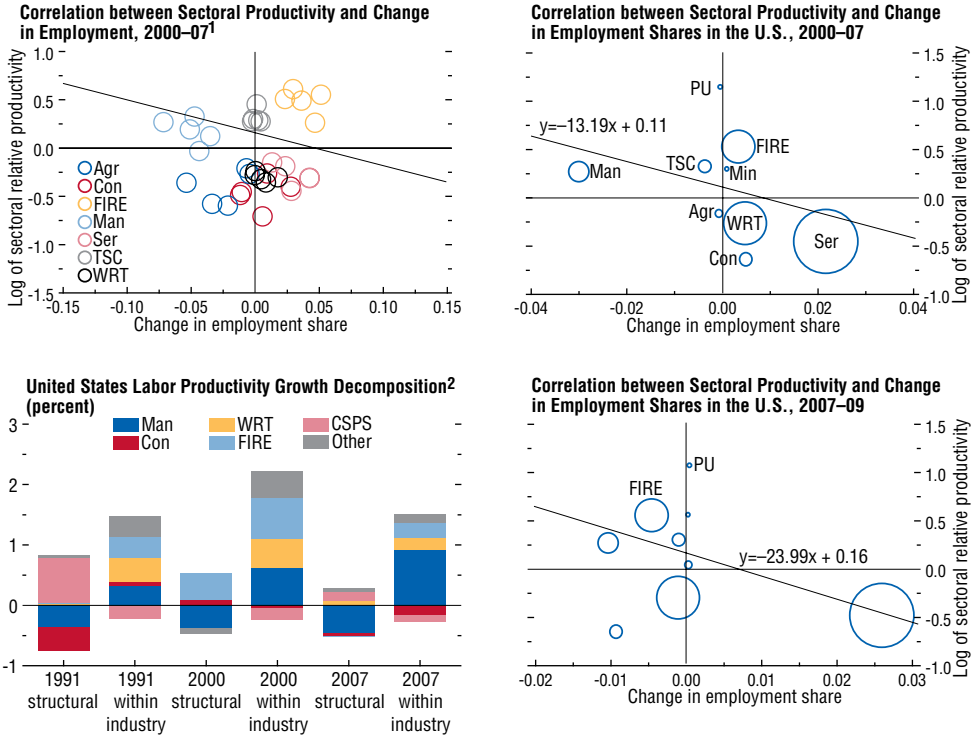
Although the shifts in the labor market documented above predate the Great Recession, the evidence suggests that they persist. For instance, with respect to the polarization of jobs, Autor (2010) finds that "the Great Recession has quantitatively but not qualitatively changed the direction of the U.S. labor market." The bottom-right panel plots the level of productivity against the change in labor market share in the United States during 2007–09. The services sector continued to grow in terms of labor share and the manufacturing sector to decline—both at faster annual rates. Indeed, total employment fell 4½ percent and employment in manufacturing by 14 percent between 2007 and 2009, but employment in services increased by 2 percent.[3]

[2]See Peneder (2003) and Bosworth and Triplett (2007) for further discussion on the decomposition.

[3]The experiences of the United Kingdom and Spain were similar; Germany, however, had a slight increase in labor share in manufacturing and a slight decrease in services.

Box 1.1 *(continued)*

Figure 1.1.2. Sectoral Trends May Affect Potential Output Growth



Sources: Groningen Growth and Development Center; Organization for Economic Cooperation and Development; and IMF staff calculations.

Note: Agr: agriculture, forestry, and fishing; Con: construction; CSPS: community, social, and personal services; FIRE: finance, insurance, and real estate; Man: manufacturing; Min: mining and quarrying; PU: public utilities; Ser: community, social, and personal services; TSC: transport, storage, and communication; WRT: wholesale and retail trade, hotels, and restaurants.

[1]Trendline is drawn for sectors other than FIRE. The countries included in this panel are France, Germany, Japan, United Kingdom, and United States.

[2]Structural effect is the relationship between productivity level and labor share; within-industry effect is the relationship between productivity growth and labor share.

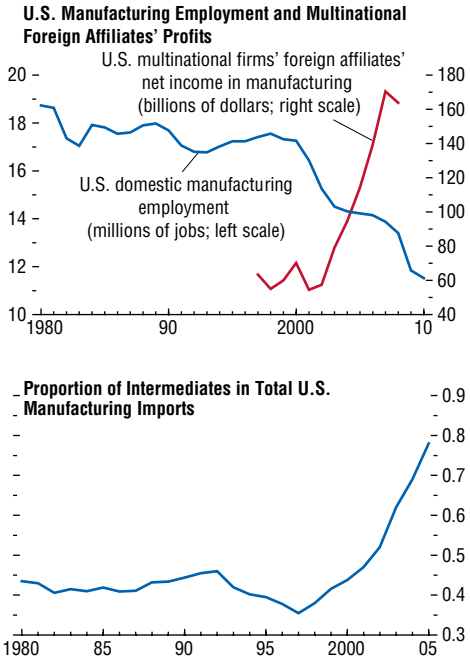
Where Are They Headed?

What impact will technology and trade trends have on labor markets in the coming years? Answering that question—and suggesting appropriate policy responses—requires some conjecture as to which of the two forces is likely to dominate, though it is not always easy to separate out their impacts. Early analyses of these developments, particularly explanations for the rising skill premium, tended to conclude that technological change was dominant (for example, Lawrence and Slaughter, 1993). And there is no doubt that technology played an important role in the gradual decline of middle-income and manufacturing jobs since the 1970s. In particular, automation has decreased employment in industries with a higher share of routine tasks (Autor, Levy, and Murnane, 2003).

Other factors besides technological change also seem to be involved, however, not least because the sharp decline in jobs occurred well after the arrival of most new information and communication technology in the 1990s. Recent work therefore assigns greater importance to the role of trade, particu-

Box 1.1 *(continued)*

Figure 1.1.3. Employment, Profits, and Intermediate Goods Trade in the United States



Sources: Goel (2011); U.S. Bureau of Labor Statistics; Bureau of Economic Analysis; and IMF staff calculations.

larly to offshoring and soaring production within multinational firms.[4] These studies stress that it is no coincidence that the decline in manufacturing jobs accelerated during the 2000s and was accompanied by a huge increase in advanced economies' imports from low-income countries. Autor, Dorn, and Hanson (2011) estimate that at least one-third of the aggregate decline in U.S. manufacturing employment during 1990–2007 can be attributed to increased imports from emerging markets. The top panel of Figure 1.1.3 shows the sharp decline in U.S. manufacturing jobs and the increase in the profits of multinational firms during the 2000s.[5]

The bottom panel shows the sharp acceleration in the share of intermediate goods imports in total imports over the same period (Goel, 2011), reflecting the establishment of global supply chains.

The consequences of job losses are amplified if there are interactions between international trade and technological innovations. If economies' comparative advantage is enhanced over time through learning-by-doing, as suggested by many authors, changes in patterns of specialization could persist over time.[6] Trade-induced technological changes would lead to similar effects.[7] As a result, the offshoring sectors with higher growth potential could dampen growth in the advanced economies in the long term.

Conclusions

This box documents the unequal impact on advanced economies of structural trends—namely, technological change and trade.[8] Over the past 20 years, these trends have lifted living standards in emerging markets and developing economies and conferred the benefits of lower prices on consumers everywhere. In advanced economies, technological innovation and the ability to take advantage of a global labor market have contributed to national income. But at the same time, there has been an adverse impact on a large class of workers in advanced economies, particularly in manufacturing, and prospects for this class remain dim. This adverse impact is reflected in increased income inequality; for example, the Gini coefficient of income inequality rose in six of the G7 economies

[4]See, for instance, Hanson, Mataloni, and Slaughter (2005).

[5]Over time, increasing labor costs in emerging market economies may partially reverse the offshoring trend. As multinationals and foreign firms begin to reopen some plants domestically, productivity growth may rebound. There are differing views on whether offshoring trends can continue. Blinder (2009) estimates that 25 percent of U.S. jobs are potentially offshorable. In contrast, Manyika and others (2011) and Deutsche Bank (2011) argue for a gradual shift from offshoring to "on-shoring" as labor costs continue to increase in coastal China and other emerging markets and as companies become aware of many hidden costs and risks intrinsic to doing business in emerging markets.

[6]See Krugman (1985), Lucas (1988), Boldrin and Scheinkman (1988), and Young (1991).

[7]See Acemoglu (2003) and Thoenig and Verdier (2003).

[8]The focus has been on medium-term trends rather than the question of how much current unemployment in advanced economies is structural (see Diamond, 2011).

