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September 3, 2008

To: Members of the Executive Board

From: The Secretary

Subject: **World Economic Outlook—Global and Regional Economic Prospects and Policy Issues—Chapters 1, 2, and 3**

Attached for consideration by Executive Directors is a paper on global and regional economic prospects and policy issues, Chapters 1, 2, and 3 of the October 2008 World Economic Outlook, which is tentatively scheduled for discussion on **Wednesday, September 17, 2008**. Chapters 4, 5, and 6 of the WEO have already been circulated to the Board (EBS/08/100, 8/27/08).

Questions may be referred to Mr. Collins (ext. 38383), Mr. Decressin (ext. 37140), and Mr. Helbling (ext. 36051) in RES.

As is the usual practice, it is intended to publish the full set of World Economic Outlook documents. It is planned that Chapters 1, 2, and 3 will be made available to the public on the IMF website slightly in advance of the publication of the full document, which will as usual be released at the World Economic Outlook press conference shortly before the IMFC meeting. The paper will be revised for publication in light of the Executive Board discussion. If Executive Directors have additional comments, they should notify Mr. Collins by close of business on **Tuesday, September 23, 2008**.

This document will be posted on the secure page of the extranet website for Executive Directors and member country authorities. It would be appreciated if Directors could ensure that the World Economic Outlook documents are treated as **Strictly Confidential** until they are published just before the IMFC meeting.

Att: (1)



INTERNATIONAL MONETARY FUND

**World Economic Outlook—Prospects and Policies**

Prepared by the Staff

Approved by Olivier Blanchard

September 2, 2008

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## Executive Summary

*The world economy is grappling with a lasting financing crisis and a surge in commodities prices. Many advanced economies are close to recession; emerging economies are also slowing, although most are still experiencing growth at or above trend. A recovery should begin to take hold in 2009 as the effects of commodities price shocks unwind or even reverse, U.S. housing prices stabilize, and financial institutions' liquidity and solvency problems are slowly resolved, although sustained deleveraging will provide continued strong headwinds. The immediate challenge is for macroeconomic and financial policies to support the recovery and stabilize financial conditions, including through fostering the restoration of healthy financial balance sheets and guarding against systemic failures through liquidity provision and prompt intervention when needed, while keeping inflation under control. More generally, policymakers should consider how to strengthen the countercyclical properties of macroeconomic and regulatory frameworks; improve supply-demand responses in commodities markets; and contain potential risks from global imbalances.*

### Global economy under stress

The world economy is cooling rapidly but also faces uncomfortably high inflation (Chapters 1 and 2). After years of strong growth, global activity is being slowed by increasingly tight supply-demand balances in oil and other commodities markets and strains from the financial crisis that erupted in August 2007. Accordingly, world growth has shifted down since the fourth quarter of 2007 and many advanced economies are now bordering on recession. Moreover, recent data and forward-looking indicators suggest that the downturn is continuing to deepen.

At the same time, the surge in food and fuel prices underway since 2004 and tightening capacity constraints have propelled inflation to levels not seen in a decade. As analyzed in Chapter 3, this rise has been particularly strong in the emerging and developing economies, given the high weight of food in consumption baskets, growth still above trend, and less well anchored inflation expectations, although countries that have adopted inflation-targeting regimes have generally fared better. Oil prices have been less of a factor, in part because pass-through of international prices has been delayed and incomplete. In the advanced economies, by contrast, oil price increases have played the lead role.

The recent deterioration of performance in the global economy comes after a sustained expansion built on healthy gains from increasing integration of emerging and developing economies into the global economy. However, with the benefit of hindsight, lax macroeconomic policies and excessive liquidity may have allowed the global economy to exceed its "speed limit," leading to a build-up in imbalances across financial, housing, and commodities markets, reaping payback when these imbalances could no longer be sustained. At the same time, flaws in the operations of the markets themselves and policy shortcomings

prevented equilibrating mechanisms from operating effectively and allowed market stresses to build.

### **Recovery not yet in sight, and likely to be gradual when it comes**

Activity is forecast to soften further in the second half of 2008 before a gradual recovery takes hold in 2009. Factors that should help turn the global economy around in 2009 include:

- Commodity prices are projected to stabilize, even if at much higher levels than at any time in the past twenty years. The adverse terms-of-trade effects of the more than 60 percent increase in oil prices during 2008 should begin to unwind in 2009, boosting consumption in oil-importing countries.
- The U.S. housing sector should finally reach bottom and start to turn around, following a deep retrenchment that has shaved some  $\frac{3}{4}$  percent off U.S. real GDP growth rate over the past two years. Stabilization of house prices would contribute to the process of resolving financial institutions' liquidity and solvency problems.
- Support from continued robust domestic demand in many emerging economies, which have benefited from rapid integration with the global economy and have been affected to a much smaller extent by the financial turmoil.

However, financial markets are expected to remain under unusual stress over the forecast period, providing continued strong headwinds to the recovery. As discussed in the Fall 2008 GFSR and as foreshadowed in the Spring 2008 WEO and GFSR reports, the negative feedback loop between the financial system and the macroeconomy has grown. Thus, while losses from the U.S. sub-prime sector have now been largely acknowledged and the U.S. housing market should stabilize over the year ahead, slowing activity is raising losses in other market segments, thus straining capital positions and raising funding costs. The necessary process of deleveraging—shedding assets and raising capital—is likely to be difficult and protracted, limiting the scope for a rapid rebound of bank lending. Emerging and developing economies will continue to face difficult external financing conditions, with those with wide current account deficits or other vulnerabilities remaining under most pressure.

Against this backdrop, the baseline projections paint a picture broadly similar to that provided in the April 2008 *WEO*. On an annual basis, global growth is expected to moderate from 5.0 percent in 2007 to 3.9 percent in 2008 and 3.7 percent in 2009. The pattern is seen more clearly on a fourth-quarter-to-fourth-quarter basis: on this metric, global growth slows from 4.8 percent during 2007 to 2.8 percent during 2008, before recovering to 4.1 percent during 2009. The advanced economies would be in or close to recession in the second half of 2008, and the recovery expected to get under way in 2009 would be gradual by past standards. Inflation would return below 2 percent by the end of 2009. In emerging and developing economies, real GDP growth is generally forecast to remain fairly strong, across

all regions, particularly in commodities exporters. Inflation would retreat only moderately, remaining at double digit rates in a number of countries, as increasingly generalized price pressures largely offset the effects of stabilizing prices for oil and food.

The risks to growth around this revised baseline are seen as moderately to the downside. The principal downside risk relates to the potential for a further deterioration in financial conditions and more protracted balance sheet adjustments. A continuing downside risk is the possibility of a further tightening of commodities markets that could put additional upward pressure on inflation, requiring more aggressive policy tightening. By the same token, further easing of oil and other commodities prices could provide more leeway to lower interest rates and sustain activity. On the upside, it remains possible that the momentum of domestic demand, notably consumption, continues to be more resilient than expected to the headwinds from financial tightening and rising food and fuel prices. Global imbalances remain a concern, but with some shift in focus to the recycling of large surpluses from oil exporters and emerging Asia in the context of major distress in mature financial markets, as well as to the threat of protectionism as the Doha round has again stalled.

The connections between financial stress and economic downturns are explored in Chapter 4, which compares recent experience to earlier episodes. It finds that financial stress that is rooted in the banking sector typically has more adverse effects on the economy than stress in stock markets or exchange rates, and that the shift towards more arms-length financial intermediation may have increased the impact. It also emphasizes the importance of initial conditions. Relatively healthy nonfinancial corporate balance sheets in the United States and western Europe provide a source of resilience. However, the run up in credit and household net lending together with rapidly declining house prices are vulnerabilities in the United States and some western European economies.

Chapter 6 raises concerns about countries with sustained large current account deficits that are particularly relevant when global deleveraging may contract the availability of external financing for emerging economies. It seeks to explain large divergences in current account behavior across the emerging world, and relates the large deficits in emerging Europe to capital account liberalization, financial reform, and opportunities created by economic convergence in Europe. However, sustained large deficits can end abruptly, and rigid exchange regimes heighten such risks.

### **Policymakers between a rock and a hard place**

Policymakers now face the challenge of nursing their economies through a period of slower growth and addressing stresses in financial and housing markets, while keeping inflation under control. Multilateral efforts take on particular importance in current circumstances, including to remedy the financial turmoil, alleviate the tightness in commodities markets, and support low-income economies burdened by high food import bills.

The immediate policy priorities for macroeconomic and financial policies differ according to countries' cyclical positions, external current accounts, and structural factors.

- In advanced economies, rapidly slowing activity and rising output gaps should contribute to containing inflationary pressure. Monetary policies are striking the right balance between supporting activity and balance sheet repair on the one hand and containing inflation on the other. Several factors mitigate risks of a wage-price spiral, including growing unemployment fears, greater real wage flexibility and lower energy intensity of production than during the shocks of the 1970s, and a solid anchoring of inflation expectations by central banks. Thus, in general policymakers can afford to keep rates on hold for now in the face of currently elevated headline inflation, while watching closely for signs of easing inflationary pressure that might permit a more accommodative stance in economies with relatively high real interest rates.
- At the same time, as underscored in the Fall 2008 GFSR, the financial authorities need to give priority to stabilizing financial conditions, including guarding against systemic failures through liquidity provision and prompt intervention when needed, while fostering the restoration of healthy financial balance sheets by encouraging recognition of losses and the rebuilding of capital bases.
- Regarding fiscal policy, automatic stabilizers play a useful role in buffering shocks to activity and should be left to operate freely, provided that adjustment paths are consistent with long-term sustainability in the face of demographic pressures. Discretionary fiscal stimulus can provide support to the economy in the event that downside risks to growth materialize, provided the stimulus is delivered in a timely manner, is well targeted, and does not undermine fiscal sustainability, an issue of particular concern in countries with relatively high public debt. Regarding targeting, the best use of available fiscal room in current circumstances may be to focus on stabilization of the financial sector rather than more broad-brush stimulus.
- Policies in emerging and developing economies need to foster adjustment to the recent surge in commodities prices while avoiding a boom-bust cycle, which would squander hard-won success in achieving more stable growth and bringing down inflation. Growth remains at or above potential and inflationary pressures are rising in most countries. While the latest declines in oil and other commodities prices may provide some respite, domestic pass-through of the recent price surge is likely to continue for some time. Accordingly, a number of countries still need to tighten the overall stance of macroeconomic policies or run the risk of having to engineer a hard landing to break a wage-price spiral. Commodity importers need to effect this tightening mindful of the impact on demand of losses in purchasing power, particularly in countries that are major food importers. Commodity exporters can afford stronger action to keep inflation in check.

- While country circumstances differ, monetary policy should generally take a lead role in short-term stabilization, especially in economies with inflation targeting and flexible exchange rate management. Many countries with heavily managed exchange rate regimes are in a challenging position, since they are now importing a highly accommodative monetary policy stance from the United States, while still experiencing strong growth and current account surpluses. More flexible exchange rates would help under current circumstances to provide for tightening of monetary conditions and to foster a rebalancing of demand in their economies, although other considerations feed into choices of exchange rate regimes, including, for example, the degree of financial development and the diversity of the export base.
- More restrictive fiscal policies can be helpful in these economies to rein in aggregate demand and alleviate pressure on the exchange rate, which is particularly important for current account deficit countries with pegged exchange rates. In the oil-exporting economies with currencies pegged to the U.S. dollar, spending also needs to be more focused on relieving supply bottlenecks. More broadly, general food and fuel subsidies have become increasingly costly and should be replaced with more targeted programs to support the poor who are struggling to meet rising living expenses.

### **Policy frameworks in need of reform**

The deterioration of performance in the global economy has raised concerns about macroeconomic policy frameworks and the appropriateness of policies affecting financial and commodities markets.

### ***Operationalizing “leaning against the wind”***

Policies in the advanced economies need to be better geared toward avoiding asset price booms and busts, including through stronger policy responses in boom times. Consideration could be given to extending monetary policy framework to provide 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. Concurrently, a macroeconomic element could be introduced into the regulatory framework to weigh against the inherent procyclicality of credit creation.

Fiscal policy frameworks need to become more credible if fiscal policy is to regain effectiveness as a countercyclical tool. The Achilles heel remains a political economy setting that fosters short-term decisions. As a result, many countries fail to adjust during good times sufficiently to build room for effective discretionary stimulus during downturns or are struggling with addressing long-term fiscal sustainability challenges. Chapter 5 suggests that the shift toward more rules-based policy frameworks— analogously to the moves toward constrained discretion in monetary policy—and stronger fiscal governance mechanisms that

can be observed in a growing number of countries could boost the effectiveness of fiscal policy in combating downturns.

***Plugging gaps in regulatory and supervisory infrastructures***

The Fall 2008 GFSR lays out key priorities for dealing with the problems revealed by the financial market turmoil. These include working toward more resilient risk management by individual institutions, including more robust regulatory capital requirements, strengthened liquidity management practices, and improved disclosure of risk on and off balance sheets. Another important task will be to strengthen approaches to crisis resolution, including clarifying roles of different official agencies, bolstering deposit insurance schemes, and ensuring adequate intervention instruments.

Moreover, the financial turmoil has revealed that national financial stability frameworks have failed to keep up with financial market innovation and globalization, at the price of deleterious cross-border spillovers. Greater cross-border coordination and collaboration among national prudential authorities is needed, particularly for the purpose of detecting, managing, and resolving financial stress both in markets as well as in major financial institutions. While international bodies such as the FSF, BIS, and the IMF are playing a crucial role in alleviating the tensions between national accountability on the one hand and the international spillovers of national actions on the other, more political will to drive coordination and collaboration forward is essential.

***Fostering energy conservation and greater oil and food supply***

Joint multilateral efforts will also be crucial to relieve strains in commodities markets. There is little concrete evidence that rising investor interest in commodities as an alternative asset or speculation have had a systematic or lasting impact on prices, although swings in market sentiment may have contributed to short-term price dynamics in some circumstances. Accordingly, the focus should be on policies to encourage better balance between supply and demand in the longer term, while avoiding measures that could exacerbate market tightness in the short term. This needs to include greater pass-through of international price changes to domestic markets and greater energy conservation as well as lower biofuels subsidies in the advanced economies.

Priority should also be given to policies to strengthen the supply response to higher prices. In energy markets, improved provision of information about resources, inventories, and investment plans, and clear and stable investment frameworks, would strengthen the basis for the needed long-term build-up of investment in this sector. Agricultural supply responses in emerging markets could be fostered by steps to build up infrastructure for irrigation and transportation, and to ensure more effective transfer of new technologies and techniques to improve yields in developing economies toward those achieved in advanced economies. Finally, liberalization of access for agricultural products to advanced economy markets, through a successful conclusion of the Doha round, would bolster the long-term

framework for agricultural development. In the meantime, greater donor support for the poorest economies will be crucial to address the humanitarian challenges raised by the surge in food prices.

### *Unwinding global imbalances*

The surge in commodities prices has led to a further widening in global imbalances, with wider current account surpluses in oil exporters and larger deficits in oil importers. This is for the most part a reasonable response, reflecting the desire of exporters to save some of the additional revenues, and the associated recycling of funding from surplus to deficit countries is working well. Furthermore, some progress has been made in bringing the large U.S. current account deficit onto a more sustainable path, including depreciation of the real effective exchange rate of the U.S. dollar more closely in line with its fundamentals, although it still remains on the strong side. However, the euro and some other flexibly managed currencies, rather than currencies of the current account surplus countries, have borne the brunt of U.S. dollar depreciation and overall imbalances have continued to rise, boosted by recent increases in oil prices.

The multilateral strategy endorsed by the IMFC in 2005 and elaborated by the Multilateral Consultation on Global Imbalances in 2006 remains relevant, but needs to be applied flexibly. U.S. fiscal consolidation remains a key medium-term objective, but counter-cyclical fiscal support has been needed to alleviate the current slowdown. Progress needs to continue toward real effective 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 over-heating in their economies, including both 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.

Finally, it will be important to resist protectionist pressures on both trade and capital flows. Breaking the current deadlock on Doha round would help strengthen the open multilateral trading system, an important underpinning of strong global growth in recent years. On the capital account side, sovereign wealth funds are likely to continue to grow as investment vehicles for surplus countries. The elaboration of a set of principles and practices for their management will help to make such flows more transparent, and thus should contribute to reducing concerns about the governance of such funds that could lead to counter-productive restrictions on such inflows. Moreover, as argued in Chapter 6, continued progress in opening up economies to foreign direct investment may help lower current account surpluses in key current account surplus economies, while boosting their growth potential.

## Chapter 1. Global Prospects and Policies

*The global economy is grappling with a lasting financial crisis and a surge in commodities prices. After four years of strong expansion, global activity is slowing markedly. Many advanced economies are now close to recession; activity is also decelerating in the emerging and developing economies, although most are still experiencing growth at or above trend. At the same time, inflation has risen to levels not seen in a decade, especially in the emerging and developing economies. A recovery should begin to take hold in 2009 as the effects of commodity price shocks unwind (or even reverse), the U.S. housing sector stabilizes, and financial institutions liquidity and solvency problems are slowly resolved. However, sustained deleveraging will provide continued strong headwinds that will make for an unusually gradual pick up in the advanced economies. The immediate challenge is for macroeconomic and financial policies to support the recovery and stabilize financial conditions, while keeping inflation under control. More generally, policymakers should consider how to strengthen the countercyclical properties of macroeconomic and regulatory frameworks; strengthen supply-demand responses in commodities markets; and contain potential risks from global imbalances.*

This chapter opens with an overview of the global economy under stress. It then examines reasons for the recent deterioration in performance, looking at both why macroeconomic policies may have been too loose at the aggregate global level, and at the consequences of market failures in financial, housing, and commodities markets. This analysis set the stage for the discussion of the outlook and risks in the third section, while the final part of the chapter discusses the policy challenges. Chapter 2 looks in more detail at developments and policy challenges 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 around 5 percent per year, its highest sustained rate since the early 1970s. Around three-fourth of this growth (measured on a purchasing power parity basis) was contributed by 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, this strong performance has faltered, as the global economy has grappled with strains from the financial crisis that erupted in August 2007, downturns in a number of advanced economy housing markets, and increasingly tight supply-demand balances in commodities markets. Global growth is estimated to have shifted down to 3¾ percent (annualized) from the fourth quarter of 2007 through the second quarter of 2008, slowing in both advanced and emerging economies. Moreover, recent data and forward-looking indicators suggest that the downturn is continuing to deepen (Figure 1.2). At the same time, inflationary pressures have increased markedly as the surge in food and fuel

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

	Year over Year						Q4 over Q4		
	2006	2007	Projections		Difference from April 2008 WEO Projections		Estimates 2007	Projections	
			2008	2009	2008	2009		2008	2009
<b>World output<sup>1</sup></b>	<b>5.1</b>	<b>5.0</b>	<b>3.9</b>	<b>3.7</b>	<b>0.2</b>	<b>-0.1</b>	<b>4.8</b>	<b>2.8</b>	<b>4.1</b>
Advanced economies	3.0	2.6	1.5	1.2	0.2	-0.1	2.5	0.7	2.0
United States	2.8	2.0	1.3	0.7	0.8	0.1	2.3	0.4	1.5
Euro area	2.8	2.6	1.4	0.9	--	-0.3	2.2	0.7	1.6
Germany	2.9	2.5	2.0	0.8	0.6	-0.2	1.7	0.7	1.9
France	2.2	2.2	1.0	0.8	-0.4	-0.4	2.2	0.3	1.4
Italy	1.8	1.5	--	0.1	-0.3	-0.2	0.1	0.1	0.7
Spain	3.9	3.8	1.5	0.7	-0.3	-1.0	3.5	0.3	1.6
Japan	2.4	2.1	1.0	1.1	-0.4	-0.4	1.4	0.6	1.8
United Kingdom	2.9	3.1	1.4	1.1	-0.2	-0.5	2.8	0.6	1.9
Canada	3.1	2.7	1.0	1.9	-0.3	--	2.8	0.7	2.6
Other advanced economies	4.5	4.6	3.2	3.2	-0.1	-0.2	5.0	2.2	4.2
Newly industrialized Asian economies	5.6	5.6	4.0	4.0	--	-0.4	6.1	2.7	5.9
Emerging and developing economies <sup>2</sup>	7.9	8.0	6.9	6.7	0.2	0.1	8.5	6.1	7.3
Africa	6.1	6.3	6.1	6.3	-0.2	-0.1	...	...	...
Sub-Saharan	6.6	6.8	6.2	6.6	-0.4	-0.1	...	...	...
Central and eastern Europe	6.7	5.7	4.6	4.4	0.2	0.1	...	...	...
Commonwealth of Independent States	8.2	8.6	7.7	7.1	0.7	0.6	...	...	...
Russia	7.4	8.1	7.7	7.3	0.9	1.0	9.5	7.1	7.2
Excluding Russia	10.2	9.8	7.6	6.8	0.2	-0.2	...	...	...
Developing Asia	9.9	10.0	8.4	8.4	0.2	--	...	...	...
China	11.6	11.9	9.7	9.8	0.4	0.3	11.3	8.7	10.5
India	9.8	9.3	7.9	7.7	--	-0.3	8.9	7.2	7.6
ASEAN-5	5.7	6.3	5.6	5.8	-0.2	-0.2	...	...	...
Middle East	5.7	5.9	6.3	6.3	0.2	0.2	...	...	...
Western Hemisphere	5.5	5.6	4.5	3.7	0.1	0.1	...	...	...
Brazil	3.8	5.4	4.9	4.0	0.1	0.3	6.2	3.4	4.5
Mexico	4.9	3.1	2.4	2.5	0.4	0.2	4.0	1.3	3.6
<i>Memorandum</i>									
European Union	3.3	3.1	1.8	1.3	--	-0.3	...	...	...
World growth based on market exchange rates	3.9	3.7	2.8	2.5	0.2	-0.1	...	...	...
<b>World trade volume (goods and services)</b>	<b>9.3</b>	<b>7.2</b>	<b>5.7</b>	<b>5.7</b>	<b>0.2</b>	<b>-0.1</b>	<b>...</b>	<b>...</b>	<b>...</b>
Imports									
Advanced economies	7.3	4.4	2.7	2.8	-0.3	-0.9	...	...	...
Emerging and developing economies	14.6	14.1	12.7	12.0	0.9	1.3	...	...	...
Exports									
Advanced economies	8.3	5.9	4.7	4.0	0.3	-0.1	...	...	...
Emerging and developing economies	11.0	9.8	7.7	9.0	0.6	0.3	...	...	...
<b>Commodity prices (U.S. dollars)</b>									
Oil <sup>3</sup>	20.5	10.7	63.8	7.3	29.5	8.3	...	...	...
Nonfuel (average based on world commodity export weights)	23.2	14.1	14.6	-5.2	7.6	-0.3	...	...	...
<b>Consumer prices</b>									
Advanced economies	2.3	2.2	3.7	2.3	1.1	0.3	3.0	3.6	1.8
Emerging and developing economies <sup>2</sup>	5.4	6.4	9.5	8.0	2.1	2.4	6.7	8.6	6.3
<b>London interbank offered rate (percent)<sup>4</sup></b>									
On U.S. dollar deposits	5.3	5.3	2.8	3.6	-0.3	0.2	...	...	...
On euro deposits	3.1	4.3	5.0	5.3	1.0	1.7	...	...	...
On Japanese yen deposits	0.4	0.9	1.1	1.5	0.1	0.7	...	...	...

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during May 21-June 18, 2008.

<sup>1</sup>The quarterly estimates and projections account for 90 percent of the world PPP weights.

<sup>2</sup>The quarterly estimates and projections account for approximately 76 percent of the emerging and developing economies.

<sup>3</sup>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 \$116.50 in 2008 and \$125.00 in 2009.

<sup>4</sup>Six-month rate for the United States and Japan. Three-month rate for the euro area.

prices underway since 2004 intensified in the first half of 2008. While a recent softening in commodities prices may provide some respite, underlying inflation has risen, particularly in emerging and developing economies, where still above-trend growth has tightened capacity constraints.

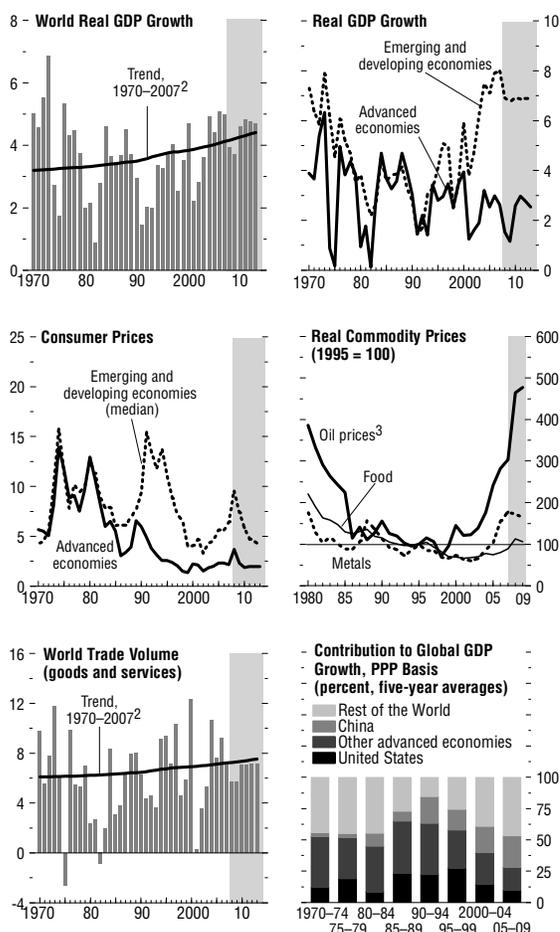
The advanced economies grew at a collective annualized rate of only 1 percent during the period from the fourth quarter of 2007 through the second quarter of 2008, down from 2½ percent during the first three quarters of 2007. The U.S. economy has suffered most from the direct effects of the financial crisis that originated in its own subprime mortgage market, which has tightened credit conditions and amplified the housing correction that has been underway since 2005. Aggressive policy easing by the Federal Reserve, a timely fiscal stimulus package, and a strong export performance on the back of a weakening U.S. dollar have helped cushion these blows, but the economy has still only managed to grow by 1¼ percent on average since the fourth quarter of 2007. Activity in western Europe has also slowed appreciably, dampened by higher oil prices, tightening credit conditions, housing downturns in several economies, the U.S. slowdown, and the rising 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.

The emerging and developing economies have not decoupled but their momentum remains strong. Growth in these countries eased from over 8 percent in the first three quarters of 2007 to an estimated 7½ percent in the subsequent three quarters, still at or above trend in most economies. The moderation largely reflected slower export growth, while domestic demand has remained robust (see Figure 1.2). Sustained strong growth in the largest emerging economies—Brazil, China, India, and Russia—continued to contribute about 40 percent of global growth. Unlike earlier episodes of financial turbulence, emerging

**Figure 1.1. Global Indicators<sup>1</sup>**

(Annual percent change unless otherwise noted)

After four years of strong growth, the global economy is slowing sharply, 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.

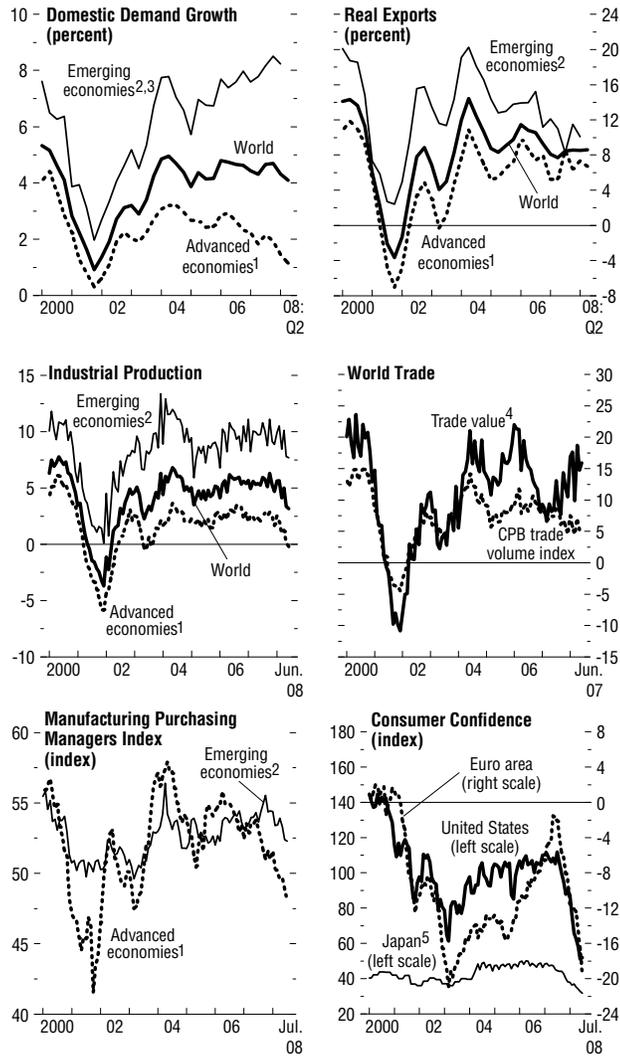
<sup>1</sup>Shaded areas indicate IMF staff projections. Aggregates are computed on the basis of purchasing-power-parity (PPP) weights unless otherwise noted.

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

<sup>3</sup>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 ago 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. By contrast, domestic demand in emerging economies has remained robust, although these economies have experienced a moderation in trade growth, which is contributing to a downturn of industrial production.



Sources: Business confidence for United States, Institute for Supply Management; for all others, NTC Economics and Haver Analytics.

<sup>1</sup>Australia, Canada, Denmark, euro area, Japan, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States.

<sup>2</sup>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.

<sup>3</sup>Data for China and Pakistan are interpolated.

<sup>4</sup>Annualized percent change from three months prior in SDR terms.

<sup>5</sup>Japan's consumer confidence data are based on a diffusion index, where values greater than 50 indicate improving confidence.

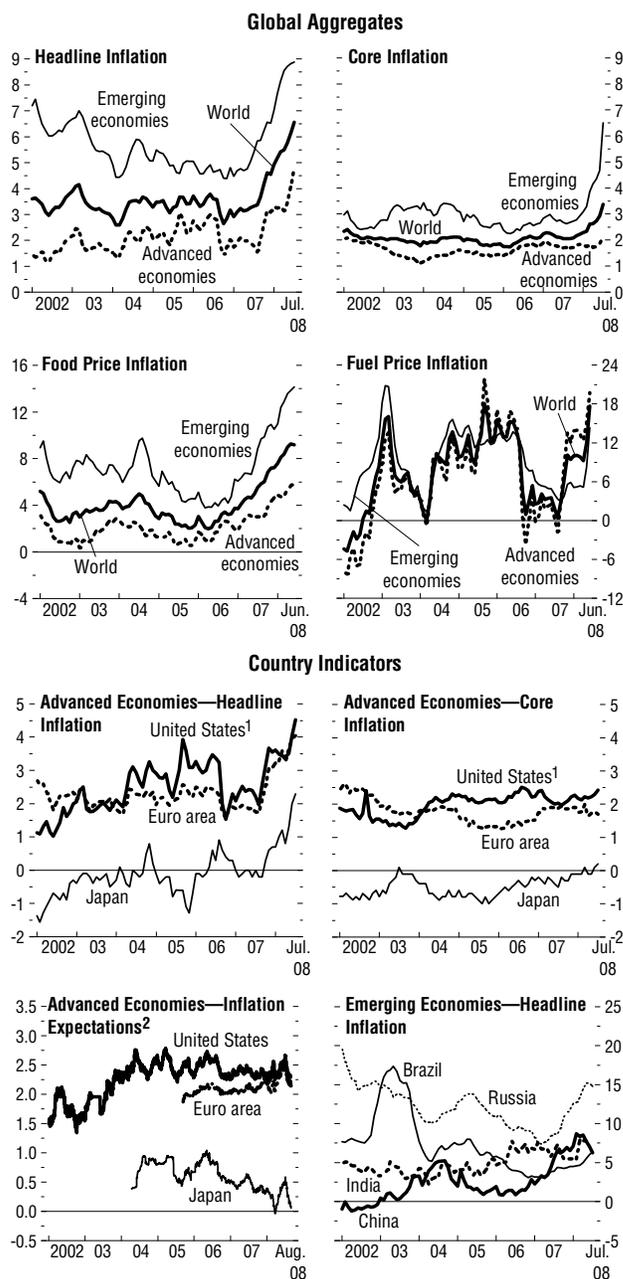
economies generally have not faced abrupt reductions in access to external financing, reflecting improvements in policy frameworks and stronger public sector balance sheets. Nevertheless, some countries that relied on bank-related or portfolio inflows to finance large current account deficits have faced greater difficulties, leading to more marked slowdowns in activity.

Despite the deceleration of global growth, headline inflation has risen around the world to the highest rates since the late 1990s as supply constraints have tightened. In the advanced economies, 12-month headline inflation increased to 4½ percent in July 2008 (Figure 1.3). Measures of underlying inflation—as reflected in price indices excluding food and fuel prices, in measures of inflation expectations, and in labor cost trends—have been broadly contained, although there has been some upward drift recently 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; the Bank of Japan has remained on hold; while the ECB increased its policy rate one notch to 4¼ percent in early July. The resurgence in inflation has gone much further in the emerging and developing economies, where headline inflation rose to almost 9 percent in the aggregate in July, and a wide swathe of countries are now experiencing double-digit inflation. To some extent, this different pattern reflects the considerably greater weight of food prices in consumption baskets—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

**Figure 1.3. Global Inflation**

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

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



Sources: Bloomberg Financial Markets, LP; Haver Analytics; and IMF staff calculations.

<sup>1</sup>Personal consumption expenditure deflator.

<sup>2</sup>Ten-year breakeven rates.

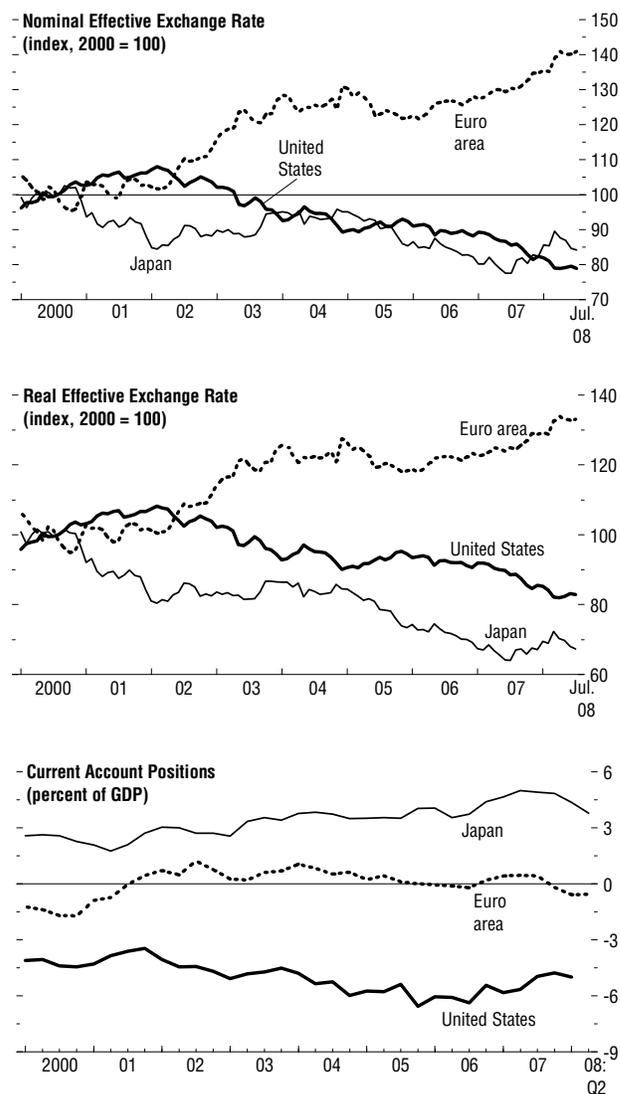
inflation expectations and wage increases, although such data are not available as systematically as in the advanced economies. Chapter 3 of this report looks in detail at the relationship between commodities prices and inflation, and finds that these economies have been more vulnerable to second-round effects because of the greater weight of food prices, 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, while others have relied more on increasing reserve requirements and tightening credit restraints, particularly where interest rate policy has been constrained by inflexible exchange rate management. Real interest rates have in fact fallen significantly in many countries, and are now negative in quite a few. Some countries have also tightened fiscal objectives to help restrain 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 potentially heavy fiscal cost—by lowering tariffs on imported food, and in some cases by banning or imposing taxes on food exports. Such actions may have yielded some short-term domestic benefits but also served to dampen the supply-demand response to rising commodities prices.

The weakening of U.S. growth relative to trading partners and the sustained depreciation of the U.S. dollar since 2002 has contributed to the adjustment of the U.S. current account deficit, which came down to 5 percent of GDP in the first half of 2008, from

**Figure 1.4. External Developments in Selected Advanced Economies**

Appreciation 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.

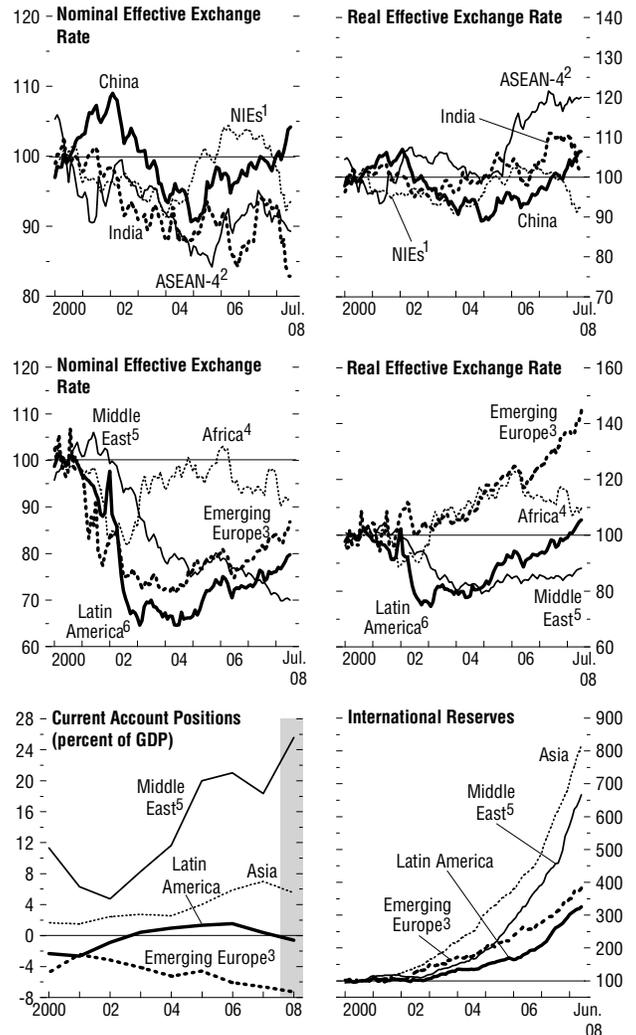
6½ percent in late 2005 (Figure 1.4). The adjustment has been even larger excluding net oil imports. Notwithstanding some recent strengthening, the real effective exchange rate of the U.S. dollar is still close to its lowest level since the late 1980s, and while the dollar is still judged to be on the strong side relative to fundamentals, the degree of overvaluation is at its lowest level since that time. 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 medium-run fundamentals) and the yen (which is still assessed to be undervalued relative to fundamentals), and 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 due to the pick-up in inflation (Figure 1.5). Nevertheless, China's current account surplus has remained over 10 percent of GDP, and with capital inflows strengthening despite a tightening of controls, reserves have continued to mount. The renminbi remains substantially undervalued relative to 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 moderately in real terms because of rising inflation. Elsewhere, the experience is 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. However, a number of currencies in Africa and South and East Asia (for example, India, Korea, Pakistan, and South Africa) have depreciated, in part owing to rising costs of commodity imports and widening current account deficits.

**Figure 1.5. External Developments in Emerging and Developing Economies**

(Index, 2000 = 100)

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 Emerging Europe and Latin America have also generally remained buoyant.



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

<sup>1</sup>Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

<sup>2</sup>Indonesia, Malaysia, Philippines, and Thailand.

<sup>3</sup>Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Turkey.

<sup>4</sup>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.

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

<sup>6</sup>Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Rep. Bolivariana de Venezuela.

### Storms Across Three Markets

The recent deterioration of performance in the global economy comes on the heels of four 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. Observers have offered two sets of explanations for the recent problems. Some have argued that lax macroeconomic policies and excessive liquidity allowed the global economy to exceed its “speed limit” for a number of years, leading inevitably to a build-up in imbalances across crucial financial, housing, and commodities markets, and an inevitable payback when these imbalances could no longer be sustained. An alternative narrative has stressed that, while no period of sustained expansion is without some imbalances, the recent expansion phase embodied serious flaws in the operations of key markets and inadequate regulatory responses, which prevented equilibrating mechanisms from operating effectively and allowed market stresses and vulnerabilities to build. In practice, both of these viewpoints have some validity, and the two explanations are interconnected, as macroeconomic policies may have interacted with market and regulatory weaknesses in complex ways to aggravate the build-up in excesses.

Why should monetary policy settings have been too loose in recent years? Proponents of this view suggest that the pronounced success in bringing down inflation in the 1990s and global productivity gains from integration of China and other labor-intense economies into the world trading system allowed excessively easy monetary policy in the advanced economies that has 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 a Taylor rule (Figure 1.6). Moreover, while 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 usual relationships with fundamentals.

In addition, and more recently, inflexible exchange regimes limited the capacity of some key emerging economies to operate independent monetary policies, a constraint that became of increasing relevance after August 2007 as the U.S. dollar depreciated and as the Federal Reserve aggressively cut interest rates. Thus, these economies effectively imported an increasingly easy monetary stance from the United States, just as inflation concerns were rising.<sup>1</sup> At the same time, strong emerging economy growth, the weakening dollar, lower U.S. interest rates, and—in the views of some observers at least—financial flows into commodity futures markets contributed to accentuate the sustained surge in commodities prices. Central banking orthodoxy would suggest that a temporary rise in inflation from a

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<sup>1</sup>Such concerns are illustrated in model simulations provided in Box 3.3.

relative price shock be accommodated, provided that underlying inflation remains consistent with forward-looking objectives. However, repeated shocks in the same direction have increased risks of second-round effects from the sustained shift in relative prices.

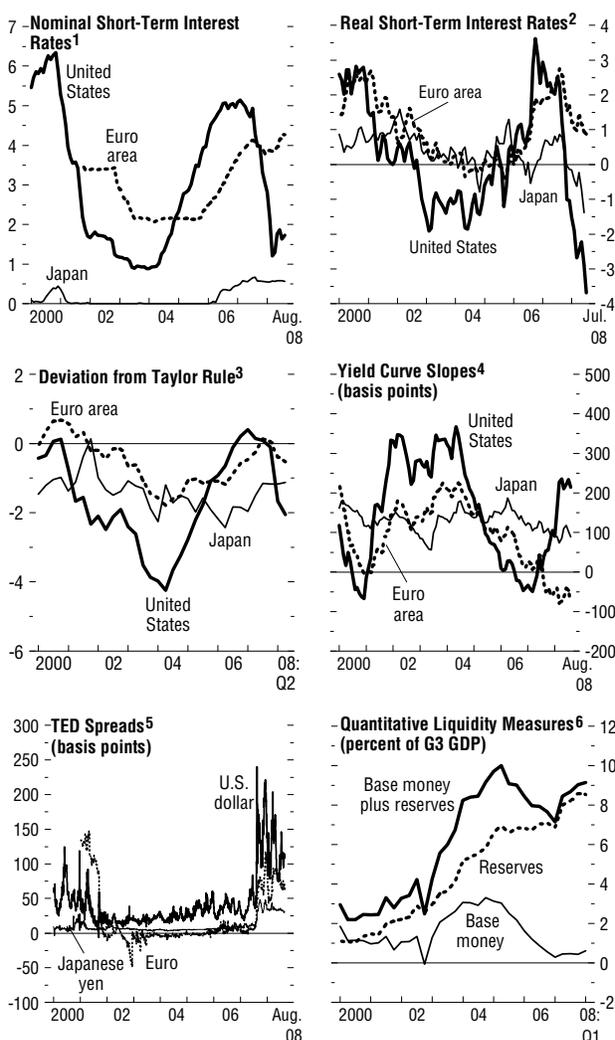
Measures of global liquidity shown in Figure 1.6 provide some but not conclusive support for these concerns. The monetary base of the largest advanced economies certainly advanced rapidly through 2005, and while the rate of base expansion has moderated since then, the continued strong build-up of international reserves of the emerging economies has implied rapid monetary growth in these economies. However, the relationship between monetary aggregates and prices is tenuous at best in advanced economies and not well understood in emerging economies. Looking at interest rates, long-term interest rates have been low by historical standards throughout this decade, although such rates are arguably determined more by fundamental forces affecting supply 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 (Figure 1.7).

Measures of the output gap provide more direct evidence of the existence of excess demand at the global level. To be sure, such measures are imprecise, and need to be interpreted cautiously, as highlighted in Box 1.1, which discusses the approach used in the WEO for assessing potential growth and output gaps. That said, on balance, the data suggest that the global economy has been operating somewhat beyond a cyclically neutral level—although less so

**Figure 1.6. Measures of Monetary Policy and Liquidity in Selected Advanced Economies**

(Interest rates in percent unless otherwise noted)

Following a period of easy monetary conditions from 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.

<sup>1</sup>Three-month treasury bills.

<sup>2</sup>Relative to headline inflation.

<sup>3</sup>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.

<sup>4</sup>Ten-year government bond minus three-month treasury bill rate.

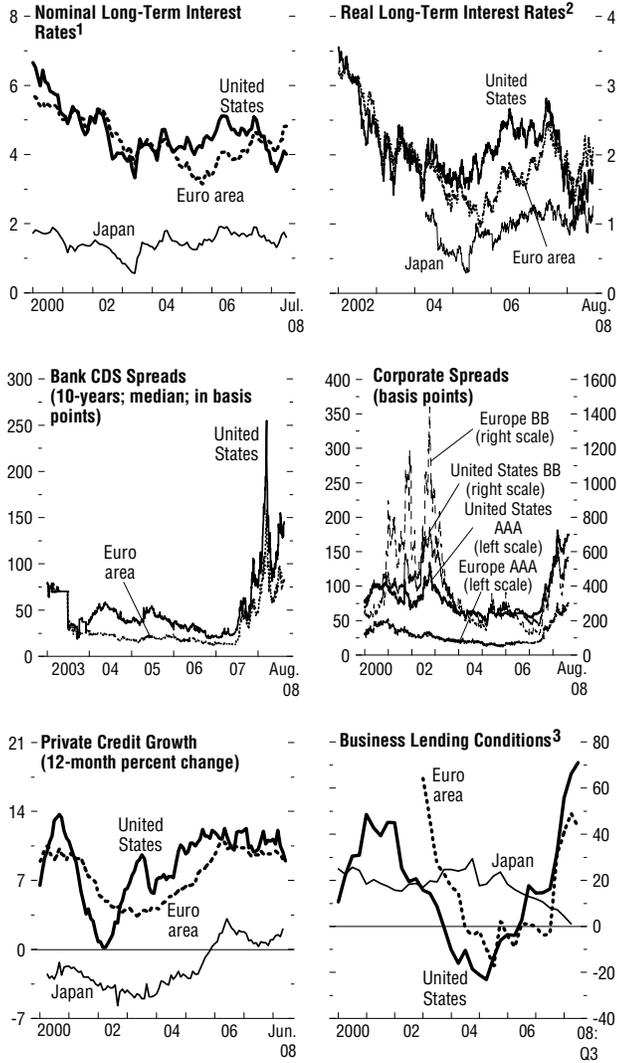
<sup>5</sup>Three-month London interbank offered rate (LIBOR) minus three-month government bill rate.

