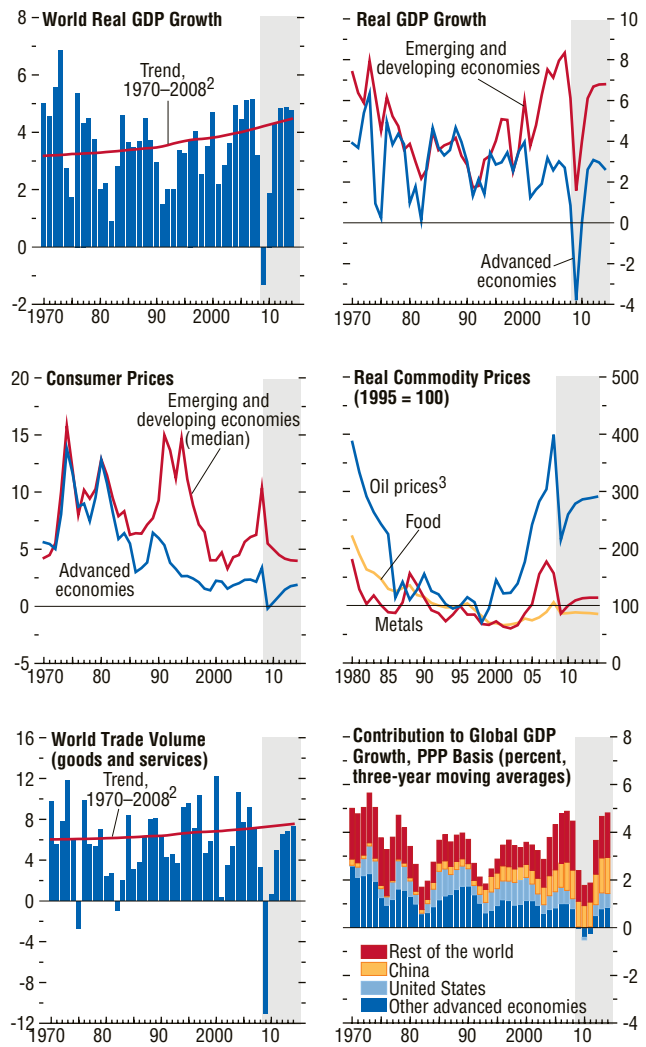


The global economy is in a severe recession inflicted by a massive financial crisis and an acute loss of confidence. Wide-ranging and often unorthodox policy responses have made some progress in stabilizing financial markets but have not yet restored confidence nor arrested negative feedback between weakening activity and intense financial strains. While the rate of contraction is expected to moderate from the second quarter onward, global activity is projected to decline by 1.3 percent in 2009 as a whole before rising modestly during the course of 2010 (Figure 1.1). This turnaround depends on financial authorities acting decisively to restore financial stability and fiscal and monetary policies in the world's major economies providing sustained strong support for aggregate demand.

This chapter opens by exploring how a dramatic escalation of the financial crisis in September 2008 has provoked an unprecedented contraction of activity and trade, despite policy efforts. It then discusses the projections for 2009 and 2010, emphasizing the key role that must be played by policies to promote a durable recovery and the downside risks if feedback between the real and financial sectors continues to intensify. The third section looks beyond the current crisis, considering factors that will shape the landscape of the global economy over the medium term, as businesses and households seek to repair the damage. The final part of the chapter reviews the difficult policy challenges at the current juncture, stressing that while the overwhelming imperative is to take all steps necessary to restore financial stability and revive the global economy, policymakers must also be mindful of longer-run challenges and the need for national actions to be mutually supportive.

Figure 1.1. Global Indicators¹
(Annual percent change unless otherwise noted)

The global economy is undergoing its most severe recession of the postwar period. World real GDP will drop in 2009, with advanced economies experiencing deep contractions and emerging and developing economies slowing abruptly. Trade volumes are falling sharply, while inflation is subsiding quickly.



Source: IMF staff estimates.

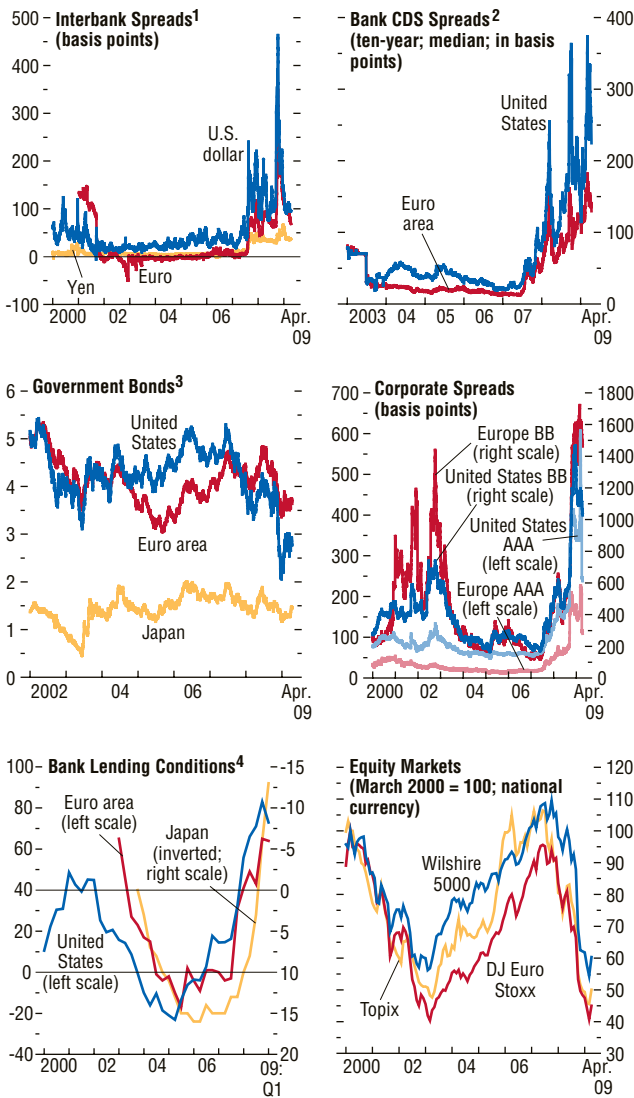
¹Shaded areas indicate IMF staff projections. Aggregates are computed on the basis of purchasing-power-parity (PPP) weights unless otherwise noted.

²Average growth rates for individual countries, aggregated using PPP weights; aggregates shift over time in favor of faster-growing economies, giving the line an upward trend.

³Simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil.

Figure 1.2. Developments in Mature Credit Markets

Conditions in mature credit markets deteriorated sharply after September 2008, and strains remain intense despite policy efforts and some improvements in market sentiment following the G20 meeting in early April. While interbank spreads have been lowered, bank CDS spreads and corporate spreads have remained wide, and equity prices are close to multiyear lows, as adverse linkages between the financial sector and the real economy have intensified.



Sources: Bank of Japan; Bloomberg Financial Markets; Federal Reserve Board of Governors; European Central Bank; Merrill Lynch; and IMF staff calculations.
¹Three-month London interbank offered rate minus three-month government bill rate.
²CDS = credit default swap.
³Ten-year government bonds.
⁴Percent of respondents describing lending standards as tightening “considerably” or “somewhat” minus those indicating standards as easing “considerably” or “somewhat” over the previous three months. Survey of changes to credit standards for loans or lines of credit to enterprises for the euro area; average of surveys on changes in credit standards for commercial/industrial and commercial real estate lending for the United States; Diffusion index of “accommodative” minus “severe,” Tankan lending attitude of financial institutions survey for Japan.

How Did Things Get So Bad, So Fast?

In the year following the outbreak of the U.S. subprime crisis in August 2007, the global economy bent but did not buckle. Activity slowed in the face of tightening credit conditions, with advanced economies falling into mild recessions by the middle quarters of 2008, but with emerging and developing economies continuing to grow at fairly robust rates by past standards. However, financial wounds continued to fester, despite policymakers’ efforts to sustain market liquidity and capitalization, as concerns about losses from bad assets increasingly raised questions about the solvency and funding of core financial institutions.

The situation deteriorated rapidly after the dramatic blowout of the financial crisis in September 2008, following the default by a large U.S. investment bank (Lehman Brothers), the rescue of the largest U.S. insurance company (American International Group, AIG), and intervention in a range of other systemic institutions in the United States and Europe. These events prompted a huge increase in perceived counterparty risk as banks faced large write-downs, the solvency of many of the most established financial names came into question, the demand for liquidity jumped to new heights, and market volatility surged once more. The result was a flight to quality that depressed yields on the most liquid government securities and an evaporation of wholesale funding that prompted a disorderly deleveraging that cascaded across the rest of the global financial system (Figure 1.2). Liquid assets were sold at fire-sale prices, and credit lines to hedge funds and other leveraged financial intermediaries in the so-called shadow banking system were slashed. High-grade as well as high-yield corporate bond spreads widened sharply, the flow of trade finance and working capital was heavily disrupted, banks tightened lending standards further, and equity prices fell steeply.

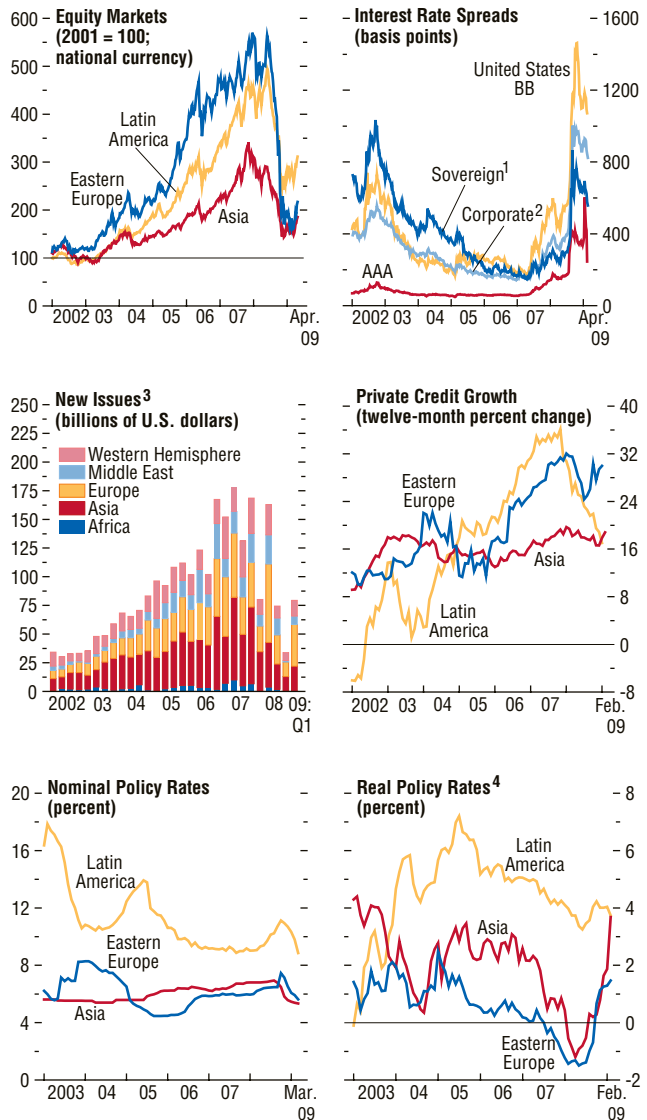
Emerging markets—which earlier had been relatively sheltered from financial strains by their limited exposure to the U.S. subprime market—

have been hit hard by these events. New securities issues came to a virtual stop, bank-related flows were curtailed, bond spreads soared, equity prices dropped, and exchange markets came under heavy pressure (Figure 1.3). Beyond a general rise in risk aversion, capital flows have been curtailed by a range of adverse factors, including the damage done to banks (especially in western Europe) and hedge funds, which had previously been major conduits; the desire to move funds under the “umbrella” offered by the increasing provision of guarantees in mature markets; and rising concerns about national economic prospects, particularly in economies that previously had relied extensively on external financing. Adding to the strains, the turbulence exposed internal vulnerabilities within many emerging economies, bringing attention to currency mismatches on borrower balance sheets, weak risk management (for example, substantial corporate losses on currency derivatives markets in some countries), and excessively rapid bank credit growth.

Although a global meltdown was averted by determined fire-fighting efforts, this sharp escalation of financial stress battered the global economy through a range of channels. The credit crunch generated by deleveraging pressures and a breakdown of securitization technology has hurt even the most highly rated private borrowers. Sharp falls in equity markets as well as continuing deflation of housing bubbles have led to a massive loss of household wealth. In part, these developments reflected the inevitable adjustments to correct past excesses and technological failures akin to those that triggered the bursting of the dot-com bubble. However, because the excesses and failures were at the core of the banking system, the ramifications have been quickly transmitted to all sectors and countries of the global economy. Moreover, the scale of the blows has been greatly magnified by the collapse of business and consumer confidence in the face of rising doubts about economic prospects and continuing uncertainty about policy responses. The rapidly deteriorating economic outlook further accentuated

Figure 1.3. Emerging Market Conditions

Emerging markets were hard hit by the escalation of the financial crisis. Equity prices plummeted, spreads widened sharply, and new securities issues were curtailed. Policy rates were lowered in response to weakening economic prospects, although less aggressively than in mature markets in view of concerns about pressure on the external accounts from a reversal in capital flows.



Sources: Bloomberg Financial Markets; Capital Data; IMF, *International Financial Statistics*; and IMF staff calculations.

¹JPMorgan EMBI Global Index spread.

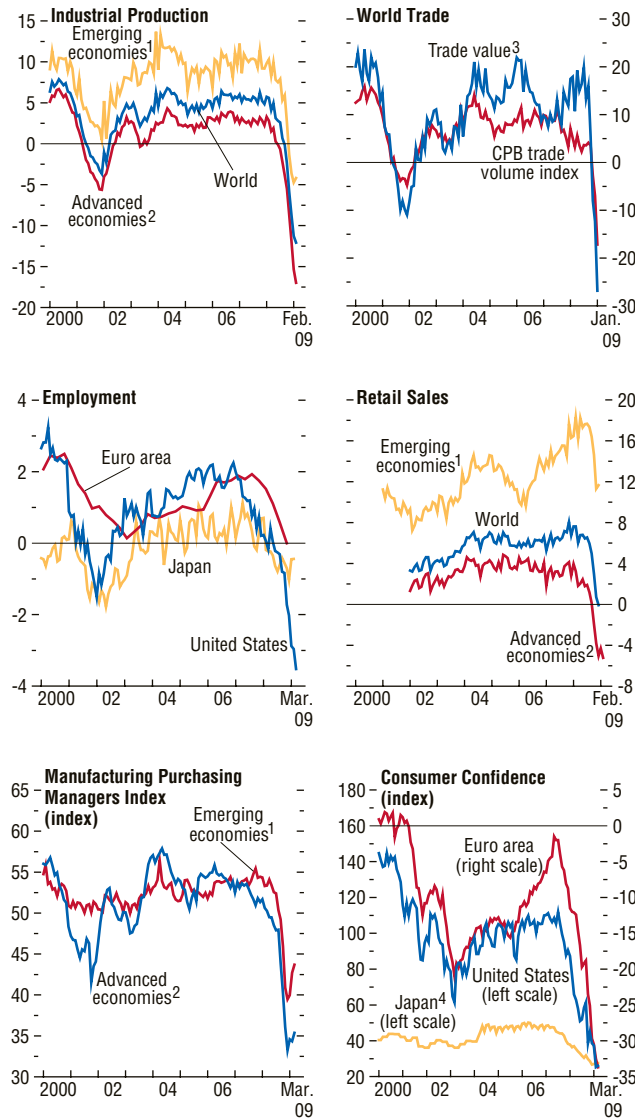
²JPMorgan CEMBI Broad Index spread.

³Total of equity, syndicated loans, and international bond issuances.

⁴Relative to headline inflation.

Figure 1.4. Current and Forward-Looking Indicators
(Percent change from a year earlier unless otherwise noted)

Industrial production, trade, and employment have dropped sharply since the blowout in the financial crisis in September 2008. Recent data on business confidence and retail sales provide some tentative signs that the rate of contraction of the global economy may now be moderating.



Sources: CPB Netherlands Bureau for Economic Policy Analysis for CPB trade volume index; for all others, NTC Economics and Haver Analytics.
¹Argentina, Brazil, Bulgaria, Chile, China, Colombia, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, Slovak Republic, South Africa, Thailand, Turkey, Ukraine, and Venezuela.
²Australia, 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.
³Percent change from a year earlier in SDR terms.
⁴Japan's consumer confidence data are based on a diffusion index, where values greater than 50 indicate improving confidence.

financial strains in a corrosive global feedback loop that has undermined policymakers' efforts to remedy the situation.

Thus, the impact on activity was felt quickly and broadly. Industrial production and merchandise trade plummeted in the fourth quarter of 2008 and continued to fall rapidly in early 2009 across both advanced and emerging economies, as purchases of investment goods and consumer durables such as autos and electronics were hit by credit disruptions and rising anxiety and inventories started to build rapidly (Figure 1.4). Recent data provide some tentative indications that the rate of contraction may now be starting to moderate. Business confidence has picked up modestly, and there are signs that consumer purchases are stabilizing, helped by the cushion provided by falling commodity prices and anticipation of macroeconomic policy support. However, employment continues to drop fast, notably in the United States.

Overall, global GDP is estimated to have contracted by an alarming 6¼ percent (annualized) in the fourth quarter of 2008 (a swing from 4 percent growth one year earlier) and to have fallen almost as fast in the first quarter of 2009. All economies around the world have been seriously affected, although the direction of the blows has varied, as explored in more detail in Chapter 2. The advanced economies experienced an unprecedented 7½ percent decline in the fourth quarter of 2008, and most are now suffering deep recessions. While the U.S. economy may have suffered particularly from intensified financial strains and the continued fall in the housing sector, western Europe and advanced Asia have been hit hard by the collapse in trade as well as rising financial problems of their own and housing corrections in some national markets.

Emerging economies too have suffered badly and contracted 4 percent in the fourth quarter in the aggregate. The damage has been inflicted through both financial and trade channels. Activity in east Asian economies with heavy reliance on manufacturing exports has

fallen sharply, although the downturns in China and India have been somewhat muted given the lower shares of their export sectors in domestic production and more resilient domestic demand. Emerging Europe and the Commonwealth of Independent States (CIS) have been hit very hard because of heavy dependence on external financing as well as on manufacturing exports and, for the CIS, commodity exports. Countries in Africa, Latin America, and the Middle East have suffered from plummeting commodity prices as well as financial strains and weak export demand.

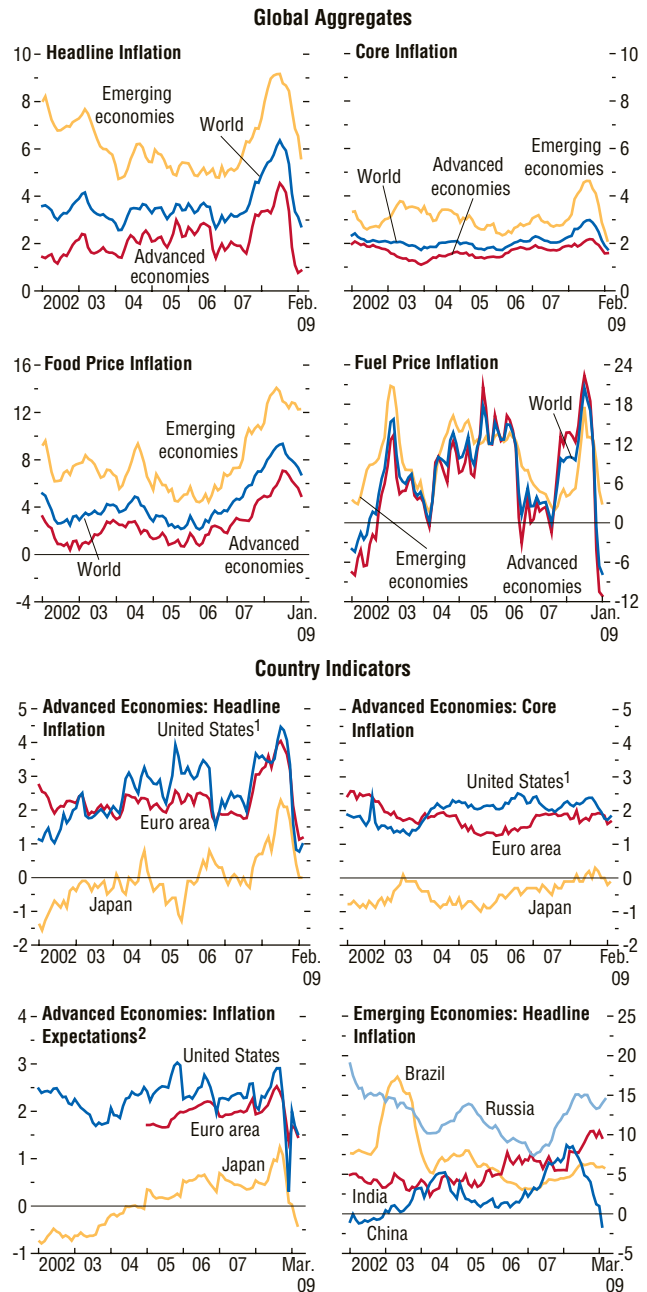
In parallel with the rapid cooling of global activity, inflation pressures have subsided quickly (Figure 1.5). Commodity prices fell sharply from mid-year highs, undercut by the weakening prospects for the emerging economies that have provided the bulk of demand growth in recent years (Appendix 1.1). At the same time, rising economic slack has contained wage increases and eroded profit margins. As a result, 12-month headline inflation in the advanced economies fell below 1 percent in February 2009, although core inflation remained in the 1½–2 percent range with the notable exception of Japan. Inflation has also moderated significantly across the emerging economies, although in some cases falling exchange rates have moderated the downward momentum.

One side effect of the financial crisis has been a flight to safety and rising home bias. Gross global capital flows contracted sharply in the fourth quarter of 2008. In net terms, flows have favored countries with the most liquid and safe government securities markets, and net private flows to emerging and developing economies have collapsed. These shifts have affected the world's major currencies. Since September 2008, the euro, U.S. dollar, and yen have appreciated notably (Figure 1.6). The Chinese renminbi and other currencies pegged to the dollar (including those in the Middle East) have also appreciated in real effective terms. Most other emerging economy currencies have weakened sharply, despite use of international reserves for support.

Figure 1.5. Global Inflation

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

Inflation pressures have subsided quickly, as output gaps have widened and food and fuel prices have dropped. One-year inflation expectations and core inflation have declined below central bank inflation objectives in major advanced economies.

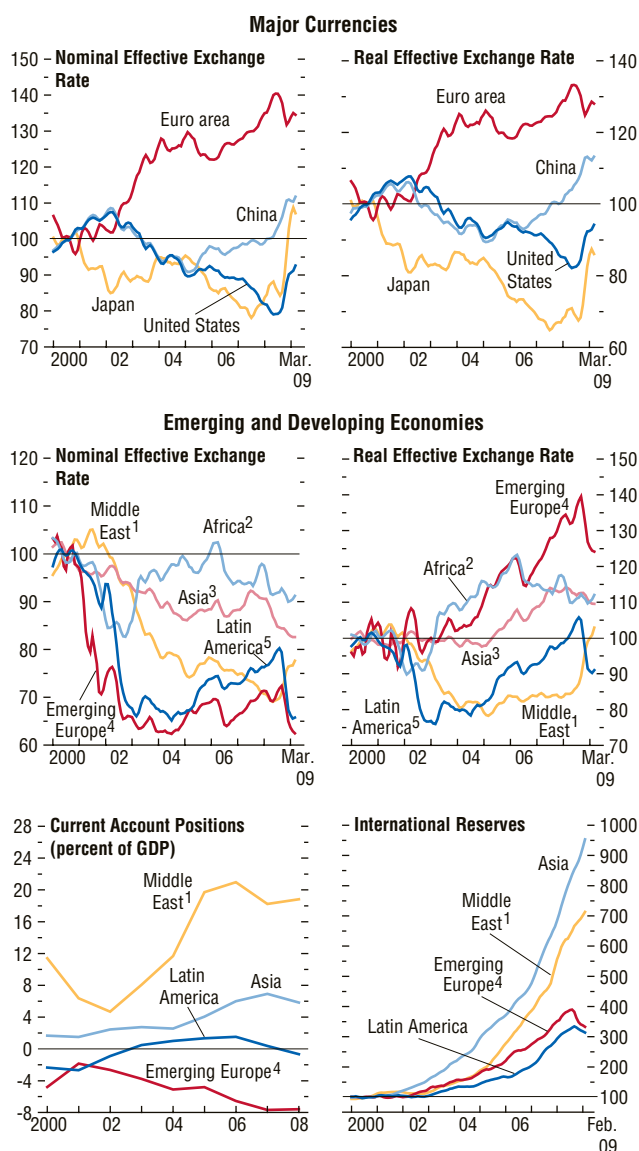


Sources: Bloomberg Financial Markets; Haver Analytics; and IMF staff calculations.
¹Personal consumption expenditure deflator.
²One-year-ahead consensus forecasts.

Figure 1.6. External Developments

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

A flight to safety since September 2008 has led to significant real effective appreciations of the major global currencies. The renminbi and other currencies closely linked to the U.S. dollar have also appreciated in real effective terms, but currencies of other emerging and developing economies have weakened considerably, as private capital account flows have reversed, despite official intervention.



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

¹Bahrain, Egypt, I.R. of Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, and Republic of Yemen.

²Botswana, Burkina Faso, Cameroon, Chad, Republic of Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Uganda, and Zambia.

³Asia excluding China.

⁴Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Turkey.

⁵Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

Policies Fail to Gain Traction

Policy responses to these developments have been rapid, wide-ranging, and frequently unorthodox, but were too often piecemeal and have failed to arrest the downward spiral. Following the heavy fallout from the collapse of Lehman Brothers, authorities in major mature markets made clear that no other potentially systemic financial institution would be allowed to fail. A number of major banks in the United States and Europe were provided with public support in the form of new capital and guarantees against losses from holdings of problem assets. More broadly, authorities have followed multifaceted strategies involving continued provision of liquidity and extended guarantees of bank liabilities to alleviate funding pressures, making available public funds for bank recapitalization, and announcing programs to deal with distressed assets. However, policy announcements have often been short on detail and have not convinced markets; cross-border coordination of initiatives has been lacking, resulting in undesirable spillovers; and progress in alleviating uncertainty related to distressed assets has been limited.

At the same time, with inflation concerns dwindling and risks to the outlook deepening, central banks have used a range of conventional and unconventional policy tools to support the economy and ease credit market conditions. Policy rates have been cut sharply, bringing them to ½ percent or less in some countries (Canada, Japan, United Kingdom, United States) and to unprecedented lows in other cases (including the euro area and Sweden) (Figure 1.7). However, the impact of rate cuts has been limited by credit market disruptions, and the zero bound has constrained central bankers' ability to add further stimulus. Some central banks (notably, in Japan, United Kingdom, United States) have therefore increased purchases of long-term government securities and provided direct support to illiquid credit markets by providing funding and guarantees to intermediaries in targeted markets, with some success in bringing down spreads in specific market segments such as the

U.S. commercial paper and residential mortgage-backed securities markets. As a result, central bank balance sheets have expanded rapidly as central banks have become major intermediaries in the credit process. Nevertheless, overall credit growth to the private sector has dropped sharply, reflecting a combination of tighter bank lending standards, securities market disruptions, and lower credit demand as economic prospects have darkened.