Box 1.1 *(continued)*

between 1985 and 2008, according to the Organization for Economic Cooperation and Development. The calculations discussed in this box also suggest that, at least in the medium term, there could be a dampening effect on potential output growth from the ongoing shift in employment from industries with high productivity growth rates to those with low productivity growth rates.

The longer-term solutions to the hollowing out of middle-income jobs lie in retraining, better education, and increased productivity in nonmanufacturing sectors. But more immediate action is also needed to cushion some of the human costs of structural change. As Spence (2011) argues, redistribution must be part of the policy response: the potential benefits include increased social cohesion and continued support for globalization. Spence cautions that if the employment challenges confronting the advanced economies are not tackled, countries may resort to "protectionist measures on a broad front [and] the global economy will be undermined."

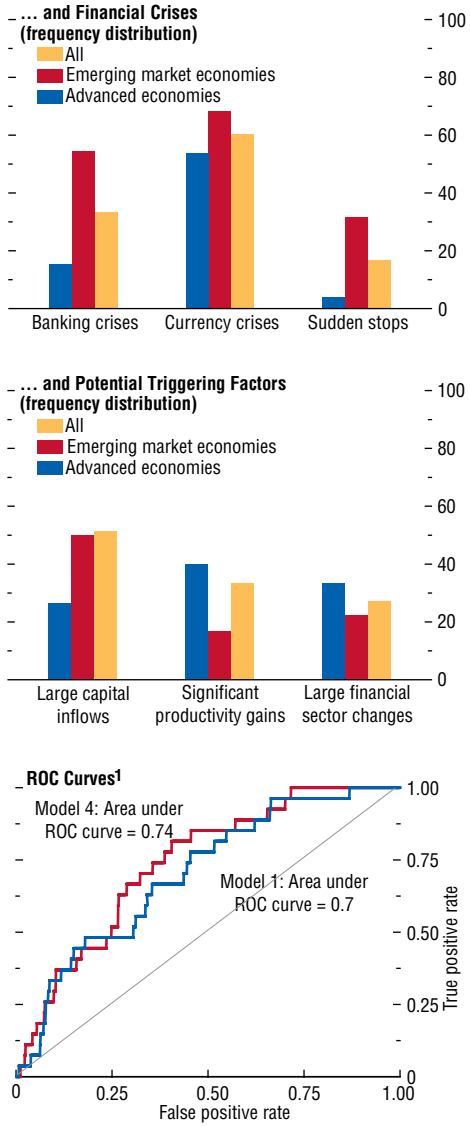
Box 1.2. Credit Boom-Bust Cycles: Their Triggers and Policy Implications

Credit has been growing rapidly in a number of emerging market economies, raising concern in some quarters. Although there can be good reasons for credit to grow rapidly—cyclical upturns, financial deepening, and improved medium-term prospects—in some circumstances credit expansion can be excessive and can be followed by financial turbulence, as shown by the recent global financial crisis and the Asian crisis of the mid-1990s. Such credit expansion is often called a "credit boom."

What is a credit boom? It is an episode during which real credit to the private sector expands significantly more than during typical economic expansions.[1] During the upswing of a credit boom, economic activity expands strongly, housing and equity prices rise rapidly, leverage increases sharply, the real exchange rate appreciates, and current account deficits widen. The opposite is observed during the downswing of a boom: activity contracts sharply, housing and equity prices drop, leverage falls, the real exchange rate depreciates, and current account deficits narrow. Financial vulnerabilities heighten as a result of these large swings in macroeconomic and financial variables. In fact, there is a strong association between credit booms and currency crises, banking crises, and sudden stops (Figure 1.2.1, top panel).

Given the strong association between such credit boom-bust cycles and financial crises, it is important to understand what drives them. This box studies credit booms in 47 economies—19 advanced and 28 emerging market economies—during 1960–2010. We find that capital inflows are good predictors of credit booms and merit close monitoring not only because of their impact on competitiveness but also because of other implications for financial stability.

Figure 1.2.1. Credit Booms



Sources: Mendoza and Terrones (2008); and IMF staff calculations.

[1]ROC = receiver operating characteristic. The ROC for a coin toss is indicated by the 45-degree line.

What Triggers a Credit Boom?

Credit booms can be driven by many factors. Three in particular garner considerable attention and are indeed strongly associated with credit booms:

The main authors of this box are Jörg Decressin and Marco E. Terrones.

[1]Credit booms are defined as extreme episodes during which the cyclical component of credit is larger than 1.75 times its standard deviation—see Mendoza and Terrones (2008) for more details and an analysis of these episodes for advanced and emerging market economies. The focus on the cyclical component of credit assumes that the trend captures mostly healthy financial deepening.

Box 1.2 *(continued)*

surges in capital inflows, financial sector reforms, and productivity gains. In particular, credit booms in emerging market economies seem to be associated mostly with large capital inflows, whereas those in advanced economies often coincide with productivity gains (Figure 1.2.1, middle panel). Although this observation is useful, it does not indicate whether these factors can help predict credit boom-busts and which among these is most relevant. To address this issue, we use a simple probabilistic model of credit booms and the following factors:

- Past capital inflows: A surge in net private capital inflows typically leads to a rapid increase in loanable funds. Banks, in an attempt to allocate these funds, often lower their lending standards and extend credit to firms and households previously without access to financial markets. This can lead to an overly rapid expansion of credit.[2]
- Past financial sector reforms: In an attempt to improve their growth performance, countries around the world have implemented measures to eliminate financial repression and develop their financial sectors, which has frequently spurred credit growth. But the process of financial sector development—that is, the emergence of financial instruments, institutions, and markets—can involve risks, particularly when such development is not accompanied by adequate evolution of the regulatory and supervisory frameworks.
- Past productivity gains: Technological progress and innovation are often financed with external resources. Indeed, there is evidence that credit plays an important role in the process of technological innovation. Optimism about rapid technological progress and about future increases in the value of collateral assets often accompanies strong credit growth.[3]

Excessive credit expansion results in part from propagation mechanisms associated with financial market imperfections. One such mechanism is the financial accelerator (Bernanke, Gertler, and Gilchrist, 1999; and Kiyotaki and Moore, 1997): shocks to asset prices and relative prices are amplified through balance sheet effects. This propagation process can be exacerbated by inadequate regulatory and supervisory frameworks, including implicit government guarantees, and herd behavior by banks.

[2]Végh (2011) shows that the macroeconomic consequences of capital inflows are the same regardless of the nature of the shock driving the inflows—that is, push or pull.

[3]Zeira (1999), building on the idea of informational overshooting, shows how increased productivity for an unknown period of time could lead to financial booms and crashes.

Main Findings

The econometric results confirm that net capital inflows, financial sector reform, and total factor productivity are good predictors of a credit boom.[4] Net capital inflows appear to have an important predictive edge over the other two factors.

The main econometric results are summarized in Table 1.2.1. This table shows the alternative specifications of a logit regression, with the dependent variable an episode dummy that takes the value of 1 if country i is experiencing a credit boom in year t, and zero otherwise. The estimated coefficients of the different triggering factors have the appropriate signs and are all statistically significant. We are interested in an assessment of the predictive power of various regression specifications, and for that purpose use the receiver operating characteristic (ROC) curve method.[5] The ROC curve is a plot of the true positive rate (TP) versus the false positive rate (FP). If the number of true positives equals the number of false positives, the three factors have the same predictive value as a coin toss—that is, none at all. Thus, the predictive value of the factors is given by the extent to which the ROC curve lies above the 45-degree line in the bottom panel of Figure 1.2.1. A summary measure of this curve—the so-called area under the curve (AUC) measure—is a useful statistic to rank the predictive performance

[4]In the econometric model, the capital inflow variable is proxied by the five-year average of net capital inflows as a percent of GDP. Financial sector reforms correspond to the five-year average of the yearly changes in the financial reform index compiled by Abiad, Detragiache, and Tressel (2008). The data were extrapolated to 2008. The productivity measure was calculated using standard growth accounting methods (Kose, Prasad, and Terrones, 2009) using data from the Penn World Table 7.0.

[5]Berge and Jordà (2011) offer a detailed discussion of this method and an application to the U.S. business cycle. Jordà, Schularick, and Taylor (2010) use this method to examine the extent to which credit expansions help predict banking crises.

Box 1.2 *(continued)*

Table 1.2.1. What Triggers Credit Booms?

