CHAPTER 1

GLOBAL PROSPECTS AND POLICIES

The world economy is now entering a major downturn in the face of the most dangerous shock in mature financial markets since the 1930s. Against an exceptionally uncertain background, global growth projections for 2009 have been marked down to 3 percent, the slowest pace since 2002, and the outlook is subject to considerable downside risks. The major advanced economies are already in or close to recession, and, although a recovery is projected to take hold progressively in 2009, the pickup is likely to be unusually gradual, held back by continued financial market deleveraging. In this context, elevated rates of headline inflation should recede quickly, provided oil prices stay at or below current levels. The emerging and developing economies are also slowing, in many cases to rates well below trend, although some still face significant inflation pressure even with more stable commodity prices. The immediate policy challenge is to stabilize global financial markets, while nursing economies through a global downturn and keeping inflation under control. Over a longer horizon, policymakers will be looking to rebuild firm underpinnings for financial intermediation and will be considering how to reduce procyclical tendencies in the global economy and strengthen supply-demand responses in commodity markets.

This chapter opens with an overview of a global economy under stress. It then examines the expanding financial crisis and its macroeconomic implications in more detail, as well as the imbalances in housing and commodity markets. This analysis sets the stage for the discussion of the outlook and risks. The final part of the chapter discusses the policy challenges. Chapter 2 looks in more detail at developments and policy issues in each of the world's main regions.

Global Economy under Stress

For four years through the summer of 2007, the global economy boomed. Global GDP rose at an average of about 5 percent a year, its highest sustained rate since the early 1970s. About three-fourths of this growth (measured on a purchasing-power-parity basis) was attributable to a broad-based surge in the emerging and developing economies (Table 1.1 and Figure 1.1). Inflation remained generally contained, albeit with some upward drift.

Over the past year, the global economy has been buffeted by the deepening crisis in financial markets, by major corrections in housing markets in a number of advanced economies, and by surges in commodity prices. Indeed, the financial crisis that erupted in August 2007 after the collapse of the U.S. subprime mortgage market entered a tumultuous new phase in September 2008 that has badly shaken confidence in global financial institutions and markets. Most dramatically, intensifying solvency concerns have triggered a cascading series of bankruptcies, forced mergers, and public interventions in the United States and western Europe, which has resulted in a drastic reshaping of the financial landscape. Moreover, interbank markets have virtually locked up as trust in counterparties has evaporated. Responding rapidly, the U.S. and European authorities have announced far-reaching measures aimed at supporting key institutions, stabilizing markets, and bolstering confidence, but markets remains highly unsettled and volatile as this report goes to press.

Faced by increasingly difficult conditions, the global economy has slowed markedly. The advanced economies grew at a collective annualized rate of only 1 percent during the period from the fourth quarter of 2007 through the second quarter of 2008, down from 2½ percent during the first three quarters of 2007. The U.S. economy has suffered most from the direct effects of the financial crisis that originated in its own subprime mortgage market, which has tightened credit conditions and amplified the

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

(Percent change, unless otherwise noted)

	Year over Year						Q4 over Q4		
			Projections		Difference from July 2008 WEO Projections		Estimates	Projections	
	2006	2007	2008	2009	2008	2009	2007	2008	2009
World output[1]	**5.1**	**5.0**	**3.9**	**3.0**	**–0.2**	**–0.9**	**4.8**	**2.8**	**3.2**
Advanced economies	3.0	2.6	1.5	0.5	–0.2	–0.9	2.6	0.7	1.0
United States	2.8	2.0	1.6	0.1	0.3	–0.7	2.3	0.8	0.4
Euro area	2.8	2.6	1.3	0.2	–0.4	–1.0	2.1	0.4	0.6
Germany	3.0	2.5	1.8	—	–0.2	–1.0	1.7	0.7	0.6
France	2.2	2.2	0.8	0.2	–0.8	–1.2	2.2	–0.1	0.8
Italy	1.8	1.5	–0.1	–0.2	–0.6	–0.7	0.1	–0.1	0.2
Spain	3.9	3.7	1.4	–0.2	–0.4	–1.4	3.2	0.1	0.1
Japan	2.4	2.1	0.7	0.5	–0.8	–1.0	1.4	0.2	0.9
United Kingdom	2.8	3.0	1.0	–0.1	–0.8	–1.8	2.9	–0.3	0.7
Canada	3.1	2.7	0.7	1.2	–0.3	–0.7	2.8	0.3	1.7
Other advanced economies	4.5	4.7	3.1	2.5	–0.2	–0.8	5.0	2.0	3.7
Newly industrialized Asian economies	5.6	5.6	4.0	3.2	–0.2	–1.1	6.1	2.6	5.4
Emerging and developing economies[2]	7.9	8.0	6.9	6.1	—	–0.6	8.5	6.1	6.5
Africa	6.1	6.3	5.9	6.0	–0.5	–0.4	. . .	. . .	. . .
Sub-Sahara	6.6	6.9	6.1	6.3	–0.5	–0.5	. . .	. . .	. . .
Central and eastern Europe	6.7	5.7	4.5	3.4	–0.1	–1.1	. . .	. . .	. . .
Commonwealth of Independent States	8.2	8.6	7.2	5.7	–0.6	–1.5	. . .	. . .	. . .
Russia	7.4	8.1	7.0	5.5	–0.7	–1.8	9.5	5.9	5.8
Excluding Russia	10.2	9.8	7.6	6.2	–0.2	–0.8	. . .	. . .	. . .
Developing Asia	9.9	10.0	8.4	7.7	—	–0.7	. . .	. . .	. . .
China	11.6	11.9	9.7	9.3	—	–0.5	11.3	9.2	9.4
India	9.8	9.3	7.9	6.9	–0.1	–1.1	8.9	7.2	6.9
ASEAN–5	5.7	6.3	5.5	4.9	–0.1	–1.0	6.6	4.7	5.7
Middle East	5.7	5.9	6.4	5.9	0.2	–0.1	. . .	. . .	. . .
Western Hemisphere	5.5	5.6	4.6	3.2	0.1	–0.4	. . .	. . .	. . .
Brazil	3.8	5.4	5.2	3.5	0.3	–0.5	6.2	3.9	3.7
Mexico	4.9	3.2	2.1	1.8	–0.3	–0.6	4.2	0.9	2.4
Memorandum									
European Union	3.3	3.1	1.7	0.6	–0.4	–1.1	. . .	. . .	. . .
World growth based on market exchange rates	3.9	3.7	2.7	1.9	–0.2	–0.8	. . .	. . .	. . .
World trade volume (goods and services)	**9.3**	**7.2**	**4.9**	**4.1**	**–1.2**	**–1.9**	**. . .**	**. . .**	**. . .**
Imports									
Advanced economies	7.5	4.5	1.9	1.1	–1.6	–2.3	. . .	. . .	. . .
Emerging and developing economies	14.7	14.2	11.7	10.5	–0.7	–1.1	. . .	. . .	. . .
Exports									
Advanced economies	8.4	5.9	4.3	2.5	–0.7	–1.8	. . .	. . .	. . .
Emerging and developing economies	11.0	9.5	6.3	7.4	–2.0	–1.7	. . .	. . .	. . .
Commodity prices (U.S. dollars)									
Oil[3]	20.5	10.7	50.8	–6.3	–13.0	–13.6	. . .	. . .	. . .
Nonfuel (average based on world commodity export weights)	23.2	14.1	13.3	–6.2	–1.3	–1.0	. . .	. . .	. . .
Consumer prices									
Advanced economies	2.4	2.2	3.6	2.0	0.2	–0.3	3.0	3.3	1.7
Emerging and developing economies[2]	5.4	6.4	9.4	7.8	0.3	0.4	6.7	7.9	6.2
London interbank offered rate (percent)[4]									
On U.S. dollar deposits	5.3	5.3	3.2	3.1	0.4	–0.5	. . .	. . .	. . .
On euro deposits	3.1	4.3	4.8	4.2	–0.2	–1.1	. . .	. . .	. . .
On Japanese yen deposits	0.4	0.9	1.0	1.2	–0.1	–0.3	. . .	. . .	. . .

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during August 18–September 15, 2008.

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

[2]The quarterly estimates and projections account for approximately 76 percent of the emerging and developing economies.

[3]Simple average of prices of U.K. Brent, Dubai, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was $71.13 in 2007; the assumed price based on future markets is $107.25 in 2008 and $100.50 in 2009.

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

housing correction that has been under way since 2006. Aggressive policy easing by the Federal Reserve, a timely fiscal stimulus package, and strong export performance on the back of a weakening U.S. dollar have helped cushion these blows, but the economy has still managed to grow by only 1¼ percent on average since the fourth quarter of 2007. Activity in western Europe has also slowed appreciably, dampened by high oil prices, tightening credit conditions, housing downturns in several economies, the U.S. slowdown, and the appreciating euro. Japan's economy initially showed more resilience but has recently been affected by slowing exports and the impact of deteriorating terms of trade on domestic demand.

Available data for the third quarter and forward-looking indicators suggest that the downturn in the advanced economies is continuing to deepen (Figure 1.2). Indeed, business and consumer confidence indicators for the United States and the euro area are now close to lows experienced during the 2001–02 recession.

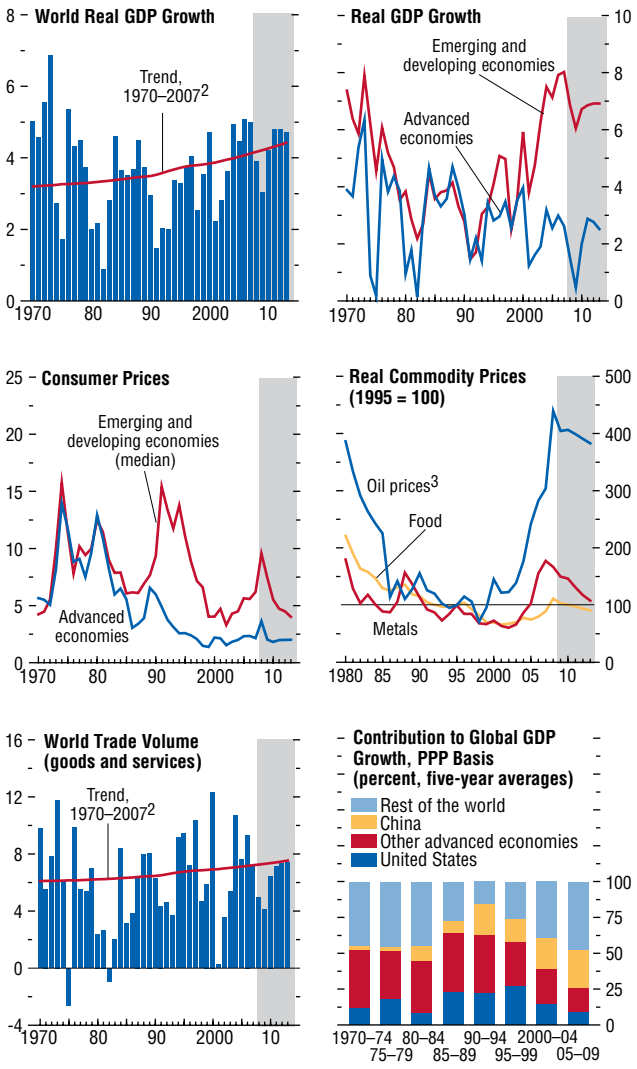
The emerging and developing economies have not decoupled from this downturn. Growth in these countries eased from 8 percent in the first three quarters of 2007 to 7½ percent in the subsequent three quarters, as domestic demand (particularly business investment) and net exports have moderated. Moreover, recent trade and business activity indicators are signaling continuing deceleration. Growth has been most resilient in commodity-exporting countries, which are benefiting from still-high export prices. By contrast, countries with the strongest trade links with the United States and Europe are slowing markedly, while some countries that relied on bank-related or portfolio inflows to finance large current account deficits have been hit hard by an abrupt tightening of external financing. Nevertheless, as a group, emerging economies have so far sustained market access better than in earlier episodes of financial turbulence, reflecting improvements in policy frameworks and stronger public sector balance sheets.

Despite the deceleration of global growth, headline inflation has risen around the world

Figure 1.1. Global Indicators[1]

(Annual percent change unless otherwise noted)

After four years of strong growth, the global economy is heading into a major downturn, led by the advanced economies. At the same time, inflation has risen to its highest rates in a decade, pushed up by a surge in commodity prices.



Source: IMF staff estimates.

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

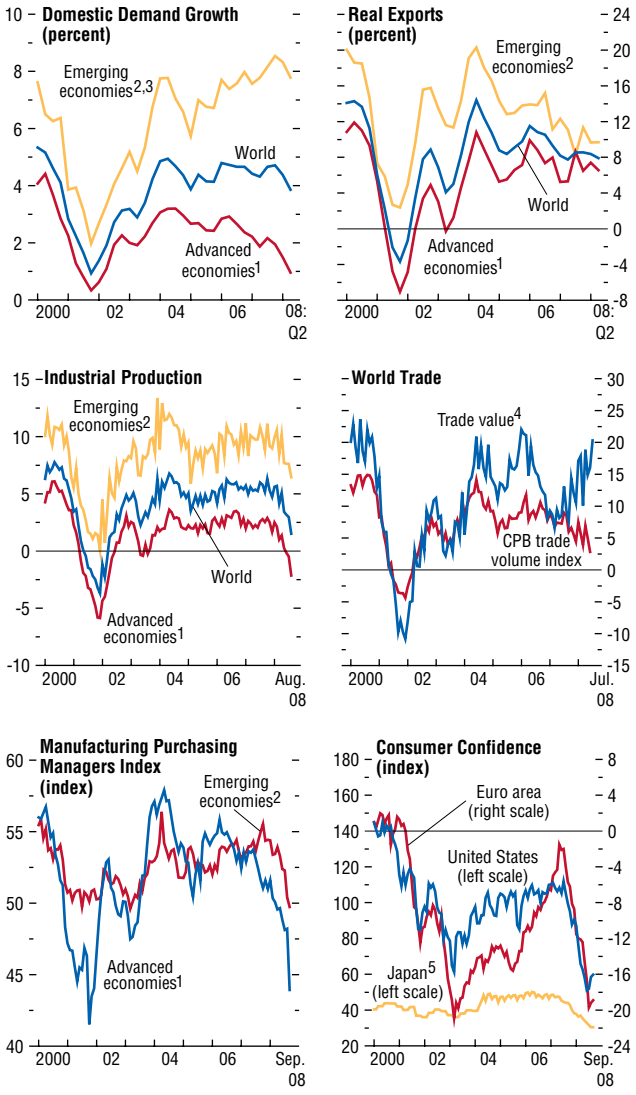
[2]Average growth rates for individual countries, aggregated using PPP weights; the aggregates shift over time in favor of faster-growing economies, giving the line an upward trend.

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

Figure 1.2. Current and Forward-Looking Indicators

(Percent change from a year earlier unless otherwise noted)

Domestic demand has slowed considerably in the advanced economies, and indicators of business sentiment and consumer confidence suggest that the deceleration is likely to intensify. Emerging economies have not decoupled, as slowing world trade has dampened manufacturing activity.



Sources: CPB Netherlands Bureau for Economic Policy Analysis for CPB trade volume index; for all others, NTC Economics and Haver Analytics.

[1]Australia, Canada, Denmark, euro area, Japan, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States.

[2]Argentina, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Estonia, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Latvia, Lithuania, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, Singapore, Slovak Republic, South Africa, Taiwan Province of China, Thailand, Turkey, Ukraine, and Rep. Bolivariana de Venezuela.

[3]Data for China and Pakistan are interpolated.

[4]Percent change from a year earlier in SDR terms.

[5]Japan's consumer confidence data are based on a diffusion index, where values greater than 50 indicate improving confidence.

to the highest rates since the late 1990s, pushed up by the surge in fuel and food prices. In the advanced economies, 12-month headline inflation registered 4¼ percent in August 2008, down modestly from a peak in July in the wake of some commodity price easing (Figure 1.3). Measures of underlying inflation—price indices excluding food and fuel prices, inflation expectations, and labor costs—have been broadly contained, although there has been upward drift in some measures. Reflecting heightened inflation concerns, the Federal Reserve has held the federal funds rate at 2 percent since April, after six months of steep cuts, and the European Central Bank increased its policy rate one notch to 4¼ percent in early July.

The resurgence in inflation has been more marked in the emerging and developing economies, with headline inflation reaching 8¼ percent in the aggregate in August and with a wide swath of countries now experiencing double-digit inflation. To some extent, the difference reflects the considerably greater weight of food prices in consumption baskets in these economies—typically in the range of 30–45 percent as opposed to 10–15 percent in the advanced economies. However, inflation excluding food and fuel has also accelerated markedly, and there are signs of rising inflation expectations and wage increases, although such data are not as systematically available as in the advanced economies. Chapter 3 looks at the relationship between commodity prices and inflation and finds that emerging economies have been more vulnerable to second-round effects. This is because the greater weight of food prices has put more pressure on real wages, because inflation expectations are less well anchored by central bank credibility, and because fast growth has eroded margins of spare capacity.

Policymakers in emerging and developing economies have responded to rising inflation with an eclectic mix of measures. Many central banks have raised interest rates, but others have relied more on increasing reserve requirements and tightening credit, particularly where interest rate policy has been constrained by inflex-

ible exchange rate management. However, as discussed below, some of these steps have been reversed recently in the face of intense liquidity strains related to recent financial turmoil. Some countries have also tightened fiscal policies to help restrain the growth of aggregate demand. Going beyond macroeconomic policies, a number of countries have sought to limit the impact of rising international commodity prices on domestic prices by delaying or limiting the pass-through of oil prices—with a potentially heavy fiscal cost—by lowering tariffs on imported food, and in some cases by prohibiting or imposing taxes on food exports.

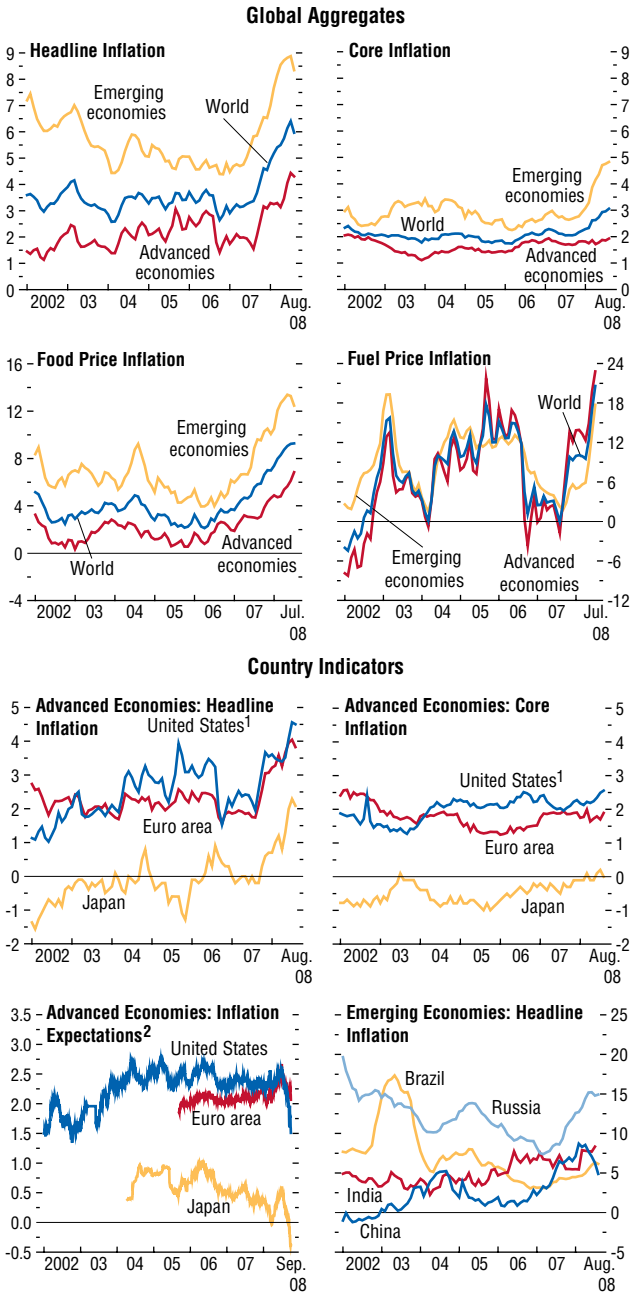
The weakening of U.S. growth relative to its trading partners and the sustained depreciation of the U.S. dollar since 2002 helped lower the U.S. current account deficit to 5 percent of GDP in the first half of 2008, from 6½ percent in late 2005 (Figure 1.4). The decrease is even larger if net oil imports are excluded. Despite some strengthening since early 2008, the real effective exchange rate of the U.S. dollar is at its lowest level in decades, and the dollar is now assessed to be broadly in line with medium-term fundamentals. The adjustment in the dollar in recent years has largely come against other advanced economy currencies, notably the euro (which is now judged to be on the strong side of fundamentals) and the yen (which is still assessed to be undervalued relative to fundamentals), as well as other floating rate currencies.