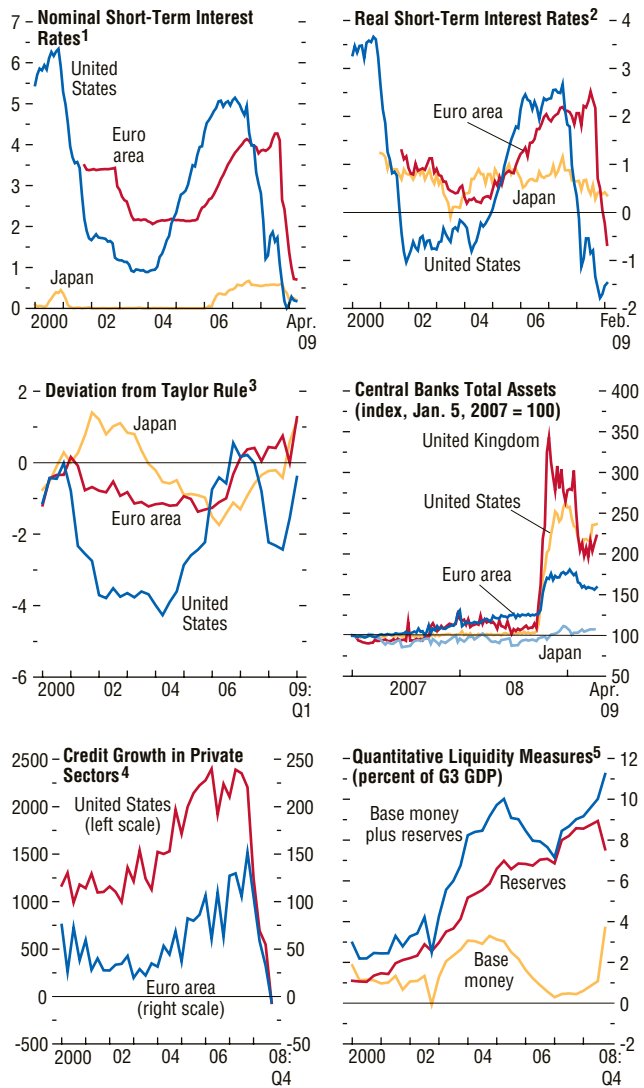
As concerns about the extent of the downturn and the limits to monetary policy have mounted, governments have also turned to fiscal policy to support demand. Beyond letting automatic stabilizers work, large discretionary stimulus packages have been introduced in most advanced economies, notably Germany, Japan, Korea, the United Kingdom, and the United States. Although the impact of the downturn and stimulus will be felt mainly in 2009 and 2010, fiscal deficits in the major advanced economies rose by more than 2 percentage points in 2008, after several years of consolidation (Table A8). Government debt levels are also being boosted by public support to the banking system, and some countries' room for fiscal action has been reduced by upward pressure on government bond yields as concerns about long-term fiscal sustainability have risen.

Policy responses in the emerging and developing economies to weakening activity and rising external pressures have varied considerably, depending on circumstances. Many countries, especially in Asia and Latin America, have been able to use policy buffers to alleviate pressures, letting exchange rates adjust downward but also applying reserves to counter disorderly market conditions and to augment private credit, including in particular to sustain trade finance. Dollar swap facilities offered by the Federal Reserve to a number of systemically important countries as well as the introduction of a more flexible credit instrument by the IMF provided some assurance to markets that countries with sound management would have access to needed external funding and not be faced with a capital account crisis. Moreover,

Figure 1.7. Measures of Monetary Policy and Liquidity in Selected Advanced Economies

(Interest rates in percent unless otherwise noted)

Policy rates in the major advanced economies have been lowered rapidly as inflation pressures have subsided and economic prospects have deteriorated. With policy rates approaching the zero floor, central banks have increasingly taken steps to support credit creation more directly, leading to the rapid expansion of their balance sheets. Despite these efforts, credit growth to the private sector has slowed sharply.



Sources: Bloomberg Financial Markets; Eurostat; Haver Analytics; Merrill Lynch; OECD *Economic Outlook*; and IMF staff calculations.

¹ Three-month treasury bills.

² Relative to core inflation.

³ The Taylor rate depends on (1) the neutral real rate of interest, which in turn is a function of potential output growth; (2) the deviation of expected consumer price inflation from the inflation target; and (3) the output gap. Expected inflation is derived from one-year-ahead consensus forecasts.

⁴ Quarter-over-quarter changes; in billions of local currency.

⁵ Change over three years for euro area, Japan, and United States (G3), denominated in U.S. dollars.

many central banks changed course to lower policy interest rates to ease domestic conditions (see Figure 1.3), as earlier inflation concerns moderated. Governments have also provided fiscal support through automatic stabilizers and discretionary measures, albeit typically on a much smaller scale than in the advanced economies, with the notable exceptions of China and Saudi Arabia. They have had room to maneuver because of their reserve stockpiles, more credible inflation-targeting regimes, and stronger public balance sheets.

Elsewhere, however, especially in emerging Europe and the CIS, greater internal vulnerabilities, and in some cases less flexible exchange rate regimes, have complicated the policy response. A number of countries that face severe external financing shortages, fragile banking systems, currency mismatches on borrower balance sheets, and rising questions about public finances have acted to tighten macroeconomic policies and received external financial support from the IMF and other official sources. However, stabilization has been elusive as the external environment has continued to deteriorate.

The Financial Hole Has Become Even Deeper

The policy responses in both advanced and emerging economies have helped alleviate the extreme financial market disruptions observed in October–November 2008, and there have been encouraging signs of improving sentiment since the G20 meeting in early April, but financial market conditions have generally remained highly stressed. Thus, financial risks have risen further along most dimensions, as discussed in detail in the April 2009 *Global Financial Stability Report* (GFSR). Most market risk and volatility indicators are still well above ranges observed before September 2008, let alone before August 2007 (see Figures 1.2 and 1.3). Although access for high-grade borrowers in securities markets has improved, bank credit growth is falling rapidly across the board, bank wholesale funding in mature markets remains highly dependent on government guarantees, and securitization

markets remain deeply impaired. The situation is further complicated by continuing uncertainty—both about economic prospects and the valuation of bad assets—particularly since little progress has been made in either reestablishing liquid markets in these assets or reducing bank exposure to fluctuations in their value.

The continued pressures reflect to an important degree the damaging feedback loop with the real economy—as economic prospects have darkened, estimates of financial losses have continued to rise, so that markets have continued to question bank solvency despite substantial infusions of public resources. The GFSR estimates that expected write-downs on U.S.-based assets suffered by all financial institutions over 2007–10 will amount to \$2.7 trillion (up from the estimate of \$2.2 trillion in January 2009). Total expected write-downs on global exposures are estimated at \$4 trillion, of which about two-thirds will fall on banks, with the remainder distributed among insurance companies, pension funds, hedge funds, and other intermediaries, although this figure is subject to a substantial margin of error. So far, banks have recognized less than one-third of estimated losses, and substantial amounts of new capital are needed. Subject to a number of assumptions, the GFSR estimates that additional capital would be required (measured as tangible common equity) amounting to \$275 billion–\$500 billion in the United States, \$475 billion–\$950 billion for European banks (excluding those in the United Kingdom), and \$125 billion–\$250 billion for U.K. banks.¹ Moreover, insurance company and pension fund balance sheets have been badly damaged as their assets have declined in value, and lower government bond yields used to discount liabilities have simultaneously widened asset-liability mismatches.

¹The lower end of the range corresponds to capital needed to adjust leverage, measured as tangible common equity (TCE) over total assets (TA), to 4 percent. The upper end corresponds to capital needed to lower leverage to levels observed in the mid-1990s (TCE/TA of 6 percent) (see the April 2009 GFSR).

Short-Term Prospects Are Precarious

As the vicious circle between the real and financial sectors has intensified, global economic prospects have been marked down further. Even assuming vigorous macroeconomic policy support and anticipating a moderation in the rate of contraction from the second quarter of 2009 onward, global activity is now projected to decline 1.3 percent in 2009, a 1¾ percentage point downward revision from the January *WEO Update* (Table 1.1). By any measure, this downturn represents by far the deepest global recession since the Great Depression (Box 1.1). Moreover, all corners of the globe are being affected: output per capita is projected to decline in countries representing three-quarters of the global economy, and growth in virtually all countries has decelerated sharply from rates observed in 2003–07. Growth is projected to reemerge in 2010, but at 1.9 percent would still be well below potential, consistent with findings in Chapter 3 that recoveries after financial crises are significantly slower than other recoveries. That chapter also finds that the synchronized nature of the global downturn tends to weigh against prospects for a speedy turnaround.

The key factor determining the course of the downturn and recovery will be the rate of progress toward returning the financial sector to health. Underlying the downgrade to the current forecast is the recognition that financial stabilization will take longer than previously envisaged, given the complexities involved in dealing with bad assets and restoring confidence in bank balance sheets, especially against the backdrop of a deepening downturn in activity that continues to expand losses on a wide range of bank assets. It also recognizes the formidable political economy challenges of “bailing out” those who have made mistakes in the past. Thus, the baseline envisages that financial strains in the mature markets will remain heavy until well into 2010, improving only slowly as greater clarity over losses on bad assets and injections of public capital reduce insolvency concerns and lower counterparty risks and mar-

ket volatility. Moreover, the process of removing bad assets, deleveraging balance sheets, and restoring market institutions will be protracted. Thus, as discussed in the April 2009 GFSR, private credit in the advanced economies is projected to contract in both 2009 and 2010.

Continuing stress and balance sheet adjustment in mature markets will have serious consequences for financing to emerging economies. Overall, emerging markets are expected to experience net capital outflows in 2009 of more than 1 percent of their GDP. Only the highest-grade borrowers will be able to access new funding, and rollover rates will decline well below 100 percent, as both bank and portfolio flows are affected by financial deleveraging and a growing tendency toward home bias (Table A13). Although conditions should improve moderately in 2010, the availability of external financing to emerging and developing economies will remain highly curtailed. These assumptions are consistent with findings in Chapter 4 that the acute degree of stress in mature markets and its concentration in the banking system suggest that capital flows to emerging economies will suffer large declines and will recover only slowly.

The projected path to recovery also incorporates sustained strong macroeconomic support for aggregate demand. Monetary policy interest rates will be lowered to or remain near the zero bound in the major advanced economies, while central banks will continue to seek ways to use their balance sheets to ease credit conditions. The projections build in fiscal stimulus plans in G20 countries amounting to 2 percent of GDP in 2009 and 1½ percent of GDP in 2010, as well as the operation of automatic stabilizers in most of these countries.² In the major advanced

²The note prepared by the IMF staff for the March 2009 London meeting of the G20 (IMF, 2009f) provides more detailed estimates of fiscal support on a country-by-country basis. This note estimates that such support will boost GDP in 2009 across the G20 by ¾–3¼ percentage points, based on a range of estimates for fiscal multipliers. About one-third of these benefits derive from cross-border spillovers.

Table 1.1. Overview of the *World Economic Outlook* Projections*(Percent change, unless otherwise noted)*

	Year over Year								
					Difference from January 2009 WEO Projections		Q4 over Q4		
	2007	2008	Projections		2009	2010	Estimates	Projections	
		2009	2010	2009	2010	2008	2009	2010	
World output¹	5.2	3.2	-1.3	1.9	-1.8	-1.1	0.2	-0.6	2.6
Advanced economies	2.7	0.9	-3.8	0.0	-1.8	-1.1	-1.7	-2.6	1.0
United States	2.0	1.1	-2.8	0.0	-1.2	-1.6	-0.8	-2.2	1.5
Euro area	2.7	0.9	-4.2	-0.4	-2.2	-0.6	-1.4	-3.5	0.6
Germany	2.5	1.3	-5.6	-1.0	-3.1	-1.1	-1.7	-4.4	0.0
France	2.1	0.7	-3.0	0.4	-1.1	-0.3	-1.0	-2.2	1.4
Italy	1.6	-1.0	-4.4	-0.4	-2.3	-0.3	-2.9	-2.9	0.2
Spain	3.7	1.2	-3.0	-0.7	-1.3	-0.6	-0.7	-2.9	0.2
Japan	2.4	-0.6	-6.2	0.5	-3.6	-0.1	-4.3	-2.7	-0.6
United Kingdom	3.0	0.7	-4.1	-0.4	-1.3	-0.6	-2.0	-3.2	0.6
Canada	2.7	0.5	-2.5	1.2	-1.3	-0.4	-0.7	-1.9	1.7
Other advanced economies	4.7	1.6	-4.1	0.6	-1.7	-1.6	-2.7	-1.9	1.7
Newly industrialized Asian economies	5.7	1.5	-5.6	0.8	-1.7	-2.3	-4.8	-1.5	2.0
Emerging and developing economies ²	8.3	6.1	1.6	4.0	-1.7	-1.0	3.3	2.3	5.0
Africa	6.2	5.2	2.0	3.9	-1.4	-1.0	...	...	...
Sub-Saharan	6.9	5.5	1.7	3.8	-1.8	-1.2	...	...	...
Central and eastern Europe	5.4	2.9	-3.7	0.8	-3.3	-1.7	...	...	...
Commonwealth of Independent States	8.6	5.5	-5.1	1.2	-4.7	-1.0	...	...	...
Russia	8.1	5.6	-6.0	0.5	-5.3	-0.8	1.2	-4.7	1.0
Excluding Russia	9.9	5.3	-2.9	3.1	-3.2	-1.3	...	...	...
Developing Asia	10.6	7.7	4.8	6.1	-0.7	-0.8	...	...	...
China	13.0	9.0	6.5	7.5	-0.2	-0.5	6.8	6.9	7.9
India	9.3	7.3	4.5	5.6	-0.6	-0.9	4.5	4.8	5.9
ASEAN-5	6.3	4.9	0.0	2.3	-2.7	-1.8	2.1	1.2	3.3
Middle East	6.3	5.9	2.5	3.5	-1.4	-1.2	...	...	...
Western Hemisphere	5.7	4.2	-1.5	1.6	-2.6	-1.4	...	...	...
Brazil	5.7	5.1	-1.3	2.2	-3.1	-1.3	1.2	1.1	2.4
Mexico	3.3	1.3	-3.7	1.0	-3.4	-1.1	-1.7	-2.1	2.5
<i>Memorandum</i>									
European Union	3.1	1.1	-4.0	-0.3	-2.2	-0.8	...	...	...
World growth based on market exchange rates	3.8	2.1	-2.5	1.0	-1.9	-1.1	...	...	...
World trade volume (goods and services)	7.2	3.3	-11.0	0.6	-8.2	-2.6	...	...	...
Imports									
Advanced economies	4.7	0.4	-12.1	0.4	-9.0	-1.5	...	...	...
Emerging and developing economies	14.0	10.9	-8.8	0.6	-6.6	-5.2	...	...	...
Exports									
Advanced economies	6.1	1.8	-13.5	0.5	-9.8	-1.6	...	...	...
Emerging and developing economies	9.5	6.0	-6.4	1.2	-5.6	-4.2	...	...	...
Commodity prices (U.S. dollars)									
Oil ³	10.7	36.4	-46.4	20.2	2.1	0.2	...	...	...
Nonfuel (average based on world commodity export weights)	14.1	7.5	-27.9	4.4	1.2	-2.9	...	...	...
Consumer prices									
Advanced economies	2.2	3.4	-0.2	0.3	-0.5	-0.5	2.1	-0.1	0.4
Emerging and developing economies ²	6.4	9.3	5.7	4.7	-0.1	-0.3	7.7	4.4	4.0
London interbank offered rate (percent)⁴									
On U.S. dollar deposits	5.3	3.0	1.5	1.4	0.2	-1.5	...	...	...
On euro deposits	4.3	4.6	1.6	2.0	-0.6	-0.7	...	...	...
On Japanese yen deposits	0.9	1.0	1.0	0.5	0.0	0.1	...	...	...

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 25–March 25, 2009. Country weights used to construct aggregate growth rates for groups of countries were revised.

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

²The quarterly estimates and projections account for approximately 77 percent of the emerging and developing economies.

³Simple 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 \$97.03 in 2008; the assumed price based on future markets is \$52.00 in 2009 and \$62.50 in 2010.

⁴Six-month rate for the United States and Japan. Three-month rate for the euro area.

Box 1.1. Global Business Cycles

The global economy is experiencing its deepest downturn in 50 years. Many observers have argued that this downturn has all the features of a global recession. One problem with this debate, however, is that there is little empirical work on global business cycles. This box seeks to fill this gap, defining global business cycles, providing a brief description of their main features, and thus putting the current downturn in perspective.

What constitutes a global business cycle? In the 1960s, it was sufficient to answer this question by looking at cyclical fluctuations in advanced economies, the United States in particular. These countries accounted for the lion's share of world output, nearly 70 percent on a purchasing-power-parity (PPP) basis; moreover, cyclical activity in much of the rest of the world was largely dependent on conditions in advanced economies.¹ Today, with the share of advanced economies in world output down to about 55 percent on a PPP basis, the coincidence between business cycles in these countries and global business cycles can no longer be taken for granted. Indeed, in 2007, as the slowdown in economic activity in the United States and other advanced economies began, the hope was that emerging and developing economies would be somewhat insulated from these developments by the size and strength of domestic demand in their economies and by the increased importance of intraregional trade in Asia.

At the same time, however, the countries of the world are more integrated today through trade and financial flows than in the 1960s, creating greater potential for spillover and contagion effects. This increases the feedback, in both directions, between business cycle devel-

opments in advanced economies and those in emerging and developing economies, increasing the odds of synchronous movements and a global business cycle.

Dating Global Business Cycles

The two standard methods of dating peaks and troughs of business cycles in individual countries—statistical procedures and judgmental methods such as those used by the National Bureau of Economic Research (NBER) and the Center for Economic Policy Research (CEPR), for instance, for the United States and the euro area, respectively—are applied at the global level. Both methods yield the same turning points in global activity.

The statistical method is employed to date the peaks and troughs in a key indicator of global economic activity, world real GDP per capita (on the basis of PPP weights).² Annual data from 1960 to 2010 are used, with the estimates for 2009–10 based on the latest *World Economic Outlook* growth forecasts.³ A per capita measure is used to account for the heterogeneity in population growth rates across countries—in particular, emerging and developing economies tend to have faster GDP growth than industrialized economies, but they also have more rapid population growth.

The algorithm picks out four troughs in global economic activity over the past 50 years—1975, 1982, 1991, and 2009—which correspond to declines in world real GDP per capita (first figure, top panel). Notably, 1998 and 2001 are not identified as troughs, since world real GDP per

The authors of this box are M. Ayhan Kose, Prakash Loungani, and Marco E. Terrones. David Low and Jair Rodriguez provided research assistance.

¹With market exchange rates, the share of advanced economies in world output is about 75 percent. Chapter 4 of the April 2007 *World Economic Outlook* analyzes the evolution of the distribution of world output and studies how the impact of growth in advanced economies on developing economies' economic performance has changed over time.

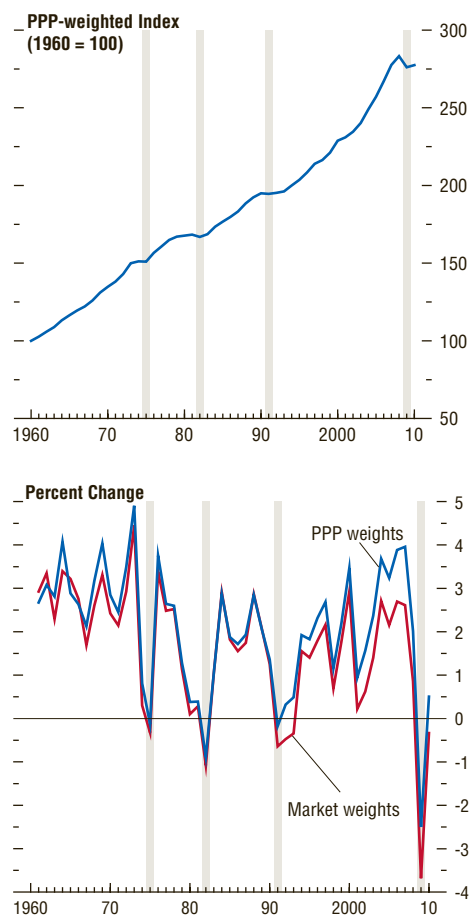
²The method determines the peaks and troughs in the level of economic activity by searching for changes over a given period of time. For annual data, it basically requires a minimum two-year duration of a cycle and a minimum one-year duration of each of the cyclical phases. A complete cycle goes from one peak to the next peak with its two phases, the recession phase (from peak to trough) and the expansion phase (from trough to peak); see Claessens, Kose, and Terrones (2008).

³The sample used to calculate this measure includes almost all the countries in the WEO database.

Box 1.1 (continued)

Real per Capita World GDP¹

(Contractions in purchasing-power-parity (PPP)-weighted global per capita GDP are shaded)



Source: IMF staff estimates.
¹Data for 2009–10 are based on the WEO forecast.

capita did not decline. In 1997–98 many emerging economies, particularly in Asia, had sharp declines in economic activity, but growth in advanced economies held up. In 2001, conversely, many advanced economies had mild recessions, but growth in major emerging markets such as China and India remained robust.⁴

⁴The analysis in Box 1.1 in the April 2002 *World Economic Outlook*, “Was It a Global Recession?” also concluded that the 2001 episode “falls somewhere short of

The use of market weights rather than PPP weights, which tilts the weights toward advanced economies, does not affect the identification of the troughs, except the one in 1991. When the market weights are used, the trough of this episode shifts to 1993 because of the downturns in many European countries during the European exchange rate mechanism (ERM) crisis of 1992–93. However, with both weights, the current projections suggest that the 2009 global recession would be by far the deepest recession in five decades (first figure, bottom panel).⁵

A Broader Assessment of Turning Points

In contrast to a statistical approach, the NBER and CEPR date business cycle peaks and troughs by looking at a broad set of macroeconomic indicators and reaching a judgment on whether a preponderance of the evidence points to a recession. The CEPR’s task is much more complex than that of the NBER because, in addition to looking at multiple indicators, it has to make a determination of whether the euro area as a whole is in recession.

This approach is applied at the global level by looking at several indicators of global activity—real GDP per capita, industrial production, trade, capital flows, oil consumption, and unemployment.⁶ The second figure shows the behavior of these indicators on average

a global recession, certainly in comparison with earlier episodes that we would have labeled as global recessions. That said, it was a close call.” See Chapter 1 of the April 2002 *World Economic Outlook* for details.

⁵By construction, the episodes of global recession the algorithm picks out correspond exactly to periods of falling world real GDP per capita. With both weights, the dates of peaks in the global business cycle are 1974, 1981, 1990, and 2008. If total (rather than per capita) real GDP is used, 2009 is the only contraction the global economy experienced since 1960.

⁶The data for unemployment are available only for a selected number of advanced economies for the full sample period. Long time series on unemployment for emerging and developing economies are difficult to obtain; moreover, the presence of large informal sectors in many of these countries lowers the usefulness of the official unemployment rate as an indicator of labor market conditions.

around the global recessions of 1975, 1982, and 1991 that were identified using the statistical approach. World industrial production and oil consumption start to slow two years before the trough and world trade and capital flows one year before. The unemployment rate registers its sharpest increase in the year of the recession. Unemployment remains high in the year after the trough, while most other indicators have recovered to close to their normal rates of growth.⁷ The current recession is following a pattern similar to that observed in past recessions, though the contractions in most indicators are much sharper this time.

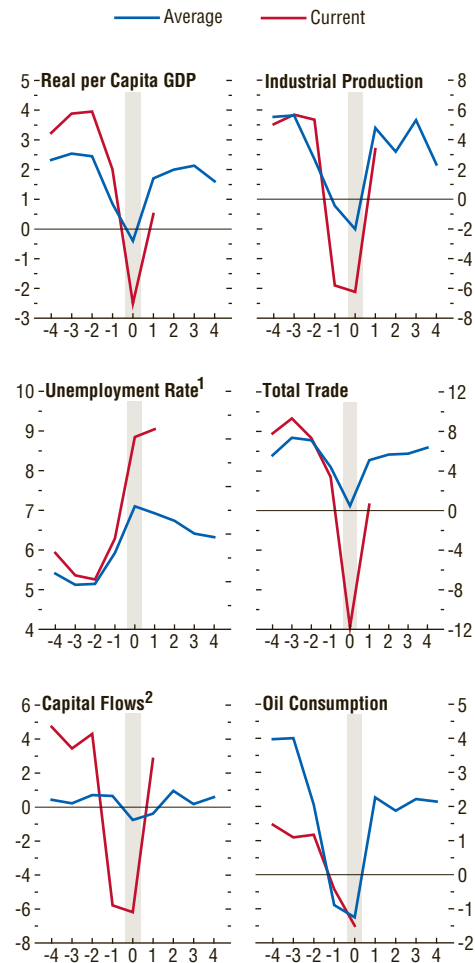
Although the four global recessions share similar qualitative features, there are some important quantitative differences among them. The table shows percent changes in the selected indicators of global activity over the course of the recessions. There are sharper declines in almost all indicators in 1975 and 1982 than in 1991; in 1991, in fact, world trade grew strongly despite the recession. Capital flows registered declines in 1982 and 1991, but those changes are much smaller than the massive contraction during the ongoing episode. Unemployment is expected to increase by about 2.5 percentage points during the current recession, which would be larger than in earlier recessions.

The severity of the 2009 recession is also indicated by the forecast decline in per capita consumption, which is much greater than that observed in 1982 and contrasts with the increase in consumption during the two other global recessions. Per capita investment declined in all global recessions, but the projected decline

⁷During the years 1998 and 2001, the behavior of these global indicators was mixed, supporting the inference from the statistical method that these episodes did not display the features of a global recession. The statistical method is also used to identify the cyclical turning points in quarterly series of global industrial production. The results are broadly consistent with those from the annual series of GDP but they also indicate a trough in industrial production over the period 2000:Q4–2001:Q4.

Selected Variables around World Recessions

(Annual percent change unless otherwise noted; years on x-axis; trough in output at t = 0)



Source: IMF staff calculations.

¹Unemployment rate in percent. Comprises data in the advanced economies only.

²Capital flows refer to the two year rolling window average of the ratio of inflows plus outflows to GDP.

in the present recession easily exceeds that observed in previous episodes.

Synchronicity of National Recessions

The third figure shows yearly fluctuations in the GDP-weighted fraction of countries that have experienced a recession, defined here as

Box 1.1 (concluded)**Global Recessions: Selected Indicators of Economic Activity***(Percent change, unless otherwise indicated)*

Variable	1975	1982	1991	Projected 2009	Average (1975, 1982, 1991)
Output					
Per capita output (PPP ¹ weighted)	-0.13	-0.89	-0.18	-2.50	-0.40
Per capita output (market weighted)	-0.33	-1.08	-1.45	-3.68	-0.95
Other macroeconomic indicators					
Industrial production	-1.60	-4.33	-0.09	-6.23	-2.01
Total trade	-1.87	-0.69	4.01	-11.75	0.48
Capital flows ²	0.56	-0.76	-2.07	-6.18	-0.76
Oil consumption	-0.90	-2.87	0.01	-1.50	-1.25
Unemployment ³	1.19	1.61	0.72	2.56	1.18
Components of output					
Per capita					
consumption	0.41	-0.18	0.62	-1.11	0.28
Per capita investment	-2.04	-4.72	-0.15	-8.74	-2.30

Note: The 1991 recession lasted until 1993, using market weights; all other recessions lasted one year.