(Logit model; dependent variable—start of a credit boom: 1 if true, zero if false)

Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lagged Net Capital Inflows (percent of GDP, five-year average of yearly changes)	0.403*** [0.126]			0.379*** [0.121]		0.412*** [0.122]			0.388*** [0.127]	0.406* [0.246]
Lagged Financial Sector Reform (five-year average of yearly changes)		0.694*** [0.259]		0.592** [0.286]		0.686** [0.297]				
Lagged Total Factor Productivity Growth (five-year average)			0.177** [0.074]	0.132** [0.063]	0.118 [0.091]	0.081 [0.072]				
Lagged Total Factor Productivity Growth x Advanced Country Dummy					0.335** [0.148]	0.390** [0.155]				
Lagged Real U.S. Interest Rate (five-year average of yearly changes, 10-year Treasury bill)							–0.375 [0.294]		–0.285 [0.311]	
Lagged VIX (five-year average of yearly changes)								0.069 [0.139]		0.129 [0.153]
Advanced Economy Dummy					0.001 [0.328]	0.233 [0.360]				
Constant	–3.827*** [0.155]	–4.137*** [0.229]	–3.844*** [0.176]	–4.231*** [0.236]	–3.921*** [0.267]	–4.504*** [0.374]	–3.754*** [0.157]	–3.966*** [0.329]	–3.824*** [0.155]	–4.012*** [0.344]
Memorandum										
Number of Observations	1,180	1,180	1,180	1,180	1,180	1,180	1,180	472	1,180	472
Log Likelihood	–124.39	–125.97	–126.77	–121.20	–125.47	–118.92	–128.00	–44.49	–124.03	–43.35
Pseudo R^2	0.03	0.02	0.02	0.06	0.03	0.08	0.01	0.00	0.04	0.03
AUC	0.70	0.58	0.63	0.74	0.67	0.74	0.51	0.56	0.71	0.67

Sources: IMF, *International Financial Statistics;* Haver Analytics; Penn World Table 7.0; World Bank, *World Development Indicators;* and IMF staff calculations.

Note: *,**, and *** denote significance at the 10, 5, and 1 percent level, respectively. Significance is based on robust standard errors, which are in brackets. VIX = Chicago Board Options Exchange Market Volatility Index. AUC refers to the area under the curve. Broadly similar results are obtained when using the probit model.

of alternative specifications. If the ROC curve coincides with the 45-degree line, the AUC measure is 0.5 (half the square in Figure 1.2.1, bottom panel). Thus, an AUC of 0.5 indicates the predictive value of a coin toss. If the AUC is greater than 0.5, the respective factor (or combination of factors) has predictive value.

The results reveal that net capital inflows are the most helpful factor in predicting credit booms. Financial sector reforms and productivity gains also help predict these booms; however, their predictive value is lower. The predictive gains of combining all these factors into a single model are marginal. The model with net capital inflows as a covariate (Table 1.2.1, column 1) shows that this variable is highly significant and possesses an AUC of 0.7. Past financial sector reforms and productivity gains are also important predictors of a credit boom (Table 1.2.1, columns 2 and 3); however, their significance level, fit, and AUC statistics are not as good as those of capital inflows. The model that includes all these factors simultaneously shows only marginal predictive gains vis-à-vis the model including only past net capital inflows (Table 1.2.1, column 4;

Box 1.2 *(continued)*

Figure 1.2.1, bottom panel). These results do not change materially if interaction terms are considered. The specification that includes an interaction term between productivity gains and the advanced economy dummy suggests that past productivity gains are strong predictors of credit booms in these economies, but not in emerging markets (Table 1.2.1, columns 5 and 6).

To explore the possibility that net capital inflows are capturing the effects of easy international financial conditions on domestic credit booms, we include in the regression analysis proxies for return (the real interest rate) and volatility (Chicago Board Options Exchange Market Volatility Index) in the United States. Although these variables have the expected signs, they are not statistically significant (Table 1.2.1, columns 7 and 8). Moreover, when included with net capital inflows, the predictive power of the volatility variable remains broadly unchanged (Table 1.2.1, columns 9 and 10).

What Are the Policy Implications?

Although net capital inflows have well-known benefits for long-term economic growth, they often raise concern among policymakers because they can undermine an economy's short-term competitiveness. The findings of this box suggest that they are also good predictors of credit booms and merit close monitoring for this reason alone. Given the high costs of credit boom-bust cycles, policymakers should closely monitor the joint behavior of capital inflows and domestic lending.[6] There is also evidence that financial sector reforms are predictors of credit boom-busts. Policymakers must ensure that financial liberalization programs are designed to strengthen financial stability frameworks. Last, there is evidence that large productivity gains increase the risk of a credit boom, particularly in advanced economies, driven perhaps by exuberant optimism in new sectors. Thus, even during particularly good periods for the economy, policymakers must be on the lookout for emerging threats to financial stability stemming from credit booms.

[6]Policymakers can use a combination of macroeconomic, exchange rate, prudential policy, and capital control measures to mitigate the adverse effects of large capital inflows. Ostry and others (2011) discuss in detail policymakers' diverse policy options for addressing different kinds of capital inflows, which is important in light of evidence that net debt flows are better predictors of credit booms than foreign direct investment flows.

Box 1.3. Are Equity Price Drops Harbingers of Recession?

The recent sharp drop in equity prices around the world has raised concerns about the possibility of a double-dip recession in a number of advanced economies. Several factors may have played a role in this fall in equity prices: the sovereign debt problems in the euro area; a downgrade of U.S. federal government debt; and the limited room for policy maneuver by advanced economies that are facing a weaker-than-expected economic recovery. To the extent that such factors simultaneously affect confidence and equity prices, an equity price drop can be indicative of a greater risk of recession, reflecting falling earnings expectations. In their own right, weak or falling equity prices can be a drag on consumption and investment through their effects on private sector wealth and borrowing constraints. Accordingly, many think that a double-dip recession in the United States and other advanced economies has become more likely. However, others have noted that equity price drops have not always been good predictors of recessions. As Paul Samuelson (1966) famously remarked, "The stock market has forecast nine of the last five recessions."

This box examines the performance of equity prices as coincident predictors of a new recession in France, Japan, the United Kingdom, and the United States.[1] Table 1.3.1 displays summary statistics on quarterly real equity price changes for these countries from the first quarter of 1970 through the first half of 2011. We find that real equity prices in these economies are useful predictors of recessions. However, in contrast with the existing literature, there is some evidence of important nonlinearities in the relationship between equity prices and recessions among those economies for which equity prices had predictive power. Equity price drops, defined as a quarterly decline in average real equity prices of 5 percent or more, significantly improve the accuracy of recession predictions for the United Kingdom and the United States but not for France and Japan.[2]

We also investigate whether the predictive power of equity prices in our simple probability model is materially changed by the addition of other financial variables, including a measure of spillovers from equity markets elsewhere, the term spread, real house price growth, real credit growth, or real oil price peaks. For Japan, the United Kingdom, and the United States, real equity prices remain an important and statistically significant coincident predictor of a new recession across all checks. This may be a reflection of the fact that these economies are home to the largest equity markets in the world. Apart from the case in which a measure of international equity prices is included, domestic equity prices are also an important predictor of a new recession in France.

Finally, we look at the predictive power of real equity price declines in the three other G7 economies. For Canada and Germany, there is no evidence

Table 1.3.1. Summary Statistics for Real Equity Price Growth
(Quarter-over-quarter, seasonally adjusted)

Statistic	France	Japan	United Kingdom	United States
Mean	1.1	0.8	1.2	1.4
Standard deviation	8.0	7.7	6.7	5.0
Median	1.5	1.5	1.8	1.9
10th Percentile	–10.0	–9.5	–7.1	–4.6
25th Percentile	–4.1	–3.1	–2.2	–1.4
75th Percentile	5.6	5.1	5.4	4.4
90th Percentile	10.6	9.2	8.7	8.4
Minimum	–22.2	–17.9	–23.1	–18.3
Maximum	25.4	27.1	18.8	14.0
Number of observations	138	141	135	132

Sources: Datastream; Haver Analytics; *IMF, International Financial Statistics;* and IMF staff calculations.

Note: The average nominal equity price index for each economy is converted to real terms using the respective consumer price index. The resulting average real equity price indices are then seasonally adjusted using the X12-ARIMA procedure.

The main authors of this box are John C. Bluedorn, Jörg Decressin, and Marco E. Terrones.

[1]The beginnings of new recessions are defined according to the method of Harding and Pagan (2002), as implemented by Claessens, Kose, and Terrones (2011c). A cyclical peak or start of a new recession is defined to occur in a quarter if the level of real GDP is higher than during both the prior two quarters and the subsequent two quarters. For the United States, the Harding and Pagan–identified peaks exactly coincide with the NBER-identified peaks in four cases and precede the NBER peak by one quarter in the other two cases.