<sup>6</sup>Change over three years for euro area, Japan, and United States (G3), denominated in U.S. dollars.

**Figure 1.7. Developments in Mature Credit Markets**

(Interest rates in percent unless otherwise noted)

Risk spreads have widened sharply across a broad range of financial assets since August 2007. 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.

<sup>1</sup>Ten-year government bonds.

<sup>2</sup>Ten-year inflation-linked government bonds.

<sup>3</sup>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.

than in previous cyclical upturns at the end of the 1980s and late 1990s (Figure 1.8). At this point, the advanced economies seem to be operating a little below cyclically neutral—and their output gaps are likely to widen as present rates of growth are well below estimated potential.

By contrast, the emerging economies seem to have been growing faster than trend for some time, and capacity pressures are still increasing. While recognizing that estimates of output gaps are particularly subject to error for this group of countries, these assessments are broadly consistent with the observed recent acceleration of inflation.

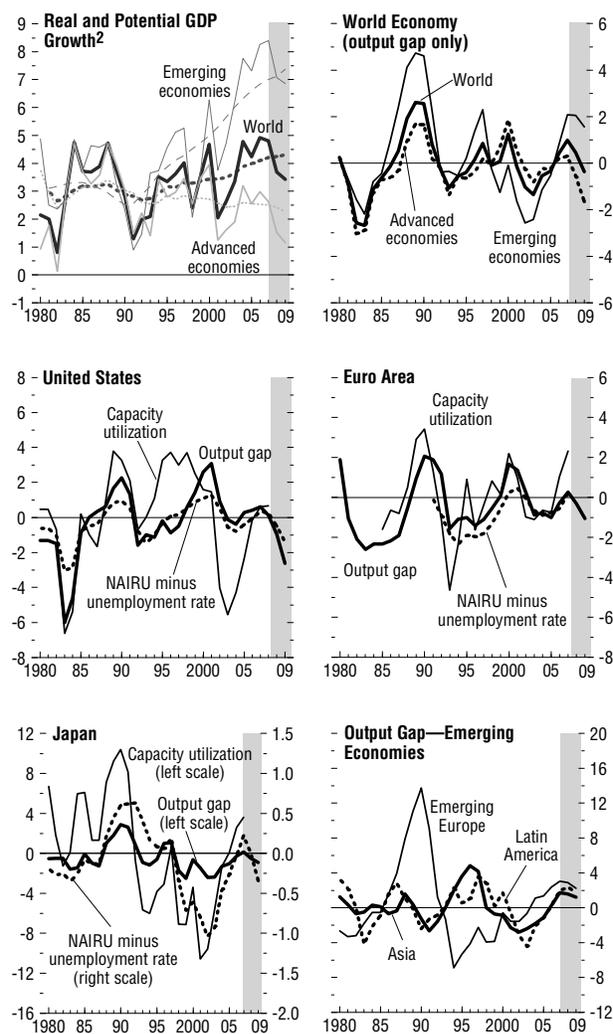
Thus, while there is indeed some evidence that monetary policy may have been too easy at the global level and that the global economy may have exceeded its collective speed limit, excessive demand pressures seem to be focused in emerging economies and do not appear egregious at the aggregate level by the standards of other recent cycles. While these macroeconomic factors may have played some role, it is hard to explain the intensity of the recent stress in financial, housing, and commodities markets purely in these macroeconomic terms. With this background, we now turn to a more detailed look at how the characteristic features of key financial, housing, and commodities markets have contributed to the build-up of market strains.

### Financial market strains

The recent turbulence in global financial markets has been driven by the unwinding of market excesses deriving from rapid application of new securitization techniques and a build-up of leverage in an environment of insufficient attention to risk. Generally liquid

**Figure 1.8. Measures of the Output Gap and Capacity Pressures<sup>1</sup>**

The global economy in the aggregate seems to be operating somewhat above a cyclically neutral level, particularly in emerging economies, where continued strong growth has implied increasing capacity pressures. In the advanced economies, by contrast, the recent growth slowdown is starting to open up an output gap, most noticeably in the United States. The methodology used to estimate potential GDP growth and output gaps is explained in Box 1.1.



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

<sup>1</sup>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).

<sup>2</sup>GDP growth rates of actual (solid line) versus potential (dashed line) for advanced economies. For emerging economies, Hodrick-Prescott filter applied for potential GDP.

market conditions and low interest rates may have encouraged the build-up in these excesses.<sup>2</sup>

As discussed in earlier *WEO* reports, and in more detail in accompanying *GFSR* reports, the crisis spread rapidly and unpredictably from its “ground zero” in the U.S. subprime mortgage market. Consequences included the collapse of structured credit markets, a broader widening of risk spreads, heavy losses for financial institutions in the United States and western Europe as U.S. mortgage-related credits were written down, a drying up of liquidity in funding markets, and a sharp tightening of bank lending standards in these economies. The latter came in response to banks’ efforts to lower leverage in the face of reduced capital and access to wholesale funding and the need to bring off-balance sheet assets back onto balance sheets. These events have exposed serious flaws underlying the rapid expansion of financial intermediation in recent years, including the lack of quality control in loan origination in assets to be securitized, the build-up of excessive leverage with insufficient attention to funding risk, the need for more effective consolidation and regulation of off-balance sheet exposures, and weaknesses in consumer protection.

The last *WEO* report was being finalized shortly last March just after strong action by the Federal Reserve to prevent the collapse of a major U.S. investment bank and to increase access to emergency liquidity for broker-dealers. These actions helped to reassure markets of central banks’ commitment to prevent systemic events, and thus reduced perception of “tail-risk,” as reflected in some moderation of spreads on credit-default swaps on major financial institutions (see Figure 1.7). There has also been some progress by banks to recognize their losses on subprime mortgage-related exposure, to rebuild capital, and reduce leverage.<sup>3</sup>

Despite these encouraging efforts, financial market strains have continued, indeed intensifying again in recent months. Once more, the greatest strains have been seen in institutions exposed to the still weakening U.S. housing market, including Fannie Mae and Freddie Mac, the two giant government-sponsored enterprises (GSEs),<sup>4</sup> related to concerns about the adequacy of their capital base in the face of rising losses. Given the crucial systemic role of the GSEs, the U.S. government acted promptly to provide assurances that

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<sup>2</sup>For example, it has been argued that the adoption of increasingly risky financial strategies in the United States was driven by a search for yield in a low-interest rate environment—although this phenomenon did not seem to have occurred in Japan to anything like the same degree despite a much longer period of easy liquidity.

<sup>3</sup>As of mid-August 2008, banks have reported \$500 billion of losses on U.S. subprime mortgages and related exposure, the lion’s share by U.S. and European banks, implying that losses on these exposures have now been largely acknowledged (see the Fall 2008 *GFSR*). Banks have also raised \$350 billion in new capital, but need to raise significantly more to build capital-to-asset ratios up to more prudent levels.

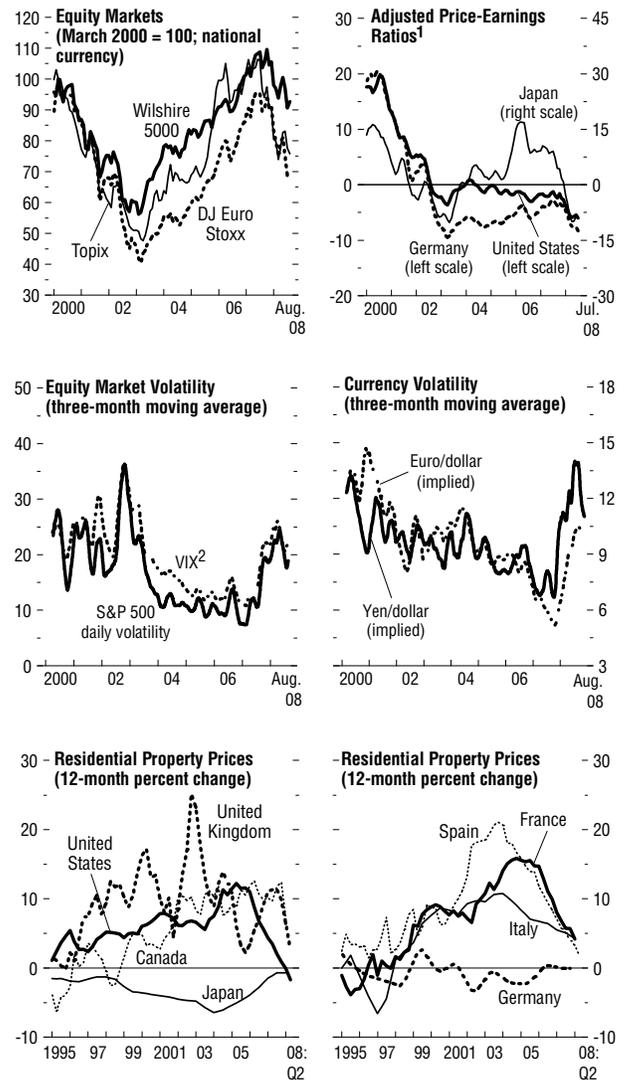
<sup>4</sup>The GSEs hold or guarantee 50 percent of U.S. mortgages and have supported 80 percent of new mortgage lending in recent months. Moreover, their securities are held widely across the global financial system and have provided a major conduit for external financing of the U.S. current account deficit.

the two institutions would have access to federal funding to meet liquidity and capital needs, which has helped to stabilize their situation, although they remain thinly capitalized and concerns about their solvency have persisted, putting upward pressure on mortgage rates. Strains are also rising in some western European economies, in particular the United Kingdom where mortgage banks have been under serious pressure from the weakening property markets. More generally, regional banks and banks with heavy mortgage exposure in both the United States and western Europe have faced rising pressure, as losses have continued to mount and interbank funding markets have remained under strain. Concurrently, market volatility has stayed high, credit spreads have widened further, and equity prices have dropped, particularly of financial institutions (Figure 1.9).

Underlying these problems are increasing realization that the process of balance-sheet repair will be long and arduous, and that the deleveraging process could last through the end of the decade, as emphasized in the Fall 2008 *GFSR*. Banks are attempting to adjust on several fronts at once—raise new capital, deal with forced accumulation of assets from off-balance sheet entities and prior loan commitments, sell liquid assets, and obtain new depositors and other stable sources of funding. Moreover, in the steady state, bank capital-to-asset ratios will need to be considerably higher than was considered adequate before the crisis. The task is complicated by the continuing deterioration of loan performance in the context of slowing economies, the increasing cost of raising new capital, and the loss of lucrative fee-based business related to securitization.

**Figure 1.9. 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 States.



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

<sup>1</sup>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 (January) average.

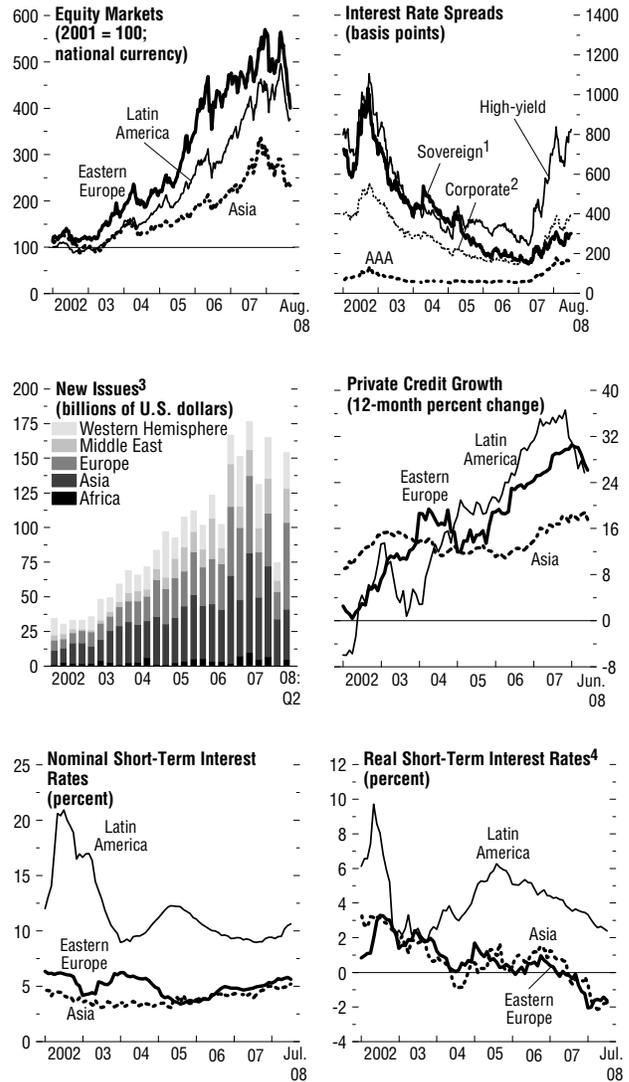
<sup>2</sup>VIX is the Chicago Board Options Exchange volatility index. This index is calculated by taking a weighted average of implied volatility for the eight S&P 500 calls and puts.

Although less affected than advanced countries overall, financial conditions have also tightened in many emerging markets. Increasing risk aversion in the context of stress in mature markets and weakening growth prospects in emerging economies have contributed to scaling back of institutional investor inflows, declining equity prices, wider spreads, and a pull-back of new issues (Figure 1.10). However, private credit growth has continued to be quite rapid, and domestic interest rates have declined in real terms as rising inflation has outstripped increases in policy rates.

The concerns expressed in the Spring 2008 *WEO* report about the impact of sustained tight credit conditions on economic activity thus remain highly relevant. These concerns have been reinforced by the further analysis reported in Chapter 4, which shows how past episodes of financial stress involving banking sector damage have typically been followed by deeper-than-usual business cycle downturns and more protracted recoveries. The main transmission channel seems to be contraction in net lending to the business and household sector, and there are now emerging signs in the data of a slowing in extension of credit in recent months in the United States and the euro area (see Figure 1.7), which is likely to intensify as drawings on prior commitments wind down. Chapter 4 emphasizes that the growing role of securities markets and of arms-length financing has not in fact reduced the vulnerability of the economy when faced with banking stress, and presents evidence to suggest that the impact could even be larger because of pro-cyclical swings in leverage, which is a particular concern at present.

**Figure 1.10. Emerging Economy Financial Conditions**

Emerging market conditions have not been unscathed by financial strains in global 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. While private credit growth has moderated some, it remains high.



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

<sup>1</sup>JPMorgan EMBI Global Index spread.

<sup>2</sup>JPMorgan CEMBI Broad Index spread.

<sup>3</sup>Total of equity, syndicated loans, and international bond issuances.

<sup>4</sup>Relative to headline inflation.

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

### **Deepening housing corrections**

Financial developments have interacted in important ways with housing cycles to amplify the extent of housing booms and busts and pro-cyclical swings of leverage. The 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, particularly in the United States, the expansion was also fuelled by new financing techniques based on securitization and weakening lending standards.<sup>5</sup> By 2006, over 40 percent of new U.S. mortgages were non-prime mortgages often with very high loan-to-value ratios and minimal documentation. In European countries, there is less evidence of declining lending standards per se, but as in the United States, in several countries the availability of housing finance was sustained through increased availability of wholesale financing, involving serious liquidity mismatches in a few cases.

The subsequent downswing of the U.S. housing market has been the largest of the post-war period. Both housing activity and prices have fallen steeply, and the still high stock of inventories and measures of home valuation suggest that the market is unlikely to reach bottom until 2009. The downswing has been exacerbated by the virtual disappearance of the subprime market, a general tightening of lending standards, increasing rates on conventional mortgages despite monetary easing as the financial situation of the GSEs has deteriorated, and sharply rising foreclosures. In western Europe, housing cycles have turned down more recently, as lending standards have been tightened and credit has become more expensive since the outset of the financial crisis. The most severe downswings are so far concentrated in a few national markets—Ireland, Spain, and the United Kingdom—which had previously seen the most rapid house price appreciation, or greatest building booms—but house prices are slowing more broadly (see Figure 1.9, lower panels). Staff analysis of house price valuations provided in Box 1.2 continues to suggest that, after allowing for the impact of key fundamentals, prices appear overvalued across a broad range of advanced economies.

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<sup>5</sup>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.

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  $\frac{3}{4}$  percentage point off U.S. growth over the past two years, and similar retrenchments are having an even larger impact in Spain and Ireland. 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 for 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. So far, consumption has been quite resilient, but its future path is a key element of uncertainty for the outlook.

### **Over-stretched commodity markets**

Notwithstanding some correction since mid-July amid the slowing global economy, commodity prices remain at much higher levels in real terms than in the past twenty years (see Figure 1.1). Some observers have argued that recent large commodity price moves could be related to speculation or increasing investor interest in commodities as assets, rather than shifts in fundamentals affecting supply and demand.

Chapter 3 of this report lays out the 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 consumption per capita but high income elasticity of demand. Moreover, the supply response to rising relative prices has been sluggish in part because of real 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, both in energy and food. With stocks and spare capacity limited, and 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, recent softening in prices seems to have been driven largely by increasing perceptions that global growth is slowing, and emerging evidence of a demand response to high prices (notably in the United States), as well as some favorable supply developments.

The depreciation of the U.S. dollar and declining U.S. interest rates seem to have played a role to the extent that they have affected supply and demand trends. However, there is little concrete evidence that rising investor interest in commodities as alternative assets or speculation have had a systematic or lasting impact on prices, although swings in market sentiment may have contributed to short-term price dynamics in some circumstances.

The boom in commodities prices has awakened unpleasant memories of the stagflation experienced during the 1970s. To a considerable degree, changes in the structure of the global economy since that time should limit the threat of such a reversion, but the impact is still likely to be substantial and the possibility remains of deteriorating outcomes if prices again surge upward.

The most immediate and direct impact has been on inflation. As already mentioned above, and examined in more detail in Chapter 3, rising food prices have been a key factor behind surging inflation in the emerging economies, given the large weight of food in consumption baskets; oil prices have been less of a factor, in part because pass-through of international prices has been delayed and incomplete. In the advanced economies, by contrast, the oil price increases have played the lead role, with food playing a smaller part.

How far will these direct contributions feed into second-round effects? Three developments that should mitigate such risks are increasing real wage flexibility—in contrast to real wage resistance seen particularly in western Europe during the 1970s—more secure anchoring of inflation expectations by vigilant central bankers, and declining energy intensity.<sup>6</sup> However, there are clearly risks that monetary policy is again falling behind the curve, particularly in the emerging economies where domestic demand growth remains robust and is pressing capacity constraints, with an extra degree of concern in countries with current account surpluses where inflexible exchange rates may restrain the monetary response. In the advanced economies, widening output gaps may help to reduce risks of second-round effects, but there is a concern that the degree of spare capacity may be overestimated if rising commodities prices have an adverse impact on productive capacity (see Box 1.1).

Rising commodities prices also have important potential effects on terms of trade, purchasing power, and hence growth. At the global level, the key factor is oil, since production of food is more evenly distributed around the globe: on average, oil imports are 2½ times the scale of food imports.

Overall, rising oil prices have had a net dampening impact of 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 effect also depends on the source of the commodity price shock, being greater where the price surge reflects a pure supply shock rather than a combination of supply and demand factors, as seems to be the case in the current episode. These redistributive effects are sizeable, although substantially smaller than in the 1970s when the oil intensity of output was about twice its current level in advanced economies and 25 percent higher in emerging markets (see

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<sup>6</sup>Blanchard and Gali (2007) provide a careful analysis of why macroeconomic impact of the recent oil price boom is likely to be less than in the 1970s.

Figure 3.9). At the country level, low-income countries are particularly vulnerable to strains from rising food and fuel import costs. Some countries in the sub-Saharan Africa have experienced terms-of-trade losses of over 5 percent of GDP (IMF, 2008).

### **Outlook and Risks**

The future course of financial market and commodity market conditions are key drivers for the global outlook. The baseline projections are based on the view that financial markets will remain under substantial stress through 2008 and much of 2009. As discussed above, U.S. subprime and related losses have now been largely acknowledged, and the U.S. housing sector should stabilize over the year ahead, contributing to the process of resolving financial institution liquidity and solvency problems. However, financial sector balance sheets are going to remain strained by the need for higher capital combined with growing credit losses coming from the broader economy, reflecting the rising strength of the negative feedback loop between the financial system and the macroeconomy. Thus, in the advanced economies, bank credit availability would remain tight and spreads on riskier asset classes wide, with conditions only starting to normalize over the course of 2009. In this context, emerging and developing economies would continue to face more difficult external financing conditions, with those with wide current account deficits or other vulnerabilities remaining under most pressure.

In commodities markets, in the absence of further supply shocks or a major downgrading of growth prospects, prices are projected to remain around current high levels, in line with pricing in forward markets. That said, markets are likely to remain volatile, responding quickly to shifting perceptions of demand and supply trends.

Against this backdrop, the baseline projections paint a picture broadly similar to that provided in the April 2008 *WEO*, of a global economy that continues to slow through end-2008, with a gradual recovery getting under way during 2009. The expected recovery would be driven by three factors: the dwindling of adverse terms of trade effects as commodities prices stabilize; a turn-around in the U.S. housing sector, together with progress toward resolution of liquidity and solvency problems in core financial institutions; and resilience of domestic demand in the emerging economies. On an annual basis, global growth is expected to moderate from 5 percent in 2007 to 3.9 percent in 2008 and 3.7 percent in 2009. The pattern is seen more clearly on a fourth-quarter to fourth-quarter basis: on this metric, global growth slows from 4.8 percent during 2007 to 2.8 percent during 2008, before recovering to 4.1 percent during 2009 (see Table 1.1 and Figure 1.11). These projections are modestly below forecasts provided in the July 2008 *WEO update*, reflecting increasing evidence of slowing activity and extended financial strains emerging in recent months.

The advanced economies are expected to be particularly weak for the remainder of 2008, either in or barely skirting recession. The U.S. economy would slow after a strong second quarter, as support from the fiscal stimulus ebbs, and export momentum moderates.

An emerging turnaround in the housing sector and more stable oil prices would help lay the basis for incipient recovery in the course of 2009, but the revival would be more gradual than in previous episodes, as tight credit conditions would continue to weigh on domestic demand. Most other advanced economies would also go through a period of extremely sluggish growth or even contraction in 2008, before a modest up-turn in 2009. In fact, all of the G-7 countries are now projected to grow by less than 1 percent on a fourth quarter over fourth quarter basis during 2008, and all but Canada would grow less than 2 percent during 2009.

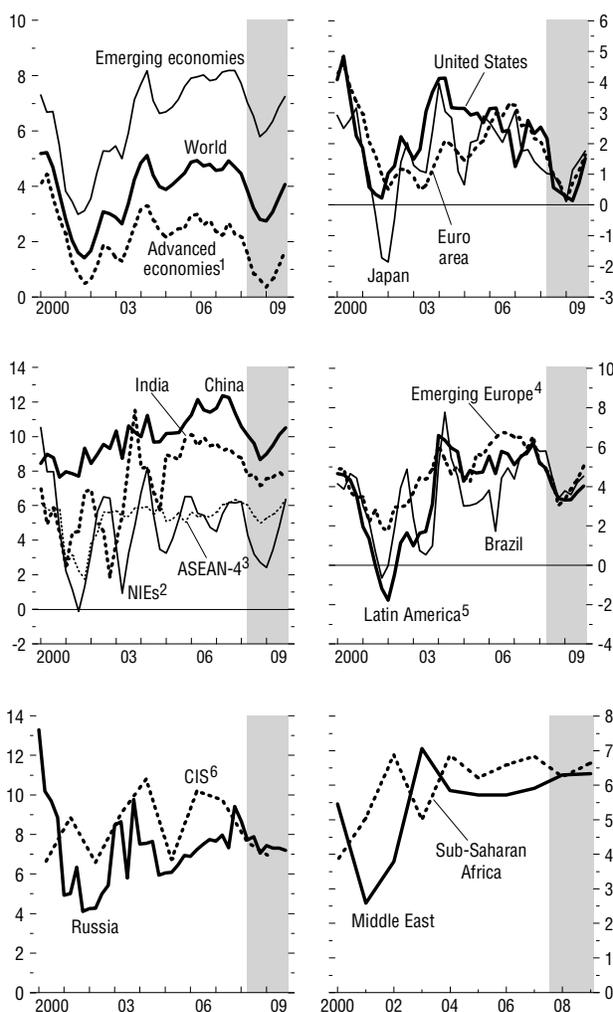
Emerging and developing economies are also projected to continue to slow, bringing growth more in line with trend. While export growth would continue to decelerate, domestic demand is expected to remain resilient, supported by the strong productivity gains made in recent years. China and India would continue to grow robustly, but at more moderate rates than during 2006 and 2007. Commodity exporting countries—particularly oil exporters—would continue to expand at a rapid pace, while countries dependent on food and fuel imports or on workers' remittances from advanced economies would tend to slow more sharply.

On the inflation front, the combination of rising slack and stabilization of commodity prices would help 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 continue to rise in 2008 as recent commodity price increases feed through the pipeline. Inflation would ease somewhat in 2009, but remain well above central bank objectives in many countries in the absence of stronger monetary policy responses.

**Figure 1.11. Global Outlook**

(Real GDP; percent change from a year ago)

The global economy is projected to slow further in the second half of 2008, and to start a gradual recovery in the course of 2009. The advanced economies would be most affected by the downturn, and would be close to recession. Growth would 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.

<sup>1</sup>Australia, Canada, Denmark, euro area, Japan, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States.

<sup>2</sup>Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

<sup>3</sup>Indonesia, Malaysia, Philippines, and Thailand.

<sup>4</sup>Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Poland.

<sup>5</sup>Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Rep. Bolivariana de Venezuela.

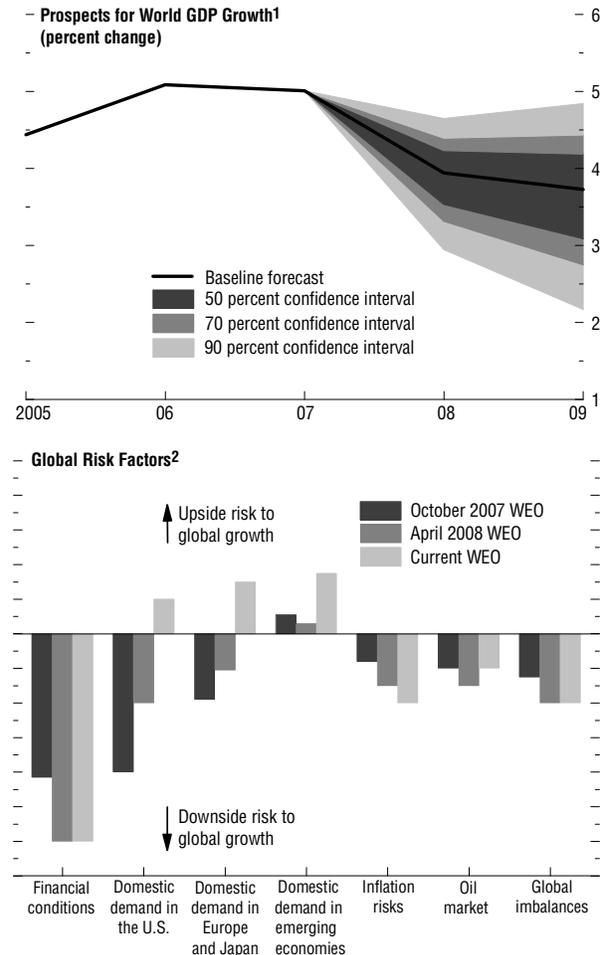
<sup>6</sup>Commonwealth of Independent States.

The balance of risks to growth around this revised baseline is seen as moderately to the downside (Figure 1.12). The principal downside risk revolves around the related threats that financial conditions could deteriorate further and that financial strains could be more protracted than envisaged in the baseline. A continuing downside risk relates to concerns that tight supply conditions could put additional upward pressure on inflation and commodity prices, requiring more aggressive policy tightening. On the upside, it remains possible that the momentum of domestic demand, notably consumption, continues to be more resilient than expected to the headwinds from financial tightening and high food and fuel prices. Global imbalances remain a concern, but with some shift in focus away from the potential problems of financing the U.S. current account deficit to risks created by the need to recycle large surpluses from oil exporters and from protectionism as the Doha round has again stalled.

Based on the fan chart, overall risks of a global recession (calibrated as global growth at 3 percent or less) are estimated to be around 20 percent. A statistical indicator of recession risks now puts the global recession risk at one-third. Box 1.3 reviews these and other approaches used to assess and communicate risk, including the methodology used to develop the growth fan chart and associated risk factors, and discusses work now under way to enhance such assessments.

**Figure 1.12. Risks to the Global Outlook**

Risks to the growth outlook lie moderately to the downside. 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 inflation, the oil market, and global imbalances. The upside potential largely relates to the possibility of greater resilience of domestic demand in advanced and emerging economies.



Source: IMF staff estimates.

<sup>1</sup>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.

<sup>2</sup>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.

## Financial market risks

Overall financial market risks remain at elevated levels, comparable to those at the time of the Spring 2008 *WEO*. Despite strong support from financial authorities to prevent systemic events, markets remain under stress, and further deterioration in financial conditions remains a serious risk to the outlook.

One major concern is that rising losses, increasing difficulty in raising capital, and more aggressive attempts to deleverage balance-sheets could imply a full-blown “credit crunch,” as described in the “stress scenario” developed in the Fall 2008 *GFSR*. In this connection, forced asset sales at distressed levels could push prices of impaired assets even lower, and require others to take greater mark-to-market losses. Adding to the concern is that deepening financial losses as growth weakens could trigger loss of confidence in individual banks and even the failure of a major complex financial institution, with systemic ramifications. Such worries have been underlined by the recent difficulties faced by banks both in the United States and the United Kingdom that remain heavily exposed to mortgage markets. Similar problems could emerge elsewhere particularly if housing downturns intensify more broadly. Moreover, strains could intensify in other related asset classes, including commercial property and consumer lending.

A related concern is that the process of deleveraging and balance sheet repair could well be extended through 2009 and beyond, implying that credit could remain highly restricted for longer than assumed in the baseline. The banking business model has been seriously called into question, and at this point it is hard to gauge what levels of capital will be regarded as adequate by markets and by regulators. Moreover, prospects for raising capital are highly uncertain, particularly in light of the large losses suffered by equity-holders in recent emerging resolutions (including Northern Rock, Bear Sterns, and the GSEs).

Up to now, financial strains have been mainly observed in the advanced economies, but emerging economies could also be vulnerable, especially those that have been reliant on short-term inflows. Intensified or extended deleveraging in mature markets could lead to a further scaling back of both bank and portfolio flows to emerging economies, putting additional pressure on economies seen as vulnerable, including those with large current account deficits, such as in Emerging Europe. This would lead to increasing pressure on domestic credit conditions, at a time when activity is slowing, leading to rising stress on financial intermediations and borrowers.

The global repercussions of an intensification of financial strains are illustrated in the left hand column in Figure 1.13, based on simulations of a global general equilibrium model (BOC-GEM).<sup>7</sup> The shock is modeled as an additional 100 basis points widening of credit

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<sup>7</sup>BOC-GEM is a version of the Fund’s global economy model (GEM) developed jointly with the Bank of Canada that includes an explicit modeling of oil and other commodities sectors.

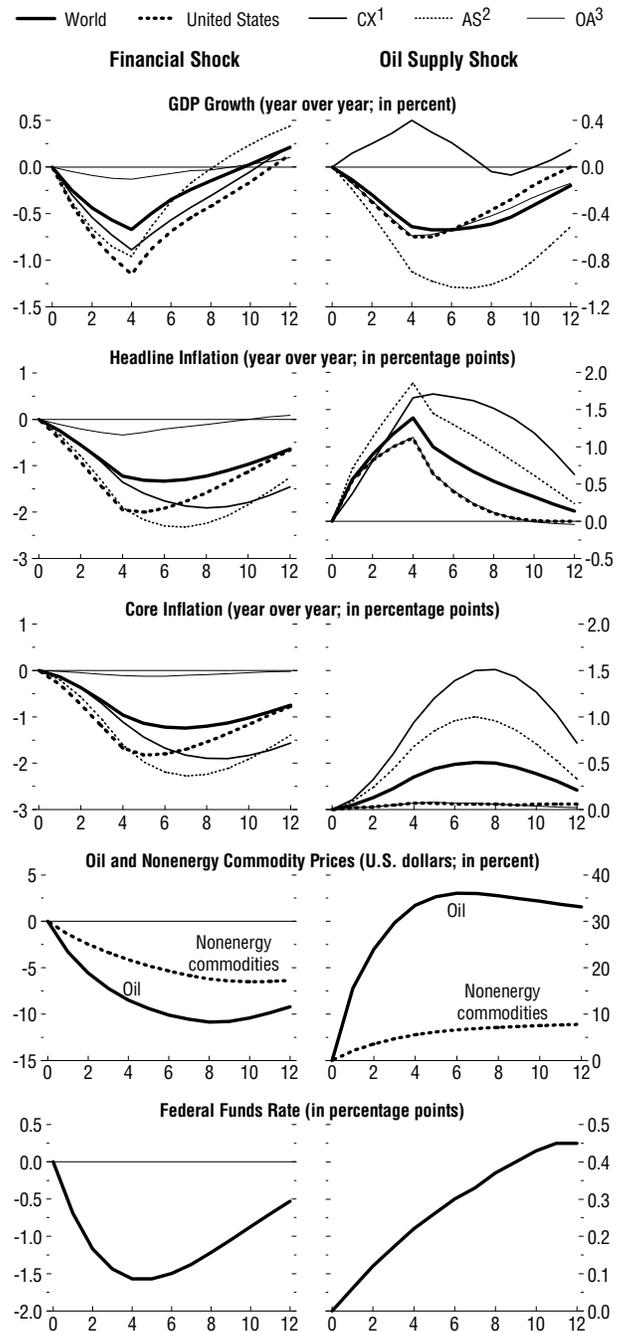
spreads in the United States, and lesser increases elsewhere, combined with a loss of confidence that knocks equity prices down further. As a result, U.S. domestic demand would slow relative to baseline, lowering real GDP growth by a further 1 percentage point over the next year, with lingering negative effects shown over a three-year period. The implication would be a significant 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 to raise output gaps, moderating pressure on inflation, and providing greater room to ease policy interest rates further.

### Inflation risks

Inflation risks to growth have increased relative to the April 2008 *WEO*, particularly in the emerging economies where there are increasing signs that higher commodities prices and increasing pressure on local supply conditions are already having an impact on wage demands and inflation expectations. The moderation in commodities prices since July may help to relieve some of the upward momentum, but pressures from this source are likely to remain for some time given that past increases had only partially passed through the supply chain, particularly for oil, since many countries had held prices well below international levels.

The concern is that once inflation expectations become unanchored, central banks would be forced to tighten abruptly to generate a “hard landing”—a period of sub-trend growth—in order to bring inflation back in line. As discussed in Chapter 3, the output costs of regaining control over inflation could be quite sizeable, particularly where initial credibility is low and the monetary response is delayed (see Figures 3.15 and 3.16). To be sure, as emphasized in Box 1.1, “speed limits” are hard to

**Figure 1.13. Impact of Two Shocks on Global Economy**  
(Deviation from control; quarters on x-axis)



Source: IMF staff calculations, based on BOC-GEM simulations.

<sup>1</sup>CX: Commodities exporters.

<sup>2</sup>AS: Emerging Asia.

<sup>3</sup>OA: Other advanced economies.

evaluate for emerging economies that have been able to achieve rapid rates of growth through trade and financial integration. While continued pools of under-utilized labor may suggest capacity for sustained strong growth, bottlenecks in infrastructure and availability of skilled labor may start to bind.

In the advanced economies, inflation is also a rising concern, although not as marked as in emerging economies. Rising output gaps associated with below potential growth and vigilant central banks should both provide protection, and there are few signs of accelerating labor costs. But resistance to further real wage cuts could emerge as a problem, particularly in western Europe if unemployment were to remain at low levels.

### **Risks from oil prices**

Given their likely continued volatility, oil prices provide an important source of two-way risks to the projections. Options markets suggest a wide band of variation around the future price, with outcomes from \$70/barrel to \$190/barrel falling within the 90 percent confidence band over the period through mid-2009 (see Appendix 3.1). On balance, however, the risks to global growth seem somewhat weighted to the downside. For one thing, possible declines in oil prices anticipated in options markets would most likely be associated with a weakening in global demand, rather than a positive supply shock, with a correspondingly lower output multiplier impact than a rise in prices associated with a negative supply shock (see discussion in Box 1.1 in the April 2007 *WEO*). In addition, the asymmetry in the demand effect from redistribution of purchasing power between oil producers and oil consumers, and thus the negative multiplier on global output, arguably becomes greater as the oil price rises. At high prices, producers are more likely to run into *absorptive capacity* constraints on additional consumption out of higher real income, while consumers are more likely to run into *liquidity* constraints on their capacity to maintain spending in the face of declining real income. Moreover, rising oil prices may reduce potential growth, implying tighter supply constraints, as discussed in Box 1.3.

The impact of a further surge in oil prices due to a negative supply shock are illustrated in the right-hand column of Figure 1.13. Again, the simulations are based on BOC-GEM, and involve a shock that pushes oil prices 30 percent above baseline. The shock has two channels for depressing global output, the terms of trade loss imposed on oil importing countries and the impact of more restrictive monetary policy needed to anchor inflation expectations. Commodities exporters show some gains in output in the short run, but global growth is lowered by around ½ percentage over the first year, with emerging Asian oil importers suffering the largest hit to output.

### **Risks to domestic demand in advanced economies**

Overall risks to the growth outlook for the advanced economies are seen as moderately to the downside. These economies are exposed to downside risk from financial and commodities markets, as just discussed. The threat of deeper and more prolonged

housing corrections than built into the forecast is also a negative risk, closely related to the downside risks in financial markets. Upside risk to the forecast stems from the possibility of greater resilience of domestic demand than projected to credit, housing and commodity price strains. Particularly in the United States, consumption remained stronger than predicted in the first half of 2008, although recent indicators suggest that much of this outcome reflected the temporary boost from the tax rebates as opposed to underlying durability. In the euro area too, consumption could surprise on the upside as oil prices stabilize, particularly since unemployment rates remain exceptionally low. Generally sound corporate balance sheets—much improved since the early years of this decade—also provide support to the outlook.

### **Risks to domestic demand in emerging economies**

Overall risks to growth in the emerging economies are also seen as moderately to the downside. The principal downside risks are external: exposure to slower global trade, tighter external financing conditions, and adverse terms-of-trade shocks. Against this, domestic demand has remained strong across emerging economies in recent quarters, and may continue to surprise on the upside, for example, in China where the government is starting to take measures to support growth. There is also general concern that monetary conditions may not be tightened sufficiently to rein in inflationary pressures. In this respect, economies with less flexible exchange rate regimes and current account surpluses that constrain monetary policy are particularly at risk that growth may remain high over the immediate horizon, and lead to overheating and loss of control over inflation. Commodities-exporting countries are also at risk of overheating in the event that strong terms of trade gains are allowed to fuel continued rapid growth of domestic demand and stoke inflation.

### **Risks from global imbalances**

Risk related to global imbalances remain a concern, even as the sources of risk are shifting. In the past, the central issue has been that there could be 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 may have moderated somewhat—as the U.S. dollar's depreciation has brought it closer to equilibrium and as 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. Moreover, reduced confidence in the liquidity and risk-return profile on U.S. assets in the wake of the financial crisis mean that risks of disorderly unwinding cannot be discounted. The recent difficulties of Fannie Mae and Freddie Mac—whose securities have been purchased heavily by foreign investors, providing a significant share of the financing of the U.S. current account deficit in recent years—is a reminder of continuing vulnerabilities on this front, particularly as U.S. net

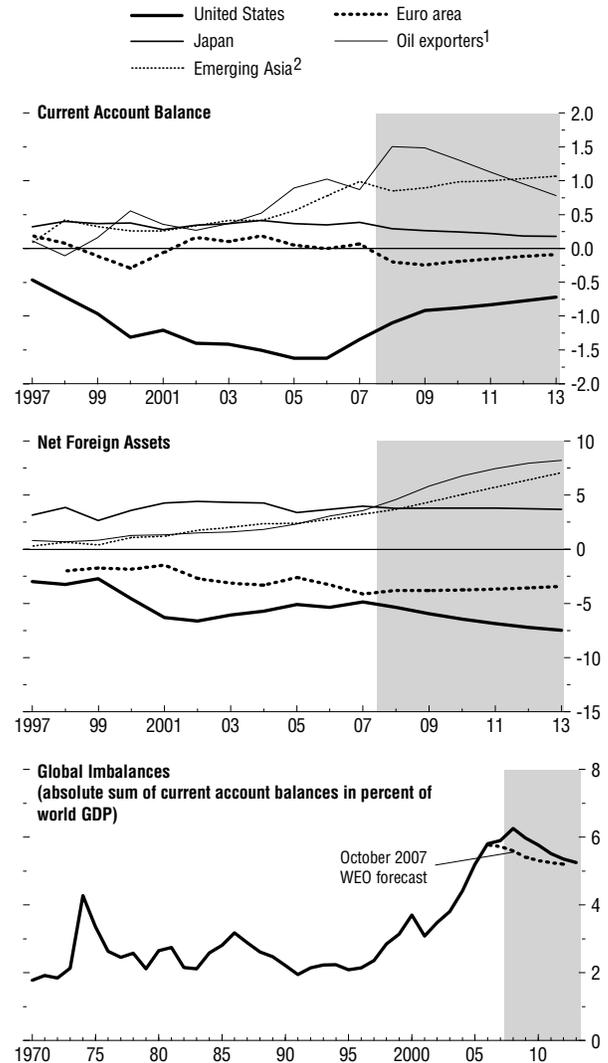
foreign liabilities are still projected as a rising share of global GDP notwithstanding the narrowing current account deficit (middle panel of Figure 1.14).<sup>8</sup>

At the same time, three other types of concern have become salient. The first is that the adjustment of the dollar has been concentrated on a number of flexibly managed countries, as certain major currencies have continued 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 over-valued.

Second, the continuing rise in international oil prices has increased the need to ensure stable recycling of large exporter surpluses. Rising current account surpluses of oil exporters is a reasonable response to higher prices, reflecting exporters' desires to save some of the additional revenues. The annual 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 around 1 percent of global GDP. So far 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 investments flows into other emerging

**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 while these surpluses are expected to come down going ahead, oil exporters are projected to accumulate rising net foreign assets. Emerging Asia would sustain large current account surpluses, and also continue to build net holdings of foreign assets.



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

<sup>1</sup>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.

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

<sup>8</sup>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 has generated net valuation gains in recent years that have served to offset the flow accumulation of new liabilities. See Box 1.2 of the April 2008 *WEO*.

economies, akin to the recycling of petrodollars in the 1970s, could contribute to excessive growth of liquidity and rising vulnerabilities in these economies.<sup>9</sup>

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

### **Policy Challenges for the Global Economy**

Policymakers around the world today face the daunting policy challenge of combating the recent rise in inflationary pressures, while nursing their economies through a period of slower growth and stabilizing financial conditions. At the same time, priority must be given to tackling the market and regulatory flaws that have contributed to recent stress. Financial markets and institutions must be placed on a healthier footing, and supply–demand responses in commodities markets improved. Continued commitment to trade and financial integration of the global economy remains essential to underpin longer-term growth prospects. Dealing with these challenges will require determined efforts at the national and multilateral level, led by the major advanced and emerging economies.

### **Macroeconomic policy settings**

Macroeconomic policies need to ensure 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 policy stance warranted will vary across countries, with assertive efforts to tighten being justified in a number of countries that seem to be growing well above their speed limits, while more supportive stances will be appropriate in some economies now facing a period of below-par growth as a result of financial strains, housing downturns, and terms-of-trade losses.

Turning first to the major advanced countries, present macroeconomic policy stances seem to provide broadly the right balance at this point, but policy makers should be alert to the shifting pattern of risks.

- In the *United States*, monetary policy is highly accommodative, providing support to the economy in the face of financial stress and the continuing housing correction, while ensuring adequate liquidity to the financial system. Underlying price pressures should be contained as economic slack rises, providing room to keep policy on hold for now, although signs that economic recovery is gaining traction and that financial conditions are improving should prompt tightening toward a more neutral stance. On

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<sup>9</sup>See Box 2.2 in the April 2008 *WEO* on the recycling of commodities surpluses and Box 6.1 in this report on the role of sovereign wealth funds.

the fiscal front, the stimulus package has provided well-timed support to the economy, but the need for medium-term consolidation constrains the room for further initiatives, and additional government support should be focused as needed on steps to support the housing market and financial system.

- In the *euro area*, the ECB has clearly signaled its determination to anchor inflation expectations and meet its inflation objective with its July rate increase. Monetary conditions are now quite tight, especially after considering the widening in risk spreads, and thus policy can afford to remain on hold, balancing concerns about inflationary risks against the disinflationary impact of decelerating activity. If the economy continues to slow, as envisaged in the baseline, scope for lowering rates should emerge provided that underlying inflation remains contained. Fiscal policy is providing support to the euro area economy through automatic stabilizers and discretionary measures in some countries, but medium-term considerations weigh against fiscal stimulus packages unless downside risks materialize.
- 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 remains medium-term consolidation.

In emerging and developing economies, policies need to foster adjustment to the recent surge in commodities prices, while avoiding a boom-bust cycle that would squander hard-won success in achieving more stable growth and bringing down inflation. As described earlier in this chapter, there are widespread signs of rising inflation pressures in the context of sharp increases in food prices, continued strong growth, and tightening supply constraints. While the recent moderation of international commodity prices may ease some of the pressure, the gains made over the past year on the inflation front are already being jeopardized, and once credibility is eroded, it will be a costly and lengthy process to rebuild.

Thus, many of these economies still need to tighten macroeconomic policy settings. In most cases, monetary policy should play the lead role, but it needs to be supported by fiscal restraint, and, in some cases, by flexible exchange rate management. Many central banks have acted to raise rates in recent months, with banks using inflation targeting frameworks in Latin America and emerging Europe showing stronger responses, but further measures are still needed in many countries. Commodities exporters that have made large terms-of-trade gains can afford stronger action to keep inflation in check, while commodity importers will need to be mindful of the impact on demand from losses in purchasing power.

Countries with tightly managed exchange rate regimes have faced particular difficulties in tightening the monetary stance, since efforts to raise interest rates are undermined by capital inflows attracted by the increase in interest rate differential, boosting money and credit growth. Many of these countries, particularly in emerging Asia and the

Middle East, have faced sharp increases in inflation. In China, foreign exchange inflows have been strong, international reserves have mounted rapidly, and interest rates have been on hold since last December despite rising inflation. While the Chinese authorities have used administrative and prudential measures in an effort to limit credit growth, allowing greater exchange rate flexibility would increase the room for operating a more independent monetary policy and support efforts to rebalance from external to domestic sources of growth.