Among emerging economies, China's exchange rate has continued to appreciate at a moderate pace, with a somewhat faster rise in real effective terms owing to the pickup in inflation (Figure 1.5). Nevertheless, China's current account surplus has remained above 10 percent of GDP, and with strong capital inflows despite a tightening of controls, reserves have continued to mount. In the IMF staff's view, the renminbi remains substantially undervalued relative to medium-term fundamentals. Many oil exporters in the Middle East have continued to peg against the U.S. dollar. As a result, their nominal effective exchange rates have tended to depreciate, although exchange rates have appreciated

Figure 1.3. Global Inflation

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

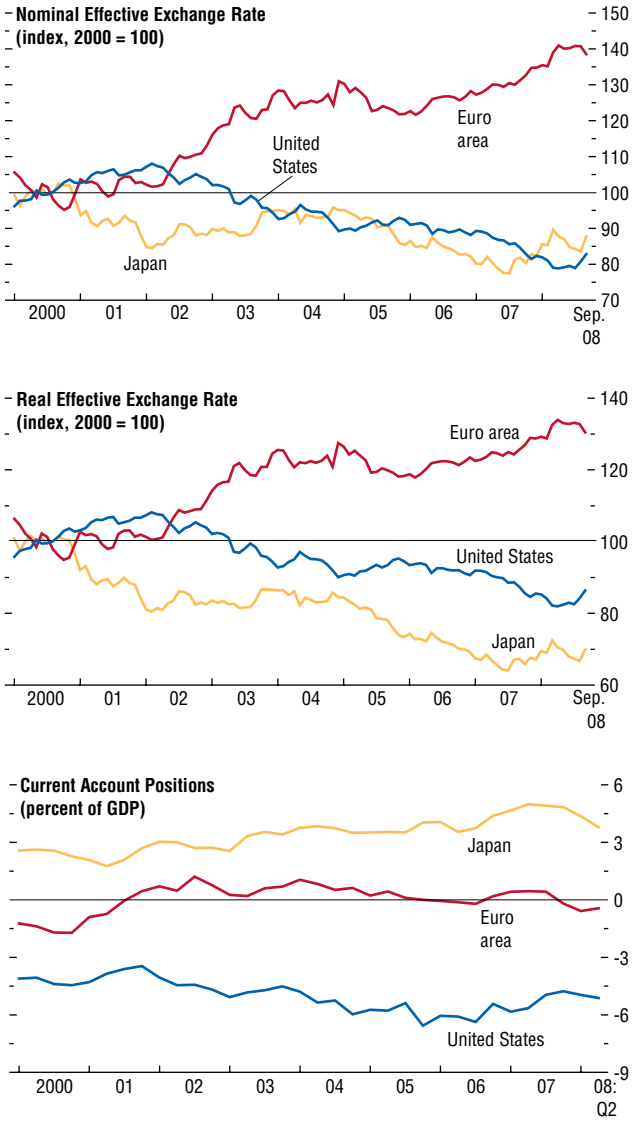
Headline inflation has surged, particularly in emerging and developing economies, reflecting both a jump in food and fuel prices and a more general tightening of capacity constraints. The advanced economies have also experienced a marked acceleration of headline inflation, driven mainly by the pass-through of high international oil prices, but indicators of underlying inflation have risen only modestly.



Sources: Bloomberg Financial Markets; Haver Analytics; and IMF staff calculations.
[1]Personal consumption expenditure deflator.
[2]Ten-year breakeven rates.

Figure 1.4. External Developments in Selected Advanced Economies

Depreciation of the real effective value of the U.S. dollar combined with slowing domestic demand have contributed to some moderation in the U.S. current account deficit. The current account positions of the euro area and Japan have weakened over the past year, reflecting exchange rate appreciation and higher oil prices.



Sources: Haver Analytics; and IMF staff calculations.

moderately in real terms because of rising inflation. Elsewhere, experiences are quite diverse. Currencies in emerging Europe and Latin America have generally appreciated, as monetary policy has been tightened and commodity exporters have benefited from terms-of-trade gains, although some currencies have come under pressure recently as commodity prices softened and risk aversion increased. A number of currencies in Africa and south and east Asia (for example, India, Korea, Pakistan, and South Africa) have depreciated over a longer period, in part owing to rising costs of commodity imports and widening current account deficits.

Financial System in Crisis[1]

The April 2008 *World Economic Outlook* was finalized just after the Federal Reserve engineered the emergency sale of a major U.S. investment bank (Bear Stearns) and increased broker-dealer access to emergency liquidity. Banks also made progress in recognizing their losses on subprime-mortgage-related exposures, rebuilding their capital, and reducing their leverage.[2]

Despite these efforts, financial market strains intensified again over the summer as solvency concerns resurfaced and as it became clear that the process of balance-sheet repair would be protracted. Bank funding came under particular stress (Figure 1.6). One source of pressure was the increasing concern that credit losses were mounting in the grip of a negative feedback loop between the economy and the financial system. At the same time, bank adjustment was hampered by high funding costs, reduced revenue streams from fee-based securitization

[1]Financial sector developments are discussed in detail in the October 2008 *Global Financial Stability Report* (IMF, 2008b).

[2]As of September 2008, banks reported $518 billion in losses on U.S. subprime mortgages and related exposure, the lion's share by U.S. and European banks. Banks also raised $364 billion in new capital. These amounts compare to losses on U.S.-based loans and related securities now estimated at $1.4 trillion, of which $640 billion–$735 billion would correspond to banks (IMF, 2008b).

business, and forced accumulation of assets from off-balance-sheet entities and prior loan commitments. Falling equity prices made raising new capital increasingly expensive, often prohibitively so, while at the same time, markets as well as regulators were looking for a significant increase in capital-to-asset ratios to levels well above those prevailing before the crisis.

Once more, the greatest strains have been experienced by institutions heavily exposed to the still-weakening U.S. housing market. Starting in August, Fannie Mae and Freddie Mac, the two giant government-sponsored enterprises (GSEs),[3] came under heavy pressure over concerns about the adequacy of their capital bases in the face of rising losses, which were not relieved by assurances from the U.S. authorities that these two institutions would have access to federal funding to meet their liquidity and capital needs. In light of the crucial current role of these agencies in the U.S. housing market and the global financial system, the two institutions were placed under the conservatorship of the U.S. Federal Housing Finance Agency, with the U.S. government pledging additional financial support as needed to maintain adequate capital and funding.

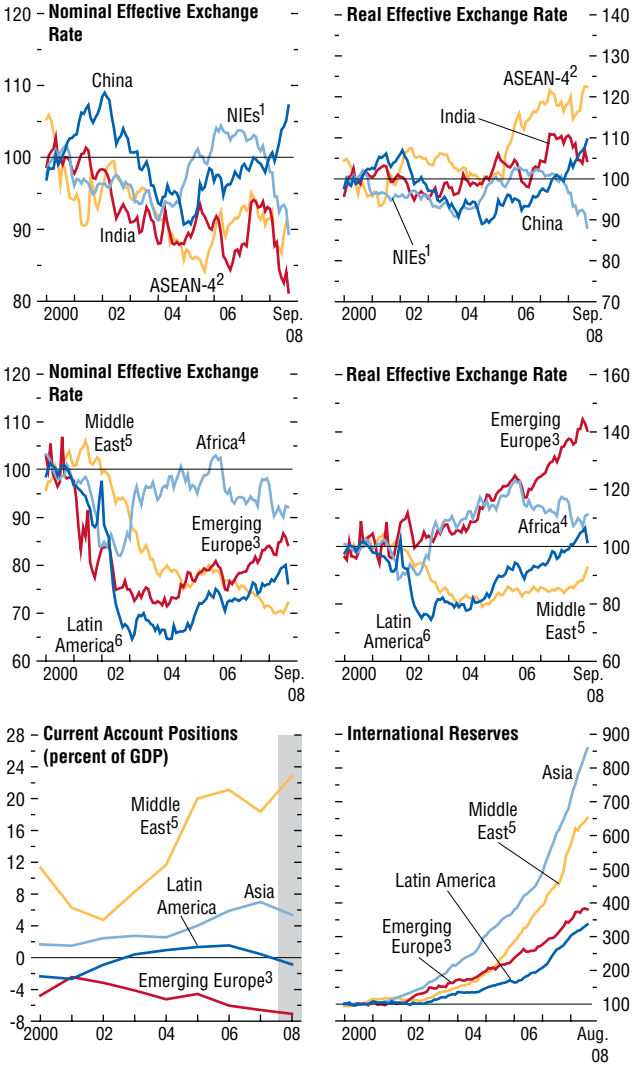
Notwithstanding these efforts, global financial markets were plunged into turmoil in mid-September following the bankruptcy of a second major U.S. investment bank (Lehman Brothers), involving significant losses to creditors and counterparties. In the next few days, market pressure drove the merger of another (Merrill Lynch & Co.) with a large commercial bank and the effective acquisition by the Federal Reserve of the world's largest insurance company (American International Group, A.I.G.) to avoid a disorderly bankruptcy. All of these institutions

[3]Formally, the Federal National Mortgage Association and Federal Home Loan Mortgage Corporation, respectively. The GSEs hold or guarantee about 50 percent of U.S. mortgages and have supported 80 percent of new mortgage lending in recent months. Moreover, their securities are held widely across the global financial system and have provided a major conduit for external financing of the U.S. current account deficit.

Figure 1.5. External Developments in Emerging and Developing Economies

(Index, 2000 = 100, unless otherwise noted)

Exchange rate movements have recently been quite diverse across emerging and developing economies. A number of oil-importing countries in Asia, especially those with close trade ties to the United States, have experienced currency depreciation, while China's currency has continued to appreciate. Currencies in Latin America and emerging Europe have also generally remained buoyant, although weakening recently.



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

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

[2]Indonesia, Malaysia, Philippines, and Thailand.

[3]Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Turkey.

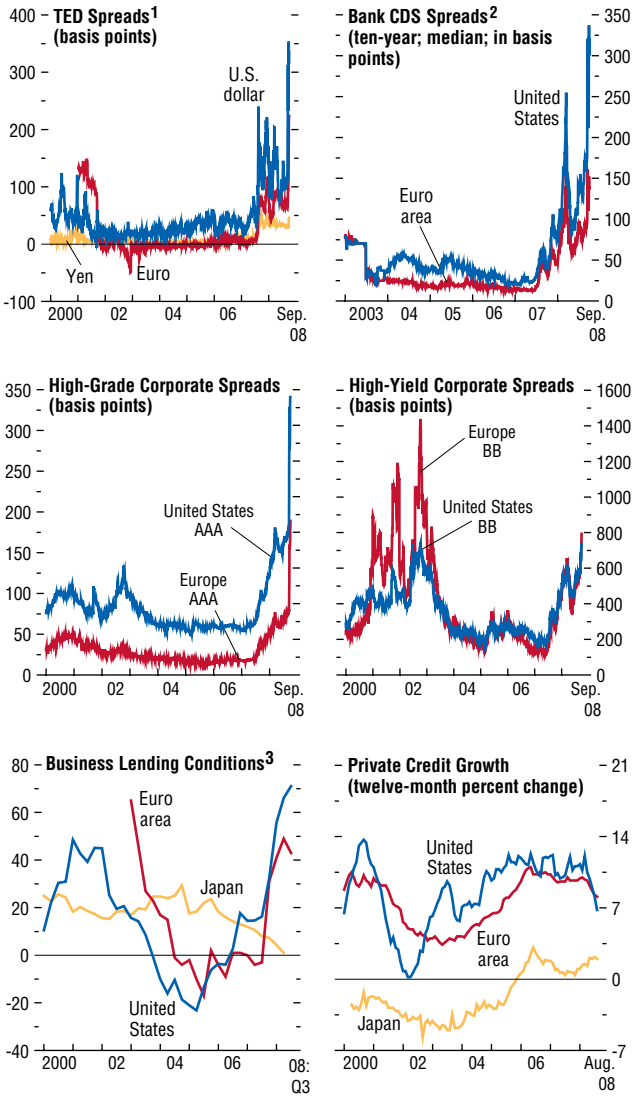
[4]Botswana, Burkina Faso, Cameroon, Chad, Republic of Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Uganda, and Zambia.

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

[6]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Rep. Bolivariana de Venezuela.

Figure 1.6. Developments in Mature Credit Markets

Credit market stresses intensified again in September, reflected in soaring spreads in the interbank market. Risk spreads have widened sharply across a broad range of financial assets. At the same time, bank lending standards have been tightened sharply in the United States and euro area, and credit growth is now starting to moderate.



Sources: Bank of Japan; Bloomberg Financial Markets; Board of Governors of the Federal Reserve System; European Central Bank; Merrill Lynch; and IMF staff calculations.

[1]Three-month London interbank offered rate minus three-month government bill rate.

[2]CDS = credit default swap.

[3]Percent of respondents describing lending standards as tightening "considerably" or "somewhat" minus those indicating standards as easing "considerably" or "somewhat" over the previous three months. Survey of changes to credit standards for loans or lines of credit to 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; average of changes in credit standards for small, medium-size, and large firms for Japan.

were heavily exposed to mortgage-related losses. As confidence in counterparties all but vanished, interbank markets effectively seized up, despite coordinated injections of massive liquidity by major central banks and agreement on foreign exchange swaps of unprecedented magnitude. Subsequently, a number of other U.S. and European banks needed to be resolved through closure, nationalization, or merger with public support.

The authorities in the United States and Europe responded to this firestorm with a series of new initiatives. Notably, in early October, legislation was passed in the United States to set up a $700 billion fund to purchase troubled mortgage-related securities from banks in order to contain risks of further losses from this source, encourage the development of more transparent pricing of these assets, and reduce illiquidity on bank balance sheets. At the same time, deposit-guarantee schemes were extended in the United States and a number of European countries, including a temporary guarantee for U.S. money market funds and a guarantee for creditors as well as depositors in Ireland. Restrictions also were imposed on short-selling of financial stocks to alleviate speculative pressure.

As this report goes to press, financial conditions continue to be under extraordinary stress. Interbank markets remain highly disrupted beyond overnight maturities, equity prices have fallen sharply, and market volatility continues to be at a high pitch (Figure 1.7). Moreover, market sectors that had been less affected by the turmoil have come under substantial increased pressure, including the nonfinancial corporate sector and emerging markets, as outlined in Box 1.1. Amid this turbulence, government securities have been viewed as a safe haven; U.S. Treasury bill yields were driven to close to zero.

Intensifying financial strains are beginning to take an increasingly heavy toll on economic activity. One of the main channels for such macrofinancial linkage is through tightening bank lending standards in both the United States and western Europe (see Figure 1.6). This has occurred in response to banks' efforts to

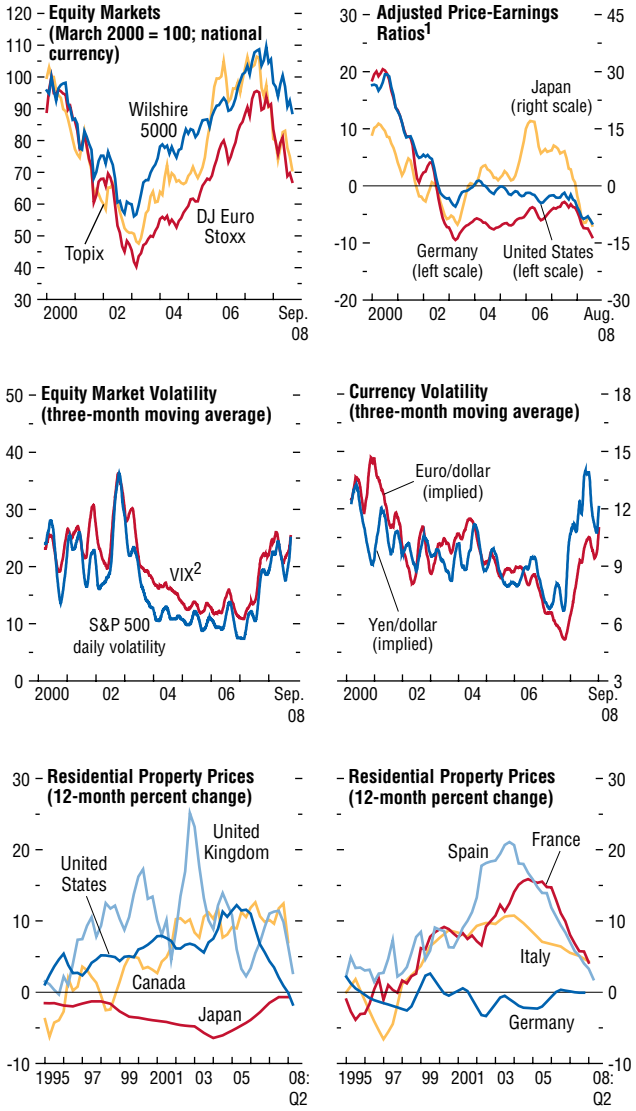
decrease their leverage in the face of reduced market tolerance for balance-sheet risk, increasingly expensive bank capital, and reduced access to wholesale funding. Actual credit growth was sustained for a while by the reintermediation of off-balance-sheet exposure and prior lending commitments, but credit growth is now slowing visibly both to the nonfinancial corporate sector as well as to households, and this winding back of credit is likely to continue until bank capitalization is raised substantially. It is also clear that financing through securities markets is likely to remain highly constrained for higher-risk borrowers as spreads have widened and securitization has fallen dramatically.

The financial crisis is increasingly affecting emerging markets too, reflecting rising risk aversion among investors, the reduced availability of funding for leveraged investors like hedge funds, and a weakening of growth prospects in emerging economies. Local money markets have experienced particular pressures, prompting central banks in a number of countries to ease reserve requirements and to take other actions to reduce strains on liquidity. Moreover, equity prices have fallen sharply, and spreads on both sovereign and corporate paper have widened markedly (Figure 1.8). Countries with large external financing needs and commodity exporters facing the prospect of lower prices have faced particular pressure from the reversal of capital flows. Nevertheless, looking back over the past year, overall capital flows to emerging economies have been quite resilient, certainly by past standards. Against this background, private credit growth has continued to be rapid in many of these economies, and domestic interest rates have declined in real terms as rising inflation has outstripped increases in policy rates.

The concerns expressed in the April 2008 *World Economic Outlook* about the impact of sustained tight credit conditions on economic activity remain highly relevant. These concerns have been reinforced by the analysis in Chapter 4, which outlines how past episodes of financial stress involving shocks to the banking sector have typically been followed by deeper-

Figure 1.7. Mature Financial and Housing Market Indicators

Financial strains are being reflected in a sharp correction in equity prices and sustained high volatility in equity and currency markets. Property price dynamics have continued to weaken, most notably in the United States, but also in France, Italy, Spain, and the United Kingdom.



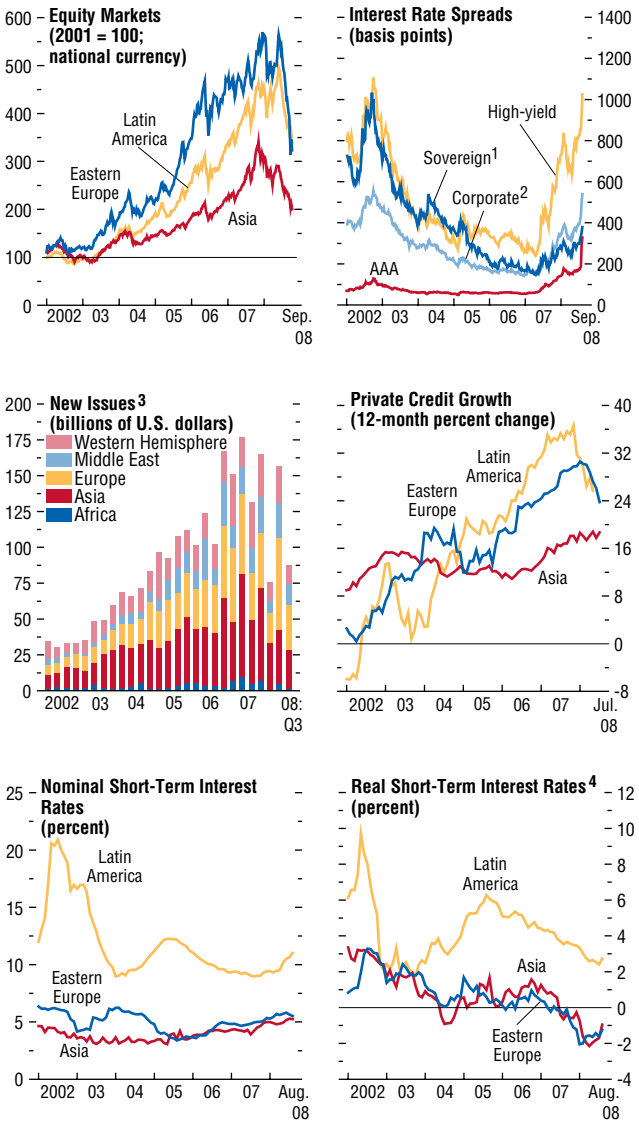
Sources: Bloomberg Financial Markets; Datastream; CEIC Data Company Limited; Haver Analytics; IMF, *International Financial Statistics;* OECD, *Economic Outlook;* and IMF staff calculations.