[2]The choice of 5 percent as the threshold is based on the evidence presented in Claessens, Kose, and Terrones (2011c) that equity price busts (the bottom quartile of periods characterized by equity price falls) have a median decline of about 5½ percent a quarter (Table 4, column 4).

Box 1.3 *(continued)*

that equity prices aid in predicting recessions, whereas for Italy, their predictive power is consistently superseded by the inclusion of additional financial market variables. Consequently, the remainder of the box focuses on the evidence for France, Japan, the United Kingdom, and the United States.[3]

Recession Forecasting

Real-time recession prediction remains an elusive endeavor (Hamilton, 2010). Forecasters are confronted with data limitations, changing economic relationships, and sometimes perverse incentive schemes (Loungani and Trehan, 2002). Although some leading indicator models find that equity prices help improve output growth forecasts for the United States, these models have failed to predict recent recessions (Stock and Watson, 2003).

More recent efforts to forecast the onset of a recession have used straightforward probabilistic models, such as logit or probit. These models take advantage of the fact that cyclical peaks can be modeled as binary indicators (with a value of 1 when the economy has reached its peak and zero otherwise). The most important finding of this literature is that the term spread (the difference between the long-term interest rate and the short-term interest rate) is an important predictor of recessions in the euro area (Moneta, 2003) and the United States (Estrella and Mishkin, 1998; Estrella, 2005; Wright, 2006; and Nyberg, 2010). A number of these studies also find that domestic equity prices can be useful in predicting recessions (Estrella and Mishkin, 1998; and Nyberg, 2010). This literature, however, does not examine in detail the role that other financial variables, such as international equity prices, house prices, and credit, play in forecasting recessions. Recent research indicates that developments in these markets are associated with the characteristics of recessions and recoveries (Claessens, Kose, and Terrones, 2011c).

Predicting the Probability of a New Recession

To explore how a particular variable helps predict new recessions in France, Japan, the United Kingdom, and the United States, we use a simple probabilistic model for each economy. The explanatory variables included in our baseline logit model are the contemporaneous quarterly growth rate of the economy's average real equity price index, an indicator variable for whether the real equity price index dropped quarter-over-quarter by 5 percent or more, and the interaction (product) of these two variables. This model allows us to explore the relevance of nonlinearities in the information conveyed by equity price changes about the likelihood of a recession. In particular, sharp drops in equity prices are more likely to be followed by a new recession, reflecting both the destruction of private sector wealth and possible underlying weaknesses in the macroeconomy.

The following findings stand out (Table 1.3.2):

- In the United Kingdom and the United States, there is evidence of important nonlinearities in the information that equity prices convey about the probability of a new recession. This is shown in the statistical significance of equity price growth, the equity price drop indicator, and their interaction as predictors of a new recession. The in-sample performance of the baseline model for these economies is very strong, as reflected by AUC statistics of 0.85 and 0.90, respectively.[4] As seen in Table 1.3.2, column 3, the average probability of a new recession occurring in any quarter, conditional upon observing a drop in equity prices of 5 percent or more, is around 20 percent. By contrast, if no equity price drop is observed, the estimated average probability is insignificantly different from zero. To get a sense for how equity price growth, which is continuous, affects the probability of a new recession, we calculate the marginal effect on the average recession probability of a 1 percent fall in equity prices. As shown in Table 1.3.2, column 1, if only equity price growth is included, the marginal effect of

[3]The results for Canada, Germany, and Italy are available at www.imf.org/weoforum.

[4]The AUC statistic is the area under the receiver operating characteristic, which is described in Box 1.2. It is indicative of how well the model classifies the start of a recession versus the absence of recession observations in-sample, relative to a fair coin toss (which would have a 50 percent chance of correctly classifying the situation). A perfect classifier would have an AUC statistic of 1.

Table 1.3.2. Predicting New Recessions with Financial Market Variables
(Logit model, dependant variable—New recession starts with quarter t [1 if true and zero if false])

	France			Japan			United Kingdom			United States		
Explanatory Variable	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Equity Price Change in Quarter *t* (Change in quarterly average equity price index)	–0.174**		–0.0984***	–0.258**		–0.304***	–0.153		0.173***	–0.181***		–0.280*
	(0.0746)		(0.024)	(0.108)		(0.0444)	(0.0598)		(0.0367)	(0.0689)		(0.169)
Equity Price Drop > 5% (Indicator is 1 if true and zero if false)		1.970**	–3.014		2.648**	–3.128		3.350***	3.767**		2.691***	4.566**
		(0.945)	(2.703)		(1.181)	(2.722)		(1.154)	(1.803)		(0.898)	(1.78)
Interaction of Equity Drop and Equity Price Change			–0.265			–0.145			–0.220*			0.546**
			(0.211)			(0.197)			(0.13)			(0.268)
Constant	–3.970***	–4.007***	–3.766***	–4.967***	–4.727***	–4.525***	–3.624***	–4.736***	–5.644***	–3.186***	–3.672***	–3.529***
	(0.801)	(0.716)	(0.723)	(1.269)	(1.008)	(1.011)	(0.616)	(1.008)	(1.004)	(0.431)	(0.587)	(0.616)
Number of Observations	138	138	138	141	1414	141	135	135	135	132	132	132
Pseudo R^2	0.209	0.101	0.251	0.303	0.167	0.33	0.163	0.264	0.287	0.124	0.16	0.233
Log Likelihood	–17	–19.33	–16.1	–12.69	–15.15	–12.18	–17.89	–15.75	–15.25	–21.39	–20.5	–18.71
AUC	0.8	0.71	0.824	0.902	0.788	0.911	0.773	0.835	0.892	0.829	0.715	0.84
Average Predicted Probabilities and Marginal Effects												
Average Predicted Probability if *No* Equity Price Drop > 5%		0.0179	0.0156		0.00877	0.00368		0.0087	0.00608		0.0248*	0.0152
		(0.0126)	(0.011)		(0.00876)	(0.00367)		(0.00869)	(0.00606)		(0.0142)	(0.0121)
Average Predicted Probability if Equity Price Drop > 5%		0.115*	0.0544		0.111*	0.0539		0.200**	0.197**		0.273**	0.228*
		(0.0629)	(0.0342)		(0.067)	(0.0405)		(0.0898)	(0.0911)		(0.135)	(0.133)
Marginal Effect if Equity Price Rise of 1%	–0.00538**		–0.00614**	–0.00606**		–0.00869**	–0.00491**		0.000157	–0.00722*		–0.002
	(0.00262)		(0.00309)	(0.00304)		(0.00405)	(0.00226)		(0.00315)	(0.00378)		(0.00587)

Sources: Datastream; Haver Analytics; IMF, *International Financial Statistics;* Claessens, Kose, and Terrones (2011c); and IMF staff calculations.

Note: Robust standard errors are in parentheses underneath the estimates. *,**, and *** denote significance at the 10, 5, and 1 percent level, respectively.

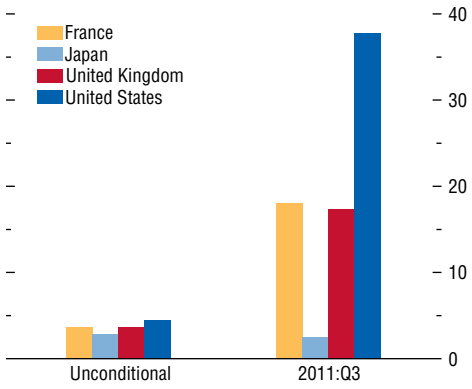
Box 1.3 *(continued)*

a 1 percent fall is a rise in the estimated probability of a new recession by around 0.7 percent for the United States and around 0.5 percent for the United Kingdom. If the equity price drop indicator and its interaction with equity price growth are included, the marginal effect of equity price growth alone is tiny and no longer statistically significant in helping to predict a recession, revealing the importance of nonlinearities in the form of large equity price drops.

- Interestingly, this nonlinearity in the predictive power of equity prices is not evident for France and Japan. Instead, there appears to be a robust, linear relationship between equity price growth and the likelihood of a new recession—large equity price drops do not appear to convey any more information than small drops. The in-sample performance of this model is also strong, as reflected in an AUC of 0.82 for France and 0.91 for Japan. The marginal effect of a 1 percent fall in equity prices is associated with a rise in the probability of a new recession of between 0.5 and 0.6 percent for France and 0.6 and 0.9 percent for Japan.