¹PPP = purchasing power parity.

²Refers to change in the two-year rolling window average of the ratio of inflows plus outflows to GDP.

³Refers to percentage point change in the rate of unemployment.

a decline in real GDP per capita.⁸ Not surprisingly, the percentage of countries experiencing recession goes up sharply during the four global recessions. Although the 1975 recession was driven largely by declines in industrialized economies, emerging and developing economies played a role in the other three episodes. In 1982, recessions in many Latin American economies contributed to the decline in global activity, whereas in 1991 declines in the transition economies played an important role. The 1991 recession was a multiyear episode in which the U.S. recession in 1990–91 was followed by recessions among European countries during the ERM crisis.

The period 2006–07 stands out as one in which the number of countries in recession was at a historical low. However, it is being followed by a sharp reversal in fortune. In 2009, almost all the

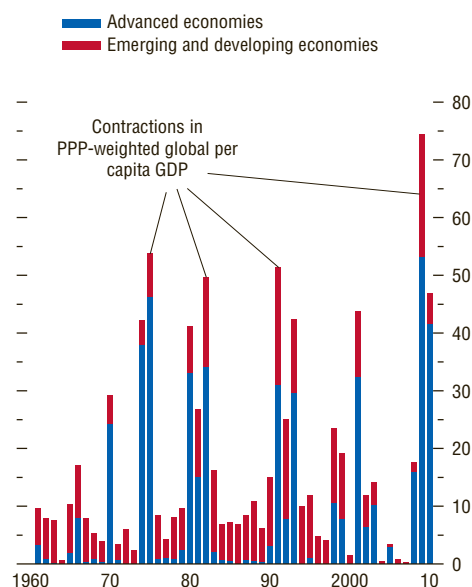
⁸Countries are weighted by their PPP weights; hence, the countries that are larger in economic size receive a greater weight in this figure.

advanced economies are expected to be in recession. The degree of synchronicity of the current recession is the highest to date over the past 50 years. Although it is clearly driven by declines in activity in the advanced economies, recessions in a number of emerging and developing economies are contributing to its depth and synchronicity.

To summarize, the 2009 forecasts of economic activity, if realized, would qualify this year as the most severe global recession during the postwar period. Most indicators are expected to register sharper declines than in previous episodes of global recession. In addition to its severity, this global recession also qualifies as the most synchronized, as virtually all the advanced economies and many emerging and developing economies are in recession.

Countries Experiencing Recessions¹

(Purchasing-power-parity (PPP)-weighted percent of countries)



Source: IMF staff estimates.

¹Data for 2009–10 are based on the WEO forecast.

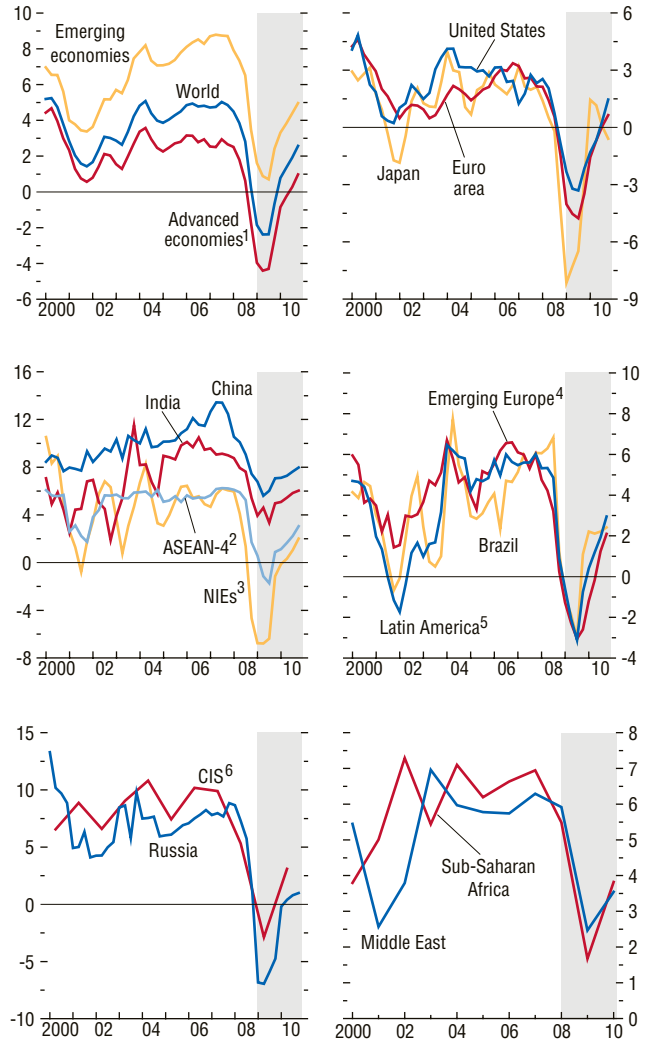
economies, the fiscal deficit is projected to jump to 10½ percent of GDP in 2009 from less than 2 percent in 2007 (see Table A8), with half of the deterioration reflecting the impact of fiscal stimulus and financial support (IMF, 2009e). Such a combined deficit would be far greater than anything experienced since World War II. Fiscal balances are expected to deteriorate in the emerging and developing economies too, swinging from a small overall surplus in 2007 to a deficit of 4 percent of GDP in 2009, with a relatively large component resulting from declining commodity and asset prices.

The third key assumption is that commodity prices will remain around current levels in 2009 and will rise only modestly in 2010 as a recovery finally gets under way, consistent with pricing in forward markets. Restrained commodity prices, together with rising output gaps, will imply a continued sharp deceleration of global inflation, as well as redistribution of purchasing power to commodity-importing countries, which will provide substantial support for demand in advanced economies (additional purchasing power on the order of 1½ percent of GDP) but will negatively affect commodity exporters.

On this basis, the advanced economies are projected to suffer deep recessions. Overall output is projected to contract by 2.6 percent (measured fourth quarter over fourth quarter) during 2009 (Figure 1.8). Following a very weak first quarter, the rate of contraction should moderate, as economies receive support from fiscal stimulus and the drag from inventory adjustment diminishes. In 2010, output is expected to increase gradually over the course of the year—by 1.0 percent—still well below potential, implying a continuing rise in unemployment to over 9 percent. Among the major economies, the United States and the United Kingdom will continue to suffer most heavily from credit constraints, given the direct damage to their financial institutions, major housing corrections, and reliance on household borrowing to support consumption. The euro area will experience an even deeper decline in activity than the United States as the sharp contraction in export

Figure 1.8. Global Outlook
(Real GDP; percent change from a year earlier)

The global economy is projected to undergo a deep and prolonged recession in 2009 with growth only returning at a gradual pace in 2010 based on strong policy actions. A wide range of advanced and emerging economies are projected to suffer substantial contractions in economic activity in 2009.



Sources: Haver Analytics; and World Economic Outlook (WEO) database.

¹Australia, 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.

²Indonesia, Malaysia, Philippines, and Thailand.

³Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

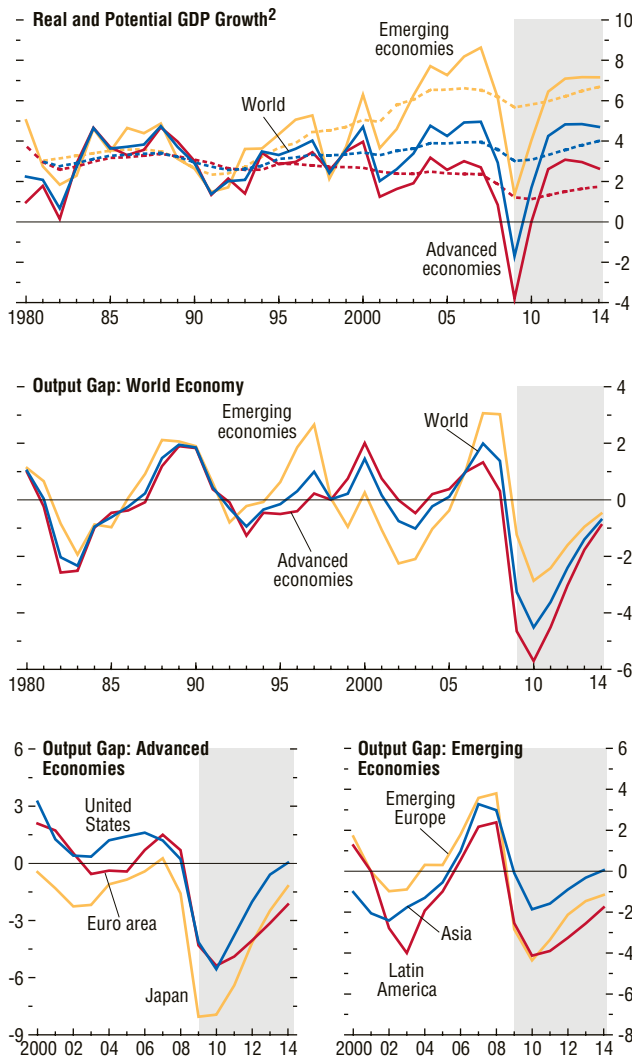
⁴Estonia, Hungary, Latvia, Lithuania, and Poland.

⁵Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

⁶Commonwealth of Independent States.

Figure 1.9. Potential Growth and the Output Gap¹

The severe global recession will imply a sharp widening in output gaps, particularly in the advanced economies, but will also affect most emerging economies. These gaps are expected to close only slowly over the medium term, implying persistently high levels of unemployment.



Source: IMF staff estimates.
¹ Estimates of the output gap, in percent of potential GDP, are based on IMF staff calculations.
² GDP growth rates of actual (solid line) versus potential (dashed line) for advanced economies. For emerging economies, Hodrick-Prescott filter applied for potential GDP.

sectors increasingly curtails domestic demand against the backdrop of financial stress and housing corrections in some national markets. In Japan, the downturn is exceptionally severe, and is being driven largely by trade, which has been hit hard because of the economy's heavy reliance on manufacturing exports, and by spillovers to domestic investment. Japan's output gap is projected to rise above 8 percent—the widest among the major advanced economies (Figure 1.9).

Emerging and developing economies as a group are still projected to eke out a modest 1.6 percent growth in 2009, rising to 4 percent in 2010. However, real GDP is expected to contract across a wide swathe of countries in 2009. The biggest output declines are projected in the CIS countries, as a reversal of capital flows has punctured credit booms and commodity export revenues have dwindled. Countries in emerging Europe are having to adjust to a sharp curtailment of external financing, as well as a drop in demand from western Europe. East Asia's exporters, like Japan, have been hit hard from the collapse in demand for manufacturing exports. China and India will see growth dropping sharply, but are still expected to achieve solid rates of growth by the standards of other countries, given the momentum of domestic demand (reinforced, particularly in China, by policy easing). Middle Eastern oil exporters are using financial reserves to maintain government spending plans to cushion the impact of lower oil prices. In Latin America, recent prudent macroeconomic management in many countries has provided buffers, but economies are heavily affected by declines in export volumes, weak commodity prices, and tight external financing conditions. African economies are also being squeezed by declines in commodity export prices and export markets, but most are less reliant on external financing.

Downside Risks Predominate

The current outlook is exceptionally uncertain, with risks still weighing on the downside,

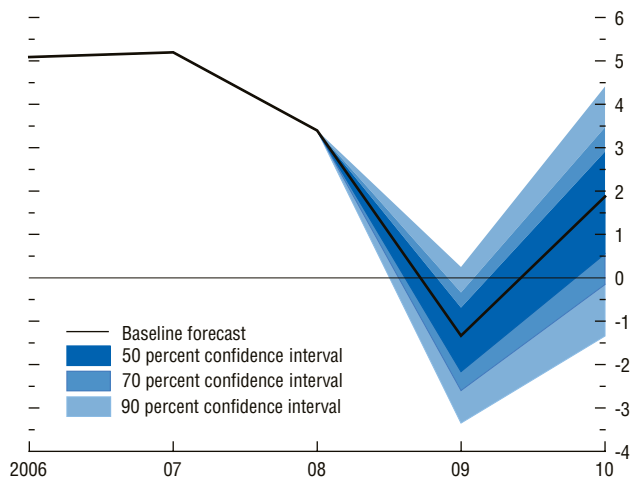
despite the lowering of the baselines, as illustrated in the fan chart for global growth (Figure 1.10). This fan chart is now constructed based on market indicators, as explained in Appendix 1.2. These indicators suggest that the variance of growth risk is at present much greater than normal and also indicate the downward skewness of risks.

Before exploring these downside risks, it should be acknowledged that there is upside potential to the outlook. Bold policy implementation that is able to convince markets that financial strains are being decisively dealt with could set off a mutually reinforcing “relief rally” in markets, a revival in business and consumer confidence, and a greater willingness to make longer-term spending commitments. The problem is that the longer the downturn continues to deepen, the slimmer the chances that such a strong rebound will occur, as pessimism about the outlook becomes entrenched and balance sheets are damaged further.

Turning to the downside, a dominant concern is that policies will continue to be insufficient to arrest the negative feedback between deteriorating financial conditions and weakening economies in the face of limited public support for policy action. The core of the problem is that as activity contracts across the globe, the threat of rising corporate and household defaults will imply still-higher risk spreads, further falls in asset prices, and greater losses across financial balance sheets. The risks of systemic events will rise, the tasks of restoring credibility and trust will be complicated, and the fiscal costs of bank rescues will escalate further. Moreover, a wide range of financial institutions—including life insurance companies and pension funds—will run into serious difficulties. In turn, additional stress in the financial sector will drive greater deleveraging and asset sales, tightening of access to credit, greater uncertainty, higher saving rates, and even more severe and prolonged recessions. In a highly uncertain context, fiscal and monetary policies may fail to gain traction, since high rates of precautionary saving could lower fiscal multipliers and steps to ease

Figure 1.10. Risks to World GDP Growth¹
(Percent change)

The outlook is exceptionally uncertain, with risks to the forecast still weighing to the downside. See Appendix 1.2 for details of how the variance and skewness of the fan chart are related to market indicators.

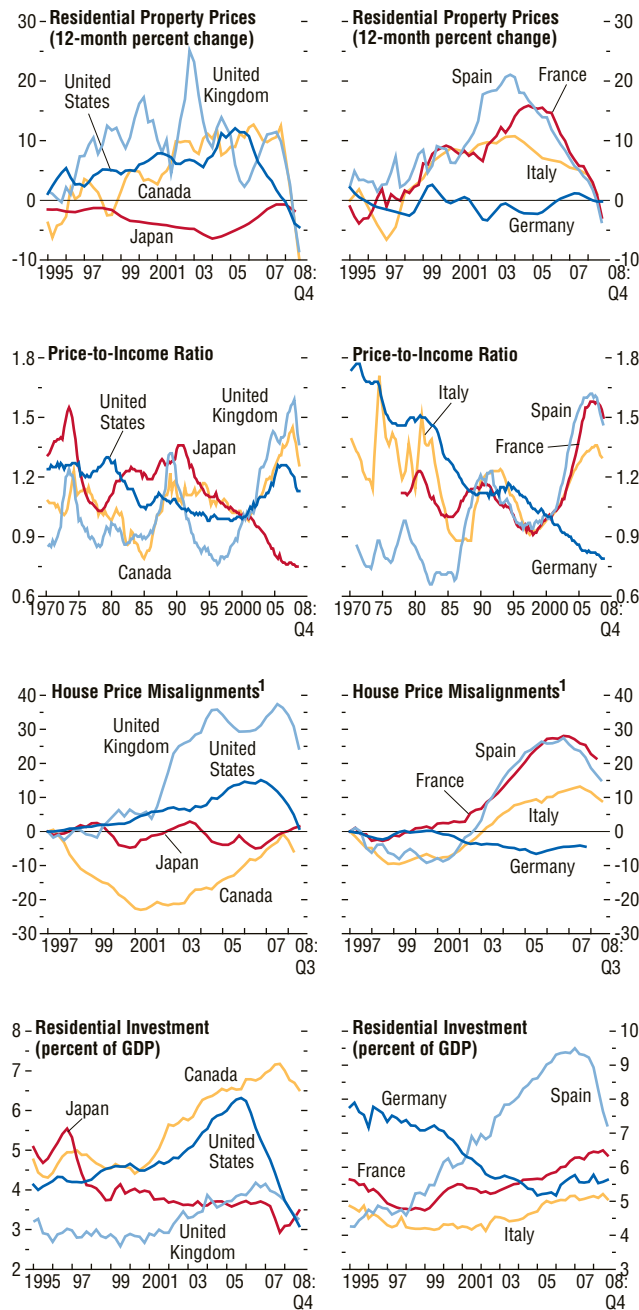


Source: IMF staff estimates.

¹The fan chart shows the uncertainty around the WEO central forecast with 50, 70, and 90 percent probability 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.

Figure 1.11. Housing Developments

House prices have decelerated sharply across a broad range of advanced economies and are now falling in a number of markets. Nevertheless, house price misalignments remain substantial in many countries.



Sources: Haver Analytics; Organization for Economic Cooperation and Development, *Economic Outlook*; and IMF staff calculations.

¹Estimates based on methodology described in Box 1.2 of the October 2008 *World Economic Outlook*.

funding could fail to slow the momentum of deleveraging.

These negative interactions would operate through a complex series of interrelated channels that would play across both advanced and emerging economies. Key transmission routes include deep corrections in national housing markets, especially but not exclusively in advanced economies; corporate stress, especially but not exclusively in emerging economies; deflation risks, mainly in advanced economies; and increasing vulnerabilities in public sector balance sheets, especially but not only in emerging economies. Each of these risks is discussed in turn below, before the section concludes with a negative downside scenario to illustrate the possible combined impact on the global economy.

When Will Housing Slumps End?

The slump in the U.S. housing market was the immediate trigger for the subprime crisis and the source of continuing heavy losses to the financial system, declines in household wealth, and dropping construction activity, which remain major drags on U.S. economic activity.³ The baseline projections envisage stabilization and turnaround in this sector after a further 10–15 percent drop in house prices (measured by the Case-Shiller 20-city index) that would lower U.S. house prices by more than 35 percent from their peak, bring valuation ratios more closely in line with medium-term norms, and leave construction activity well below previous cyclical troughs (Figure 1.11). However, rising unemployment and an increasing share of households with “negative equity” (house prices are currently below outstanding mortgages for 20 percent of borrowers) threaten a further increase in foreclosure rates that could generate serious overshooting and continued housing weakness through 2010. This concern underlines the importance of effective implementation of recent government initiatives to

³These connections are explored in Box 1.2 in the October 2008 *World Economic Outlook*.

facilitate mortgage restructuring and to ensure an adequate supply of credit.

Many European housing markets also suffered from boom conditions in recent years, and IMF staff estimates suggest that house price misalignments were as large or even larger than in the United States in a number of countries. Although not all national markets were affected, Ireland, Spain, and the United Kingdom are now experiencing major corrections that most likely have a considerable distance still to run. A number of countries in emerging Europe are also suffering major housing downturns, and for some of these countries, the situation is made more dangerous because a high proportion of mortgages are denominated in foreign currencies, implying a rising burden on households if currencies move abruptly. Downside risks include overshooting in western European markets already experiencing major corrections, more severe corrections in other markets where there are indicators of significant house price misalignments (although household leverage is much lower than elsewhere), and rising household stress in emerging Europe.

Rising Threat of Emerging Market Corporate Defaults

As the global downturn deepens and credit markets remain severely impaired, the threat of corporate defaults is rising to dangerous levels, particularly in those emerging economies most dependent on external financing.

As shown in Box 1.2, the nonfinancial corporate sector in both advanced and emerging economies took advantage of the boom years over 2003–07 to strengthen balance sheets—lowering leverage and raising liquidity—and to boost returns on assets. However, the economic downturn and financial crisis have already brought considerable corporate distress in their wake, and bankruptcies have risen sharply, notably in the United States.

Dealing with corporate bankruptcies will be a major challenge in the advanced economies, but an even greater threat lies in the corporate

sector in emerging economies. In total, these economies face rollover needs (short-term debt plus amortization of medium- and long-term debt) of \$1.8 trillion in 2009. The bulk of requirements will come from the corporate sector, particularly in emerging Europe (see the April 2009 GFSR). The risk is that such rollover needs will not be met because external financing will be curtailed even more sharply than anticipated in the baseline projections, in the context of deteriorating economic prospects and intense global deleveraging.

Emerging economies are especially exposed because factors that are generally pushing banks to retrench from cross-border positions, such as swap market dislocations and the high cost of foreign currency liquidity, are exacerbated. Moreover, hedge funds and other emerging market portfolio investors face continued pressures to deleverage positions from lack of access to funding and from redemptions. Banks that have been a dominant source of funding in emerging Europe could start to cut exposures, and rollover rates for maturing short-term credits could fall sharply, as occurred, for example, during the Asian crisis. To date, subsidiaries of foreign banks operating in emerging Europe have largely maintained their exposures, given long-term business interests in the region, but the situation could shift quickly as conditions deteriorate.

Sudden stops in external financing could trigger dangerous repercussions, because liquidity problems could rapidly become threats to solvency, as has happened too often in the past. Corporations that previously relied on foreign funding may try to shift to domestic funding markets, adding to pressures on smaller local enterprises. Rapid exchange rate depreciation would add to pressure on balance sheets, particularly for borrowers with large foreign currency exposures.

Countries that have accumulated stockpiles of foreign reserves and have sound public balance sheets would have room to buffer the impact through policy responses, but these buffers are in danger of being eroded over time if the loss

Box 1.2. How Vulnerable Are Nonfinancial Firms?

This question is more relevant than usual for assessing the outlook for the financial sector and the broader economy. The balance-sheet and market-based indicators presented in this box show that the resilience of the nonfinancial corporate sector to shocks has improved considerably since the late 1990s and until recently has been a supporting factor for the financial sectors and economies affected by the crisis. Yet as the financial crisis has deepened and the economic recession has become more synchronized between advanced and emerging economies, balance sheets of nonfinancial firms across the world have started to weaken. A further deterioration in the health of the nonfinancial corporate sector now risks triggering further losses in the banking sector and intensifying the vicious macrofinancial feedback in this global crisis.

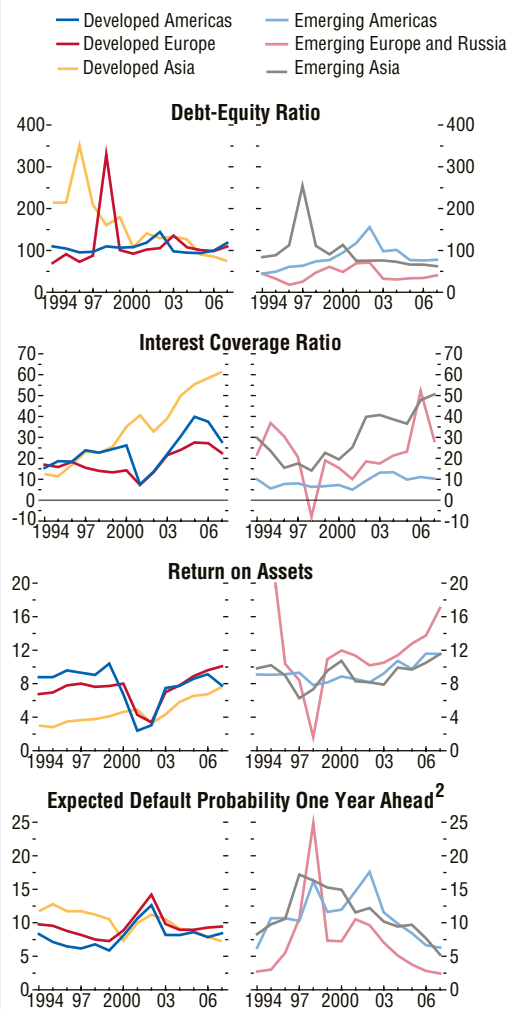
For several years prior to the current crisis, leverage in the nonfinancial corporate sector declined steadily, largely owing to successful restructuring exercises following previous stress episodes (particularly, the Japanese crisis, the Asian crisis, and the bursting of the dot-com bubble). At the start of the present crisis, the degree of leverage in advanced and emerging economies' firms was broadly similar (first figure, top panel). In Asia, in particular, leverage was down significantly from the Asian crisis peaks. Emerging European and Russian firms enjoyed particularly low leverage owing to high oil prices and asset valuations.

Other balance-sheet indicators also registered an improvement in the run-up to the crisis. In particular, subdued investment and easy access to credit helped boost corporate liquidity (first figure, second panel). Profitability was also strong, especially in emerging Europe and Russia (first figure, third panel).

Stronger balance sheets implied a lower risk of insolvency in response to shocks, reducing the value of assets and equity. Measures of default probability based on accounting data

The main authors of this box are Dale Gray and Natalia Tamirisa, with assistance from Ercument Tulun and Jessie Yang.

Selected Balance Sheet Indicators for Nonfinancial Firms¹

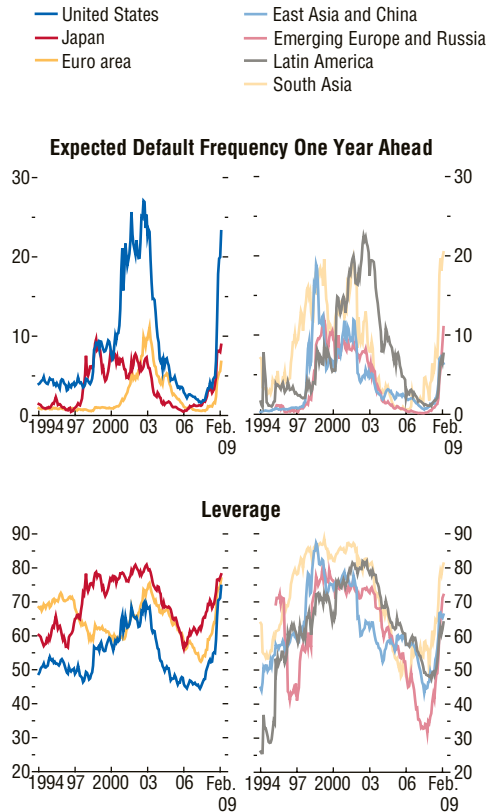


Sources: Worldscope and IMF staff calculations.

¹In percent. Regional aggregates are computed by weighing country data by market capitalization valued at market exchange rates. Within countries, firm-level data are also weighed by market capitalization, to focus on the default risk of the largest, economically most important firms.

²Default probabilities are calculated based on so-called Z-scores—a weighted sum of the ratio of working capital to total assets, retained earnings to total assets, earnings before interest and taxes, total assets, market value of equity to total liabilities, and sales to total assets. The weights are estimated for a sample of U.S. firms (Altman, 1968).

Selected Market-Based Indicators for Nonfinancial Firms¹



Sources: Moody's-KMV CreditEdgePlus database; and IMF staff calculations.