[1]Adjusted price-earnings ratio is the ratio of stock prices to the moving average of the previous 10 years' earnings, adjusted for nominal trend growth. Adjusted price-earnings ratios are measured as the three-month moving average of deviations from the 1990–2008 (August) average.

[2]VIX is the Chicago Board Options Exchange volatility index. This index is calculated by taking a weighted average of implied volatility for the eight S&P 500 calls and puts.

Figure 1.8. Emerging Market Conditions

Emerging market conditions have been affected increasingly by financial strains in mature markets. Equity prices have dropped sharply in recent months, spreads have widened, and new issues have moderated from last year's highs. At the same time, domestic interest rates have been increased in response to rising inflation, but real rates have declined. Although private credit growth has moderated some, it remains high.



Sources: Bloomberg Financial Markets; Capital Data; IMF, *International Financial Statistics;* and IMF staff calculations.
[1]JPMorgan EMBI Global Index spread.
[2]JPMorgan CEMBI Broad Index spread.
[3]Total of equity, syndicated loans, and international bond issuances.
[4]Relative to headline inflation.

than-usual business-cycle downturns and more protracted recoveries. The main transmission channel from financial sector shocks to downturns in activity seems to be a contraction in net lending to the business and household sectors. Chapter 4 points out that the growing role of securities markets and of arm's-length financing has not in fact reduced the vulnerability of the economy in the face of banking stress and presents evidence suggesting that the impact could be even larger because of procyclical swings in leverage.

One important lesson from Chapter 4 is that the extent of damage to the economy depends on the initial strength of corporate and household financial positions and housing price developments. The U.S. economy seems particularly vulnerable because household balance sheets are stretched and the housing sector is undergoing a major correction. The relatively strong initial position of the U.S. corporate sector and the rapid shift toward monetary easing are identified as mitigating factors. Western European economies should gain some protection from the strong position of households, but would nevertheless also be at considerable risk from a sustained period of financial stress.

Deepening Housing Corrections

Financial factors have interacted in important ways with housing cycles to amplify the extent of housing booms and busts and procyclical swings in leverage. The historic housing booms experienced in the United States and many western European economies since the early years of this decade had their origin in falling real interest rates, strong growth, and in some cases rapid immigration. However, the expansion was also fueled by new financing techniques based on securitization and weakening lending standards, particularly in the United States.[4] By 2006, more than 40 percent

[4]Dell'Ariccia, Igan, and Laeven (2008) document how the weakening of lending standards contributed to the deterioration of credit quality in the U.S. subprime sector.

Box 1.1. The Latest Bout of Financial Distress: How Does It Change the Global Outlook?

Since the beginning of the financial crisis in mid-2007, the *World Economic Outlook* baseline forecast has envisaged that financial strains would be protracted and would take a significant toll on economic activity. However, the resilience of the nonfinancial corporate sector in advanced economies and the momentum of growth in emerging economies were expected to cushion the impact on global growth. Data through mid-September 2008 were broadly consistent with this assessment. With the financial crisis entering a new, more severe stage in September 2008, the question arises as to whether the likely course of the global economy has changed. This box specifically explores how the nonfinancial corporate sector in advanced economies and emerging markets have been affected by the latest financial events, highlighting mounting risks to these segments of the global economy.

The latest stage of the financial crisis started in September 2008, when several systemically important U.S. financial institutions abruptly exited the market. Lehman Brothers' decision to file for bankruptcy, in particular, reverberated across global financial markets, exacerbating the severe contraction in market liquidity and heightening concerns about counterparty risks. The cost of U.S. dollar funding surged globally, and other money markets also came under severe strain. As investors' appetite for risk declined, pressures extended to emerging markets, particularly to Russia, which faced a confluence of shocks. The global financial turmoil has been met with a far-reaching public response. However, financial markets remain under strain, and confidence is still fragile. Major structural shifts in the U.S. financial sector, which took place during this latest stage of the crisis, have intensified and broadened the deleveraging process, laying the groundwork for a further downsizing of the financial sector.[1]

Note: The authors of this box are Andreas Jobst and Natalia Tamirisa.

A worrying aspect of this latest bout of turbulence is that there are now increasing signs that market strains are starting to fall more heavily on the nonfinancial corporate sector and on emerging markets. If sustained, such strains could well foreshadow a more severe macroeconomic impact of the financial crisis than previously anticipated.

The nonfinancial sector in advanced economies is now more broadly affected than during the earlier stages of the crisis. Spreads on high-grade nonfinancial corporate bonds, which have risen gradually since the beginning of the crisis, rose further during the latest round of turbulence (first figure). They now stand at almost double the 2002 peaks and indicate a default risk comparable to that of emerging market sovereign debt. Low-grade corporate spreads also surged, but they remain below the historical highs of 2002. Access to short-term financing has tightened and equity prices have declined (upper panel of second figure), although equity prices still remain above previous troughs.

The recent surge in borrowing costs for nonfinancial firms has taken place against the backdrop of a gradual worsening of their risk profiles over the course of the financial crisis. The market-based measures of default risk and leverage ratios[2] have risen across the credit spectrum in both the United States and Europe—not only for low-grade bonds, as would be expected during a slowdown,[3] but for high-grade bonds too (middle panel of second figure). For high-grade corporate bonds in the

[1]For more details, see the main text of Chapter 1 and Box 1.1 of the October 2008 *Global Financial Stability Report* (IMF, 2008b).

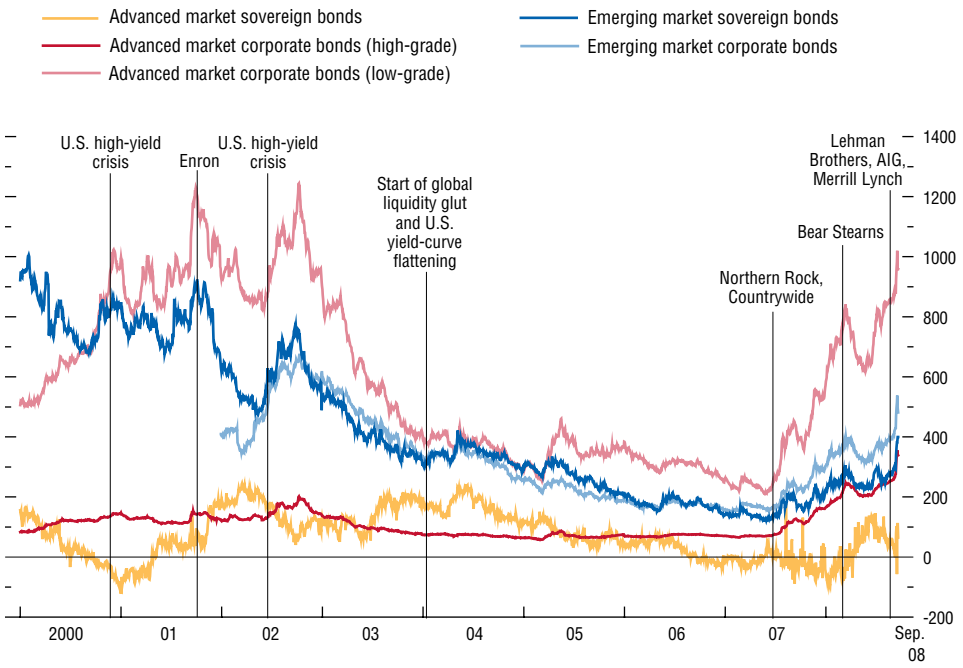
[2]The default probabilities are calculated for individual companies from market data using the modified Black-Scholes-Merton option pricing formula and balance-sheet data over a one-year risk horizon before they are aggregated to the country and regional levels. The market value, based on equity prices, approximates the company's asset value. Market leverage is defined as the ratio of debt to equity, valued at market prices.

[3]See Box 1.1 in the April 2008 *World Economic Outlook*.

Box 1.1 *(continued)*

Advanced and Emerging Markets: Sovereign and Corporate Bond Spreads, 2000–08[1]

(In basis points)



Sources: Bloomberg Financial Markets; Datastream; JP Morgan; Moody's KMV; Thomson Reuters; and IMF staff calculations.

[1]The corporate bond spreads are derived as the difference between the asset swap spread and the commensurate London interbank offered rate. The sovereign bond spread series for advanced markets is a composite of the five-year U.S. Treasury rate over the effective federal funds rate and the five-year German Bund over the EONIA rate (i.e., the effective European Central Bank policy rate).

United States, for example, the probability of default has doubled since June 2007, although it remains below the levels experienced in 2004,[4] in part owing to strong corporate balance sheets, particularly, ample internal funds.

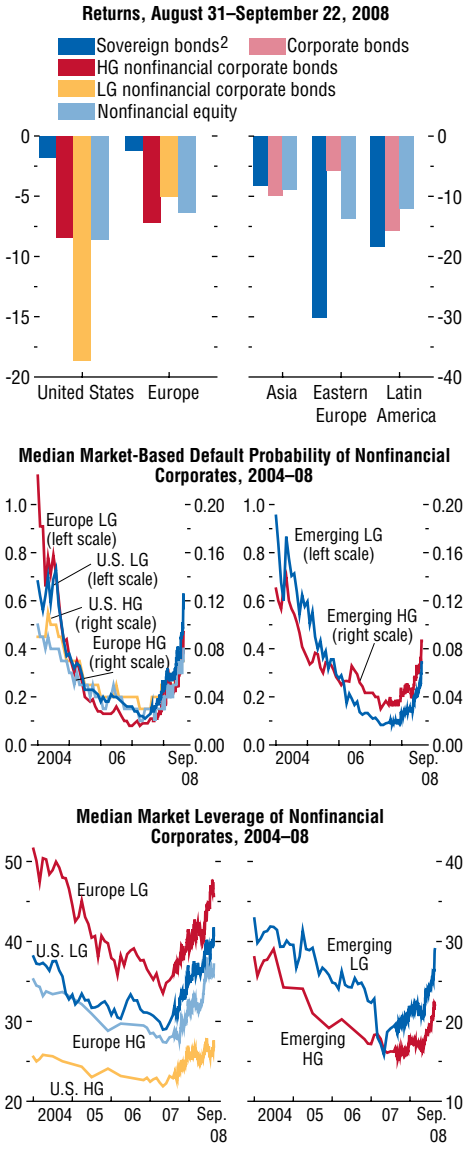
Why are high-grade nonfinancial firms being affected more severely during the current crisis than during the previous major decline in financial markets in 2000–02, following the collapse of the dot-com bubble? A possible general explanation relates to differences between the shocks that triggered the respective downturns.

The current downturn has its roots in the financial sector, where the originate-to-distribute model largely ceased to function. The financial shock is being transmitted to the nonfinancial sector via tighter financing conditions and, more recently, a drying up of market liquidity. The ubiquity of these channels leaves little room for differentiation across the credit spectrum. In contrast, the dot-com bubble originated in the nonfinancial sector, notably high-yield corporate credit, and was transmitted mainly through the solvency channel, affecting low-grade nonfinancial corporate bonds to an appreciably larger extent than high-grade ones. A more specific reason for increased pressures on high-grade

[4]Earlier data are not available.

Selected Financial Indicators[1]

(Percent)



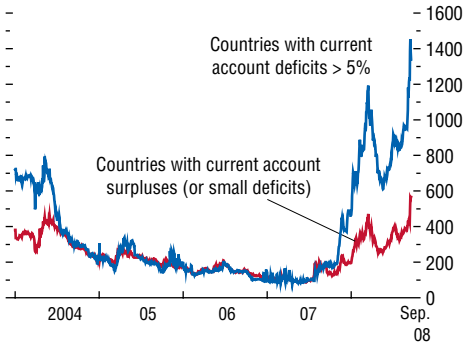
Sources: Bloomberg Financial Markets; Datastream; Moody's KMV; Thomson Reuters; and IMF staff calculations.

[1]LG = low-grade; HG = high-grade.

[2]The change in returns of sovereign bonds in the United States and Europe is based on prices of the one-month futures contract on the effective Fed Funds rate and the total return index on German Bunds, respectively.

Emerging Economies: Credit Default Swap Spreads, 2004–08[1]

(In basis points)



Sources: Bloomberg Financial Markets; and IMF staff calculations.

[1]Equally weighted composites of five-year sovereign credit default swap contracts.

nonfinancial firms relates to a growing concern about their rollover risk during the current crisis, because refinancing plans have led to a bunching of maturing bond obligations over the coming years, while bank financing has tightened. Moreover, declines in equity prices have increased the cost of raising capital.

The cost of borrowing for emerging markets has also increased further in recent weeks, although it remais below the peaks during 2001–02 and the Asian crisis of 1997–98. There has been a sharp and broad-based retrenchment from emerging market assets as a result of investors' reduced appetite for risk and their need to sell assets to raise cash in response to margin calls. Idiosyncratic risks are rising. Emerging Europe and Latin America are experiencing the largest declines in sovereign and corporate bond returns, while the effect on emerging Asian assets has been more muted (see upper panel of second figure). The increased differentiation in credit markets according to countries' financing needs points to a heightened risk of sudden stops in capital

Box 1.1 *(concluded)*

flows and currency crises in vulnerable emerging economies (third figure).

Since the beginning of the crisis, corporate spreads for emerging economies have risen above sovereign spreads (see first figure), suggesting that investors consider the emerging market nonfinancial sector to be more vulnerable than the public sector, possibly owing to their more limited domestic finance opportunities, higher leverage, and greater rollover risks compared with sovereigns. The latter are perceived to be more protected, including by high official international reserves and improved public sector balance sheets.

As in advanced economies, the recent increase in emerging market corporate spreads comes on the heels of an earlier weakening in the risk profiles of nonfinancial firms, in part owing to slower growth (see lower panels of second figure). Market-based default probabilities have nearly tripled since the beginning of the crisis for both high- and low-grade bonds, although they remain below recent peaks. High-grade nonfinancial corporates from emerging Asia currently have the highest default probabilities, reflecting the fact that they have the highest market-based leverage ratios in the respective subgroup. This is partly due to increased external corporate borrowing on the back of appreciating currencies in the past two years. In the low-grade segment, Latin American corporate bonds have the highest leverage ratios.

Nonetheless, corporate spreads and emerging sovereign spreads remain well below the levels experienced after the Asian crisis, the Argentine default, and the dot-com collapse (see first figure). One reason is that emerging economies have become more resilient to external financing shocks because of larger international reserves, higher revenues from commodities, and more robust domestic demand. Another reason is that emerging economies are facing a less-direct shock: the collapse of the dot-com bubble revolved around a technological innovation that was shared more broadly across the world than the originate-to-distribute banking model, and the Asian crisis originated in emerging economies.

In sum, the latest stage of the financial crisis has seen a further steady weakening in corporate and emerging economies' positions. Whether this deterioration will be sustained is unclear at the moment. Markets remain exceptionally volatile, and it is difficult to predict how long this volatility will persist. The longer the turmoil lasts, the more entrenched the feedback loop between the financial and real sectors will become and the more broadly real sectors across the world will suffer. This, together with intensified and broadened deleveraging, would delay the recovery and increase the likelihood of a global recession. Accordingly, recent developments suggest that the outlook for global growth has weakened considerably as a result of recent events and that the downside risks to the baseline forecast have increased.

of new U.S. mortgages were nonprime mortgages, often with very high loan-to-value ratios and minimal documentation. In European countries, there is less evidence of declining lending standards, but, as in the United States, in several countries the availability of housing finance was sustained through the increased availability of wholesale financing, involving serious liquidity mismatches in some cases.

The subsequent downswing in the U.S. housing market has been the largest of the postwar period, as housing activity and prices have both fallen steeply. The downswing has been exacerbated by the virtual disappearance of the subprime market, a general tightening of lending standards, increasing spreads on conventional mortgages despite monetary easing (due to the deteriorating financial situation of the GSEs), and sharply rising foreclosures. In western Europe, housing cycles have also turned down recently, in some cases because lending standards have been tightened and

credit has become more expensive. The most severe downswings have been concentrated in a few national markets—Ireland, Spain, and the United Kingdom—which had experienced the most rapid house price appreciation or the greatest building booms, but house prices are slowing more broadly (see Figure 1.7, lower panels). IMF staff analysis of house price valuations provided in Box 1.2 suggests that, after allowing for the impact of key fundamentals, houses continue to appear overvalued across a broad range of advanced economies, although prices in the United States are now moving closer in line with past relationships.

As discussed in Box 1.2, housing downturns can have a strong negative impact on growth through a range of channels. Most directly, the contraction of residential investment has subtracted ¾ percentage point a year from U.S. growth over the past two years, and similar retrenchments are having an even larger impact in Ireland and Spain. In addition, the heavy and continuing losses from mortgage-related assets—both direct losses through rising loan delinquencies and indirect losses on mortgage-backed assets being marked to market—have been a central driver of the financial crisis and the related tightening of credit conditions. Finally, there is the negative impact of declining house prices on opportunities for borrowing using housing collateral, as well as possible wealth effects. While consumption has been quite resilient in the United States, in part because of tax rebates, it is now slowing fast.

Overstretched Commodity Markets

Commodity prices remain at much higher levels in real terms than at any time in the past 20 years, despite some correction since mid-July amid the slowdown of the global economy (see Figure 1.1). Chapter 3 lays out evidence that the driving force behind the sustained run-up in commodity prices has been the tightness of demand-supply balances for many key products and realization that markets are likely to remain tight for the foreseeable future, after many years of ample spare capacity. Commodity demand growth has essentially been driven by the continuing integration of large pools of low-income labor, especially in Asia, into the global economy—groups with low per capita consumption but high income elasticity of demand. Moreover, the supply response to rising relative prices has been sluggish, in part because of geological and technological constraints, particularly in the oil sector, in part because of lingering concerns that oil prices may yet revert to the much lower levels observed in the second half of the 1980s and the 1990s, and in part because of policy shortcomings that have discouraged investment in new supply, for both energy and food. With inventories low and spare capacity limited, and with very low short-term supply-and-demand price elasticities, commodity prices have become highly sensitive to news about possible supply disruptions or changing perceptions of cyclical prospects. Thus, the recent softening in prices seems to have been driven largely by perceptions that global growth is slowing and emerging evidence of a demand response to high prices (notably in the United States), as well as by some favorable supply developments.

Some observers have suggested that recent large commodity price swings are related to speculation or increasing investment in commodities as assets, rather than to shifts in fundamentals affecting supply and demand. IMF staff has found some evidence that the depreciation of the U.S. dollar and declining U.S. interest rates have had an effect on prices through their impact on supply and demand. However, as discussed in Box 3.1, while limitations on data availability make it hard to reach definitive judgments, there is little concrete evidence that rising speculation or increased investor interest in commodities as alternative assets has had a systematic or lasting impact on prices, although swings in market sentiment may well have contributed to short-term price dynamics in some circumstances.

The most immediate and direct macroeconomic impact of the boom in commodity prices has been on inflation. As already mentioned and

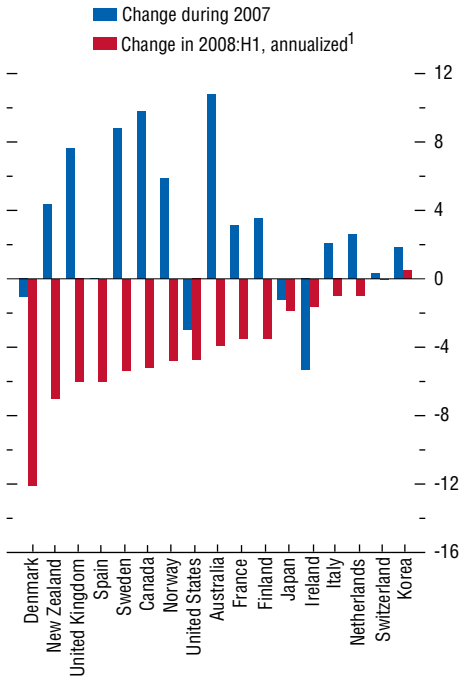
Box 1.2. House Prices: Corrections and Consequences

Housing prices have begun falling this year in several advanced economies, a sharp contrast from the increase in prices seen during 2007 in almost all countries except the United States, where a housing correction has been under way since 2006. In real terms, and on a seasonally adjusted basis, house prices fell in the first half of 2008 at an annual rate of 5 percent to 12 percent in Canada, Denmark, Spain, New Zealand, and the United Kingdom (first figure).[1] How much more are house prices likely to come down? And what are the consequences of the declines in house prices for the macroeconomy?

Corrections in house prices. As a basis for assessing the potential for house price declines, a first step is to try to account for the increase in house prices that has taken place over the past decade in terms of important driving forces. To this end, real house price growth is modeled as a function of the following variables: growth in per capita disposable income, working-age population, credit and equity prices, and the level of short-term and long-term interest rates. The dynamic effects of these variables are captured through the inclusion of lagged real house price growth and an affordability ratio (the lagged ratio of house prices to disposable incomes). This model is estimated for each country using quarterly data for the time period 1970 to 2007.[2]

The increase in house prices not explained by these fundamental factors—referred to as the house price gap—is taken as an estimate of the potential for correction in house prices. Of course, the gap estimates could partly reflect omitted fundamental factors, such as changes in supply-side factors in the housing market.[3] Nevertheless, the estimates provide an indication of how large those omitted factors would have

Changes in Real House Prices
(Percent)



Sources: Organization for Economic Cooperation and Development; and IMF staff calculations.
[1]Change in 2008:H1, annualized, for Canada, Denmark, France, Ireland, Italy, Japan, New Zealand, and United States.