As noted earlier, we also investigate whether the predictive power of equity prices is materially changed by the addition of other financial variables (such as the term spread, real house prices, and real credit) and real oil prices. Apart from one instance in the case of France, equity prices remain important, coincident predictors of new recessions. The additional financial variables that improve recession prediction differed across these economies. For the United States, a measure of spillovers from equity price movements in the G7, the term spread, and the change in real house prices are all significant predictors of new recessions.[5] For the United Kingdom, commodity prices appear to be important, with the peak real oil price growth serving as a significant predictor, while the measure of equity spillovers, the term spread, and real house prices do not.[6] For France, the measure of equity spillovers and the term spread are important predictors. In the model that includes the equity spillover measure, the domestic equity price variables are not statistically significant. For Japan, none of the additional financial variables are important—equity prices alone appear to convey information on the likelihood of a recession.

Figure 1.3.1. Predicted Probability of a New Recession in a Quarter



Sources: Claessens, Kose, and Terrones (2011c); Haver Analytics; and IMF Staff Calculations.

Note: The equity price indices used in the estimation are: S&P 500 for the United States, FTSE All Shares for the United Kingdom, CAC All-Tradable for France, and the Nikkei 225 for Japan. The Claessens, Kose, and Terrones (2011c) recession indicator is used for the starts of recessions. Probability estimates are derived from a simple logit model for the recession indicator over the period 1970:Q1 to 2011:Q2, excluding periods during which the economy is already in recession and the quarter just after a recession concludes. The logit model takes as arguments the real equity price change, a dummy for large drops (> 5%) and their interaction. To calculate the average for 2011:Q3, we assume that the last, daily equity price index extends to the end of the quarter. We then calculate the quarterly average level for 2011:Q3 over these daily observations. Latest data are for August 24, 2011.

[5]The measure of spillovers from equity price movements is defined as the weighted average of quarter-over-quarter, real equity price growth in the G7 economies, with the weight being nominal GDP in U.S. dollars. The term spread is defined to be the difference between the interest rate on a 10-year government bond and that on a three-month Treasury bill. Real house price changes are calculated from real house price data supplied by the Organization for Economic Cooperation and Development. Real credit growth is calculated from the CPI-deflated credit (line 22d) in the IMF's *International Financial Statistics*. Peak real oil price growth is calculated from the seasonally adjusted (X-12 ARIMA), U.S. CPI-deflated oil price index in the *World Economic Outlook*.

[6]The peak real oil price growth is defined according to Hamilton (2003). It is the maximum of either zero or the log difference between the current real oil price and the peak real oil price over the previous three years.

Box 1.3 *(continued)*

Despite the statistical significance of some of the additional financial variables, the in-sample performance (as measured by the AUC statistic) is not statistically significantly different from the baseline model (column 3 of Table 1.3.2) for any of the four economies.

What Does This Say about the Future?

This box examines the performance of sharp drops in equity prices in predicting new recessions in France, Japan, the United Kingdom, and the United States. The findings suggest that allowing for nonlinearities in the effects of equity prices can be useful in predicting recessions in the United Kingdom and the United States. Although there is no evidence of such nonlinearities in France and Japan, equity price changes still show up as useful coincident predictors of new recessions. These findings suggest that policymakers should be mindful of sharp drops in equity prices because they are associated with an increased risk of a new recession.

An application of the baseline model paints a sobering picture about the likelihood of a double-dip recession in France, the United Kingdom, and the United States in light of the recent sharp drop in equity prices. As seen in Figure 1.3.1, the historical or unconditional probabilities of a new recession starting in the third quarter of 2011 are about 3½ percent for France and the United Kingdom and about 4½ percent for the United States. Assuming that the recent behavior of the equity markets in these economies during the third quarter of 2011 continues, the predicted likelihood of a new recession rises about fivefold for France and the United Kingdom (to about 18 percent and 17 percent, respectively) and eightfold for the United States (to about 38 percent). By contrast, the model for Japan indicates that there has been essentially no change in the likelihood of a new recession there.

Box 1.4. Financial Investment, Speculation, and Commodity Prices

Was financial speculation a major force behind the commodity price boom of 2003–08 and behind stubbornly high prices since the end of the Great Recession? This question continues to be widely debated against the backdrop of the financialization of commodity markets—that is, the greater role of noncommercial participants (including speculators and long-term investors) in commodity derivative markets and large increases both in trading volume and in outstanding stocks of derivatives (Figure 1.4.1).

There is an element of déjà vu to this debate, given the long tradition of attributing commodity price increases and booms to speculation.[1] In earlier episodes, however, the focus was on traditional speculation through inventory hoarding. This box reviews the financialization of commodity markets and its impact on commodity prices, building on recent research.[2] It argues that although financialization has influenced commodity price behavior, recent research does not provide strong evidence to suggest that it either destabilizes or distorts spot markets. In this light, policy efforts should focus on making markets work better at a time of structural change in global commodity markets.

The Case for Attributing High Commodity Prices to Financialization

Many arguments have been advanced to support the view that financialization has driven commodity spot prices over the past decade.[3] At the risk of oversimplifying, their essence is that commodity markets have had trouble adjusting to financialization because of one imbalance and two distortions.

- The imbalance is the continued large inflow into derivative markets by long-only investors seeking exposure to commodity prices. These inflows have led to an upward shift in the demand for commodity futures and upward pressure on futures prices. Because commodity spot and futures prices are connected through price discovery linkages and arbitrage, spot prices could also be affected by this upward pressure.
- This imbalance contributes to the first distortion. After years of rapid growth, open positions and trading volumes in commodity derivative markets now exceed transactions in physical markets, suggesting that investors now dominate commodity price formation.[4]
- The second distortion arises from an investment strategy widely used by institutional investors—indexing—which is seen as having led to "noise trading" (trading by investors on the basis of erroneous beliefs or other reasons unrelated to market fundamentals or meaningful new information).The strategy builds exposure through a synthetic derivative, issued by a financial intermediary, which tracks returns on a fixed-weight portfolio of commodity futures. The noise trading arises through the intermediation process, which implies that demand simultaneously increases for the whole set of underlying futures, irrespective of specific market conditions and prospects for the individual commodities. It could thus affect both futures and spot prices, as above.

Together, the distortions imply that fundamentals may not fully explain recent commodity price increases, reflecting the destabilizing effects of noise traders.[5]

Recent Empirical Evidence Concerning Such Imbalances and Distortions

In the absence of a recognized fair value for commodities, recent research has tried to find evidence that apparent imbalances and distortions have destabilizing effects on prices. There is no general evidence of increased commodity price volatility since the onset of financialization in the early 2000s (Figure 1.4.2).

The main authors of this box are Thomas Helbling, Shaun Roache, and Joong Shik Kang.

[1]Jacks (2007) provides a historical perspective.

[2]This box draws on Helbling, Kang, and Roache (2011), which includes an extensive list of references in addition to those provided here.

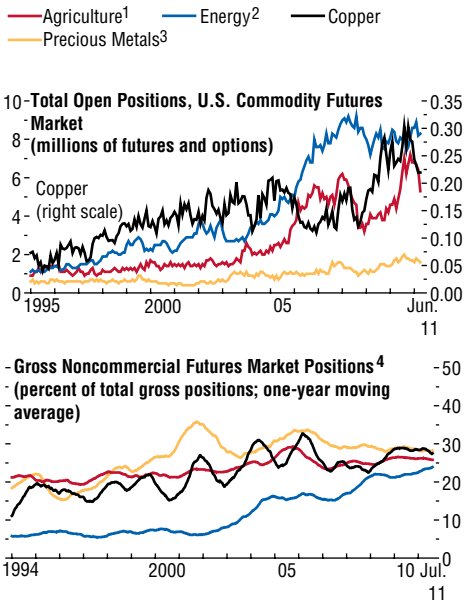
[3]Irwin, Sanders, and Merrin (2009) survey the arguments.

[4]The well-known testimony of Masters (2008) at a U.S. congressional hearing exemplifies this view.

[5]The effects of noise trading in finance are examined by Shleifer and Summers (1990) and De Long and others (1990).