¹In percent. Data refer to the 75th percentile of companies, which means that 25 percent of companies have default probabilities or leverage above the plotted values. The 75th percentile default probabilities focus on the most vulnerable group of companies and tend to be considerably higher than the median values of default probabilities. Leverage is calculated as the default barrier divided by the market value of assets.

showed that corporates in emerging economies—in Asia, emerging Europe and Russia, and Latin America—were much less likely to default in 2006 than in 1996, just before the onset of the late 1990s crises (first figure, bottom panel). Thanks to successful restructuring and a long period of strong growth, the default probabilities of emerging econo-

mies' firms declined to advanced economies' levels or even lower (for emerging Europe and Russia). Based on accounting data, the likelihood of default among advanced economies' firms was broadly the same as before the previous crisis episodes, such as, for example, the bursting of the dot-com bubble of the early 2000s and the Japanese financial crisis. Market-based measures of default probabilities and leverage paint a broadly similar picture (second figure).

Since the onset of the financial crisis, balance sheets of nonfinancial firms across the world have weakened significantly. At the beginning of the crisis in 2007, the debt-equity ratios in western Europe and the United States rose in tandem with falling asset values. (Balance sheet data for 2008 are not available yet for most nonfinancial firms.) The structure of corporate debt in emerging economies is generally more biased toward short-term debt. And with the onset of the crisis, the reliance of emerging economies' firms on short-term debt increased, especially in emerging Europe and Russia, possibly reflecting preferences of lenders concerned about vulnerabilities in the region. The first year of the crisis saw a decline in liquidity and profitability in the United States and to a lesser extent in western Europe, as credit conditions tightened.

More recent market-based indicators suggest that corporate solvency risks rose sharply across the world following the collapse of Lehman Brothers in September 2008. Among the G3 economies (United States, euro area, Japan), U.S. firms experienced the largest increase in default probabilities, to levels that are more than double those in the euro area and four times higher than in Japan (second figure, top panel).¹

¹These default probabilities are calculated using a contingent claims approach that uses equity market information combined with balance-sheet data to estimate forward-looking default probabilities. The estimates are provided by Moody's-KMVCreditEdgePlus, which is an extension of the original Contingent Claims Analysis model developed by Robert C. Merton, and is applied to 30,000 firms and 5,000

Box 1.2 (concluded)

As of February 2009, corporate default probabilities in the United States were still below the peaks experienced when the dot-com bubble burst in the early 2000s. However, corporate default probabilities in Japan have already reached previous crisis levels. Corporate default probabilities in emerging economies have also risen since September 2008. The largest increases occurred in south Asia, possibly owing to the high leverage of Indian companies (second figure, bottom panel), their close production links with the United States, a collapse in equity prices, and a drop in real estate prices that has undermined the position of construction firms.² The risk of default has also increased sharply in emerging Europe and Russia, approaching previous crisis peaks. In Latin America and east Asia and China, however, corporate default probabilities remain considerably below the levels experienced during the late 1990s crises.

The position of nonfinancial firms is set to weaken further amid the deepening financial

crisis and global recession. Many nonfinancial firms in advanced and emerging economies have so far weathered the crisis by drawing on their large cash reserves, but plummeting external and domestic demand has recently started to take its toll on corporate cash revenues. Firms with large outstanding external debt have been affected in some cases by exchange rate depreciation. A financing squeeze has also intensified, as manifested in tighter external financing conditions, difficulties in obtaining trade finance, and domestic banks' increased aversion to risk. Smaller and lower-credit-quality firms and firms with high rollover needs in 2009 are being more severely affected than others.

A weakening of corporate balance sheets is contributing to a slowdown in investment and, through a rise in nonperforming loans, a deterioration in bank balance sheets. Such negative feedback loops are of particular concern in emerging economies, where financial sectors have so far weathered the crisis better than financial sectors in advanced economies. Nonfinancial corporate defaults also pose a risk for financial markets, as large-scale bankruptcies may heighten counterparty risks and cause spillovers to other countries' banks, both in advanced and emerging economies.

financial institutions in 55 countries. It provides forward-looking indicators of risk updated daily.

²For more details on corporate vulnerabilities in Asia, see the IMF's *Regional Economic Outlook* for the Asia-Pacific region. Also see IMF (forthcoming).

of external financing is prolonged. Legal frameworks for corporate restructuring are generally less well developed in emerging economies, implying that rising distress would be more likely to lead to insolvency and liquidation. And debt defaults would damage both domestic financial systems and foreign creditors. Emerging market banks already face large losses, and these could be magnified, while banking systems in western Europe that have built up large exposures would also be vulnerable.

Gauging Risks for Deflation

Since the summer of 2008, there has been a sea change from concern in many countries

that overheating and booming commodity prices could stoke excessive inflation to the opposite worry—that price deflation could exacerbate the downturn in activity, as occurred in Japan in the 1990s and more intensely during the Great Depression of the 1930s.

Inevitably, the aftermath of the sharp drop in oil and food prices in the context of widening output gaps has been a rapid deceleration of headline inflation. Consumer prices declined at an annual rate of more than 4 percent in the advanced economies during the fourth quarter of 2008. Measures of core inflation and of 12-month-ahead inflation expectations still remain in the 1–2 percent range, except in Japan (see Figure 1.3), but sustained high rates of

excess capacity together with sharp falls in house and equity prices threaten continued declines in consumer prices that could eventually lead to entrenched expectations of price deflation. This would have two negative consequences. First, the ability of monetary authorities to provide stimulus through low policy rates would be curtailed; indeed real interest rates could rise as deflation intensifies with policy rates jammed against the zero bound. Second, falling prices would imply increasing real debt burdens on businesses and households, adding to risks that weakening activity and financial stress would trigger widespread defaults and providing a further twist to the negative interaction between the real economy and the financial sector.

How large are deflation risks? In the baseline projections, 12-month consumer price index inflation falls well below zero in the first half of 2009 in both Japan and the United States but returns to positive territory in the United States and close to zero in Japan in the first half of 2010. In western Europe, where energy has a lower weight in consumption baskets, inflation falls to low levels but mostly avoids going negative. In most emerging economies, which entered the crisis with substantially higher inflation and with excess demand, inflation is projected to remain solidly positive, although inflation in some east Asian economies (including China) is projected to be low or even negative in 2009. However, there are clearly downside risks, especially in the event of weaker growth outcomes and wider output gaps. Recent work by the IMF staff finds that an indicator of global deflation risk has now risen to well above levels observed in 2002–03, when deflation was also a concern (Decressin and Laxton, 2009). This index does not take into account weakness in housing markets nor the whole range of financial market strains, both of which add to deflation concerns.

Box 1.3 investigates deflation risks in more detail for the G3—United States, euro area, and Japan—using a stochastic forecasting tool that takes into account the zero interest floor and was developed by the IMF staff to explore the

risks around the baseline. As illustrated in the box, there are considerable risks of sustained very low inflation (below ½ percent), moderate deflation risk in the United States and the euro area, and significant likelihood of deeper price deflation in Japan. In each economy, policy interest rates are likely to remain close to the zero floor for a lengthy period, but real rates could come under upward pressure in the weaker part of the range of outcomes as deflation intensifies. Such outcomes would add to negative momentum, underlining the need for vigorous monetary policy responses to head off such risks.

Sovereigns under Stress

Like businesses, many governments in both advanced and emerging economies took advantage of buoyant revenues in the 2003–07 boom years to strengthen their finances, bringing down fiscal deficits and lowering public debt levels (although little progress was made to address longer-term demographic pressures on government spending). However, the combination of deteriorating economic prospects, falling commodity prices, and severe financial stress has raised concerns about the potential for sharp increases in debt issuance related to both widening fiscal deficits (from both stimulus measures and cyclical factors) and the use of public resources to support the financial and corporate sectors.

Against this backdrop, yield spreads and prices on credit default swaps on government securities have spiked upward across a range of countries, even as yields on debt issued by major economies such as the United States, Germany, and Japan have declined. In the advanced economies, among the most affected have been those with a large and vulnerable banking sector, whether from excessive leverage (for example, Iceland), exposure to emerging Europe (Austria), or exposure to housing corrections (Ireland, Spain), although concerns over the impact of a prolonged downturn on already weak fiscal positions have also played a part (for example, Greece). Indeed, wide dif-

Box 1.3. Assessing Deflation Risks in the G3 Economies

Simulations with a version of the Global Projection Model, covering the United States, the euro area, and Japan, shed light on the risks of deflation in the current outlook.¹ The simulations assume that the relevant central banks continue to pursue an objective for inflation consistent with their behavior over the past decade. In the model, they adjust their policy interest rate according to an estimated monetary policy rule, which responds to the deviation between expected and desired inflation and the gap between actual and potential output. The rule is, however, subject to the constraint of the zero interest rate floor (ZIF).

Model projections are constructed to be broadly consistent with the World Economic Outlook (WEO) baseline scenario; thus, they reflect currently enacted fiscal policies, including the U.S. February 2009 stimulus package.

The figure shows confidence intervals for four variables (the policy interest rate, inflation, growth, and the unemployment rate) in the three economies.² The intervals were derived using stochastic simulations, based on the estimated historical distributions of all the random factors in the model. The projection period in the figure is 2009:Q1–2011:Q4.

Results for the United States are shown in the first column of panels. The confidence bands suggest a high probability that the federal funds rate will remain close to zero for much of the next two years and a low probability that it will rise above 2 percent over the three-year forecast horizon. Year-over-year inflation drops very sharply in early 2009, to negative numbers, largely as a result of falling energy prices. As the latter stabilize, the inflation rate rebounds, but the median projection (at the center of the bands) remains close to

The main authors of this box are Kevin Clinton, Marianne Johnson, Ondra Kamenik, and Douglas Laxton.

¹This box is based on Clinton and others (forthcoming).

²The narrowest interval (darkest shading) is for the 0.1 confidence level; the wider intervals are for, respectively, the 0.30, 0.50, 0.70, and 0.90 levels.

zero through 2010, and the bands indicate a sizable continuing risk of deflation. The probability that inflation will reach the Federal Reserve's comfort zone over the next two years is low.³

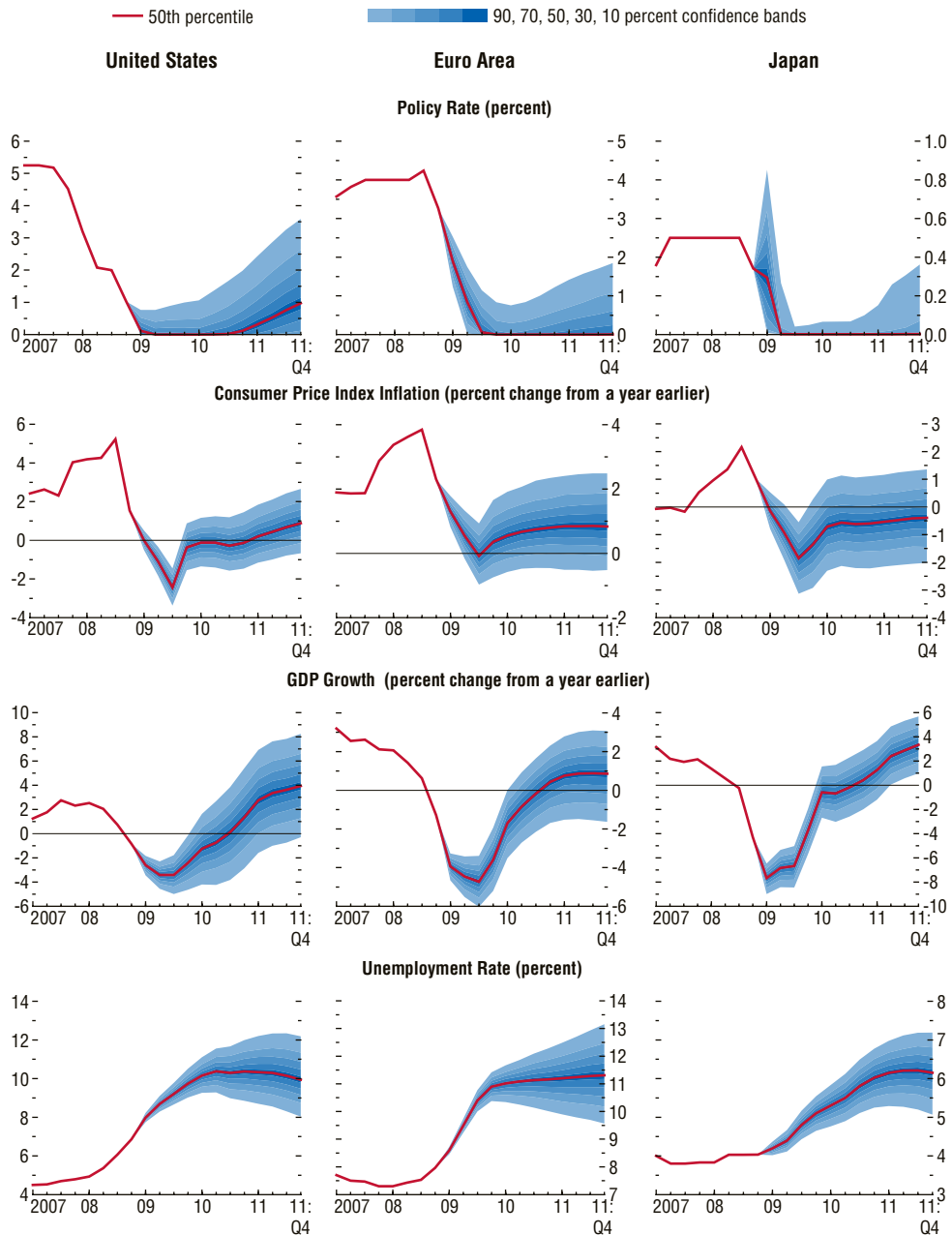
In the baseline, U.S. GDP growth, on a four-quarter basis, troughs in 2009:Q2, at about –3.0 percent; positive growth does not resume until mid-2010. Unemployment continues to rise through 2010 as employment growth lags output growth. At the peak unemployment rate, the confidence bands are somewhat wider above the median than below, suggesting that downside risks exceed upside risks. This asymmetry reflects nonlinearities; negative shocks have increasingly negative effects, through feedback between the real and financial sectors (for example, loss in collateral value leads to a tightening in lending conditions) and through the ZIF.

The euro area (second column) shows significantly less risk of deflation in the near term than the United States. In the baseline, inflation declines by much less, but rises more slowly.

As a result, the median path for the European Central Bank (ECB) policy rate does not hit the ZIF exactly, but stays lower for longer because of greater inertia in the economy. The probability that inflation will reach the ECB target of just under 2 percent by end-2010 looks fairly low. Output shows a similar profile to the United States, with a return to positive growth in 2010:Q3. The median path for the unemployment rate reaches double digits, and again the confidence interval is asymmetric, reflecting downside risks in the baseline.

³The model uses headline consumer price index (CPI) in all countries. Based on past trends in relative prices, a target range of 2–2.5 percent for headline CPI for the United States would be associated with a 1.5–2 percent range for the core consumption deflator, a range that includes each Federal Reserve Board Federal Open Market Committee (FOMC) member's views of appropriate long-term inflation objectives. In January 2009 the Federal Reserve started to publish FOMC members' long-term forecasts to provide a better focal point for long-term inflation expectations.

Forecast Confidence Bands for the G3 Economies¹



Source: IMF staff estimates based on Global Projection Model.
¹Clinton and others (forthcoming).

Box 1.3 (concluded)

Japan starts with significantly greater deflation risks than the United States or the euro area. Economic activity is very weak, and, apart from the energy-related spike in 2008, the inflation rate has not been much above zero for many years. Largely as a result, the policy rate is kept at zero throughout the projection. The median path for inflation remains negative, even after energy prices stabilize, through 2010 and 2011. The median for the unemployment rate peaks at about 5½ percent, which would be historically high for Japan.

These projections are quite bleak, and since the ZIF allows little, if any, room for further interest rate reductions, they imply an argument for enhanced fiscal stimulus. It turns out that simulations of the model for a common higher

level of fiscal stimulus (equivalent to about 1 percent of GDP in 2011) yields outcomes in which the probability of hitting the ZIF is lower, inflation is closer to target, and unemployment is lower (see Clinton and others, forthcoming). Moreover, the higher fiscal stimulus reduces the risks in the unemployment outlook in that it results in narrower, and more symmetric, confidence bands for unemployment.⁴

⁴Models will often fail to converge under deflation shocks, and this is the case for the current model under various conditions. For example, a very low inflation target, or a high weight on actual inflation in the expectations process, can result in deflation spirals. This is more than a mere technical issue: it indicates a real risk that a deflation problem could become intractable in the absence of strong stabilizing policies.

ferentials in government bond spreads within the euro area have raised particular concern about how to handle a possible loss of market access by a sovereign borrower. In the emerging economies, among the most affected have been countries with large external financing needs (for example, in emerging Europe), high risks of financial and corporate stress as credit booms are unwound (for example, in central Asia), and risks of widening fiscal deficits as commodity revenues plummet (for example, in some South American countries).

To date, sovereigns have avoided defaults, with the singular exception of Ecuador. However, there could certainly be dangerous contagion effects spreading from a debt event in one country to others with similar characteristics. Moreover, rising concern about sovereigns under stress is reducing room to use fiscal policy as a countercyclical tool to respond to weakening macroeconomic conditions in the short term, as well as adding to sustainability concerns over the longer term if spreads do not narrow. Particularly damaging to the global system would be an abrupt loss in appetite for longer-term U.S. government bonds in the face of increasing worries

about the U.S. fiscal trajectory. Such an event could prompt a sharp drop in the value of the dollar, put strong upward pressure on other currencies viewed as safe havens, and give a further jolt to financial market volatility. These concerns underline the importance of advancing credible medium-term fiscal consolidation plans in the United States.

Exploring the Downside

Putting together the downside risks from macrofinancial linkages through the full range of channels is a hugely complex task, even for a single country—let alone the global economy—and is far beyond the capacity of any single economic model. But clearly the risks are large, as illustrated by the way macrofinancial interactions have already led to such an abrupt slowdown in activity and have intensified stress since last September. A particular concern is that as the situation has deteriorated, room for further macroeconomic policy support has dwindled—interest rates have approached the zero bound, fiscal policy faces rising concern about long-term sustainability, and reserve buffers are being depleted.

A downside scenario for the global economy is sketched in Figure 1.12, based on a simple global macroeconomic model, to illustrate how, in the context of weak policy implementation, further demand shocks from macrofinancial interactions could spill across borders to generate an even deeper and more prolonged global recession. This scenario corresponds broadly with the lower end of the 90 percent confidence interval shown in the fan chart in Figure 1.10. Although the links are not modeled explicitly, these demand shocks would include tighter restrictions on bank credit, falling asset and commodity prices, deeper housing corrections, and greater corporate distress.⁴ These shocks are applied at a global level, although with different intensity in different regions, consistent with the findings in Chapter 4 that high levels of stress are quickly transmitted from advanced to emerging economies. The model assesses the impact of trade linkages, showing the damage done to output in emerging Asia in particular, where the domestic demand shock has been relatively mild. The central message from this scenario is that the current global downturn could persist much longer than in a normal business cycle. As illustrated, activity would continue to decline through 2010 before a recovery finally gets under way in 2011. It would take many years to reduce the large output gaps accumulated over this period, which could rise to about 9 percent at the global level by end-2010.

Medium-Term Prospects beyond the Crisis

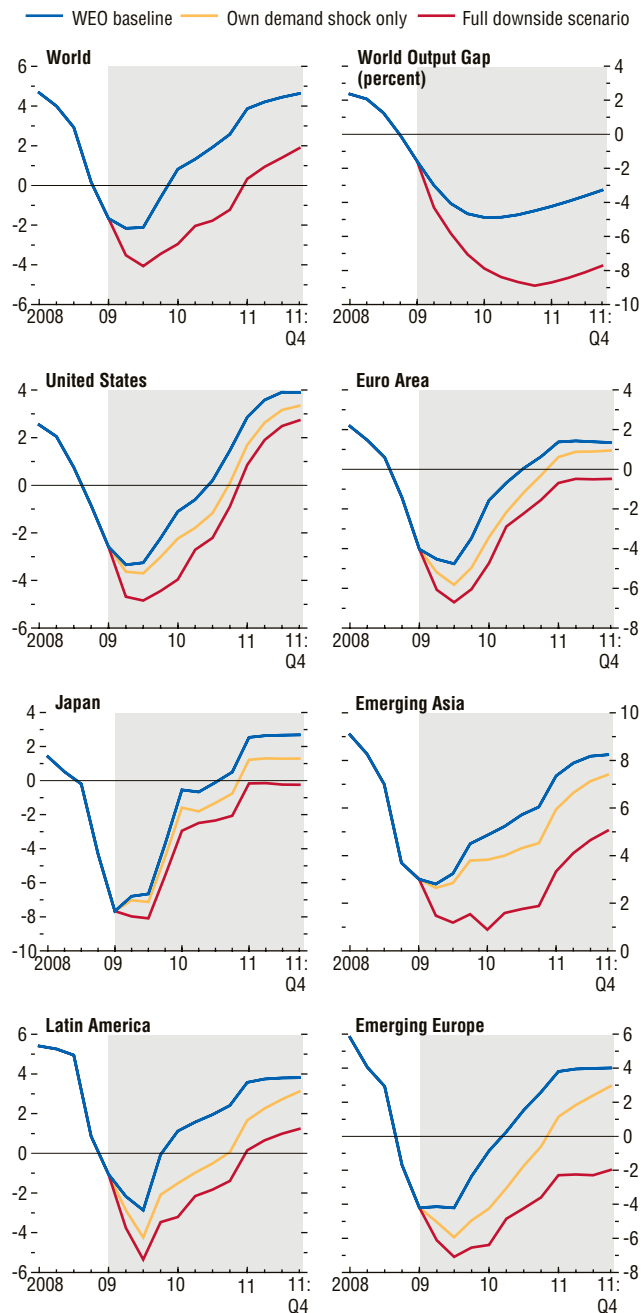
Although the precise length and severity of the present global downturn remain highly uncertain, it is not too soon to start looking ahead to how the global economy and financial system will emerge from the crisis and identifying the forces that will shape the new landscape. This section focuses on the difficult transition ahead—covered by the World Economic Out-

⁴The shocks built into the downside scenario are described in more detail in Appendix 1.3.

Figure 1.12. Downside Scenario

(Percent change in output from a year earlier unless otherwise noted)

With weak policy implementation, the global economy would be vulnerable to a further intensification of negative macrofinancial feedbacks. The downside scenario presented here, based on a global macroeconomic model, represents the impact of a variety of region-specific demand shocks and shows how the total impact on real GDP growth would be further magnified by trade linkages. See Appendix 1.3 for additional details.



Sources: WEO database; and model simulations.

look (WEO) five-year projection period—during which damage now being done will need to be repaired and the world economy will need to adjust to new realities. How this occurs will be crucial to returning to a path of sustained global growth, rather than undergoing years of lackluster performance, and has relevance for policy design and implementation to deal with the present crisis. Although short-term needs are paramount, stabilization will be hard if not impossible to achieve if policies do not provide a clear path to a more robust global economy in the future.

This section first looks at forces at play in four key areas: the global financial system and capital flows, public finances, private saving behavior, and productivity. It then considers how these drivers may interact to shape global economic prospects.

Deleveraging Will Continue to Weigh on Credit Creation and Capital Flows

A central challenge will be the restoration of healthy financial systems capable of providing the credit needed for investment and growth while avoiding the excessive buildup of risk that led to the current crisis. Clearly, financial systems will go through lengthy transition periods. After being propped up by massive government intervention, private capital must be rebuilt, government guarantees rolled back, and the expansion of central bank balance sheets unwound as confidence and trust are restored. At the same time, it is now widely understood that regulation of financial markets and institutions will need to be overhauled to broaden the regulatory perimeter and bring all systemically important institutions and markets under regulatory oversight, establish stricter control over leverage, and promote more robust risk management, while applying a macroprudential approach to mitigate procyclical effects. Moreover, market discipline will need to be strengthened through improved transparency and more incentive-compatible compensation structures. How exactly this should be achieved—and in particular

how to strike the right balance between market incentives for risk taking and safeguarding system stability—is now the subject of intense study and review.⁵

Whatever the specifics, the process of restoring capital and trust, reducing leverage, and rebuilding institutions and markets will inevitably take considerable time—measured in years—during which credit availability is likely to remain seriously curtailed. Projections presented in the April 2009 GFSR suggest that bank credit expansion in the major advanced economies will remain sluggish through the middle of the next decade. The recovery of securitization may also be gradual, since institutions and markets will need to be redesigned and confidence rebuilt. Tighter credit discipline and the reduction of leverage are likely to have a particular impact on the availability and pricing of credit to riskier borrowers, both firms and households.

These changes in the global financial system will have important consequences for international capital flows across a number of dimensions. Greater constraints on leverage and a stronger tendency for home bias are likely to continue to dampen gross cross-border flows in the aggregate, after years of rapid growth. Moreover, tighter risk management and greater limits on leverage should in principle reduce the tendency for surges in flows in response to short-term opportunities and bring greater attention to long-run vulnerabilities. Both of these shifts would make it more difficult for countries to finance very large current account deficits or sustain overvalued exchange rates. At the same time, however, countries that have responded well in dealing with the current storms and avoided the debt defaults experienced with sudden stops in the past should gain credibility and be well placed to attract capital looking for an attractive balance of risk and return.

⁵See the discussion in the April 2009 GFSR, as well as other recent studies by the IMF (2009a, 2009b, 2009c, 2009d, 2009f); Group of 30, 2009; and de Larosière Group, 2009.

Capital flows to emerging and developing economies are projected to regain momentum over the next five years, after a sharp drop in 2009, but to remain well below the peaks seen in 2007 and 2008 (Figure 1.13). In fact, aggregate net inflows are expected to be close to zero or negative, since economies in Asia and the Middle East would be capital exporters as current account surpluses are invested elsewhere—in emerging as well as mature markets. Flows to countries in emerging Europe and the CIS are expected to be less than half the rates observed in recent years as a reaction to the vulnerabilities involved with large-scale bank and portfolio financing of current account deficits. Net flows to Latin America and Africa will depend largely on foreign direct investment.⁶

Paths to Fiscal Consolidation

Like financial systems, public finances will go through difficult transitions over the next five years. After jumping in 2009, fiscal deficits will need to be consolidated to bring public finances back on a sustainable trajectory, particularly with looming demographic pressures on spending.