The main author of this box is Prakash Loungani. Ercument Tulun and Jair Rodriguez provided research assistance. This box updates analysis presented in the October 2007 and April 2008 issues of the *World Economic Outlook*.

[1]These data are provided by the Organization for Economic Cooperation and Development (OECD) and are based on commonly used national sources, as shown here: www.olis.oecd.org/olis/2006doc.nsf/linkto/ECO-WKP(2006)3 (p. 34). The data are seasonally adjusted by the OECD if the national authority does not provide a seasonally adjusted series. The use of seasonally adjusted data leads to some difficulty in comparability with headline figures on house prices but may be a better indication of developments in house prices over the coming months.

[2]The data start in 1971 for Spain and in 1986 for Korea.

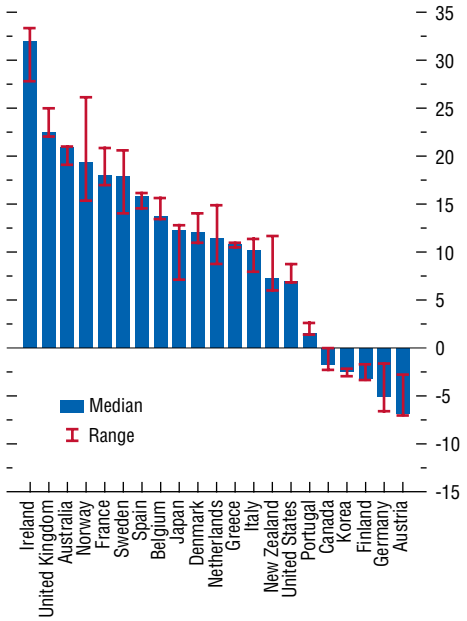
[3]The models estimated here focus on explaining short- to medium-run changes in house prices rather than the long-run level of house prices, which could differ considerably across countries, reflecting national supply constraints and long-term institutional factors, such as the extent of taxation of housing (Poterba, 1984). A study of European housing markets by Hilbers and others (2008) provides a good exposition of the role such factors can play in house price movements.

to be for the rise in house prices over the past years to be considered an equilibrium outcome.

The second figure shows the house price gaps—the percent increase in house prices during the period 1997 to end-2007 that is not accounted for by fundamentals. Also shown, as an indicator of the robustness of these results, is the range of gap estimates generated by small perturbations of the estimated models. These changes include using the average value of housing prices over 1994 to 1997, instead of the 1997 value, as the starting point for computing the gap estimates; estimating a parsimonious version of the model with only incomes and interest rates as the driving forces; and changing the dynamic specification by estimating a vector autoregressive model for house prices instead of a single-equation model.

The countries that have experienced the largest unexplained increases in house prices over the past decade are Australia, Ireland, and the United Kingdom;[4] house prices in these countries were 20 percent to 30 percent higher in 2007 than can be attributed to fundamentals. A group of other countries—including France, Italy, the Netherlands, and Spain[5]—have house price gaps of between 10 percent and 20 percent.[6] The gap estimate for the United States—about 7 percent—is smaller than for most other countries and has been narrowing compared with earlier estimates, partly reflecting the decline in U.S. house prices over the past 18 months.[7] The range of estimates for each country, respectively. Recent IMF Article IV staff reports that point to either a cooling of housing markets or the onset of a correction include reports for Canada, Korea, New Zealand, Norway, Spain, and the United Kingdom. For Germany, some studies have found higher undervaluation than the estimate of 5 percent reported here, perhaps reflecting supply-side impacts from social housing in post-reunification Germany.

House Price Gaps
(Percent)



Source: IMF staff calculations.

[4]As noted in the 2008 IMF staff report for Australia, if some country-specific factors, particularly the impact of long-term migration on housing demand, are taken into account, the results do not produce evidence of a significant overvalulation of house prices.

[5]The 2008 IMF Article IV staff report for the Netherlands notes that the estimated house price gap—estimated here as ranging from 9 to 15 percent—is likely to be much smaller if the rise in single-person households, which is very important in boosting housing demand in the Netherlands, is taken into account along with institutional factors (for example, strict zoning regulations and generous mortgage interest deductibility).

[6]Hilbers and others (2008) group European countries into "fast," "average," or "slow movers," depending on the extent to which their house prices in recent years have risen above long-term averages. The gap estimates presented here turn out to be consonant with this classification: the average estimated gap for the three groups is 19 percent, 11 percent, and –3 percent, respectively. Recent IMF Article IV staff reports that point to either a cooling of housing markets or the onset of a correction include reports for Canada, Korea, New Zealand, Norway, Spain, and the United Kingdom. For Germany, some studies have found higher undervaluation than the estimate of 5 percent reported here, perhaps reflecting supply-side impacts from social housing in post-reunification Germany.

[7]Klyuev (2008) estimates that single-family homes in the United States "remained 8 to 20 percent overvalued as of the first quarter of 2008." The U.S. house price gap was estimated at about 12 percent in 2007 (Box 3.1 in April 2008 *World Economic Outlook*) and about 20 percent in 2006 (Box 2.1 in October 2007 *World Economic Outlook*).

Box 1.2 ***(continued)***

try is about 3½ percent on average, though for the Netherlands, Norway, and Sweden the range is considerably higher.

To put these gap estimates in perspective, it is useful to compare them with house price cycles in the advanced economies over the past several decades (OECD, 2006). Between 1970 and 2005, the average house price cycle lasted about 10 years, with an expansion phase of 6 years during which real house prices increased by about 45 percent. During the subsequent four-year contraction phase, real house prices declined about 25 percent, with the range of declines across countries varying from about 10 percent in the United States to more than 30 percent in Japan and several European countries.

Thus, if house price corrections were to occur in line with the gaps shown in the second figure, they would be well within the range of previous experience. Moreover, the evidence indicates that corrections typically occur over several years. Evidence from countries with regional (that is, subnational) data suggests that for some regions, price-level corrections could be much more pronounced and last longer than the national cycle (Calomiris, Longhofer, and Miles, 2008; Estevão and Loungani, forthcoming).

Macroeconomic consequences. Experience during past housing market cycles can also be a guide to the macroeconomic consequences of these price corrections (Claessens, Kose, and Terrones, forthcoming; *World Economic Outlook,* April 2008 and April 2004). The evidence suggests, not surprisingly, that the consequences are more adverse if they occur in the context of a weakening economy and tight credit conditions, which is likely to be the situation facing many countries at present. Over the period 1960 to the present, recessions in advanced economies that are associated with house price busts and credit crunches are slightly longer and deeper than other recessions. The duration of a recession is more than one quarter longer in the case of a housing bust, total output loss during the recession is somewhat higher, and the unemployment rate increases notably more and for longer in recessions with housing busts (third figure, top panel). Over the 12 quarters following the onset of a recession, the unemployment rate has increased on average by 1.5 percentage points. But in recessions associated with house price busts, the increase in unemployment is 3 percentage points.

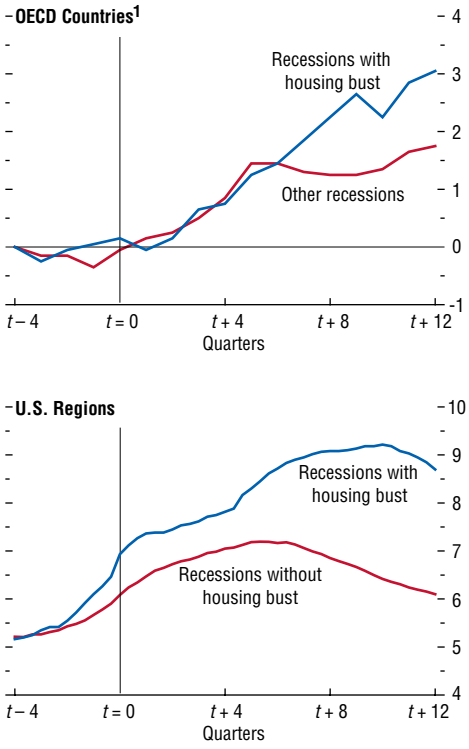
There is some evidence that this pattern holds up at both the national and regional levels. As shown in the lower panel of the third figure, during regional recessions in the United States that are associated with a house price bust the peak impact on unemployment is an increase of 4 percentage points, compared with an increase of 2 percentage points for all regional recessions (Estevão and Loungani, forthcoming).

What about the impact of house price declines on the components of output? There is a growing literature on the possible impact of changes in housing wealth on consumption. Buiter (2008) demonstrates that changes in house prices are redistributions of wealth and hence do not have much impact on net wealth in the aggregate; however, they can affect individual consumption by relaxing collateral constraints. Consistent with this point, Muellbauer (2008) finds that with careful modeling of the effect of credit market development and deregulation, which raises access to housing collateral, changes in house prices have a medium-run liquidity effect on U.S. and U.K. consumption.

The impact on investment is more readily apparent. Claessens, Kose, and Terrones (forthcoming) find that investment—residential investment in particular—tends to fall more sharply in recessions associated with housing busts and with credit crunches than in other recessions.[8] There are also significant cross-

[8]Benito (2007) finds, using household-level data for the United Kingdom, that it is much more common for withdrawal from home equity to flow into residential investment than consumer spending, which suggests that the collateral channel stressed by Buiter (2008) and Muellbauer (2008) could be stronger for investment than consumption.

Unemployment Rate
(Percent)



Sources: Claessens, Kose, and Terrones (forthcoming); Estevão and Loungani (forthcoming); and IMF staff estimates.
[1]OECD = Organization for Economic Cooperation and Development.

country differences in the extent of the residential investment declines, which in principle can depend on a wide range of characteristics of national financial and legal systems. One important dimension is the ease with which households can access mortgage credit. This can be measured either by the depth of mortgage markets or by an index that summarizes the institutional features of mortgage markets. The mortgage market index incorporates features such as the typical ratio of mortgage loans to property values, the standard length of mortgage loans, the capacity to borrow against accumulated home equity, and the degree of development of secondary markets for mortgage loans. As shown in the top two panels of the fourth figure, declines in residential investment have tended to be higher in countries where households have had more access to mortgage credit.[9]

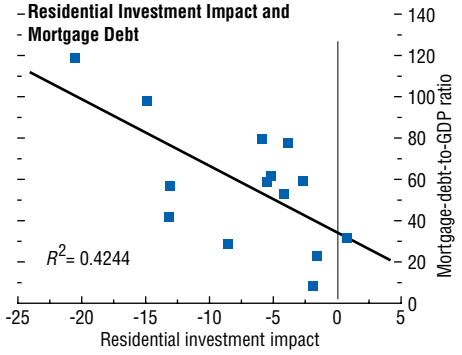
Other factors can play a role in explaining the amplitude of the economic cycle following house price corrections. In addition to the characteristics of mortgage markets already discussed, a key feature at the current juncture is the prevalence of mortgages with variable (as opposed to fixed) interest rates. There are differences within Europe in this respect, where Finland, Ireland, and Spain have mostly variable rate mortgages. Higher interest payments (relative to household disposable income) have also been historically associated with bigger declines in residential investment during housing busts—see the bottom panel in the fourth figure.[10] Countries also differ in terms of legal provisions, such as those that govern

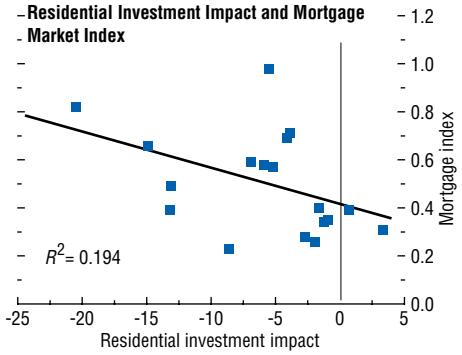
[9]Data on the depth of mortgage markets—the ratio of outstanding mortgage debt to income—are reported in Warnock and Warnock (2007) and OECD (2006). The mortgage market index is described in Chapter 3 of the April 2008 *World Economic Outlook*. The debt measure used here is the ratio of mortgage debt to household disposable income for the 1990s (from OECD, 2006), but the use of other measures of debt—for other years or expressed as a ratio to GDP—gives similar results. Controlling for the magnitude of the house price corrections makes the correlation between residential investment declines and the mortgage-debt-to-GDP ratio stronger. Cardarelli and others (forthcoming) take this analysis a step further by using sign restrictions to identify housing demand shocks and tracing the impact of these shocks on house prices, residential investment, and output. They conclude that housing finance innovation has amplified the spillovers from housing to the rest of the economy by strengthening the role of housing as collateral.

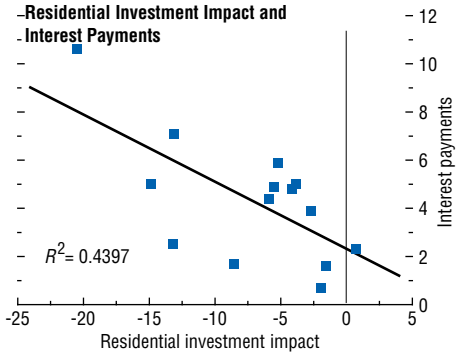
[10]See Tsatsaronis and Zhu (2004). Warnock and Warnock (2007) add Greece, Portugal, Sweden, and the United Kingdom to the list of European countries with mostly variable rate mortgages; outside of Europe, Canada, Japan, and the United States are classified as countries with mostly fixed rate mortgages.

Box.1.2 *(concluded)*

Residential Investment Impact







Sources: Claessens, Kose, and Terrones (forthcoming); OECD (2006); and IMF staff calculations.

residential mortgage lenders' recourse regarding defaulted residential mortgages, which can influence foreclosure rates.[11] In many of the countries that are the focus of study in this box—France, Germany, Ireland, the Netherlands, Spain, and the United Kingdom—debtors are personally liable for the full amount of mortgaged debt, thus reducing incentives for foreclosure. In the United States, mortgage foreclosure is regulated at the state level. In six states, lenders have recourse only to the mortgaged property, which they may repossess and sell. In the other states, debtors are also personally liable for the full amount of the debt, but there are differences in the extent to which lenders can recover the difference between the mortgage debt and the foreclosure sale price. In practice, lenders may choose not to seek deficiency judgments mainly because of the time and cost involved.

Another factor that can play a role in explaining the amplitude of the economic cycle following house price corrections is banking sector exposure to the housing sector, which varies across countries as well as across lending institutions within countries. The value of mortgage loans held by banks, expressed as a multiple of their overall market capitalization, gives an indication of their ability to withstand the deterioration of their real estate loan portfolios. This indicator varies from about 4 in Denmark and Germany, less than 3 in Spain, about 1.5 in Canada, Japan, and the United Kingdom, and less than 1 in the United States.[12] Cross-country declines in residential investment during housing cycles have been higher in countries with greater banking sector exposure to mortgage lending, but the effect has not been as strong as that shown earlier with the mortgage-debt-to-

[11]See Klyuev (2008) and Deutsche Bank (2008) for a discussion of the impact of foreclosure rates on house prices.

[12]Estimates for countries other than the United States are from Ahearne and others (2005) and are based on bank-level data on mortgage loans and market capitalization from Bloomberg L.P. and Worldscope; the U.S. estimate is based on total real estate loans by the banking sector and total banking sector market capitalization.

GDP ratio. Nevertheless, at the current juncture, with bank balance sheets under renewed stress and bank equity prices low, the potential for an adverse impact on the real economy from banking system exposure to mortgage lending is perhaps greater than in the past.

Conclusions. Many advanced economies experienced a house price run-up in recent years that is difficult to account for fully in terms of fundamental driving forces such as income growth and interest rates. The correction in house prices appears to have now begun in most of these economies. If past is prologue, these corrections could average about 25 percent and be spread out over a period of two to four years. Past evidence also suggests that cross-country differences in the impact of these corrections on the macroeconomy are likely to depend on the characteristics of the housing finance systems, particularly the ease with which households have been able to access mortgage credit in recent years. This feature is likely to be correlated with the extent of investment declines that occur during the house price corrections and could also have a dampening impact on consumption.

as examined in detail in Chapter 3, rising food prices have been a key factor behind surging inflation in emerging economies. By contrast, oil price increases have played the lead role in spurring inflation in the advanced economies.

How far will these direct contributions feed into second-round effects? Three structural trends should mitigate such risks: (1) increasing real wage flexibility, in contrast to the real wage resistance seen particularly in western Europe during the 1970s; (2) more secure anchoring of inflation expectations by vigilant central bankers; and (3) declining energy intensity.[5] Slowing economic activity is also mitigating inflation risks, particularly in the advanced economies. However, there remain concerns in some emerging economies, particularly those where capacity constraints are still tightening, where public wages have been increased rapidly, and where inflexible exchange rates may constrain the monetary response.

Rising commodity prices also have important potential effects on the terms of trade and purchasing power and hence on growth. At the global level, the key factor is oil, not food, because the production of food is more evenly distributed around the globe: on average, oil imports are two-and-a-half times greater than food imports.

Overall, rising oil prices have had a net dampening impact on global demand, because oil exporters save a high proportion of additional oil revenues, particularly since their economies are already running into absorptive capacity limits. The size of the redistributional effect also depends on the source of the commodity price shock; there is a greater effect when the price surge reflects a pure supply shock instead of a combination of supply and demand factors, as seems to be the case in the current episode. The redistributional effects are sizable, although substantially smaller than in the 1970s, when the intensity of oil output was about twice its current level in advanced economies and 25 percent higher in emerging markets (see Figure 3.9). At the country level, low-income countries are particularly vulnerable to strains from rising food and fuel importation costs. Some countries in sub-Saharan Africa have experienced terms-of-trade losses of more than 5 percent of GDP (IMF, 2008a).

Have Macroeconomic Policies Been Too Loose?

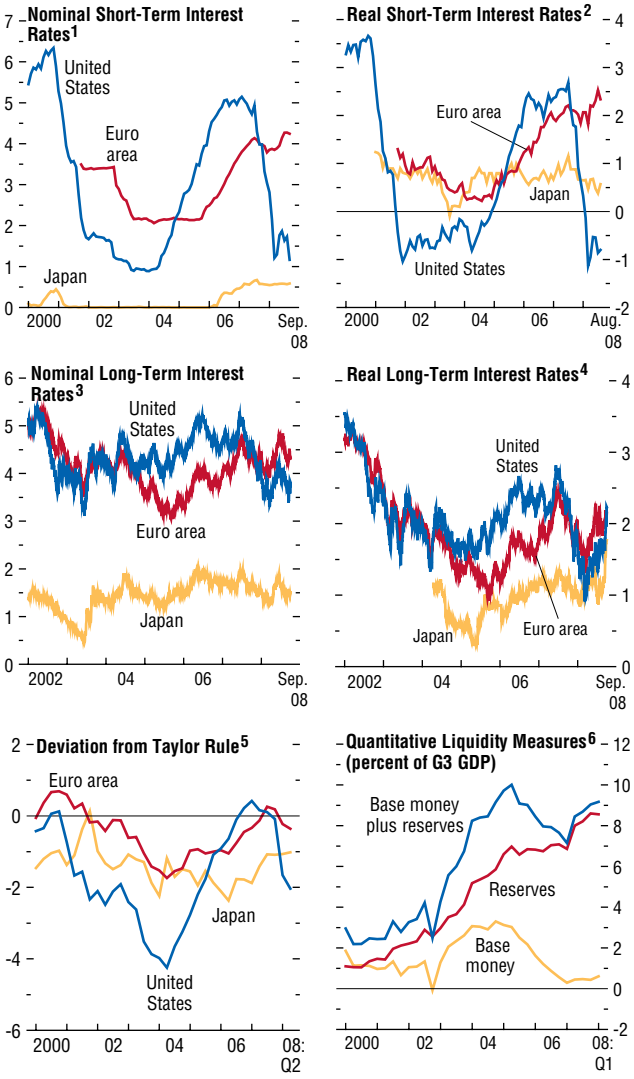
The recent deterioration of performance in the global economy comes on the heels of four

[5]Blanchard and Galí (2007) provide a careful analysis of why the macroeconomic impact of the recent oil price boom is likely to be smaller than in the 1970s.

Figure 1.9. Measures of Monetary Policy and Liquidity in Selected Advanced Economies

(Interest rates in percent unless otherwise noted)

Following a period of easy monetary conditions during 2001–05, monetary policy was tightened across the advanced economies. Since the onset of financial stress in August 2007, the Federal Reserve has eased its policy stance aggressively. By contrast, monetary policy settings in the euro area and Japan have been kept broadly unchanged.



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]Ten-year government bonds.

[4]Ten-year inflation-linked government bonds.

[5]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 breakeven rates of inflation-indexed bonds.

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

years of exceptionally strong expansion, during which healthy gains from the increasing integration of emerging and developing economies into the world economy contributed to the strongest period of global growth since the early 1970s. With the benefit of hindsight, however, it is clear that major imbalances built up across crucial financial, housing, and commodity markets, reflecting serious flaws in the operations of these markets and inadequate regulatory responses, with an inevitable payback.