Box 1.4 *(continued)*

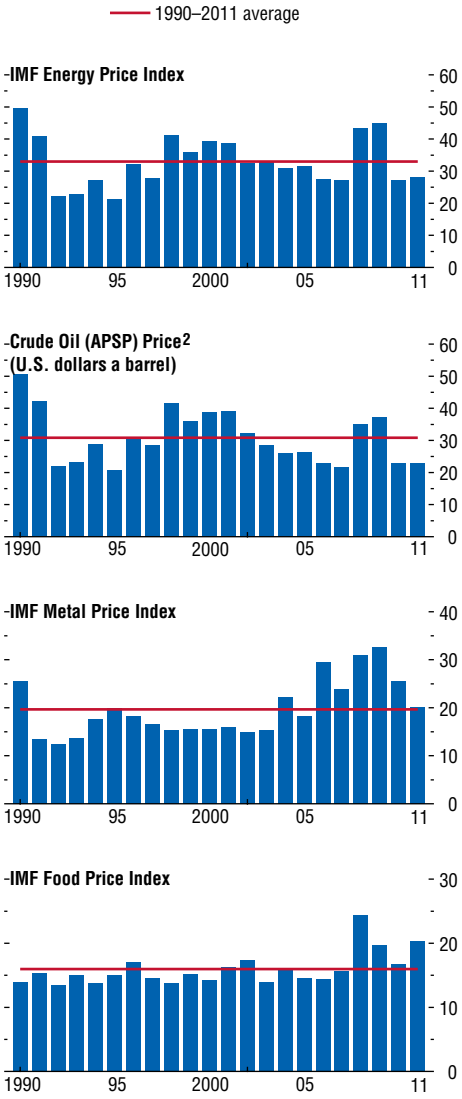
Figure 1.4.1. Commodity Market Financialization



Sources: Bloomberg Financial; U.S. Commodity Futures Trading Commission; and IMF staff calculations.
[1]Includes corn, wheat, soybeans, and rice.
[2]Includes crude oil, gasoline, heating oil, and natural gas.
[3]Includes gold and silver.
[4]Gross noncommercial positions include long and short positions. Total gross positions include long and short commercial, noncommercial, and nonreportable positions. For agriculture, energy, and precious metal groups, average gross noncommercial positions are shown. Options are included in terms of futures equivalents: number of options multiplied by the previous day's risk factor for the option series.

Figure 1.4.2. Commodity Price Volatility, 1990–2011[1]

(Annual averages of estimates of conditional daily returns; annualized, in percent)



Sources: Bloomberg Financial; and IMF staff calculations.
[1]Conditional standard deviation from a GARCH (1,1) model estimated from daily data. Data are through July for 2011.
[2]APSP (average petroleum spot price) denotes an equally weighted average of three crude spot prices: West Texas Intermediate, Dated Brent, and Dubai Fateh.

If noise trading (and destabilizing speculation more generally) had become more important, commodity price volatility should have increased. On the other hand, if investors provide liquidity and facilitate price discovery, price volatility would be expected to decrease. Although there is no general evidence of increased price volatility across the 51 commodities included in the IMF's commodity price index, there are two points worth noting. First, there are occasional increases in volatility, before and after financialization. But in most cases, times of higher volatility can be attributed to specific factors, such as the Great Recession of 2008–09 or times of low inventories

Box 1.4 *(continued)*

(metal prices during 2005–07). Second, the price volatility of a number of major food commodities has increased over the past few years (see also Roache, 2010). Although fundamentals likely contributed to this increase (for example, low inventories and bad weather), it is difficult to establish statistically significant relationships in this respect.

Evidence based on other approaches to assessing the impact of financialization suggests the following.

- A large number of studies covering different time periods and commodities have not found evidence that changes in futures positions of financial ("noncommercial") investors in U.S. markets had statistically significant effects on subsequent futures price changes.[6] If order flows from commodity financial investment affected price dynamics beyond the usual horizon of a few hours to a few days, such predictive power should be apparent.[7]
- The forecast performance of futures prices—the success in predicting future spot prices—does not depend on whether markets are in a bull or a bear market phase (Roache and Reichsfeld, 2011).[8] If bull markets involved an element of price overshooting driven by the herd behavior of uninformed long-only investors, the forecast performance of futures prices would be expected to deteriorate during such market phases.
- Global macroeconomic factors explain a large and broadly stable share of commodity price fluctuations.[9] In addition, Kilian (2009) found that shocks to global activity explain a large part of the run-up in oil prices during 2003–08. If noise trading had become more important, the unexplained share in econometric models of commodity price fluctuations would have increased. Because global macroeconomic factors influence all commodities to some extent, comovement in commodity prices over the past few years does not seem unusual.
- Inventories of major commodities did not rise steadily during the boom of 2003–08. If the price boom had reflected simply the unrealistically bullish expectations of uninformed investors, such a situation could be sustained only with increasing inventory hoarding. Otherwise, physical markets would not clear as consumption declined with ever-rising prices.[10] This stylized fact rules out simple bubble explanations of the 2003–08 commodity price boom, but it does not preclude short-lived price overshooting because of noise trading (given price-inelastic demand in the short term). It also does not preclude interaction between financialization and the cyclical behavior of the demand for commodity inventories, including because of changes in the cost of hedging.

Why Is the Empirical Evidence of These Imbalances and Distortions So Inconclusive?

Although recent research does not rule out spot price effects of commodity market financialization, it has not uncovered a smoking gun for obvious price misalignments or destabilizing effects due to financial speculation. This broad conclusion still seems counterintuitive to many. A number of factors can help reconcile evidence and intuition.

In practice, there is greater diversity among investors and investment strategies than the caricature of new market participants as index investors suggests. Hedge funds, which now account for a substantial share of the holdings of commodity derivatives in U.S. markets, often go long or short, depending on

[6]See, for example, Büyükşahin and others (2009). Singleton (2011) is a notable exception.

[7]This analysis, based on so-called Granger causality tests, long suffered from data shortcomings. But more recent studies based on disaggregated data that allow identification of trading behavior of specific investor categories (such as swap dealers) have corroborated earlier findings. Studies based on daily data have yielded similar results.

[8]Similarly, Alquist and Gervais (2011) do not find evidence that changes in investor positions have statistically significant effects on the spread between futures and spot prices. They would have such an effect if expectations of future spot prices embedded in futures prices were driven primarily by noise traders.

[9]See, for example, Vansteenkiste (2009); Helbling (2011); and Roache (2011).

[10]This argument was put forward in the oil market context by Krugman (2008), drawing on Jovanovic (2007). Alternatively, as noted by Hamilton (2009), if producers shared investors' expectations, they would lower current production to produce more later when prices are higher. But, again, if unrealistic expectations by investors were the initial driving force, they would ultimately be validated by fundamentals in the physical market.

Box 1.4 *(continued)*

circumstances.[11] They also pursue arbitrage strategies, which may offset distortions from indexing strategies.[12] Many of the large new investors are also well informed and follow supply and demand closely.

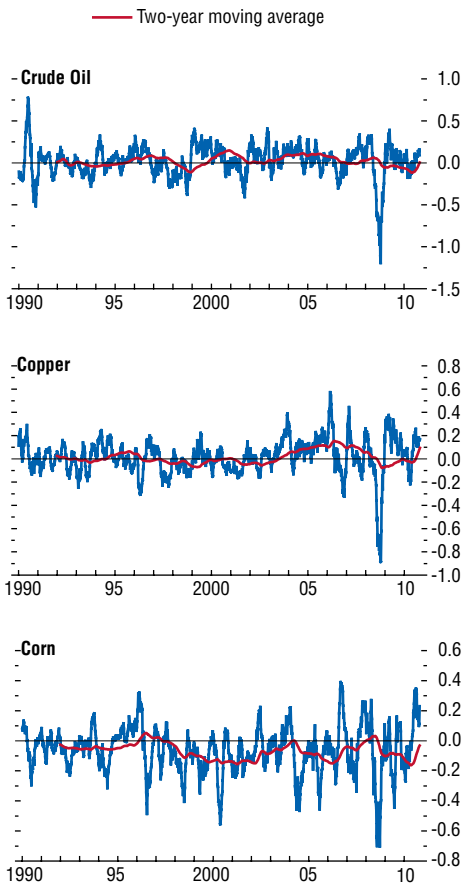
Supply constraints play very different roles in commodity futures markets compared with physical commodity markets. In the latter, they are the main reason for very small short-term supply price elasticities (see below), whereas in futures markets, limits to arbitrage by large informed investors and financial intermediaries are the main obstacle to highly elastic supply. Although arbitrage is sometimes limited—for example, because of capital or risk constraints—it usually is a strong force even though it may have occasional spillovers into physical markets.[13] As a result, price pressure from increased futures demand by index investors typically seems small in practice.

Commodity market fundamentals can also explain the large, abrupt price changes that are sometimes attributed to speculation. Because physical demand and supply are highly price-inelastic in the short and sometimes also in the medium term, unexpected small changes in demand or supply fundamentals, including, for example, in global activity, can trigger large rapid price changes. In other words, large initial price increases are often needed to induce the demand reduction and supply increases needed for market clearing (and vice versa). Temporary price spikes can be amplified if inventory or spare capacity buffers are low and consumers fear physical shortages. Such amplification, while not always present, can introduce regime-switching behavior in commodity prices.