Fiscal policy should play a more supportive role in restraining demand growth and easing inflation pressures in a number of emerging and developing countries. Fiscal deficits have generally been reduced across these economies, as rapid growth has boosted revenues, but government spending has increased rapidly, adding to demand pressures. Greater restraint on spending growth would be helpful as a complement to tighter monetary policy, including because it would moderate some of the upward pressure on the exchange rate, alleviating concerns that policy tightening will undermine competitiveness needed for long-term growth. In addition, within a given spending envelope, greater priority to infrastructure spending may help to relieve supply bottlenecks, a particular concern in Middle Eastern oil exporters, which have clearly been overheating while their dollar pegs limit scope for monetary tightening. Moreover, as discussed below, countries should reduce the extent of general food and fuel subsidies, that can be very costly to the budget, while providing targeted support to low-income groups.

### **Strengthening macroeconomy 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 since 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 a pragmatic, broad-based, and forward-looking approach, with the scope for tolerating temporary deviations from inflation targets depending on how well anchored are expectations.

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? Monetary policy settings in each country tend to treat international commodities prices as given exogenously and thus do not reflect the impact of a country's demand on global commodities 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 focusing on minimizing volatility in their domestic inflation and output, while relying on more direct action being taken to relieve commodity market pressures, as discussed below. If they successfully do so, 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 that latter country's monetary conditions, which may not be appropriate to their circumstances. The tension is particularly great when, as now, countries are being faced by 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 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 choosing to peg against the reserve currency. Moreover, such a tightening would be likely to contribute to dollar appreciation, and thus not be helpful in terms of the desired rebalancing of current accounts. While there are many considerations that feed into choices on 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 issue of 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 impact short-term output and price prospects and risks. There is a concern, however, that this may lead to asymmetrical responses, since sharp declines in asset prices may lead to quick policy easing, while a longer period of asset-price build-up 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 Spring 2008 *WEO* and BIS, 2008). The usual counter-arguments 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 pro-cyclicality of leverage (Adrian and Shin, 2008).

A complementary approach would be to introduce a system-wide element to the regulatory framework to weigh against the inherent pro-cyclicality of credit creation. Such a "macro-prudential approach" could involve increasing regulatory attention to how financial

incentives and constraints affect risk-taking behavior through the credit cycle (Bernanke, 2008). Going further, capital and provisioning requirements could be tightened during the upswing of the economic cycle to reduce risks 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.

Attention should also be paid to fiscal policy frameworks. As discussed in Chapter 5 of this report, fiscal policy can play a useful counter-cyclical role, provided that its support is timely, does not undermine medium-term sustainability, and is well structured to maximize its 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 counter-cyclical impact without distorting the basic purpose of government tax or spending policies. Discretionary policy can also play a counter-cyclical role but timeliness and, especially, reversibility can be more problematic. A “deficit-bias” can contribute to undermining policy credibility and therefore effectiveness, as shown by the chapter’s results showing the limited impact of fiscal stimulus in “high debt” countries. To remedy this, consideration could be given to developing rules-based counter-cyclical policy responses 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 properties of macroeconomic policies and reduce some of the burden on monetary policy.

### **Dealing with financial market strains**

The Fall 2008 *GFSR* lays out key priorities for dealing with continuing stress in mature financial markets. The immediate task remains to restore healthy financial balance sheets by encouraging recognition of losses and the rebuilding of capital bases, while guarding against systemic failures through liquidity provision and prompt intervention when needed. At the same time, determined efforts are required to build firmer underpinnings for financial intermediation, learning lessons from the weaknesses revealed by the present period of turbulence. A central objective is to ensure more effective and resilient risk management by individual institutions, including more robust regulatory capital requirements, strengthened liquidity management practices, and improved disclosure of risk on and off balance sheets. Another important task will be to strengthen approaches to crisis resolution, including clarifying roles of different official agencies, bolstering deposit insurance schemes, and ensuring adequate intervention instruments.

The emergency actions taken to deal with the collapse of Bear Stearns in March and the heavy pressure on the GSEs in July has underlined the need for more effective regulation and more secure capitalization of systemically important institutions beyond the traditional banking system. A clear and permanent solution will be needed for the GSEs that addresses the long-known systemic vulnerabilities emerging 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 U.S. investment bank regulation, including capital requirements, in view of those institutions' expanded access to central bank liquidity.

Emerging economies should also learn lessons from recent strains. While less exposed to the problems created by the proliferation of structured credits, basic lessons concerning the importance of strong risk management, transparency, and effective crisis management are highly relevant, particularly in countries that have experienced strong capital inflows and rapid domestic credit growth.

In many of these areas, coordination of approaches across national boundaries will be crucial, given the growing international integration of institutions and markets. First, differences in national legal and regulatory frameworks create scope for regulatory arbitrage. While some differences can foster healthy competition and innovation, recent events have shown that this process has gone too far. Second, as recent events have demonstrated, regulatory and supervisory failure, 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. While international bodies such as the FSF and BIS 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.

### **Improving supply and demand responses in commodities markets**

A broad range of bilateral and multilateral efforts will also be crucial to relieve strains in commodities markets. Here the focus should be on policies to encourage better market balance in the longer term by improving 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 bio-fuels subsidies.

Priority should also be given to policies to strengthen the supply response to higher prices. Agricultural production in emerging markets could be fostered by steps to build up

infrastructure for irrigation and transportation, and to ensure more effective transfer of new technologies and techniques to improve yields in developing economies toward those achieved 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 build-up 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 to 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 the unwinding of the large U.S. current account deficit, but rising oil prices have slowed the process, and financial vulnerabilities have added to concerns. The multilateral strategy endorsed by the IMFC in 2005 and elaborated by the Multilateral Consultation on Global Imbalances in 2006 remains relevant, but needs to be applied flexibly (Box 1.3 in the Spring 2008 *WEO* provides a comprehensive overview of progress since the Multilateral Consultation). U.S. fiscal consolidation remains a key medium-term objective, but counter-cyclical fiscal support has been needed to alleviate the current slowdown. 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 over-heating in their economies, including both 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, current account imbalances will inevitably 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 that 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 build-up of vulnerabilities in capital-importing countries. Recently, a number of emerging economies—notably in emerging Europe but elsewhere too—have run 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 build-up of vulnerabilities or balance sheet mismatches, including by strengthening financial

supervision and domestic financial institutions, as well as 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 build up in protectionist measures on either the current or capital account. Breaking the current deadlock on the Doha round would help to strengthen the open multilateral trading system. On the capital account side, the growing role of sovereign wealth funds as an investment vehicle is an important development. The elaboration of a set of principles and practices for their management will help to make such flows more transparent, and thus should help to reduce concerns about the governance of such funds that could lead to counter-productive restrictions on such inflows (Box 6.1).

**Box 1.1. Measuring Output Gaps**<sup>10</sup>

Rising inflation concerns have brought increasing attention to the issue of whether economies are over-heating, and how to measure an economy's productive capacity. Other things equal, an economy operating beyond its capacity—with a positive gap between actual and potential output—is likely to face rising inflation pressures, while 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, like assessing the fiscal stance over the cycle, as discussed in Chapter 5 of this report. Overall, understanding the current and future cyclical position of the economy is crucial for making sound monetary and fiscal policy decisions.

Measuring output gaps is, however, a highly inexact science, since 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 have been used, with various degrees of sophistication, adjusting to data limitations. This box reviews methods used in estimates of output gaps used in the WEO projections, and discusses a new model-based approach that is now being developed.

***Measurement of Output Gaps in the WEO.*** 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.<sup>11</sup> Considerable attention has been paid in the literature to devising increasingly careful measures of inputs—for example, adjusting labor inputs for the impact of education and training on the quality of labor and by introducing 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.

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<sup>10</sup>The main authors of this box are Charles Collyns, Doug Laxton, and Natalia Tamirisa, with input from Gianni de Nicolò and assistance from Ercument Tulun.

<sup>11</sup>Box 3.1 in the September 2006 World Economic Outlook, "Japan's Potential Output and Productive Growth" provides an example of this approach.

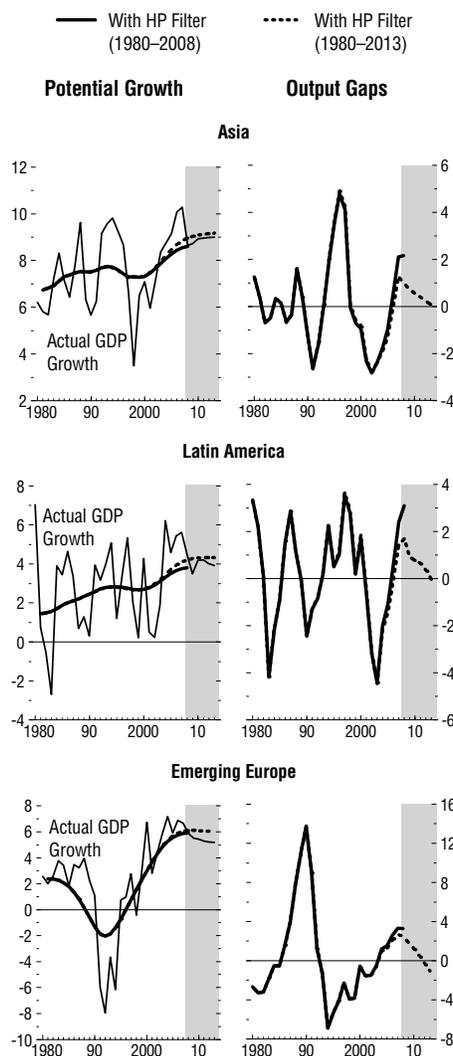
Turning to the emerging economies, typically data on labor and capital inputs is inadequate to use the production function approach. Moreover, the possibility of rapid change following major reforms reduces continuity and would make the approach more difficult to apply. Estimates of output gaps in these economies presented in this report 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 (H-P) filters, which disentangle a time series into a trend component and a cyclical component (Hodrick and Prescott, 1997), using a  $\lambda$  coefficient of 100 on annual data.<sup>12</sup>

Notwithstanding their simplicity and wide use, one difficulty with the H-P 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 H-P filter is applied to data (in log form) over the period 1980–2008 (essentially historical data since data for 2008 are now largely given) and again to data and projections over the period 1980–2013. Using the latter estimates takes advantage of the Fund desk economists' best judgment on medium-term growth prospects. Potential output and output gaps have then been derived as the average of these two estimates.

Applying this technique over data from 1980–2008 suggests a significant acceleration in potential growth over the past decade across emerging economies (left column of the first figure). The extent of acceleration is estimated to be even larger based on data including medium-term projections. Using either series, emerging economies are seen as operating significantly above capacity, especially in emerging Europe and Latin

### Potential Growth and Output Gaps in Emerging Economies

Although potential growth is likely to have risen 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 last year or so. The estimated size of the gap is sensitive to choice of end-point, and to Fund desks' judgments of the extent to which potential growth has risen.



Source: IMF staff estimates.

<sup>12</sup>Filtering results strongly depend on the value for the smoothing parameter  $\lambda$ . The value of 100 captures the properties of the U.S. business cycle well, but it has been less useful for other countries.

America, with the excess approaching 4 percent of GDP in each region in 2008 using the more conservative potential growth estimates.<sup>13</sup>

***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 good and services, in part because it is used in transportation. If the relative price of oil rises, other inputs into production (capital and labor) 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.<sup>14</sup>

Using a production function approach, 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 per barrel) would reduce potential output by 4 percent in the United States and 2 percent in the euro area (OECD, 2008). The impact on the US potential output is higher because of a larger share of oil in production, as well as 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 percent age 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 service lives above average.

***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, 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. On this criterion, of all the economically plausible paths that potential output might take, the procedure selects the one which 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.

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<sup>13</sup>Vamvakidis (2008) compares estimates of potential growth across emerging Europe using an H-P filter, a production function approach and a growth equation similar to a specification used by Barro and Sala-I-Martin. The production function approach provides the highest estimates for potential growth, assuming continued strong TFP growth.

<sup>14</sup>For example, press reports suggest that the automotive industry in the United States are moving fast to retool car manufacturing plants to produce smaller, more energy efficient vehicles.

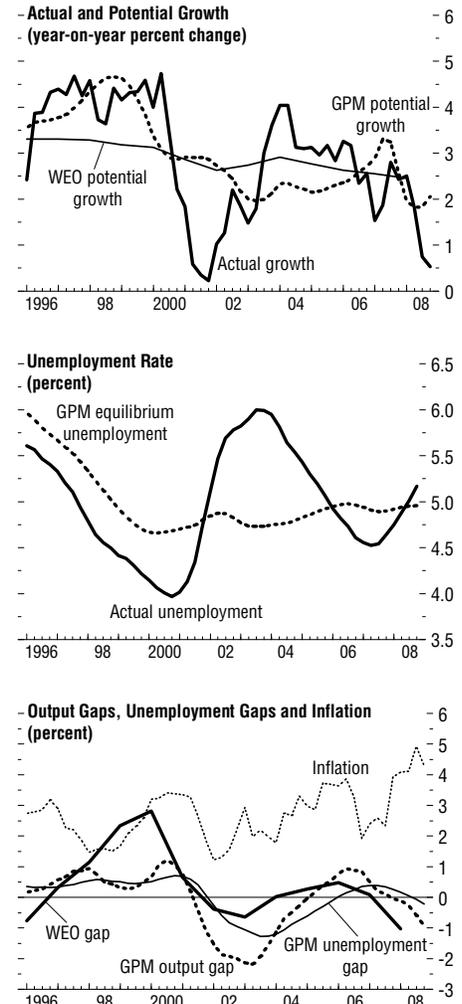
The model contains two critical equations in this regard. The first links inflation to the output gap. The second is a dynamic Okun's law, which links unemployment gaps (actual-minus-equilibrium levels) to past movements in the output gap.

The model-based technique is less mechanical, with much more economic content, than the HP and other univariate filters. It potentially offers a 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.<sup>15</sup> The top panel compares the estimates of potential growth from GPM and from WEO. The GPM estimates display considerably more variation than the WEO estimates. This is to be expected, as 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, inflationary 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 WEO.

#### Alternative Measures of U.S. Potential Growth



Source: IMF staff calculations.

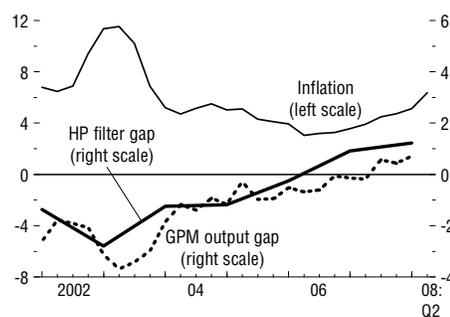
<sup>15</sup>In current versions of the GPM, the observable variables for the U.S. economy include oil prices, headline CPI inflation, real GDP, unemployment, exchange rates, the Federal Funds rate, and a measure of bank lending tightness. The last variable is calculated from the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices.

A widening discrepancy is again evident in 2008, with potential growth in GPM dropping from 3 to 2 percent, while 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 GPM to drop for a while below its long-run rate. This implies a smaller negative output gap in GPM for 2008, and hence less downward pressure on the core inflation rate, than in WEO.

The final figure provides estimates of the output gap based on applying the GPM approach to a group of five Latin American countries. The output gap series tracks quite closely estimates derived from the H-P filter approach, providing some support for using the H-P filter as a credible first-cut for estimating 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 any time soon. In the meantime, policymakers would 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.

**Output Gap in Selected Latin American Countries<sup>1</sup>**  
(Percent)



Source: IMF staff calculations.

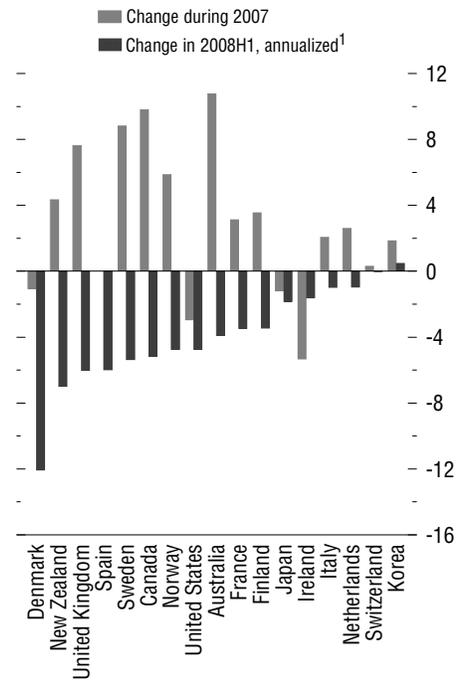
<sup>1</sup>For the aggregate of Brazil, Chile, Colombia, Mexico, and Peru.

### Box 1.2. House Prices: Corrections and Consequences<sup>16</sup>

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 save the United States where a housing correction has been underway since late 2005. 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).<sup>17</sup> How much further are house prices likely to come down? And what are 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. 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.<sup>18</sup>

**Changes in Real House Prices**  
(Percent)



Sources: Organization for Economic Cooperation and Development; and IMF staff calculations.  
<sup>1</sup>Change in 2008:Q1, annualized, for Canada, Denmark, France, Ireland, Italy, Japan, New Zealand, and United States.

<sup>16</sup>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 *World Economic Outlook* reports.

<sup>17</sup>These data are provided by the OECD and are based on commonly used national sources, as shown here: [http://www.oilis.oecd.org/olis/2006doc.nsf/linkto/ECO-WKP\(2006\)3](http://www.oilis.oecd.org/olis/2006doc.nsf/linkto/ECO-WKP(2006)3) (page 34). The data are seasonally adjusted by the OECD in cases where the national authority does not provide a seasonally-adjusted series. The use of seasonally-adjusted data creates 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.

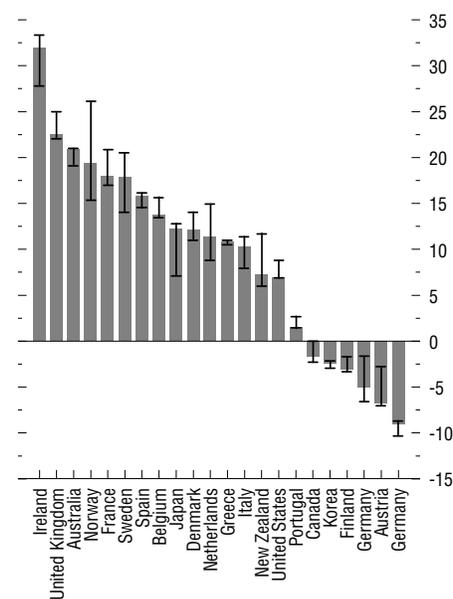
<sup>18</sup>The data start in 1971 for Spain and in 1986 for Korea.

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.<sup>19</sup> Nevertheless, the estimates provide an indication of how large those omitted factors would have 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 Ireland, the United Kingdom and Australia;<sup>20</sup> house prices in these countries were 20 percent to 30 percent higher in 2007 than could be attributed to fundamentals. A group of other countries—including France, Spain, the Netherlands<sup>21</sup> and

**House Price Gaps**  
(Percent)



Source: IMF staff calculations.

<sup>19</sup>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, Hoffmaister, Banerji and Shi (2008) provides a good exposition of the role such factors can play in house price movements.

<sup>20</sup>As noted in the 2008 staff report for Australia, estimated price gaps could be somewhat smaller if the impact of strong immigration on housing demand is modeled more explicitly.

<sup>21</sup>The 2008 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 the Netherlands as a factor that boosts housing demand, is taken into account, together with institutional factors (e.g., strict zoning regulations and generous mortgage interest deductibility).

Italy—have house price gaps of between 10 percent and 20 percent.<sup>22</sup> The gap estimate for the United States—about 7 percent—is smaller than for most other countries and has been narrowing compared to earlier estimates, partly reflecting the decline in U.S. house prices over the past eighteen months.<sup>23</sup> The range of estimates for each country is about 3½ percent on average, though for Norway, Sweden and the Netherlands the range is considerably higher.

To put these gap estimates in perspective, it is useful to compare them to 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 ten years, with an expansion phase of six 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 over 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 past evidence indicates that corrections typically occur over several years. Evidence from countries with regional (i.e. sub-national) 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; Estevao and Barrera, 2008).

**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, 2008; IMF, 2008; IMF, 2004). The evidence suggests, not surprisingly, that the consequences are more adverse if they occur against 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 countries 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 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

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<sup>22</sup>Hilbers et al. (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 Article IV staff reports that point to either a cooling of housing markets or the onset of a correction include 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 Germany post-reunification.

<sup>23</sup>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 (IMF 2008, Box 3.1) and about 20 percent in 2006 (IMF 2007, Box 2.1).

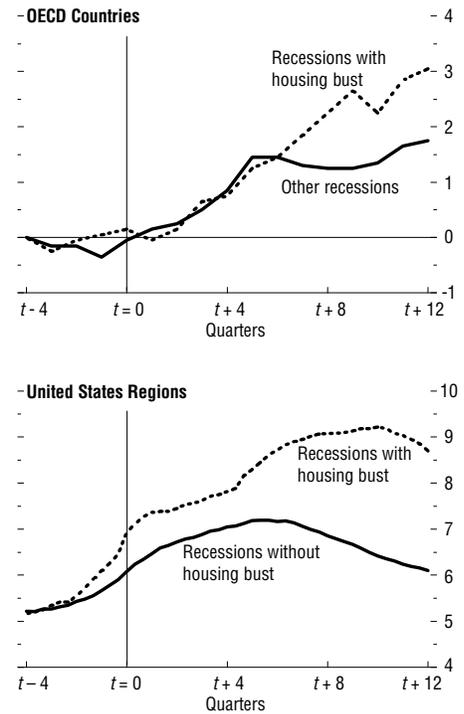
(third figure, top panel). Over the 12 quarters following the onset of a recession, the unemployment rate has increased on average by 1.5 percentage points. But in recessions associated with house price busts, the increase in unemployment is 3 percentage points.

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 housing 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 (Estevao and Barrera, 2008).

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 a 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 et al. 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.<sup>24</sup> There are also significant cross-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

**Unemployment Rate**  
(Percent)



Sources: Claessens, Kose, and Terrones (2008); Estevao and Barrera (2008); and IMF staff estimates.

<sup>24</sup>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 and Muellbauer could be more stronger for investment than consumption.

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.<sup>25</sup>

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 feature that is important at the present conjuncture is the prevalence of mortgages with variable (as opposed to fixed) interest rates. There are differences within Europe in this respect, with Finland, Ireland and Spain having 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.<sup>26</sup> Countries also differ in legal provisions, such as those that govern the recourse that residential mortgage lenders have in the case of defaulted residential mortgages, which can influence foreclosure rates.<sup>27</sup> For many of the countries that have been the focus of study in this box—United Kingdom, Ireland, Germany, Netherlands, France and Spain—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 only have recourse to the mortgaged property, which they can repossess and sell. In the other states, debtors are also personally liable for the full amount of the debt, but there are differences on the extent to which lenders can recover the difference between the mortgage debt and the foreclosure sale price; in practice, however, lenders may choose not to seek deficiency judgments mainly because of the time and cost involved.

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<sup>25</sup>Data on the depth of mortgage markets—the ratio of outstanding mortgage debt to income are reported in Warnock and Warnock (2008) and OECD 2006. The mortgage market index is described in IMF (2008). 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, Monacelli, Rebucci and Sala (2008) take this analysis a step further by using sign restrictions to identify housing demand shocks and tracing through 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.

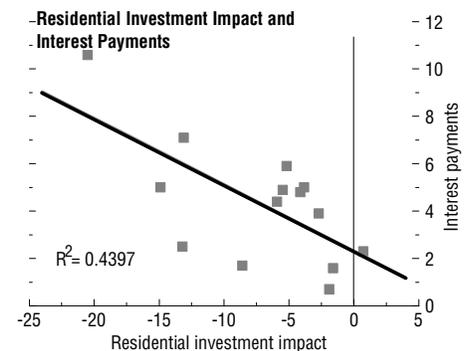
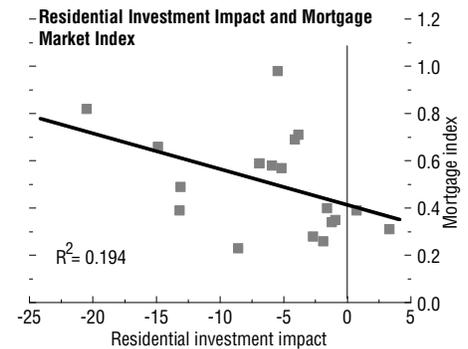
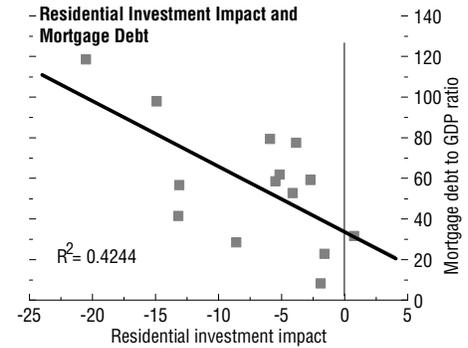
<sup>26</sup>See Tsatsaronis and Zhu (2004). Warnock and Warnock (2008) add Greece, Portugal, Sweden, and the United Kingdom to the list of European countries with mostly variable rate mortgages; outside of Europe, the United States, Canada, and Japan are classified as countries with mostly fixed rate mortgages.

<sup>27</sup>See Klyuev (2008) and Deutsche Bank (2008) for a discussion of the impact of foreclosure rates on house prices.

Another factor 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, under 3 in Spain, about 1.5 in Canada, Japan and the U.K, and under 1 in the United States.<sup>28</sup> 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-GDP ratio. Nevertheless, at the present conjuncture, with bank balance sheets under renewed stress and bank equity prices low, the potential for an adverse impact from banking system exposure to mortgage lending on the real economy 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 around 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 their housing finance systems, particularly the ease with which household have been able to access mortgage credits 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.

### Residential Investment Impact



Sources: Claessens, Kose, and Terrones (2008); OECD (2006); and IMF staff calculations.

<sup>28</sup>Estimates for countries other than the United States are from Ahearne et al. (2005) and are based on bank-level data on mortgage loans and market capitalization from Bloomberg and Worldscope; the U.S. estimate is based on total real estate loans by the banking sector and total banking sector market capitalization.

**Box 1.3. Assessing and Communicating Risks to the Global Outlook**<sup>29</sup>

Like all forecasts, the WEO central, or baseline, projections are subject to considerable uncertainty. This box 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 Fund 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 multi-stage 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 market participants and academics during multilateral surveillance missions.

***The Fan Chart.*** In recent years, following up on the recommendations of the Timmerman Report (Timmerman, 2006), staff have represented 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 (see Britton and others, 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 from 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 risks, and about the way they may affect macroeconomic developments. The contributions of each risk factor to the overall balance of risks to global growth is 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, as well as judgment.

The assessed risks are usually not symmetric—but more weighted to one side or the other. 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

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<sup>29</sup>The main authors of this box are Kevin Clinton, Thomas Helbling, Douglas Laxton, and Natalia Tamirisa, with assistance from Juigang Chen, Ioan Carabenciov, and Ondra Kamenik.

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 which splits the forecast distribution in half, with 50 percent probability on either side) falls between the mode and the mean.

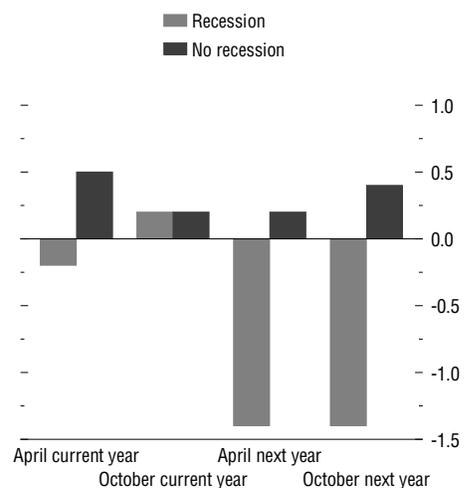
Skewed distributions reflect the staff’s views on the risks to the forecasts. The staff might see a higher risk of deviations from the forecast in one direction than the other for a number of reasons. First, asymmetric risk assessment may result from an acknowledgment of *nonlinearities* in the global 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 which 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 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 WEO 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 PPP weights) falling below 3 percent (see first and second figures). This may reflect the well-known difficulty of predicting “tail events” (defined as adverse outcomes that could occur with up to 10 percent probability), for example, systemic financial events or hard landing outcomes.

**Median Forecast Errors during Global Recessions and Otherwise, 1991–2007<sup>1</sup>**



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

<sup>1</sup>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 next-year forecasts in the April and October WEO reports for the period from 1991 to 2007. A negative (positive) forecast error indicates that the actual value is below (above) the forecast, i.e., the forecast is biased upward (downward).

While 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 as they are not derived from a formal model of the economy while the actual distribution of likelihood of different outcomes may not be normal. Also, the standard deviation of the distribution used to construct the fan chart is fixed and does not vary with the state of the world. Lastly, 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, while risks to domestic demand depend on the evolution of financial conditions. As discussed above, the fan chart based on a “two-piece normal” distribution may underestimate the risks of “tail events”, such as global recessions.

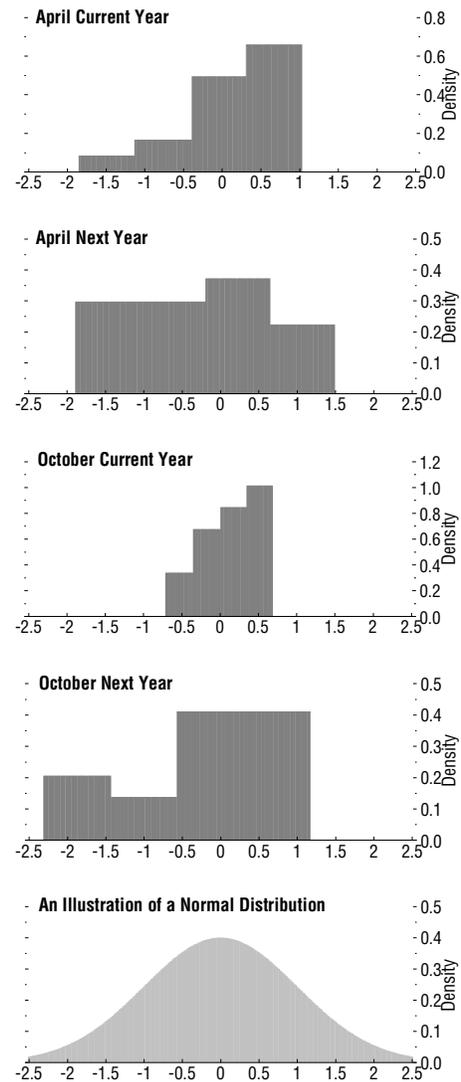
**Leading Indicator Approach.** One way for complementing the fan chart approach is to gauge risks of a global recession using a leading indicator approach.

Leading indicators are variables that help to predict the probability of global downturns (“recessions”) some three to nine months ahead.<sup>30</sup> A suitable indicator has a turning point that precedes that in global activity in a systematic and consistent manner. Leading indicators have long been used in business cycle analysis (for example, Zarnovitz, 1992), although finding reliable indicators remains surprisingly difficult.<sup>31</sup>

<sup>30</sup>The dating of the cycle in global activity is based on a monthly series of global industrial production.

<sup>31</sup>Another difficulty is the lack of sufficiently long time series for many relevant high frequency indicators.

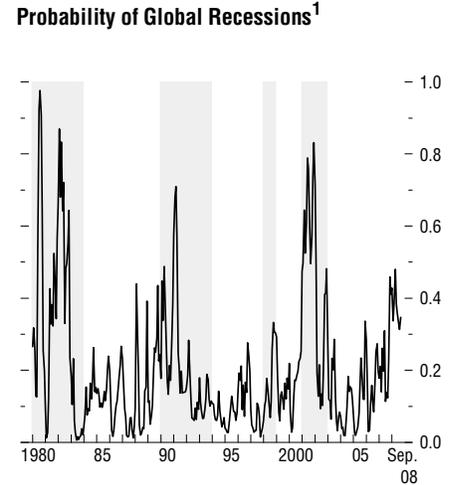
### Histograms of Forecast Errors, 1991–2007<sup>1</sup>



Source: IMF staff calculations.

<sup>1</sup>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 next-year forecasts in the April and October WEO reports for the period from 1991 to 2007. A negative (positive) forecast error indicates that the actual value is below (above) the forecast, i.e., the forecast is biased upward (downward).

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 3 months rates) and stock returns (S&P 500). The other variables are U.S. industrial production and the IMF's metals price index. Based on July 2008 data, this indicator points to a probability of global recession within the next three months of 33 percent, down from almost 50 percent late last year.<sup>32</sup> As the third figure shows, together, these variables have predicted past global recessions with a probability of over 50 percent without providing false signals during 1980–2007.<sup>33</sup>



Source: IMF staff estimates.  
<sup>1</sup>Shaded area represents periods of global recession.

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 and 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, while simple and intuitive, is not a panacea to assess 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 1.13 illustrates the impact of a deeper financial-sector shock and of an oil supply shock. 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. For this, one must include within the model a probabilistic framework, which contains estimates of the distributions of relevant shocks.

**Macroeconomic Model-Based Confidence Intervals.** Work is now underway at the IMF on an estimated multicountry model that would be capable of producing baseline forecasts and fan charts, with all numerical assumptions—including distributions of shocks—

<sup>32</sup>For comparison, the fan chart now suggests that the risk of global recession is almost 20 percent.

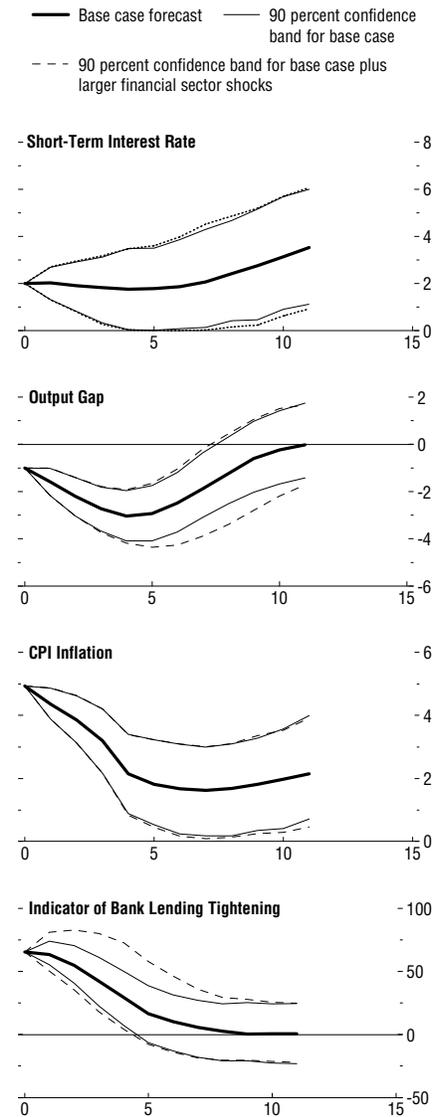
<sup>33</sup>A false signal would be a prediction of more than 50 percent probability of a global recession at a time when the global economy was expanding.

clearly spelled out.<sup>34</sup> 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, which link demand and supply shocks in different markets to macroeconomic variables.<sup>35</sup> Such a model would not be capable of producing forecasts with the full country detail provided by the WEO forecasts, but would have 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 to one or more variables.

Almost all of this research has so far been based on symmetric shock distributions and linear models, which will result in symmetric confidence bands, but staff has been working to introduce three sources of asymmetry: (i) the zero interest rate floor; (ii) a nonlinear output-inflation process, in which positive shocks to aggregate demand have larger inflationary implications when the economy is already overheating than when there is significant slack in the economy; and (iii) 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 the safety of their loans, a further increase in the value of the collateral may not affect their behavior very much).

The fourth figure provides some illustrative confidence intervals (fan charts) from this extended version of the GPM.<sup>36</sup> The central path lines within the fans represent the baseline solutions of the model for the

#### Illustrative GPM-Based 90 Percent Confidence Intervals



Source: IMF staff calculations.

<sup>34</sup>See Carabenciov and others (2008) for a description of a preliminary 3-region version of GPM that includes models for the United States, euro area and Japan. In the near term, GPM will be used to run scenarios and check the macro consistency in the desks' baseline forecasts much like the Federal Reserve Board of Governors uses macro models to check the consistency of their own judgmental forecasts.

<sup>35</sup>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 (2008).

<sup>36</sup>See Chen and others (2008) for a description of the model and methodology used to construct the GPM fan charts.

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.<sup>37</sup> The boundaries of the fans (the interior solid lines) represent 90 percent confidence intervals, which are derived from estimated historical distributions of shocks. The wider confidence intervals depicted in the fourth figure are based on building into GPM an assumption that shocks to credit conditions become larger when credit conditions are exceptionally tight. They suggest that the increased uncertainty would be all on the downside for the output gap, inflation and short-term interest rates.

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<sup>37</sup>Efficient model-based projections developed in policymaking 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 (2008).

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## Chapter 2: Country and Regional Perspectives

*Against the background of the global outlook outlined in Chapter 1, this chapter discusses how the main countries and regions that make up the world economy are coping with the tensions from continuing financial strains, high commodity prices, and slowing activity. It then draws policy lessons, with a view to finding an appropriate balance between resisting inflationary pressures, containing downside risks to short-term growth, and fostering longer-term growth prospects.<sup>1</sup>*

### United States and Canada: Bending but not Buckling

The U.S. economy has continued to grow at a moderate pace in the teeth of strong headwinds from financial turmoil, a continuing housing correction, and rising commodity prices. Preliminary data suggest that GDP rose 3.3 percent at an annualized rate in the second quarter as net exports surged and tax rebate checks buoyed consumer spending. However, taking the last three quarters together, the pace of growth has averaged only 1¼ percent, well below potential. Moreover, forward-looking indicators—such as consumer confidence and financial market conditions—remain at a low ebb—signaling slower or even negative growth in the second half.

Since the summer of 2007, declining residential investment has remained a major drag on output (subtracting about ¾ percentage points off growth), inventories have been compressed, and consumption has slowed. By contrast, there have been two sources of resilience. First, net exports have continued to be an important source of strength—adding 1½ percentage points to growth over the period—although surging oil prices kept the current account deficit at around 5 percent of GDP in the second quarter. Second, U.S. corporates have remained healthy, benefiting from relatively low leverage, high profits, and strong export demand, and have not cut back business spending or employment sharply despite the slowing economy and tighter credit conditions.

Can the U.S. economy continue to skirt recession? And what will be the character of the eventual recovery? Key determinants of the short-term outlook will be the behavior of U.S. households in the face of rising stress; the depth of the housing cycle; the pace of balance sheet repair in the financial system; and the extent to which inflation concerns require a turn in monetary policy.

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<sup>1</sup>Further analysis of regional and country developments is provided in regional economic outlook (REO) reports.

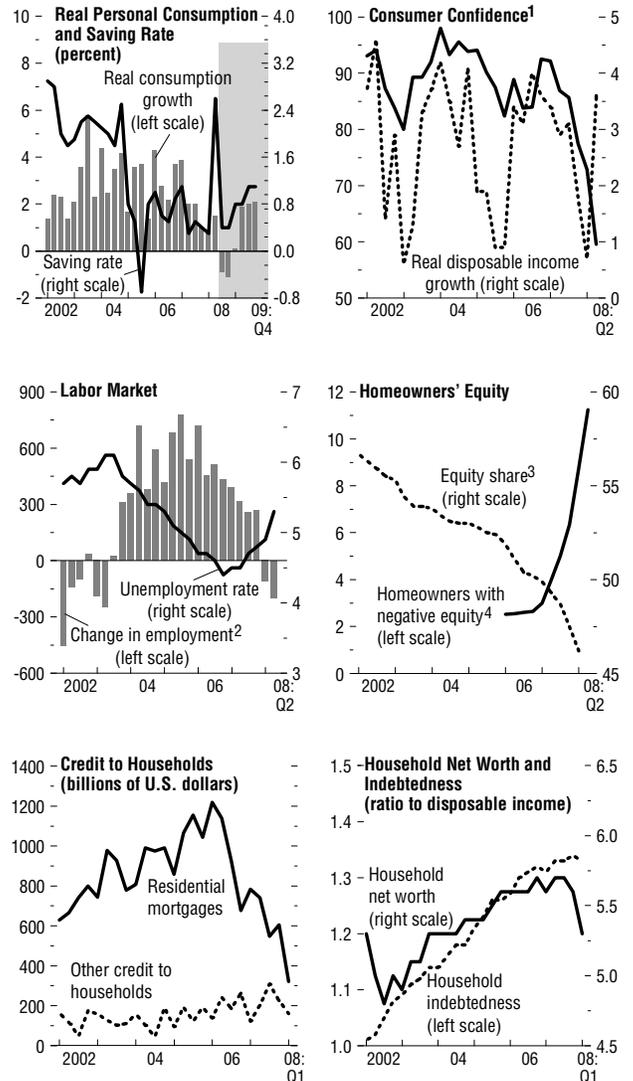
The U.S. consumer has remained a source of resilience for the economy, but now faces major cash-flow and balance sheet strains. Income growth has slowed as employment has dropped since January, the average work week has shrunk, unemployment has risen by a full percentage point, wages have stagnated, and gas prices have soared (see Figure 2.1). Falling house prices and the weakening equity market have contributed to a 10 percent drop in household net wealth relative to GDP. Moreover, access to credit has tightened, notably on mortgages but other sources of finance have also been affected.

A key element of the baseline forecast is that consumption will now show more obvious signs of weakness. In the projections, consumption declines moderately in the second half of 2008, as the stimulus from the tax rebate checks wears off, and then recovers at only a modest rate in 2009, held back by continuing cash flow strains and the need to rebuild savings.

Strains on households are in part a reflection of the massive continuing downturn in the housing market. The drop in house prices—in the range of -5 to -17 percent over the past year depending on index used—is unprecedented since the Great Depression, and as a result over 10 million households owe more on their homes than their market value. Housing-related activity has also plummeted—housing starts have fallen 60 percent from their peak. This has been a needed correction after a period of excess, and there are now some tentative signs of stabilization, for example in recent home sales data, although up to a third of sales now involve foreclosure, a sign of weakness rather than strength. The just-passed legislation to facilitate the refinancing of under-water mortgages with federal guarantees and to provide assurances that Fannie Mae and Freddie Mac, the government-sponsored enterprises (GSEs) that have accounted for about 80 percent of new mortgage lending in

**Figure 2.1. United States: Strains on the Consumer**

U.S. households are coming under increasing strain. So far they have maintained moderate spending growth, but drags on growth ahead include falling employment, tightening credit, and declining net worth, as well as rising fuel and food prices.



Sources: Haver Analytics; Moody's Economy.com; and IMF staff estimates.

<sup>1</sup>Michigan consumer sentiment, 1966:Q1 = 100, left scale.

<sup>2</sup>Quarterly change in total nonfarm payrolls, thousands.

<sup>3</sup>Owners' equity as a percent of household real estate.

<sup>4</sup>Millions of homeowners who owe more on their mortgages than their homes are worth.

recent quarters, would have access if needed to federal funding to meet liquidity and capital needs should also provide some support.

However, the housing correction is still far from complete, and the baseline projections do not anticipate a turn-around until mid-2009. Measures of house price valuation have improved but still remain well above historical norms, and markets are anticipating house prices to decline by a further 10 percent in the year ahead (although these forward markets are very thin). Moreover, while inventories of unsold homes have come down, they remain elevated, especially relative to the rate of sales, and mortgage rates have increased recently, because of continuing concerns about the adequacy of the GSEs' capital base. Thus, residential investment is projected to continue contracting through early 2009, albeit at a diminishing rate, and pressures on households from declining prices and rising foreclosures are expected to extend well into next year.

The difficulties in the U.S. financial sector have been at the core of the crisis in global financial markets, as covered in Chapter 1 of this report, and more extensively in the September 2008 *GFSR*. The authorities have taken strong steps to deal with immediate threats to systemic stability, but rising losses and declining profitability are taking a toll on financial sector balance sheets. The key implication for the U.S. outlook is that it will take considerable time to restore capital, reduce leverage, and regain market confidence. Tight bank lending conditions are now having a visible impact on the extension of new loans; and conditions are likely to remain tight throughout 2009. The impact is likely to be greater on households than corporates, which have stronger balance sheets and have maintained robust profit margins.

On the inflation front, rising energy prices boosted headline PCE inflation to 5.1 percent (12-month rate) in July 2008, while core PCE inflation picked up to 2.4 percent. Given the recent retreat in international oil prices, headline figures are likely now to start coming down, while the widening output gap, moderate wage increases, and a pick-up in productivity should all help to contain underlying inflation.

Putting the pieces of the puzzle together, the picture is of a weak second half of 2008, followed by a gradual recovery in 2009. On a year-over-year basis, growth would moderate from 2.0 percent in 2007, to 1.3 percent in 2008, and 0.7 percent in 2009 (Table 2.1). Measured from fourth quarter to fourth quarter, growth moderates from 2.3 percent in 2007 to 0.4 percent in 2008, and then rises to 1.5 percent in 2009—well below the usual pace of U.S. recoveries. Risks around this forecast are seen as moderately to the downside. The main concerns are that the housing correction may continue downwards all through 2009, that an emerging credit crunch could impose an ever greater constraint on activity (including on housing), and that inflation pressures prove more persistent, pushing the Fed to tighten despite a soft economy. The principal upside potential is that U.S. households and corporates are able to maintain their spending patterns better than expected despite the financial strains.