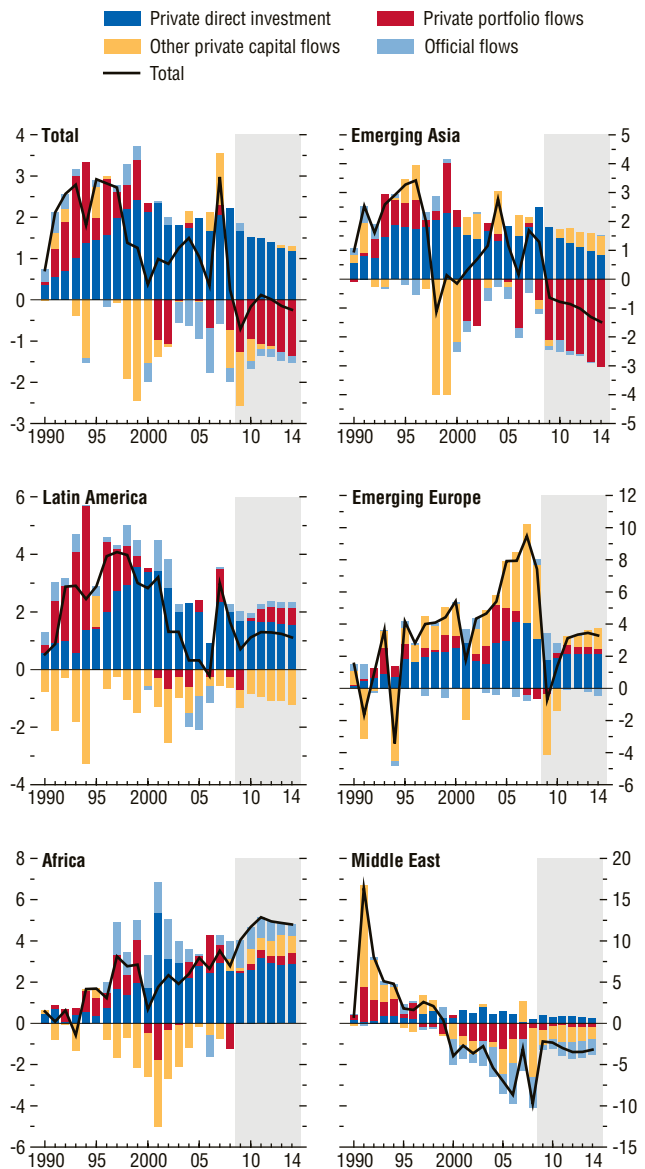
The feasible pace of fiscal consolidation will depend to a considerable extent on the degree to which economic growth is restored in 2010 and beyond. Fiscal deficits will inevitably remain wide in 2010 as fiscal support continues to be provided to sustain still-fragile economic conditions, but a return to more self-sustaining economic growth thereafter would provide the basis for a deliberate withdrawal of stimulus. The fiscal accounts should also benefit from improving cyclical conditions and rising asset prices.

Even after building in consolidation, fiscal prospects in the advanced economies cause serious concern, especially considering impending pressures from population aging. In the baseline projections, fiscal deficits in these economies are brought back to 4 percent by 2014. Even so,

⁶However, gross portfolio and bank-related flows are likely to rise more strongly than net flows, as investors in emerging economies place funds offshore.

Figure 1.13. Net Capital Flows to Emerging and Developing Economies
(Percent of GDP)

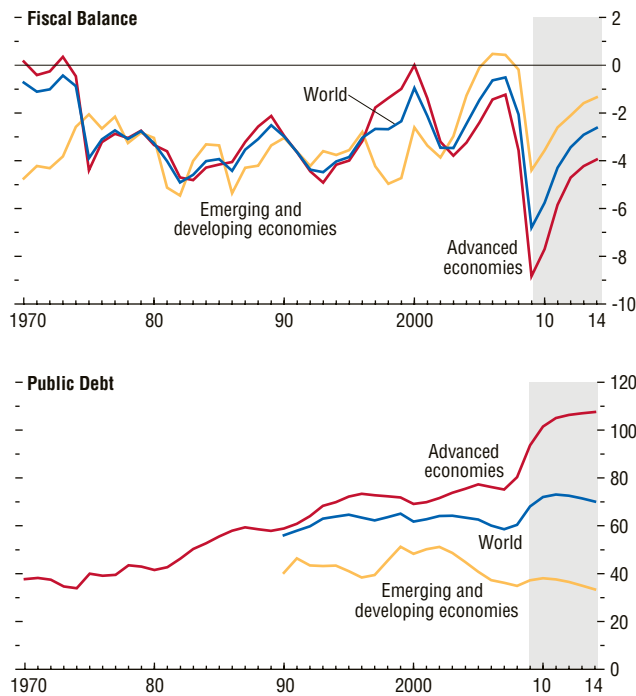
Net capital flows to emerging and developing economies are projected to remain subdued for many years as global deleveraging continues. Emerging Asia and the Middle East are expected to see significant outflows related to investment of current account surpluses, while other regions are generally expected to see much lower rates of inflows than in recent years.



Source: WEO database.

Figure 1.14. General Government Fiscal Balances and Public Debt
(Percent of GDP)

Fiscal consolidation will be a major challenge as the global economy starts to recover from the present crisis. Public debt is expected to continue mounting even as deficits are reduced.



Source: WEO database projections.

public debt would rise substantially, from about 75 percent of GDP in 2008 to almost 110 percent by 2014 (Figure 1.14). And there are multiple downside risks: from a prolonged period of slower growth (requiring greater fiscal stimulus) and cyclical effects; from the possible greater costs of fiscal support for the financial sector (both because of new operations and possible shortfalls from the returns on the management and sale of assets acquired); from the possible need for public support to pension systems damaged by losses related to recent asset price declines; and from rising real interest rates on government debt as fiscal prospects deteriorate, particularly if deflation becomes entrenched. A recent IMF study suggests that the combined impact of such factors could raise the combined government debt-to-GDP ratio in the advanced economies in the G20 to 140 percent by 2014 (IMF, 2009e).

Overall, fiscal prospects and risks seem somewhat better in emerging and developing economies, but individual economies could face sharp weakening of fiscal trajectories, particularly if downside risks materialize. The most vulnerable countries include those where financial and corporate bailouts in response to crisis conditions are allowed to cause a blowout in public debt and those that allowed public spending to balloon in years of high revenues (often related to rocketing commodity prices) and do not rein in spending in accordance with more modest commodity price prospects. On the other hand, in some economies fiscal prudence could be reinforced by a desire to rebuild policy buffers against future global shocks.

Private Sector Challenges and Responses

Turning from the public to the private sector, the global economy faces a protracted period of higher private saving in the advanced economies. As explored in Box 2.1, households have been battered by a steep loss in financial wealth and, in a number of countries, by reductions in housing wealth. Moreover, tighter restrictions on credit availability and leverage and concerns

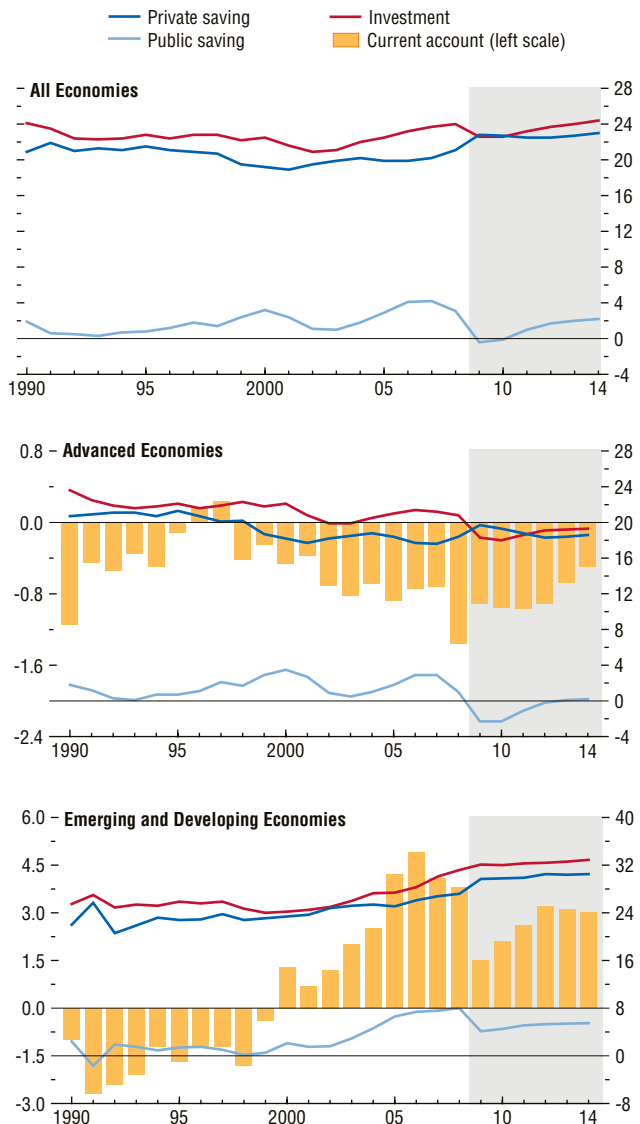
about high unemployment are likely to weigh on consumption for some time. Although the recent jump in precautionary saving is likely to subside as the global economy finds a more secure footing, private saving is still projected to be sustained at rates substantially higher than in the past decade, notably in economies like the United Kingdom and the United States, where households had previously relied largely on wealth accumulation through capital gains rather than net savings out of income (Figure 1.15). Corporate saving will also likely rise, as businesses look to restore balance sheets after the severe downturn, and borrowing constraints imply that retained earnings are likely to be the dominant source of funding for investment.

In the emerging economies, tighter financial constraints are expected to weigh on prospects for investment and income convergence. This is most clearly the case for emerging Europe, which had previously relied on large inflows of foreign savings to finance rising investment. More moderate prospects for commodity prices, as well as financing constraints, may also lead to a scaling back of investment plans in oil exporters and other commodity-rich economies (see Box 1.5 in Appendix 1.1).

With investment constrained, a key issue is whether countries will be able to compensate with improved investment efficiency (or faster growth of total factor productivity) in order to sustain potential growth rates. This occurred to a degree after the Asian crisis, as east Asian countries were able to achieve strong growth despite lower rates of investment (see Chapter 3 in the September 2006 *World Economic Outlook*). The challenge is likely to be greater in the years ahead, however, as growth will probably be more focused in sectors geared toward meeting domestic demand, where productivity gains are expected to be slower than in export sectors heavily involved in manufacturing. Success in restoring credit flows subject to market discipline will be essential to ensure that resources are well allocated: reliance on funding from retained earnings would likely mean less efficient investment allocation. Productivity growth

Figure 1.15. Global Saving, Investment, and Current Accounts
(Percent of world GDP)

Private saving is likely to remain elevated in the years ahead, as households in advanced economies repair balance sheets and emerging economies adjust to weaker prospects for capital inflows.



Source: WEO database projections.

will also depend on sustained product and labor market reforms and continued integration into global markets. Conversely, any tendency toward rising trade or financial protectionism would have a negative impact.

Alternative Paths Depend on Policy Choices

Considering these various forces, the global economy will face the challenge of sustaining aggregate demand to absorb excess capacity while avoiding the reemergence of asset price bubbles. More restrained demand for global savings by countries that previously had run large external deficits (whether housing-led consumption booms in advanced economies or commodity- or capital-inflow-fueled booms in emerging economies) could put downward pressure on world real interest rates. This tendency could be amplified to the extent that economies seek to replenish reserve stockpiles through tight macroeconomic policies or competitive advantage by limiting exchange rate appreciation. Countervailing tendencies would result if slow fiscal consolidation means sustained high public borrowing, if fast-growing economies in Asia that account for a rising share of global GDP are able to shift smoothly from external to internal sources of demand through a sustained increase in consumption, and if the advanced economies are able to restore the financial system's capacity to extend credit and to push forward ambitious reforms to support productivity growth.

Alternative paths for the global economy are illustrated in Figure 1.16, based on the IMF staff's Global Integrated Monetary and Fiscal Model. The simulations show a benign scenario and a downside scenario. In the benign scenario, policies foster a successful rebalancing of the global economy. Key ingredients include stronger consumption growth in east Asia alongside an appreciating real effective exchange rate facilitated by more flexible exchange rate management, successful implementation of plans to rebuild effective financial intermediation at both the national and international levels, and advances toward financial and trade

integration of the global economy (including, for example, completion of the Doha Round of world trade negotiations). Global growth would return to robust rates, allowing output gaps to be closed more quickly and providing room for more rapid fiscal consolidation in the United States and elsewhere. Global imbalances would be reduced as a depreciating dollar continues to lower the U.S. current account deficit, while Asian surpluses moderate.

In the downside scenario, adjustment is slower, reforms are sidetracked, and growth prospects are subdued. Fiscal consolidation is slower, unemployment remains elevated for longer, deflation risks remain a concern, and creeping trade and financial protectionism hamper productivity growth. Moreover, in these circumstances, global imbalances would remain wide, implying a further buildup in U.S. indebtedness to the rest of the world and higher risks of an eventual disorderly unwinding, particularly if the sustainability of the U.S. fiscal position comes into question. Thus, although global imbalances may not have been the central driving force behind the current global crisis, concerns in this area remain pertinent, especially if the global crisis leads to a permanent decline in gross cross-border capital flows (see Box 1.4).

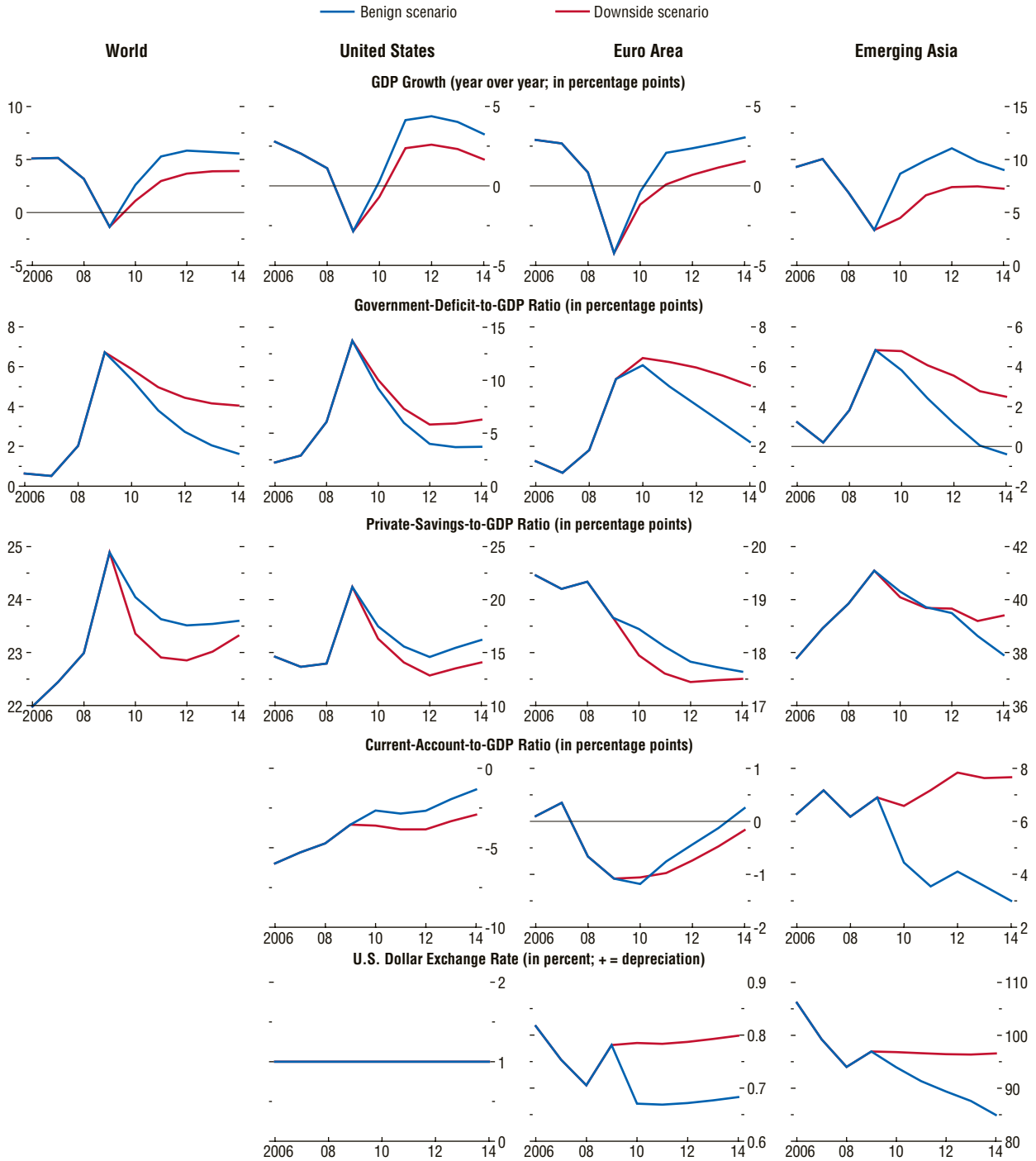
Policies to End the Crisis while Paving the Way to Sustained Recovery

The difficult and highly uncertain short-term outlook underlines the need for policymakers to act decisively to deal with a severe global recession that has taken on dangerous dimensions despite wide-ranging efforts. The immediate imperative is to move boldly with credible plans to deal with the financial crisis that has been at the core of the global recession over the past six months. Past episodes of financial crisis have shown that delays in tackling the underlying problems mean a more prolonged economic downturn and ultimately a greater burden on the taxpayer. At the same time, macroeconomic policies must continue to be geared as far as possible to supporting demand to minimize fur-

Figure 1.16. Alternative Medium-Term Scenarios

(All variables in levels; years on x-axis)

Alternative scenarios for the global economy, based on the Global Integrated Monetary and Financial (GIMF) Model, illustrate how favorable policies would promote stronger and more balanced global growth.



Source: GIMF simulations.

Box 1.4. Global Imbalances and the Financial Crisis

As policymakers begin to ponder the causes and lessons of the financial crisis, the topic of global current account imbalances has once again become an issue:

- To what extent did global external imbalances contribute to the financial crisis?
- Has the crisis changed the outlook for global imbalances?
- Do global imbalances remain a concern?

These questions are explored in this box. It concludes that although global imbalances may have been a factor behind the buildup of macroeconomic and financial excesses that led to the crisis, the crisis was largely caused by weak risk management in large institutions at the core of the global financial system combined with failures in financial regulation and supervision. Despite earlier concerns, a disorderly exit from the dollar has not yet been part of the crisis narrative. Looking ahead, imbalances are projected to moderate but will remain a source of policy concern.

Origin of the Imbalances

The phrase “global imbalances” refers to the pattern of current account deficits and surpluses that built up in the global economy starting in the late 1990s, with the United States and some other countries developing large deficits (United Kingdom; southern Europe, including Greece, Italy, Portugal, and Spain; central and eastern Europe), and others large surpluses (notably, China, Japan, other east Asian economies, Germany, and oil exporters).¹ Multiple explanations were put forward to rationalize this rise in imbalances:

- Some authors emphasized macroeconomic policy factors: the “global savings glut” as Asia cut back on investment after the Asian

crisis and its savings soared (Bernanke, 2005); the rise in the U.S. fiscal deficit and a decline in U.S. household savings (see Chapter 3 of the April 2005 *World Economic Outlook*); and emerging Asia’s export-led development, relying on undervalued exchange rates and reserve accumulation (Dooley, Folkerts-Landau, and Garber, 2004).

- Other explanations centered around long-term structural factors. In particular, the attractiveness of U.S. financial assets, owing to their perceived high liquidity and sophisticated investor protection, created sustained demand for U.S. assets (Blanchard, Giavazzi, and Sa, 2005; Caballero, Farhi, and Gourinchas, 2008; and Cooper, 2008).

Many authors expressed concern that continued widening of imbalances implied an unsustainable buildup in external claims on the deficit countries, particularly the United States, which would eventually need to be unwound through a substantial dollar depreciation, possibly in a disorderly fashion (see Chapter 3 of the April 2005 *World Economic Outlook*; and Obstfeld and Rogoff, 2005, 2007). In 2006–07, major governments agreed to implement wide-ranging policies to redistribute the pattern of global demand to moderate these risks, in the context of a Multilateral Consultation coordinated by the IMF (IMF, 2007).² Yet other observers took a more sanguine view, emphasizing that imbalances could be sustained as long as the structural factors supporting them remained in place.

Imbalances and the Crisis

Some predictions concerning the unwinding of global imbalances did materialize during the early stages of the financial crisis. Even

The main authors of this box are Charles Collins and Natalia Tamirisa, with input from Gian Maria Milesi-Ferretti and assistance from Ercument Tulun.

¹The global distribution of current account imbalances widened over past four decades, suggesting that countries were generally running larger deficits and surpluses (Faruqee and Lee, 2008).

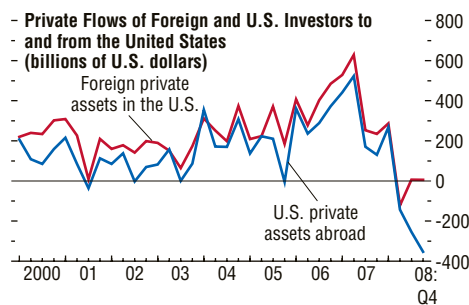
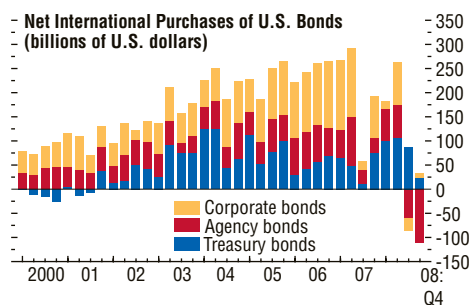
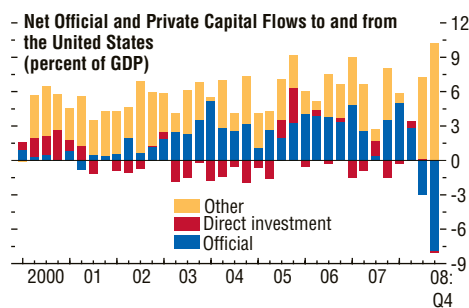
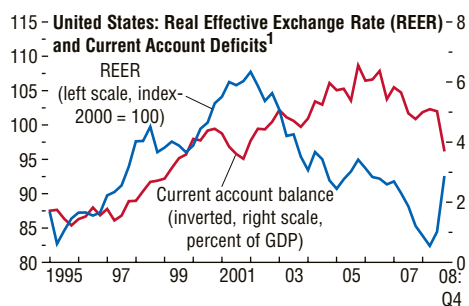
²For the United States, to take steps to boost national saving, including fiscal consolidation; for Europe and Japan, to implement growth-enhancing structural reforms to boost domestic demand; for emerging Asia, to boost domestic demand and allow currencies to appreciate; and for Saudi Arabia, to boost domestic demand by increasing fiscal spending consistent with absorptive capacity and macroeconomic stability (IMF, 2007).

before the crisis, the U.S. (non-oil) current account deficit started to narrow on the back of past dollar depreciation and a slowing of the U.S. economy relative to its trading partners (Milesi-Ferretti, 2008). The collapse of the U.S. subprime mortgage market in August 2007 and a further deceleration of the U.S. economy driven by the housing market correction hastened the adjustment in the U.S. non-oil trade balance, although rising oil prices weighed on the oil balance. In the meantime, shocks to the U.S. subprime and mortgage-based securities markets further weakened the dollar—by about 8½ percent in real effective terms between June 2007 and July 2008 (first figure, top panel). Yet the scenario that some had feared—a broad-based flight from U.S. assets and a sudden drop in the value of the dollar—did not occur, in part because a flight to safety in the context of intensifying global financial turmoil prompted a surge in demand for U.S. government securities. The dollar has rebounded strongly since September 2008, as the crisis deepened and increasingly engulfed other economies.

Thus, a reversal of capital inflows to the United States and the depreciation of the dollar clearly were not the trigger for the current global crisis. The shock, rather, came from a reversal of the overoptimistic assessment of risk on U.S. subprime and other mortgage-backed assets, which prompted a massive increase in risk aversion, a loss of financial capital, and deleveraging. It is not surprising that the effects of this immense financial shock were also different from a currency crisis.

Indeed, the composition of U.S. asset holdings in countries' sectoral balance sheets has played a key role in how the crisis has spread to other countries. Overseas holdings of U.S. toxic assets were concentrated in highly leveraged financial institutions in advanced economies such as France, Germany, Switzerland, and the United Kingdom (U.S. Treasury and Federal Reserve, 2008). When the value of these assets declined with the onset of the crisis, the financial sectors of these countries became affected,

U.S. Current Account Deficit and Its Financing

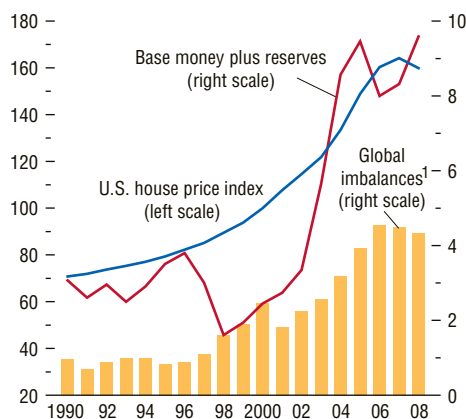


Sources: Haver Analytics; U.S. Treasury; and IMF staff calculations.

¹Based on consumer price index.

Box 1.4 (continued)

Global Imbalances, Liquidity, and U.S. House Prices



Sources: Haver Analytics; and IMF staff calculations.
¹Absolute sum of current account balances in percent of world GDP.

even though their current account imbalances were not necessarily large.

With the benefit of hindsight, a more nuanced view is emerging of the role of global imbalances in the buildup of systemic risk in the run-up to the crisis (IMF, 2009a). Global imbalances were an integral part of the global pattern of low interest rates and large capital inflows into U.S. and European banks, which in turn fostered a buildup of leverage, a search for yield, and the creation of riskier assets and house price bubbles in the United States and some other advanced economies (second figure).³ But a central role in the current crisis has been played by the failure of risk manage-

³Caballero and Krishnamurthy (2008) develop a model linking increased demand for U.S. assets to rising leverage and securitization in the U.S. financial system. The link was more complicated in practice: official investors from emerging economies tended to buy agency debt, whereas private investors from advanced economies were buying mortgage-backed securities that were not supported by guarantees from the government-sponsored enterprises.

ment in financial institutions and weakness in financial supervision and regulation.

In any event, the financial crisis accelerated the adjustment of global current account imbalances. Three channels are playing a key role in this process:

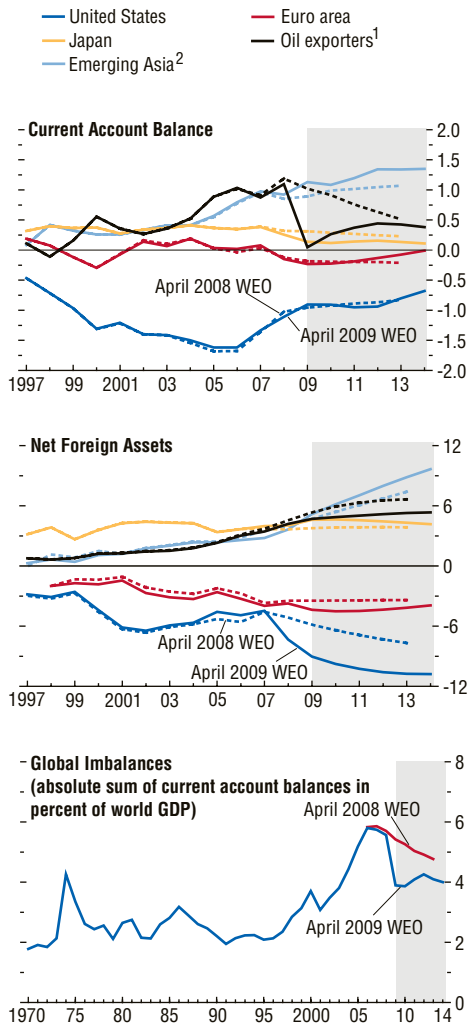
- an increase in private savings, owing to the unwinding of housing and credit bubbles in the United States, with a partly offsetting decline in public savings;
- a tightening of global credit conditions, owing to deleveraging in the financial sector, particularly in the United States, partly offset through the easing of monetary policy, liquidity provision, and bank rescue measures; and
- an improvement in the terms of trade, owing to a decline in oil prices for oil-importing countries, with opposite effects for oil-exporting countries.