Another consideration is that, even if commodity market financialization does influence pricing, it is not clear that the effects on spot prices are large, especially at cyclical horizons. The price changes would be the result of closer integration of commodity derivative markets into global financial markets.[14] A first obvious channel for change is that an expanding, broader set of market participants (which includes participants who also invest in other markets) means that unexpected changes in global factors may now be priced more rapidly and more in sync with other financial markets. Second,

Figure 1.4.3. Commodity Futures Risk Premiums

(Based on 91-day futures; log difference between future and realized spot price)



Sources: Bloomberg Financial; and IMF staff calculations.

[11]See Büyükşahin and Robe (2010), among others.

[12]Irwin and Sanders (2010) noted that the behavior of index investors is very predictable, thereby facilitating arbitrage.

[13]Spillovers are also possible because liquidity suppliers in futures markets may seek to arbitrage index investors without assuming additional risk by taking offsetting long spot and short futures positions.

[14]See, for example, Tang and Xiong (2011).

Box 1.4 *(continued)*

commodity prices might respond more to global risk premiums, as investors compare their risks and expected returns on commodities to those of other financial assets in their portfolios.

These changes in pricing can be expected to affect high-frequency price dynamics, but they may not affect commodity price behavior at monthly or quarterly frequencies. The reason is that these same underlying factors influenced commodity prices long before financialization. Factors such as prospects for global activity, for example, have always influenced prices through their effects on commodity supply and demand. Similarly, the risk premiums that compensate commodity futures investors—part of the well-known risk transfer function of futures markets—were present before financialization. Although they have not yet been closely scrutinized, there is no evidence of fundamental changes in commodity futures risk premiums (Figure 1.4.3).

Finally, research remains constrained by a lack of data. In particular, data that differentiate positions by type of trader have only recently become available and cover only U.S. markets for a five-year period. Such differentiation is needed to examine the impact of new investors on indicators of market performance such as futures returns and risk premiums, given the great diversity in trading strategies among traders and investors. Promising research along these lines has only begun.[14]

Does Commodity Market Financialization Call for Policy Action?

In sum, recent research does not provide strong evidence that commodity market financialization has had obvious destabilizing effects. On the other hand, there is evidence that it has added to market liquidity, which generally enhances rather than distorts price discovery. And a number of recent developments that are often perceived to be anomalies can be explained based on fundamentals. For example, after a recession, when evolving expectations about the path of global economic recovery are key factors in asset price fluctuations, high correlation between equity and commodity prices should not be a surprise. The conclusion is that commodity market financialization does not call for urgent policy intervention. Nevertheless, at a time of rapid structural change in global commodity markets—significant and largely permanent shifts in the sources and strength of demand for major commodities amid new supply challenges and changing market structures—it is important to ensure a framework for the proper functioning of globalized markets.

[14]Etula (2009) and Büyükşahin and Robe (2010) are recent examples.

Box 1.5. External Liabilities and Crisis Tipping Points

The extent to which the level of a country's net external liabilities affects the risk of a debt crisis is an important policy question. This is particularly true in economies in which rising fiscal and current account deficits have translated into an unprecedented accumulation of net foreign liabilities (NFLs), as in many advanced economies and some emerging markets in recent years. The aim of this box is to characterize whether there are in fact "thresholds" beyond which the risk of being tipped into an external crisis becomes nontrivial and accelerates with further exposure.

Such thresholds can be gauged by examining NFL levels around crisis episodes. Recent developments, particularly in Europe, suggest that such tipping points in external liabilities are not exclusive to emerging markets (EMs), so the analysis here includes both EMs and advanced economies. Debt crises are defined either as an outright external default or the disbursement of a large multilateral financial support package, including IMF support. The latter is considered large when net disbursements from a program's inception to its end are at least twice as large as the respective economy's IMF quota. The sample contains 62 crisis events in a panel of 74 economies over the period 1970–2010. Catão and Milesi-Ferretti (2011) provide additional information on the data and sample selection.

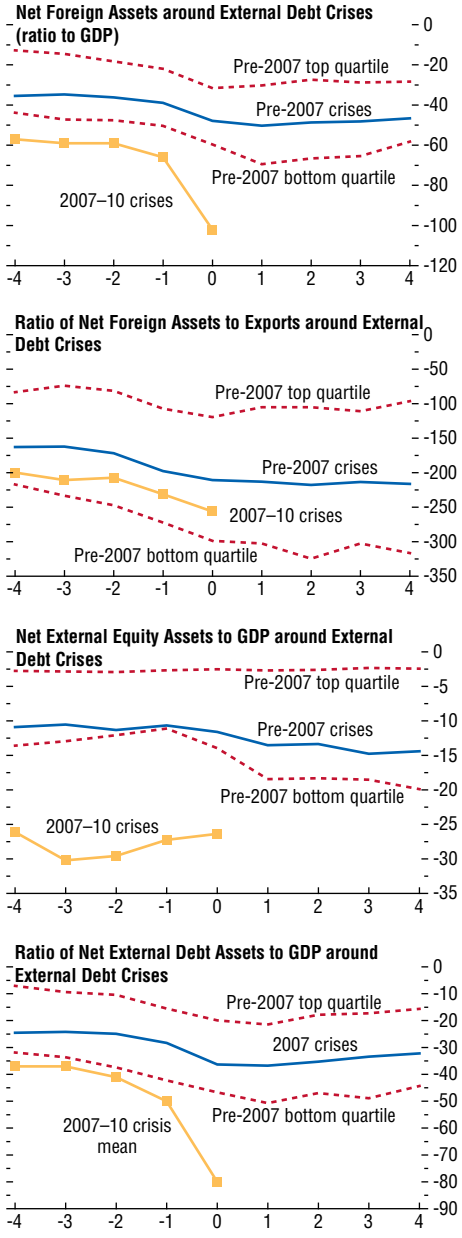
The top panel of Figure 1.5.1 plots the evolution of cross-country means of the ratio of net foreign assets (NFA) to GDP, within an eight-year window centered on the crisis outbreak, delimited by the upper and lower quartiles around the mean. Crisis events are split into two groups: one comprising crises occurring during 2007–10 and the other comprising crises over 1970–2007. One reason for this split is that the recent crises are ongoing, and so the full set of pre- and postcrisis observations is not yet available; the other reason is to allow comparison between recent and past crises.

The top panel of Figure 1.5.1 shows that the run-up period to external crises is typically characterized by a gradual NFA deterioration, which tends to be steeper during the two-year window before the event

The main authors of this box are Luis Catão and Gian Maria Milesi-Ferretti.

Figure 1.5.1. Net Foreign Asset Indicators in the Run-up to External Crises

(Percent; years on x-axis; t = 0 is the year of the crisis outbreak)



Source: IMF staff calculations.

Box 1.5 *(continued)*

for both pre-2007 and post-2007 crises. Recent crises were triggered at higher NFL levels: although the cross-country mean points to a tipping point threshold between 40 percent and 50 percent, recent crises point to a threshold around 60 percent.

Some models of debt and external crises emphasize that openness tends to raise the cost of default and that the ratio of exports to GDP is a rough gauge of an economy's capacity to generate revenues sufficient to repay its external liabilities. This suggests that exports of goods and services can serve as an alternative scaling variable for NFL. Such a metric is plotted in the second panel of Figure 1.4.1, which shows narrower differences in NFL positions between the pre- and post-2007 crises: both recent and past crises are now suggestive of a tipping point at about 200 percent of exports of goods and services. This is equivalent to an average NFL-to-GDP threshold of 60 percent once the exports-to-GDP ratio averages 30 percent. So the somewhat lower crisis threshold (about 50 percent) that typically characterized pre-2007 episodes appears attributable in part to lower trade openness.

Because debt liabilities—as opposed to equity liabilities—tend to be particularly burdensome in times of economic distress, including because for emerging markets they are often denominated in foreign currency, it seems important to disaggregate NFL into its debt and equity components.[1] Specifically, the net equity position is defined as the sum of a country's net foreign direct investment and portfolio equity positions, whereas the net debt position reflects the sum of the net position in other investment instruments (such as loans and deposits), portfolio debt instruments, and net foreign exchange reserves. The third panel of Figure 1.5.1 shows that crises have not typically been accompanied by a rise in net equity liabilities, but these have been on average much larger in recent crises than in pre-2007 crises. Still, debt liabilities appear to have a much stronger link to crises, and the bottom panel shows in particular how the 2007–10 crises were preceded by a dramatic increase in net external debt.