**Table 2.1. Advanced Economies: Real GDP, Consumer Prices, and Unemployment**  
(Annual percent change and percent of labor force)

	Real GDP				Consumer Prices				Unemployment			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Advanced economies</b>	<b>3.0</b>	<b>2.6</b>	<b>1.5</b>	<b>1.2</b>	<b>2.3</b>	<b>2.2</b>	<b>3.7</b>	<b>2.3</b>	<b>5.7</b>	<b>5.4</b>	<b>5.6</b>	<b>6.2</b>
United States	2.8	2.0	1.3	0.7	3.2	2.9	4.2	2.0	4.6	4.6	5.4	6.3
Euro area <sup>1</sup>	2.8	2.6	1.4	0.9	2.2	2.1	3.6	2.5	8.2	7.4	7.5	8.1
Germany	2.9	2.5	2.0	0.8	1.8	2.3	2.9	2.3	9.8	8.4	7.5	7.6
France	2.2	2.2	1.0	0.8	1.9	1.6	3.5	1.9	9.2	8.3	7.6	8.0
Italy	1.8	1.5	--	0.1	2.2	2.0	3.8	2.8	6.8	6.1	6.3	6.1
Spain	3.9	3.8	1.5	0.7	3.6	2.8	4.7	3.1	8.5	8.3	11.1	14.6
Netherlands	3.4	3.5	2.3	1.3	1.7	1.6	2.9	2.6	3.9	3.2	2.8	2.9
Belgium	2.9	2.8	1.6	1.0	2.3	1.8	4.6	2.7	8.2	7.5	7.3	8.1
Austria	3.4	3.1	2.1	1.5	1.7	2.2	3.4	2.5	4.8	4.4	4.3	4.5
Finland	4.9	4.5	2.6	2.0	1.3	1.6	3.9	2.5	7.7	6.8	6.2	6.1
Greece	4.2	4.0	3.0	2.8	3.3	3.0	4.4	3.2	8.9	8.3	8.1	8.0
Portugal	1.4	1.7	1.0	0.8	3.0	2.4	3.2	2.1	7.7	8.0	8.0	8.0
Ireland	5.7	6.0	-1.5	0.6	2.7	2.9	3.6	2.4	4.4	4.5	5.6	6.5
Luxembourg	6.1	4.5	2.9	3.9	2.7	2.3	4.0	2.5	4.4	4.4	4.7	4.8
Slovenia	5.7	6.1	4.3	3.7	2.5	3.6	5.9	3.3	5.9	4.8	4.8	5.0
Cyprus	4.0	4.4	3.4	3.5	2.2	2.2	4.9	3.9	4.6	3.9	3.9	3.9
Malta	3.4	3.8	2.5	2.3	2.6	0.7	4.1	2.7	7.3	6.4	6.5	7.0
Japan	2.4	2.1	1.0	1.1	0.2	0.1	1.6	1.1	4.1	3.8	4.1	4.4
United Kingdom <sup>1</sup>	2.9	3.1	1.4	1.1	2.3	2.3	3.8	3.0	5.4	5.4	5.5	5.7
Canada	3.1	2.7	1.0	1.9	2.0	2.1	2.6	2.5	6.3	6.0	6.2	6.3
Korea	5.1	5.0	4.1	4.3	2.2	2.5	4.9	4.2	3.5	3.3	3.1	3.0
Australia	2.7	4.3	2.7	2.8	3.5	2.3	4.4	3.5	4.8	4.4	4.2	4.7
Taiwan Province of China	4.9	5.7	3.7	3.4	0.6	1.8	4.5	2.9	3.9	3.9	3.9	3.9
Sweden	4.1	2.7	1.3	1.6	1.5	1.7	3.4	2.8	7.0	6.1	6.6	7.1
Switzerland	3.2	3.1	1.4	1.3	1.0	0.7	2.4	1.4	2.5	2.8	3.1	3.8
Hong Kong SAR	7.0	6.4	4.4	4.2	2.0	2.0	5.8	5.3	4.8	4.1	3.4	3.4
Denmark	3.9	1.7	1.0	0.5	1.9	1.7	3.0	2.7	3.9	2.8	1.8	2.6
Norway	2.5	3.7	2.7	2.5	2.3	0.8	4.0	3.2	3.4	2.5	2.5	3.0
Israel	5.2	5.3	4.0	3.3	2.1	0.5	4.0	2.0	8.4	7.3	6.7	7.0
Singapore	8.2	7.7	4.2	4.2	1.0	2.1	6.7	3.5	2.7	2.1	2.1	2.2
New Zealand <sup>2</sup>	1.6	3.1	1.0	1.9	3.4	2.4	4.2	3.7	3.8	3.6	4.0	4.3
Iceland	4.4	3.8	-0.3	-2.1	6.8	5.0	11.7	9.7	1.3	1.0	2.2	3.9
<i>Memorandum</i>												
Major advanced economies	2.7	2.2	1.2	0.8	2.3	2.2	3.5	2.1	5.8	5.4	5.7	6.2
Newly industrialized Asian economies	5.6	5.6	4.0	4.0	1.6	2.2	5.1	3.9	3.7	3.4	3.3	3.2

<sup>1</sup>Based on Eurostat's harmonized index of consumer prices.

<sup>2</sup>Consumer prices excluding interest rate components.

With this outlook, policy makers have a difficult task to find the right balance between the need to provide support to the economy and the risks on the inflation front. The present highly accommodative stance of monetary policy remains appropriate, although the Federal Reserve must continue to be vigilant on inflation, and be ready to move toward a more neutral stance as the economic recovery gathers steam and financial conditions improve. On the fiscal front, the stimulus package has provided well timed support, but the fiscal deficit is rising sharply, and is now projected at 4½ percent of GDP in 2009, the highest among the G-7 countries. The need for consolidation in the face of medium-term spending pressures and long-term challenges posed by demographics and rising medical costs constrain the room for further initiatives, and additional government support should be focused as needed on steps to support the housing market and financial system. In this latter respect, the authorities should build on the recent Treasury blueprint to put in place longer-term reforms to address revealed weaknesses in financial regulation and supervision, and contain potential moral hazard from the effective extension of the federal safety net.

Providing a suitable long-term framework for mortgage financing remains a particular challenge as recent events have cast doubt on the hybrid public-private model that remains in place.

In Canada, economic activity has slowed sharply since mid-2007, and growth is projected to come down from 2.7 percent in 2007 to 1.0 percent in 2008, before picking up to 1.9 percent in 2009. While the construction and energy sectors have benefited from high commodities prices, the real appreciation of the Canadian dollar, together with the U.S. slowdown, has hit manufacturing hard. Inflation has generally remained well anchored, in part reflecting the rising currency. The Bank of Canada eased interest rates by 150 basis point between December 2007 and April 2008, and has held rates steady since then. Banks have generally weathered the financial strains well so far, reflecting conservative regulation and low exposure to structured products.

### **Western Europe: Slowing Demand and High Inflation**

Western Europe is being hit by multiple shocks that are weakening economic activity but also sustaining inflation. Real GDP growth has stalled in the euro area, following a first quarter rebound. Growth was already noticeably weaker elsewhere during the first quarter, including in the United Kingdom and most Nordic countries, and conjunctural indicators now point to little growth throughout western Europe for the remainder of the year.

Economic growth is being slowed by a number of factors.<sup>2</sup> Relative to 2007, oil prices are some 60 percent higher in euro terms and, together with surging food prices, are squeezing already sluggish consumption growth.<sup>3</sup> Other things equal, standard rules-of-thumb would imply output losses in a broad range up to about 1 percent of GDP for the euro area, less for oil producers such as the United Kingdom or Norway. Compared to other surges over the past decade, the latest run-up in oil prices appears to be driven to a larger extent by oil-supply constraints rather than prospects for stronger demand and thus might have a larger effect on output, as did, for example, the large shocks experienced during the 1970s (Bruno and Sachs, 1985). However, in the decades since then western Europe's monetary policy frameworks have become more robust, and structural policies now emphasize raising labor utilization, rather than prolonged unemployment support and early retirement in response to falling labor demand, policies that amplified the supply-side impact of earlier oil price shocks (Blanchard and Wolfers, 2000). Moreover, wage setting has

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<sup>2</sup>See also the forthcoming *Regional Economic Outlook: Europe*, where the implications for Europe of the commodity prices shocks and the ongoing financial turmoil are discussed in more detail.

<sup>3</sup>CPI food price inflation in the euro area increased from around 2 percent in mid-2007 to 6.7 percent in July 2008, contributing 0.9 percentage point to the 4.0 percent June headline CPI inflation rate. Energy contributed 1.4 percentage points. Higher food prices mainly redistribute income within western Europe and thus have much smaller direct effects on economic growth than high oil prices (see Chapter 3).

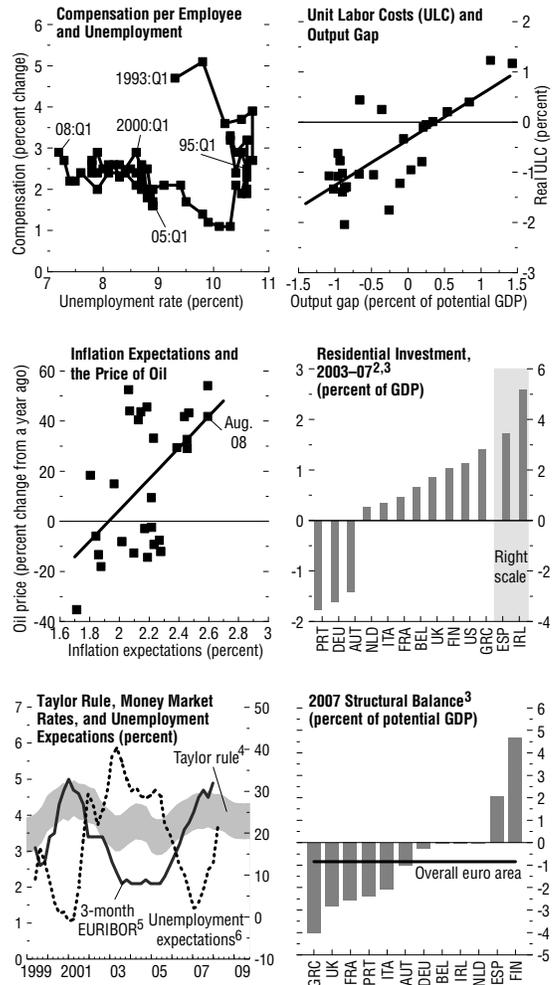
become more decentralized and responsive to economic conditions, even if wage indexation schemes remain in some countries. As a result, while oil prices increased seven-fold over 1999–2008, the response of wages has remained generally subdued, unlike during the 1970s, and this should help contain the output losses to the recent shocks (see Figure 2.2).

While oil and food price hikes are undercutting real disposable incomes, tightening financial conditions are raising the costs of household mortgages and slowing investment. European banks entered the turmoil from a position of strength relative to earlier in the current decade but have been exposed to losses on their holdings of U.S. mortgage-related assets and overall credit quality has deteriorated since 2007. In this challenging environment, central banks have tried to ease liquidity pressures on banks, but banks continue to retrench from risk-taking, to tighten lending standards, and to raise lending rates, which are now appreciably above pre-turmoil levels. Households and firms operating in real estate are struggling under growing debt burdens, particularly in countries where floating-rate mortgages indexed to short-run interest rates prevail, such as Ireland, Spain, and the United Kingdom. In real terms, residential property prices are falling in these and some other countries, while slowing quickly more generally (see Box 1.2).

Nonetheless, various factors suggest that an outright credit crunch will probably be avoided. While residential real estate generally accounts for a larger share of activity in western Europe than the United States, the recent expansion of residential investment was generally less pronounced, except in Greece, Finland, Ireland, Spain, and the United Kingdom. Furthermore, the financial vulnerabilities exposed in the United States are less present: household saving is generally higher and debt lower, non-prime lending much less widespread, loan-to-value ratios more conservative, and opportunities for equity withdrawal much more limited. This should help contain pernicious feedback loops between these economies'

**Figure 2.2. Western Europe: Slowing Demand and High Inflation<sup>1</sup>**

Although headline inflation is high, wages have generally remained subdued, and slowing activity and rising unemployment fears should restrain demand for pay hikes. In the euro area, monetary conditions are on the tight side by the standards of recent history, and countries have little room for discretionary fiscal stimulus, lest they breach the Maastricht 3 percent of GDP deficit limit.



Sources: European Central Bank; European Commission; Eurostat; Haver Analytics; Thomson Datastream; and IMF staff estimates.

<sup>1</sup>Data refer to the euro area unless otherwise noted.

<sup>2</sup>Deviation from 1993–2002 average.

<sup>3</sup>AUT: Austria; BEL: Belgium; FIN: Finland; FRA: France; DEU: Germany; GRC: Greece; IRL: Ireland; ITA: Italy; NLD: Netherlands; PRT: Portugal; ESP: Spain; UK: United Kingdom.

<sup>4</sup>The formula gives equal weight (0.5) to the deviation of breakeven inflation from the inflation target and to the output gap; the lower band is based on a natural rate equal to 3.5 percent; the upper band is based on a natural rate equal to 4.5 percent.

<sup>5</sup>Euro interbank offer rate.

<sup>6</sup>Through August 2008. Right scale.

real and financial sectors (see also Chapter 4). However, even if an outright credit crunch is not likely, the downturn in residential real estate will probably have an appreciable short-run impact in some countries (e.g., Ireland, Spain, the United Kingdom) and, with the exception of a few countries (e.g., Austria, Germany, and Switzerland), make for noticeable medium-run headwinds. Turning to the nonfinancial corporate side, while European businesses are relatively dependent on bank lending and are more leveraged than their U.S. peers, which makes investment vulnerable to the ongoing tightening of credit, their balance sheets are stronger than at the onset of the previous credit cycle downturn.

The euro area's external current account was close to balance in 2007 (Table 2.2). Going forward, however, exports would slow in line with world demand and the current account is expected to deteriorate, reflecting also a real effective exchange rate that has appreciated to the strong side of medium-run fundamentals, notwithstanding some weakening lately. By contrast, the United Kingdom's current account is in noticeable deficit and the pound has depreciated by more than 10 percent in real effective terms since the onset of the market turmoil.

The WEO baseline projections thus envisage a significant slowdown in activity across western Europe. Euro area growth would moderate from 2.6 percent in 2007, to 1.4 percent and 0.9 percent, respectively, in 2008–09. The picture is clearer on a fourth-quarter-on-fourth-quarter basis (q4/q4): growth would decelerate from 2.2 percent in 2007 to 0.7 percent in 2008 before reaccelerating to 1.6 percent in 2009. In the United Kingdom, q4/q4 real GDP growth would fall from 2.8 percent in 2007 to 0.7 percent in 2008, and then reaccelerate to 1.9 percent in 2009. The risks around these growth projections are large but broadly balanced. On the downside, risks include further increases in energy and food prices; an accelerated deleveraging in the financial sector set off by broader asset price deflation and a global credit crunch; and an abrupt unwinding of global imbalances and sharp appreciation of the euro. On the upside, risks relate to still buoyant employment and therefore higher-than-projected consumption. There could also be some decline in volatile energy and food prices.

Amid the various cross-currents in western European economies, the outlook for inflation is more benign than current headline numbers suggest, although unusually

**Table 2.2. Advanced Economies:  
Current Account Positions**  
(Percent of GDP)

	2006	2007	2008	2009
<b>Advanced economies</b>	<b>-1.3</b>	<b>-1.0</b>	<b>-1.2</b>	<b>-1.1</b>
United States	-6.0	-5.3	-4.8	-4.2
Euro area <sup>1</sup>	0.3	0.2	-0.9	-1.1
Germany	6.1	7.6	6.4	5.7
France	-0.7	-1.2	-3.1	-3.4
Italy	-2.6	-2.5	-3.3	-3.3
Spain	-8.9	-10.1	-10.3	-9.4
Netherlands	8.2	6.8	5.6	5.1
Belgium	2.7	1.9	0.4	-0.1
Austria	2.4	3.2	3.2	3.0
Finland	4.6	4.6	3.4	2.9
Greece	-11.1	-14.1	-13.7	-13.8
Portugal	-10.1	-9.9	-11.7	-12.0
Ireland	-3.6	-5.4	-5.0	-4.4
Luxembourg	10.5	9.9	9.0	8.6
Slovenia	-2.8	-4.9	-4.7	-4.7
Cyprus	-5.9	-9.7	-10.9	-8.5
Malta	-8.2	-5.4	-6.7	-6.2
Japan	3.9	4.8	3.7	3.5
United Kingdom	-3.9	-4.3	-4.3	-3.8
Canada	1.4	0.9	1.0	--
Korea	0.6	0.6	-1.3	-1.0
Australia	-5.5	-6.1	-6.1	-4.2
Taiwan Province of China	7.2	8.6	7.4	6.7
Sweden	8.5	8.5	6.4	5.8
Switzerland	14.7	16.9	12.6	10.9
Hong Kong SAR	12.1	13.5	11.1	9.4
Denmark	2.9	1.1	1.4	2.0
Norway	17.3	15.4	20.5	21.3
Israel	6.0	3.1	0.1	0.8
Singapore	21.8	24.3	19.1	17.0
New Zealand	-8.6	-7.9	-7.8	-7.8
Iceland	-25.4	-15.6	-16.7	-12.3
<i>Memorandum</i>				
Major advanced economies	-2.0	-1.5	-1.6	-1.5
Euro area <sup>2</sup>	--	0.3	-0.9	-1.1
Newly industrialized Asian economies	5.3	6.2	4.5	4.1

<sup>1</sup>Calculated as the sum of the balances of individual euro area countries.

<sup>2</sup>Corrected for reporting discrepancies in intra-area transactions.

uncertain. Headline inflation is running around 3–4 percent in many countries, up from around 2 percent in the third quarter of 2007. However, excluding energy and food, core inflation has broadly moved sideways at less than 2 percent in the euro area and the United Kingdom, consistent with subdued wage pressure. Inflationary expectations have generally remained well anchored, although somewhat less so in the United Kingdom than in the euro area.

With further weakening of economic activity lying ahead and considering high risk premia, monetary conditions already quite tight, the response of central banks to rising headline inflation has been muted. The ECB hiked policy rates by 25bp to 4.25 percent in July 2008, the first move since June 2007, while the Bank of England has kept rates unchanged at 5 percent since April 2008. WEO projections see headline inflation falling below 2 percent in the euro area and to close to 2 percent in the United Kingdom by end–2009. These central banks can thus afford to keep policy rates on hold. If their economies continue to slow, as envisaged in the baseline, scope for lowering rates should emerge provided that underlying inflation remains contained. In Norway and Sweden, where activity and inflation are projected to be stronger, central banks have been in a tightening mode. Going forward, policy rates can be kept on hold but with a tightening bias.

The fiscal positions of western European countries differ widely but many have made significant progress toward consolidation since the previous downturn. Even with some widening in 2008 related to both cyclical factors and policy support, the general government deficit for euro area countries would still average around 1½ percent of GDP, 1½ percentage points less than in 2003–04. However, fiscal deficits of some countries (France, Greece, Ireland, Italy, Portugal) are still distant from their medium-term objectives and, in some cases, at risk of exceeding the Maastricht 3 percent of GDP deficit limit in the near term. The United Kingdom's fiscal position, a deficit of 3 percent of GDP projected for 2008, is considerably weaker than before the previous downturn. Between short-run falls in demand and supply on the one hand and long-run population aging-related challenges on the other hand, fiscal policy should mainly be guided by medium-run objectives. In the current setting this means that euro-area countries that have reached their medium-term close-to-balance or surplus objectives could consider additional discretionary loosening should downside growth risks materialize; others should continue to adjust at a pace of at least ½ percent of GDP per annum but can let automatic stabilizers operate freely around the adjustment path in response to weakening activity, except when this might lead to breaches of the fiscal rules. Similarly, the United Kingdom needs to adjust to conform with its fiscal rules and therefore is targeting fiscal adjustment of around ½ percent of GDP per annum for 2009–10.

The continuing financial turmoil presents important policy challenges on various fronts, including on account of complex cross-border financial linkages and spillovers. The latter is a particular challenge for E.U. countries, given their quest to build a single market in financial services. Addressing this challenge will require movements toward more joint responsibility and accountability for financial stability, notably for crisis prevention,

management, and resolution, in line with the commitments that have been made in the ECOFIN Council of Finance Ministers in May 2008.<sup>4</sup>

The emphasis on policies to limit the damage from the financial turmoil should, however, not distract attention from structural policy challenges. Ten years following the introduction of the euro, the main medium-term policy challenge facing euro area member countries is to make economic union as successful as monetary union (Box 2.1). In this regard, productivity growth has lagged that in other advanced economies and persistent intra-euro-area current account divergences are raising concerns. Accordingly, the structural reform momentum needs to be kept up and re-oriented in a coordinated manner to improve adjustment in response to intra-area disparities. The ongoing reforms are bearing fruit, contributing to the marked growth in employment and to improved productivity in liberalized sectors. However, large parts of the services sector still remain unaffected, forfeiting important income, resilience, and inflation benefits. Thus, the specific reform recommendations under the Lisbon Agenda that concern the euro area as a whole appropriately emphasize accelerating services market reform and financial integration. Greater consistency of National Reform Programs with these euro-area recommendations is needed, requiring enhanced policy coordination.

### **Advanced Asia: Living with Terms-of-Trade Shocks**

Although growth in Japan held up well through the first quarter, rising commodity prices and weakening external demand have recently started to weigh on economic activity. In the second quarter of 2008, the economy contracted at a 2.4 percent quarter-on-quarter annualized rate, and growth over the last four quarters was around 1 percent. The recent decline was led by private consumption and residential investment, while the contribution from net exports fell to zero (see Figure 2.3).

Recent indicators point to continued weakness ahead. Rising input costs and diminishing profit expectations are weighing on companies' investment plans, while rising food and fuel prices and weakening wage prospects have pushed consumer confidence to low levels. Exports have also slowed, particularly to Europe. Although financial conditions have tightened to a lesser extent than in other major economies, in part owing to Japanese banks' lower exposure to securitized products, the stock market has recently fallen sharply, driven mainly by foreign selling on concerns about the weaker growth outlook. Bank CDS spreads

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<sup>4</sup>For further details see May 15, 2008, "[ECOFIN Council of Finance Ministers adopt conclusions on financial supervision and provision of financial stability in the EU](#)".

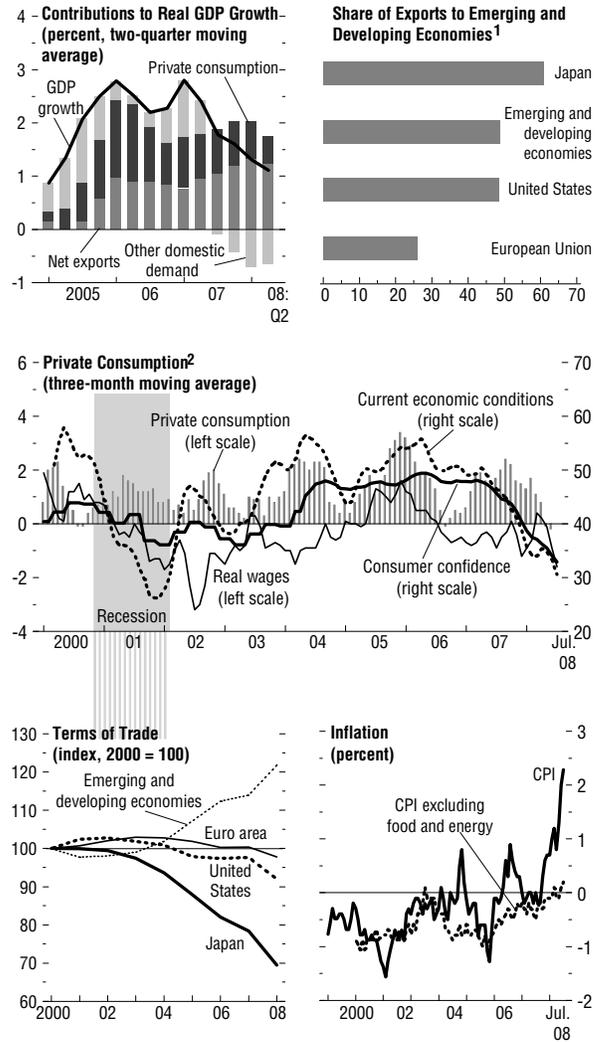
have also risen because of concerns over global financial stability and rising credit costs from a slowing domestic economy.<sup>5</sup>

Headline inflation has risen well above the 2007 level, to the two percent range, on the back of higher food and fuel prices, but core inflation, excluding food and fuel, remains around zero.<sup>6</sup> Firms have started to pass through cost increases to consumers, but they are also granting smaller wage increases as activity is slowing, and unit labor costs continue to fall on a year-on-year basis. Measures of inflation expectations suggest that short-term expectations have edged up, while long-term expectations remain contained.

Although the trade surplus deteriorated because of a higher bill for commodity imports, rising investment income helped to keep the current account balance near historical highs. Through March 2008, the yen appreciated against other major currencies, particularly the U.S. dollar, reflecting an unwinding of carry trades in volatile foreign exchange markets (see Figure 2.3). However, in recent months, the currency started to weaken again, as expectations of monetary tightening dissipated amidst slowing growth. Given the medium-term prospects for continued large external surpluses, the yen is still assessed to be undervalued relative to medium-term fundamentals.

### Figure 2.3. Japan: How Well Would the Economy Weather a Terms-of-Trade Shock?

The Japanese economy has been particularly exposed to a deterioration in the terms of trade. Robust exports to emerging and developing economies should provide support for growth, but the outlook for consumption is weakening.



Sources: Haver Analytics; IMF, *Direction of Trade Statistics*; and IMF staff calculations.

<sup>1</sup>Percent of total exports, 2006–08 averages.

<sup>2</sup>Year-over-year percent changes of real private consumption and real earnings; current economic conditions, Econ Watch Survey diffusion index; and consumer confidence, all households diffusion index.

<sup>5</sup>Although liquidity pressures have been less acute in Japan than in other G3 economies, the BoJ's significant liquidity provision also contributed to stabilizing money markets. See the *Selected Issues* paper accompanying the 2008 Report on Article IV consultations with Japan (available at [www.imf.org](http://www.imf.org)) for more details on the impact of the global financial turmoil on the Japanese economy (IMF, 2008a).

<sup>6</sup>Core inflation on the authorities' definition (excluding only fresh food) has been running around 2 percent, reflecting recent increases in fuel and other commodity prices.

Against this backdrop, a key question going forward is how resilient the economy will be to a significant deterioration in the terms of trade. As shown in Figure 2.3, Japan has experienced a much larger decline in its terms of trade in the past years than other major advanced economies. Several factors have so far mitigated the impact on activity. First, robust exports to emerging and developing economies, many of which are exporters of commodities, provide a natural hedge against the deterioration in Japan's terms of trade. Second, although Japan is dependent on imported oil for almost all of its domestic needs, the efficiency with which oil is used in the economy is high: production of one unit of output required almost 4 times more oil in the United States than in Japan in 2007. Lastly, with underlying price pressures subdued, monetary conditions are likely to remain accommodative.

The outlook remains for a modest slowdown in 2008–09, to about 1 percent, somewhat below potential. Robust, albeit moderating, growth in emerging economies should continue to support exports, which are expected to remain the main driver of the economy. Private consumption is expected to continue to moderate because of weakening prospects for wage increases and surging food and fuel prices, while the weakening demand and profit outlook will slow private investment.

While the outlook is subject to considerable uncertainty surrounding the external environment, the overall risks are slightly tilted to the downside. Downside risks mainly relate to a larger-than-expected slowdown in emerging and developing economies and a renewed bout of financial instability. On the domestic front, high commodity prices could weigh further on corporate profits and household incomes. Upside risks relate to a faster-than-expected recovery in residential investment following the tightening of regulatory policies last year.

Given the outlook for a further weakening of domestic demand and subdued inflationary pressures, the Bank of Japan (BoJ) is appropriately retaining an accommodative monetary policy stance and keeping interest rates at the current low levels until uncertainties over the outlook are resolved. Japan has been battling deflation for nearly a decade, and although exit from this problem appears more likely now, it is not yet assured. Core inflation on the authorities' definition is close to the 2 percent upper bound of the "understanding" of price stability by the BoJ Policy Board Members, wage growth is slowing, and inflation expectations are contained. There are few indications of excessive risk-taking in asset markets (the second perspective of the BoJ's monetary policy framework) or of bubbles in the financial or real estate markets.<sup>7</sup>

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<sup>7</sup>The BoJ's monetary policy framework encompasses two perspectives: the short-term outlook for economic activity and prices and a longer-term outlook for risks to the outlook, including from asset price bubbles.

A sharper-than-expected slowdown of the economy may justify a further reduction of the policy interest rate, although with the current rate already at 50 basis points, the room for easing is limited. On the other hand, if a sharp rise in inflation concerns were to result in a significant tightening of monetary policy in other major economies and a further weakening of the yen, the BoJ may need to consider raising policy rates if such cross-border spillovers began to undermine domestic price stability. In this context, the BoJ's move to greater transparency by expanding the discussion of the Policy Board Members' views on the outlook and the risks to it, and to place a greater emphasis on the 1 percent median of the "understanding of price stability" in its communications, should help to guide inflation expectations.

Looking beyond the near term, the Japanese economy continues to face a rapidly aging population and rising public debt. The pace of fiscal consolidation has understandably slowed in the environment of diminishing global growth, with the general government primary deficit excluding social security expected to widen slightly in 2008 and 2009, and discussions on raising the consumption tax rate have been postponed.<sup>8</sup> However, building fiscal space for projected increases in expenditures owing to demographic pressures remains a top priority for the medium term. The authorities' current plans, which target a primary balance by FY2011, need to be strengthened further, to prevent net public debt from trending up.

Australia and New Zealand are slowing, after prolonged economic expansions driven by commodity and housing booms. The expansions have stretched productive capacity, pushing inflation to historical highs. The authorities have responded by tightening monetary policies, and domestic demand pressures have eased. Real GDP growth in Australia is projected to fall below potential, to about 2¾ percent in 2008 and 2009 from 4¼ percent in 2007. The recent moderation in domestic demand has prompted the Reserve Bank of Australia (RBA) to shift to a less restrictive policy stance. The RBA's cautious approach to easing is appropriate to ensure that high core inflation does not persist, given greater-than-usual uncertainties about the outlook. With the Commonwealth government's budget in a solid surplus and no net public debt, fiscal policy can focus on supporting monetary policy by allowing automatic stabilizers to operate and saving windfall revenues. The outlook for inflation has eased in New Zealand, prompting the central bank to cut interest rates in July.

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<sup>8</sup>In late August, the Japanese government put forward an economic-stimulus package aimed at supporting faltering growth. The government's proposal is reported to include spending of around \$17 billion (0.4 percent of GDP); possible income tax breaks for households; and government guarantees for business loans. The exact size and content of the package and hence its likely impact on the economy remain uncertain at the time of writing, ahead of the parliamentary debates, particularly in light of the Prime Minister's resignation.

## Emerging Asia: Balancing Risks to Growth and Price Stability

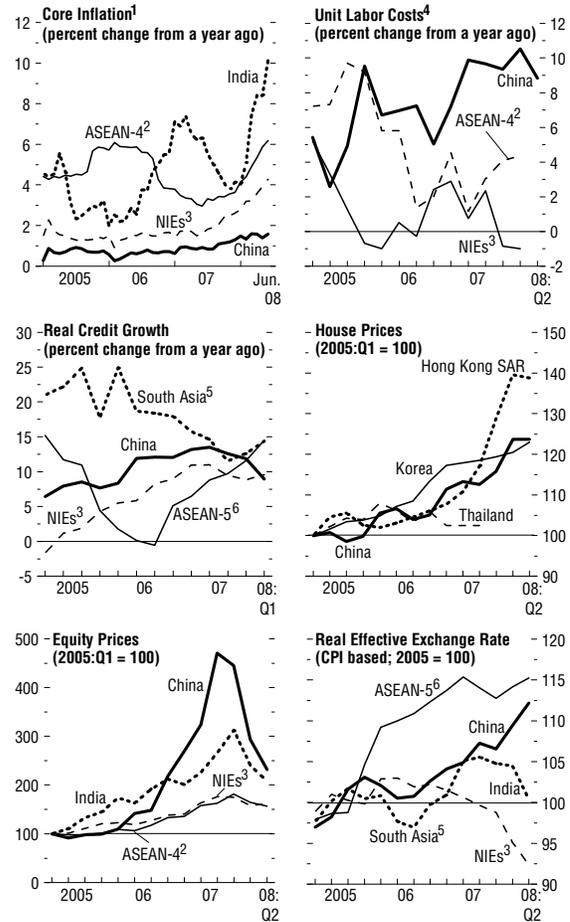
The economic cycle in emerging Asia started to turn in early 2008. Growth in China eased to 10½ percent (year-on-year) in the first half of 2008 from 12 percent in 2007, largely because of slowing exports. Activity continued to be supported by steady investment growth and accelerating consumption. In India, growth in the second quarter came down to around 8 percent, on the back of weakening investment, while private consumption and export growth have held up well. In the NIEs and in the ASEAN countries, activity has also been decelerating. Domestic demand has softened, as rising food and fuel prices have started to weigh on consumption, while declining profit margins and weakening demand have prompted firms to scale back their investment plans. Vietnam is undergoing a sharp correction as the demand boom caused by large capital inflows is unwinding.

Financial markets have weakened in recent months, driven by increasing concerns for the global outlook. Equity markets that experienced the largest run-up in prices in recent years—during 2005–07, prices more than quadrupled in China and tripled in India—declined most during the first half of 2008 (see Figure 2.4). Corrections were smaller in the NIEs and in ASEAN, where the run-up in prices had been more subdued. In some countries, borrowing spreads have risen for banks relying on wholesale funding, but these pressures have so far been manageable.

Current accounts have generally come under pressure from rising import bills for commodities and slowing export growth, while capital account and exchange rate developments varied. Capital inflows to China have remained strong, as evidenced by a continuing surge of foreign reserves, while capital flows to some other countries have become more volatile, particularly to those running sizable external deficits. Their currencies

**Figure 2.4. Emerging Asia: Mounting Inflation Pressures**

Underlying inflationary pressures rose across emerging Asia in recent quarters. Wage increases, despite productivity improvements, have contributed to a buildup in inflation in some cases. In part owing to a rapid expansion of bank loans, house prices have continued to trend upward. In contrast, an extended runup in equity prices ended with a sharp correction in early 2008, triggered by the global financial turmoil. Exchange rates have failed to provide much respite for inflation, because currencies have either appreciated too little or weakened.



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

<sup>1</sup>The definition of core inflation varies across countries though it generally excludes food and energy prices from overall CPI.

<sup>2</sup>Indonesia, Malaysia, the Philippines, and Thailand.

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

<sup>4</sup>Calculated as overall compensation divided by GDP, except for China where wages are used instead of compensation and Indonesia and Malaysia where calculations cover only the manufacturing sector. Data for China need to be treated with caution because of their partial coverage, biased toward large state-owned manufacturing enterprises.

<sup>5</sup>Bangladesh, India, Maldives, Nepal, Pakistan, and Sri Lanka.

<sup>6</sup>ASEAN-4 and Vietnam.

have come under pressure, prompting central banks to intervene in support (India, Pakistan, and Vietnam). The Korean won has also weakened, largely owing to a turnaround in the current account balance to a small deficit, on the back of worsening terms of trade. Differing nominal exchange rate developments, in turn, have driven divergent trends in real effective exchange rates, with the Chinese renminbi and the ASEAN currencies continuing to appreciate, and the South Asian and NIEs' currencies weakening (see Figure 2.4).

Growth in the region is projected to moderate to under 8 percent in 2008–09 from 9¼ percent in 2007, a markup of about ¼ percent in 2008 compared to the April *World Economic Outlook*, largely owing to upward revisions for China (Table 2.3). This would still leave growth around trend in most countries. Weakening external demand is likely to weigh on exports, but, in some cases, the impact may be mitigated by still loose macroeconomic policies and currency depreciation. Investment will also moderate, as rising cost pressures squeeze corporate profits. Consumption will ease because of rising fuel and food prices, although subsidies, which are common in the region, may cushion the impact on purchasing power. The risks to the outlook are moderately to the downside. The main concern is that a renewal of financial market stress and a sharper-than-anticipated global slowdown could further weigh on activity. On the upside, domestic demand may continue to grow robustly, while falling commodity prices could provide a boost to real incomes.

**Table 2.3. Selected Asian Countries: Real GDP, Consumer Prices, and Current Account Balance**  
(Annual percent change unless noted otherwise)

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Emerging Asia<sup>3</sup></b>	<b>9.2</b>	<b>9.3</b>	<b>7.7</b>	<b>7.7</b>	<b>3.8</b>	<b>4.9</b>	<b>7.7</b>	<b>6.0</b>	<b>5.8</b>	<b>6.8</b>	<b>5.3</b>	<b>5.3</b>
China	11.6	11.9	9.7	9.8	1.5	4.8	7.0	4.9	9.4	11.3	9.9	10.5
<b>South Asia<sup>4</sup></b>	<b>9.2</b>	<b>8.7</b>	<b>7.5</b>	<b>7.2</b>	<b>6.5</b>	<b>6.8</b>	<b>8.5</b>	<b>8.4</b>	<b>-1.4</b>	<b>-1.7</b>	<b>-3.8</b>	<b>-4.2</b>
India	9.8	9.3	7.9	7.7	6.2	6.4	7.7	6.8	-1.1	-1.4	-3.2	-3.7
Pakistan	6.9	6.4	5.8	4.5	7.9	7.8	11.0	16.5	-3.9	-4.8	-8.7	-8.5
Bangladesh	6.5	6.3	6.6	5.3	7.1	8.4	8.7	9.3	1.2	0.9	0.6	0.7
<b>ASEAN-5</b>	<b>5.7</b>	<b>6.3</b>	<b>5.6</b>	<b>5.8</b>	<b>8.1</b>	<b>4.4</b>	<b>10.4</b>	<b>7.5</b>	<b>4.8</b>	<b>5.1</b>	<b>3.0</b>	<b>1.5</b>
Indonesia	5.5	6.3	6.1	6.3	13.1	6.4	10.6	8.7	3.0	2.5	2.0	0.8
Thailand	5.1	4.8	5.3	5.3	4.6	2.2	7.6	4.1	1.1	6.4	2.2	-0.8
Philippines	5.4	7.2	5.2	5.1	6.2	2.8	10.3	8.0	4.5	4.4	1.7	0.4
Malaysia	5.8	6.3	5.3	5.5	3.6	2.0	5.7	5.3	16.1	15.6	14.1	12.9
Vietnam	8.2	8.5	6.0	6.0	7.5	8.3	24.0	14.0	-0.3	-9.9	-12.2	-10.4
<b>Newly industrialized Asian economies</b>	<b>5.6</b>	<b>5.6</b>	<b>4.0</b>	<b>4.0</b>	<b>1.6</b>	<b>2.2</b>	<b>5.1</b>	<b>3.9</b>	<b>5.3</b>	<b>6.2</b>	<b>4.5</b>	<b>4.1</b>
Korea	5.1	5.0	4.1	4.3	2.2	2.5	4.9	4.2	0.6	0.6	-1.3	-1.0
Taiwan Province of China	4.9	5.7	3.7	3.4	0.6	1.8	4.5	2.9	7.2	8.6	7.4	6.7
Hong Kong SAR	7.0	6.4	4.4	4.2	2.0	2.0	5.8	5.3	12.1	13.5	11.1	9.4
Singapore	8.2	7.7	4.2	4.2	1.0	2.1	6.7	3.5	21.8	24.3	19.1	17.0

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.

<sup>2</sup>Percent of GDP.

<sup>3</sup>Consists of developing Asia, the newly industrialized Asian economies, and Mongolia.

<sup>4</sup>Includes Maldives, Nepal, and Sri Lanka.

Headline CPI inflation has soared on the back of recent increases in food prices and administered fuel prices, and pressures are becoming increasingly broad based. In China, headline CPI inflation peaked at 8½ percent in April, pushed up by food supply disruptions,

but has eased somewhat in recent months. In India, inflation jumped to almost 8 percent in May and June. Underlying inflationary pressures have increased, as high resource utilization and robust credit growth have created fertile ground for second-round effects (see Figure 2.4). Insufficient policy tightening, as evidenced by negative real interest rates, has also contributed. In China, core inflation has been rising gradually, albeit from a very low base. Although rapid investment has helped relax capacity constraints, wage growth seems to have picked up recently, outpacing productivity growth, and house prices have continued to climb.<sup>9</sup> In India, core inflation rose to 10 percent in June.

Although increases in food and fuel prices may subside in the coming months, inflation is expected to remain at elevated rates over the near term. Headline inflation is projected to rise to about 7¾ percent year-on-year in 2008 from 5 percent in 2007, before declining to 6 percent in 2009. Underlying inflationary pressures are also likely to remain high in the environment of tight resource utilization and still loose macroeconomic policies. There are upside risks to these projections, related to rising inflation expectations and the possibility of future shocks to food and fuel price inflation.

Responses to rising inflation have varied across the region. Some economies tightened monetary policy—by hiking interest rates (India, Indonesia, Korea, the Philippines, Thailand, Taiwan Province of China, and Vietnam), tightening reserve requirements (China and India) and creating more scope for appreciation in the exchange rate band (Singapore). India and Korea also intervened in the foreign exchange market to support their currencies in an effort to contain inflation. Countries that have continued to accumulate foreign reserves (particularly, China) have partially sterilized them through the issuance of bonds and increases in reserve requirements to contain the buildup of liquidity. Offsetting the effects of monetary tightening, the fiscal policy stance has been eased in many countries, however, reflecting significant increases in fuel subsidies. Although several countries have raised administered fuel prices (for example, China, India, Malaysia, and Vietnam), the increase was small compared to the increase in world fuel prices and in some cases resources raised have been used to increase other expenditures, for example, food subsidies. Several major rice exporters in the region (Cambodia, China, India, and Vietnam) introduced export bans, quotas or taxes to raise domestic food supplies and lower domestic prices, adding to pressure on world prices.

Against this background, the main policy dilemma for the region is how to strike a balance between maintaining brisk growth and not losing control over inflation. The considerable uncertainty regarding the global economic environment, notably the path of energy and food prices, and the wide divergence in many countries between headline and

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<sup>9</sup>Wage data for China need to be treated with caution because of their partial coverage, with a bias toward large state-owned manufacturing enterprises. Nonetheless, wage changes may be indicative of the underlying inflation dynamics.

core inflation, are complicating policymaking. However, given the potentially large output costs of reigning in inflation should expectations become unanchored, countries should err on the side of caution. In some countries—in particular where growth is expected to remain strong, signs of second-round effects are clear, and monetary policy credibility has not yet been firmly established—a tightening of macroeconomic policies will be required (for example, Indonesia, Malaysia, and Vietnam). In other countries, including those in which domestic demand is weakening and some tightening has already taken place, a wait-and-see approach would be justified, although authorities would need to remain alert to the potential of falling behind the curve (Thailand and the Philippines). In countries where credit has been expanding rapidly and house prices have been rising, monetary and financial policies will need to be vigilant against the risks of asset price bubbles (see Figure 2.4).

Monetary policy tightening should be the first line of defense against rising inflation, but may need to be complemented in some cases by greater exchange rate flexibility or fiscal actions. In countries with limited monetary policy independence (particularly, China and Malaysia), allowing faster exchange rate appreciation would help to foster a needed shift from external to domestic sources of demand, while lowering the cost of sterilizing foreign exchange inflows. In countries where higher interest rates risk fueling “hot money” inflows or where monetary transmission mechanism is weak, a further tightening of reserve requirements could be attempted (China and India), but limitations of such strategy (particularly, the burden it places on smaller banks) need to be taken into account.

Fiscal restraint could help to reduce inflation pressures, especially in countries where rising food and fuel subsidies, as well as public wage increases have weakened fiscal positions and contributed to price pressures.<sup>10</sup> In countries where significant risks to fiscal sustainability exist (India and Pakistan), medium-term considerations also call for a fiscal correction. In the environment of rising commodity prices, a tightening of fiscal policy requires scaling back and improving targeting of costly and distortionary fuel subsidies, which are preventing the needed adjustment to price shocks while weakening the public sector balance sheet.

### **Latin America and the Caribbean: Heading off the Inflationary Threat**

Like other parts of the world, Latin American economies are faced by an awkward combination of slowing activity and increasing inflationary pressures. After four years of strong growth, the pace eased across the region in the first half of 2008, largely due to moderating export growth. Domestic demand has remained quite robust so far this year, sustained by terms of trade gains for commodity exporters, but is expected to be dampened

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<sup>10</sup>A number of governments in emerging Asia are considering stimulus packages aimed to support slowing growth.

**Table 2.4. Selected Western Hemisphere Countries: Real GDP, Consumer Prices, and Current Account Balance***(Annual percent change unless noted otherwise)*

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Western Hemisphere</b>	<b>5.5</b>	<b>5.6</b>	<b>4.5</b>	<b>3.7</b>	<b>5.3</b>	<b>5.4</b>	<b>7.8</b>	<b>7.1</b>	<b>1.5</b>	<b>0.4</b>	<b>-0.6</b>	<b>-1.5</b>
<b>South America and Mexico<sup>3</sup></b>	<b>5.4</b>	<b>5.6</b>	<b>4.5</b>	<b>3.7</b>	<b>5.2</b>	<b>5.4</b>	<b>7.6</b>	<b>7.0</b>	<b>1.8</b>	<b>0.8</b>	<b>-0.2</b>	<b>-1.2</b>
Argentina	8.5	8.7	6.5	4.0	10.9	8.8	9.1	9.1	2.6	1.7	0.2	-1.2
Brazil	3.8	5.4	4.9	4.0	4.2	3.6	5.7	5.1	1.3	0.1	-1.6	-2.3
Chile	4.3	5.1	4.2	4.6	3.4	4.4	7.4	4.4	4.7	4.4	-0.5	-2.0
Colombia	7.0	8.2	4.5	4.5	4.3	5.5	6.8	5.7	-1.8	-2.9	-2.5	-2.6
Ecuador	3.9	2.0	3.0	4.0	3.3	2.4	9.3	2.7	3.9	2.4	6.3	6.0
Mexico	4.9	3.1	2.4	2.5	3.6	4.0	4.9	4.3	-0.2	-0.5	-1.0	-1.9
Peru	7.6	9.0	8.2	6.5	2.0	1.8	4.8	3.0	3.0	1.4	-0.6	-0.7
Uruguay	7.0	7.4	6.5	5.5	6.4	8.1	6.8	6.2	-2.4	-0.8	-2.6	-1.9
Venezuela	10.3	8.4	5.1	1.9	13.7	18.7	28.7	35.0	14.7	8.8	8.9	4.9
<b>Central America<sup>4</sup></b>	<b>6.3</b>	<b>6.6</b>	<b>4.9</b>	<b>4.7</b>	<b>6.5</b>	<b>6.7</b>	<b>10.6</b>	<b>8.4</b>	<b>-4.8</b>	<b>-6.9</b>	<b>-9.2</b>	<b>-9.0</b>
<b>The Caribbean<sup>4</sup></b>	<b>7.8</b>	<b>5.6</b>	<b>3.9</b>	<b>4.1</b>	<b>7.8</b>	<b>6.7</b>	<b>11.5</b>	<b>8.1</b>	<b>-0.9</b>	<b>-3.8</b>	<b>-3.9</b>	<b>-2.7</b>

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.<sup>2</sup>Percent of GDP.<sup>3</sup>Includes Bolivia and Paraguay.<sup>4</sup>The country composition of these regional groups is set out in Table F in the Statistical Appendix.

going ahead as the global economy slows and by the regional shift toward monetary policy tightening to contain inflation.

Overall, GDP growth is projected to come down from 5½ percent in 2007 to 4½ percent in 2008 and 3¾ percent in 2009, numbers that are broadly unchanged from the Spring 2008 WEO (Table 2.4). Growth in Mexico would come in below trend, as exports and remittances are dampened by the U.S. slowdown, but most other countries—including Brazil—would still be growing close to trend. The deceleration would be greatest in Argentina, Colombia, and Venezuela where rapid growth has put most pressure on capacity limits. Growth in the Caribbean is due to ease, reflecting the impact of low U.S. growth and high fuel costs on tourism. Risks to these growth projections are seen as moderately to the downside, largely related to external risks. The strong momentum of domestic demand provides upside potential, particularly if macroeconomic policies are not tightened sufficiently to restrain inflation.