Reflecting these factors, the World Economic Outlook (WEO) summary measure of global imbalances is projected to decline abruptly from 5¾ percent of world GDP in 2007 to about 4 percent in 2009, driven by a reduction in the current account imbalances in the United States, oil-exporting countries, and, to a lesser extent, Japan (third figure, bottom panel).⁴ The U.S. current account deficit, in particular, is set to narrow from a peak of 6 percent of GDP in 2006 to about 3¼ percent of GDP in 2009 (third figure, top panel). Current accounts are also contracting sharply in other countries, with large deficits as credit booms are reversed (for example, southern Europe and United Kingdom among the advanced economies, and central and eastern Europe among emerging economies).

Dramatic declines in financial asset prices caused by the crisis have had a strong impact on countries' net external positions (Milesi-Ferretti, 2009). In particular, the U.S. net external position is projected to deteriorate from about 4½ percent of global GDP in 2007

⁴The summary measure is defined as the absolute sum of current account imbalances, in percent of world GDP.

Current Account Balances and Net Foreign Assets
(Percent of global GDP)



Sources: Lane and Milesi-Ferretti (2006); and IMF staff estimates.

¹Algeria, Angola, Azerbaijan, Bahrain, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Islamic Republic of Iran, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, Syrian Arab Republic, Turkmenistan, United Arab Emirates, Venezuela, and Republic of Yemen.

²China, Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand.

to about 9 percent of global GDP in 2009 (third figure, middle panel). A significant portion of the deterioration that has already taken place represents valuation losses, mostly on foreign equity holdings, and the remainder is the financing of the U.S. current account deficit. Economies that have experienced corresponding gains on their external positions are the euro area and emerging economies (for example, Brazil, Russia, India, and China). Given large foreign holdings of domestic stocks in these economies, the collapse of domestic stock markets has led to significant reductions in domestic residents' liabilities to foreigners.

Patterns of financing for the U.S. current account deficit have also changed as a result of the crisis. From the beginning of the crisis to the third quarter of 2008, official purchases dominated as private inflows declined sharply (first figure, second panel). In the second half of the year, however, net official flows to the United States decreased, largely owing to drawings on temporary swap lines between the U.S. Federal Reserve and foreign central banks, while private inflows rose because U.S. residents repatriated capital from abroad. Since September 2008, foreigners have been unloading U.S. agency bonds (first figure, third panel). Purchases of U.S. Treasury bonds remained strong through the third quarter of 2008, when foreigners started to shift away from purchasing U.S. Treasury bonds toward U.S. Treasury bills, in part owing to their increased issuance. This trend continued through the end of the year. More generally, however, private capital flows have plummeted during the crisis, pointing to a sharp increase in home bias—that is, the share of private savings invested domestically rather than abroad (first figure, bottom panel).

Post-Crisis Outlook for Imbalances

The evolution of imbalances in the coming years will depend critically on how policy responses to the crisis and post-crisis reforms affect the long-term saving and investment behavior of the private and public sectors.

Box 1.4 (concluded)

According to current WEO baseline projections, global imbalances are set to stabilize over the medium term, with the summary measure of imbalances settling at about 4 percent of world GDP (third figure, bottom panel). The U.S. current account deficit is expected to remain broadly stable at about 3¼ percent of GDP during 2010–11, owing to the effects of the crisis fiscal stimulus, and then resume a declining trend, reaching 2¼ percent of GDP by 2014 (third figure, top panel). However, surpluses in Asia are projected to continue to widen gradually over the medium term, and the crisis-related drop in oil exporters' surpluses will partially unwind. The U.S. net external position will also continue to deteriorate, as U.S. external borrowing needs remain substantial (third figure, middle panel).

Thus, concerns about global imbalances

have not gone away. The financing of current account deficits, particularly in the United States, may still be problematic in the coming years. If the attractiveness of U.S. assets were to decline, for example, because foreigners became concerned that higher government financing needs would push up U.S. long-term bond yields, foreign investors might reduce their U.S. exposure, leading to an abrupt depreciation of the dollar. Another possibility, closely related to the structural explanations of global current account imbalances, is that the financial crisis may lead to a lasting increase in home bias and a decline in cross-border gross capital flows. This may reduce the availability of financing for the U.S. current account deficit as well as current account deficits of many emerging and developing economies that benefited from financial globalization during the decades prior to the crisis.

ther corrosive feedback from weakening activity onto the financial sector. This task will become increasingly challenging since the conventional weapons have already been deployed and the deepening downturn may put a damper on further actions in many countries.

These policy challenges are amplified—and given added urgency—by the global nature of the crisis. Economies will not be able to rely on exports as an escape route, as they could in the Asian crisis or as Japan did in the 1990s (see Chapter 3). Moreover, policymakers must be mindful of the cross-border ramifications of policy choices. Initiatives that support trade and financial partners—including fiscal stimulus and official support for international financing flows—will help bolster global demand, with shared benefits. Conversely, a slide toward trade and financial protectionism would be hugely damaging to all, a clear warning from the experience with 1930s beggar-thy-neighbor policies.

Policies must also be guided by a medium-term compass. It will be critical to find financial

solutions that foster a healthy financial system that is less prone to boom-and-bust cycles but still capable of its primary task of efficient intermediation of savings and investment. Moreover, the short-term effectiveness of macroeconomic policies will depend on medium-term credibility. Exit strategies will be needed to transition fiscal and monetary policies from extraordinary short-term support to sustainable medium-term frameworks.

Financial Sector Policies—Dealing with the Core of the Problem

Decisive progress toward the restoration of financial sector stability and market trust is the critical prerequisite for arresting the downward momentum of the global economy and paving the way for an enduring recovery. Systematic and proactive approaches have started to supplant ad hoc interventions, but markets remain to be convinced that financial sector policies will be effective, which undermines the impact

of the monetary and fiscal policy stimulus now in train. Moreover, to the extent that financial market strains are global and policy actions have cross-border spillovers, international policy cooperation is crucial for restoring market trust.

There are three key elements of a strategy to restore financial institutions to health: (1) ensuring that financial institutions have access to liquidity, (2) identifying and dealing with distressed assets, and (3) recapitalizing weak but viable institutions. The first area is being addressed forcefully, but policy initiatives in the other two areas need to advance more convincingly.

The critical underpinning of an enduring solution must be credible loss recognition. Uncertainty about the valuation of troubled assets continues to raise concerns about the viability of financial institutions, including those that have received government support. Policymakers must require that assets be valued conservatively, transparently, and consistently across institutions. Although the lack of liquidity and their complex structure make it difficult to precisely value many impaired assets, governments need to establish methodologies for realistically valuing illiquid securitized credit instruments based on realistic expectations of future income streams.⁷ Such valuation should ideally be applied consistently across countries to avoid regulatory arbitrage or competitive distortions.

Limiting further losses from distressed assets can be achieved in different ways but is likely to require substantial public support and must be transparent to be convincing. Ring-fencing troubled assets on balance sheets and providing partial public guarantees can be done quickly with minimal upfront fiscal costs, but efforts to do so in recent months have not improved market confidence, and this approach is unlikely

⁷Recent proposals provided by the International Accounting Standards Board and the Basel Committee regarding disclosure and fair value practices offer useful guidance in this regard.

to lift the broader uncertainty clouding banks' portfolios. An alternative with a proven track record is to remove impaired assets from financial sector balance sheets, moving them into publicly owned asset management companies (also known as "bad banks"). Purchases by public-private partnerships, as proposed in the United States, could also be used as a means to remove troubled assets in a transparent manner, but these need to be structured in a way that encourages participation by both buyers and sellers on terms consistent with resources available under the program. In general, different approaches can work, depending on country circumstances, and the priority is to choose an approach, ensure that it is adequately funded, and implement it in a transparent and consistent manner.

Recapitalization efforts must be based on a careful evaluation of the long-term viability of financial institutions, taking into account a realistic assessment of likely losses on problem assets, the quality of capital and management, and business prospects. Supervisors will need to establish an appropriate level of regulatory capital for institutions, taking into account regulatory minimums and the need for buffers to absorb further unexpected losses. Viable banks with insufficient capital should then be quickly recapitalized, with capital injections from the government accompanied by private funds, if possible, to achieve a level sufficient to restore market confidence in the bank. Given the deepening of the crisis, governments should be prepared to provide capital in the form of common shares as the best means to improve confidence and funding prospects, even if this implies temporary government majority ownership.⁸ Nonviable institutions should be intervened promptly, leading to orderly resolution through closure

⁸Although permanent public ownership of core banking institutions would be undesirable from a number of perspectives, there have been numerous instances (for example, Japan, Korea, Sweden, United States) of a period of public ownership being used to cleanse balance sheets and pave the way for the banks' resale to the private sector.

or merger. To avoid further systemic effects, the authorities will need to be cognizant of the legal conditions under which intervention may be considered “insolvency” and thus a credit event for the purpose of triggering default clauses in credit default swap contracts. Institutions operating with government capital should be carefully monitored, with restrictions on dividend payments and scrutiny of executive compensation policies. The amount of public funding required is likely to be large—considerably more than has been put on the table so far—but the requirements for public support are likely to continue rising the longer the solution is delayed.

Greater international cooperation is needed to avoid exacerbating cross-border strains. Disparities in the degree of support afforded to financial institutions in different countries have created additional strains and distortions. It is important to provide greater clarity and consistency to the rules applied to valuation of troubled assets, guarantees, and recapitalization in order to avoid unintended consequences and competitive distortions—whereby domestic institutions or local credit provision is favored to the detriment of others.

The need for a broader international approach is particularly relevant for emerging economies. As emphasized previously and in the April 2009 GFSR, emerging European economies have been particularly vulnerable to disruptions in credit flows because of their large external financing needs and may have been adversely affected by financial support measures in western Europe aimed at safeguarding the position of domestic banks. There is an urgent need to establish clear guidelines for cross-border crisis management and burden sharing, to support the continued availability of credit lines, and to provide needed emergency external financing. In parallel, recent reforms to increase the flexibility of lending instruments for good performers caught in bad weather together with plans advanced by the G20 summit to increase the resources available to the IMF are enhancing the capacity of the international financial community to address

the risks related to sudden stops of private capital flows.

Measures to deal with financial distress must also be mindful of transition problems and the future contours of the financial system. Current actions should be consistent with a long-term vision of a healthy, efficient, and dynamic financial system. Achieving these objectives requires steps to limit moral hazard and to develop exit strategies from large-scale public interventions, including to ensure a smooth transition back to private intermediation in dislocated markets. Lower leverage and a smaller financial sector are inevitable, and current actions should not impede the necessary restructuring of the system as a whole. Regulatory standards should be strengthened—consistent with the systemic risks posed by institutions—but changes should be introduced gradually after recovery is assured to avoid aggravating adverse feedback with the real economy.

The difficult task of restoring the financial system to health must be supported by actions to facilitate borrower restructuring to mitigate the destruction of value associated with disorderly liquidations. A key challenge has been to find ways to facilitate mortgage modifications in the United States to reduce the damaging wave of foreclosures that has added to the downward momentum in the U.S. housing market. Recent initiatives that commit public funds to improve incentives for both borrowers and lenders to participate and facilitate write-downs of principal through personal bankruptcy procedures should help deal with this problem, and similar approaches may be needed in other countries.

Another area of strain is the wave of corporate failures likely in the period ahead, especially in the emerging economies where companies are exposed to high rollover risks on external financing and have limited domestic alternatives and where the legal framework and capacity for restructuring may be limited. Authorities in a number of countries have already taken steps to support credit flows through guarantees and back-stop facilities, and direct government support for corporate borrowing may be war-

ranted. In addition, plans should be readied for large-scale restructuring in case circumstances deteriorate further. Experiences with the aftermath of the Asian crisis suggest that a comprehensive rather than piecemeal approach to debt workouts can help ensure that large-scale corporate restructuring occurs in an orderly fashion, including through consensual private involvement.

Monetary Policy—Turning to Unconventional Approaches

Inflation fears are a fast-receding memory, and central bankers around the world are now on the front lines in the fight to sustain demand in the face of financial disruptions. In advanced economies, the task is magnified by the rising threat of deflation and the constraint of the zero interest rate floor. In such circumstances, it is crucial to act aggressively to counter deflation risks. Although policy rates are already near the zero floor in many countries, policy room still remains in some regimes (such as the euro area) and should be used quickly. There seems little risk of overdoing monetary easing in the current circumstances. At the same time, clear communication is important—central bankers should underline their determination to avoid deflation by sustaining easy monetary conditions for as long as it takes, while making clear their long-term commitment to avoiding a resurgence of inflation.

Nonetheless, the firepower from conventional policy instruments is unlikely to be sufficient—the zero floor constrains room for further cutting, and the impact of lower policy rates is reduced by credit market disruptions. In these circumstances, lowering interest rates will need to be supported by increasing recourse to less conventional approaches, using both the size and composition of the central bank’s own balance sheet to support credit intermediation. As discussed previously, many central banks have already introduced an array of new instruments, including purchases of long-term government securities and more direct measures to support

intermediation. In the current circumstances, such approaches may be particularly effective if they help unlock illiquid or disrupted markets—so-called credit easing (Bernanke, 2009). Such a strategy extends the “quantitative easing” used by the Bank of Japan in 2001–06, where the focus was on boosting commercial bank reserves through government bond purchases.

In pursuing credit easing, central banks should structure their activities in a way that maximizes relief in dislocated markets—increasing credit availability and lowering spreads—while minimizing possible longer-term collateral damage. To the extent possible, credit allocation decisions should be left with private financial intermediaries, rather than taken over by the central bank. Moreover, credit risk that is not retained in the private sector should be covered by national treasuries rather than allowed to jeopardize central bank balance sheets. Consideration should also be given to how the extraordinary credit operations would be unwound. Support provided in the form of short-term liquidity facilities can be quickly reversed when market conditions eventually normalize, but operations involving longer-maturity assets could be harder to unwind.

These points are also relevant to central banks in emerging economies. However, in many of those economies, the central bank’s task is further complicated by the need to sustain external stability in the face of highly fragile financing flows. To a much greater extent than for advanced economies, emerging market financing is subject to dramatic disruptions—sudden stops—in part because of greater concerns about the creditworthiness of the sovereign. Emerging economies also have tended to borrow more heavily in foreign currency, so large exchange rate depreciations can do severe damage to their balance sheets.

Thus, although most central banks in these economies have lowered interest rates in the face of the global downturn, they have been appropriately cautious in doing so in order to maintain incentives for capital inflows and to avoid disorderly exchange rate moves or a full-

blown capital account crisis. To some degree, war chests of international reserves have provided ammunition to counter volatile exchange rate movements and sustain the availability of foreign currency funding, but as time has passed, these reserve stockpiles have been depleted, leaving less room to maneuver. Countries facing particularly difficult external conditions—including large current account deficits to be financed, large rollover requirements, a reliance on fragile interbank flows, and dwindling reserves—may have to tighten monetary policy to preserve external stability, despite adverse consequences for domestic activity. Access to official financing—including both regional and bilateral credit lines and contingent financing from the IMF—can play an important part in reducing such painful trade-offs.

Turning to the post-crisis world, a key challenge will be to calibrate the pace at which to withdraw the extraordinary monetary stimulus now being provided. Acting too quickly would risk undercutting what is likely to be a fragile recovery, but acting too slowly could risk a return to overheating and new asset price bubbles. In some cases, achieving a smooth transition may call for new instruments, such as allowing central banks to issue their own paper to soak up excess liquidity.

These choices will arise in the context of the broader issue of whether the approach to monetary policy should be extended to more explicitly encompass macrofinancial stability as well as price stability, and if so, how this should be done. It is now painfully clear that asset price booms fed by leveraged financing and involving financial intermediaries need to be dealt with forcefully, since they threaten to undermine the credit supply and the economy. Although regulatory policy must play a central part in controlling such risks, monetary policy cannot neglect booms in asset prices and credit and should respond to unusually rapid asset price movements or signs of asset market overshooting, particularly in the context of credit booms. Prudential measures provide a more targeted and less costly policy solution than interest rate

changes and should be a central element of the policy response.⁹

Fiscal Policy—Stimulus with Sustainability

In view of the extent of the downturn and the limits on monetary policy's effectiveness, fiscal policy must play a crucial part in providing short-term support to the global economy. Indeed, a key finding of Chapter 3 is that in the context of a financial crisis, fiscal policy can be particularly effective in shortening the duration of recessions, whereas the impact of monetary policy is reduced. However, room to provide such fiscal support will be limited if such efforts erode credibility in the absence of a medium-term framework. Thus, governments are faced with a difficult balancing act—delivering short-term expansionary policies but also providing reassurance for medium-term prospects.

This task is becoming increasingly difficult as the downturn extends in depth and duration. Although governments have acted to provide substantial stimulus in 2009, it is now apparent that the effort will need to be at least sustained, if not increased, in 2010, and countries with fiscal room should stand ready to introduce new stimulus measures as needed to support the recovery. As far as possible, this should be a joint effort since part of the impact of an individual country's measures will leak across borders but brings benefits to the global economy.

It is thus welcome that most G20 countries—emerging as well as advanced—have contributed to the fiscal efforts. However, the task of sustaining stimulus is becoming more difficult as some countries face increasing limits on their fiscal room from market concerns about the sustainability of their public finances. This is particularly true for emerging economies with less developed fiscal institutions, less secure financing, and downgraded medium-term growth

⁹These issues are discussed further in IMF (2009c). See also Chapter 3 of the October 2008 *World Economic Outlook* for a discussion of how monetary policy could be adapted to give greater weight to house prices in particular.

prospects. But it is also true for an increasing range of advanced economies, where trajectories for the public accounts show a major buildup in debt, particularly those that also face heavy bills for financial sector cleanup and aging populations.

How to alleviate the tension between stimulus and sustainability? One key is the choice of stimulus measures. As far as possible, these should be temporary and maximize “bang for the buck.” Typically, this argues for steps to raise spending on specific projects and time-bound tax cuts that focus on improving the cash flow of credit-constrained households.¹⁰ It is also desirable to target measures that bring long-term benefits to an economy’s productive potential (and hence tax-raising capacity). For both these reasons, initiatives to boost infrastructure spending are particularly helpful at the current juncture. In a normal business cycle, such spending often arrives just as the need for it diminishes, but in the present cycle, a higher level of spending will be needed over a number of years. In principle, this can be done by advancing planned projects, thus leaving the net present value of spending unchanged.

Second, governments need to complement initiatives to provide short-term stimulus with reforms to strengthen medium-term fiscal frameworks. Relevant areas include tax reform to reduce reliance on asset-price-linked tax revenues, measures to improve transparency and oversight of government spending, and steps to provide robust medium-term budgetary frameworks to deliver consolidation in periods of strong growth as well as room to ease up during downturns. Reforms in these areas would be valuable across the advanced economies but are even more important in emerging economies where fiscal management systems are far less developed.

Third, probably the greatest contribution to improving credibility of fiscal sustainability would be to make concrete progress toward

dealing with the fiscal challenges posed by aging populations. The costs of the current financial crisis—although sizable—are dwarfed by the impending costs from rising expenditures on social security and health care for the elderly (IMF, 2009e). Credible policy reforms to these programs may not have much immediate impact on the fiscal accounts but could have an enormous effect on fiscal prospects and thus could help preserve fiscal room to provide short-term fiscal support.

Global Responses Will Be Critical

In the face of a crisis of global dimensions, a global response will be essential to drive turnaround and recovery. The preceding discussion has already outlined a range of areas where cooperative efforts across countries are indispensable.

- Measures to deal with financial stress and restore financial viability must be coordinated internationally to reduce cross-border spillovers and generate coherent resolution of financial institutions that are often global in character. Creeping financial protectionism should be avoided.
- The provision of fiscal stimulus to sustain global demand should be a joint effort, with countries with the most fiscal room playing the lead role, again in recognition of cross-border implications.
- Monetary and credit policies should also be geared toward supporting demand as far as possible but should avoid seeking to engineer competitive currency depreciation that would be futile from a global perspective.
- Similarly, countries must be careful to resist the temptation to slip toward protectionist measures on the trade front.
- Sources of official financing support should be strengthened so that countries facing pressure to finance current account deficits can avoid unnecessarily harsh adjustments that would also spill across borders.
- Better early-warning systems and more open communication of risks would help provide

¹⁰See, for further elaboration on these issues, Spilimbergo and others (2008) and IMF (2009e).

a stronger basis for international policy collaboration.

Global cooperation will also be important in paving the path to prosperity as the world seeks to rebuild after the crisis. Completion of the Doha multilateral trade round would provide a boost to the global trade integration that is at the center of productivity growth. The task of rebuilding the financial regulatory framework, to better control and guarantee stability while providing for efficient financial intermediation, must be a multilateral endeavor. Similarly, a more flexible system of currency management across all the world's major economies would support more fluid rebalancing of global supply and demand to underpin the process of convergence of income levels. Increasing the availability of international financial resources that can be tapped in adverse market conditions and providing greater flexibility in terms of such credits would help limit a continued push to self-insurance and a massive buildup of official international reserves. Finally, aid flows to low-income countries need to be protected and built up to prevent the required fiscal retrenchment in donor countries in the years ahead from jeopardizing progress toward eliminating global poverty.

Appendix 1.1. Commodity Market Developments and Prospects

The authors of this appendix are Kevin Cheng, To-Nhu Dao, Nese Erbil, and Thomas Helbling.

Financial turmoil and a sharp deterioration in global economic prospects in the third quarter of 2008 abruptly ended the commodity price boom of the past few years. The price correction was sharp and rapid, with the magnitude of price changes and volatility rising to unprecedented levels for many major commodities (Table 1.2). By December, the IMF commodity price index had declined by almost 55 percent from its July peak (Figure 1.17, top panel).

The start of the turnaround in commodity prices broadly coincided with incoming data

indicating a stronger-than-expected downturn in activity in advanced, emerging, and other developing economies in mid-2008. These developments defied earlier expectations that emerging and developing economies would remain resilient to slowing growth in advanced economies. Because these economies had accounted for the bulk of incremental demand during the boom, near-term demand prospects in global commodity markets became less promising. Another reason for the turnaround was the demand decline in advanced economies. Although these economies only accounted for a small share of the demand increases during the boom, they have accounted for most of the fall in the levels of global commodity consumption in recent months.

The sharp deterioration in global growth prospects associated with the global financial turmoil during September and October 2008 led to accelerated downward price adjustment through November. Commodity prices broadly stabilized in December. Since then, prices have mostly fluctuated within a range, with several so far short-lived rallies for some commodities, notably oil and more recently base metals.

The impact of the global slowdown has varied across commodities. Following past cyclical patterns, commodities closely tied to the manufacturing of investment and durable goods and construction—particularly fuels and base metals—have been most affected. The impact of the slowdown on food prices was markedly milder than for other commodities, given the lower income elasticity of underlying demand. Nevertheless, with declining pressure from energy costs and biofuel demand—two key factors during the price run-up—the price response of food commodities to the downturn was stronger than usual.

How Has Financial Stress Affected Commodity Markets?

Besides the indirect impact through the real economy, commodity markets were also directly affected by the escalation of the financial crisis

in September. Investors unwound commodity asset positions for the same reasons that led to the general disorderly deleveraging discussed in this chapter. First, many commodity investment instruments are over-the-counter (OTC) products (such as total return swaps anchored on commodity index returns) that involve counterparty risks. Second, some highly leveraged commodity investment positions had to be unwound because of refinancing difficulties. Third, more generally, as commodity financial markets remained relatively liquid compared with some other asset markets, commodity positions were liquidated as investors sought to increase their holdings of safe assets.¹¹

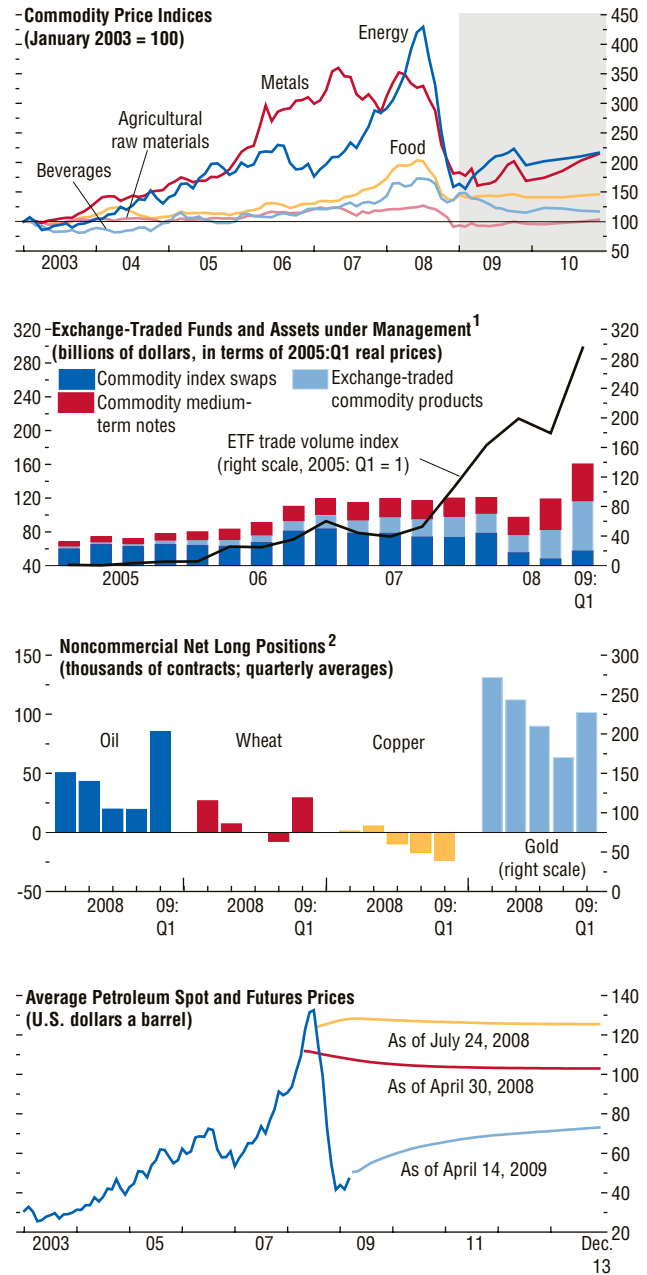
The strength of the unwinding of commodity investment in the second half of 2008 is difficult to quantify, given the lack of data and the fact that a good part of the reduction in the notional value of commodity positions reflected declines in commodity prices. At the level of commodity assets under management, the reduction in positions in real terms (adjusted by the IMF commodity price index) seems to have been relatively minor (Figure 1.17, second panel). However, there was a marked shift from OTC commodity index positions to exchange-traded funds and structured products (medium-term notes). On U.S. commodity futures exchanges, there was a noticeable reduction in overall open interest between July and November, including of noncommercial participants. Since then, there has been some pickup in open interest.