Some observers argue that these imbalances in financial, housing, and commodity markets were exacerbated by excessively loose macroeconomic policy settings during the strong expansion over 2003–07. In particular, the pronounced success in bringing down inflation during the 1990s and the global productivity gains from the integration of China and other labor-intensive economies into the world trading system allowed for excessively easy monetary policy in the advanced economies, which generated a series of market bubbles. Following the collapse of the hi-tech dot-com bubble early this decade, monetary policy settings were kept very loose to counter deflation concerns. Indeed, in the United States and to a lesser extent in the euro area and Japan, policy rates were set well below what would be implied by the Taylor rule (Figure 1.9). Moreover, even though monetary policy was tightened starting in 2003, it has been suggested that the tightening did not do enough to "lean against the wind" as credit flowed into the housing sector and house prices rose to levels that were far out of line with underlying fundamentals.

In addition, inflexible exchange rate regimes have recently limited the capacity of some key emerging economies to carry out independent monetary policies, a constraint that became increasingly relevant after August 2007 as the U.S. dollar depreciated and the Federal Reserve aggressively cut interest rates. Thus, these economies effectively imported an increasingly easy monetary stance from the United States, just as inflation pressures were

rising.[6] At the same time, the sustained surge in commodity prices was accentuated by strong growth in emerging economies, a weakening U.S. dollar, lower U.S. interest rates, and—in the view of some observers although not IMF staff—financial flows into commodity futures markets. Central banking orthodoxy is to accommodate a temporary rise in inflation from a relative price shock, provided underlying inflation remains consistent with forward-looking objectives. However, repeated shocks in the same direction have increased the risks of second-round effects from the sustained shift in relative prices.

Measures of global liquidity shown in Figure 1.9 provide only inconclusive support for these concerns. The monetary base of the largest advanced economies certainly grew rapidly through 2005, and although the rate of base expansion has moderated since then, the emerging economies' continued strong buildup of international reserves implies rapid monetary growth in these economies. However, the relationship between monetary aggregates and prices is tenuous at best in advanced economies and is not well understood in emerging economies. Long-term interest rates have been low by historical standards throughout this decade, although such rates are arguably determined more by fundamental forces affecting the supply of and demand for savings—including the high rates of saving in emerging economies, increased public saving in advanced economies, and low rates of investment globally (outside China)—than by monetary policy settings.

Measures of the output gap provide more direct evidence of excess demand at the global level. To be sure, such measures are imprecise and need to be interpreted cautiously, as highlighted in Box 1.3, which discusses the approach used in the *World Economic Outlook* for assessing potential growth and output gaps. That said, on balance the data suggest that the global economy has been operating well above a cyclically neutral level—comparable to the late 1990s (Figure 1.10).[7] The advanced economies seem to be operating at somewhat below a cyclically neutral level—and their output gaps are likely to widen, given that current rates of growth are well below estimated potential. By contrast, the emerging economies seem to have been growing faster than trend until recently, and pressures on capacity are still high. Even though estimates of output gaps are particularly subject to error for this group of countries, these assessments are broadly consistent with the observed recent acceleration in inflation.

Thus, while there is indeed some evidence that monetary policy may have been too easy at the global level and that the global economy may have exceeded its collective speed limit, excessive demand pressures seem to be concentrated in emerging economies and do not appear egregious at the global level by the standards of other recent cycles. It is hard to explain the intensity of the recent stress in financial, housing, and commodity markets purely through these macroeconomic factors, although they have played some role.

Prospects for a Turnaround

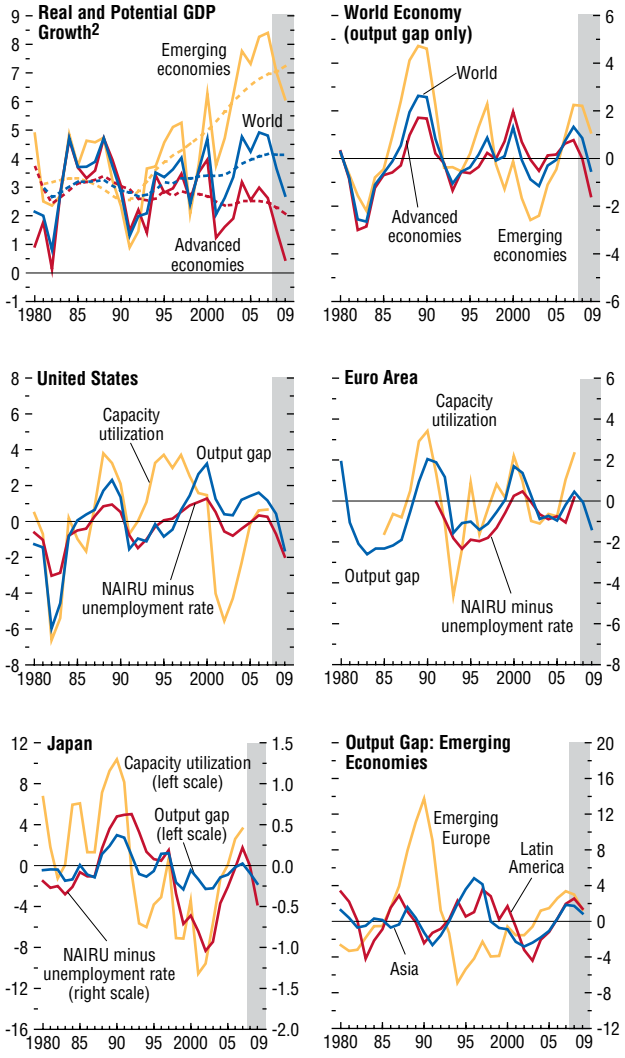
Prospects for the global economy are exceptionally uncertain as this report goes to press. A key assumption underlying the baseline projections is that comprehensive actions by the U.S. and European governments succeed in stabilizing financial market conditions and avoiding further systemic events. Nonetheless, markets are likely to remain under heavy strain throughout 2008 and 2009. Even with successful implementation of the plan to remove troubled assets from U.S. bank balance sheets, it will take time to rebuild confidence in asset valuations and alleviate counterparty concerns. Moreover, banks are going to remain under pressure from the need for more capital combined with growing

[6]Such concerns are illustrated in model simulations provided in Box 3.3.

[7]It is worth noting, however, that estimates of potential output are frequently marked down after a cyclical downturn.

Figure 1.10. Measures of the Output Gap and Capacity Pressures[1]

After a period of above-trend growth, global activity is now slowing well below potential. In the advanced economies, output gaps are expected to widen to the range of 1–2 percent of GDP in 2009. In the emerging economies, output would remain somewhat above cyclically-neutral levels, although capacity pressures would ease some. The methodology used to estimate potential GDP growth and output gaps is explained in Box 1.3.



Sources: OECD, *Economic Outlook;* and IMF staff estimates.

[1]Estimates of the nonaccelerating inflation rate of unemployment (NAIRU) come from the OECD. Estimates of the output gap, in percent of potential GDP, are based on IMF staff calculations. Capacity utilization measured as deviations from 1980–2007 averages for the United States (percent of total capacity) and Japan (operation rate index for manufacturing sector), and deviations during 1985–2007 for the euro area (percent of industry capacity).

[2]GDP growth rates of actual (solid line) versus potential (dashed line) for advanced economies. For emerging economies, a Hodrick-Prescott filter is applied for potential GDP.

credit losses coming from the broader economy. Detailed projections laid out in the October 2008 *Global Financial Stability Report* (IMF, 2008b) indicate that sustained deleveraging will reduce credit growth to very low levels in the advanced economies during 2009 and even beyond, while spreads on riskier asset classes will remain wide. Emerging and developing economies will continue to face difficult external financing conditions, and those with large current account deficits or other vulnerabilities will remain under the most pressure.

In commodity markets, in the absence of further supply shocks or a major downgrading of growth prospects, prices are projected to stay around current high levels, in line with pricing in forward markets. Thus, the price of petroleum would average about $100 a barrel in 2009. But markets are likely to remain volatile, responding quickly to shifting perceptions of demand and supply trends.

Against this backdrop, the baseline projections show the global economy undergoing a major downturn, with growth falling to its slowest pace since the 2001–02 recession. A gradual recovery is projected to get under way later in 2009, but global growth is not expected to return to trend until 2010. Important supports for the eventual recovery will be the unwinding of adverse terms-of-trade effects as commodity prices stabilize, a turnaround in the U.S. housing market, and rising confidence that the liquidity and solvency problems in core financial institutions are being resolved. On an annual basis, global growth is expected to moderate from 5.0 percent in 2007 to 3.9 percent in 2008 and 3.0 percent in 2009 (see Table 1.1 and Figure 1.11). These projections are well below those provided in the July 2008 *World Economic Outlook Update*, reflecting increasing evidence in recent months of slowing activity, the further burgeoning of the financial crisis, and a heightened appreciation of the degree to which financial deleveraging is likely to be an extended constraint on growth.

The advanced economies are expected to be particularly weak for the remainder of 2008 and

the first half of 2009. The U.S. economy faces flat to negative growth during this period, as support from the fiscal stimulus ebbs, export momentum moderates, and tight financial conditions take an increasing toll. An eventual turnaround in the housing sector and more stable oil prices should help lay the basis for incipient recovery in the second half of 2009, but the revival is expected to be much more gradual than in previous business cycles, as tight credit conditions continue to weigh heavily on domestic demand.[8] Most other advanced economies are also expected to go through a period of extremely sluggish growth or contraction in 2008 and the first half of 2009, and to experience only a modest upturn in the latter part of the year. In fact, all the G7 countries but Canada are now projected to grow by less than 1 percent on a fourth-quarter-over-fourth-quarter basis during both 2008 and 2009.

Growth in emerging and developing economies is also projected to continue to decelerate, falling somewhat below trend during the second half of 2008 and early 2009 before picking up during the course of the year. Over this period, overall growth is projected to remain well above rates experienced in the 2001–02 global downturn. Export growth will continue to slow and domestic demand will also moderate, although demand will continue to be supported by the strong productivity gains made in recent years. Commodity-exporting countries—particularly oil exporters—are expected to maintain their momentum, but growth in countries dependent on food and fuel imports or external financing will slow quite sharply. Net external capital inflows are projected to fall by half in the aggregate, and some countries could face substantial pressure on reserve positions.

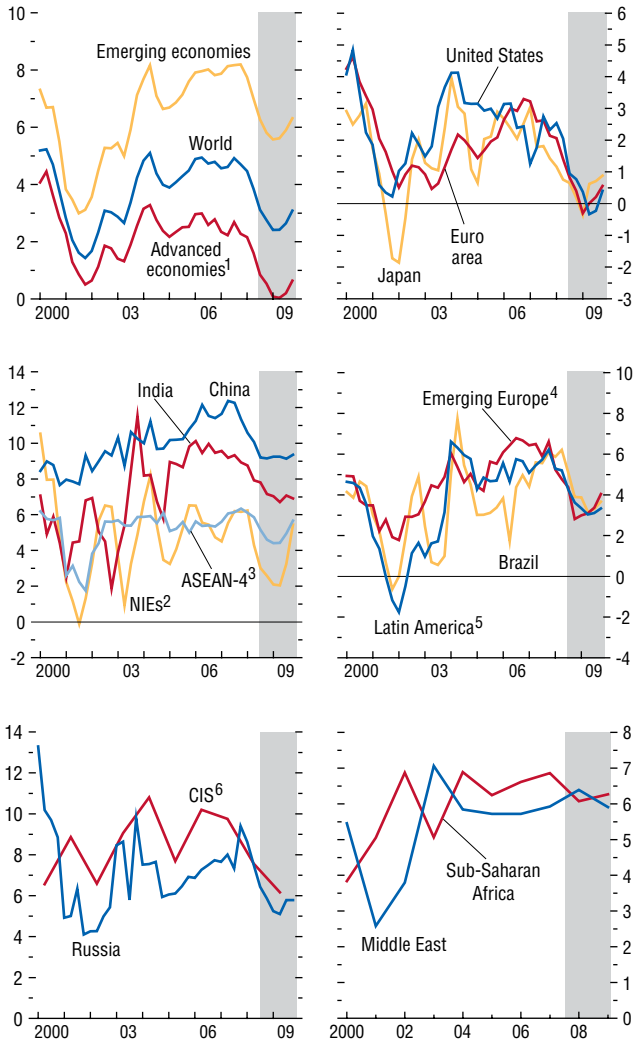
On the inflation front, the combination of rising slack and stabilizing commodity prices is

[8]By itself, however, slow credit growth need not prevent a recovery. Evidence from past business cycles shows that activity typically recovers in advance of a turnaround in the credit cycle (Claessens, Kose, and Terrones, forthcoming).

Figure 1.11. Global Outlook

(Real GDP; percent change from a year earlier)

The global economy is projected to slow further in the second half of 2008 and early 2009, and then to start a gradual recovery. The advanced economies will be most affected by the downturn and will be in or close to recession. Growth will also moderate in the emerging economies, particularly those in Asia, emerging Europe, and Latin America with close trade links.



Sources: Haver Analytics; and IMF staff estimates.
[1]Australia, Canada, Denmark, euro area, Japan, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States.
[2]Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.
[3]Indonesia, Malaysia, Philippines, and Thailand.
[4]Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Poland.
[5]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Rep. Bolivariana de Venezuela.
[6]Commonwealth of Independent States.

Box 1.3. Measuring Output Gaps

Rising inflation concerns have brought increasing attention to the issue of whether economies are overheating and how to measure an economy's productive capacity. All else being equal, an economy operating beyond its capacity—with a positive gap between actual and potential output—is likely to face rising inflation pressures, whereas an economy well within its capacity—with a negative output gap—will tend to experience declining inflation. Measurements of capacity are also important for other purposes, including assessment of the fiscal stance over the cycle, as discussed in Chapter 5. Overall, understanding the current and future cyclical position of the economy is crucial to making sound monetary and fiscal policy decisions.

Measuring output gaps is, however, a highly inexact science, because productive capacity for a whole economy is not directly observable (although some measures of capacity are typically available for some sectors, such as the industrial sector). Accordingly, a mix of approaches has been used, with varying degrees of sophistication, adjusting to data limitations. This box reviews methods used in estimates of output gaps in the *World Economic Outlook* (WEO) projections and discusses a new model-based approach that is now being developed.

Measurement of output gaps. For most advanced economies, estimates of output gaps used in the WEO are derived from an assessment of potential GDP based on a production function approach. Under such an approach, a production function is estimated for the economy, relating output to measured inputs of labor and capital. The residual is a measure of total factor productivity (TFP) in the economy, which can then be related to explanatory variables such as competition, structural reforms, and import penetration.[1] Considerable attention has been paid in the literature to devising increasingly careful measures of inputs—for example, by adjusting labor inputs for the impact of education and training on the quality of labor and by introducing a measure of the flow of capital services—and trying to explain the TFP residual.

This approach has the advantage that once the basic relationship is estimated, an assessment can be made of the impact of shifting factors that affect potential growth—for example, the impact of demographics on the growth of labor services and the impact of investment rates on capital services.

Turning to the emerging economies, data on labor and capital inputs are typically inadequate for the production function approach. Moreover, the possibility of rapid change following major reforms reduces continuity and would make the approach more difficult to apply. Estimates of output gaps in the economies presented in this issue of the WEO therefore rely on time-series techniques to estimate trend GDP based on observed and projected GDP series. Specifically, the output data presented used standard Hodrick-Prescott (HP) filters, which disentangle a time series into a trend component and a cyclical component (Hodrick and Prescott, 1997), using a λ coefficient of 100 on annual data.[2]

Despite their simplicity and widespread use, one difficulty with the HP filters (and time-series techniques more generally) is the sensitivity of the estimates to the choice of end point. As a rough-and-ready approximation, the HP filter is applied to data (in log form) over the period 1980–2008 (which can essentially be considered historical data) and again to data and projections over the period 1980–2013. Using the latter estimates takes advantage of the IMF desk economists' best judgment on medium-term growth prospects. Potential output and output gaps were are then derived as the average of these two estimates.

The main authors of this box are Charles Collyns, Douglas Laxton, and Natalia Tamirisa, with input from Gianni de Nicolò and assistance from Ercument Tulun.

[1]Box 3.1 of the September 2006 *World Economic Outlook* provides an example of this approach.

[2]Filtering results depend heavily on the value for the smoothing parameter λ. The value of 100 captures the properties of the U.S. business cycle well, but it has been less useful for other countries.

Applying this technique to 1980–2008 data suggests a significant acceleration in potential growth over the past decade across emerging economies (first figure, left-hand column). The extent of acceleration is estimated to be even larger using data that include medium-term projections. Using either series, emerging economies are seen as operating significantly above capacity, especially in emerging Europe and Latin America, with the excess approaching 4 percent of GDP in each region in 2008 using the more conservative potential growth estimates.[3]

Quantifying the impact of oil-price shocks on potential output. One issue of current relevance is how much the recent increase in oil prices, if sustained, could affect the level and the rate of growth potential output. Oil is a key input for the production of many goods and services, in part because it is used in transportation. If the relative price of oil rises, other inputs into production (capital and labor), which are available in limited supply and with limited substitution possibilities in the short run will need to be used more intensively, implying a fall in productive potential. The impact of the growth rate of potential output would depend on how quickly output converges to its long-run level.[4]

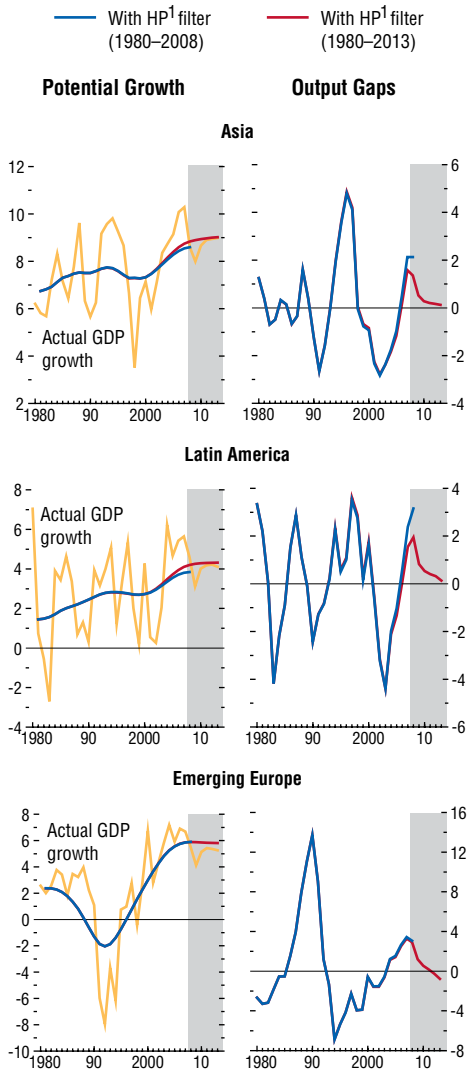
Using a production function approach, Organization for Economic Cooperation and Development (OECD) estimates suggest that an increase in oil price by 240 percent from its 20-year average in the United States and by 170 percent above that in the euro area (to $120 a barrel) would reduce potential output by 4 percent in the United States and 2 percent in the euro area (OECD, 2008). The impact on

[3]Vamvakidis (2008) compares estimates of potential growth across emerging Europe using an HP filter, a production function approach, and a growth equation similar to a specification used by Barro and Sala-í-Martin (2004). The production function approach provides the highest estimates for potential growth, assuming continued strong TFP growth.

[4]For example, press reports suggest that the automotive industry in the United States is moving quickly to retool car manufacturing plants to produce smaller, more energy efficient vehicles.

Potential Growth and Output Gaps in Emerging Economies

Although potential growth probably rose in emerging economies over the past decade, time-series techniques suggest that recent growth has been above potential, implying the opening of significant output gaps in the past year or so. The estimated size of the gap is sensitive to the choice of end point and to the IMF staff's judgment of the extent to which potential growth has risen.



Source: IMF staff estimates.
[1]HP = Hodrick-Prescott.

Box 1.3 *(concluded)*

U.S. potential output is higher because of a larger share of oil in production and the declining value of the dollar. Potential growth is estimated to decline by 0.2 percentage point a year in the United States and 0.1 percentage point in the euro area in the first year of adjustment, based on the average rate at which existing capital is typically scrapped and replaced. However, the adjustment could well occur more rapidly in the face of a large relative price shock because the renewal rate is likely to accelerate—although energy-intensive capital tends to have an above-average service life.