Notwithstanding the growth slowdown, inflation has become an increasing concern in the region, propelled by rising food prices, as well as tightening capacity constraints. Headline inflation for the region as a whole rose to 8 percent in June, the highest rate in five years. Measures of underlying inflation—excluding the impact of higher food and fuel prices—are also rising. Inflation has risen well into double digits in a number of countries in the region including Venezuela, Bolivia, Paraguay, and several in Central America, and analysts believe that actual inflation in Argentina is considerably higher than the official rate

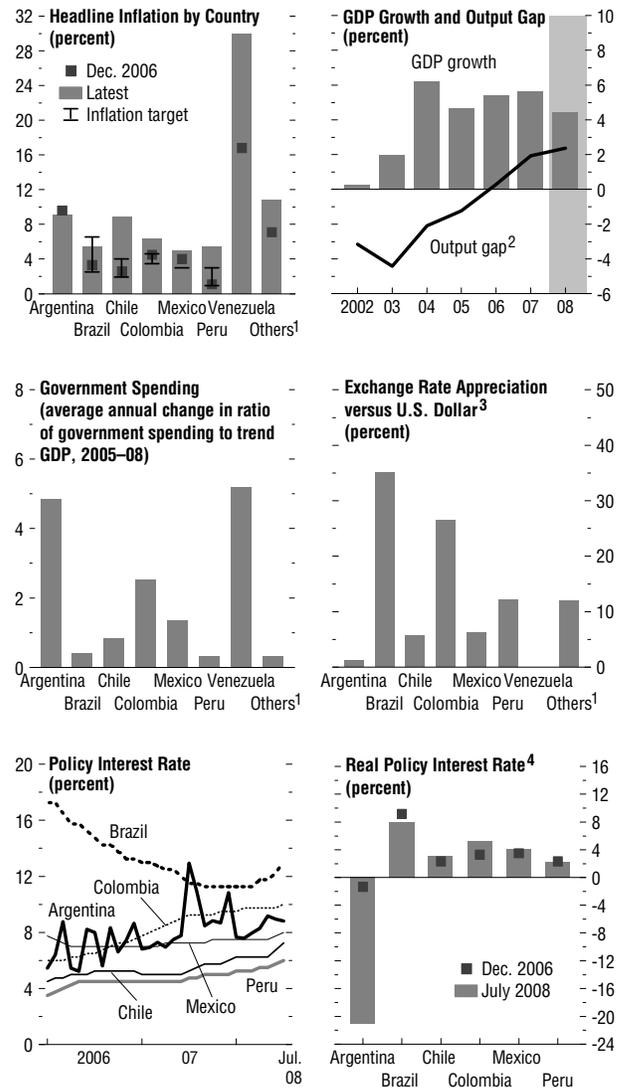
of 9.3 percent in June (see Figure 2.5).<sup>11</sup> In countries with inflation targeting central banks—Brazil, Chile, Colombia, Mexico, and Peru—inflation has also risen in some cases above target ranges, but increases have generally been more contained than elsewhere in the region.

In response, central banks have raised policy interest rates, most actively in the inflation targeting countries where exchange rate appreciation has also helped to contain inflation pressures. In Brazil, monetary policy tightening has been supported by increasing the primary fiscal surplus target for 2008 by ½ percentage point of GDP. However, fiscal policy has not in general been restrictive across the region, in part because of the budgetary impact of delayed pass-through of international oil price increases and increased explicit subsidies. Steps to dampen food price inflation more directly include reduced import tariffs (Mexico) and increased export taxes on food items (Argentina, now reversed). Mexico has also increased funding to targeted social programs to reduce the impact of rising food prices on low-income groups.

Looking forward, inflation is projected to peak later in 2008 and start to moderate in 2009, helped by softening international commodity prices, tighter monetary policies, and slowing demand growth. However, risks to these projections are clearly to the upside particularly with output projected to remain above estimated potential. While nominal wage growth has so far remained under control, rising inflation expectations could start feeding into wage negotiations, especially in countries such as Argentina and Venezuela where capacity constraints are tight. Indeed, in

**Figure 2.5. Latin America: Inflation Returns**

Inflation has risen across the region, driven by rising food prices and tightening capacity constraints. Inflation-targeting central banks have generally been more active in raising interest rates, supported by more flexible exchange rate management.



Sources: Haver Analytics; and IMF staff estimates.

<sup>1</sup> Bolivia, Costa Rica, Guatemala, Honduras, Paraguay, and Uruguay.

<sup>2</sup> Estimates of the output gap, expressed as ratio to potential GDP, are based on IMF staff calculations.

<sup>3</sup> Since December 2006.

<sup>4</sup> Relative to one-year inflation expectations.

<sup>11</sup> Provincial CPI data, private estimates, and wage increases suggest that consumer inflation is in the range 24–28 percent, although it should be noted that provincial data are incomplete and subject to region-specific factors.

Argentina, inflation expectations among the general public have now risen to the 30 percent range and wage increases have been 20 percent and above.

Besides the immediate threat of rising inflation, countries in the region must also be mindful of the possibility of more difficult external conditions. Thus far, Latin America has suffered limited contagion from the turbulent conditions in mature financial markets, in contrast to previous periods of stress, reflecting in part more robust external positions. The region's current account balance has been in surplus since 2003, boosted by terms-of-trade gains on commodity exports and generally restrained macroeconomic policies. Balance sheet vulnerabilities have been reduced, and credit ratings raised—Brazil and Peru both achieved “investment grade” in recent months. However, the current account is projected to move into small deficit in 2008 because of the continued strength of domestic demand. In addition, capital inflows have generally slowed since August 2007, and risks spreads have widened on sovereign and corporate issues, albeit much less dramatically than in earlier episodes of turbulence. Overall, reserves continued to rise in the first half of 2008, but at a lower pace than last year, and there have been periods of net foreign exchange outflows. These external pressures could intensify, particularly if there were a sustained drop in commodity prices or further deterioration in international financial conditions.

The priority for policies is to quell the surge in inflation. While some recent easing in commodities prices could help in this task, the risk that high headline inflation is becoming entrenched in inflation expectations and wage formation, in an environment of strong demand growth and tightening capacity constraints, and the high costs of regaining credibility once it is lost, argue strongly for maintaining efforts to bring inflation down. Monetary policy should play the central role. Tightening is needed most urgently in countries where real interest rates have become significantly negative and there is a sense that policy credibility is being eroded. Central banks with inflation targeting regimes may have earned some limited scope to tolerate some temporary deviations of headline inflations from objectives but must ensure that inflation expectations are consistent with target bands over a 1-2 year time horizon, and also are likely to need to raise rates further in most cases. At the same time, more restrictive fiscal policies, particularly tighter control over the growth of government spending, would help to restrain domestic demand growth, and may help relieve upward pressure on exchange rates from monetary tightening. Flexible exchange rate management would contribute to efforts to control inflation, as well as providing resilience in the face of potentially volatile foreign exchange flows.

With a shift to tighter macroeconomic policies, reliance on administrative or other measures to suppress inflation should be phased out. While they may provide some short-term relief, they reduce incentives for the needed long-term supply and demand adjustments, and can be costly from a fiscal perspective. Thus, shifts in international food and oil prices should be allowed to pass through to the domestic market, using targeted programs to protect low-income groups. There is also scope to strengthen frameworks to foster increased investment in the hydrocarbon sector in a number of countries in the region—the Mexican

government has recently launched an important initiative in this area—and in agriculture. Such policies would help to ensure the regions' ability to take full advantage of what looks likely to be a permanent upward shift in prices of its commodities exports, while containing short-term inflation consequences.

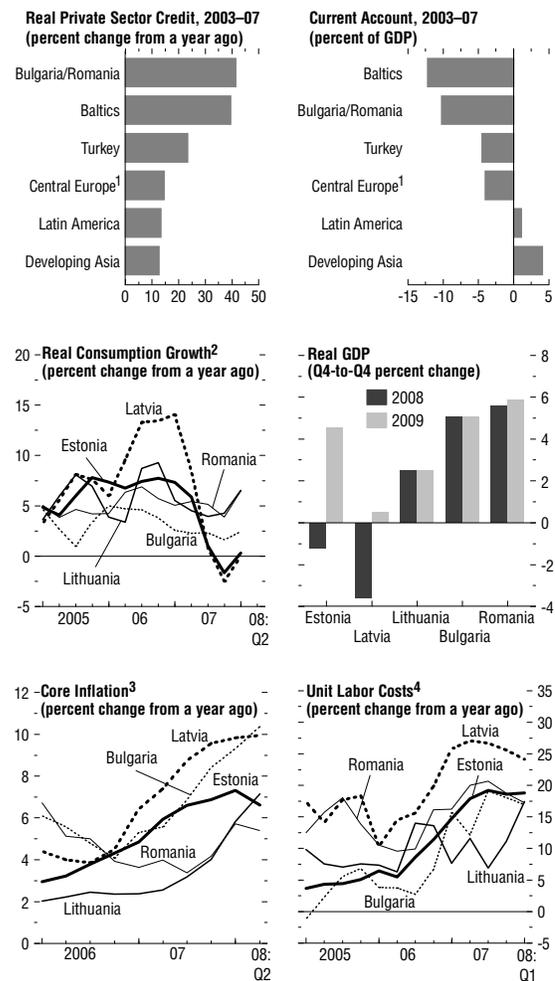
### Emerging Europe: Prospects for Soft Landing

Following a prolonged economic expansion, activity in emerging Europe has started to moderate. Weaker external demand and tighter external financing conditions have weighed on investment and exports, while private consumption has slowed in the face of soaring food and energy prices. Nonetheless, an ongoing expansion of productive capacity as well as rapid lending to the private sector by mostly foreign banks (particularly, in Bulgaria and Romania) has continued to support domestic demand. An exception to this pattern are the Baltics, notably Estonia and Latvia, which are undergoing sharp corrections as large domestic and external imbalances that had accumulated during long-drawn-out consumption and investment booms are starting to unwind (Figure 2.6). With real incomes eroded by high debt service and inflation, and foreign banks that are increasingly concerned about a build up of imbalances pulling back loan expansion, private consumption and, to a lesser extent, investment have plummeted and the current account deficits have started to decline. Despite slowing growth, labor markets across emerging Europe have remained tight, owing to still robust employment growth and continuing outward migration.

Amidst still buoyant domestic demand and emerging resource constraints, inflation has been further boosted by increases in food and energy prices. By June 2008, headline inflation in most countries was double the rates observed a year earlier, reaching double-digits in the Baltics (especially Latvia), Bulgaria and

**Figure 2.6. Emerging Europe: Are Credit Booms Cooling Off?**

Credit to the private sector has expanded at a much faster rate in the Baltics, Bulgaria, and Romania than in other countries in the region. Credit booms have been accompanied by a buildup of significant external imbalances. Estonia and Latvia are now undergoing a sharp correction, while consumption and GDP continue to grow briskly in Bulgaria and Romania and, to a lesser extent, in Lithuania. Core inflation and growth of unit labor costs have started to stabilize in Estonia and Latvia, while in Bulgaria, Lithuania, and Romania inflation pressures remain strong.



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

<sup>1</sup>Includes Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia.

<sup>2</sup>Two-quarter moving average.

<sup>3</sup>Overall CPI excluding energy, food, alcohol, and tobacco.

<sup>4</sup>Calculated as overall compensation divided by GDP except for Romania where wages are used instead of compensation.

Turkey. Underlying inflation has also climbed because of rising wages (for example, in Poland and the Slovak Republic) and strong domestic demand pressures (particularly, in Bulgaria, Romania, and Turkey). There is also evidence of second-round effects from surging food and energy prices, and inflation expectations have edged up. With inflation targets exceeded by wide margins, monetary policy has been tightened in central Europe (CEEs), Romania, and Turkey in the context of floating exchange rate regimes. In the CEEs, strengthening currencies have helped to combat inflation pressures. However, countries with fixed exchange rates (the Baltics and Bulgaria) have had less room to tighten the monetary stance, while in Romania and Turkey, currency depreciation contributed to inflation despite interest rate increases. Nonetheless, in Estonia and Latvia, as well as in Hungary, inflationary pressures have started to ebb in the course of economic corrections (see Figure 2.6).

Looking forward, growth is expected to continue to slow. In the CEEs, growth is projected to ease from about 6 percent in 2007 to near 5 percent in 2008 and 4½ percent in 2009 (Table 2.5). Weakening demand from western Europe will slow export and investment, while high inflation will take its toll on real incomes and consumption. Growth in southern and south-Eastern Europe (SEEs) and Turkey will also soften, as a worsening external outlook and high commodity prices weigh on consumption and investment. Corrections in the Baltics are expected to continue, with growth projected to drop from an average of 9 percent in 2007 to near 1¾ percent in 2008 and 1 percent in 2009. The economies are projected to start to recover gradually in the course of 2009. Inflationary pressures are expected to level off in 2009 as increases in commodity prices and domestic cost and demand pressures subside.

**Table 2.5. Selected Emerging European Countries: Real GDP, Consumer Prices, and Current Account Balance**  
(Annual percent change unless noted otherwise)

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Emerging Europe</b>	6.7	5.7	4.6	4.4	5.4	5.7	7.8	5.8	-6.1	-6.6	-7.3	-7.7
Turkey	6.9	4.5	4.0	4.3	9.6	8.8	10.2	8.1	-6.0	-5.7	-7.4	-8.5
Excluding Turkey	6.6	6.3	4.9	4.4	3.2	4.1	6.6	4.7	-6.1	-7.2	-7.3	-7.3
<b>Baltics</b>	9.9	8.9	1.6	0.9	4.8	7.3	12.9	7.4	-15.8	-17.6	-12.2	-8.6
Estonia	11.2	7.1	-1.0	1.5	4.4	6.6	10.3	5.1	-16.6	-17.7	-9.2	-8.2
Latvia	12.2	10.3	-0.4	-1.0	6.5	10.1	16.5	10.8	-22.7	-22.9	-14.5	-7.3
Lithuania	7.7	8.8	4.3	1.8	3.8	5.8	11.7	6.3	-10.8	-13.7	-12.1	-9.7
<b>Central Europe</b>	6.2	6.1	4.8	4.5	2.1	3.4	5.1	3.8	-3.7	-3.9	-4.4	-4.8
Czech Republic	6.8	6.6	4.4	4.7	2.5	2.8	6.5	3.5	-3.1	-2.5	-3.0	-2.9
Hungary	3.9	1.3	2.0	2.8	3.9	7.9	6.3	4.2	-6.1	-5.0	-4.8	-5.4
Poland	6.2	6.7	5.3	4.7	1.0	2.5	4.4	3.9	-2.7	-3.8	-4.7	-5.5
Slovak Republic	8.5	10.4	7.4	6.5	4.3	1.9	3.9	3.7	-7.1	-5.4	-5.1	-4.7
<b>Southern and south-eastern Europe</b>	7.0	6.0	6.2	5.3	6.2	5.1	8.8	6.3	-10.7	-14.1	-14.8	-14.2
Bulgaria	6.3	6.2	6.0	5.0	7.4	7.6	12.2	6.7	-15.6	-21.4	-22.5	-21.3
Croatia	4.8	5.6	4.1	4.2	3.2	2.9	7.0	4.9	-7.9	-8.6	-10.0	-9.3
Romania	7.9	6.0	6.8	5.8	6.6	4.8	8.2	6.6	-10.4	-14.0	-14.4	-14.0

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.

<sup>2</sup>Percent of GDP.

The risks to the outlook are tilted to the downside. They relate to a larger-than-expected weakening of external demand, increases in commodity prices or deterioration in external financing conditions. Countries with large current account deficits financed in part by volatile capital inflows—the Baltics, Bulgaria, Romania and Turkey—are particularly vulnerable to a sharp reversal of capital inflows. Large nonresident holdings of local currency bonds, extensive domestic borrowing in foreign currencies and dependence of some financial institutions on wholesale funding from abroad, accentuate the vulnerability of emerging Europe to changes in market sentiment. Beyond these risks, there is considerable uncertainty about the pace of adjustment in the Baltics. An even sharper-than-projected slowdown cannot be ruled out, should external or domestic confidence plummet. The downturn may also be more prolonged than expected, if the labor markets, which must adjust to restore competitiveness, prove to be less flexible than expected.

Financial risks have also risen with the onset of the turbulence in mature financial markets. Although emerging European banks have no direct exposure to the U.S. subprime market, some of them are owned by western European and U.S. parents, which creates scope for spillovers. A decline in global risk appetite has raised liquidity risks by increasing banks' external funding costs and by shortening maturities. Credit risks have also risen, as the credit boom was accompanied by lengthening maturities, rising loan-to-value ratios, and more exposure to riskier products (for example, yen-denominated loans in Hungary and Swiss franc-denominated loans in Poland, including at variable rates). A recent deceleration in real estate prices, at least in some countries, makes banks more vulnerable to credit risk. Foreign-currency lending is widespread, particularly in fixed exchange rate countries (for example, most lending is done in euros in the Baltics) and to a lesser, but still significant extent in floating exchange rate countries (for example, in Hungary and Romania, foreign currency loans accounted for around 60 percent of total household loans in 2007).

The policy challenge is how to engineer a soft landing, while laying the ground for sustainable convergence to western European living standards.

- In the CEEs, the predominance of inflation risks over risks to growth points to the need for further monetary tightening, although the balance of risks hinges on unpredictable exchange rate developments. Fiscal positions have recently been strengthened by buoyant revenues and spending restraint, but the room for allowing automatic stabilizers to operate in full is small. Continued fiscal consolidation would help to widen these margins and to unburden monetary policy. Public finances need to be put on a sustainable long-term path to meet the challenges posed by population aging as well as to support continued convergence with the euro area, particularly in the Slovak Republic, which is scheduled to adopt the euro in January 2009. Addressing remaining rigidities in the labor market would facilitate long-term fiscal adjustment while easing labor market constraints and wage pressures.

- In the Baltics, macroeconomic adjustment needs to run its course. Although domestic demand pressures have started to subside, especially in Estonia and Latvia, external imbalances still loom large, inflation is at double-digit levels and confidence is weakening. The temptation to ease fiscal policy should be resisted, considering also that the high degree of openness of these economies would limit its impact on demand. It will be important to claw back unsustainable expenditure increases of the recent past and target structural balance over the medium term. There is also a need for heightened supervisory vigilance and preparing contingency plans for financial institutions to deal with possible shocks to confidence and an economic downturn. This will require close collaboration between domestic and foreign prudential authorities, given the large share of foreign-owned banks.
- In the SEEs, expeditious action is needed to rein in rising external and internal imbalances. Like the Baltics several years ago, these countries are enjoying “good times”, and fiscal and incomes policies need to avoid adding procyclical impulses to the already overheating private sector. Specifically, growth in public expenditures needs to be kept in check by keeping public wage increases in line with productivity growth and reducing the size of government, in conjunction with reforms to raise the efficiency of the public sector. With credit to the private sector growing at double-digit rates, maintaining high prudential standards, and rigorously applying them, is critical to prevent a weakening in credit standards. Again, close cross-border collaboration will be important, for the same reasons as in the Baltics.

### **Commonwealth of Independent States: Managing the Commodity Price Boom**

Real GDP growth remains strong in most countries of the Commonwealth of Independent States (CIS), underpinned by buoyant domestic demand that has been boosted by terms-of-trade gains in most countries in the region and expansionary macroeconomic policies. The region has so far successfully weathered the effects of the global financial turmoil, with Kazakhstan the most significantly affected by the cutback in foreign capital inflows and increased financing costs.

Soaring world prices for food and fuel have contributed significantly to inflationary pressures across the region. Due in part to the high weight of food in household consumption, headline inflation accelerated sharply during the first half of 2008, reaching nearly fifteen percent by the summer (Figure 2.7). Moreover, core inflation has picked up around the region, reflecting the combination of strains from rising commodity prices and domestic demand pressures. Thus, concerns about overheating are mounting, with output consistently above potential and labor markets remaining tight. The policy stance generally continues to be expansionary across the region; interest rates have turned negative in real terms while government spending continues to expand rapidly. Rising international commodity prices have continued to boost trade balances in net commodity exporters, while net commodity importers have seen a marked weakening in their external positions. Azerbaijan, Kazakhstan,

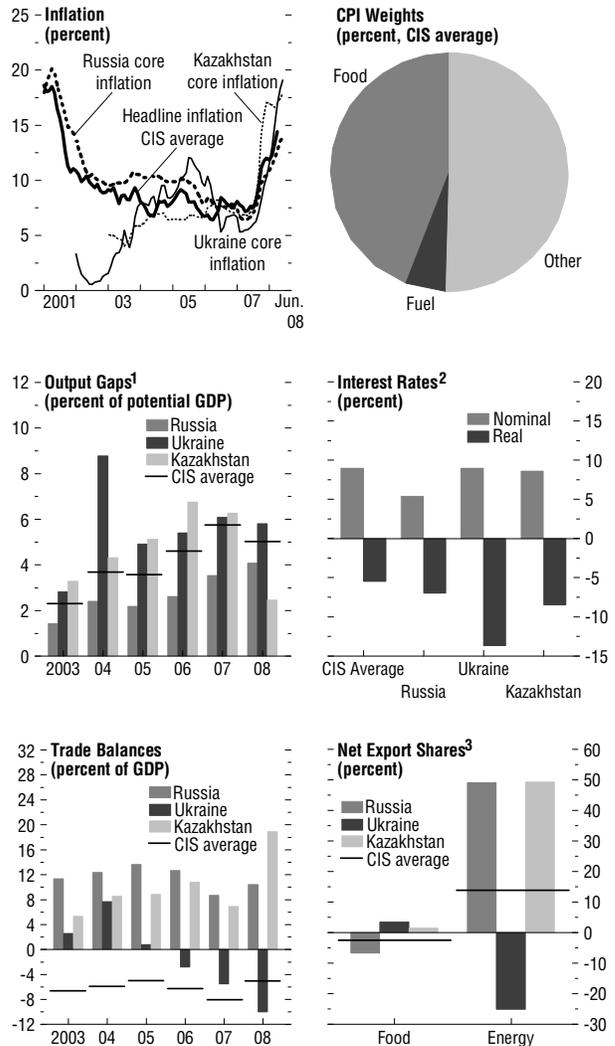
Russia, Turkmenistan, and Uzbekistan have benefited most from terms-of-trade gains, while terms of trade in Armenia, Moldova, and Tajikistan have worsened. In net food importers, food balances have deteriorated significantly, with deficits reaching precarious levels in some countries. Linked to the rising cost of food imports, the Kyrgyz Republic received an augmented disbursement from the Fund in May, to help meet a larger than expected balance of payments shortfall.

Looking forward, growth in the region is set to remain robust, although the effects of the ongoing commodity price boom will likely be mixed (Table 2.6). Real GDP growth is projected at 7¾ percent this year and about 7 percent in 2009, significantly higher than projected in the April WEO, mostly on account of Russia and Ukraine. Output is expected to grow at a brisk pace in net energy exporters, where terms-of-trade gains should continue to boost demand, while net energy importers will likely see their growth momentum weaken. In Russia, the upward revision of the growth forecast reflects a stronger than expected performance early in the year, rising terms-of-trade gains, and a larger than expected fiscal stimulus package. In Kazakhstan, growth is expected to remain relatively subdued as the excesses of the earlier credit boom unwind, although the buoyant oil sector should continue to partially offset the effects of the credit crunch. In Ukraine, the upward revision of the growth forecast reflects a strong performance during the first half of 2008, terms-of-trade gains, and indications of a bumper harvest. Nonetheless, growth is projected to decelerate going forward, reflecting weaker export-market growth, slowing real wage increases, moderating terms-of-trade gains, and higher financing costs.

Risks to the outlook at this juncture appear tilted to the upside, although tempered by recent declines in oil and commodity prices. Domestic demand and price pressures may prove even stronger than projected, as was the case in the first half of the year, and terms-of-

**Figure 2.7. Commonwealth of Independent States (CIS): Managing the Commodity Price Boom**

Soaring food and fuel prices are causing divergence in external positions and contributing to rising inflation across the region, while expansionary policies continue to stimulate demand.



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

<sup>1</sup>Output gaps are estimated using a Hodrick-Prescott filtered potential GDP. See Box 1.1 for more detail on the methodology and the estimation issues involved.

<sup>2</sup>Deposit rates. Real rates are computed using headline inflation.

<sup>3</sup>Shares in total exports minus shares in total imports.

trade could strengthen again. This said, financial market uncertainties remain a source of concern for countries with rapidly expanding current account deficits, like Ukraine, and for other countries that are already heavily reliant on capital inflows. While more aggressive monetary and fiscal tightening is expected in the second half of 2008, the near-term effects on activity and inflation will likely be limited. Linked to this, inflation risks are on the upside for net commodity importers and exporters alike.

**Table 2.6. Commonwealth of Independent States: Real GDP, Consumer Prices, and Current Account Balance**

(Annual percent change unless noted otherwise)

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Commonwealth of Independent States</b>	<b>8.2</b>	<b>8.6</b>	<b>7.7</b>	<b>7.1</b>	<b>9.5</b>	<b>9.7</b>	<b>15.9</b>	<b>14.3</b>	<b>7.5</b>	<b>4.4</b>	<b>7.0</b>	<b>4.8</b>
Russia	7.4	8.1	7.7	7.3	9.7	9.0	14.4	14.0	9.5	5.9	8.1	5.3
Ukraine	7.3	7.6	6.6	4.5	9.0	12.8	25.4	19.2	-1.5	-4.2	-9.1	-11.8
Kazakhstan	10.7	8.9	4.5	5.8	8.6	10.8	17.6	9.8	-2.4	-6.9	5.6	6.8
Belarus	10.0	8.2	7.1	6.7	7.0	8.4	13.5	13.3	-4.1	-6.6	-4.9	-8.1
Turkmenistan	11.1	11.6	9.5	10.0	8.2	6.4	12.0	12.0	15.3	16.8	23.6	28.1
<b>Low-income CIS countries</b>	<b>14.7</b>	<b>14.5</b>	<b>11.5</b>	<b>10.3</b>	<b>10.1</b>	<b>12.7</b>	<b>16.3</b>	<b>14.6</b>	<b>7.7</b>	<b>11.2</b>	<b>19.2</b>	<b>21.2</b>
Armenia	13.3	13.8	10.0	8.0	2.9	4.4	8.9	5.1	-1.8	-6.4	-8.6	-10.1
Azerbaijan	30.5	23.4	17.3	14.3	8.4	16.6	23.0	23.0	17.7	28.8	43.2	45.5
Georgia <sup>3</sup>	9.4	12.4	9.0	9.0	9.2	9.2	9.6	7.5	-15.9	-19.9	-17.0	-16.2
Kyrgyz Republic	3.1	8.2	7.5	7.2	5.6	10.2	24.6	12.1	-3.1	-0.2	-4.4	-4.2
Moldova	4.8	4.0	6.5	7.5	12.7	12.4	13.0	10.0	-11.8	-17.0	-16.4	-15.7
Tajikistan	7.0	7.8	5.2	7.0	10.0	13.2	20.8	12.7	-2.8	-11.2	-10.0	-8.1
Uzbekistan	7.3	9.5	8.0	7.5	14.2	12.3	11.1	10.6	17.2	19.1	16.8	12.9
<i>Memorandum</i>												
Net energy exporters <sup>4</sup>	8.2	8.7	7.9	7.5	9.7	9.4	14.8	13.9	9.1	5.9	9.2	6.9
Net energy importers <sup>5</sup>	8.0	8.1	6.9	5.5	8.4	11.4	21.1	16.3	-3.0	-5.8	-8.8	-11.2

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.

<sup>2</sup>Percent of GDP.

<sup>3</sup>Projections for Georgia are subject to change to reflect the impact of the early August armed conflict.

<sup>4</sup>Includes Azerbaijan, Kazakhstan, Russia, Turkmenistan, and Uzbekistan.

<sup>5</sup>Includes Armenia, Belarus, Georgia, Kyrgyz Republic, Moldova, Tajikistan, and Ukraine.

Inflation is now expected to be higher than projected in April, close to 16 percent this year and 14¼ percent next year, reflecting intensifying price pressures amid persistently high commodity prices and booming domestic demand. Against this backdrop, monetary policy effectiveness generally remains constrained by inflexible exchange rate regimes, although in Ukraine the exchange rate was recently revalued within a widened trading band. To compensate, governments in CIS countries have resorted to a variety of fiscal and trade measures in order to contain inflationary pressures and alleviate the social impact of rising food prices. These measures include reducing or eliminating import taxes and tariffs on key food items, cutting back domestic consumption taxes or stepping up subsidies for food and fuel, introducing direct price caps on key food items, and imposing export taxes and quotas. Some countries have introduced short-term supply-oriented measures, mainly subsidies and other support to agriculture. However, the fiscal costs of these measures have reached disconcerting proportions in a number of economies, raising concerns about fiscal sustainability.

Stronger policy action is needed in many countries across the region, in order to ensure that long-term inflation expectations remain firmly anchored. A comprehensive policy response would require a combination of monetary tightening and greater exchange rate flexibility, combined with a prudent fiscal stance. In particular, universal subsidies, which reinforce domestic demand pressures and burden public resources, could usefully be replaced with temporary and targeted measures to alleviate the social effects of soaring food and energy prices on the vulnerable segments of the population. In this regard, export restrictions and other policy interventions that prevent the needed supply adjustment are likely to prove counterproductive.

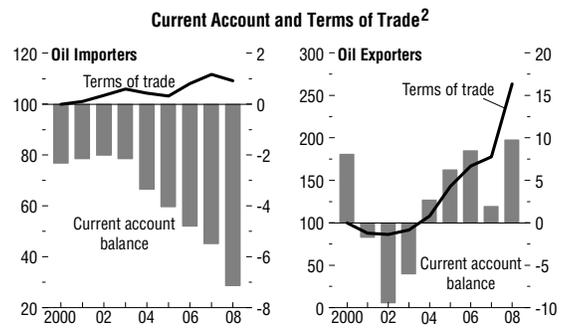
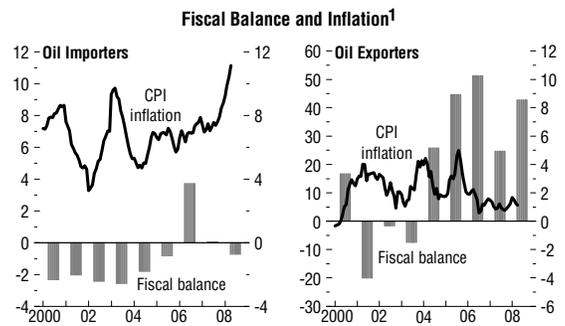
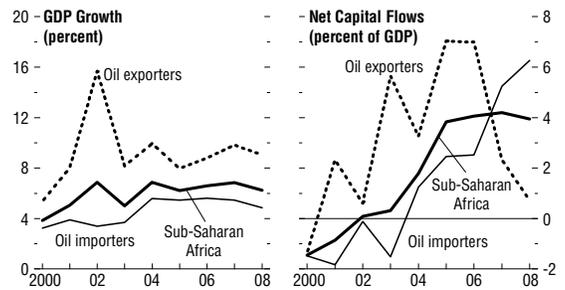
Over the longer term, the region continues to face the challenge of reducing its sensitivity to commodity price shocks through diversification of the economy away from primary commodities. Further efforts to improve the business climate, increase competition including in the food and energy sectors, strengthen domestic financial systems, and continue to build market institutions more broadly would foster a strong performance going forward and reduce vulnerabilities associated with terms of trade shifts.

### Sub-Saharan Africa: A Test of Policy Frameworks

Growth in sub-Saharan Africa (SSA) is expected to show resilience to the global slowdown, as many SSA countries are benefiting from the terms-of-trade gains from the surge in commodity prices and continued capital inflows. Overall, growth is projected to decline moderately to 6¼ percent in 2008, before recovering to 6½ percent in 2009. However, there are important cross-country variations (see Figure 2.8 and Table 2.7). Economic expansion in oil exporting countries is expected to soften in 2008, with growth declining to 7½ percent in 2008–09 from near 8 percent in 2007 on the back of a near 50 percent improvement in the terms of trade. For oil importers, the terms of trade would deteriorate, but modestly, by 2 percent on average, with higher oil prices partly offset by higher export prices of metal,

**Figure 2.8. Sub-Saharan Africa: The Mixed Blessing of High Commodity Prices**

At the aggregate level, growth in Africa is expected to show some resilience to the global slowdown, as many countries benefit from improvement in the terms of trade owing to a surge in fuel and nonfuel commodity prices, and net capital inflows to the region remain steady. Nonetheless, there are dramatic differences in the economic performance of oil importers and exporters, with the former experiencing a significant deterioration in their current account and fiscal positions, as well as a sharp rise in inflation.



Sources: Haver Analytics; IMF, *Direction of Trade Statistics*; and IMF staff calculations.  
<sup>1</sup>CPI inflation measured as percent change from a year earlier, left scale; fiscal balances measured as percent of GDP, right scale.  
<sup>2</sup>Current account balances measured as percent of GDP, right scale; terms of trade measured as index, 2000 = 100, left scale.

coffee, cocoa and cotton.<sup>12</sup> However, the worst hit countries (Djibouti, Comoros, Guinea, Kenya, Mozambique, Rwanda, Sierra Leone, and Tanzania) are projected to experience a 10 to 25 percent deterioration in the terms of trade. In South Africa, the SSA's largest economy, electricity shortages early in 2008 and a 500 basis point rise in policy interest rates since mid-2006 needed to contain inflation are expected to slow growth from 5 percent in 2007 to about 3¾ percent in 2008–09. The risks to the regional growth outlook are tilted to the downside and mainly relate to slower-than-expected growth in global demand and slowing capital inflows.

**Table 2.7. Selected African Countries: Real GDP, Consumer Prices, and Current Account Balance**

(Annual percent change unless noted otherwise)

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Africa</b>	<b>6.1</b>	<b>6.3</b>	<b>6.1</b>	<b>6.3</b>	<b>6.3</b>	<b>6.2</b>	<b>10.1</b>	<b>8.4</b>	<b>2.9</b>	<b>0.5</b>	<b>4.1</b>	<b>3.5</b>
<b>Maghreb</b>	<b>4.3</b>	<b>4.3</b>	<b>5.5</b>	<b>5.3</b>	<b>3.1</b>	<b>3.1</b>	<b>4.6</b>	<b>3.8</b>	<b>14.1</b>	<b>12.2</b>	<b>18.5</b>	<b>17.2</b>
Algeria	2.0	4.6	4.9	4.9	2.5	3.7	4.3	4.1	25.2	23.2	32.8	31.4
Morocco	7.8	2.7	6.5	5.7	3.3	2.0	4.8	2.9	2.2	-0.1	0.3	-1.4
Tunisia	5.5	6.3	5.5	5.8	4.5	3.1	5.1	4.5	-2.0	-2.6	-3.5	-3.3
<b>Sub-Sahara</b>	<b>6.6</b>	<b>6.8</b>	<b>6.2</b>	<b>6.6</b>	<b>7.3</b>	<b>7.1</b>	<b>11.7</b>	<b>9.7</b>	<b>-0.2</b>	<b>-2.8</b>	<b>-0.1</b>	<b>-0.3</b>
<b>Horn of Africa<sup>3</sup></b>	<b>11.3</b>	<b>10.6</b>	<b>8.8</b>	<b>8.3</b>	<b>9.1</b>	<b>11.0</b>	<b>18.3</b>	<b>19.9</b>	<b>-13.4</b>	<b>-10.3</b>	<b>-5.6</b>	<b>-5.2</b>
Ethiopia	11.6	11.4	8.4	6.0	12.3	15.8	25.3	40.8	-9.1	-4.5	-4.8	-6.5
Sudan	11.3	10.2	9.2	9.8	7.2	8.0	14.0	8.5	-15.1	-12.4	-5.4	-4.3
<b>Great Lakes<sup>3</sup></b>	<b>7.1</b>	<b>7.0</b>	<b>6.7</b>	<b>7.6</b>	<b>10.4</b>	<b>9.2</b>	<b>15.9</b>	<b>8.2</b>	<b>-4.3</b>	<b>-4.5</b>	<b>-7.0</b>	<b>-9.9</b>
Congo, Dem. Rep. of	5.6	6.3	10.0	10.8	13.2	16.7	17.5	15.1	-2.4	-1.9	-5.2	-19.7
Kenya	6.4	6.9	4.0	6.8	14.5	9.8	25.8	8.0	-2.3	-3.1	-6.7	-5.8
Tanzania	6.7	7.3	7.0	7.5	7.3	7.0	9.0	5.9	-7.8	-9.3	-10.4	-11.7
Uganda	10.8	7.9	9.8	8.1	6.6	6.8	7.3	7.8	-3.5	-2.8	-3.4	-6.7
<b>Southern Africa<sup>3</sup></b>	<b>10.9</b>	<b>12.8</b>	<b>11.0</b>	<b>9.6</b>	<b>11.5</b>	<b>10.0</b>	<b>10.9</b>	<b>8.9</b>	<b>12.8</b>	<b>6.8</b>	<b>11.7</b>	<b>12.8</b>
Angola	18.6	21.1	16.0	13.3	13.3	12.2	11.5	8.9	23.3	11.3	20.7	21.7
Zimbabwe <sup>4</sup>	-5.4	-6.1	...	...	1,016.7	10,452.6	...	...	-7.0	-3.5	...	...
<b>West and Central Africa<sup>3</sup></b>	<b>4.8</b>	<b>5.1</b>	<b>5.6</b>	<b>7.1</b>	<b>6.8</b>	<b>4.6</b>	<b>9.5</b>	<b>8.3</b>	<b>4.6</b>	<b>-0.4</b>	<b>4.2</b>	<b>3.8</b>
Ghana	6.4	6.3	6.5	5.8	10.2	10.7	18.1	16.1	-9.0	-10.9	-12.8	-13.3
Nigeria	6.2	5.9	6.6	8.7	8.3	5.5	11.5	11.0	9.5	2.1	7.7	6.3
<b>CFA franc zone<sup>3</sup></b>	<b>2.8</b>	<b>4.1</b>	<b>4.2</b>	<b>5.6</b>	<b>3.2</b>	<b>1.4</b>	<b>5.4</b>	<b>4.0</b>	<b>0.1</b>	<b>-1.7</b>	<b>2.5</b>	<b>2.9</b>
Cameroon	3.2	3.3	4.5	4.6	5.1	0.9	4.1	2.5	0.7	0.4	2.0	0.6
Côte d'Ivoire	0.7	1.6	2.9	4.7	2.5	1.9	5.6	5.7	2.8	-0.7	-0.5	-0.9
<b>South Africa</b>	<b>5.4</b>	<b>5.1</b>	<b>3.8</b>	<b>3.7</b>	<b>4.7</b>	<b>7.1</b>	<b>11.3</b>	<b>9.2</b>	<b>-6.5</b>	<b>-7.3</b>	<b>-9.0</b>	<b>-9.6</b>
<i>Memorandum</i>												
Oil importers	5.9	5.3	5.1	5.2	6.3	6.6	10.8	8.9	-3.8	-4.8	-6.3	-7.3
Oil exporters <sup>5</sup>	6.4	7.9	7.6	8.3	6.4	5.6	9.0	7.7	13.2	8.1	16.1	15.2

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.

<sup>2</sup>Percent of GDP.

<sup>3</sup>The country composition of these regional groups is set out in Table F in the Statistical Appendix.

<sup>4</sup>No projections for 2008 and beyond are shown. The inflation figure for 2007 represents an estimate.

<sup>5</sup>Includes Chad and Mauritania in this table.

<sup>12</sup>Oil importers stand to benefit from higher prices for metal (South Africa, Kenya, Ghana, Guinea, Botswana, Mozambique, Togo, Senegal, Uganda, and Zambia), coffee, cocoa and cotton (Côte d'Ivoire, Ethiopia, Uganda, Kenya, Burundi, Rwanda, Zambia, among others). For more details on the effects of the recent commodity price shock, see Chapter 3 and IMF (2008).

Recent sharp increases in food and fuel prices pose significant challenges for price stability across SSA. Inflation is expected to rise from about 7 percent in 2007 to about 11¾ percent in 2008, before easing to 9¾ percent in 2009. The average masks significant variation across countries, with Seychelles expected to experience a 21 percentage point jump in inflation in 2008 and Burkina Faso, Burundi, Chad, Ethiopia, and Kenya 9½–16 percentage points increases. Food price rises tend to have a large impact on inflation in SSA, reflecting a high share of food in consumer baskets (see Chapter 3). Fuel price increases are also being passed on to consumers in countries where fiscal pressures have forced governments to partially roll back fuel subsidies. Domestic demand pressures, which have emerged in some SSA countries during the past several years of robust growth, may be amplifying the initial impact of food and fuel price shocks through second-round effects on inflation.

Against the backdrop of rising inflation, the impact of higher food prices on poverty is a major concern as it risks undermining past progress in this area and putting social cohesion at risk. High dependence of SSA countries on imports of food and fuel as well as a high incidence of poverty make them most vulnerable to increases in prices of these commodities. Populations in these countries have few options to hedge themselves against rising food prices, and the urban poor tend to be hit most. IMF staff estimates that rising prices for imported food would have the largest impact on poverty in Gambia, Ghana, Mauritania and Swaziland owing to their high import dependence and low incomes (IMF, 2008). Some countries have responded to rising inflationary pressures by tightening monetary policy, but many have reduced VAT on food and import tariffs or have imposed export taxes and other restrictions.

The external positions of oil-importing countries are also coming under pressure because of surging prices of imported food and fuel. Current account deficits in oil-importing countries are projected to deteriorate on average from about 5 percent of GDP in 2007 to 6¼ percent of GDP in 2008 and 7¼ percent in 2009. The worst hit countries are Lesotho (with a 15 percent of GDP deterioration in the current account deficit in 2008), Seychelles (11 percent), Madagascar (8 percent), and Botswana (7¼ percent). A widening current account deficit, which reached 9 percent of GDP in the first quarter of 2008, is also a particular concern in South Africa. The deficit is financed largely through volatile portfolio flows, although low external debt and a flexible exchange rate should provide some resilience if capital flows were to reverse. By contrast, current account balances in oil-exporting countries are in surplus, and are projected to strengthen further, from 8 percent in 2007 to 16 percent in 2008 and 15¼ percent in 2009.

The main challenge for the region is how to adjust to the large commodity price shock. Oil-importing countries, where the negative terms-of-trade shock has weakened fiscal and external positions, need to adjust their monetary, fiscal and incomes policies. Delaying the adjustment would put at risk not only macroeconomic stability but also recent

achievements in improving policy and institutional frameworks, which have been largely responsible for SSA's impressive growth performance in recent years.

- A tightening of monetary policies through interest rate increases, or administrative measures in countries with managed or fixed exchange rates, would be needed to prevent inflation expectations from becoming ingrained and to strengthen the balance-of-payments and fiscal positions. A reduction in public sector borrowing and greater exchange rate flexibility would support monetary tightening and ease pressure on the balance of payments.
- At the same time, targeted fiscal measures, including subsidies, are needed to help to protect the poor. These measures would need to be complemented by steps to safeguard the long-term budget position, including a gradual, yet full pass-through of international oil prices to consumer prices as better targeted measures are put in place for the poor. Price controls on food items are likely to be ineffective, resulting in shortages rather than helping to reduce inflation.
- Additional donor assistance is needed to cushion the impact of adjustment on vulnerable countries with high poverty levels, limited access to foreign financing, low reserve cushions, and high external or public debt levels. Such funding would allow countries to meet higher import bills and provide targeted budget assistance to the poorest segments of the population, while the necessary adjustments are phased in. Over the longer term, donor assistance could seek to promote the development of domestic agriculture and sustainable social safety nets.

Oil-exporting countries face the challenge of managing the windfall gains from high commodity prices more successfully than during similar past episodes that failed to result in permanent improvements in living standards. Rising current account surpluses and inflationary pressures call for close coordination between monetary and fiscal policies. Saving a portion of oil revenues would help to mitigate emerging inflationary pressures, while laying a solid financial basis for addressing vital infrastructure, health and social needs. Monetary tightening could help to stabilize inflation, guarding against the development of a generalized inflation process. Allowing nominal exchange rates to appreciate would also help to keep inflation under control.

### **Middle East: Managing Inflation Pressures**

Activity continues to grow at a robust pace in much of the Middle East, while inflationary pressures either remain high or keep rising, particularly in a number of oil exporters. Real GDP growth in Middle Eastern countries is projected at around 6¼ percent for 2008–09, with oil exporters and non-oil economies growing at a similar pace (Table 2.8), a notch higher than in 2007. The effects of falling demand in advanced partner countries and increasing supply-side constraints in oil sectors are projected to be offset by robust domestic demand and activity in non-oil sectors. Rising oil and food prices are posing important

budgetary challenges for many of the non-oil economies. By contrast, the global financial turmoil has had little effect on the region thus far, beyond pressing stock markets to surrender earlier gains.

**Table 2.8. Selected Middle Eastern Countries: Real GDP, Consumer Prices, and Current Account Balance**

(Annual percent change unless noted otherwise)

	Real GDP				Consumer Prices <sup>1</sup>				Current Account Balance <sup>2</sup>			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
<b>Middle East</b>	<b>5.7</b>	<b>5.9</b>	<b>6.3</b>	<b>6.3</b>	<b>7.0</b>	<b>10.6</b>	<b>14.9</b>	<b>13.3</b>	<b>21.0</b>	<b>18.4</b>	<b>25.6</b>	<b>24.1</b>
<b>Oil exporters<sup>3</sup></b>	<b>5.6</b>	<b>5.7</b>	<b>6.1</b>	<b>6.2</b>	<b>7.6</b>	<b>10.7</b>	<b>15.7</b>	<b>13.1</b>	<b>24.1</b>	<b>21.2</b>	<b>29.1</b>	<b>27.9</b>
Iran, I.R. of	5.8	6.4	5.7	5.2	11.9	18.4	24.0	21.0	9.2	10.1	14.6	11.6
Saudi Arabia	3.0	3.5	5.0	4.8	2.3	4.1	10.6	8.5	27.9	25.1	35.5	33.6
United Arab Emirates	9.4	7.3	6.8	6.8	9.3	11.0	13.0	10.0	22.6	20.5	26.5	27.4
Kuwait	6.3	4.6	5.9	6.1	3.1	5.5	9.0	5.8	52.2	43.1	47.4	46.9
<b>Mashreq</b>	<b>5.9</b>	<b>6.3</b>	<b>6.7</b>	<b>6.5</b>	<b>5.4</b>	<b>9.2</b>	<b>11.1</b>	<b>12.9</b>	<b>-2.2</b>	<b>-2.6</b>	<b>-4.3</b>	<b>-5.7</b>
Egypt	6.8	7.1	7.4	7.0	4.2	11.0	11.7	14.9	0.8	1.5	-0.8	-4.0
Syrian Arab Republic	4.4	3.9	4.2	5.2	10.4	4.7	8.0	7.0	-5.6	-3.3	-5.2	-3.7
Jordan	6.3	6.0	5.5	5.8	6.3	5.4	12.5	7.8	-11.3	-17.5	-17.6	-16.8
Lebanon	--	4.0	6.0	4.5	5.6	4.1	11.0	8.1	-5.6	-12.6	-13.9	-12.7
<i>Memorandum</i>												
Israel	5.2	5.3	4.0	3.3	2.1	0.5	4.0	2.0	6.0	3.1	0.1	0.8

<sup>1</sup>Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.

<sup>2</sup>Percent of GDP.

<sup>3</sup>Includes Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, and Republic of Yemen.

Economic growth is being sustained mainly by non-oil sectors, as capacity constraints are slowing oil output growth (see Figure 2.9). Growth in oil exporters is being driven by private construction, retail trade, transportation, and financial services. Aside from the indirect effect of high oil revenues, the strength reflects an improved business environment that is fostering private investment, and a build-up in public projects to alleviate infrastructure and housing bottlenecks that have accumulated as populations have grown rapidly. Notwithstanding record oil prices, activity in the oil sector has lately been noticeably less buoyant than in the non-oil sector. Despite heavy investment, production and distribution capacity are rising slowly, owing to soaring investment costs, technological and geological constraints, and the run-down of existing fields. Nonetheless, oil and natural gas production capacity and, to a lesser extent, output are projected to expand moderately in 2008-09, with significant capacity coming on stream in Qatar and Saudi Arabia. Real GDP growth in the non-oil economies is briefly from past efforts to improve their business environments. Sizable FDI inflows are boosting activity in Egypt and Jordan, while Lebanon is continuing to recover from the conflict in 2006.