On balance, this evidence points to a relatively short period of marked unwinding of commodity positions from September to November. As a result, liquidity in commodity futures markets declined, which contributed to the sharp increase in price volatility at the time.¹² With

¹¹In addition, the effective appreciation of the U.S. dollar since fall 2008 has also played a role. As discussed in Box 1.1 in the April 2008 *World Economic Outlook*, U.S. dollar shocks can have a significant impact on prices of nonperishable commodities, particularly crude oil and metals.

¹²Some investors, notably hedge funds, have direct exposure to commodity futures markets. There can

Figure 1.17. Commodity and Petroleum Prices



Sources: Barclays Capital; Bloomberg Financial Markets; and IMF staff estimates.
¹Deflated by IMF Commodity Index.
²At the Chicago Board of Trade, New York Mercantile Exchange and Commodity Exchange, respectively.

Table 1.2. Comparison of Commodity Price Volatility*(Weekly; in percent)*

	Six-Month Change			Standard Deviation ¹			
	Largest six-month decline in 2008	Largest six-month decline during 1970–2007 ²	(year)	2008	Highest during 1970–2007 ²	(year)	Average during 1970–2007 ²
Crude oil (WTI) ³	–76.8	–60.1	(1986)	18.4	16.1	(1999)	8.5
Aluminum	–52.9	–33.4	(1991)	12.1	8.9	(1994)	5.6
Copper	–54.8	–52.6	(1974)	12.2	13.0	(1974)	6.7
Nickel	–68.0	–49.0	(1990)	23.6	17.7	(2006)	9.2
Corn	–52.4	–51.8	(1997)	13.9	13.6	(1988)	7.6
Wheat	–45.2	–38.0	(1996)	16.0	12.9	(2007)	6.4
Soybeans	–44.1	–51.3	(2004)	12.8	15.5	(2004)	6.3
<i>Memorandum</i>							
Gold	–25.4	–30.1	(1981)	8.7	13.3	(1979)	5.1

Sources: Datastream; and IMF staff calculations.

¹Standard deviation of weekly changes in commodity prices over a 12-month period.²Data beginning in 1983–2007 for crude oil; 1988–2007 for aluminum; and 1979–2007 for nickel, corn, wheat, and soybeans. With increased financial turmoil in September–October, the price decline accelerated.³WTI = West Texas Intermediate.

the pickup in investor interest since December, however, the large-scale unwinding of commodity positions ended, and the main channel through which financial factors affect prices now is through their impact on activity and global demand for and supply of commodities.

When Will Commodity Markets Rebound?

Commodity markets are now in a phase of cyclical weakness. Demand has softened rapidly, while the supply response to falling prices has been slow, resulting in rising inventories. In this period of adjustment, spot prices have generally declined much more than futures prices, and futures curves for major commodities have been upward sloping, suggesting that markets expect

prices to rise in the future. This “contango” constellation, which has been observed in other recent episodes of cyclical demand weakness, provides incentives for inventory accumulation.

Commodity prices are expected to remain subdued as long as global activity continues to slow but then to pick up on more definitive signs of a turnaround. There is some upside potential from supply retrenchment, notably from production cuts in less competitive markets or adverse weather conditions, as inventory levels for some major food staples are still low by historical standards. On the downside, although strong declines in demand for commodities are already reflected in current prices, prices would likely decline further in the event of a much deeper than expected global downturn.

A key question is whether commodity prices will recover in the medium term. As discussed in Box 1.5, the main factors that have supported high commodity prices in recent years—continued rapid increases in commodity demand from emerging economies and the need to tap higher-cost sources of supply—are likely to reemerge in the context of a sustained global recovery. Even so, prices are unlikely to rebound quickly to the very high levels seen in 2007 or the first half of 2008. Global growth is not

be indirect effects on futures demand or supply from commodity financial investment more generally because financial intermediaries tend to hedge their exposure to OTC commodity derivative positions, including those of institutional investors, through offsetting positions in futures markets. In view of these linkages between commodity investment and futures markets, financial flows can have short-term price effects. However, there is no compelling evidence of a sustained price impact of commodity financial investment. These issues are discussed in more detail in Box 3.1 in the October 2008 *World Economic Outlook*.

Box 1.5. Will Commodity Prices Rise Again when the Global Economy Recovers?

Since the commodity price collapse in the second half of 2008, price prospects have been widely debated. On the one hand, strongly upward-sloping futures curves for many major commodities point to prices rising over the next few years. These “contango” constellations are consistent with the view that prices will rebound when the global economy recovers, because of renewed sharp increases in commodity demand from emerging economies and the need to open up more costly supplies.

On the other hand, spot prices remain under downward pressure, given still-weakening demand and rising inventories. With a protracted global slowdown increasingly likely, prospects for a rapid commodity price rebound seem remote, reminiscent of past episodes when commodity prices experienced long slumps after short booms.¹

To evaluate commodity price prospects, this box analyzes the information content of futures prices and past trends and examines how the interplay between global growth and commodity demand over the downturn and the recovery affects the likelihood of a rebound in commodity prices.

Will Prices Resume Their Trend Decline?

Over very long horizons, prices for many commodities have declined relative to those of manufactures and services (first figure). The secular declines reflect relatively strong productivity gains in the commodity-extracting sectors and the fact that many commodities are necessities—their share in total consumption declines as income increases. Within this broad picture, rates of decline vary greatly by commodity, depending on factors such as available reserves in the case of nonrenewable resources, industry structure, and specific demand characteristics. Oil is the main exception to the rule of decline—reflecting

an oligopolistic supply structure, concentrated reserves, and luxury characteristics (car ownership is a key driver of consumption).

The first figure also suggests that long-term trends often are not a good guide to medium-term price fluctuations.² Average rates of change, for example, vary considerably by decade. The trend component in commodity prices shifts over time, reflecting changes in longer-run price determinants, such as average costs of marginal fields or mines. How important are the fluctuations in the trend component relative to those in the cyclical component? If fluctuations in the latter dominated, longer-term trends would provide useful signals. If not, past trends would provide little guidance.

A simple way to gauge the relative importance of these two components is to compare the volatility of spot and futures prices. The latter are predictors of future spot prices. The cyclical component should therefore be discounted in futures prices, with the discount increasing with the maturity of futures contracts. In other words, the volatility in longer-term futures contracts should largely reflect the volatility of markets’ view of the trend component.

As shown in the first table, futures price volatility is lower than spot price volatility for four major commodities—crude oil, aluminum, copper, and wheat. At the one-year horizon, for example, the ratio of futures to spot volatility ranges between 0.6 for wheat and about 0.9 for copper. However, although it decreases with the maturity of the futures contract, the ratio remains relatively high. Even at the five-year horizon, futures volatility is still about one-half that of spot prices,³ and in the past few years, relative futures price volatility has risen. These results imply that fluctuations in the trend components account for a substantial share of commodity price fluctuations. They also suggest that the current levels of the trend components

The main authors of this box are Kevin Cheng and Thomas Helbling.

¹See, for example, Cashin, McDermott, and Scott (2002).

²See Pindyck (1999), Cuddington (2007), and Cashin and McDermott (2002), among others, on trends and cycles in commodity prices.

³Five-year contracts for wheat are not available.

Box 1.5 (continued)

Spot and Futures Price Volatility

(Standard deviations of daily price changes; in percent)

	Spot	Futures Prices			
		Three-month	One-year	Two-year	Five-year
Crude oil (WTI¹)					
1998–2008	8.6	7.9	6.0	5.1	4.7
1998–2003	8.4	7.5	4.3	2.9	2.5
2004–08	8.8	8.4	7.5	6.8	6.5
Aluminum					
1998–2008	4.6	4.4	3.7	3.2	3.3
1998–2003	3.5	3.2	2.4	1.8	0.5
2004–08	5.7	5.5	4.8	4.2	3.7
Copper					
1998–2008	7.0	6.9	6.3	6.0	6.8
1998–2003	4.2	4.2	3.6	3.3	2.7
2004–08	9.4	9.3	8.6	8.1	7.5
Wheat					
1998–2008	8.1	21.6	5.1	4.0	—
1998–2003	5.9	21.3	3.6	2.2	—
2004–08	10.2	22.1	6.5	5.1	—

Sources: Bloomberg Financial Markets; and IMF staff calculations.

¹WTI = West Texas Intermediate.

(shown in the first figure), which remain relatively high despite the recent price corrections, are subject to considerable uncertainty.

How Reliable Are Futures Curve Signals?

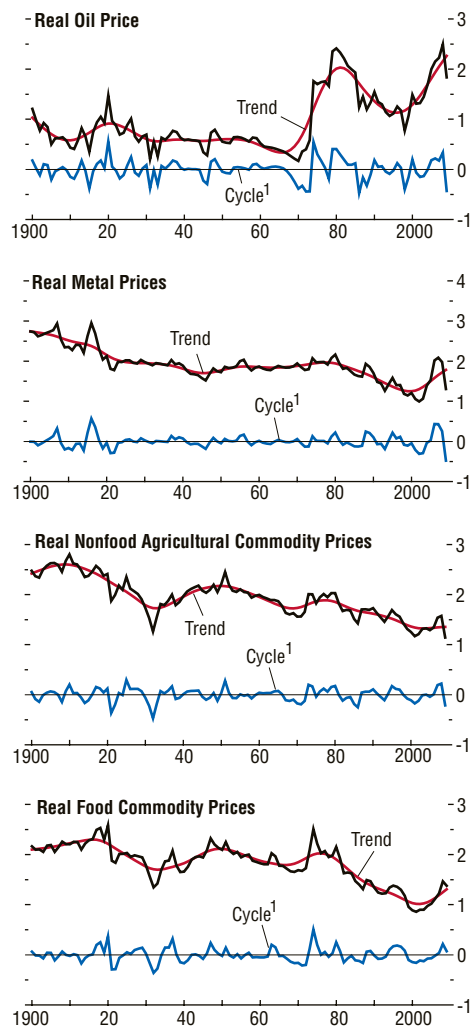
A related question is whether the slope of the commodity futures curve provides a useful signal for the direction of future commodity price changes. Evidence from past global downturns suggests that it should.

During periods of weak global demand and declining spot prices, futures curves were typically upward sloping, implying that prices are expected to recover in the cyclical upswing.⁴ Such a constellation of current and expected future spot prices also provides an incentive for inventory accumulation to absorb the excess supply (production minus consumption) of commodities, which is often observed in downturns. The reason is that the expecta-

⁴There are other reasons futures curves can be partially or fully upward sloping, including higher future inflation or expectations of supply shortages.

Trends and Cycles in Commodity Prices

(In logs; in terms of U.S. Consumer price index)



Sources: Grilli and Yang (1988); Pfaffenzeller, Newbold, and Rayner (2007); Bloomberg; and IMF staff calculations.

¹Deviations from trend (in logs).

tion of higher future prices and the associated returns from price appreciation provide an incentive for inventory accumulation during a downturn, since other benefits (for example,

Success Ratios of Price Forecasts Based on Futures Spreads¹

	Crude Oil ²	Aluminum ²	Copper ²	Wheat ³
12-month futures⁴				
1990:M1–2008:M11	0.84 [0.00]			
1998:M1–2008:M11	0.81 [0.00]	0.88 [0.00]	0.93 [0.00]	0.65 [0.00]
24-month futures⁴				
1998:M1–2008:M11	0.87 [0.00]	0.88 [0.00]	0.89 [0.00]	0.68 [0.00]

Sources: Bloomberg Financial Markets; and IMF staff calculations.

¹Fraction of periods for which the futures-spot spread correctly predicted the direction of actual price changes over the following 12 or 24 months. Values in square brackets denote the statistical significance of the success ratios (see text for details).

²New York Mercantile Exchange.

³Chicago Board of Trade.

⁴Last observation of the month.

from precautionary motives) tend to decrease at the margin as inventories increase.⁵

To assess the reliability of the futures curve slope as a predictor, so-called success ratios for price forecasts were computed for crude oil, aluminum, copper, and wheat based on current 12-month and 24-month futures spreads (second table).⁶ The ratio measures how often these spreads between futures and spot prices correctly predict the direction of actual price changes for these four commodities. Thus, over a 12-month horizon, the current West Texas Intermediate crude oil spread correctly predicted the future price changes 84 percent of the time. Typically, these ratios are statistically significant—that is, they predict the direction of change more often than they would if the futures price had no significance in predicting future spot prices. In sum, the current contango constellation provides useful signals for a cyclical recovery in commodity prices.

⁵See Pindyck (2001), among others, on inventory and commodity price dynamics.

⁶See Pesaran and Timmermann (1992).

When Will Commodity Demand Recover?

Considering the case for a return to high commodity prices from a fundamental perspective, the key question is whether and, if so, how fast the interplay of demand and supply factors will again lead to supply-constrained market conditions. With demand now below production and inventories rising, this will significantly depend on demand prospects. Although the supply side also matters, it is less likely to be a constraint in the early stages of the next global expansion. The reason is that despite the postponement of some capital expenditures, especially on new projects, investment is likely to decrease only gradually. Spending on large investment projects that have been in train for some time will continue, given the high costs of project delays or, even more so, shutdowns. As a result, although producers may seek to curtail actual output—which may limit price declines—capacity will continue to increase into the downturn. In a global recovery, spare capacity and inventories can then absorb rising demand in the early stages, and price increases will primarily reflect the cyclical rebound in costs and margins rather than rents from capacity constraints.

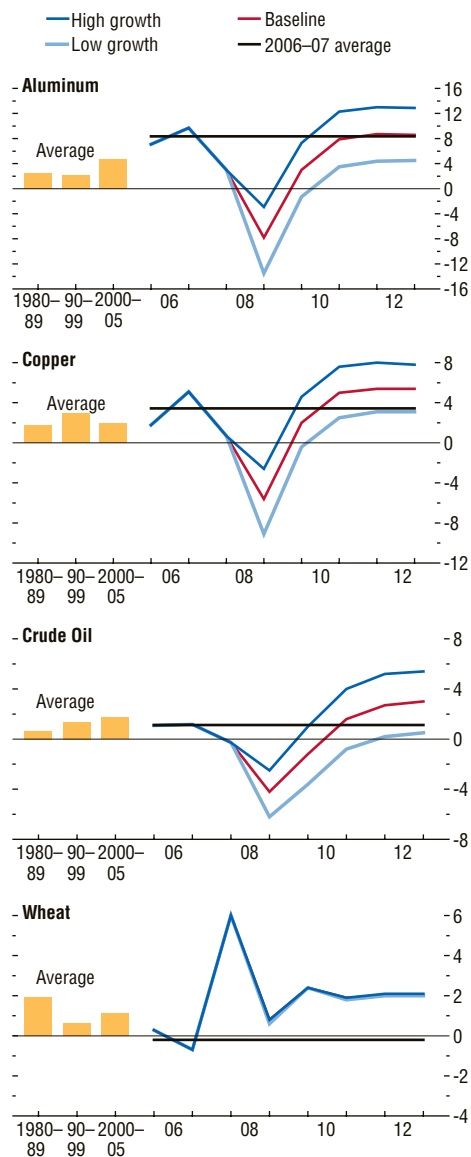
To assess demand prospects, simple dynamic demand equations were estimated for the same four commodities analyzed above—aluminum, copper, crude oil, and wheat.⁷ These equations were then used to predict demand under the assumption of prices remaining at current low levels for three global growth scenarios—the World Economic Outlook (WEO) baseline and two alternative scenarios, for high and low growth (growth at one standard deviation above or below the baseline rate). To allow for heterogeneity across countries, equations are estimated for three different country groups—advanced economies, major emerging and developing economies—Brazil, Russia, India,

⁷The equations include real GDP, the relative price of the commodity, lagged consumption of the commodity, and dummy variables to account for structural breaks.

Box 1.5 (concluded)

Demand Growth Projections for Major Commodities¹

(Annual percent change)



Source: IMF staff estimates.

¹The charts show projected demand growth under the assumption of unchanged prices. The baseline scenario is based on the April 2009 WEO projections for regional growth; the high- and low-growth scenarios assume GDP growth paths at plus or minus one standard deviation around the baseline case.

and China—and other emerging and developing economies.

Using annual data for 1970–2008, the results suggest the following:

- Among the four commodities, demand for aluminum and copper respond most strongly to GDP changes, with the income elasticities typically exceeding 1. For crude oil, income elasticities are smaller than those for metals and are typically below 1. For wheat, income elasticities are virtually zero in all country groups. From a demand perspective, market conditions should therefore tighten first in metals markets.
- The model predicts that with unchanged prices, aluminum demand growth will rebound to the high average rates of 2006–07 by 2010 in the high-growth and baseline cases (second figure). In the low-growth scenario, which would represent a more protracted global downturn, demand growth would remain below the 2006–07 average through 2013.
- In the case of copper and crude oil, average growth during 2006–07 would be reached again in 2011 in the baseline scenario and by 2010 in the high-growth scenario. In the low-growth scenario, demand growth would again remain below recent average rates through 2013.
- Comparing the implied path for oil demand with capacity estimates suggests that in the high-growth scenario, spare capacity would again fall to the average level of 3 million barrels a day over 1989–2008 by 2010 and reach recent lows by 2011. In the baseline scenario, spare capacity would decrease more gradually.
- The model predicts that wheat demand will remain relatively buoyant in any scenario, suggesting that wheat prices may remain high throughout the downturn.

In sum, the scenarios highlight how the strength of demand depends on the timing and buoyancy of a global recovery. If the recovery is late or sluggish, the demand rebound will be slow, and capacity constraints are unlikely to put upward pressure on prices before 2012–13.

expected to recover to the rapid pace achieved in 2003–07 anytime soon since the financial crisis will have lasting effects on credit and capital flows. Spare capacity has risen rapidly, and more capacity is likely to come onstream, suggesting that the need for additional capacity will emerge later and more gradually than previously assumed.

Oil Markets

Among the main primary commodity markets, oil markets have been most affected by the rapid decline in global activity since the third quarter of 2008 and the sharp deterioration in near-term global prospects. After peaking at an all-time record high (in both nominal and real terms) of \$143 a barrel on July 11, oil prices collapsed to about \$38 by end-December.¹³ Since then, prices have broadly stabilized in the \$40–\$50 range, with some recent upticks beyond that range (Figure 1.17, fourth panel).

The turnaround in oil prices last year coincided with a turnaround in global oil demand (Table 1.3). Although oil consumption had risen by some 0.8 million barrels a day (mbd) in the first half of 2008 (year over year), it turned in the third quarter and fell by 2.2 mbd (year over year) in the fourth quarter. On an annual basis, global oil demand fell by 0.4 mbd in 2008, the first decrease since the early 1980s, compared with an expected increase of 1 mbd just some nine months previously. The decline in global oil demand was entirely attributable to sharply decelerating demand in advanced economies (a decline of 1.7 mbd compared with a decline of 0.4 mbd in the previous year), particularly in the United States (1.2 mbd) and Japan (0.4 mbd). Oil demand in emerging and other developing economies continued to increase through 2008, albeit at a slowing pace in all regions but the Middle East.

¹³Unless otherwise stated, oil prices refer to the IMF's Average Petroleum Spot Price, which is a simple average of the prices for the West Texas Intermediate, dated Brent, and Dubai Fateh grades.

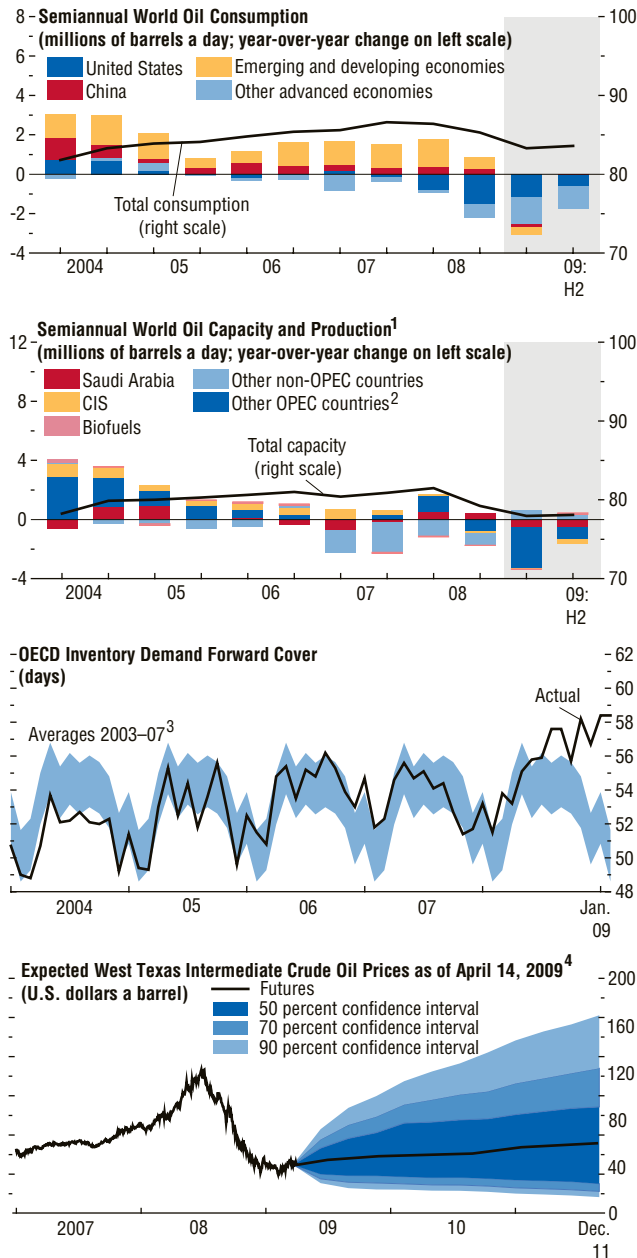
Although demand growth decelerated in 2008, production through the third quarter of the year was markedly above levels recorded in 2007, largely because of increased Organization of Petroleum Exporting Countries (OPEC) production. On an annual basis, global oil production increased by 0.9 mbd in 2008, double the increase recorded in the previous year.

Non-OPEC production fell short of projections once again in 2008. Unlike in the past few years, when production was simply slowing, non-OPEC output actually fell throughout the year relative to production levels recorded in 2007, as declines in the North Sea and in Mexico were not offset by higher production elsewhere, given sluggish investment in real terms.

OPEC production was some 1.2 mbd above levels in the previous year through the third quarter of 2008. Subsequently, OPEC decided to reduce production quotas, in response to weakening oil demand, by a total of 4.2 mbd a day by January 2009. Although production cuts were implemented beginning in October, the impact on average production in the fourth quarter was relatively small (–0.6 mbd). By March 2009, the reduction in OPEC production from the September base level was estimated at 4.0 mbd, some 95 percent of the target. In the past, the compliance rate after six months amounted to about 66 percent. With these production cuts, and so much new capacity having come onstream in 2008, OPEC spare capacity was estimated at 6.7 mbd in March, almost twice the average level of the past 10 years.

With higher production and falling demand, the supply-demand balance turned around decisively in 2008. On average, supply exceeded demand by 0.7 mbd, implying substantial inventory accumulation at the global level. In terms of actual inventory data, inventory in Organization for Economic Cooperation and Development (OECD) countries started rising noticeably in the second half of 2008, particularly in the United States (Figure 1.18, third panel). Reflecting this easing of broad market conditions (see below), the futures price curve has moved from the usual backwardation to strong contango, a

Figure 1.18. World Oil Market Developments



Sources: Bloomberg Financial Markets; International Energy Agency; U.S. Energy Information Agency; and IMF staff estimates.

¹CIS is the Commonwealth of Independent States. OPEC is the Organization of Petroleum Exporting Countries.

²Includes OPEC natural gas liquids.

³Band is based on averages for each calendar month during 2003-07 and a 40 percent confidence interval based on deviations during this period.

⁴From futures options.

constellation that is consistent with incentives for building inventory.

Near-term price prospects depend on the interplay between likely further declines in both demand and supply. On an annual basis, the International Energy Agency forecasts that global demand will decline by about 2.4 mbd in 2009, largely because of further decreases in OECD demand. If March 2009 production levels were maintained through 2009, OPEC production would be some 3.2 mbd below average 2008 levels. Non-OPEC supply is likely to drop slightly in 2009, as low oil prices have not only increased incentives to delay or defer investment spending but have also reduced incentives for spending on field maintenance (to slow down the fields' natural decline). In the aggregate, supply is therefore likely to fall more than demand, and oil market tightness is expected to reemerge in 2009. High inventory levels will provide some cushion initially, but this will not be lasting. As a result, prices are expected to stabilize and rise moderately during the second half of 2009.

In the medium term, oil prices are likely to rebound further, although a rapid recovery to the record price levels seen in the first half of 2008 is unlikely, given prospects of more moderate growth in emerging and developing economies in the next global expansion. Supply constraints in the oil sector, however, could emerge sooner than for other nonrenewable commodities, given the adverse effects of the financial market crisis and low oil prices on capital expenditures.¹⁴ Although lower investment and maintenance spending is a general trend across nonrenewable commodities, its implications for oil capacity may be more severe because of the relatively high field decline rates in recent years. Adequate investment and maintenance spending is therefore needed to sustain current production capacity.

¹⁴Box 1.5 in the April 2008 *World Economic Outlook* discusses the reasons for the sluggish supply response to high oil prices during the recent oil price boom.