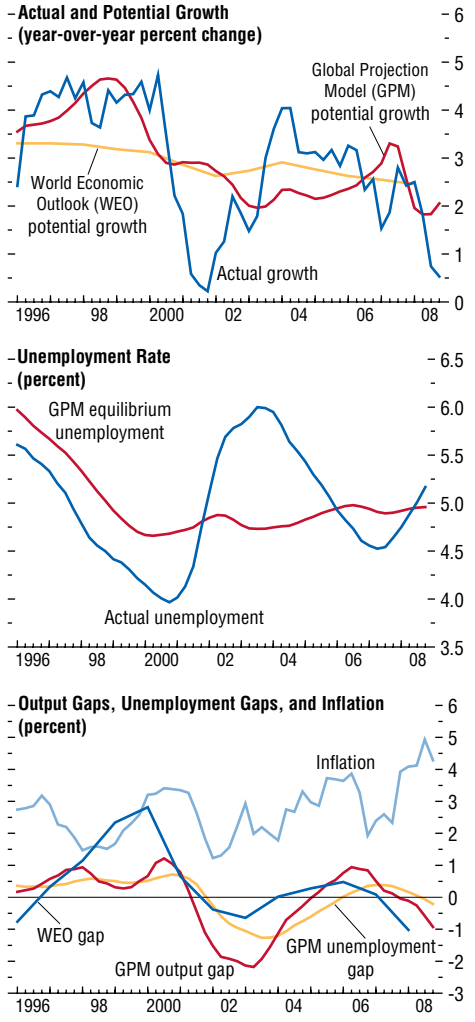
Model-based estimates of output gaps. Recent work for the Global Projection Model (GPM) has developed model-consistent measures of potential output—and thus of the output gap—that exploit information on observable variables, such as GDP, unemployment, and inflation. Like any macroeconomic model, the GPM contains a system of equations, an array of key observable variables, and a few unobservable but crucial variables, notably potential output. Estimates for the latent variables may be based on predictive power. Using this criterion, of all the economically plausible paths that potential output might take, the procedure selects the one that best predicts the observable variables in the model. In other words, the procedure "backs out" values of the latent variables implied by the structure of the model and the behavior of the observable variables.

The model contains two critical equations in this regard. The first links inflation to the output gap. The second is a dynamic Okun's law, which links unemployment gaps (actual-*minus*-equilibrium levels) to past movements in the output gap.

The model-based technique is less mechanical, with much more economic content, than the HP and other univariate filters. It offers a potentially substantial improvement, especially in gauging the current level of potential output in real time, although it requires more advanced modeling than simple filters like the HP filter.

The second figure provides some illustrative GPM estimates for the United States and contrasts them with WEO estimates based on the production function approach.[5] The top panel

Alternative Measures of U.S. Potential Growth



Source: IMF staff calculations.

[5]In current versions of the GPM, the observable variables for the U.S. economy include oil prices, headline CPI inflation, real GDP, unemployment, exchange rates, the federal funds rate, and a measure of bank lending tightness. The last variable is calculated from the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices.

compares the estimates of potential growth from the GPM and from the WEO. The GPM estimates display considerably more variation than the WEO estimates. This is to be expected, given that the former vary in line with the outcomes for inflation and unemployment.

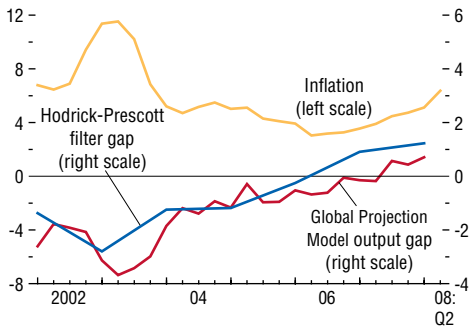
The figure shows a marked discrepancy between the two estimates in the second half of the 1990s, a period with strongly increasing output and declining unemployment, yet stable inflation. The model interprets these facts to be consistent with a more marked increase in the growth of potential output during this period (and hence a permanent increase in the trend level of output) and a decline in the equilibrium (or natural) unemployment rate (middle panel). By the end of the decade, inflation pressure, as gauged by the output gap, or by the deviation of unemployment from equilibrium, was present under either estimate, but much less under the model estimate. By the same token, the GPM estimate of the negative output gap in the 2001–02 recession is significantly larger than that in the WEO estimate.

A widening discrepancy is again evident in 2008, with potential growth in GPM dropping from 3 percent to 2 percent, whereas the WEO measure continues on a smoother path. A major factor at play is the sharp increase in the price of energy, which causes productivity growth in the GPM to drop for a while below its long-run rate. This implies a smaller negative output gap in the GPM for 2008, and hence less downward pressure on the core inflation rate, than in the WEO.

The third figure provides estimates of the output gap based on applying the GPM approach

Output Gap in Selected Latin American Countries[1]

(Percent)



Source: IMF staff calculations.
[1]For the aggregate of Brazil, Chile, Colombia, Mexico, and Peru.

to a group of five Latin American countries. The output gap series tracks quite closely estimates derived from the HP filter approach, providing some support for using the HP filter as a credible first attempt at estimating the output gap across groups of countries.

All in all, it is unlikely that a methodological silver bullet for measuring potential output and output gaps will be found anytime soon. In the meantime, policymakers will need to continue to rely on an eclectic approach, drawing on various measures of slack in the economy (output gaps and unemployment gaps) as well as survey-based measures of capacity utilization and high-frequency indicators, while continually testing available estimates against reality.

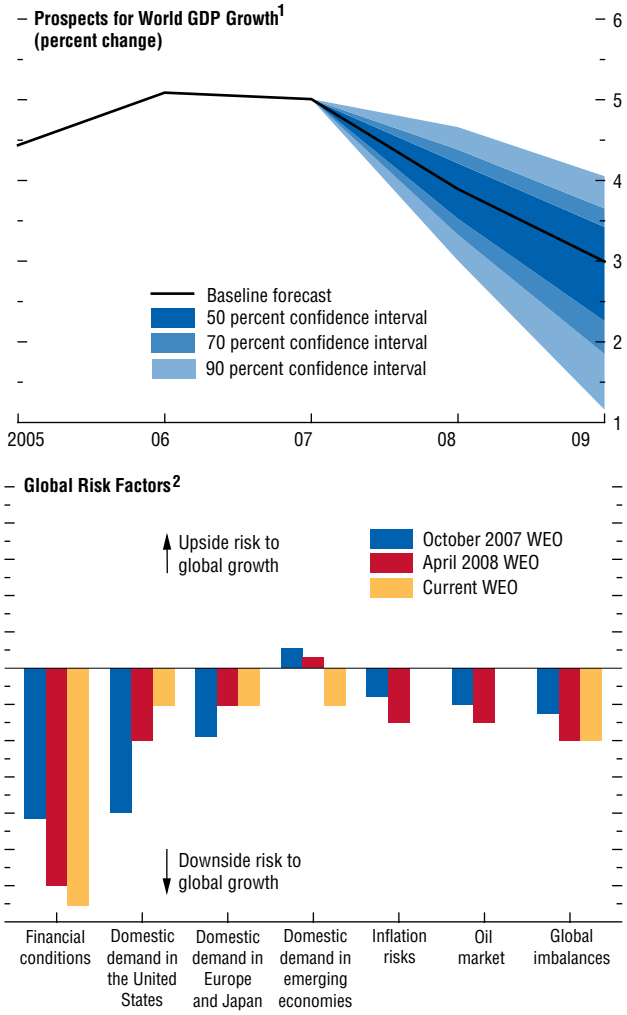
expected to contain the pace of price increases in the advanced economies and bring inflation back below 2 percent by the end of 2009. In emerging and developing economies, inflation is projected to remain at about 8 percent at end-2008 as recent commodity price increases continue to feed through the pipeline. Inflation is expected to ease to 6¼ percent during 2009 but to remain well above central bank objectives in a number of countries.

There are substantial downside risks to the baseline forecast, as illustrated in the global growth fan chart (Figure 1.12).[9] The princi-

[9]Appendix 1.1 reviews these and other approaches used here to assess and communicate risk, including the

Figure 1.12. Risks to the Global Outlook

There are substantial downside risks to the growth outlook. The greatest concern relates to the risk that financial strains will be more intense and more protracted than already envisaged in the baseline projections. Negative risks also relate to concerns about domestic demand and global imbalances, while risks related to inflation and the oil market are now seen as balanced.



Source: IMF staff estimates.

[1]The fan chart shows the uncertainty around the *World Economic Outlook* (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. See Box 1.3 in the April 2006 WEO for details.

[2]The chart shows the contributions of each risk factor to the overall balance of risks to global growth, as reflected by the extent of asymmetry in the probability density for global GDP growth shown in the fan chart. The balance of risks is tilted to the downside if the expected probability of outcomes below the central or modal forecast (the total "downside probability") exceeds 50 percent (Box 1.3 in the April 2006 WEO). The extent of asymmetry in the probability density in the fan chart depends on the various sources of risk and their potential impact as well as the standard deviation of past forecast errors—which, among other factors, varies with the length of the forecasting horizon. To make the risk factors comparable across forecast vintages, their contributions are rescaled to correct for differences in the standard deviations.

pal downside risk revolves around two related financial concerns: that financial stress could continue at very high levels and that credit constraints from deleveraging could be deeper and more protracted than envisaged in the baseline. In addition, the U.S. housing market could deteriorate for longer than envisaged, and European housing markets could weaken more broadly. Inflation risks to growth are now more balanced, in light of the retreat in commodity prices and the slower trajectory of the global economy. Global imbalances remain an issue, but with some shift in focus away from the potential problems of financing the U.S. current account deficit toward risks created by the need to recycle large surpluses from oil exporters and toward risks of protectionism now that the Doha Round has again stalled.

Financial Market Risks

Financial market risks remain acute, even more of a concern than at the time of the April 2008 *World Economic Outlook*. Despite unprecedented actions by financial authorities to prevent systemic events and a major new initiative to help banks in the United States deal with illiquid assets, markets remain under heavy stress, and the threat of disorderly deleveraging remains a serious risk to the outlook.

After the events of recent weeks, concerns remain high about the solvency of financial institutions in mature markets faced with rising losses, tight funding conditions, and dwindling capital bases. Successful implementation of the U.S. government's plan to purchase troubled assets would over time reduce such risks by limiting the downside to U.S. real estate exposure in U.S.-based institutions, but low bank capital could remain a serious issue, especially because asset sales could imply greater loss recognition and because weakening activity is likely to push up losses on a broad range of assets in the

methodology used to develop the growth fan chart and associated risk factors, and discusses work now under way to enhance such assessments.

United States and Europe. Moreover, funding pressures are likely to remain intense until counterparty confidence is restored.

A related concern is that the process of deleveraging and balance-sheet repair could be deeper and more extended than projected, implying that credit constraints on growth could be greater than built into the baseline. At this point it is hard to gauge how much bank capital levels will need to rise to be considered adequate by markets and by regulators. Indeed, the events of recent weeks seem likely to increase pressure on banks to accelerate deleveraging efforts and to be extremely cautious in extending new credit as long as financial conditions remain highly volatile. Moreover, prospects for raising capital are highly uncertain, particularly in light of the large losses suffered by equity holders in recent resolutions and continuing uncertainty over valuation. In the baseline, credit continues to grow moderately in the advanced economies, in line with projections presented in the October 2008 *Global Financial Stability Report* (IMF, 2008b), but credit supply would contract under a "stress scenario" that factors in more aggressive deleveraging efforts.

Recent events have underlined the vulnerability of emerging economies to turbulence in advanced financial markets. Intensified or extended deleveraging in U.S. or European banks or growing risk aversion among investors could prompt a further scaling back of bank and portfolio flows to emerging economies, putting particular pressure on those economies considered vulnerable, including those with large current account deficits, such as in emerging Europe, or countries that have experienced rapid credit growth based on heavy capital inflows, such as in Russia and other countries in the Commonwealth of Independent States. Further cutbacks in financing flows would put increasing pressure on domestic credit conditions at a time when activity is slowing, leading to rising stress on financial intermediaries and borrowers.

The global repercussions of an intensification of financial strains are illustrated in Figure 1.13, based on simulations of a global general equilibrium model (BoC-GEM).[10] The shock is modeled as an additional 100-basis-point widening of credit spreads in the United States and lesser increases elsewhere, combined with a loss of confidence that knocks equity prices down by a further 10 percent. As a result, U.S. domestic demand would slow relative to baseline, lowering real GDP growth by a further 1 percentage point over the next year, with lingering negative effects over a three-year period. The implication would be a considerably deeper U.S. recession and only a gradual recovery thereafter, with similar if less-intense effects elsewhere. Slower global growth would tend to depress commodity prices and raise output gaps, moderating pressure on inflation and providing greater room to ease policy interest rates.

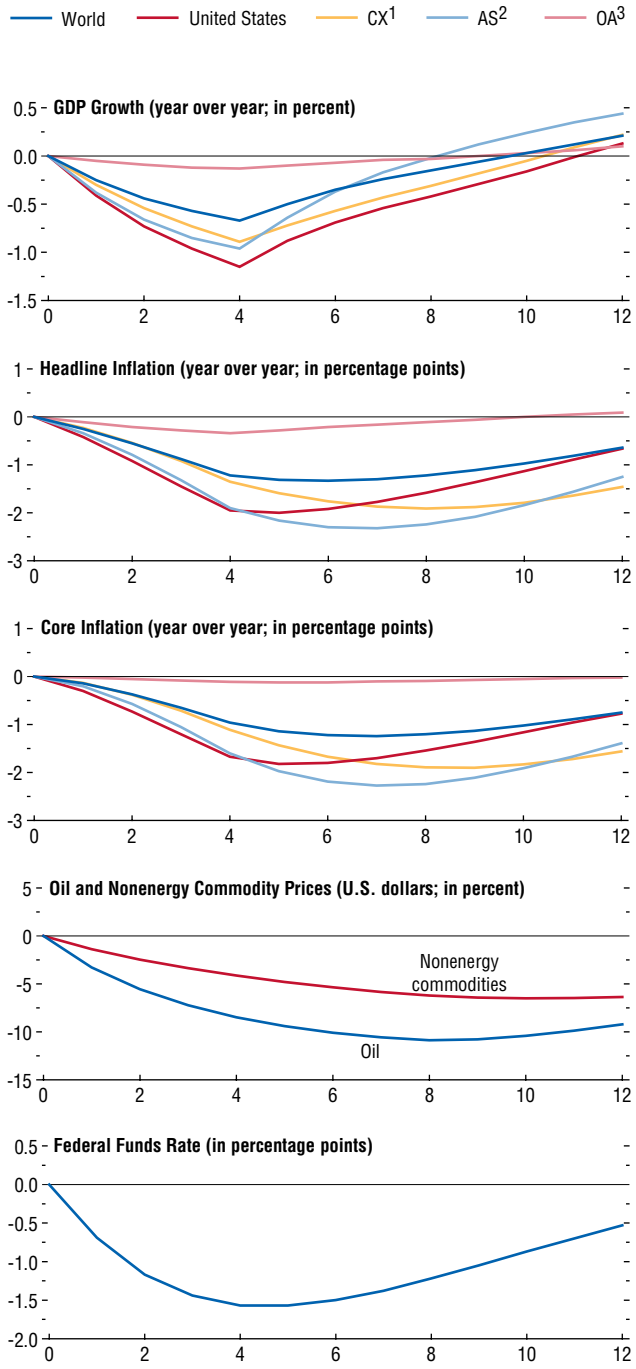
Risks to Domestic Demand in Advanced Economies

Downside risks to domestic demand in advanced economies remain clearly evident. Related to the financial risks just discussed is the threat of deeper and more prolonged housing corrections than built into the forecast. The intervention in the GSEs and the troubled-asset purchase plan should alleviate risks in the U.S. market to some degree by providing assurances of the availability of housing finance and reducing risks of fire sales of distressed real estate in a declining market. Moreover, U.S. housing valuations are moving closer in line with fundamentals; residential construction is already near a 40-year low; and inventories are falling. However, the real possibility remains that U.S. housing prices and activity will not find the projected bottom in 2009, and instead will overshoot, in the context of still-depressed sentiment. In western Europe, housing market prospects are uncertain, and dynamics could be affected by financial deleveraging that restricts the supply of

[10]BoC-GEM is a version of the IMF's global economy model (GEM), developed jointly with the Bank of Canada, which includes explicit modeling of oil and other commodity sectors.

Figure 1.13. Impact of Financial Shock on the Global Economy

(Deviation from control; quarters on x-axis)



Source: IMF staff calculations, based on BoC-GEM simulations.
[1]CX = commodity exporters.
[2]AS = emerging Asia.
[3]OA = other advanced economies.

mortgage financing. Thus, existing downturns could intensify, and a broader range of countries could experience house price declines, a sharp reduction in residential investment, and greater strains on household balance sheets.

The possibility of greater-than-projected resilience of domestic demand in the face of credit strains provides some upside to the forecast. Nonfinancial corporate balance sheets are generally sound—much improved since the early years of this decade—and profitability is high, although corporate bond spreads have widened sharply in recent weeks. In the euro area, consumption could be stronger than projected, as oil prices stabilize, particularly because unemployment rates remain exceptionally low and household balance sheets are stronger than in the United States.

Risks to Domestic Demand in Emerging Economies

Risks to domestic demand in the emerging economies are now distinctly to the downside. The principal concerns for these economies are external—exposure to slower global trade, tighter external financing conditions, and adverse terms-of-trade shocks—but domestic demand also could be adversely affected by deteriorating conditions in financial markets and by corrections in housing markets. Countries that have allowed easy access to external financing and buoyant commodity-related revenues to drive rapid growth in domestic credit and strong growth in government spending are at particular risk of a "sudden stop" in capital inflows that could have a damaging impact on domestic financial conditions and apply a sharp knock to domestic demand. Conversely, there remains potential for domestic demand to surprise on the upside, for example in China, where the government has moved quickly to introduce measures to support growth.

Inflation Risks

Inflation risks have receded relative to the April 2008 *World Economic Outlook*, as commod-

ity prices have retreated and slowing growth has reduced pressure on capacity. In the advanced economies, headline inflation could drop even faster than projected, back into line with central bank objectives, which would provide more scope to ease monetary policy in response to slowing activity. The concern remains, however, that wages could accelerate in response to the loss in purchasing power from higher food and fuel prices if activity does not slow as projected, particularly in western Europe, where unemployment remains low by recent standards.

Inflation risks are still manifest in a number of emerging and developing economies, amid signs that higher commodity prices and increasing pressure on local supply conditions are already spilling into wage demands and inflation expectations. The moderation in commodity prices since July is helping to relieve some of the upward momentum, but pressures from this source are likely to remain for some time because past price increases have only partially passed through the supply chain, particularly for oil, given that many countries have held prices well below international levels. The concern is that once inflation expectations become unanchored, central banks may be forced to tighten abruptly to generate a "hard landing"—a period of subtrend growth—in order to bring inflation back in line. As discussed in Chapter 3, the output costs of regaining control over inflation could be sizable, particularly in economies where initial policy credibility is low and the monetary response is delayed (see Figures 3.15 and 3.16). To be sure, as emphasized in Box 1.3, "speed limits" are hard to estimate for economies that have been able to achieve rapid rates of growth through trade and financial integration. Although continued pools of underutilized labor may suggest a capacity for sustained strong growth, bottlenecks in the infrastructure and availability of skilled labor may start to bind.

Risks from Oil Prices

Given the likely continued volatility, oil prices are an important source of two-way risks to the projections. Option market data suggest that market participants are operating with an unusually wide band of uncertainty about the future price, with outcomes from $60 a barrel to $165 a barrel falling within the 90 percent confidence band over the period through end-2008 (see Appendix 3.1). On the upside, oil prices could continue to decline, providing some stabilizing benefit to the global economy, although such an occurrence would most likely be associated with weakening global demand rather than a positive supply shock, with a correspondingly lower multiplier (see discussion in Box 1.1 of the April 2007 *World Economic Outlook*). Against this, further supply shocks could again push oil prices up, in the context of continued limited spare capacity, keeping pressure on consumer purchasing power, particularly in oil-importing countries, and limiting the relief to headline inflation from stabilizing oil prices built into the baseline.