Signs of overheating are multiplying. Inflation has reached double-digit rates even in some countries with traditionally low rates, such as Saudi Arabia, and exceeds 20 percent in Egypt and Iran. The surge in inflation has occurred despite limited pass-through of high fuel

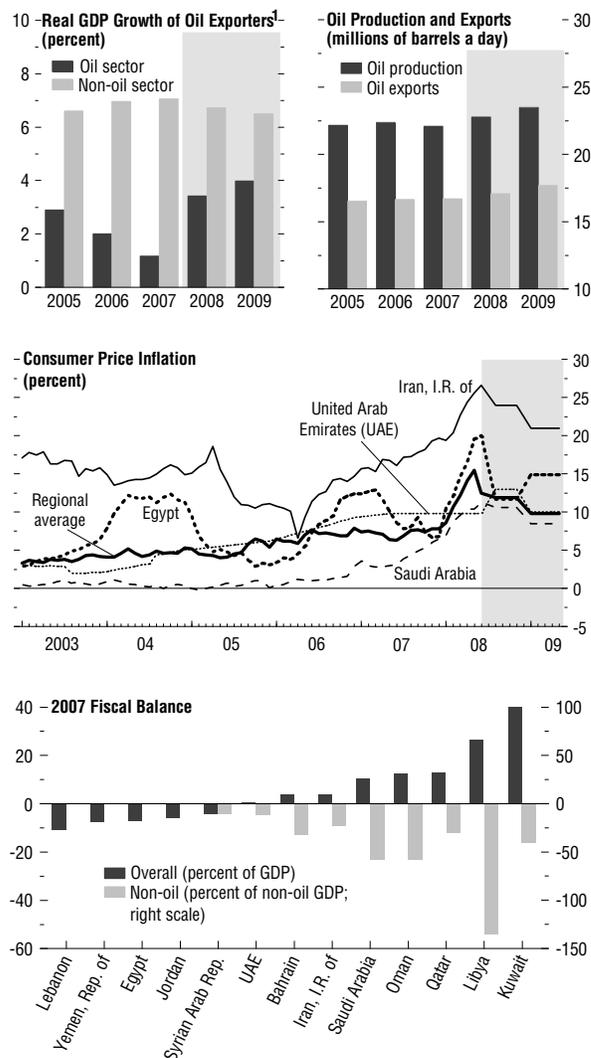
and, to a lesser extent, food prices to domestic markets.<sup>13</sup> Not surprisingly, while inflation is still driven mainly by foreign-determined prices (including the depreciation of the U.S. dollar against third currencies), pressures are increasingly spilling over into domestically determined prices of non-traded goods. This is particularly the case in oil exporters, where expanding and wealthier populations as well as the influx of foreign workers are putting pressure on services prices, notably for housing, and where governments are granting large wage hikes. However, other countries are beginning to see broader pressures too. Accordingly, despite the technical assumptions of no further real effective exchange rate depreciation and broadly unchanged prices for fuel and food, inflation is expected to retreat only moderately in 2009.

At the same time, robust domestic demand is driving an acceleration of imports across the region. However, current account developments differ widely between oil exporters and non-oil economies. Oil exporters are recording large and growing surpluses, generally projected to reach 10–50 percent of GDP in 2008-09. In the other countries, deficits have widened in response to rising import costs, to double-digit levels in Jordan and Lebanon, although still remaining relatively low in Egypt.

The risks to the growth outlook are broadly balanced. External risks are mostly to the downside and relate to weaker demand in advanced economies and potentially lower oil prices. Capital inflows to deficit countries could take a hit if global financial conditions worsened suddenly. Upside risks relate to still robust domestic demand and continued strong interest of foreign investors both from within (notably the GCC countries) and outside the

**Figure 2.9. Middle East: Managing Inflation Pressures**

Real GDP growth is forecast to remain buoyant, mainly on account of activity in non-oil sectors. Inflation pressure is rising, and tighter fiscal policies are needed to keep inflation expectations wellanchored, particularly in non-oil economies, which are also experiencing widening current account deficits.



Sources: IMF, *International Financial Statistics*; and IMF staff calculations.  
<sup>1</sup>Oil exporters include Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, and Republic of Yemen.

<sup>13</sup>These items typically have a combined weight of between one-quarter and one-third in consumption baskets, with the bulk accounted for by food.

region. However, if upside risks materialize and exacerbate inflationary pressure, this would further complicate macroeconomic policies.

In this setting, preventing a mounting of inflationary pressures requires resolutely addressing the growing imbalances. Countries that are not pegging exchange rates to foreign currencies (e.g., Egypt and Iran) can further tighten monetary policy, while enhancing its effectiveness through greater exchange rate flexibility. In countries with pegged exchange rates, monetary policy is imported from abroad, mainly the United States. In many oil exporters, currencies are undervalued, although the degrees differ, and higher inflation is contributing to an appreciation of real effective exchange rates. The main driver of the undervaluation is the peg to the U.S. dollar, which has been depreciating while terms of trade have been improving. Once adjustment of domestic prices to the higher levels that are consistent with an appreciated real effective exchange rate is complete, inflationary pressures should subside, provided the peg and fiscal policy effectively anchor expectations.

The move to a new equilibrium could also be achieved through a revaluation of currencies, but this would raise many complexities, particularly in the GCC countries, which plan to move to monetary union in 2010. First, revaluations would introduce uncertainty as to how policy would respond to external shocks in the future, undermining the value of the peg as a nominal anchor. Second, many pegging countries still need to develop their capacity to conduct an independent monetary policy as well as the supporting financial market infrastructure. Third, volatility in oil markets could lead to volatile exchange rates under a floating regime, which could hamper some countries' efforts to diversify their export bases. An option that addresses some of these issues would be to switch from a peg to the U.S. dollar to a basket of currencies that better reflects the composition of trade and services exchange with the rest of the world. However, had such a peg been in place recently, it would not have made a major difference with respect to excess demand pressures, as evidenced by Kuwait's experience. In the long run, however, if inflation persists, a switch to a basket peg is an option worth exploring. Overall, the extent of the role of the exchange rate in managing demand pressure has to depend on country-specific circumstances, including the scope for adjustments in fiscal policy and the commitment of GCC countries to peg their currencies to the U.S. dollar in the period leading up to monetary union.

Fiscal policy will be key in restraining demand pressures in Middle Eastern economies. Many non-oil economies have significantly reduced debt levels over the past decade. Nonetheless, domestic debt levels remain high by international standards and thus both conjunctural and medium-run requirements point toward fiscal tightening. In oil exporters, the rise in oil prices has provided fiscal room for a build-up in government spending, but has added to pressures on domestic resources. As a result of rapidly rising expenditures on wages and subsidies, for example, the oil price at which countries' budgets balance over the medium run has been on the rise, reaching around US\$80 in Saudi Arabia, for example. The specific fiscal policy requirements vary but generally would need to emphasize cutbacks in current spending, while continuing to support critical infrastructure

projects that alleviate internal supply-side bottlenecks. Furthermore, fiscal policy can also help to address the social challenges raised by high energy and food prices. The development of more targeted transfer programs would help to tackle poverty and, in oil exporters, share the gains from higher oil prices. As progress is made, high outlays on general oil and food subsidies—reaching around 10 percent of GDP in Egypt and Saudi Arabia, for example—need to be rolled back.

Over the medium run, stronger macroeconomic policy frameworks and continued structural reforms are key to strengthening the resilience of Middle Eastern economies to shocks, while providing for a young and rapidly expanding population. Fiscal policies could usefully be imparted with a longer-run orientation—for example, with the help of medium-term budgetary frameworks—because of the need to lower debt in non-oil economies and preparing for lower oil revenues in some oil exporters. The capacity to conduct independent monetary policy and supporting financial markets needs to be built up. As domestic financial systems become more complex, rising regulatory and supervisory challenges will need to be addressed. Moreover, many countries stand to benefit from further improvements in their business environment, including by raising investment in education and providing better social safety nets.

**Box 2.1. EMU 10 Years On**

Ten years ago, EU heads of state gave the go-ahead for the third stage of Economic and Monetary Union (EMU), approving the introduction of the euro in 11 EU member states on January 1, 1999. Since then, four more EU member states have adopted the euro, and Slovakia is set to follow at the beginning of 2009. Monetary union is a distinct success, with the euro area being a zone of stability in the international economy. Thanks to the high credibility of the ECB, inflation has declined over the past decade compared to a decade earlier and inflationary expectations are now less variable in the euro area than in other advanced economies (Beechey and others, 2008).<sup>51</sup> The key remaining challenge on the monetary front is the integration into the euro area of all those EU member states that are presently outside, which, with the exception of Denmark and the United Kingdom, are committed to adopt the euro.<sup>52</sup> Economic union, however, remains a challenge even among the current euro area members. Concerns that have been raised center on the area's growth performance and large intra-area current account divergences.

***The record on growth.*** The widespread perception among observers that EMU has delivered economic stability but not growth is not well founded. The EMU record with respect to employment has been strong, helping to explain why in per capita terms euro area real GDP growth has not lagged U.S. growth during EMU (first table). The euro area's employment performance is partly related to EMU, which likely has contributed to greater monetary policy credibility, as well as labor market reforms, including well ahead of the introduction of the single currency in 1999. Employment rates remain lower than in the United States, and per capita income is still about 30 percent below U.S. levels. However, full convergence is not likely: Europeans have used more of the growth in productivity since World War II to increase leisure than U.S. citizens (Blanchard, 2004), and for as long as welfare states can sustain the greater leisure, this development is not undesirable.

The euro area's poor productivity performance under EMU has attracted much attention (e.g., Pisani-Ferry and others, 2008) but, as with economic growth, the reality may well be more complex than the bare numbers suggest. Labor productivity growth, for example, averaged just around 1 percent per annum in the past fifteen years, down from much higher rates in earlier times. Total factor productivity (TFP) growth almost ground to a halt during the current decade. However, the low productivity growth may well be related to the boom in employment, as argued by Dew Becker and Gordon (2008). In fact, there is strong evidence for a negative relation between total factor productivity (TFP) growth and

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<sup>51</sup>The main authors of this box are Jörg Decressin and Emil Stavrev based on the findings in Decressin and Stavrev (2008).

<sup>52</sup>To do this, they must meet certain economic convergence criteria. For further details, see "[European Commission - Economic and Financial Affairs - Who can join and when?](#)"

Euro area and United States: Key Macroeconomic Variables  
(7 trailing-year average, in percent)

		1992	1999	2007
Per capita real GDP growth	Euro area	2.5	1.7	1.3
	United States	1.7	2.6	1.3
Real GDP growth	Euro area	2.9	2.0	1.8
	United States	2.8	3.7	2.4
Employment growth	Euro area	0.5	0.7	0.9
	United States	1.8	1.8	1.4
Employment-population ratio, end of period	Euro area	40.8	41.7	44.4
	United States	45.3	47.4	47.8
General government fiscal balance	Euro area	-5.0	-3.7	-2.1
	United States	-4.5	-1.7	-3.1
Current account	Euro area	-0.7	0.3	0.3
	United States	-1.7	-2.0	-5.1
Inflation	Euro area	3.4	2.1	2.2
	United States	3.9	2.5	2.7
Per capita GDP <sup>1</sup>	Euro area	75.1	70.8	70.9
Memorandum item:	TFP	1980–1995	1995–2004	
	Euro area	0.8	0.2	
	United States	0.7	1.6	

Sources: Eurostat; IFS; and Fund staff calculations.

<sup>1</sup>Percent of US per capita GDP, at purchasing power parity.

labor input in a cross section of EU KLEMS data (van Ark and others, 2007) for twelve advanced countries and six sectors for each country (see first figure). There could be many reasons for such a trade-off. One obvious reason is capital-labor substitution in response to reforms that raised labor supply and, possibly, demand (via cuts in payroll taxes). Accordingly, as the labor market completes its adjustment to reforms and demographic changes, TFP growth may well revert back to the higher levels recorded in the 1980s.

However, a concern remains that even adjusting for differences in labor input, TFP growth on average has been lower in the euro area than in the United States, particularly in the services sectors. This points to the need to open up the more sheltered services sectors to competition, that is, to make services tradable.

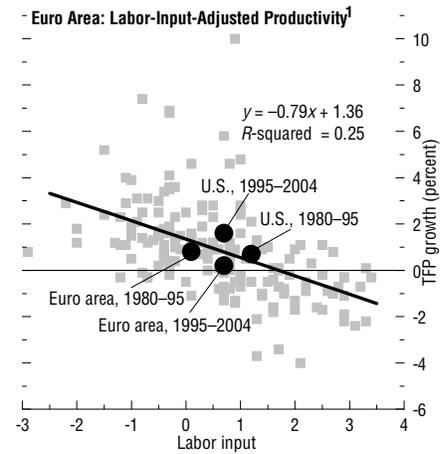
Dispersions of real GDP growth rates have also raised concerns. However, business cycles among EMU members have in fact become more synchronized, as the importance of common shocks has increased over time. These shocks now explain some 60 percent of output developments, as opposed to 30 percent before the introduction of the euro (Stavrev, 2007). Furthermore, country-specific developments in output reflect, to a considerable extent, per capita income convergence to higher levels. Overall, growth dispersions in the euro area are now similar to those among U.S. states, although they are more persistent. The slow speed of adjustment means that prolonged periods of strong growth can be followed by prolonged periods of sluggish activity, as experienced recently, for example, by Portugal (Blanchard, 2006).

**The record on the current account.** The external position of the euro area as a whole has remained in balance since EMU inception and thus has not raised concerns. This external balance has been preserved despite the significant appreciation of the real effective exchange rate of the euro over the past several years (see Chapter 1). Also, the credible macroeconomic framework, sound financial system, and increased resilience of the euro area, as a result of the ongoing structural reforms, have boosted the confidence in the newly-established currency. Accordingly, the euro has firmly established itself as the world’s second international currency, accounting for over one quarter of international reserves and more than one half of trade invoicing.

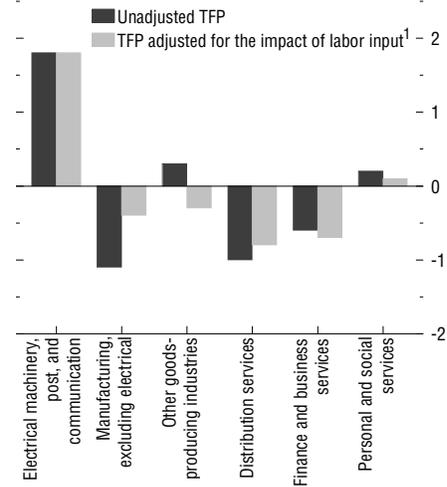
The European Commission and others have raised concerns about large intra-area current account and competitiveness imbalances (e.g., European Commission, 2008). Current account divergences between euro area members appear wide, ranging from deficits close to or exceeding 10 percent of GDP (e.g., Greece, Portugal, and Spain), to surpluses over 5 percent of GDP (e.g., Germany, the Netherlands) (see second table). In fact, these divergences—measured by the standard deviation across countries in each year—have risen substantially over the past two decades (see second figure). But, are they unusually wide in today’s world? As Chapter 6 shows, greater divergence of current account behavior is a broad phenomenon. A simple approach to answer this question is to divide the standard deviation of current accounts for euro area countries by the same measure for the current accounts of a group of 13 other advanced economies.<sup>53</sup> As can be seen, this ratio has not grown systematically. The reason is that divergences among the other 13 advanced economies have also been on the rise.

**Productivity Performance**

(Percentage points unless otherwise noted)



**Euro area: Developments in TFP by Sector<sup>2</sup> (1995-2004 minus 1980-95)**



Sources: EU Klems database; and IMF staff calculations.  
<sup>1</sup>Based on a cross-country, cross-sector pooled regression of total factor productivity (TFP) on labor input.  
<sup>2</sup>For average TFP growth rates. Negative numbers indicate a deterioration of TFP performance.

<sup>53</sup>Specifically, the two samples include, on the one hand, 11 EMU members (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain), and, on the other hand, 13 other advanced countries (Australia, Canada, Denmark, Iceland, Israel, Japan, Korea, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States). Data are from the 2008 Spring WEO.

## Current Account Dispersions and Implications for NFA

	Current account	Estimated	NFA position when the current	
	balance <sup>1</sup>	equilibrium	current account	account balance reaches
			NFA position	estimated equilibrium <sup>2</sup>
	(2007, in percent of GDP)			
Austria	2.7	1.1	-22	-10
Belgium	3.2	2.5	34	40
Finland	4.6	-0.3	-28	10
France	-1.3	0.6	5	-9
Germany	5.6	2.5	28	52
Greece	-13.9	-4.4	-100	-174
Ireland	-4.5	1.1	-1	-45
Italy	-2.2	-0.1	-6	-22
Netherlands	6.6	2.2	0	35
Portugal	-9.4	-5.8	-80	-107
Spain	-10.1	-5.7	-74	-109

Sources: IFS; and IMF staff estimates.

<sup>1</sup>Data are based on the April 2008 *World Economic Outlook* estimates. Please see Table A11 in the Statistical Appendix for the latest figures.

<sup>2</sup>The estimated speed of convergence implies that 70 percent of the deviation of the current account from the steady state is closed in about 7 years.

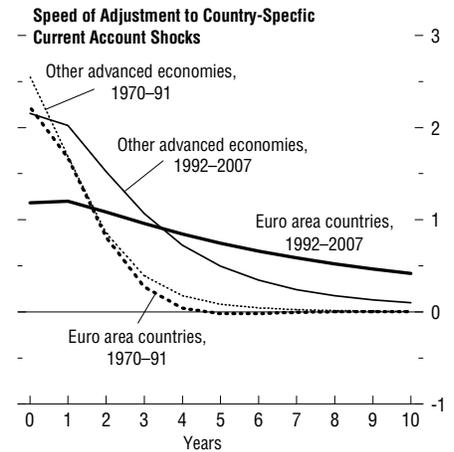
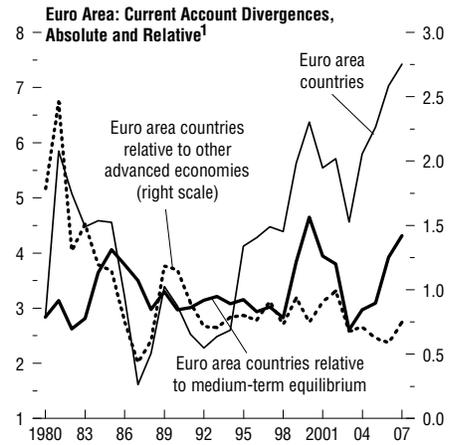
A related question is whether current account imbalances are a reflection of equilibrium or disequilibrium forces, and how these have evolved over time. To answer this question, a model of equilibrium current account balances, based closely on the IMF CGER methodology (Lee and others, 2008), is used to compute the developments in deviations from equilibria over time. Specifically, the equilibrium current account for each euro area country is obtained as a function of real GDP growth, relative per capita income, population growth, the net foreign assets-to-GDP ratio, the fiscal balance in percent of GDP, the old age dependency ratio, and the oil balance in percent of GDP. The next step is to compute for each year the sum across countries of the absolute values of the deviations from equilibrium current accounts. This shows that divergences from equilibria too have not increased over time.

While the size of divergences might not be a major concern, slow adjustment to equilibrium current account balances could be. The reason is that sustained deficits add to countries' external debt and, unlike in a currency union, such as the United States, people cannot expect help from a federal authority or easily move to better-off areas to improve their repayment capacity. Moreover, in a currency union of countries, adverse economic developments in parts of the union are more likely to affect the strength of the union as a whole. The persistence of the current account imbalances in EMU over time can be gauged with a pooled univariate regression of the current account balances on their own lags, allowing for country-specific "steady-state" current account balances (fixed effects). The results suggest that since 1992 it takes roughly 10 years to close about 70 percent of a gap between actual and "steady-state" current accounts within the euro area (see second figure). This speed of adjustment is significantly lower than during the pre-1992 period, when exchange rates were more flexible, but has not slowed significantly further during EMU.

Moreover, it is significantly lower than in the group of the 13 other advanced countries. However, the typical country-specific current account shock in the euro area is only about half as large as that in the other countries during 1992–2007, which is a mitigating factor. Also, it is only about half as large as in 1970–91 within the euro area, which again underscores the growing integration of EMU members.

The results can be used to gauge the implications of today’s current account divergences for the net foreign asset positions of euro area countries (see second table). Clearly, some countries will be footing considerably higher external debt servicing bills that will limit consumption and slow growth. Since there is a risk that during periods of austerity the functioning of EMU might be questioned, it is imperative for policymakers to ensure that goods and factor markets are flexible enough to deliver rapid adjustment: boosting productivity is one way to foster internal adjustment and so are measures to foster more wage flexibility (Blanchard, 2006). At the same time, social safety nets need to provide sufficiently generous but temporary help to those who suffer from the dislocations that accompany adjustment. Moreover, since internal adjustment processes (via their effects on the union) concern all countries, addressing this challenge is a matter of common interest. The European Union’s Lisbon Agenda offers the right vehicle to design and implement the required structural reforms in a manner that leverages reform spillovers and complementarities.

**Current Account Divergence**



Source: IMF staff calculations.  
<sup>1</sup>Based on current account balances in percent of GDP. Divergences are measured by the standard deviation across European Economic and Monetary Union members and across the other advanced economies, respectively.

## References

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### Chapter 3. Is Inflation Back? Commodity Prices and Inflation<sup>1</sup>

*This chapter examines the current commodity price boom and evaluates the risks that the associated relative price adjustment could ratchet up inflation, as in the 1970s. It concludes that despite some recent easing, many of the forces underlying the boom are still in place and that commodity prices will likely remain at high levels by historical standards. Continuing inflation risks arise from the adjustment to the large increases in commodity prices that have not fed fully through the supply chain. Most vulnerable to risks of a ratcheting up in inflation are economies where the likelihood of second-round effects is high—large shares of commodities in final expenditure and limited credibility of monetary management, where price pressures from other sources such as overheating are present, and where macroeconomic policies have not responded adequately to rising inflation.*

Could the large commodity price surge over the past year and a half uproot a decade or so of success in achieving and maintaining price stability and herald a return to high inflation, as in the 1970s? This question continues to be widely debated even as commodity prices have begun to ease in recent weeks. In many economies, headline inflation rates remain at levels last seen ten to fifteen years ago, and core inflation is still rising, particularly in emerging and developing economies.

While there is broad agreement that upward inflation risks have increased across the globe, the reasons for concern differ among analysts and policymakers. For some, the main reason is that the commodity price increases have been so broad-based, large, and rapid that they could trigger perceptions of rising inflation that could spill over into expectations, demands for higher wages, and underlying inflation (“second-round” effects). A second reason is that in a number of emerging and developing economies, the pressures from surging commodity prices come on top of price pressures from overheating. This combination exacerbates the risks of second-round effects. The problem is particularly acute in commodity exporters for which the commodity price surge has been expansionary.

A third reason is that the commodity price surge might not, in fact, be a pure supply shock but the consequence of global excess demand resulting from overly expansionary macroeconomic policies. As during the 1970s, soaring commodity prices may be an early indication that capacity is being overestimated in some countries. By mistakenly reading the price surges entirely as the result of sector-specific constraints, policy makers may amplify inflationary pressures.

The chapter analyzes the current commodity price boom and the implications for inflation prospects and risks. Specifically, it will seek to answer the following questions.

- Why are commodity prices so high and will they stay high?

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<sup>1</sup>The main authors of this chapter are Thomas Helbling, Douglas Laxton, Valerie Mercer-Blackman, and Irina Tytell, with contributions by Kevin Cheng and Kevin Clinton. To-Nhu Dao, Nese Erbil, Emory Oakes, and Ercument Tulun provided research support.

- What has been the impact of rising commodity prices on headline and core inflation across the globe? Which countries have been most affected? What are the risks of significant second-round effects and what do these risks depend on?
- What should be the appropriate monetary policy response to rising commodity prices? Under what circumstances can inappropriate monetary policies in individual countries have significant global implications?

The chapter concludes that the current commodity price boom has, broadly speaking, reflected the interaction of strong demand, low inventories and spare capacity, slow supply expansion in key sectors, and adverse supply shocks. Prospects of slowing global growth in 2008-09—partly in response to high commodity prices—and the resolution of weather-related supply constraints for key food crops this year have recently led to some easing of commodity prices. However, some of the underlying forces behind the commodity price boom are still in place, notably strong growth in large emerging economies, low inventories, and supply constraints in key sectors. Barring an intense global downturn, these factors will likely limit the extent of easing from recent price peaks and provide for continued price volatility.

While commodity prices may exert less direct inflationary pressure than over the past year and a half, inflation risks will remain elevated for some time. The adjustment to the large increase in relative commodity prices is still in train. In some economies, the recent commodity price increases have already led to second-round effects, while others are still at risk. In particular, emerging and developing economies generally are more vulnerable to the main risk factors, including the share of commodities in final expenditure and the credibility of monetary management. Moreover, higher international price levels for fuels in particular have not yet been fully passed on to domestic prices in many economies.

Notwithstanding some recent commodity price easing, a determined monetary policy response to recent inflation increases remains important in economies where inflationary pressures were already elevated before the recent commodity price surge and where risks of second-round effects are high. Delaying the monetary policy response could lower the credibility of policymakers and thereby significantly worsen the inflation-output tradeoff, highlighting concerns about falling behind the curve. Other macroeconomic policies should be supportive, particularly when exchange-rate related constraints may limit the scope for monetary tightening.

The chapter is organized as follows. The next section examines the origins of high commodity prices and assesses prospects going forward. The following section looks at the relationship between commodity price shocks and inflation at the country level, examining whether sustained increases in food and energy prices could reverse the recent “great moderation” in inflation across the globe. The subsequent section then focuses on the monetary policy implications of the commodity price shocks and the implications for global inflation dynamics. A summary and conclusions follow in the last section.

## Surging Commodity Prices: Origins and Prospects

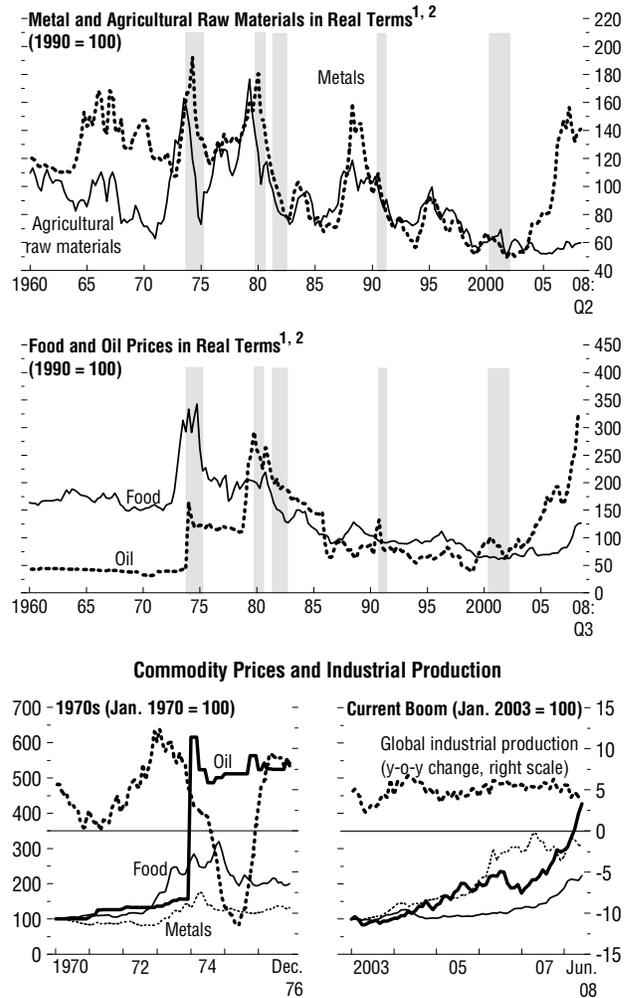
Commodity prices surged over the past year and a half (Figure 3.1, 2 top panels). The oil price more than doubled between December 2006 and mid-July 2008 before easing in recent weeks, while food prices rose by over 50 percent during this period. These surges came on top of already large price increases in 2003-06. Overall, cumulative commodity price increases since 2003 are broadly similar in magnitude to those recorded during the commodity price boom of the early 1970s (1971-74), the last major boom. By contrast, other periods of sustained global growth—for example, during the 1980s and the 1990s—were not accompanied by broad-based commodity price booms involving fuel and food commodities. This section compares the current commodity price boom with that of the early 1970s, and then discusses oil and food price developments and prospects.<sup>2</sup>

### The current commodity price boom compared with the 1970s

Three common factors seem to underlie both booms. First, the origins can be traced to strong global growth (Figure 3.1, third panel).<sup>3</sup> Prices of many commodities, especially those of intermediate inputs in manufacturing (metals and agricultural raw materials, but also oil), are pro-cyclical and respond strongly to changes in global growth or industrial activity. This, of course, reflects the role of global industrial activity or, depending on the commodity, income as a determinant of commodity demand.

**Figure 3.1. Commodity Prices in Historical Comparison**

The current commodity price boom shares many common features with the last major commodity price boom of the early 1970s, including sharp increases in oil and food prices and an environment of strong global growth.



Source: IMF staff calculations.

<sup>1</sup>Deflated by U.S. CPI.

<sup>2</sup>Shaded areas denote periods of global recession (identified with a monthly index of global industrial production).

<sup>2</sup>Appendix 3.1 provides a more detailed overview of recent commodity market developments and prospects.

<sup>3</sup>Among others, Radetzki (2006) noted that the beginning of each significant broad commodity price boom in post-World War II history (1950-52, 1972-74, and 2003 until now) coincided with an acceleration in economic growth and industrial production.

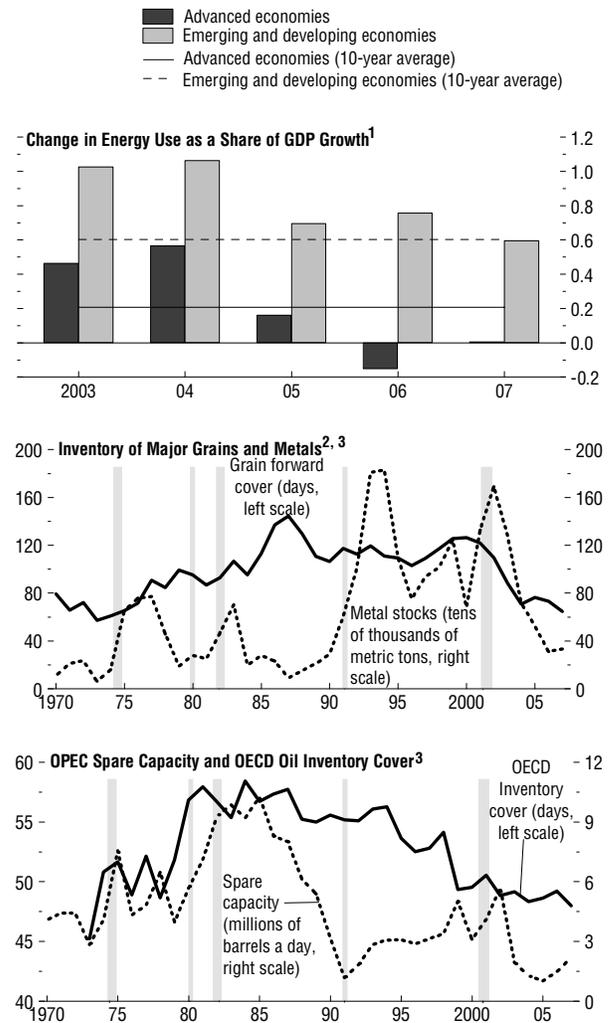
The growth acceleration in emerging and developing economies over the past few years—driven by industrialization take-off and strong per-capita income increases from a low base—has likely altered the relationship between global activity and commodity prices in the current boom. The reason is that the rotation in global growth toward these economies has catalyzed commodity demand, as their growth has been relatively more commodity-intensive (Figure 3.2, top panel). With this growth rotation, the slowing in advanced economy growth has so far had less of an impact on commodity prices than during earlier downturns in these economies. That said, turning points in price cycles have been broadly synchronized with those in global economic activity.<sup>4</sup>

A second common underlying factor is that both booms started with lower-than-usual initial inventories and spare capacity levels (Figure 3.2, middle and bottom panels). This lack of buffers amplified the price impetus from the pick-up in commodity demand due to strong global growth in both booms.<sup>5</sup> The reasons for low inventories and spare capacity vary across commodities, although under-investment and slow supply growth in the late 1990s after two decades of low commodity prices played a role in many commodity sectors in the current boom.

A third common factor has been that supply constraints have put upward pressure on prices. The abrupt rise in oil prices in December 1973, together with a temporary reduction in oil production in the context of an

**Figure 3.2. Marginal Change in Energy Intensity, Commodity Inventories and OPEC Spare Capacity**

Strong commodity-intensive growth in emerging and developing economies was a major factor behind declining inventory levels and low OPEC oil spare capacity.



Sources: *British Petroleum Statistical Review* (2007); International Energy Agency; U.S. Department of Agriculture; U.S. Department of Energy; and IMF staff calculations.

<sup>1</sup>Primary energy in millions of barrels of oil equivalent per GDP (expressed in billions of 2005 U.S. dollars).

<sup>2</sup>Grains include corn, rice and wheat; metals include copper, lead, and zinc.

<sup>3</sup>Shaded areas denote periods of global recession (identified with a monthly index of global industrial production).

<sup>4</sup>See Box 5.2 “The Current Commodity Price Boom in Perspective” in the April 2008 *World Economic Outlook*.

<sup>5</sup>The presence of such interaction between strong demand and low initial levels of buffers likely is one of the factors that turn a cyclical price upswing into a price boom, since differences in global growth between expansions are too small to plausibly explain the large differences in commodity price observed during global upswings. See, among others, Deaton and Laroque (1992) and Radetzki (2006) on the mechanics of commodity price cycles.

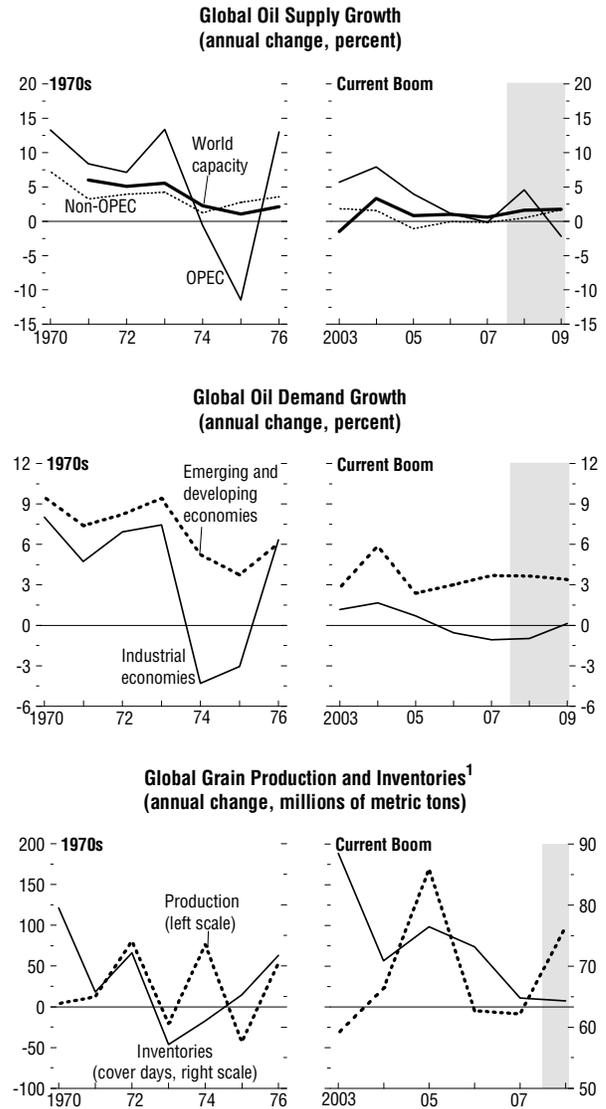
embargo, has become a textbook case of a commodity supply shock. Weather-related crop failures for wheat, in particular boosted prices in 2006-7. Such shortfalls also propelled prices in 1971 and 1973 during the earlier boom (Figure 3.3).

In the current boom, the supply-side constraints in commodity sectors other than agriculture typically were not sharp, temporary supply reductions, but capacity constraints arising from protracted, inelastic supply responses to higher demand and rising prices. In the oil market and, to a lesser extent, some metals markets, “time to build” lags appear to have increased in the current cycle, as discussed below. Combined with strongly growing demand, the resulting slow capacity expansion has led to a perpetuation of low inventories and spare capacity and has kept up price pressures. This feature of the current boom has given rise to the notion of a “supercycle” in commodity prices—a period with secular trend increases in commodity prices because of the need for a substantial build-up in capacity.<sup>6</sup>

Then and now, speculation—the purchase of commodities intended for resale at a higher price rather than for commercial use—has been widely seen as a factor driving up commodity prices.<sup>7</sup> In the 1970s, speculative inventory holdings appear to have risen for some commodities, notably metals (e.g., Cooper and Lawrence, 1975). In the current boom, however, inventory holdings of key commodities have generally remained low or even declined, suggesting that a shift toward holdings of real assets has not played

**Figure 3.3. Grain and Oil Demand, Production, and Inventories in Comparison**

Strong demand and slow capacity expansion in key sectors, as well as supply disruptions for major crops have been aspects of both the current and the 1970s commodity price booms.



Sources: *British Petroleum Statistical Review* (2008); U.S. Department of Agriculture; U.S. Department of Energy; and IMF staff estimates.  
<sup>1</sup>Grains include corn, rice and wheat.

<sup>6</sup>See Cuddington (forthcoming) for a recent analysis. More generally, lags in supply responses (as well as demand responses) to unexpected price changes can lead to price cycles (e.g., Krautkraemer, 1998), with the length and amplitude of a cycle depending on differences between long- and short-term price elasticities and the lag structure as well as the magnitude of the initial unexpected change.

<sup>7</sup>See Harrison and Kreps (1978) or Feiger (1976) on definitions of speculation.

the role in driving up prices it has in the earlier boom. While recent financial innovation in commodity markets, such as indexing, has allowed investors to benefit from rising commodity prices without physical inventory holdings, there is little discernible evidence that the build up of related financial positions has systematically driven price trends or price formation more broadly (see Box 3.1).

Nevertheless, financial factors and sentiment play a role in commodity price formation. Financial variables, such as interest rates, affect commodity prices through their effects on physical demand and supply. Indeed, the recent decline in U.S. policy interest rates likely has spurred commodity demand, as discussed below. As many commodity prices have traditionally been more flexible than prices of other goods or wages, they tend to respond faster to such monetary policy impulses, with some possibility of short-term price overshooting.<sup>8</sup> More generally, as most commodities are storable, they are real assets. Their prices are thus affected not only by current but also expectations of future market conditions. In the short term, such expectations can be influenced by sentiment and investor behavior, which can amplify short-term price fluctuations, as in other asset markets.

Going forward, prospects for a continuation of the commodity price boom depend on the extent to which the constellation of strong demand, low inventories and spare capacity, and supply constraints remains in place. There are indications that some elements of this constellation may have started to unwind. Prospects for slowing global growth in 2008-09 and the resolution of weather-related supply constraints for key food crops this year have led to some easing of commodity prices in recent weeks. However, inventories and spare capacity are still low, growth momentum in the large emerging economies remains strong, and some supply constraints are still present, which, barring a more severe global downturn, will likely limit the extent of easing and provide for continued price volatility.

Within this general outlook, prospects for individual commodities vary. The role of common factors in short-term commodity price fluctuations is generally limited even during booms, as reflected in the wide differences in magnitudes and timing of price increases (Table 3.1). Fundamentally, these cross-commodity variations reflect differences in commodity characteristics (e.g., extent of storability or position in the stages of production), and the fact that supply problems and inventory conditions tend to be commodity-specific. Against this backdrop, the chapter now turns to developments and prospects for the two commodity groups that are most relevant for the global inflation outlook: oil and food.

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<sup>8</sup>See Bordo (1980) the commodity price response to monetary policy impulses, and Frankel (1984, 2005) and Akram (2007) on the commodity price effects of real interest rate changes.

**Table 3.1. Contributions of Common Factors to Commodity Price Fluctuations<sup>1</sup>**  
(In percent)

	Booms			"Great moderation period"	"Period with no oil shocks" <sup>2</sup>
	1970 2008 (June)	1972 1974	2003 2008 (June)	1984 2008/5	1992 2002 (June)
Crude oil	1.6	1.9	3.6	2.6	3.2
Metals	37.9	29.6	34.5	27.7	63.7
Ag. Raw Materials	23.9	1.3	21.8	13.0	12.5
Food	16.7	1.2	23.9	24.7	15.2
Meat	8.3	0.5	26.7	9.7	6.8
Cereals	18.9	1.7	11.9	22.8	12.4
Vegetable Oils and Protein Meals	24.3	0.7	28.5	42.6	25.9
Other Foods	7.8	3.0	24.5	6.9	5.2
Beverages	11.2	2.2	28.0	7.5	2.4

Source: IMF, Primary Commodities Database; and IMF Staff calculations.

<sup>1</sup>Contributions are based on the first principal component of logarithmic changes of prices of 38 primary commodities in team terms (corrected for serial correlation and standardized).

<sup>2</sup>See Killian (2007).

### How much oil price relief will slowing growth provide?

Over the past year and a half, oil prices rose well above previous highs in real terms, some 30 percent above the earlier December 1979 record at the mid-July peak before easing in recent weeks.

The rise in oil prices from early 2007 mirrored a noticeable tightening in market balances in a context of low buffers (inventories, spare capacity). OPEC production through most of 2007 was below 2006 levels and non-OPEC production declined in the second half of 2007, while global oil demand continued to expand at a broadly unchanged pace. With oil market capacity tightly stretched, relatively small unexpected shifts in global supply (or demand) can have large price effects, given the generally very low short-term price responsiveness of oil demand.<sup>9</sup> Over the past year and a half, the price impact of shifts in global demand was reinforced by the decreased pass-through to domestic prices in emerging and developing economies, which further reduced the already low short-term price elasticity of global oil demand.<sup>10</sup> Other contributing factors were rising risks of supply disruptions in some major producers and geopolitical concerns.

<sup>9</sup>Short-term price elasticities of oil demand are generally believed to be low. The U.S. Department of Energy (2006) considers them to be in the range of 0.01 to 0.04 (absolute values)—while income elasticities are much higher. Similarly, Hamilton (2008) reports elasticities of 0.03 to 0.07 (absolute values), while IMF (2005) found values ranging from 0.03 to 0.08. As a result, income effects have dominated price effects in oil demand. In a simple demand model with exogenous supply that ignores nonlinearities from low inventories and intertemporal considerations, such price elasticities imply that a 0.5 million barrel a day reduction in oil production—roughly the amount of the reduction in non-OPEC supply in the second half of 2007—should lead to 10 to 60 percent higher prices (the calculations are based on 2007 production data). If longer-term price elasticities are higher than short-term ones, prices will overshoot their long-term increase in response to a supply reduction.

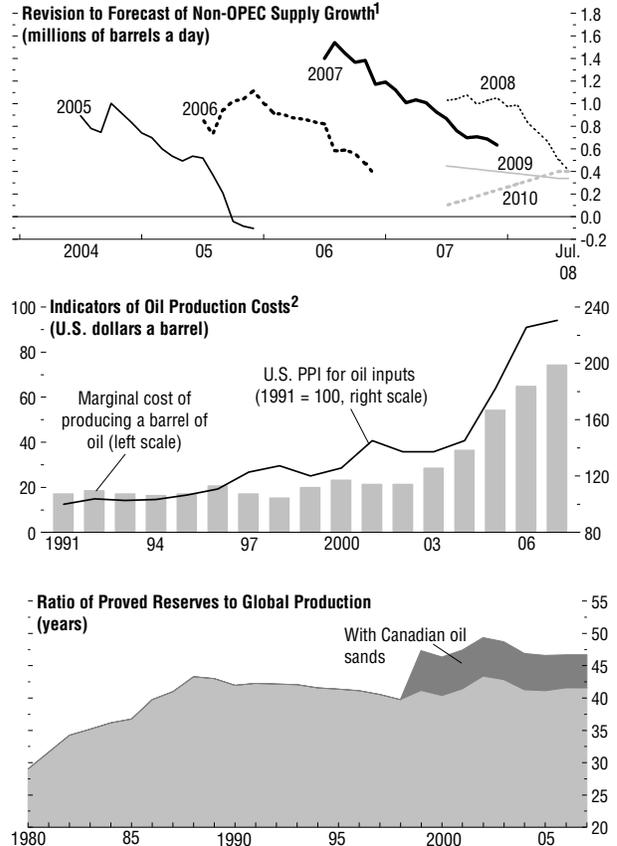
<sup>10</sup>Oil consumers in many countries have recently been increasingly sheltered from rising world market prices. In a sample of 43 emerging and developing countries, fewer than half allowed full pass-through in 2007 (compared to three quarters in 2006). See IMF (2008b).

Growing pessimism that medium-term oil market conditions will remain tight likely contributed importantly to price increases over the past year. The pace of capacity expansion has been slow and consistently fallen short of expectations in recent years, particularly outside OPEC (Figure 3.4, first panel).<sup>11</sup> A broad consensus has emerged that the build-up of production capacity needed to absorb the expected robust expansion of emerging and developing economies will remain sluggish because of cyclical, technological and geological, and policy constraints.<sup>12</sup> In effect, the “time to build” lags noted above have lengthened, although the scope for such a build up to be achieved eventually remains in place—as reflected in a broadly constant ratio of proven oil reserves to current production, a measure of the long-term scarcity of oil (Figure 3.4, second panel). The capacity build up will, however, come at a much higher cost than in the past decade, as the constraints have resulted in sharply rising extraction costs in marginal fields, with a substantial permanent component (Figure 3.4, third panel).

Even relatively small downward revisions in the expected path of future supply expansion because of increased pessimism can imply large increases in expected future prices, given the relatively low price elasticity of oil demand noted above.<sup>13</sup> Such expectations of higher prices in the future must be reflected in higher spot prices today. Otherwise, producers would have

**Figure 3.4. Oil Supply Developments**

Oil production, which has consistently fallen short of expectations over the past four years amid high production costs, has fostered concerns that tight market conditions will be lasting for some considerable time despite adequate reserve levels.



Sources: Bloomberg Financial Markets; *British Petroleum Statistical Review* (2008); Goldman Sachs Global, Inc. Equity Group; International Energy Agency; U.S. Bureau of Labor Statistics; U.S. Department of Energy; and IMF staff calculations.

<sup>1</sup>The forecast refers to a simple average from OPEC, the International Energy Agency, and the U.S. Energy Information Administration at the time of the forecast.