Table 1.3. Global Oil Demand and Production by Region*(Millions of barrels a day)*

	2003–06 Average	2007	2008	2009 Proj.	2007 H2	Year over Year Percent Change						
						2008		2007	2008	2009 Proj.	2008	
						H1	H2				H1	H2
Demand												
OECD ¹	49.4	49.2	47.5	45.3	49.4	48.1	47.0	-0.8	-3.4	-4.9	-1.9	-4.8
North America	25.2	25.5	24.3	23.3	25.5	24.7	23.9	0.4	-4.8	-4.2	-3.4	-6.3
<i>of which</i>												
United States	20.9	21.0	19.9	19.0	20.2	19.5	19.5	0.0	-5.6	-4.4	-7.3	-3.7
Europe	15.6	15.3	15.2	14.6	15.5	15.0	15.4	-2.4	-0.6	-4.0	0.0	-1.1
Pacific	8.6	8.3	8.0	7.3	8.3	8.3	7.7	-1.6	-3.8	-8.9	-0.6	-7.1
Non-OECD	33.5	36.9	38.2	38.3	37.1	38.2	38.1	3.8	3.5	-0.1	4.3	2.7
<i>of which</i>												
China	6.5	7.5	7.9	7.8	7.6	7.9	7.8	4.6	4.3	-0.8	5.0	3.6
Other Asia	8.7	9.3	9.4	9.4	9.2	9.6	9.1	2.8	1.4	-0.6	3.8	-1.1
Former Soviet Union	3.9	4.1	4.2	4.1	4.2	4.1	4.3	1.6	2.3	-2.9	2.4	2.2
Middle East	5.8	6.5	6.9	7.2	6.6	6.8	7.0	4.7	6.4	2.5	5.9	6.8
Africa	2.8	3.1	3.1	3.2	3.1	3.2	3.1	3.8	2.1	0.9	2.4	1.8
Latin America	5.0	5.6	5.9	5.9	5.7	5.8	6.0	5.4	4.4	-0.1	5.1	3.8
World	82.8	86.0	85.7	83.4	86.5	86.3	85.1	1.1	-0.4	-2.8	0.8	-1.6
Production												
OPEC (current composition) ²	33.6	34.9	35.9	—	35.3	36.0	35.8	-0.9	3.0	—	4.7	1.4
<i>of which</i>												
Saudi Arabia	10.2	10.0	10.4	—	10.1	10.4	10.4	-4.4	4.2	—	5.4	3.0
Nigeria	2.5	2.3	2.2	—	2.4	2.1	2.2	-4.8	-7.9	—	-8.0	-7.9
Venezuela	2.8	2.6	2.6	—	2.6	2.6	2.6	-7.8	-1.2	—	-0.5	-2.0
Iraq	1.8	2.1	2.4	—	2.2	2.4	2.4	9.9	14.0	—	23.9	5.5
Non-OPEC	49.8	50.7	50.6	50.3	50.5	50.8	50.3	0.8	-0.2	-0.7	-0.2	-0.3
<i>of which</i>												
North America	14.4	14.3	13.9	13.9	14.2	14.1	13.8	0.1	-2.3	0.1	-1.7	-2.8
North Sea	5.4	4.6	4.4	3.9	4.5	4.4	4.3	-5.0	-4.8	-10.7	-5.5	-4.1
Russia	9.4	10.1	10.0	9.7	10.1	10.0	10.0	2.4	-0.8	-2.5	-0.8	-0.9
Other former Soviet Union	2.1	2.7	2.8	2.8	2.7	2.9	2.7	12.1	2.5	1.5	6.5	-1.6
Other non-OPEC	18.6	19.1	19.5	19.9	19.1	19.4	19.6	0.4	2.3	1.6	1.7	2.9
World	83.4	85.5	86.5	—	85.8	86.8	86.1	0.1	1.1	—	1.8	0.4
Net demand³	-0.6	0.5	-0.8	—	0.7	-0.5	-1.0	—	—	—	—	—

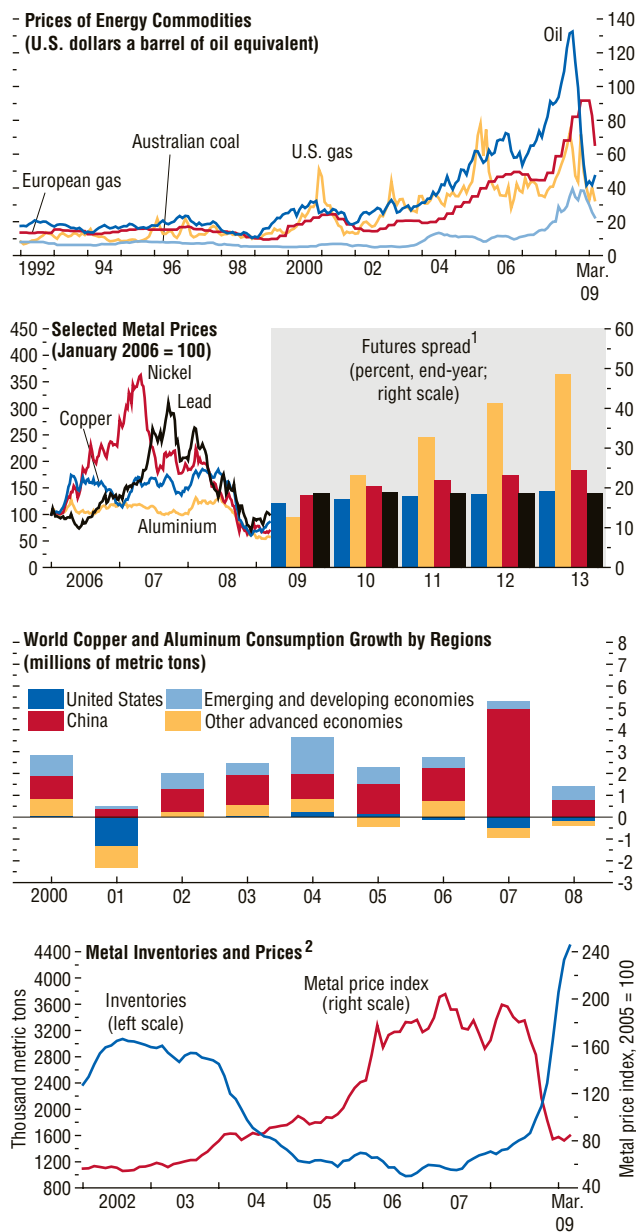
Sources: *Oil Market Report*, International Energy Agency (April 2009); and IMF staff calculations.¹OECD = Organization for Economic Cooperation and Development.²Includes Angola (subject to quotas since January 2007) and Ecuador (rejoined Organization of Petroleum Exporting Countries, OPEC, in November 2007, after suspending its membership during December 1992–October 2007).³Net demand is the difference between demand and production. It includes a statistical difference. A positive value indicates a tightening of market balances.

Other Energy Prices

Other energy markets were also disrupted by the downturn. Coal prices had by end-2008 fallen by more than 50 percent from their record high in July (Figure 1.19, top panel), given declining demand for power and from steel production across the globe. On the supply side, major coal producers have begun to cut production, but inventories are still rising.

Natural gas prices have followed different trends across major regions. In the United States, prices fell by more than 50 percent from their summer 2008 highs. Although residential consumption held up as a result of colder weather, industrial and power sector demand weakened significantly. Given a robust supply and reduced exports to Asia, natural gas inventories in the United States

Figure 1.19. Developments in Metal and Energy Markets



Sources: Bloomberg Financial Markets; World Bureau of Metal Statistics; and IMF staff calculations.

¹ Spread between end-year futures contract and latest available spot price (January 30, 2009) in percent.

² Inventories refer to the sum of global stocks of copper, aluminum, tin, zinc, nickel, and lead monitored by the London Metal Exchange. Price refers to a composite index of those metals.

rose above recent five-year-average levels. In contrast, European natural gas prices continued to rise during the second half of 2008, reflecting supply disruptions related to the disputes between Russia and Ukraine against the backdrop of limited capacity for storage and imports of liquefied natural gas.

Metal Prices

After surging to record highs last spring, metal prices fell rapidly during the second half of 2008, with prices of key metals—aluminum, copper, and nickel—losing more than half of their peak values (Figure 1.19, second panel). Prices of some metals have somewhat recovered more recently—notably those of copper and zinc, which rose by more than 20 percent during the first quarter of 2009. But prices of others have declined, with those of aluminum falling by more than 10 percent during the same period.

The sharp deceleration in industrial production and construction in major emerging economies, notably China—the largest consumer of major metals—has taken a heavy toll on metal demand (Figure 1.19, third panel). On the supply side, prices that are approaching or falling below marginal costs and tightening credit conditions have prompted producers to reduce output and scale back investment. Nevertheless, supply retrenchment lagged demand declines, with metal inventories doubling in 2008 relative to levels seen in the previous year (Figure 1.19, bottom panel).

Food Prices

Food prices fell by 34 percent in the second half of 2008—led by corn, soybeans, and edible oils (Figure 1.20, top panel). As for other non-fuel commodities, the price declines reflected not only slowing demand but also reduced energy costs. In addition, improved supply conditions for major grains and oil seeds were a key factor (Figure 1.20, second panel). The latter reflected both increased acreage and enhanced yield per acre in response to the ear-

lier high prices (Figure 1.20, third panel). Yield per acre was boosted by greater use of higher-quality seeds and fertilizers and more favorable weather conditions, particularly in major wheat producers such as Russia and Ukraine.

There are concerns that declining prices and the financial turmoil adversely affected supply-side prospects in the second half of 2008. In the face of weaker demand from emerging economies, reduced biofuel production with declining gasoline demand, falling energy prices, and insufficient financing amid tightened credit conditions, farmers across the globe have reportedly reduced acreage and fertilizer use (Figure 1.20, bottom panel). For example, the U.S. Department of Agriculture projects that the combined area planted for the country's eight major crops will decline by 2.8 percent (year over year) during the 2009–10 crop year. At the same time, stocks of key food staples, including wheat, are still at relatively low levels. These supply factors should partly offset downward pressure from weak demand during the downturn.

Appendix 1.2. Fan Chart for Global Growth

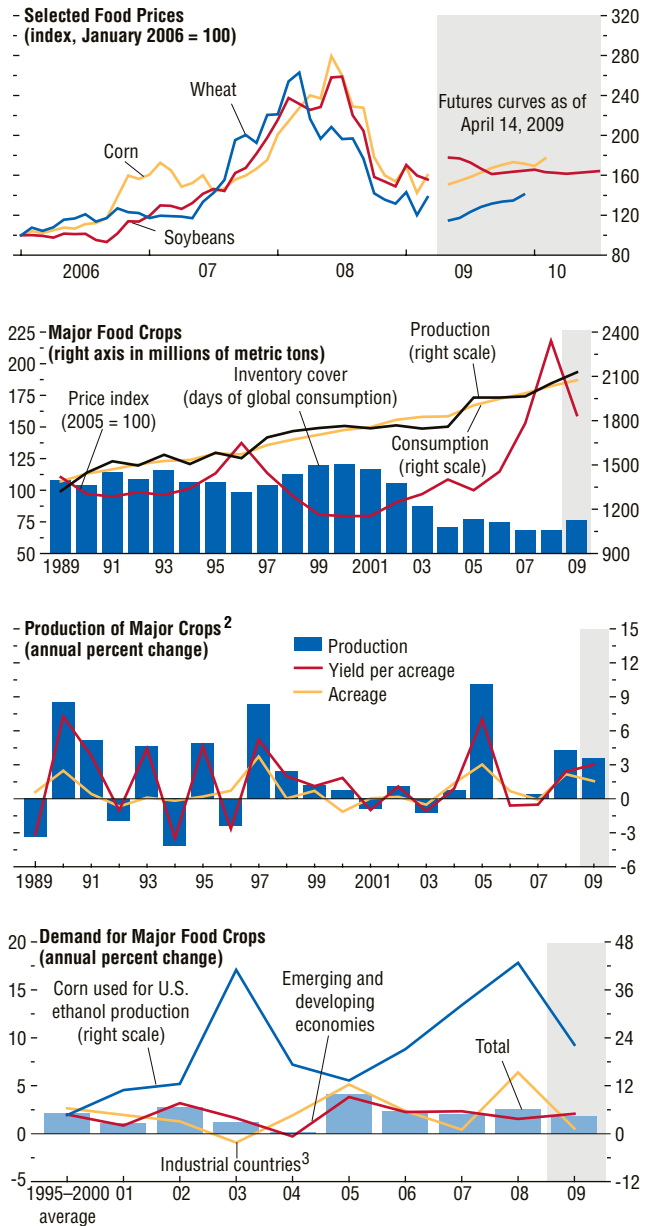
The author of this appendix is Prakash Kannan, with research assistance provided by Murad Omoev.

Since the April 2006 issue of the *World Economic Outlook*, global growth projections have been accompanied by a fan chart, which illustrates the confidence intervals associated with end-year and next-year baseline projections. The fan chart serves primarily as a visual communication device that addresses the following three questions:

- What is the baseline forecast for the current and future years?
- What level of uncertainty surrounds the forecast?
- Where does the balance of risks lie?

The baseline WEO projection, however, is not based on a single formal model, but rather on a suite of models, together with informed judgments made by IMF desk economists. As

Figure 1.20. Recent Developments in Markets for Major Food Crops¹



Sources: Bloomberg Financial Markets; U.S. Department of Agriculture; and IMF staff estimates.

¹Major food crops are wheat, corn, rice, and soybeans.

²Yield per acreage includes corn, rice, and wheat.

³Excludes corn used in U.S. ethanol production.

such, the projections do not naturally have conventional measures of confidence intervals associated with them. In order to impose a greater degree of objectivity on the construction of the fan chart, the existing methodology was modified to allow the incorporation of information embedded in market indicators that have strong associations with the level of global economic activity. This information is subsequently aggregated and mapped into the degree of uncertainty and the balance of risks associated with global growth. This appendix provides a brief overview of the new methodology, as well as an assessment of the current reading of market indicators on the risks associated with the global growth forecast.¹⁵

The sources of information that were used to gauge the market's assessment of risks range from survey-based measures, such as those provided by Consensus Economics, to market-based measures, such as option prices for equities and commodities. Consensus Economics surveys more than 25 institutions each month for its forecasts regarding key macroeconomic indicators for a broad set of countries. The variance and skew of the distribution of forecasts serve as proxies for the degree of uncertainty as well as the balance of risk. Beyond the fact that such data are easily obtained, the use of survey-based measures has the additional benefit of providing quantitative measures of the distribution of risks related to macroeconomic variables that do not have active markets directly associated with them. Apart from the use of survey-based data, information embedded in option prices for equities and commodities has also been incorporated into the new methodology.¹⁶

In order to construct uncertainty bands around the baseline forecasts for global growth, assumptions need to be made regard-

ing the underlying distribution of global growth and the set of risk factors that are of the most immediate interest. As in the previous version of the fan chart, a convenient assumption is that both global growth and the key risk factors are drawn from a two-piece normal distribution function.¹⁷ The two-piece normal distribution is widely used by central banks in the construction of fan charts because it has the benefit of a simple-to-compute density function and an ability to incorporate asymmetries (see, for example, Britton, Fisher, and Whitley, 1998). Asymmetry in the distribution provides the source of the balance of risks illustrated in the fan chart.

Three sets of macroeconomic variables are considered to represent key quantifiable risk factors associated with global growth prospects. Survey or options price data for these variables are used to construct one-year-ahead probability distributions for these variables. The variance and skew of these distributions, together with the relationship between these variables and global real GDP growth, are then used to build the confidence intervals around WEO projections for global real GDP growth. The three sets of variables cover (1) financial conditions, (2) oil price risk, and (3) inflation risk. Financial conditions are proxied by the term spread (measured as the long-term minus the short-term interest rate) and the returns of the Standard & Poor's (S&P) 500 index. Financial market data are naturally forward looking, and so they can convey useful information regarding growth prospects. Increased asset price volatility, for example, is a sign of heightened uncertainty and will likely be associated with less favorable growth developments. The slope of the yield curve has been a reliable predictor of recessions because it embeds expectations of future monetary policy and inflation, which in turn are informative about future growth

¹⁵See Elekdag and Kannan (2009) for a more detailed discussion.

¹⁶Bahra (1997) is a good survey that covers the theoretical basis for a variety of methodologies used to extract probability distributions from data on option prices along with some useful applications.

¹⁷The two-piece normal distribution is formed by combining two halves of two normal distributions that have different variances but share the same mean. See John (1982) for a summary of its main properties.

prospects (see Estrella and Mishkin, 1996). As a result, the risk of a decrease in the slope of the term spread is indicative of downside risk. Meanwhile, the oil price risk factor captures the risks associated with the baseline projection for oil prices, which serves as a key input to individual country growth projections. Finally, inflation risk is characterized by high or volatile price dynamics, which may trigger aggressive monetary tightening, thereby potentially depressing growth.

Information on the distribution of the three sets of macroeconomic variables is subsequently mapped into real GDP growth on the basis of econometric relationships. The estimated elasticity of global growth with respect to standardized estimates of the term spread, S&P 500 returns, inflation, and oil prices are 0.35, 0.15, -0.4 , and -0.35 , respectively.

The inflation forecasts compiled by Consensus Economics for the United States, the euro area, Japan, and several key emerging markets were used to provide information for inflation risk. The calculations for the term spread and oil price risk factors are performed in an analogous manner. In the case of the term spread, however, only data on the slope of the yield curves in the United States, the United Kingdom, Japan, and Germany are used.¹⁸ Finally, the balance of risks associated with the equity market risk factor are obtained by estimating the distribution function of equity returns implicit in call option data on the S&P 500 index.¹⁹

Previous fan charts presented in the *World Economic Outlook* used historical forecast errors for projections of global growth at the one- and

two-year horizons as a measure of the baseline degree of uncertainty to construct the two-piece normal distribution. In principle, this baseline measure of uncertainty could subsequently be increased or decreased based on the level of the standard deviation of the risk factors relative to their historical levels. An alternative way of incorporating changes in the degree of uncertainty relative to the historical forecast error, and one that is applied in the present approach, is through an aggregation of the dispersion of real GDP forecasts for individual countries. By comparing the dispersion of these individual growth forecasts with their historical values, it is possible to obtain an indicator of the uncertainty associated with global growth. Several studies, including Kannan and Kohler-Geib (2009) and Prati and Sbracia (2002), find that the dispersion of growth forecasts is a significant predictor of financial crises.

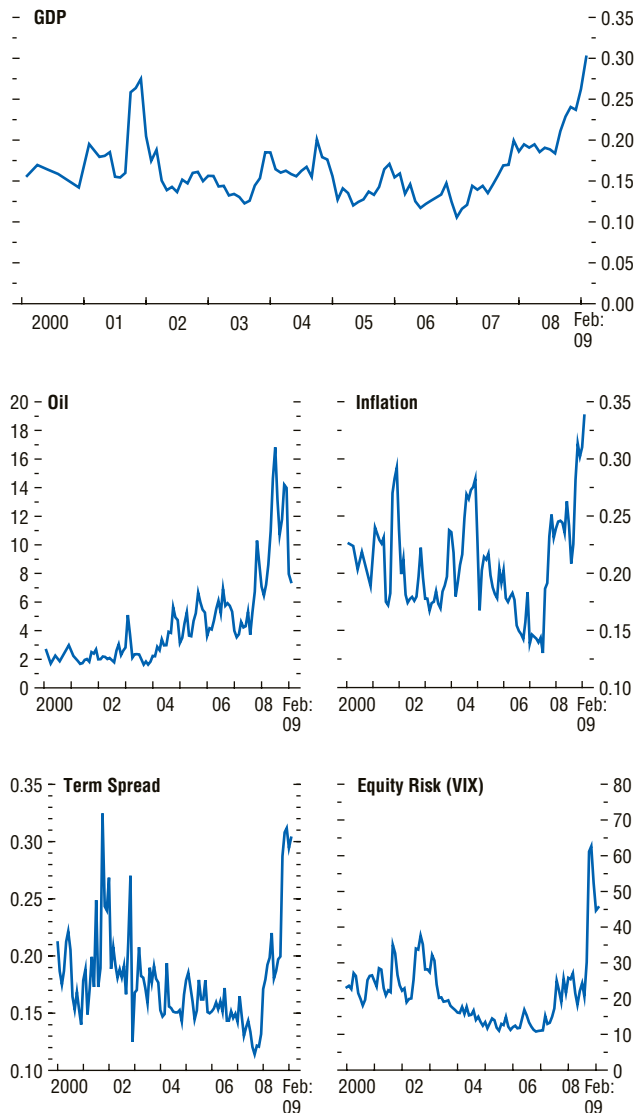
The current distribution of forecasts for GDP growth in key economies, as well as for the identified risk factors, shows much higher dispersion relative to recent years, indicating a larger degree of uncertainty associated with the baseline projection than has historically been the case (Figure 1.21). In the construction of the fan chart (Figure 1.10), the increase in the dispersion of growth forecasts, relative to the average over the past 10 years, is translated into a higher variance in the distribution of global growth projections by augmenting the historical one- and two-year-ahead forecast errors proportionately. In this particular case, the standard deviation of the distribution was increased by about 80 percent relative to its historical average.

Market indicators can also be used to provide information on the balance of risks surrounding the baseline forecast. The measure of skewness provides an indicator of the direction and degree of imbalance in the distribution of survey forecasts or in the distribution of expected future price changes implicit in option prices. The most recent reading of indicators on the balance of risks arising from financial condi-

¹⁸The distribution of oil price forecasts was obtained from Bloomberg Financial Markets, extracting information on the probability density function from option prices for oil-yield densities with peculiar shapes. However, recent IMF staff efforts that impose more restrictions on the shape of the density have yielded promising results and will be used as an alternative measure in the future.

¹⁹The nonparametric constrained estimator introduced in Ait-Sahalia and Duarte (2003) was used to estimate the risk-neutral density of the S&P 500 returns.

Figure 1.21. Dispersion of Forecasts for GDP and Selected Risk Factors¹



Sources: Consensus Economics; Bloomberg Financial Markets; Chicago Board Options Exchange; and IMF staff calculations.

¹The series for GDP and inflation measure the dispersion (standard deviation) of GDP and inflation forecasts respectively for the G-7 economies, Brazil, India, China and Mexico, taking into account the covariance of forecasts. The series for term spread measures the dispersion of forecasts of the term spread (10-year government bond yield minus 3-month interest rate) for the United States, the United Kingdom, Germany and Japan. The oil price series measures the dispersion of one-year ahead oil forecasts. Finally, the series for equity risk is the VIX series which measures the implied volatility of the S&P 500.

tions, equity markets, inflation, and oil prices cumulatively points toward a downside risk to global growth (Figure 1.22). The negative skew in the forecasts for the slope of the yield curve and the negative skew implicit in the option prices for the S&P 500 indicate continued stress in financial market conditions. The negative skew in the distribution of inflation forecasts reflects in part limited room for further monetary easing. Meanwhile, market indicators of the risks associated with oil price shocks over the next year appear to be roughly balanced, with a slightly positive skew.

The incorporation of market indicators into the construction of the fan chart represents a move toward using an objective analysis as a starting point to gauge the balance of risk and the level of uncertainty inherent in the baseline projection of global growth. From this starting point, however, a layer of judgment can subsequently be introduced in order to incorporate other important risk factors. Indeed, as is explicitly shown in Figure 1.22, an additional judgment factor is introduced that relates to the overall balance of risk associated with the projections for global growth for this year and the next. This additional judgment factor is meant to capture some of the risks highlighted in the main text that do not lend themselves to easy quantification.

Appendix 1.3. Assumptions behind the Downside Scenario

The author of this appendix is Dirk Muir.

The downside scenario presented in the chapter was developed using a global macroeconomic model, the National Institute Global Econometric Model (NIGEM), based on a variety of assumptions. A key component of the scenario is the spillovers from one region to another. These are based on the bilateral trade flows outlined in Table 1.4.

Using information in this table, the model decomposes the additional decline in output growth that occurs in this scenario, relative to the WEO baseline, between the international spillovers and the effects of domestic shocks in

Table 1.4. Underlying World Merchandise Trade Flows*(As a percent of world GDP)*

Importer	Exporter							Total Imports
	United States	Japan	Euro area	Emerging Asia	Latin America	Emerging Europe	Rest of the world	
United States	—	0.27	0.50	1.04	0.57	0.04	1.26	3.68
Japan	0.11	—	0.09	0.44	0.04	0.01	0.43	1.14
Euro area	0.33	0.14	—	0.76	0.18	0.59	1.74	3.74
Emerging Asia	0.41	0.61	0.43	—	0.15	0.05	1.36	3.15
Latin America	0.42	0.06	0.15	0.18	—	0.01	0.16	1.07
Emerging Europe	0.03	0.03	0.74	0.16	0.01	—	0.41	1.40
Rest of the world	0.82	0.20	1.88	1.02	0.17	0.34	—	4.38
Total exports	2.12	1.31	3.78	3.36	1.06	1.04	4.66	—

Source: IMF, *Direction of Trade Statistics*.

each region (Table 1.5). Three types of domestic shock are considered: (1) additional financial stress adding to credit constraints; (2) deeper corrections in housing markets, weighing on residential investment and private consumption; and (3) large equity price declines, implying weaker private consumption. Each of these shocks is applied in each region at one of three intensities: mild, moderate, or severe, relative to the WEO baseline.

Consider the case of the United States. International spillovers in this case account for 63 percent of further decline in GDP over 2009 and 2010. The remaining 37 percent is attributed to shocks related to domestic demand. There are additional moderate shocks to the financial and housing sectors and an additional mild shock in equity markets. Taken together with the international spillovers, the United States' additional decline is relatively mild.

To summarize, mild declines, in comparison with the WEO baseline, are the case for the United States, the euro area, and Japan. Emerging Asia and Latin America face moderate declines, with international spillovers dominating in emerging Asia. Emerging Europe suffers a severe additional decline, driven by large shocks to the financial sector and the housing market, with only a mild contribution from the equity market.

Finally, there are two global shocks. First, trade volumes decline worldwide on average in 2009 and 2010, by 10 percent to 15 percent,

relative to the baseline. Second, the price of oil declines by an additional 15 percent in 2009, ending 20 percent lower than the baseline by the end of 2010.

Table 1.5. Factors Explaining the Additional Decline in Output Growth for 2009–10

United States		Euro Area	
Additional decline International spillovers	*	Additional decline International spillovers	*
Domestic factors: Financial	63%	Domestic factors: Financial	48%
Housing	**	Housing	**
Equity markets	**	Equity markets	*
Japan		Emerging Asia	
Additional decline International spillovers	*	Additional decline International spillovers	**
Domestic factors: Financial	61%	Domestic factors: Financial	78%
Housing	**	Housing	*
Equity markets	*	Equity markets	**
Latin America		Emerging Europe	
Additional decline International spillovers	**	Additional decline International spillovers	***
Domestic factors: Financial	40%	Domestic factors: Financial	41%
Housing	**	Housing	***
Equity markets	*	Equity markets	**

Sources: IMF staff calculations; and National Institute Global Econometric Model simulations.

"Additional decline" is a weighted average of international spillovers and domestic demand shocks.

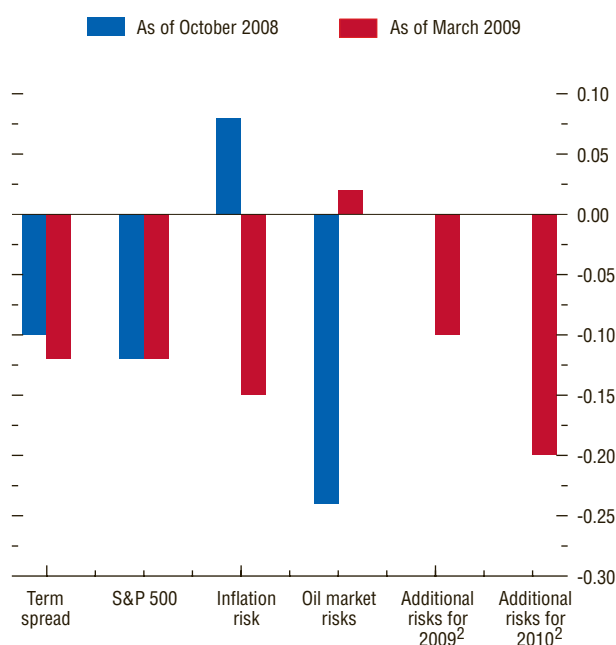
"International spillovers" is the percentage of decline attributable to the effects of international trade linkages.

*** is a severe shock, relative to the WEO baseline.

** is a moderate shock, relative to the WEO baseline.

* is a mild shock, relative to the WEO baseline.

Figure 1.22. Balance of Risks Associated with Selected Risk Factors¹
(Percentage points)



Sources: Consensus Economics; Bloomberg Financial Markets; and IMF staff estimates.

¹Bar charts show the skew of each risk factor based on either the distribution of analyst forecasts or the distribution implied by option prices.

²The additional risks represent a judgement regarding the magnitude of the impact of additional non-quantifiable risks highlighted in the main text of the chapter.

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