Risks from Global Imbalances

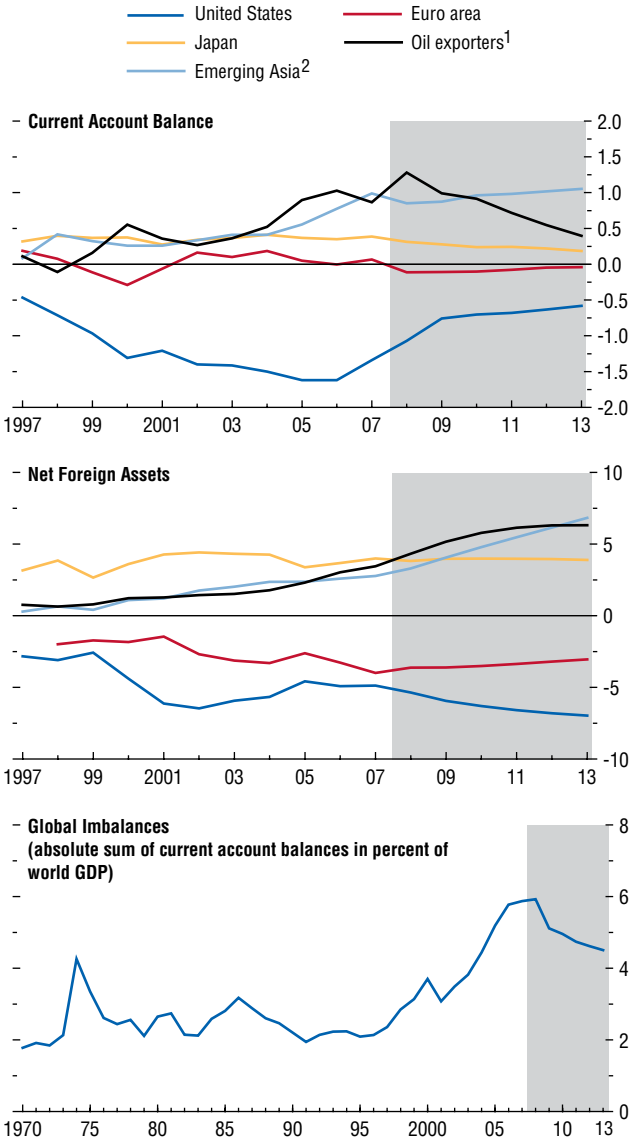
Global imbalances remain an issue, even as the sources of risk are shifting. In the past, the central concern was the possibility of a disorderly unwinding of the imbalances driven by a discontinuous shift in foreign investors' willingness to continue financing the large U.S. current account deficit and add to the share of U.S. assets in their wealth portfolios. Such risks have moderated somewhat as the U.S. dollar's depreciation has brought it closer in line with medium-term fundamentals and the U.S. current account deficit has moved onto a more sustainable trajectory (Figure 1.14, top panel). Still, rising oil prices have slowed the adjustment process as the U.S. oil deficit has jumped, and U.S. net foreign liabilities are still projected as a rising share of global GDP (Figure 1.14, middle panel).[11] Moreover, reduced confidence in the liquidity

[11]Projections are constructed assuming unchanged exchange rates and asset prices. In fact, U.S. dollar depreciation and the relative decline of U.S. equity prices have generated net valuation gains in recent years that have served to offset the flow accumulation of new liabilities. See Box 1.2 in the April 2008 *World Economic Outlook*.

Figure 1.14. Current Account Balances and Net Foreign Assets

(Percent of global GDP)

The U.S. current account deficit has moderated in recent years and is projected to continue to narrow over the medium term, although net foreign liabilities would continue to build. Oil exporters' surpluses have been boosted by rising international oil prices, and although these surpluses are expected to come down, oil exporters are projected to accumulate rising net foreign assets. Emerging Asia would sustain large current account surpluses and continue to build net holdings of foreign assets.



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

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

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

and risk-return characteristics of U.S. assets in the wake of the financial crisis mean that the risk of disorderly unwinding cannot be discounted. The recent difficulties of the GSEs—whose securities have been purchased heavily by foreign investors, thereby providing a significant share of the financing for the U.S. current account deficit in recent years—are a reminder of continuing vulnerabilities on this front.

At the same time, three other types of concern have become salient. The first is that the adjustment of the dollar has been concentrated in a number of flexibly managed currencies while certain major currencies continue to be tightly managed or pegged to the dollar. This situation could create new imbalances over time, for example in the euro area, whose currency is now somewhat overvalued.

Second, the sustained rise in international oil prices has increased the need to ensure the stable recycling of exporters' large surpluses. Allowing current account surpluses to increase is a reasonable response by oil exporters, reflecting their desire to save some of the additional revenues. The annual aggregate surplus of oil-exporting countries projected over 2008–09 has jumped to 1½ percent of global GDP, notwithstanding the rapid increase in domestic demand in these countries. At the same time, emerging Asia continues to run surpluses of about 1 percent of global GDP. To date, the recycling of these funds has been relatively smooth, and indeed investment by sovereign wealth funds (SWFs) has played a valuable stabilizing role in providing capital to banks during the financial crisis. However, there is a concern that continued investment of large surpluses could lead to protectionist resistance to rising foreign ownership. A related concern is that large investment flows into other emerging economies, akin to the recycling of petrodollars in the 1970s, could contribute to excessive growth of liquidity and increase the vulnerability of these economies.[12]

[12]See Box 2.2 in the April 2008 *World Economic Outlook* on the recycling of commodity surpluses and Box 6.1 in this *World Economic Outlook* on the role of SWFs.

The third concern is that continuing large trade deficits combined with weakening employment prospects in some advanced economies could prompt rising trade protectionism. Such concerns are heightened by the recent deadlock in the Doha Round of multilateral trade negotiations.

Policy Challenges for the Global Economy

Policymakers around the world today face the imperative of stabilizing global financial markets, while nursing their economies through a global downturn and tight credit and ensuring that the recent rise in inflation is reversed. While these are the immediate priorities, work must also progress on tackling the market and regulatory flaws that have contributed to recent stresses. Financial markets and institutions must be placed on a healthier footing and supply-demand responses in commodity markets strengthened. Continued commitment to trade and financial integration of the global economy remains essential to underpin longer-term growth prospects.

Stabilizing Global Financial Markets

Policymakers face the enormous challenge of dealing with the immediate threat to financial stability, while also paving the way for rebuilding a firm underpinning for financial intermediation. Achieving this daunting task will require comprehensive solutions that address the systemic problems—the proliferation of illiquid, problem assets; the shortage of capital; and the collapse of counterparty confidence—while dealing rapidly and effectively with emerging problems in individual institutions. Approaches at the national level must be internationally coordinated in order to address joint problems and avoid creating adverse cross-border incentives. At the same time, while recognizing the urgent need to restore stability to the system, it is important to protect taxpayers' interests, to ensure that government intervention is temporary, and to avoid exacerbating moral hazard as much as possible.

The plan by the U.S. government to purchase troubled real estate assets from banks is a bold initiative aimed at restoring liquidity to balance sheets, achieving more transparent pricing of problem assets, and reducing fears about further losses from fire-sale liquidations. Although the implementation details of this plan are uncertain as this report goes to press, the principal challenge will be to balance the need for quick and effective implementation against the longer-term objective of containing the overall fiscal costs, including by creating mechanisms to ensure that the government will share in any gains as banks return to health. It will also be critical to ensure that bank capital is rebuilt quickly, especially because sales of problem assets may spur recognition of additional losses. Public money may be needed to help sound and viable institutions meet their capital needs.

Comprehensive solutions will be important in western Europe too, where cross-border issues are particularly relevant. Appropriate policy actions would be mutually reinforcing with those taken in the United States. Cooperative approaches within Europe should aim at rebuilding confidence through timely bank recapitalization, dealing with problem assets, and protecting depositors in a consistent manner. As recent events have shown, cooperative agreements are essential for resolution of large cross-border institutions, requiring that weaknesses in the cross-border crisis management framework be remedied, including through much greater sharing of supervisory data. It will also be important to ensure consistency of approaches when providing temporary extensions of deposit insurance coverage.

Beyond these immediate tasks, determined efforts will be required to address the manifold underlying weaknesses in financial markets revealed by the current period of financial turbulence. As laid out in the October 2008 *Global Financial Stability Report* (IMF, 2008b), a central objective is to ensure more effective and resilient risk management by individual institutions,

including by setting more robust regulatory capital requirements, insisting on stronger liquidity management practices, and improving disclosure of risk, on and off balance sheets. Another important task will be to strengthen approaches to crisis resolution frameworks, including by clarifying the roles of various official agencies, bolstering deposit insurance systems, and ensuring adequate intervention instruments.

The emergency actions taken to deal with the collapse of major nonbank financial intermediaries (NBFIs) over the past six months have underlined the need for more effective regulation and more secure capitalization of systemically important intermediaries outside the traditional banking system. A clear and permanent solution will be needed for the GSEs that addresses the long-known systemic vulnerabilities resulting from their size, the nature of their risks, and their hybrid public-private governance structure, while dealing with their current shortage of capital. There is also a need to rethink the regulatory structure for and capital adequacy of other NBFIs that play a systemic role in securities and derivatives markets.

Emerging economies should also learn lessons from recent strains. While less directly exposed to the problems created by the proliferation of structured credits, financial systems in a number of emerging economies have been seriously disrupted by shifts in capital flows in the wake of the financial crisis. Basic lessons concerning the importance of strong risk management, transparency, contingency planning, and effective crisis management are thus highly relevant to these countries as well.

Recent events have demonstrated that greater coordination of approaches across national boundaries will be crucial in many of these areas, given the growing international integration of institutions and markets. First, differences in national legal and regulatory frameworks open up room for regulatory arbitrage. Although some differences can foster healthy competition and innovation, this process has gone too far. Second, regulatory and supervisory failures, particularly in major financial centers, have large cross-border spillover effects. And third, cooperative approaches to resolving difficulties in the financial sector are likely to be more effective than individual approaches because of the interconnectedness of financial institutions and markets. In general, policymakers have found it challenging to stay abreast of a financial system that, on the one hand, is globalizing but, on the other hand, is governed by a multitude of national legal and regulatory frameworks. Although international bodies such as the Financial Stability Forum and the Bank for International Settlements, as well as the IMF, are playing a crucial role in alleviating the tensions between global and national forces, more political will to drive collaboration forward is essential. The latest steps in this direction, including proposals for colleges of supervisors for the world's largest financial institutions, are welcome in this regard.

Nursing Economies through a Global Downturn

Macroeconomic policymakers are seeking to find a balance between supporting activity in the face of a global downturn and extremely difficult financial conditions and ensuring that the sustained shift in relative prices implied by the surge in commodity prices does not drive a ratcheting up of inflation, as occurred in the 1970s. The appropriate policy stance will vary across countries. A turn to more supportive stances is justified in some economies now facing recession as a result of financial strains, housing downturns, and terms-of-trade losses. Nevertheless, policy tightening is still called for in a number of countries that are still growing well above their speed limits.

Turning first to the major advanced economies, although macroeconomic policies alone can have a limited impact as long as financial markets are under extreme degrees of stress, steps to provide support to economies in or near recession should supplement efforts to stabilize financial conditions, thus helping to break the negative feedback loops between real and financial conditions.

- In the *United States*, monetary policy settings are already highly accommodative, providing

needed support to the economy in the face of extreme financial stress and the continuing housing correction. Underlying price pressures should be contained as economic slack rises, providing room for further policy easing if the downturn seems likely to deepen, even though its effectiveness may be limited if financial strains persist. On the fiscal front, the stimulus package provided well-timed support to the economy, and recent initiatives to stabilize the housing market and the financial system are justified by the need to avert a systemic crisis. Given the potential costs of these measures and the need for medium-term consolidation, however, adjustment measures will be required elsewhere in the fiscal accounts as conditions normalize, to offset the additional spending over time.

- In the *euro area*, monetary conditions are now quite tight, especially after considering the widening in risk spreads. Rapidly slowing activity, rising output gaps, and the recent softening in commodity prices should contribute to lowering inflation to below 2 percent by end-2009, providing scope to ease monetary policy. Fiscal policy is already providing support to the euro area economy through automatic stabilizers and discretionary measures in some countries. The limited further scope for fiscal easing available under the revised Stability and Growth Pact should be used to focus public resources on stabilizing financial conditions, as needed.
- In *Japan*, the monetary policy stance remains accommodative and should remain so, given that the economy is weakening and that underlying price pressures are well contained, with inflation excluding food and fuel still close to zero. The priority for fiscal policy continues to be medium-term consolidation, which suggests that the currently planned fiscal package should be limited in size.

Macroeconomic policy priorities vary considerably across emerging and developing economies. In an increasing number of these countries, the balance of risks has now shifted toward concerns with slowing activity as external conditions deteriorate and headline inflation starts to moderate. This shift would justify a halt to the monetary policy tightening cycle, particularly in countries where second-round effects on inflation from commodity prices have been limited, and a turn to easing would be called for if the outlook continues to deteriorate. Moreover, in the face of sharp capital outflows, countries will need to respond quickly to ensure adequate liquidity and deal with emerging problems in weaker institutions. The exchange rate should be allowed to absorb some of the pressure, but stockpiles of reserves provide room for intervention to avoid disorderly market conditions.

However, in some other countries, notably but not exclusively in the Middle East and Commonwealth of Independent States, inflation pressures are still a concern in the context of sharp increases in food prices, continued strong growth, and tightening supply constraints. Although the recent moderation in international commodity prices may ease some of the pressure, the gains made over the past years on the inflation front are already being jeopardized, and once credibility is eroded, rebuilding it will be a costly and lengthy process. Thus, policymakers in a number of countries may still need to tighten policy settings further.

In most cases, monetary policy should play the lead role in macroeconomic policy management, but it should be supported by prudent fiscal policy and, in some cases, by flexible exchange rate management. Inflation-targeting regimes have generally served well as a framework that has encouraged early responses to rising inflation pressures, while also providing scope to respond to deteriorating external conditions. However, countries with tightly managed exchange rate regimes have faced greater difficulties. Efforts to tighten the monetary stance in the face of rising inflation are undermined by capital inflows attracted by the increase in interest rate differential, boosting money and credit growth, and many of these countries, particularly in emerging Asia and the Middle East, have faced sharp increases in

inflation. In China, the authorities have used administrative and prudential measures in an effort to limit credit growth, but allowing greater exchange rate flexibility would increase the room for a more independent monetary policy and support efforts to rebalance from external to domestic sources of growth.

Fiscal policy should play a supportive role in macroeconomic management. Fiscal deficits have generally been reduced in recent years across emerging and developing economies as rapid growth has boosted revenues, but government spending has increased rapidly in many countries, adding to demand pressures. Greater restraint on spending growth, including public sector wage increases, would complement tighter monetary policy, in the face of rising inflation, which is particularly important in economies with inflexible exchange regimes. Within a given spending envelope, giving greater priority to infrastructure spending may help relieve supply bottlenecks, a particular concern in Middle Eastern oil-exporting countries, which have clearly been overheating and whose dollar pegs leave little scope for monetary tightening. Some countries with limited exchange rate flexibility have also been more exposed to sharply deteriorating capital inflows, and here again fiscal tightening may be required to help stabilize conditions.

In the face of deteriorating economic prospects, a number of emerging economies have greater scope than in the past to use fiscal policy as a countercyclical tool, in particular by letting automatic stabilizers operate. However, the results of Chapter 5 caution that fiscal stimulus packages are unlikely to be effective—and could be counterproductive—unless confidence in medium-term fiscal sustainability has been firmly established and measures are timely and well targeted.

Strengthening Macroeconomic Policy Frameworks

Beyond such immediate cyclical considerations, a more difficult global environment has raised questions about monetary and fiscal policy frameworks more broadly. Are modifications to these frameworks warranted to improve their stabilization properties?

The inflation-targeting approach has been challenged by the need to deal with a series of large and one-sided commodity price shocks. Clearly, there would be risks in focusing single-mindedly on measures of inflation excluding food and fuel prices because such an approach could accommodate years of high headline inflation that could eventually spill over into expectations and wage formation. At the same time, however, allowing some deviation of headline inflation from inflation targets does seem justified to help accommodate a relative price shift without undue output volatility, although sustained large deviations could undermine policy credibility, as discussed in Chapter 3. This underlines the need for clear communications and a forward-looking approach, prepared to tolerate temporary deviations from inflation targets, provided that expectations are sufficiently well anchored.

Is there now a global inflation bias inherent to the way monetary policy is set, implying a need for more coordinated approaches to policy setting? Policymakers tend to treat international commodity prices as exogenously determined and thus do not account for the impact of the country's demand on global commodity markets, exacerbating the global supply constraint. However, the size of the externality seems likely to be of second-order magnitude even for major oil consumers, and it is not clear how such an externality could be effectively internalized. Practically, it seems sensible for monetary policymakers to continue to focus on minimizing volatility in domestic inflation and output while relying on more direct action to relieve commodity market pressures, as discussed below. If they do so successfully, they will also contribute to minimizing volatility in global markets, including those for commodities.

A second concern is that countries that manage their currencies tightly against another country's currency find themselves importing the other country's monetary conditions, which

may not be appropriate to their circumstances. The tension is particularly great where countries face large shocks of opposite sign. Thus, the United States has been easing at a time when many countries with dollar pegs are running current account surpluses and operating at or beyond capacity. These latter countries would benefit from tighter monetary conditions and exchange rate appreciation. However, absent a formal currency union arrangement, it is not reasonable to expect the central bank with the reserve currency to adjust its policy to reflect monetary conditions in other countries that choose to peg against that reserve currency. Moreover, such tightening would be likely to contribute to dollar appreciation and thus not be helpful in terms of the desired rebalancing of current accounts. Although there are many considerations that feed into the choice of an exchange rate regime, there would be stabilization benefits for countries with adequately developed financial institutions to move over time to more flexible rate regimes that provide for greater control over domestic monetary conditions. This issue is explored further in Box 3.3.

Recent events in housing and financial markets have again brought attention to the extent to which monetary policy should respond to asset price movements. Inflation-targeting central banks do take asset price movements into account to the extent that they have an impact on short-term output and price prospects and risks. There is a concern, however, that this may lead to asymmetrical responses, because sharp declines in asset prices may lead to quick policy easing, whereas a longer period of asset price buildup may not generate much resistance, provided near-term prospects remain fair. This has led to proposals for leaning against the wind of asset price movements, especially when these are rapid or seem to be moving prices seriously out of line with fundamentals (Chapter 3 of the April 2008 *World Economic Outlook* and BIS, 2008). The usual counterarguments are that such a policy would be hard to calibrate and that it is not clear how successful monetary policy by itself can be in dampening asset price cycles. However, recent research has emphasized that short-term interest-rate settings have played an increasingly important role in the monetary transmission mechanism as the shift toward market-based financing has increased the procyclicality of leverage (Adrian and Shin, 2008).

A complementary approach would be to introduce a systemwide element to the regulatory framework to weigh against the inherent procyclicality of credit creation. Such a "macroprudential" approach could involve increasing regulatory attention to the way financial incentives and constraints affect risk-taking behavior throughout the credit cycle (Bernanke, 2008). Moreover, capital and provisioning requirements could be tightened during the upswing of the economic cycle to reduce the risk of destabilizing credit booms and could be aligned with reforms to strengthen risk management within individual institutions. Such reforms would need to be developed in the broader context of an overhaul of regulatory approaches discussed further below.

Increasing attention is also being paid to fiscal policy frameworks. As discussed in Chapter 5, fiscal policy can play a useful countercyclical role, provided its support is timely, does not undermine medium-term sustainability, and is well structured to maximize impact. Automatic stabilizers provide support that generally satisfies at least the first two of these criteria, and reforms could be considered, for example to safety net programs, that would increase their countercyclical impact without distorting the basic purpose of government tax or spending policies. Discretionary policy can also play a countercyclical role, but timeliness and, especially, reversibility can be more problematic. A "deficit bias" can contribute to undermining policy credibility and therefore effectiveness, as shown in Chapter 5, by the limited impact of fiscal stimulus in high-debt countries. To remedy this, a rules-based countercyclical policy response could be considered, supported by stronger fiscal governance mechanisms to give greater emphasis to ensuring consistency with long-term fiscal sustainability. Such an approach could reinforce the overall stabilization proper-

ties of macroeconomic policies and reduce some of the burden on monetary policy.

Strengthening Supply and Demand Responses in Commodity Markets

The recent decline in commodity prices in the face of a global slowdown should not be allowed to undercut policy efforts to relieve strains in commodity markets. The focus should be on policies to improve supply and demand responsiveness, while avoiding measures that could exacerbate market tightness in the short term. It will be important to pass through changes in international prices to domestic markets, while developing well-targeted safety nets to cushion the impact on low-income groups. Policies that discourage exports in favor of domestic markets should continue to be rolled back. Advanced economies generally allow commodity price changes to feed through but should take steps to moderate their use of energy and food—far higher per capita than in the emerging and developing economies—by encouraging greater energy conservation (for example, through fuel-efficiency standards as well as price-based measures) and reducing biofuel subsidies.

Priority should also be given to policies that strengthen the supply response to higher prices. Agricultural production in emerging markets could be fostered by steps to build up the infrastructure for irrigation and transportation and to ensure more effective transfer of new technologies to improve yields in developing economies so they are more in line with those in advanced economies. In energy markets, improved provision of information about resources, inventories, and investment plans, and clear and stable investment frameworks, would provide a better basis for the needed long-term buildup of investment in this sector. Finally, liberalization of access for agricultural products to advanced economy markets, through a successful conclusion of the Doha Round, would play an important part in establishing a stronger long-term framework for agricultural development.

Managing Global Imbalances

As emphasized above, the issue of global imbalances has multiple dimensions. Some progress has been made toward unwinding the large U.S. current account deficit, and more adjustment is in train, even though rising oil prices have slowed the process and financial vulnerabilities have added to concerns. The multilateral strategy endorsed by the International Monetary and Financial Committee in 2005 and elaborated by the Multilateral Consultation on Global Imbalances in 2006–07 remains broadly relevant, but needs to be applied flexibly (Box 1.3 in the April 2008 *World Economic Outlook* provides a comprehensive overview of progress since the Multilateral Consultation). U.S. fiscal consolidation remains a key medium-term objective, but recent countercyclical fiscal stimulus and public support for the housing and financial sectors have been justified to alleviate the current slowdown and to stabilize markets. Progress needs to continue toward appreciation of the renminbi as part of China's broader strategy to shift the sources of growth toward internal demand and to increase the effectiveness of monetary policy. Middle Eastern oil exporters will need to adjust plans to build up spending out of oil revenues in order to reduce overheating in their economies, including less-ambitious spending increases and a tighter focus on relieving supply bottlenecks. For their part, the euro area and Japan should press ahead with product and labor market reforms to raise potential growth in their economies.