<sup>2</sup>Marginal cost is defined as the average of the highest-cost (or bottom quartile) producers, based on a survey of listed oil companies. The PPI for oil inputs refers to the unweighted average of drilling oil and gas wells, oil and gas operation support activities, and oil field machinery and equipment.

<sup>11</sup>Capacity constraints in the downstream oil sectors, notably in refining, have also contributed to rising oil prices. That said, the longer-term supply issues discussed here are primarily concerned with upstream investment, where the long-term constraints are more severe.

<sup>12</sup>See Box 1.5 “Why Hasn’t Oil Supply Responded to Higher Prices?” in the April 2008 *World Economic Outlook*.

<sup>13</sup>A more inelastic medium-term supply response because of longer time-to-build lags also implies that upward revisions to the expected path of global demand should have a larger impact on current spot prices.

incentives to leave oil reserves in the ground while traders would have incentives to accumulate inventories, as they could be sold later at a higher price. It is for this reason that some observers have referred to recent oil price increases as an “expected supply shock”, that is, a response to tighter medium-term market conditions.<sup>14</sup>

What about the role of financial factors? Speculation and commodity investment are frequently mentioned as contributing to the recent oil price increase. However, there is little discernible evidence for a systematic price impact of these factors. Investment inflows into energy and oil funds and net futures markets positions of financial investors, for example, peaked in late 2007 and have declined since. Nevertheless, shifts in sentiment may well have some impact on short-term price dynamics, particularly given the lack of timely information on global market conditions. In addition, recent financial conditions likely exerted some upward pressure. Both U.S. dollar depreciation and the decline in real policy interest rates tend to push oil prices upward. The effects are primarily short-term, with scope for overshooting, but longer-term effects are possible through the effects on physical oil demand and supply.<sup>15</sup>

In recent weeks, oil prices have eased on increased OPEC production (primarily in Saudi Arabia), data signaling a continued decline in U.S. oil demand that seems to reflect a growing demand response to high prices, not just slowing income, prospects of lower growth in other major advanced economies, and less supportive financial conditions, given the U.S. dollar rebound. Looking forward, oil demand growth is likely to moderate with the slower global growth envisaged in the second half of 2008 and 2009. If recent production increases are sustained, near-term market conditions will thus be less tight and support prices below recent peaks, with some scope for further downward adjustment if the global downturn intensifies or the demand response to high prices strengthens further in advanced economies. Nevertheless, supply constraints and continued strong growth in emerging economies are likely to keep prices well above pre-boom levels, and subject to continued price volatility.

### **High food prices reflect a combination of permanent and temporary factors**

The food price boom that began around mid-2006 intensified in the first four months of 2008, largely driven by increases in the prices of six key food commodities (corn, wheat, rice, soybeans and related products, rapeseed oil and palm oil). Together, these commodities have accounted for over 80 percent of the rise in the IMF’s food price index since early 2006 despite a weight of only 40 percent.

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<sup>14</sup>See, for example, Clarida (2007).

<sup>15</sup>Effective U.S. dollar depreciation can exert upward pressure on commodity prices through a number of channels. The empirical analysis in Box 1.4 in the April 2008 *World Economic Outlook* suggests that a 1 percentage point depreciation raises oil prices (in U.S. dollars) by more than 1 percentage point. Lower short-term real interest rates lower inventory holding costs and could induce shifts from money market instruments to commodities and other higher-yielding assets. See also the references in footnote 8.

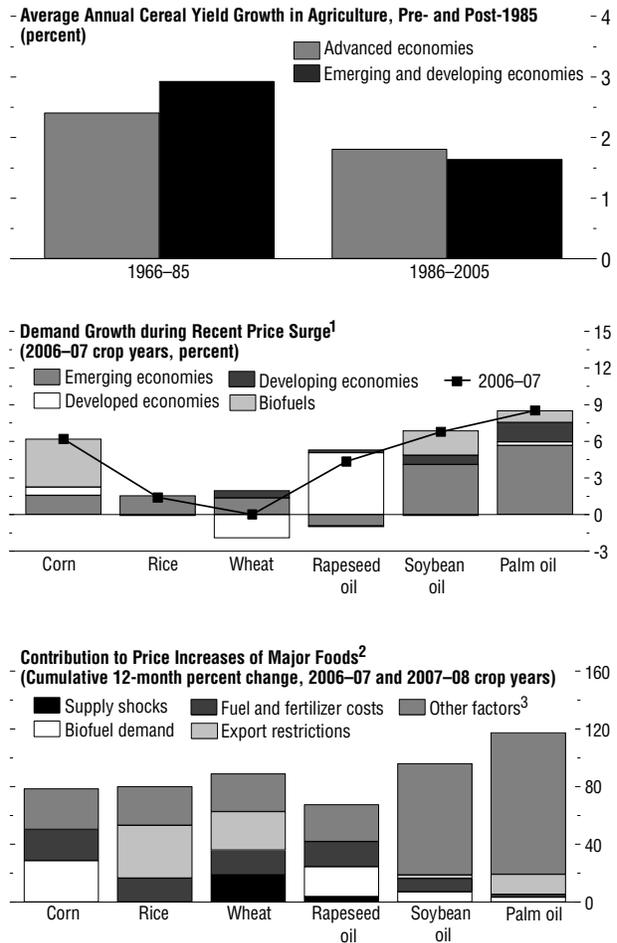
The decline in global inventory levels for these food commodities over the past few years was an important initial condition for the price surges. On the supply side, a decline in yield growth rates from the mid-1980s amid declining relative prices and low investment rates was an important contributing factor (Figure 3.5, first panel). The high levels of protection in agriculture in advanced economies and the bias in public expenditures in developing countries towards subsidies (instead of agricultural infrastructure and research investment) contributed to this trend.<sup>16</sup> On the demand side, a strong pick-up in consumption growth—driven by rapid income growth in emerging and developing economies—was a key factor (Figure 3.5 second panel).<sup>17</sup>

Staff analysis has sought to estimate the contributions of a number of supply and demand factors to the price increases of these six food commodities in 2006-08 (Figure 3.5, third panel). As a caveat, it should be noted that the exercise is based on simple partial equilibrium analysis and does not incorporate nonlinear effects from low inventories. Moreover, uncertainty involved is considerable, given complex interactions across markets and time.<sup>18</sup>

The first factor was a series of weather-related supply shocks in both

**Figure 3.5. Price Trends of Major Foods**

The recent price surge followed a period of declining yield growth in grains amid sluggish investment in agriculture. Recent demand growth, mostly from emerging economies, has shifted toward soybean and palm oil. In addition to biofuel growth, the price surge reflects a confluence of factors.



Sources: Food and Agriculture Organization; U.S. Department of Agriculture; World Development Report (2008); and IMF staff calculations.

<sup>1</sup>Demand growth from biofuels is excluded from the calculation for country groups.

<sup>2</sup>See technical appendix for details on the calculations.

<sup>3</sup>Including spillovers and substitution effects.

<sup>16</sup>In the OECD, progress has been slow in reducing overall support in the last 20 years, with the average transfer to agricultural producers as a share of farm-gate prices falling from 37 percent to 30 percent in 2005. See World Development Report (2008).

<sup>17</sup>The composition of demand has also changed towards protein-rich foods, feeds and oils in line with consumption trends in developing countries.

<sup>18</sup>The methodology is described in more detail in Appendix 3.2. Unless otherwise stated, references are to crop years (with the 2007 crop year running from mid-2007 to mid-2008).

2006 and 2007—which occurs less than once per decade on average—that caused drought damage, particularly to wheat crops (particularly in Australia, Eastern Europe and Northern Africa), reducing average yields for 2 consecutive years. This shock is estimated to have accounted for about 20 percent of the increase in wheat prices since 2006.<sup>19</sup> The impact of weather shocks is typically temporary; indeed, the wheat area planted for the 2008 crop year has risen sharply in response to high prices in the United States (Trostle, 2008).

Soaring demand for corn and some vegetable oils from biofuels producers was the second factor boosting prices. Rising fuel prices, as well as ambitious biofuels mandates, government subsidies and tariff protection in major advanced economies, have been driving rapidly expanding biofuels production, particularly corn-based ethanol in the United States.

- Almost 30 percent of the U.S. corn crop was diverted towards the production of biofuels during 2006-2007, and this share is projected to rise to 36 percent in 2008. Despite a strong production response, the additional demand pressure is estimated to have accounted for some 25 to 45 percent of the rise in the international corn prices during the period, given a range of plausible values for the price elasticity of demand. Looking ahead, demand pressures from ethanol will likely continue to exert a rising effect on food prices unless policies are changed.
- The price effect of biofuels production on rapeseed oil—the main biodiesel feedstock in Europe—has become less important over time. A reduction of EU subsidies amid a reexamination of biofuels policies and soaring vegetable oil prices rendered many biodiesel plants unprofitable, and demand of rapeseed oil for biodiesel use declined in 2007.<sup>20</sup> Also, the share of rapeseed oil in edible oils is small and has been declining.

A third factor pertains to the pass-through of higher energy costs directly to food prices, estimated to have accounted for around 20 percent of the rise in the prices of the six commodities. An almost tripling of fertilizer prices and a doubling of fuel prices since mid-2006 pushed up costs, particularly for the energy-intensive corn, rapeseed and rice crops.

More restrictive trade policies have been a fourth factor. Growing concerns about the domestic impact of rising food prices led a number of major food exporting countries to impose export restrictions starting in mid-2007. The restrictions had particularly strong effects on rice prices—accounting for about one half of the price increases according to staff estimates—but also affected prices of wheat and, to a lesser extent, of palm oil and soybean oil. These policies also led to some short-term price-overshooting, as they reportedly

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<sup>19</sup>Indeed, without the bumper crops in soybean, wheat, and corn in 2005, the price surge may well have occurred earlier.

<sup>20</sup>About 20 percent of global rapeseed oil demand is currently diverted towards biodiesel production. Use of soybean oil and palm oil for biodiesel production also grew in during this period, but remained a very small fraction of total global use (an estimated 9 percent and 3 percent in 2006-2008, respectively).

triggered panic-buying and inventory hoarding.<sup>21</sup> More recently, restrictions have been removed and some countries have released stocks. The removal of restrictions is likely to continue with more favorable harvest prospects for rice and wheat.

Taken together, the most important direct factor driving up food prices since 2006 has been rising energy costs, with trade restrictions following as a close second. However, the direct effects of these factors do not account for all of the observed increases in the prices of the affected crops. Mutually reinforcing indirect effects, which operate mainly through supply and demand substitution channels, have also contributed. Table 3.2 illustrates the such spillover effects from the price increases for corn and rapeseed oil (which are inputs for biofuels) on other foods, using demand and supply cross-price elasticities. The results suggest that these effects are particularly important in explaining price increases of soybean and related products: a 1 percent increase in corn prices, all else equal, raises soybean prices by about 3/4 of a percent, as farmers substitute acreage between soybeans and corn and consumers switch from corn to soybean meal.<sup>22</sup> If it were assumed that the increase in corn

**Table 3.2. Selected Indicators of Spillovers Across Major Food Commodity Prices**

	Corn	Rice	Wheat	Soybean oil	Rapeseed oil	Palm oil
Estimated percentage price change resulting from a 1 percent increase in the price of foods used for biofuels <sup>1</sup>						
Corn	1.00	0.23	0.19	0.78	---	---
Rapeseed oil	---	---	0.62	1.19	1.00	---
Concordance statistic of cyclical comovement <sup>2</sup>						
with corn (Jan 1957-May 2008)	100**	82**	61*	71**	74**	66**
with rapeseed oil (Jan 1980-May 2008)	74**	76**	46	82**	100**	78**
Memorandum items (2007 crop year)						
Share of global production exported.	13	6	18	29	10	72
Share of fuel and fertilizers in total production costs <sup>3</sup>	32	30	25	12	30	1-7

Source: USDA (2008); FAOSTA; Fedepalma (2008); North Carolina Solar Center (2006); and IMF staff calculations (see Appendix 3.2 for details).

<sup>1</sup>Derived from composite estimate of elasticities of substitution.

<sup>2</sup>The concordance statistic measures the proportion of time that prices of two commodities are in the same phase, with a range between 0 and 100. A high value implies that their cycles are more synchronized, suggesting the two commodities are highly substitutable (Cashin, McDermott and Scott, 2003). \* = significance at the 10 percent level; \*\* = significance at the 5 percent level.

<sup>3</sup>Production costs for soybean and rapeseed oil refers to corresponding plant crop. Share of fuels used for transport not included.

<sup>21</sup>Such effects are common when international markets are segmented and the share of trade in total production is small, as it is the case for rice, but they are not considered in the estimates. See FAO (2008).

<sup>22</sup>Consumers in this case would be mostly meat and poultry producers, which use cornmeal and soymeal as animal feed.

prices were unrelated to other rises in the other major foods, the indirect effects of higher corn prices would account for some 60 percent of the increase in soybean prices, and around 20 percent of the increases in rice and wheat prices

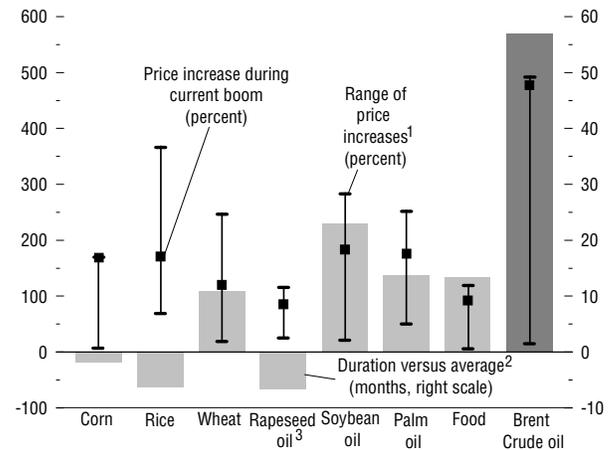
Looking forward, the resolution of weather-related supply disruptions in the current crop year and removal of export restrictions has already led to some easing of food prices. However, price pressure from high oil prices and further increases in biofuels production will likely remain, limiting the extent of the easing while low inventories will continue to contribute to price volatility. Indeed, with such more permanent factors in effect, the duration of the present boom has already exceeded the average length of a food price boom by 12 months (Figure 3.6).

### Commodity Price Shocks and Inflation

Can the large relative price adjustments implied by the recent commodity price surges be accommodated without affecting underlying inflation? The main concern is that a lengthy period of high headline inflation following the commodity price surges may unhinge inflation expectations.<sup>23</sup> The broad context for such a concern is the contrast in commodity price behavior in two key episodes in recent history. During the “great moderation”—the long period of low and falling inflation rates from the 1990s until recently—changes in commodity prices were relatively modest and temporary, whereas in the 1970s—the time of the “great inflation”—these shocks were large and persistent, as they have been in the present period.<sup>24</sup>

**Figure 3.6. Duration and Amplitude of Food and Crude Oil Price Cycles**

The current boom is already longer than average for most foods and for crude oil. However, with the exception of crude oil and corn, the price increase is not exceptionally high.



Source: IMF staff calculations.

<sup>1</sup>Range of prices increase during past trough-to-peak phases since January 1957.

<sup>2</sup>Months price is rising within the cycle compared to the average of past cycles.

<sup>3</sup>Rapeseed oil price series starts in January 1980.

<sup>23</sup>While relative price shifts do not generally lead to sustained changes in the overall price level, large and persistent temporary shocks, especially to prices of essential commodities, may unhinge inflation expectations and spill over into underlying inflation. For a more formal discussion of the relationship between relative price changes and overall inflation, see Ball and Mankiw, 1995, and Sims, 2003.

<sup>24</sup>There is a growing literature on the sources of the “great moderation”. For example, Gerlach, Giovannini, Tille, and Vinals (2008) attribute the “great moderation” primarily to improved monetary policies. The role of globalization is less clear. Falling manufactured goods prices driven by rapid productivity gains from integration of large underutilized labor forces in emerging and developing economies helped to make the process of reducing inflation less costly than otherwise. However, recently strong growth in demand for commodities has added to price pressures. The observed flattening of the Phillips Curve (documented in Chapter 3 of the April 2006 *World Economic Outlook*) may be related to global competition, but may also reflect better monetary management.

Concerns about second-round effects remain relevant despite the recent easing of international commodity prices, as domestic price pressures will likely persist for some time, reflecting the feed-through of past commodity price increases and continued overheating pressures in many emerging economies. This section will examine the links between commodity prices and inflation over time and across a broad sample of economies and highlight how the risks to the inflation outlook are linked to the credibility of monetary policy—its ability to anchor expectations effectively—the magnitude and persistence of the commodity price shocks, and to structural factors.

Turning first to current events, the dramatic rise in headline inflation in recent months owes much to commodity price increases over the past year and a half, with food prices playing a particularly important role in emerging and developing economies (Figure 3.7). In comparison, the contribution of energy prices has been moderate, with stronger effects in advanced economies. Indeed, domestic food prices have accelerated primarily in emerging and developing economies, while energy prices surged mainly in advanced economies (Figure 3.8).<sup>25</sup> To date, however, underlying or core inflation has remained broadly stable in advanced economies, although it has risen significantly in the rest of the world, as discussed in Chapter 1 (see Figure 1.3).<sup>26</sup> Inflation expectations have also begun to move up, especially in emerging economies, where wages have been on the rise amid generally tight labor markets.

What factors may affect the extent of transmission, or pass-through, from international commodity prices into domestic food and fuel retail prices? First, since domestic prices are denominated in local currencies, while world prices are typically denominated in dollars, exchange rate movements can amplify or mitigate the domestic impact of changes in world prices.<sup>27</sup> Second, many economies levy taxes or subsidies on

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<sup>25</sup>It should be noted from the outset that there are substantial differences across countries in the way food and fuel prices are treated in consumer price indices, especially across emerging and developing economies. The food baskets used to measure food inflation vary from country to country, with some countries including beverages and tobacco alongside food items, and other countries using narrower definitions including fresh foods but not processed foods. The measurement issues are even more acute in the case of fuel prices: definitions of the fuel component of the consumer price index range from gasoline prices to prices of household utilities.

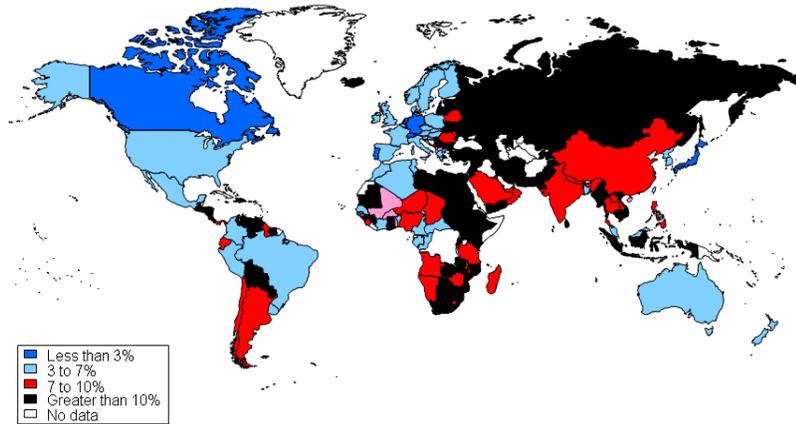
<sup>26</sup>Measuring core inflation is difficult. In theory, core inflation is defined as the underlying, or persistent part of inflation that provides an indication of future inflation, although precise definitions vary (see, for example, Eckstein, 1981 and Bryan and Cecchetti, 1994). In practice, core inflation is commonly measured using the consumer price index that excludes food and energy prices, or their most volatile components, but these measures differ across countries. The variation in measurements of core inflation tends to be especially significant among emerging and developing economies, where inferences about the underlying inflation need to be made with caution.

<sup>27</sup>De Gregorio, Landerretche, and Neilson (2007) argue that past oil shocks were often accompanied by depreciations that may have amplified their pass-through into domestic prices, while depreciations were less common in the past few years and many economies have, in fact, experienced appreciations that may have softened the pass-through.

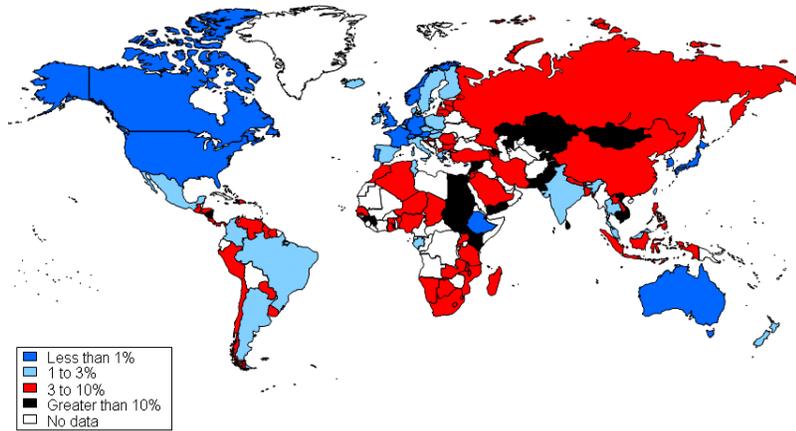
**Figure 3.7. Inflation around the World<sup>1</sup>**  
 (2008:Q2 over 2007:Q2 percent change)

Headline inflation is on the rise, especially in emerging and developing economies, where the role of food prices is particularly significant. The contribution of energy prices is smaller in comparison, with stronger effects in advanced economies.

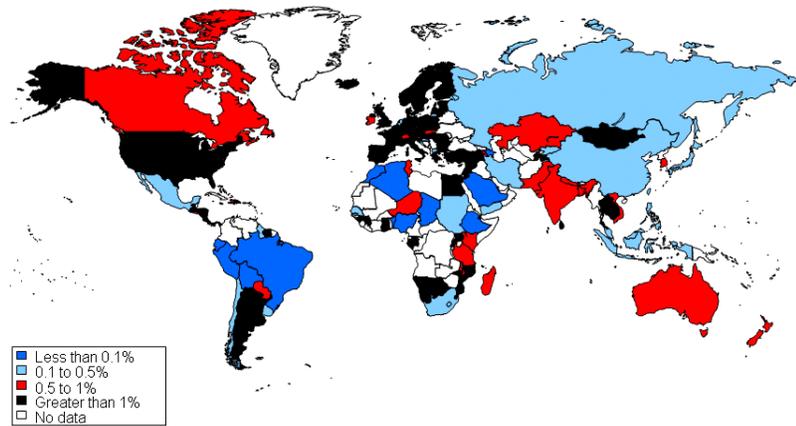
Overall CPI Inflation



Food Price Contribution to Inflation



Fuel Price Contribution to Inflation



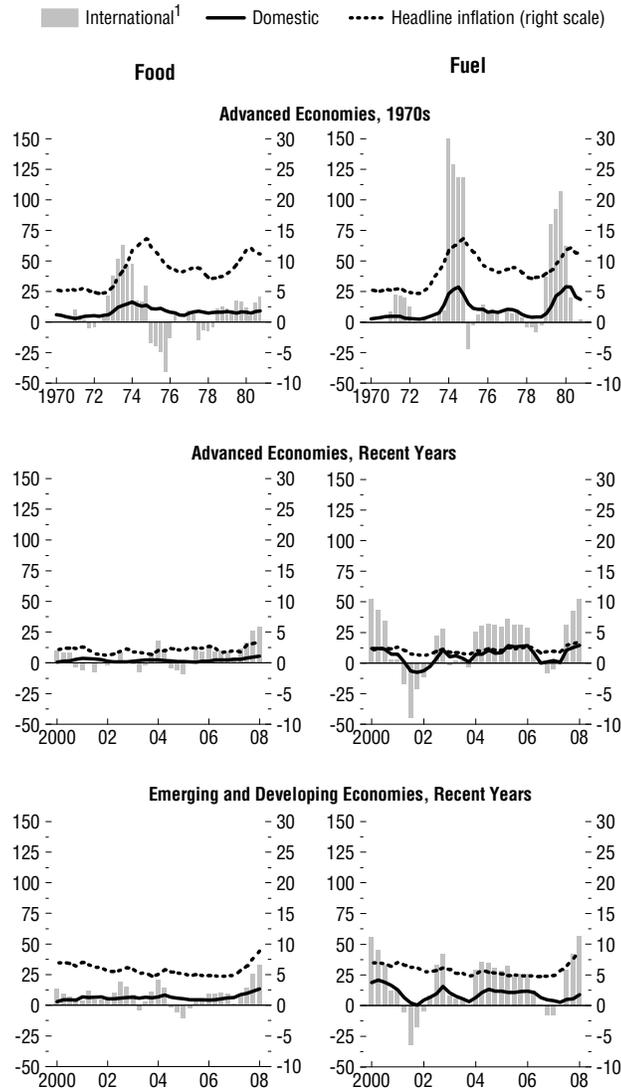
Source: IMF staff calculations.

<sup>1</sup>Food and fuel price contributions are calculated as, respectively, food and fuel inflation multiplied by the corresponding weight in the CPI.

**Figure 3.8. Changes in International and Domestic Commodity Prices and Headline Inflation**

*(Year-over-year changes, in percent)*

Large changes in commodity prices were a characteristic of the 1970s, when inflation reigned in advanced economies. In comparison, the recent price fluctuations have been modest, although in recent months domestic food prices have accelerated in emerging and developing economies and domestic energy prices have surged in advanced economies, while inflation has picked up around the world.



Sources: IMF Primary Commodity Prices database; and IMF staff calculations.  
<sup>1</sup>International food and fuel prices are converted into local currencies. Food and fuel price indices in 1970s include a narrower set of commodities for data availability reasons.

certain commodities, especially fuels, which, again, may amplify or mitigate the transmission (see Box 3.2).<sup>28</sup> Third, the extent of integration of domestic and international commodity markets matters, since in more isolated markets domestic supply conditions (for example, for certain crops) may dominate the role of world price changes. Fourth, the cost structure of domestic production plays a very important role in the extent and timing of the pass-through to retail prices, as labor, transportation, and retailing costs account for a large part of the final price of many food items, especially in advanced economies, and the costs associated with commodity prices may be moderate in comparison.<sup>29</sup>

Changes in domestic prices of food and fuel may influence overall inflation both directly and indirectly. The direct (first-round) effects on headline inflation are determined by the weights of these commodities in the consumption basket. While these effects are large in many—especially poor—economies, they will eventually dwindle once international price changes are passed through, unless underlying, or core, inflation is affected.<sup>30</sup> Such indirect (second-round) effects on core inflation depend on the extent to which expectations of future inflation get unhinged and wage demands are set in motion.<sup>31</sup> This is partly linked to the relative magnitudes of demand and supply effects associated with commodity price shifts. On the one hand, higher food and energy prices raise costs and may lower productivity—a negative supply effect that puts upward pressure on inflation. On the other hand, they may cause expenditure switching from other goods and services—a negative demand effect that pushes inflation down. Although the supply effect tends to dominate, the balance between the two effects is subject to some uncertainty, especially in net commodity importers. In net

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<sup>28</sup>A number of emerging and developing economies rely on energy subsidies to limit domestic consequences of international energy price shocks. However, the associated fiscal costs may be large, especially at times of significant pressures from international prices (see IMF (2008b)). Indeed, escalating fiscal costs have recently forced a number of countries to roll back some of these subsidies. Furthermore, the associated fiscal expansion and financing requirements for ensuing government deficits may themselves lead to inflation (Sargent and Wallace, 1985).

<sup>29</sup>Movements in domestic labor and transportation costs may vary and either offset or reinforce pressures from commodity price changes. For example, labor costs in advanced economies followed a declining trend in the past couple of decades, in part due to increased access to the global pool of labor (see Jaumotte and Tytell, 2007). This may have helped offset higher energy and material costs in recent years.

<sup>30</sup>In fact, these effects are rarely immediate, since commodity price shocks may take considerable time to propagate to final retail prices. For example, Rigobon (forthcoming) estimates that oil price shocks typically take nine to twelve months to pass through, while food price shocks can take up to 30 months.

<sup>31</sup>In the past, the risk of a wage-price spiral was exacerbated in many countries by wage indexation. Since wages were indexed to past inflation, this introduced an additional source of inflation persistence. However, changes in the design of indexation systems over the past decades have weakened the associated inflationary effects. This said, the role of indexation is difficult to quantify, given differences in wage-setting practices across countries. In some countries—especially where labor markets are already tight—transfer revenue indexation could indirectly affect wage negotiations and increase inflationary risks. In addition, public sector wage adjustments in response to increases in food and energy prices that are practiced in a number of countries may contribute to a wage-price spiral.

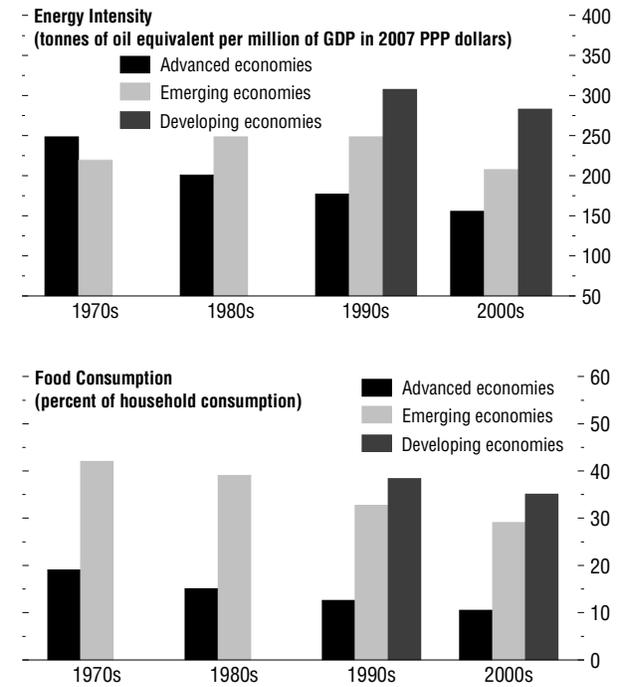
commodity exporters, a commodity price boom typically raises aggregate demand and intensifies inflationary pressures, although exchange rate adjustment could mitigate this effect.

What factors could influence the vulnerability of countries to inflationary risks associated with commodity price shifts? Broadly, these could be grouped into structural and policy-related factors. A key structural factor is the intensity of use. Indeed, the energy intensity—measured as energy consumption per unit of real GDP—has fallen by about forty percent in advanced economies since the 1970s. In comparison, emerging and especially developing economies are considerably more energy intensive (Figure 3.9).<sup>32</sup> The difference between these two groups is even more dramatic when it comes to food consumption. Food represents over a third of household consumption in emerging and developing economies, with the share ranging from just over ten to almost eighty percent in some developing economies. In contrast, in advanced economies food amounts to only one tenth of household consumption (half of what it was in the 1970s), and the share of raw material costs in total costs is considerably lower.

Turning to policies, monetary policy credibility plays a key role in shaping the inflationary impact of a commodity price shock. The quality of monetary management—approximated by an index of central bank autonomy<sup>33</sup>—has improved around the world, but in emerging and especially developing economies, it remains lower than in advanced economies (Figure 3.10). Over eighty percent of emerging and developing economies maintain heavily managed exchange rate regimes, in sharp contrast to advanced economies where exchange rates are

**Figure 3.9. The Relative Importance of Food and Energy**

While the relative economic importance of energy and food consumption has broadly followed a declining trend, emerging and developing economies are both more energy-intensive and more dependent on food consumption than advanced economies.



Sources: *British Petroleum Statistical Review*; UN National Accounts; U.S. Department of Agriculture; and IMF staff calculations.

<sup>32</sup>Energy intensity in emerging and developing economies is even higher when GDP is evaluated at market exchange rates.

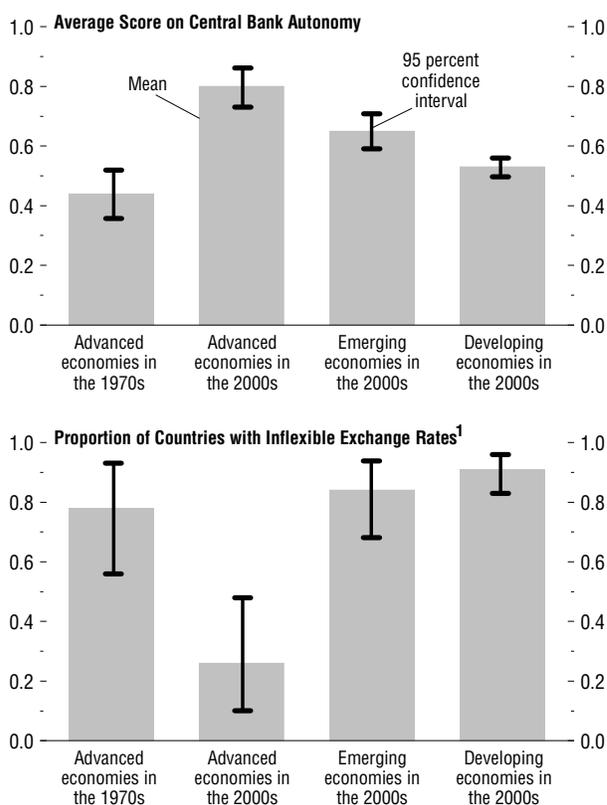
<sup>33</sup>This index captures the ability of a central bank to pursue independent monetary policy and is based on Arnone, Laurens, Segalotto, and Sommer (2007).

now overwhelmingly floating.<sup>34</sup> While pegged exchange rates helped many emerging and developing economies anchor inflation expectations in the past, they do constrain monetary policy responses, when advanced and non-advanced economies face very different cyclical conditions. The dissonance between buoyant activity and easy policy stance in emerging and developing economies is striking and reminiscent of the situation faced by advanced economies in the 1970s during the “great inflation”. This said, while monetary and exchange rate policies in emerging and developing economies are less flexible than those in advanced economies, their labor markets are typically less rigid and wage bargaining is less centralized, which could mitigate somewhat otherwise higher risks of a wage-price spiral.

To assess the potential for second-round effects from changes in food and fuel prices and to relate them to structural and policy characteristics across different economies, two related econometric exercises were conducted. The first one links core inflation to changes in prices of food and fuel, controlling for changes in the output gap (the Phillips curve).<sup>35</sup> It is based on country-by-country estimations over a relatively extended time period and allows a comparison between current developments and those at the time of the “great inflation” in the 1970s. The second exercise directly links changes in expected inflation to changes in actual headline inflation and disaggregates the latter into core inflation and changes in domestic

**Figure 3.10. Monetary and Exchange Rate Policies**

While the quality of monetary management has improved around the world, advanced economies score better on this dimension than emerging and developing economies, the majority of which continue to maintain inflexible exchange rate regimes.



Sources: Arnone, Laurens, Segalotto, and Sommer (2007); Reinhart and Rogoff (2004), updated; and IMF staff calculations.

<sup>1</sup>Inflexible exchange rate regimes include all de jure and de facto exchange rate pegs and bands and exclude currency unions.

<sup>34</sup>This comparison is based on an updated classification of exchange rate regimes of Reinhart and Rogoff (2004). Inflexible exchange rate regimes include all de jure and de facto exchange rate pegs and bands and exclude currency unions. See also Ilzetzki, Reinhart, and Rogoff (forthcoming).

<sup>35</sup>See Blanchard and Gali (2007) for an analysis of oil price pass-through across industrialized economies. De Gregorio, Landerretche, and Neilson (2007) undertake a similar study for a sample of industrial and some emerging and developing economies. Both studies find that the pass-through from oil price changes to overall inflation has declined over time.

inflation rates for food and fuel.<sup>36</sup> This exercise is based on a panel of advanced and emerging economies and allows a comparison of performance depending on structural and policy characteristics of these economies over recent years.

The first set of estimations show that the pass-through from international to domestic food prices and from domestic food prices into core inflation in emerging economies is comparable to that seen in advanced economies in the 1970s, and much higher than the pass-through observed in advanced economies more recently (Figure 3.11).<sup>37</sup> In emerging economies, over a half of the shock to domestic food prices ultimately makes its way through to core inflation following a shock to the world price, while in advanced economies, less than a quarter passes through. These findings are in line with the high share of food in consumption and the relative importance of material costs in production across emerging economies and underscore their sensitivity to food price developments.

Turning to fuel prices, the pass-through from international to domestic prices is substantially lower in emerging than in advanced economies. The pass-through from domestic prices to core inflation has recently been markedly lower than in the 1970s when over twenty percent of the price shock reached core inflation. The low pass-through coefficients may reflect a combination of factors, including declining energy intensity, widespread fuel subsidies and controls in emerging economies, and high fuel taxes in many advanced economies.<sup>38</sup>

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<sup>36</sup>Inflation expectations are typically measured in one of two ways. One way is based on surveys of consumers or professional forecasters and the other on the difference in yields between conventional and inflation-linked bonds (see Soderlind and Svensson, 1997, Fung, Mitnick, and Remolona, 1999, and Shen and Corning, 2001). Both of these measures have shortcomings: survey-based measures may reflect subjective and sometimes unfounded perceptions about inflation, while bond-based measures may reflect liquidity and inflation volatility premia, as well as institutional features of specific bond markets. In this study, expected inflation is measured using inflation forecasts published by Consensus Economics, since bond-based measures are not available for a sufficiently broad set of countries. See Goretto and Laxton (2005) and Levin, Natalucci, and Piger (2004) for similar analyses.

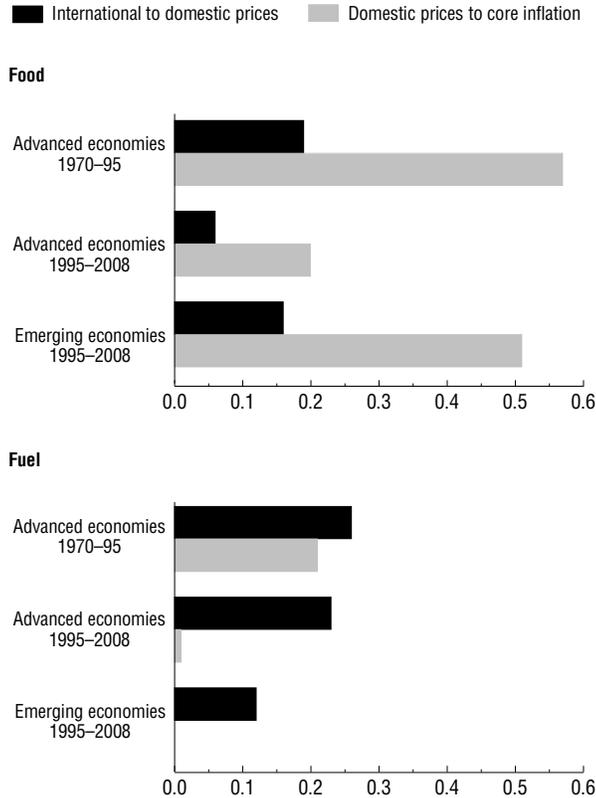
<sup>37</sup>The sample consists of 25 emerging and 21 advanced economies (9 for the 1970-95 period). In order to avoid contaminating the estimates by endogenous factors, the pass-through from domestic commodity prices to core inflation is estimated using only the variation in domestic prices that is due to changes in international prices. It must be mentioned that the estimates vary considerably across countries, reflecting in part differences in data quality, measurement of inflation, and sample periods, especially across emerging economies. The estimated pass-through captures the full long-term pass-through and does not reflect any differences in the time path of the inflation responses. Appendix 3.3 provides a detailed description of this exercise.

<sup>38</sup>In addition, comovement between food and energy prices could make the two effects hard to disentangle. Indeed, energy price changes contribute significantly to the dynamics of food prices, as pointed out in the preceding section. Furthermore, measurement issues in domestic food and especially fuel prices noted above could attenuate the estimated pass-through coefficients.

### Figure 3.11. Commodity Price Pass-through<sup>1</sup>

(Full long-term response to a 1 percentage point change in commodity price inflation, in percentage points)

The food price pass-through in emerging economies has recently been comparable to that seen in advanced economies in the 1970s, while the fuel price pass-through has been markedly lower. The pass-through in advanced economies has recently been moderate in the case of both food and fuel prices.



Source: IMF staff calculations.

<sup>1</sup>Weighted averages of country-by-country estimates using quarterly data. The pass-through from international to domestic prices is estimated using bivariate regressions. The pass-through from domestic commodity prices to core inflation is estimated using Phillips curve equations with domestic prices net of any influences other than international prices. In both estimations, the full long-term pass-through is calculated as the sum of coefficients on the current value and the four lags of the independent variable divided by one minus the sum of coefficients on the four lags of the dependent variable.

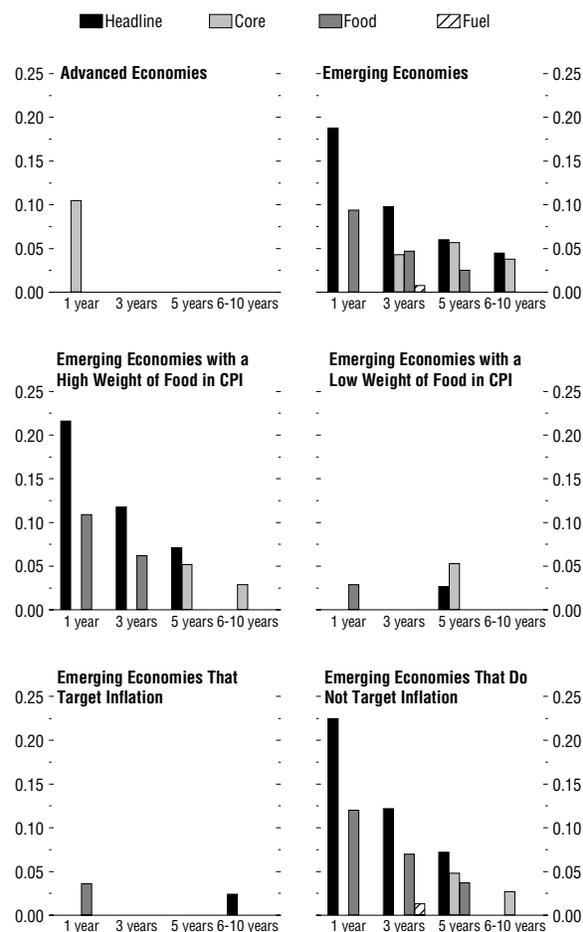
The econometric analysis of the relationship between changes in expected and actual inflation suggests that differences in structural and policy vulnerabilities shape expectations across economies (Figure 3.12).<sup>39</sup> In advanced economies, expectations appear to be well anchored: long term inflation forecasts do not react to actual inflation. Expectations are generally less well anchored in emerging economies, where expected inflation continues to be influenced by actual inflation even at long forecast horizons. Thus, when headline inflation increases by one percentage point, inflation expected in the following year rises by nearly 0.20 of a percentage point on average. Even as far as six to ten years into the future inflation is still expected to rise by about 0.05 of a percentage point. In these economies, expectations also respond strongly to changes in domestic food price inflation, while energy price inflation does not appear to exert significant effects, likely reflecting the relative shares of food and energy in consumption.<sup>40</sup> Economies where food accounts for a large share of household consumption experience a particularly sizeable increase in expected inflation in response to changes of domestic food price inflation.

The transmission of commodity price shocks into expected inflation appears to depend crucially on the conduct of monetary policy. Specifically, inflation targeting appears to have been quite

**Figure 3.12. Changes in Expected Inflation in Response to Changes in Actual Inflation<sup>1</sup>**

(Expected inflation 1, 3, 5, and 6–10 years ahead; percentage point responses to a 1 percentage point change in actual inflation)

Inflation expectations appear significantly better anchored in advanced economies than in emerging economies, especially those with a high share of food in the CPI. In emerging economies, exchange rate targeting seems to have been less successful recently in anchoring expectations than inflation targeting.



Sources: Consensus Forecasts; and IMF staff calculations.

<sup>1</sup>Based on statistically significant coefficients from panel regressions with fixed effects, using semiannual data since 2003. The measure of core inflation is net of food and fuel inflation.

<sup>39</sup>The estimations are based on a panel of semi-annual observations beginning in 2003. The sample includes 14 advanced and 21 emerging economies. In order to disentangle the effects of core inflation from those of changes in commodity prices, only the variation in core inflation that is not due to changes in food and fuel prices is used in the analysis. More information on this exercise is provided in Appendix 3.3.

<sup>40</sup>In addition, as noted above, comovement between food and energy prices could make the two effects hard to disentangle, while measurement issues in domestic food and especially fuel prices could attenuate the estimated coefficients.

effective in anchoring inflation expectations: beyond the one-year horizon, expectations do not appear to respond much to changes in actual inflation. In contrast, non-inflation-targeting countries—many of which formally or informally target nominal exchange rates—seem less successful in anchoring expectations. This said, the apparent benefits of inflation targeting may reflect in part the general quality of domestic monetary management in these countries, although even so achieving the targets has recently become more difficult.<sup>41</sup> In addition, other country-specific factors—such as the level of development, the extent of labor market flexibility, and the conduct of fiscal policy—may also influence the response of expectations to actual inflation.

Will the recent food and energy price surges lead to a sustained increase in inflation rates across the globe? The findings described above may give reason to be cautiously optimistic, particularly for the advanced economies and emerging economies that have adopted inflation targeting. However, empirical relationships based on past data may not provide reliable guidance for the future, even if one assumes that monetary policy credibility will continue to improve and global integration and competition will continue to rise. Recent commodity market-related shocks have been larger and more persistent than they were over the sample period used for the estimations, and for this reason, the actual pass-through going forward may surprise on the upside, unless the global slowdown intensifies.<sup>42</sup> The risks of such surprises are intimately linked to expectations of future inflation and the ability of monetary policies to anchor them effectively, as discussed in the following section.

### **Monetary Policy Responses to Commodity Price Shocks**

Monetary policy mistakes can have serious consequences in the presence of permanent commodity price shocks, as demonstrated by the great inflation of the 1970s in the advanced economies. Given already increasing inflation and easy monetary conditions, the appropriate response to the oil price shock—an adverse supply shock—at that time would have been to tighten. Instead, the inflation surge was exacerbated by a continued easing of the monetary policy stance, which further increased inflation expectations and eroded policy credibility. Since that experience, central banks have been very aware that monetary policy should not accommodate second-round effects of adverse supply shocks.<sup>43</sup>

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<sup>41</sup>Inflation targeting in emerging economies is discussed in Chapter 4 of the September 2005 *World Economic Outlook*. In a more recent study, Mishkin and Schmidt-Hebbel (2007) suggest that inflation targeting helps countries to lower inflation and to strengthen monetary policy and, in particular, to reduce inflationary effects of oil price shocks.

<sup>42</sup>In addition, while the flexibility of domestic labor markets will in all probability continue to improve, the anti-inflationary role of the global labor market may eventually weaken, as labor markets in emerging and developing countries mature and their wages catch up to advanced economy levels.

<sup>43</sup>Many economists have noted the substantial decline in the volatility of important macroeconomic variables since the 1980s, e.g. Bernanke (2004) and King (2005). Kumhof and Laxton (2007) estimate that about one half of the higher output variability in the 1970s and early 1980s relative to the period 1995-2007 can be attributed to inefficient monetary policy and one half to larger supply and demand shocks.