Although the above discussion has focused on individual NFL variables, to establish causality between NFLs and debt crises allowance must be made for the role of other factors. In addition, it is important to examine econometrically whether the effect is in fact nonlinear—that is, whether it grows stronger closer to the crisis tipping points. To this end, the first column of Table 1.5.1 reports the results of a probit regression in which the dependent variable equals 1 when there is a crisis and zero otherwise. The estimated coefficient shows that as NFA decreases there is a statistically significant increase in crisis risk. As with probit models, the respective elasticity (marginal effect) varies nonlinearly with the level of NFL and approaches 1 percent on average around crises—that is, a 1 percentage point increase in NFL tends to increase the probability of crisis by roughly the same amount.

The second column in the table disaggregates NFA into the net position in debt instruments and equity instruments. As discussed earlier, the net debt position is far more important than the net equity position in accounting for crisis risk. (The estimated coefficient of 1.4 percent is statistically significant and some four times as large as that for equity.) The third column of Table 1.5.1 controls for a variety of variables that are widely held to affect crisis risk. Of these, the negative coefficient on foreign exchange reserves is notable. It implies that higher reserves reduce the probability of a crisis over and above their effects through an economy's NFA and net debt position. One rationale for this effect is that foreign exchange reserves are a tool under the direct control of a policymaker, unlike, say, private sector deposits overseas. As a result, foreign exchange reserves can provide a more effective offset to external liabilities than can private sector assets.

The effect of other variables is broadly consistent with what economic theory suggests. A higher current account balance relative to GDP lowers the probability of crisis, whereas appreciation (a rise in the index) of the real exchange rate relative to its five-year moving average increases the probability of a crisis. Economies that are historically more volatile (with volatility measured as the standard deviation of the output gap over a 10-year window) tend to be more prone to crisis, whereas richer countries (measured by their constant GDP per capita in thousands of U.S. dollars) are less so. Another important variable included in these regressions—not featured in previous studies in this

[1]Data that would allow calculation of countries' net foreign currency positions are unfortunately unavailable.

Box 1.5 *(continued)*

Table 1.5.1. Probit Estimates of Crisis Probability

	(1)	(2)	(3)	(4)
Net Foreign Assets to GDP	–0.89***			
	[0.190]			
Net Debt to GDP		–1.41***	–1.29***	–1.16***
		[0.28]	[0.38]	[0.40]
Net Equity to GDP		–0.32	0.80**	1.10**
		[0.278]	[0.394]	[0.477]
Foreign Exchange Reserves to GDP			–2.03*	–2.45*
			[1.12]	[1.36]
Current Account to GDP			–5.99***	–5.29***
			[1.66]	[1.65]
Real Exchange Rate Gap			2.03***	1.96***
			[0.50]	[0.49]
Output Volatility			3.69	4.41
			[3.00]	[2.95]
GDP per Capita			–0.08***	–0.09***
			[0.01]	[0.01]
U.S. Corporate Spread			0.44***	0.40***
			[0.15]	[0.15]
Net Debt to GDP, 2007–09				–0.74*
				[0.40]
Net Equity to GDP, 2007–09				–0.75
				[0.67]
Observations	1,983	1,983	1,979	1,979
Pseudo R^2	0.06	0.08	0.27	0.28

Source: IMF staff calculations.

Note: Robust standards are in brackets under each estimate. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

literature—is the spread between U.S. AAA and AAB corporate bonds, which is a proxy for global financial conditions and attitudes toward risk. The estimates show that the higher such spreads, the higher the crisis probability. Interestingly, an independent role for fiscal variables such as public debt to GDP and general government deficits for GDP was considered but not found to be statistically significant. This suggests that the effect of these fiscal variables on crisis risk occurs via their effects on net foreign debt and/or the remaining explanatory variables.

The final column in Table 1.5.1 distinguishes between pre- and post-2007 crises by interacting the net debt and net equity variables, respectively, with a dummy variable, defined as 1 for 2007–10 and zero otherwise. The purpose is to gauge whether the effect of net foreign debt and net foreign equity positions on crisis risk has changed since 2007. The point estimate of –0.74 for the debt variable indicates that higher debt positions have had a stronger effect during recent crises. A similar result is found for net equity positions, but the effect is not statistically significant at 5 percent.[2]

How well does this empirical model predict "out of sample" the most recent wave of crises? To address that question, the specification of column (3) was run for the period up to 2007, and fitted values were constructed for the probability of a crisis in the subsequent period. Results in Table 1.5.2 show that the model correctly predicts a "high" probability of crisis (10 percent or above) for 6 out of 11 economies that actually suffered a major debt crisis during 2008–10.[3]

[2]A fuller set of regressions and discussion, including a robustness analysis for an alternative crisis definition, is available from Catão and Milesi-Ferretti (2011).

[3]Because the unconditional probability of a crisis in the sample is about 3 percent (62 crisis events in close to 2,000 observations), a 10 percent probability of a crisis is quite elevated.

Box 1.5 *(continued)*

Table 1.5.2. Model's Predictive Power

Country	First Year of Crisis	Predictive Crisis Probability (percent)	Default or Multilateral Support	Growth in First Crisis Year (percent)	Growth in Second Crisis Year (percent)
Bulgaria	2009	13	No	–5.48	0.15
Dominican Republic	2009	10	Yes	3.45	7.75
Ecuador	2008	1	Yes	7.24	0.36
Estonia	2009	12	No	–13.90	3.11
Greece	2009	18	No	–2.34	–4.35
Greece	2010	23	Yes	–4.35	. . .
Hungary	2008	2	Yes	0.80	–6.69
Latvia	2008	16	Yes	–4.24	–17.95
Lithuania	2009	15	No	–14.74	1.32
Pakistan	2008	5	Yes	3.68	1.72
Portugal	2009	15	No	–2.51	1.33
Portugal	2010	20	Yes	1.33	. . .
Romania	2009	17	Yes	–3.72	–0.15
Serbia	2009	22	Yes	–3.50	0.95
Spain	2010	10	No	–3.72	–0.15
Turkey	2008	5	Yes	0.66	–4.83
Ukraine	2008	2	Yes	1.94	–14.46

Source: IMF staff estimates.

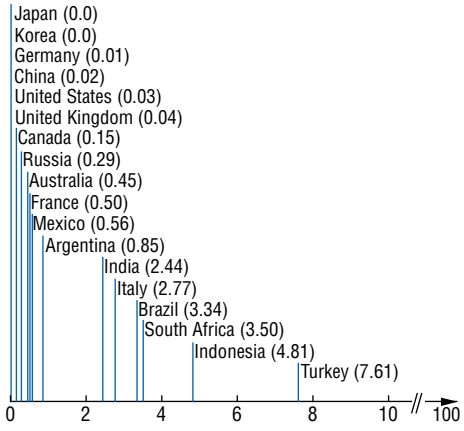
Moreover, several countries in the table designated as having "no crisis" according to our strict default/multilateral bailout definition (for example, Bulgaria, Estonia, Lithuania, Spain) did undergo severe output contractions (contemporaneously and/or a year later) and faced macroeconomic distress related to the need for broader external adjustment.

To sum up, once economies' NFL rises above 40 percent of GDP and is composed mostly of debt liabilities, the risk of crisis accelerates with further net liability exposure. There is also evidence that this threshold may have shifted upward—to the 50 to 60 percent range—in recent years, reflecting, at least in part, greater trade openness. The effect of net external debt on the probability of a crisis is strong even after controlling for other fundamentals such as real exchange rate appreciation, the current account balance, and the level of development. We also find evidence that higher reserves mitigate crisis risk, over and above their effects on the net debt position.

Among the G20 countries, the model generally finds crisis probabilities below or close to the unconditional sample crisis probability of 3 percent (62 crises/1,999 observations), with the one exception of Turkey (Figure 1.5.2). Of course, while the overall performance of the model is good, not all point estimates and orderings of country crisis probabilities are to be taken as pre-

Figure 1.5.2. Model Estimate of Crisis Probabilities

(Percent)



Source: IMF staff calculations.

Box 1.5 *(continued)*

cise assessments of external risks. Estimates rely on past information and historical crisis patterns and hence do not fully take into account the current and expected future trend behavior of some important variables (including, for example, public debt dynamics in the euro area, Japan, and the United States; the strong public sector balance sheet and external liabilities predominantly in domestic currency in Australia; as well as NFL in some current account deficit countries) and likely place too much weight on the mitigating effect of high per capita income on crisis risk (given the small number of external crises in advanced economies during the sample period).

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