Even with implementation of such a strategy, global current account imbalances are likely to be sustained at high levels for a considerable period, particularly given the impact of rising oil prices and increasingly binding capacity constraints on oil exporters' current account surpluses. It will be important to ensure that such imbalances do not undermine continued commitment to open trade and capital flows, which has underpinned global growth over the past decades. One challenge is to ensure the investment of these resources in a secure fashion that

does not lead to the buildup of vulnerabilities in capital-importing countries. Recently, a number of emerging economies—notably in emerging Europe but elsewhere too—have had large current account deficits for sustained periods that stand out by historical standards on both dimensions. As discussed in Chapter 6, to some degree this experience can be understood in terms of the opportunities created by financial development, capital account liberalization, and European integration. However, the experience of the Latin American debt crisis in the early 1980s after years of strong oil-related inflows provides a salutary lesson that such episodes can end with a painful bump. Countries receiving capital inflows must therefore be careful to ensure that the flows do not lead to a buildup of vulnerabilities or balance-sheet mismatches, including by strengthening financial supervision and domestic financial institutions and ensuring an overall macroeconomic context conducive to sustainable growth.

Finally, it will be important to ensure that large imbalances in trade flows do not lead to a buildup in protectionist measures on either the current or capital account. Breaking the current deadlock on the Doha Round would help strengthen the open multilateral trading system. On the capital account side, the growing role of SWFs as an investment vehicle is an important development. The set of principles and practices recently agreed by SWFs (the Santiago Principles) to guide their governance, investment, and risk management will help make such flows more transparent and thus should help reduce concerns about governance of such funds that could lead to counterproductive restrictions on such inflows (see Box 6.1).[13] Moreover, the new guidelines that are under development at the Organization for Economic Cooperation and Development for recipient countries will help reassure SWFs of fair, transparent, and open access to markets.

[13]*The Generally Agreed Principles and Practices of Sovereign Wealth Funds* (forthcoming, October 2008).

Appendix 1.1. Assessing and Communicating Risks to the Global Outlook

The main authors of this appendix are Kevin Clinton, Thomas Helbling, Douglas Laxton, and Natalia Tamirisa, with assistance from Juigang Chen, Ioan Carabenciov, and Ondra Kamenik.

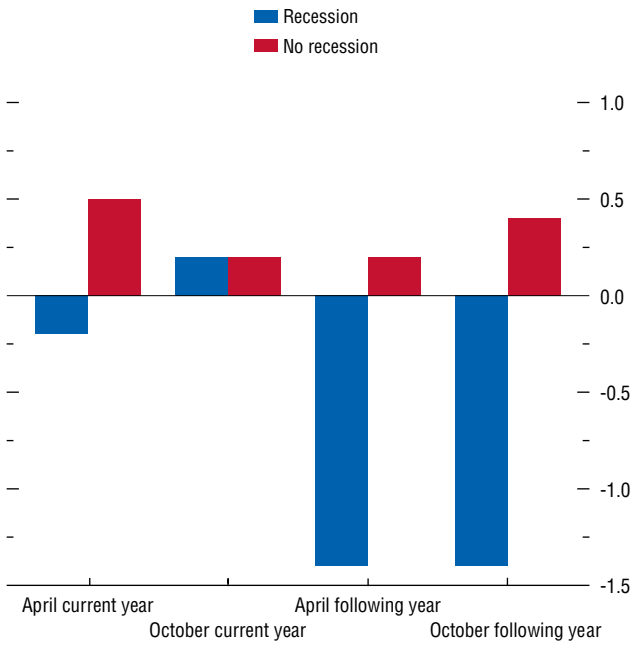
Like all forecasts, the *World Economic Outlook* (WEO) central, or baseline, projections are subject to considerable uncertainty. This appenddix discusses approaches that have been used in the WEO to assess and communicate risks to the WEO forecasts and reports on ongoing work to strengthen macroeconomic risk analysis.

As background, it is important to understand how the global projections are prepared by IMF staff. The process underlying the preparation of the WEO forecast is not based on a single formal model. It is driven by the judgment of specialists who prepare individual country projections combined, through a multistage interactive process based on a consistent set of basic assumptions, with assessments from the teams covering global economic and financial developments. This process is supported by a suite of country-specific, regional, and multicountry macroeconomic models. It also draws on discussions with country authorities in the course of bilateral surveillance as well as with market participants and academics during multilateral surveillance missions.

The Fan Chart

In recent years, following the recommendations of Timmermann (2006), the IMF staff has presented risks to the WEO projections using a fan chart (see, for example, Figure 1.12). The chart shows the estimated confidence intervals around the baseline world growth forecast, which widen as the forecast horizon stretches into the future. The methodology for constructing the fan chart is similar to that originally developed by the Bank of England

Figure 1.15. Median Forecast Errors during Global Recessions and at Other Times, 1991–2007[1]



Sources: World Economic Outlook (WEO) database; and IMF staff estimates.
[1]Forecast errors are defined as the difference between actual world growth and the WEO forecast of world growth. The errors are calculated for the current-year and following-year forecasts in the April and October issues of the WEO for the period 1991–2007. A negative (positive) forecast error indicates that the actual value is below (above) the forecast, that is, the forecast is biased upward (downward).

(see Britton, Fisher, and Whitley, 1998). Outcomes for world growth are assumed to follow a "two-piece-normal" distribution. The central forecast is represented as the mode, or the most likely outcome, and the width of the fan is determined by the distribution of past forecast errors. The skewness of the distribution, or the relative size of the two pieces of the normal distribution, represents the balance of risks to the central forecast.

The preparation of the fan chart incorporates an array of empirical judgments about the most likely sources of risk and about the way they may affect macroeconomic developments. The contributions of each risk factor to the overall balance of risks to global growth are shown in the risk factor chart, which complements the fan chart. The impact of individual risk factors is quantified using the IMF's suite of macroeconomic models and the IMF staff's judgment.

The assessed risks are usually not symmetric—but weighted more to one side. The sum of the risk factors provides a measure of the balance of risks, or the skew of the probability distribution around the mode, defined as the distance between the mean (the average outcome) and the mode (the most likely outcome). When the risks are symmetric, the average of all possibilities is the most likely outcome. However, when the risks are unbalanced, for example to the downside, the left-hand tail of the distribution is longer, the mean forecast is below the mode, and the skew is negative. The median (or the point that splits the forecast distribution in half, with 50 percent probability on either side) falls between the mode and the mean.

Skewed distributions reflect the IMF staff's views on the risks to the forecasts. The staff might see a higher risk of deviation from the forecast in one direction than the other for a number of reasons. First, asymmetric risk assessment may result from an acknowledgment of *nonlinearities* in the global economy. For example, capacity constraints in the goods market and labor market would limit the room for upside potential when the economy is operating close to full capacity. The zero bound

on nominal interest rates, financial accelerator mechanisms that amplify shocks throughout the system, and herd behavior in financial markets could all generate complex and asymmetric feedback effects.

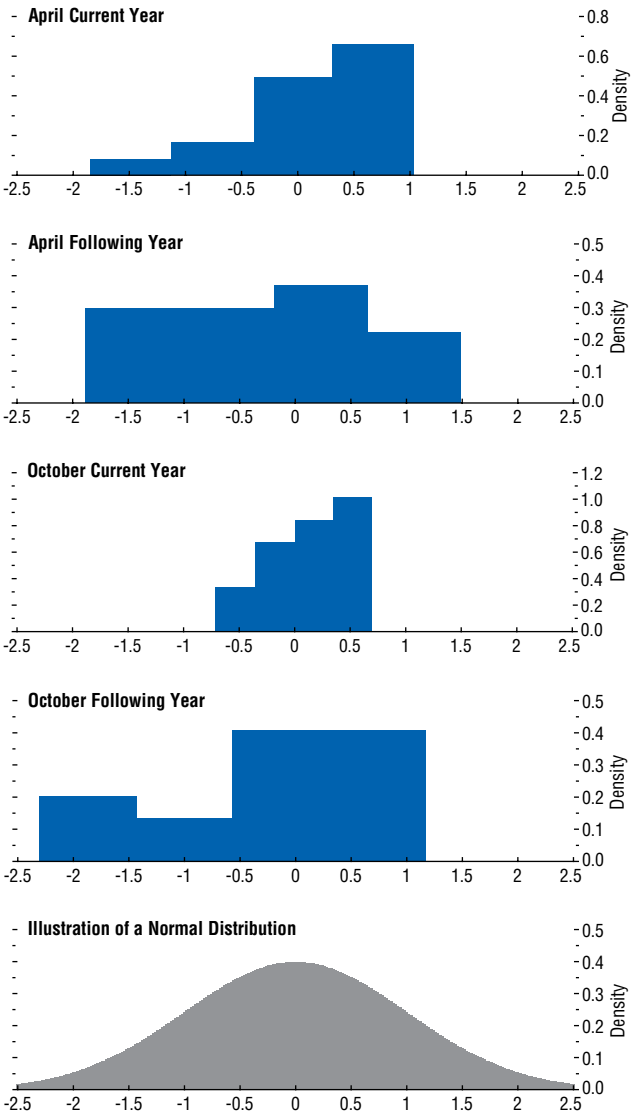
The second reason for asymmetries is to reflect incoming *new information*, after the forecast is "frozen." For example, oil prices could move substantially out of line with the assumed path, or there could be rapid financial developments whose impact is hard to assess but that clearly could have a significant and asymmetric impact, as was the case last year.

The third reason for asymmetry stems from possible *internal inconsistency of the WEO forecasts.* These are not based on an internally consistent macroeconomic model and assume interest rates and oil prices broadly consistent with market expectations and constant real exchange rates, which may be at odds with the IMF staff's assessment of the outlook.

The fourth reason relates to the possibility of a *systematic behavioral bias in the WEO baseline forecasts.* An analysis of past forecast errors suggests that during 1991–2007 the *World Economic Outlook* had a general tendency to underpredict world growth somewhat while overpredicting it substantially in the years immediately preceding global recessions—defined as annual world growth (based on purchasing-power-parity weights) falling below 3 percent (see Figures 1.15 and 1.16). This may reflect the well-known difficulty of predicting "tail events" (defined as adverse outcomes that have up to a 10 percent probability of occurring), for example, systemic financial events or hard-landing outcomes.

Even though the fan chart provides a useful illustrative device for communicating risks underlying the WEO baseline forecasts, and the heuristic approach underlying its construction is sufficiently flexible to incorporate a wide range of complex considerations, the methodology has some drawbacks. The sources of uncertainty are somewhat ad hoc, because they are not derived from a formal model of the economy, and the actual distribution of likelihood of different outcomes may not be normal. In addition, the

Figure 1.16. Histograms of Forecast Errors, 1991–2007[1]

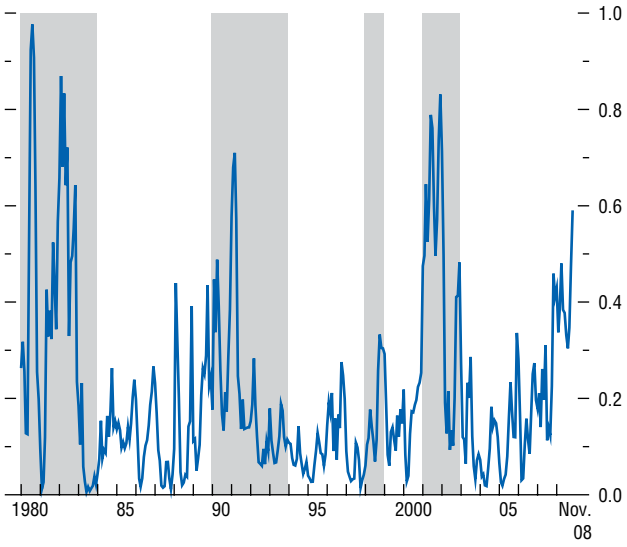


Source: IMF staff calculations.

[1]Forecast errors are defined as the difference between actual world growth and the WEO forecast of world growth. The errors are calculated for the current-year and following-year forecasts in the April and October issues of the WEO for the period 1991–2007. A negative (positive) forecast error indicates that the actual value is below (above) the forecast, that is, the forecast is biased upward (downward).

standard deviation of the distribution used to construct the fan chart is fixed and does not vary with the state of the world. The risk factors used to determine the extent of asymmetry in the distribution are typically ad hoc and, in reality, jointly distributed rather than independent. Thus, inflation risks are greater in the presence of an oil price spike, whereas risks to domestic demand depend on the evolution of financial conditions. As discussed above, a fan chart based on a two-piece-normal distribution may underestimate the risks of tail events such as global recessions.

Figure 1.17. Probability of Global Recessions[1]



Source: IMF staff estimates.
[1]Shaded area represents periods of global recession.

Leading Indicator Approach

One way to complement the fan chart approach is to gauge the risk of a global recession using a leading indicator approach.

Leading indicators are variables that help predict the probability of global downturns (recessions) some three to nine months ahead.[14] A suitable indicator has a turning point that precedes a change in global activity in a systematic and consistent manner. Leading indicators have long been used in business cycle analysis (for example, Zarnowitz, 1992), although finding reliable indicators remains surprisingly difficult.[15]

IMF staff analysis suggests that an index constructed as a combination of U.S. financial and real variables and cyclical commodity prices has promising leading indicator properties. The financial variables include the slope of the term structure (proxied by the spread between 10-year and three-month Treasury rates) and stock returns (S&P 500). The other variables are U.S. industrial production and the IMF's metals price index. Based on September 2008 data, this indicator points to a probability of global recession within the next three months of approaching 60 percent, up from almost 50 percent late last

[14]The dating of the cycle in global activity is based on a monthly series of global industrial production.

[15]Another difficulty is the lack of sufficiently long time series for many relevant high-frequency indicators.

year.[16] As Figure 1.17 shows, together these variables have predicted past global recessions with a probability of more than 50 percent without providing false signals during 1980–2007.[17]

This approach should also be used cautiously. The strength and timing of the signal varied across recessions, which is consistent with the general experience with leading indicators (for example, Stock and Watson, 1989, 2003). Moreover, the leading indicator approach is essentially statistical and does not provide much insight into the processes generating adverse outcomes or how they might change over time. Thus, a leading indicator approach at the global level, although simple and intuitive, is not a panacea when it comes to assessing risks to global growth.

Scenario Analysis

An alternative way to address the above issues is to complement the judgment-based risk assessment, as embodied in fan charts, with analyses using a fully articulated model to assess the impact of shocks to key variables. Thus, Figure 1.15 in the April 2008 *World Economic Outlook* illustrated the impact of a deeper financial sector shock, and Box 1.1 in the April 2007 *World Economic Outlook* illustrated the effects of oil-price shocks stemming, respectively, from demand and supply factors. Model simulations are particularly useful for tracing the complex dynamic interactions that occur when a shock moves the economy away from its previously expected path. However the simulated scenarios, in themselves, do not provide a guide to the distribution of risks. This requires inclusion within the model of a probabilistic framework that contains estimates of the distributions of relevant shocks.

[16]For comparison, the fan chart now suggests that the risk of global recession is almost 20 percent.

[17]A false signal would be a prediction of more than 50 percent probability of a global recession at a time the global economy was expanding.

Macroeconomic Model-Based Confidence Intervals

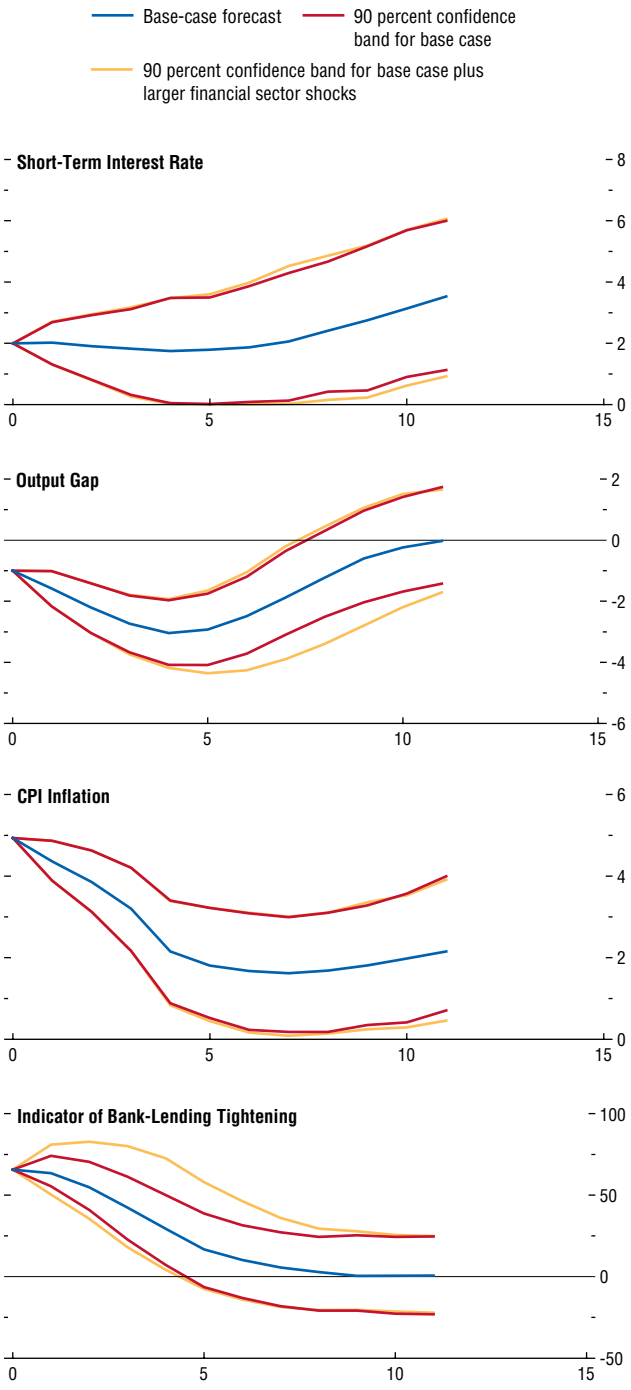
Work is now under way at the IMF on an estimated multicountry model capable of producing baseline forecasts and fan charts, with all numerical assumptions—including distribution of shocks—clearly spelled out.[18] This new Global Projection Model (GPM) builds on the significant progress that has been made, at various central banks, in estimating a complete system of equations that link demand and supply shocks in different markets to macroeconomic variables.[19] Such a model is not capable of producing forecasts with the full country detail provided by the WEO forecasts, but has the advantage of greater consistency and clarity between assumptions and outcomes. It can also be used to produce conditional forecasts to indicate the impact of shocks on one or more variables.

Almost all this research has so far been based on symmetric shock distributions and linear models, which will result in symmetric confidence bands, but the IMF staff has been working to introduce three sources of asymmetry: (1) the zero-interest-rate floor; (2) a nonlinear output-inflation process, in which positive shocks to aggregate demand have larger inflation implications when the economy is already overheating than when there is significant slack in the economy; and (3) a credit-tightness effect on the real economy, whereby an easing of financial conditions may not increase lending much beyond a certain threshold (once there is sufficient collateral to satisfy lenders of

[18]See Carabenciov and others (forthcoming) for a description of a preliminary three-region version of the GPM that includes models for the United States, the euro area, and Japan. In the near term, the GPM will be used to run scenarios and check the macro consistency in the IMF desk economists' baseline forecasts much as the Federal Reserve Board of Governors uses macro models to check the consistency of their own forecasts.

[19]This has been made possible by the development of user-friendly Bayesian-estimation routines, which are now being used extensively in policymaking institutions and academia to estimate macro models—see Laxton, Rose, and Scott (forthcoming).

Figure 1.18. Illustrative GPM-Based 90 Percent Confidence Intervals[1]



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

the safety of their loans, a further increase in the value of the collateral may not affect their behavior very much).

Figure 1.18 provides some illustrative confidence intervals from this extended version of the GPM.[20] The central path lines within the fans represent the baseline solutions of the model for the expected path of the economy. Unlike conventional forecasts, this is an unconditional forecast, which assumes that all shocks are set to zero, with none of the judgment-based input that usually proves to be very useful when producing near-term forecasts.[21] The boundaries of the fans represent 90 percent confidence intervals, which are derived from estimated historical distributions of shocks. The wider confidence intervals depicted in the fourth panel are based on building into the GPM an assumption that shocks to credit conditions become larger when credit conditions are exceptionally tight. The wider bands suggest that the increased uncertainty would all be on the downside for the output gap, inflation, and short-term interest rates.

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[20]See Chen, Kamenik, and Laxton (forthcoming) for a description of the model and methodology used to construct the GPM fan charts.

[21]Efficient model-based projections developed in policy-making institutions typically rely very heavily on judgment for setting the first two quarters of the projection. This judgment is based on considerably more information than can be summarized by pure forecasts generated from a macro model—see Laxton, Rose, and Scott (forthcoming).

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