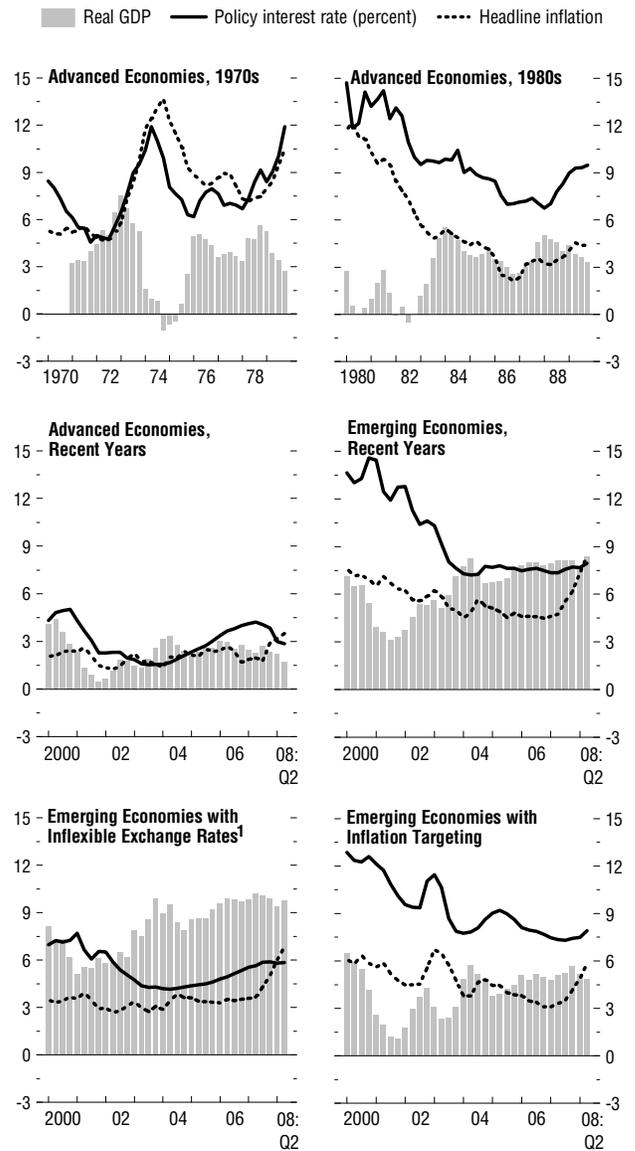
It is well established that the appropriate response of monetary policy to supply shocks depends on the cyclical position of an economy and the degree of policy credibility. For example, with a high degree of capacity utilization and low credibility, dangers of pass-through into core inflation are relatively high. This has implications for the monetary policy responses to the current increases in food and energy prices. As discussed in Chapter 1, many emerging-market economies have been showing signs of overheating, with easing monetary conditions. Short-term nominal interest rates are significantly below nominal income growth—partly because expansionary U.S. monetary conditions have been imported with exchange rate constraints on monetary policy, as noted above (Figure 3.13). At the same time, monetary policy credibility in these countries is more fragile. To bring inflation under control and avoid a boom-bust cycle, monetary conditions will have to tighten considerably. As shown in Box 3.3., this would also have some moderating influence on commodity demand at the global level and on international commodity prices.

**Monetary policy credibility and inflation dynamics**

Simulations based on models with endogenous credibility and capacity constraints can provide useful guidance on how monetary policy should respond to adverse supply shocks with different degrees of policy credibility as well as different cyclical positions and levels of initial inflation. The analysis is based on a small open-economy macroeconomic model, in which inflation behavior and inflation expectations depend on the credibility of monetary policy. Credibility is determined

**Figure 3.13. Activity, Interest Rates, and Inflation**  
(Percent change from a year ago unless otherwise noted)

Low or negative real interest rates were a feature of the inflationary period in the 1970s in advanced economies, in contrast to the period of stabilization that followed in the 1980s. Recently, real interest rates have turned negative in emerging economies—especially those with inflexible exchange rates—alongside substantially more buoyant activity than in advanced economies.



Source: IMF staff calculations.

<sup>1</sup>Inflexible exchange rate regimes include all de jure and de facto exchange rate pegs, bands, and crawling pegs or bands that are narrower than plus or minus 2 percent. See Reinhart and Rogoff (2004) and Ilzetzki, Reinhart, and Rogoff (forthcoming).

endogenously and depends on the evolving track record of inflation relative to the long-run target<sup>44</sup>. This, in turn, affects the extent of second-round effects of supply shocks in the model, since the extent to which inflation shocks feed into expectations depends on current and past inflation. With full credibility, inflation expectations are entirely forward-looking, implying that a permanent increase in commodity prices has little effect on expectations. If credibility is low, however, expectations depend mostly on current and past inflation, and they are affected by shocks to current inflation.

The model determines the optimal monetary policy response—through changes in the short-term interest rate—given the central bank’s policy objectives. These relate to: deviations from the inflation target, output gaps, and short-term variability in interest rates.

The model postulates that the central bank sets interest rates to minimize variability along all three dimensions. With adverse supply shocks, the difficulties in setting policies arise because inflation and output initially move in opposite directions and because monetary policy tightening reduces both output and inflation in the short term. The central bank’s policy preferences determine how it trades off gains from reducing inflation against the costs of lower output.

### **Supply shocks and policy credibility**

In a first simulation, the supply shocks hit the model economy when inflation is at the target rate of two percent and the initial level of the output gap is zero.<sup>45</sup> With high initial credibility—reflecting conditions prevailing in advanced countries—inflation rises to more than three percent following the inflationary supply shock (Figure 3.14, left panels). The optimal policy response brings inflation back to the target within eight quarters—which is in line with conventional estimates of the lags involved in the transmission of monetary policy. The interest rate has to rise temporarily to a peak of about five percent—about one percentage point above the neutral rate of four percent assumed in the model. In the low credibility case, the general picture is roughly similar, although inflation rises by more, and the interest rate increase required to bring inflation back to target is proportionally higher (Figure 3.14, right panels).

A positive disinflationary shock has roughly symmetric implications for the inflation rate, and for the other key variables. Thus, there is a transitory decline in inflation, which allows the central bank to lower the interest rate temporarily.

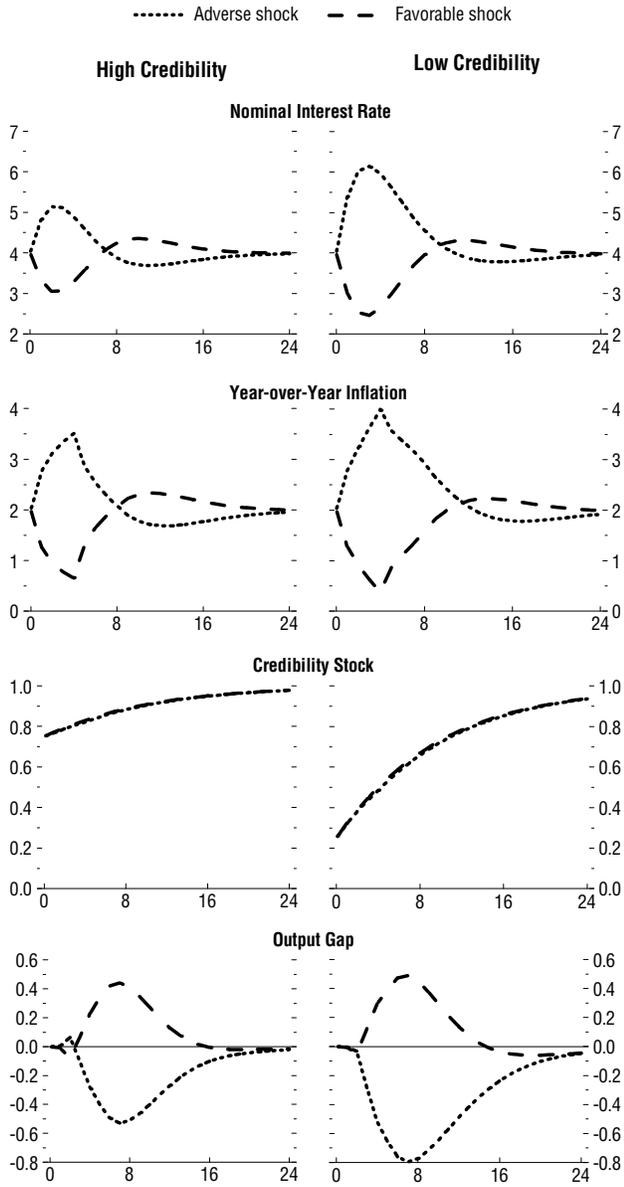
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<sup>44</sup>See Alichì and others (2008) for a description of the model and its properties.

<sup>45</sup>The experiments are based on supply shocks that either permanently increase or decrease the price of commodities. The output gap is defined so that a positive value is excess demand and associated with inflationary pressures.

**Figure 3.14. Stylized Advanced Economy with Adverse and Favorable Supply Shocks<sup>1</sup>**  
*(Percent; quarters on the x-axis)*

Adverse and favorable supply shocks are broadly symmetric in their impact on inflation and output and monetary policy implications if credibility is high.



Source: IMF staff calculations.

<sup>1</sup>The experiments are based on supply shocks equivalent to a 1 percentage point change in annual average inflation for one year.

### Supply shocks and existing inflationary pressures

In a second simulation, the same shock hits an economy where there are excess demand pressures and inflation is already significantly above target. Initial inflation is assumed to be at eight percent, which is above the long-run target of 3 percent—reminiscent of the inflationary pressures from overheating faced today by some emerging economies. With initial inflation above target and low credibility, an adverse supply shock will have larger second-round effects on inflation (Figure 3.15, right panels). As expected, to bring inflation back to target, an aggressive immediate interest rate response is needed, with rates rising up to 14 percent, an increase substantially larger than the increase in inflation. Interest rates also need to remain higher for longer, and the negative output gap is longer lived. Thus, even if policy responds appropriately, an inflationary supply shock in conjunction with low credibility results in a period of stagflation. By way of comparison, if credibility is higher, inflation can be brought back to target with a less aggressive interest rate response and a lower output cost (Figure 3.15, left panels). In contrast, in the case of a favorable, disinflationary supply shock, it is optimal to reduce inflation over a shorter time period than otherwise, as the faster credibility gains lower the output costs of reducing inflation.

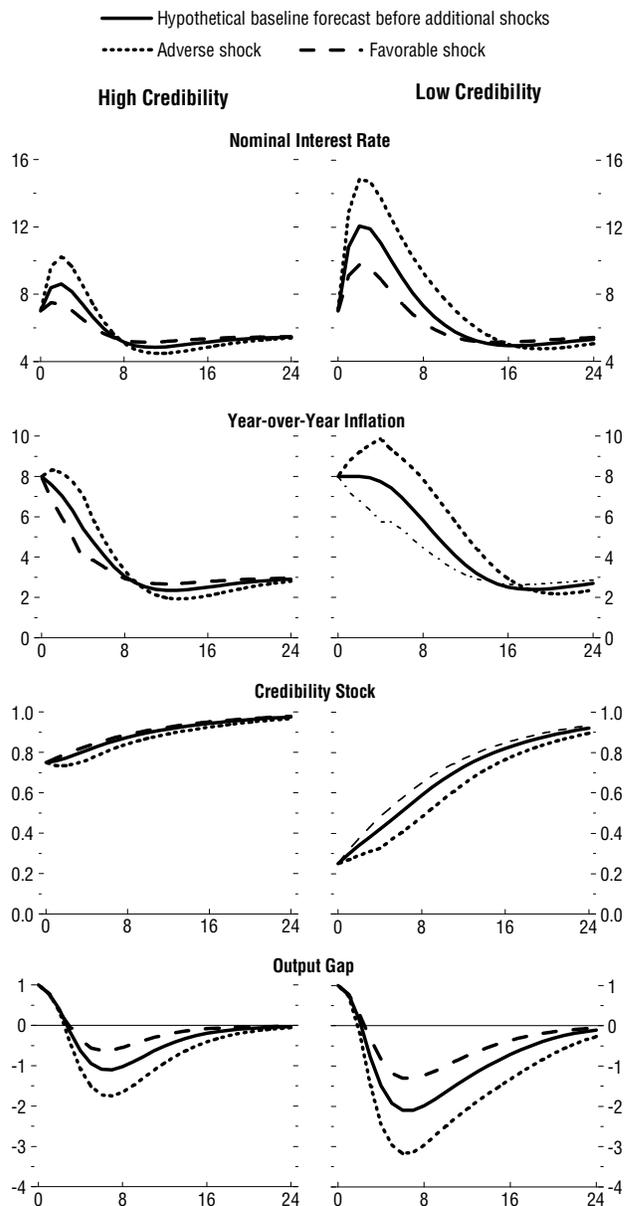
### Supply shocks with delayed monetary policy responses

In a final simulation, monetary policy is assumed to fall behind the curve. Specifically, optimal policy is over-ruled, for two quarters, by a decision to hold interest rates constant in the face of an inflationary supply shock. In the case of on-target initial inflation and high credibility,

**Figure 3.15. Stylized More Vulnerable Emerging Market Economy with Adverse and Favorable Supply Shocks<sup>1</sup>**

(Percent; quarters on the x-axis)

The symmetry between adverse and favorable supply shocks disappears if monetary policy credibility is low and initial inflation is already above target. A more aggressive immediate interest rate response is needed to bring inflation back to target after an adverse supply shock.



Source: IMF staff calculations.  
<sup>1</sup>The experiments are based on supply shocks equivalent to a 1 percentage point change in annual average inflation for one year.

the picture does not change materially from the path under the optimal responses discussed above (Figure 3.16, left panels). The delay does mean, however, that the interest rate has to rise by more than otherwise. In contrast, in the excessive initial inflation, low credibility case, the delay in raising interest rates in response to an adverse supply shock causes inflation to ratchet upwards and remain persistently higher than the long-term target. The damage to credibility means that significantly larger interest rate increases and a more prolonged negative output gap are needed to bring inflation back to target.<sup>46</sup> At the same time, the time horizon for inflation stabilization lengthens, which increases risk exposure to possible future adverse supply shocks.

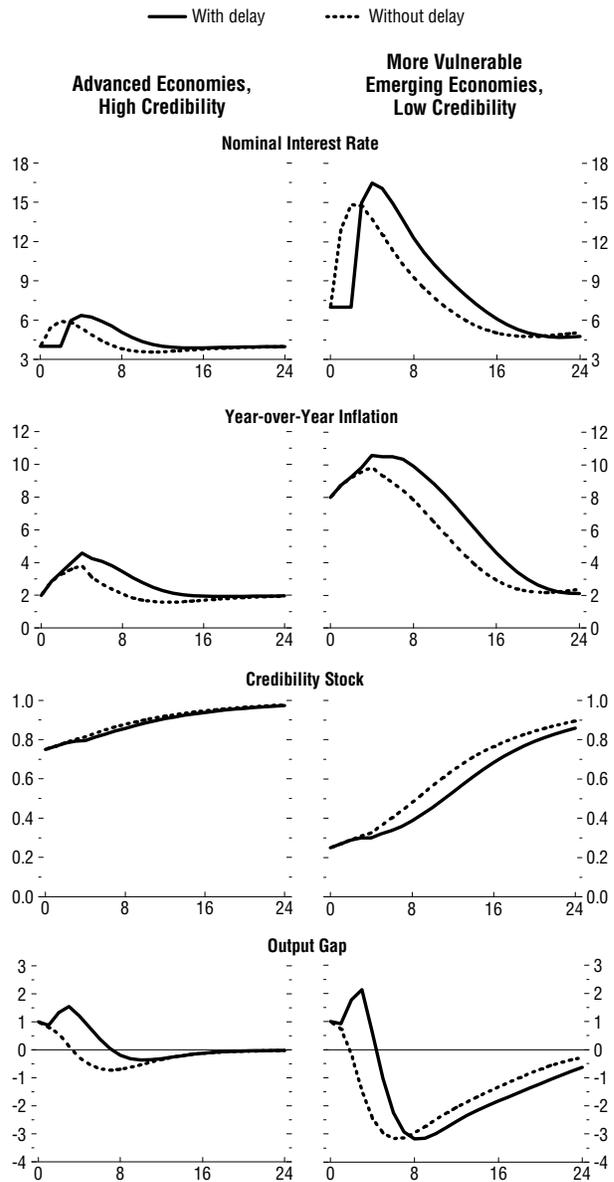
If the adverse supply shock resulted in an *upward trend* in commodity prices rather than a *one-off* permanent increase in prices, the monetary policy challenges associated with low credibility and existing inflationary pressures would increase further. Simulations (not reported) that consider a more persistent rise in commodity prices show that such shocks would require an even more aggressive monetary policy responses. The costs from falling behind the curve would be even greater with such a supply shock.

To sum up, the simulation results underline the overarching importance of monetary policy credibility. When credibility is low, the short-run inflation-output trade-off is worse, which implies that the policy interest rate has to increase more vigorously in response to adverse supply shocks with second-round effects. Inappropriate actions

**Figure 3.16. Potential Costs of Delaying Interest Rate Hikes<sup>1</sup>**

(Percent; quarters on the x-axis)

Delaying the monetary policy response to adverse supply shocks implies that interest rates have to rise more in the end to bring inflation back to target, with possible disruptions to credibility building.



Source: IMF staff calculations.

<sup>1</sup>The experiments are based on supply shocks equivalent to a 1 percentage point change in annual average inflation for one year.

<sup>46</sup>Historical experience supports this result. For example, in the United States and Canada in the early 1980s, short-term interest rates rose well above 20 percent, following the adoption of anti-inflation policies by the U.S. Federal Reserve and the Bank of Canada.

or delays can undermine credibility quickly and make achieving price stability more difficult.

### **Summary and Conclusions**

The world economy has experienced the broadest and most sustained commodity price boom since the early 1970s. The boom has largely been driven by the interaction of strong global growth, a lack of sector-specific spare capacity and low inventories from the onset of the boom, and slow supply responses. In addition, commodity-specific factors such as demand for biofuels use, supply disruptions for major crops, and trade restrictions have contributed to the recent food price surge. Cross-commodity price linkages have reinforced the price momentum, with rising energy prices spilling into food prices. In contrast, the increasing role of commodities as alternative financial assets has had little, if any, discernible systematic impact on prices, although shifts in market sentiment can affect short-term price dynamics and financial variables such as interest rates can affect prices through their effects on physical demand and supply.

Recent developments suggest that some of the factors driving the boom appear to be unwinding. Prospects of slowing global growth in 2008-09—partly in response to high commodity prices—and the resolution of weather-related supply constraints for key food crops this year have already led to some easing of commodity prices. However, supply constraints and low inventories are likely to remain in place for some time and the momentum of demand growth in large emerging economies still remains robust. The extent of further easing of prices will depend on the evolving balance between supply factors and global growth, with considerable scope for price volatility.

Looking forward, barring a sharp drop in commodity prices, inflation risks will remain elevated for some time. The adjustment to the earlier commodity price surge is still in train in many economies, and the challenge remains to accommodate these relative price change without “second-round effects,” that is, spillovers into underlying inflation.

The chapter’s empirical findings on the pass-through from food and fuel prices to core inflation and inflation expectations suggest that the risks of second-round effects depend importantly on monetary policy’s credibility and its ability to anchor expectations as well as on the exchange rate regime, and on the weight of food and fuel prices in final expenditure. Emerging and developing economies score lower along these dimensions and are thus more at risk, notwithstanding some offset from generally more flexible labor markets. Such ex ante risk concerns are corroborated by the recent increases in core as well as headline inflation in these economies. However, advanced economies are not immune to such inflation risks. Since the recent commodity market-related shocks have been larger and more persistent than they were over the sample period for the estimation of the pass-through, the actual pass-through may surprise on the upside, unless the global slowdown intensifies.

There are growing signs that in many emerging and developing economies, monetary policy has not yet responded adequately to the increasing risks of rising inflation. Despite growth at historically high rates, recent increases in core inflation, and relatively higher risks of second-round effects from recent commodity price increases, real policy interest rates in many of these economies are low and declining. In some countries, these declines partly

reflect exchange rate-related constraints on monetary policy, as a result of which economies have imported the expansionary U.S. monetary policy stance. In turn, strong demand growth and insufficiently tight monetary policy from a domestic point of view may recently have put some additional pressure on international commodity prices.

As the chapter's simulation results highlight, delays in responding to rising inflation can erode monetary policy credibility, particularly if inflation expectations are not well anchored—which the chapter suggests remains the case for many emerging economies. As a result, more aggressive monetary policy responses will ultimately be needed to bring inflation back to target, at a higher cost in terms of output compared to a timely monetary policy response. Higher initial inflation or inflationary pressure from tightening capacity constraints more generally reinforce such dynamics. At the same time, even with a timely response, the time needed to reduce inflation is likely to be longer with low policy effectiveness, making an economy more vulnerable to possible future adverse supply shocks. This highlights the critical importance of a strong, timely monetary policy response to rising inflation after the recent commodity price surges, especially where current inflation is already high (“above” target) for other reasons, notably overheating, and where credibility is low.

**Box 3.1. Does Financial Investment Affect Commodity Price Behavior?<sup>47</sup>**

Commodities have become an alternative asset class in recent years, with open positions at futures exchanges and investments in commodity-indexed assets growing rapidly.<sup>48</sup> This financialization of commodity markets is often thought to have affected commodity price behavior, although views about the extent of influence vary widely among analysts. One perspective is that financialization of commodities is largely beneficial and would improve market efficiency and price discovery. Another view is that recent commodity price surges are largely driven by speculators and herd behavior by investors looking for alternative asset classes. This box analyzes the potential impact of investment flows on commodity price behavior. Specifically, it considers whether the evidence supports the notion that speculation in commodity-related financial assets has driven the recent commodity price booms. To shed further light, it will also consider how other aspects of price formation such as price volatility and comovements have been affected by increased financial flows.

***How do financial factors affect price formation?*** Financial markets can affect commodity prices through two channels. First, certain financial variables—such as exchange rates and interest rates—can directly affect commodity supply and demand. For example, a weakening US dollar and a lower interest rate could raise demand and reduce production of commodities, thereby exerting price pressures.<sup>49</sup> Second, transactions by financial investors, including speculators, might directly influence price behavior. A prominent controversy in this area relates to whether the recent commodity price booms have been underpinned by speculation or the rapid rise in investments in commodity-indexed assets by investors seeking to diversify portfolios.

Since the fair value of commodities is difficult to determine, the issue of whether such behavior has driven prices away from fundamentals has been addressed through indirect approaches. One approach is to examine whether changes in commodity financial positions lead to commodity price changes using time-series analysis (“Granger causality tests”). Many recent studies in this vein, including in the Fall 2008 *Global Financial Stability Report*, have not found evidence systematic causality between positions and prices in either direction.<sup>50</sup> Indeed, the direction of financial flows often is not consistent with the direction of price movements. For example, while crude oil prices rose sharply in May and June of 2008, net

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<sup>47</sup>The main author of this box is Kevin Cheng.

<sup>48</sup>For example, the open interest of crude oil futures traded in NYMEX has increased by 155 percent during 2003-2008, with corresponding figures increasing by 63 percent for gold. Investment in commodity-related assets has increased from below \$10 billion in 1997 to around \$240 billion by end-March 2008 (Barclays Capital).

<sup>49</sup>See, for example, Box 1.4 of the April 2008 *World Economic Outlook*.

<sup>50</sup>See also Box 5.1 of the 2006 September *World Economic Outlook* or the Interim Report on Crude Oil by the U.S. Interagency Task Force on Commodity Markets.

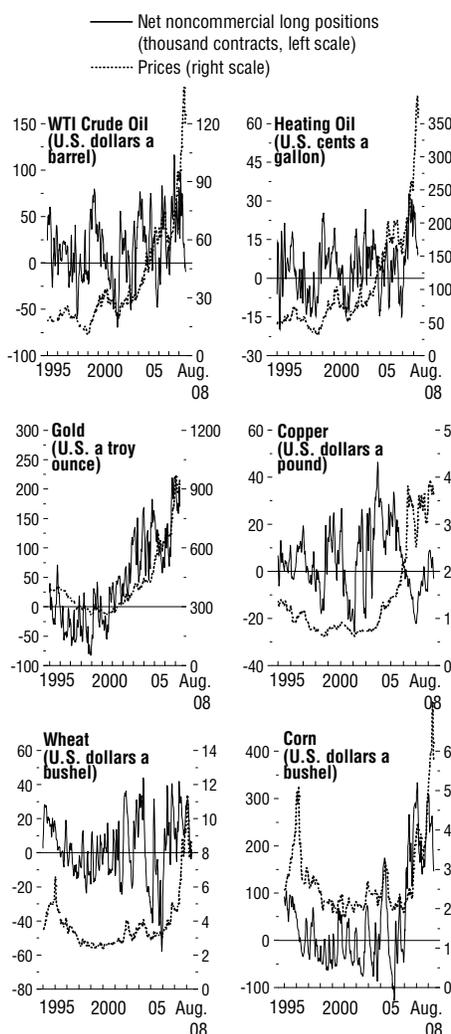
speculative positions continued to decline, falling by over 70 percent during the first half of the year (first figure).

A second approach is to examine whether recent inventory behavior is consistent with the hypothesis that the recent price trends have been mostly driven by speculation. The basic intuition is as follows: for speculation to have a persistent effect on commodity prices, it needs to be accompanied by increasing physical hoarding of the commodities to keep spot markets in balance since consumption would decline at the higher prices (see Krugman, 2008). Available data, however, suggest that, while inventories for some commodities increased somewhat in recent years, inventories for some other commodities with significant price appreciation have declined or remained broadly stable (second figure, upper panel). In particular, while crude oil prices almost doubled during 2007-2008, OECD crude oil inventories in 2008 have remained flat. Overall, therefore, there is little evidence of a systematic inventory hoarding of commodities, although a caveat is that data on commodity inventories are poor and lack global coverage.

A third approach to assess the impact of financial investment is to gauge the cross-sectional relationship between price formation and investor activities before and after the financialization of commodities. To shed further light, this box examines the relationship between financialization and price levels across markets. It also extends the analysis to two other aspects of price formation:

- **Volatility**—The impact of speculators on price volatility has long been a source of controversy among economists. Some economists—including Smith; Mill; and Friedman—argued that speculators provide liquidity, facilitate price discovery, and improve intertemporal allocation of resources by buying low and selling high, thus stabilizing prices. Others contend that market participants could often be “irrational”, trading based on emotion, heuristics, and herding mentality, thereby increasing market volatility.
- **Price comovement**—Another hypothesis is that enhanced financialization of commodities could raise the degree to which commodity prices move together. The reason is that increased financial flows could amplify exposure of commodities to some common financial shocks, such as exchange and interest rates. Moreover, investors may

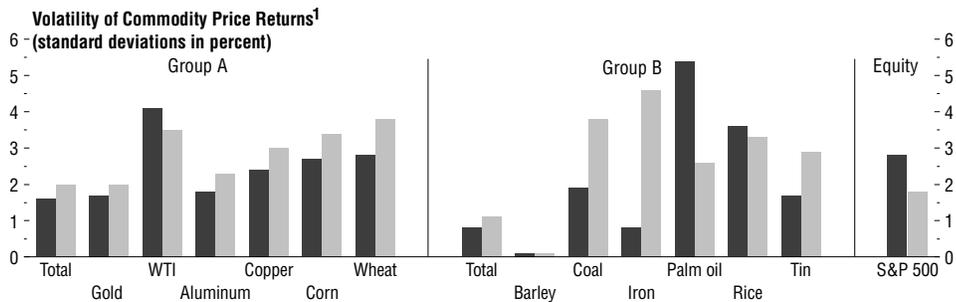
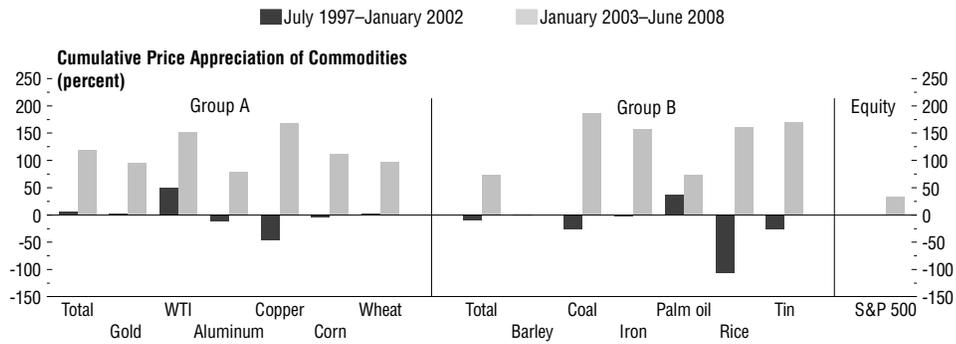
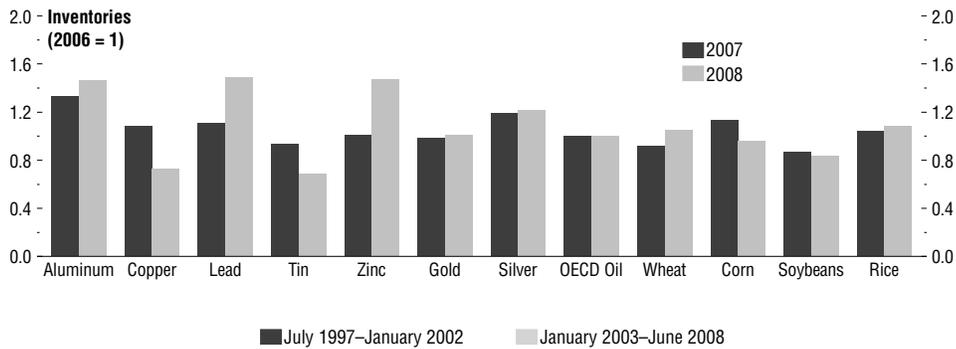
### Net Noncommercial Futures Positions and Prices (Four-week moving averages)



Sources: Bloomberg Financial Markets; U.S. Commodities Futures Trading Commission; and IMF staff calculations.

lack familiarity with individual commodities, thereby leading them to allocate funds to commodities as a whole (the habitat/category theory). For example, an investor could invest on commodities by buying a commodity index—which allocates funds across various commodities according to some pre-specified weights—rather than invest in any specific commodity on which she lacks knowledge. Moreover, financialization of commodities could increase the correlation—either positively or negatively—between commodity prices and other asset prices, such as equity prices purely on account of the overall financial market conditions.

**Inventories, Price Changes, and Volatility**



Sources: Bloomberg Financial Markets; International Energy Agency; London Metal Exchange; U.S. Department of Agriculture; and IMF staff calculations.

¹An F-test at 5 percent significance level indicates that the standard deviations of the two periods are statistically different, except for rice.

To examine the possibility of a price impact, properties of weekly commodity price returns (weekly changes of prices in logarithms) of 50 commodities are examined before and after the take off in commodity investment. Since the recent commodity price and investment

booms began roughly in 2003, the focus period is between January 2003 and June 2008, with the control period being July 1997-December 2002. To distinguish the extent of financialization, commodities are divided into two groups:

- **Group A**—These are commodities heavily traded in the financial markets. Specifically, a commodity is included in Group A if it is included in one of the four major commodity indices.<sup>51</sup> A total Group A price index is computed based on the average weights of the underlying four commodity indices. Also, six individual commodities within the group are examined in greater details, including gold, WTI crude oil, aluminum, copper, corn, and wheat.
- **Group B**—This includes all the commodities in the IMF commodity index that are not included in Group A.<sup>52</sup> In addition to the total Group B price index calculation based on the IMF commodity weights, six of them are examined in greater details: barley, coal, iron ore, palm oil, rice, and tin.

### *Price Level*

While prices of Group A commodities rose by less than 6 percent between 1997 and 2002, they increased by around 120 percent during 2003-2008. Group B fell by around 12 percent during the first period but rose by almost 75 percent in the second period (first figure, middle panel). Indeed, many commodities without significant futures markets—such as iron ore and rice—have experienced a greater extent of price appreciation than those with sizable futures markets such as gold and crude oil. Further, a simple cross-sectional regression indicates an almost flat and slightly negative relationship between price changes and changes in the speculative net long positions<sup>53</sup> during 2003 (third figure, upper panel).

### Price Volatility

To gauge if greater financial investment has destabilized markets by increasing price volatility, measures of price volatility (standard deviations) were computed for each

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<sup>51</sup>The four commodity indices examined are the S&P Goldman Sachs Commodity index, Deutsche Bank Commodity Index, the Dow Jones-AIG Commodity Index, and the UBS Bloomberg Constant Maturity Commodity Index. Commodities included in Group A are Brent crude, natural gas, WTI crude, gas oil, unleaded gasoline, heating oil, aluminum, copper, gold, lead, nickel, silver, zinc, cocoa, coffee, corn, cotton, lean hogs, beef, orange juice, soybean oil, soybeans, soybean meal, sugar, and wheat.

<sup>52</sup>These include banana, barley, coal, fish, fish meal, groundnut, hard logs, hard sawn wood, hides, iron ore, lamb, olive oil, palm oil, poultry, rapeseed oil, rice, rubber, shrimp, soft logs, soft sawn wood, sunflower, oil, tea, tin, uranium, and wool.

<sup>53</sup> Following the classification of futures positions by type of trader by the U.S. Commodity Futures Trading Commission (CFTC), net non-commercial futures positions are used as a measure of speculative positions in commodity futures markets. These positions are defined as the net of long and short positions of non-commercial traders.

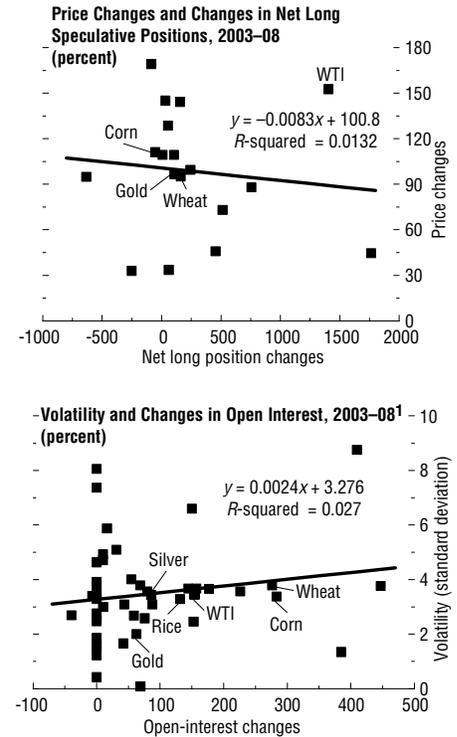
commodity groups before and after 2003 (second figure, lower panel). The results are mixed: first, price volatilities for most commodities in Group A were higher after 2003, with the notable exception of crude oil, which has significantly declined, despite being heavily traded. Second, volatilities for most commodities in Group B have also risen, despite the fact that they are not heavily financially traded, which suggests that the volatility increases in Group A may reflect factors other than the financialization of commodities. Furthermore, a simple cross-sectional equation is estimated by regressing return volatilities on changes in open interests of commodity futures during 2003-08.<sup>54</sup> The results indicate a positive but weak relationship between return volatilities and the extent of financialization suggesting that price volatility may be better linked to other variables such as market tightness, stock levels or geopolitical risks<sup>55</sup> (third figure, lower panel).

#### *Price Comovement*

To gauge if comovement has increased among commodity prices and with stock prices, weekly returns of selected commodities were regressed on a constant and an “explanatory” variable—including a return of another commodity (within the same group), the return of the total group index (excluding the individual commodity under investigation), or the return of the S&P 500. The extent of comovement is measured by the coefficient of determination or  $R^2$ . Intuitively, if comovements were primarily driven by commodity investment, especially indexing, one should expect that the  $R^2$  for Group A commodities would be higher than those for Group B and would increase after 2003 as the financialization accelerated.<sup>56</sup>

The results do suggest increasing price comovements among some of the more financialized commodities (table). Overall, Group A commodities demonstrate a higher

#### **Financialization, Price Changes, and Volatility**



Sources: Bloomberg Financial Markets; U.S. Commodities Futures Trading Commission; and IMF staff calculations.

<sup>1</sup>Sample size may vary among commodities because data on open interests for some commodities are not available before 2003. Commodities with no futures markets are shown as zero changes in open interests.

<sup>54</sup>An open interest—defined as the total number of options and/or futures contracts that are not closed or delivered on a particular day—is used as a proxy for the degree of financialization.

<sup>55</sup>Haigh, Hramiova, and Overdahl (2005) also demonstrated that there is no evidence that increased commodity index trading has raised price volatility.

<sup>56</sup>As a caveat, given the interlinkages among commodities (such as production/consumption substitution), it is possible that financialization could affect Group B indirectly through Group A even though Group B commodities are not heavily traded.

comovement than those in Group B both before and after 2003. Moreover, on average, comovement among Group A commodities has increased to a greater extent than those in Group B. Most notably, the explanatory power of gold returns for other Group A returns have increased significantly, rising from around 2 percent during 1997-2002 to over 20 percent during 2003-2008, suggesting that gold increasingly comoves with other commodities in Group A. However, the explanatory power of crude oil for other Group A commodities has declined significantly since 2003.<sup>57</sup> Finally, commodity returns in both groups do not seem to be closely related with stock returns in either period.

In summary, while financialization may have led to increases in comovements between some commodities—particularly with respect to gold, no apparent systematic connection is found to either price volatility or price changes. These findings are consistent with recent studies in the area by the CFTC and others. Thus, there is little evidence to suggest that trading in futures markets is driving the recent price run-up or is destabilizing the commodity markets.

**Table Box 3.1. Comovement between Returns (R-squares in percent)<sup>1</sup>**

	Group A													
	July 4, 1997-December 27, 2002							January 3, 2003-June 27, 2008 <sup>3</sup>						
	Gold	WTI	Aluminum	Copper	Corn	Wheat	Group A	Gold	WTI	Aluminum	Copper	Corn	Wheat	Group A
WTI Crude	0.9							6.6*						
Aluminum	0.8	2.1						23.4*	4.8					
Copper	2.9	1.6	43.4					19.5*	3.5	34.6				
Corn	1.1	0.1	0.2	0.0				3.4	0.1	1.6*	1.2			
Wheat	0.5	0.5	0.3	0.5	40.6			4.7	0.5	1.0	1.9	23.1		
Group A <sup>2</sup>	2.3	7.2	0.5	40.1	2.5	36.5		21.0*	0.9*	2.5*	28.1*	0.0*	17.6	
S&P 500	0.0	0.6	0.2	0.2	0.0	0.3	0.5	0.1	0.1	0.6	0.8	0.7	0.1	0.0
<b>Average</b>	<b>6.7</b>							<b>7.2</b>						
	Group B													
	July 4, 1997-December 27, 2002							January 3, 2003-June 27, 2008						
	Barley	Coal	Iron Ore	Palm oil	Rice	Tin	Group B	Barley	Coal	Iron Ore	Palm oil	Rice	Tin	Group B
Coal	0.0							0.0						
Iron Ore	0.4	0.0						1.3	0.8					
Palm oil	2.0	0.2	0.1					0.2	0.0	0.2				
Rice	0.0	0.1	0.0	0.0				0.0	0.2	0.1	0.4			
Tin	0.1	0.2	0.1	0.1	0.4			0.5	0.4	0.3	0.0	0.2		
Group B <sup>2</sup>	0.4	56.3	0.0	17.4	0.1	0.4		0.6	73.1*	0.1	0.0*	1.1	0.2	
S&P 500	0.9	1.0	0.3	0.1	0.4	0.0	1.4	0.7	2.7	0.0	0.4	0.1	0.8	2.3
<b>Average</b>	<b>2.9</b>							<b>3.1</b>						

Source: Bloomberg and IMF staff calculations.

<sup>1</sup>A higher R-square indicates higher comovement. In bivariate regressions, R-squares are invariant to the choice of left- and right hand side variables. For example, regressing gold on WTI yields the same R-square as regressing WTI on gold.

<sup>2</sup>Excluding the commodity of the column under investigation.

<sup>3</sup>An asterisk indicates that there is a structural break between the two periods according to the Chow test at 5 percent significance level.

<sup>57</sup>Using monthly data, however, WTI crude oil has a high explanatory power—over 30 percent—for other commodity returns in Group A, reflecting energy cost pass-through over a longer horizon.

**Box. 3.2. Fiscal Responses to Recent Commodity Price Increases—An Assessment<sup>58</sup>**

The ongoing boom in prices of food and energy has led to a wide range of fiscal responses across the globe aimed at mitigating the domestic impact of higher international prices. This box summarizes these responses and discusses their effectiveness in alleviating the impact of commodity price increases on the poor and their macroeconomic implications more broadly.

A recent IMF survey, collected information for 146 countries on their fiscal responses to international price increases (IMF, 2008b). The survey found that:

- Expenditure measures are more prominent in the case of fuels, while revenue measures dominate food. Almost half of the surveyed countries increased fuel subsidies, while a quarter reduced fuel taxes. Fuel subsidies reached high levels in many countries this year, exceeding 5 percent of GDP in Egypt, Venezuela, Saudi Arabia, Ecuador, Yemen, and Turkmenistan. The picture is almost opposite on the food side, with more than half of the countries reducing food taxes, while a quarter increased food subsidies.
- Exporting countries have used both tax and regulatory measures to contain increases in domestic food prices. These measures have included increases in export taxes, the introduction of export quotas, and even the imposition of an outright ban on certain exports. Notably, export bans and export taxes have been imposed by key exporters of major cereals, including Argentina, China, India, and Vietnam.
- About a quarter of the surveyed countries have recently increased financing for more targeted transfer programs and ten countries increased public-sector wages and pensions in response to the price increases.

The total fiscal cost of these measures has been substantial and can be expected to increase. The median annualized increase in fiscal cost across the surveyed countries over 2007-08 was 0.6 percent of GDP. For about one-fifth of the countries, the fiscal costs exceeded 1 percent of GDP, with increases in universal subsidies for food and fuel accounting for most of the increase. By 2008, the fiscal cost of these universal subsidies had become a major fiscal burden in many countries. For example, these subsidies now account for at least 5 percent of GDP in 8 countries and at least 2 percent in another 15 countries (Figure).

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<sup>58</sup> The main author of this box is David Coady.

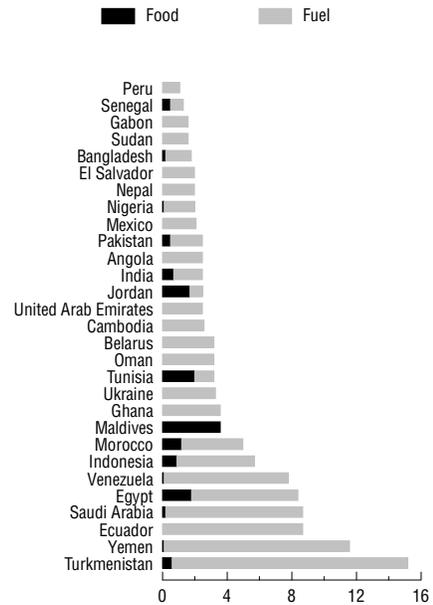
These measures are adopted, in part, because increases in the prices of food and fuel are seen as being particularly damaging for the poor. However, while the burden of food price increases is typically highly regressive, the burden of fuel price increases depends on their composition. Indeed, recent IMF studies<sup>59</sup> found that while a doubling of rice prices results in a 12 percent decrease in real incomes for the poorest income quintile compared to a 5 percent decrease for the richest quintile, a doubling of all fuel prices results in approximately a 10 percent decrease in income for all income groups. This said, while increases in gasoline prices are roughly proportional, increases in kerosene prices are highly regressive.

Universal price subsidies are a fiscally costly approach to protecting the welfare of poor households. This reflects the fact that a high proportion of the benefits from low food and fuel prices accrues to higher income groups. For example, an IMF study (IMF, 2008B) found that around 64 percent of the subsidy for rice went to the top three income quintiles. For kerosene and gasoline the corresponding shares were 55 percent and 92 percent (See Coady et al, 2006). Switching to better targeted mitigation measures can substantially reduce the associated costs, while reaching more effectively the most affected segments of the population.

Furthermore, incomplete pass-through of international to domestic commodity prices distorts incentives of domestic consumers and producers and ultimately reinforces global price pressures. More specifically, tax reductions and subsidy increases muffle the impact of higher international commodity prices on demand, while the imposition of export taxes and quotas reduces the gains from higher prices for exporters and therefore obstructs the supply response that would, in time, help bring the prices down. Financing requirements implied by the large fiscal costs of subsidies will eventually either cause their reversal, or lead to higher taxes—and therefore higher prices - for other goods and services. They could also feed into more general inflationary pressures if the ensuing deficits are monetized, or cause an excessive accumulation of government debt. For these reasons, the ongoing broad brush fiscal intervention in a wide range of countries is not a viable substitute for an appropriate monetary policy response to maintain macroeconomic stability in the face of the commodity price boom.

#### Universal Subsidies, 2008

(Percent of GDP)



Source: IMF Fiscal Survey.

<sup>59</sup> IMF (2008) analyzes the case of Senegal, while Coady et al (2006) provide evidence for Bolivia, Ghana, Jordan, Mali and Sri Lanka.

**Box 3.3. Monetary Policy Regimes and Commodity Prices<sup>60</sup>**

Policymakers around the world have recently shown much concern about heightened inflationary pressures, with sharp spikes in oil and food prices starting to feed into headline and even core inflation in a large number of countries. The question is whether monetary policy arrangements, specifically the dollar standard that has many countries pegging their currencies to the U.S. dollar (formally or informally through heavily managed exchange rates) can partly be held accountable for this development. And, if the answer to that question is yes, what would be the impact of adopting alternative approaches?

Under current monetary policy arrangements the U.S. exports its monetary policy stance to a significant proportion of the global economy, through other countries either pegging their exchange rates or intervening in foreign exchange markets. But the world is currently facing highly asymmetric shocks, with the U.S. and the euro area being slowed by financial strains and terms of trade losses while much of the rest of the world continues to expand at historically high rates. A monetary policy that is appropriate for the U.S., namely, relatively low nominal and real interest rates, is therefore highly inappropriate elsewhere.

This box seeks to answer two questions. First, if the most significant exchange rate pegs continue for the time being, is it in the best interests of the United States to take account of the effects of its monetary policy on the world economy? Second, given current circumstances, what difference would it make to the behavior of the world economy and of individual economies if the countries that now peg to the dollar moved to more flexible exchange rate regimes?

We attempt to answer these questions with the help of illustrative dynamic simulations that use the Bank of Canada's version of the Global Economy Model (BoC-GEM).<sup>61</sup> This is a five-region dynamic stochastic general equilibrium model that separately specifies each region's monetary policy regime as either a peg to the U.S. dollar or as an inflation targeting regime.<sup>62</sup> The latter is characterized by an interest rate reaction function whereby nominal interest rates are raised when inflation accelerates. These characterizations of monetary policies are not intended as an accurate depiction of policies but as a useful stylized representation that can help shed light on the issues. A critical feature of BoC-GEM for this investigation is its assumption of significant nominal rigidities in manufacturing and services but no nominal rigidities in the oil and commodities sectors.<sup>63</sup> This implies that if

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<sup>60</sup>The main authors of this box are Michael Kumhof, Douglas Laxton and Dirk Muir.

<sup>61</sup>See Lalonde and Muir (2007).

<sup>62</sup>The regions are United States (21.2% of world GDP using PPP weights), Emerging Asia (24.8%), Commodity Exporters (15.2%), Canada (1.8%) and Remaining Countries (37.0%). Our simulations do not address the issue of transitions from one monetary regime to another. They also do not address aspects of monetary policy other than the pure timing of interest rate changes, such as questions of portfolio preferences for reserve assets in different currencies, and questions of financial system regulation and control of credit expansion.

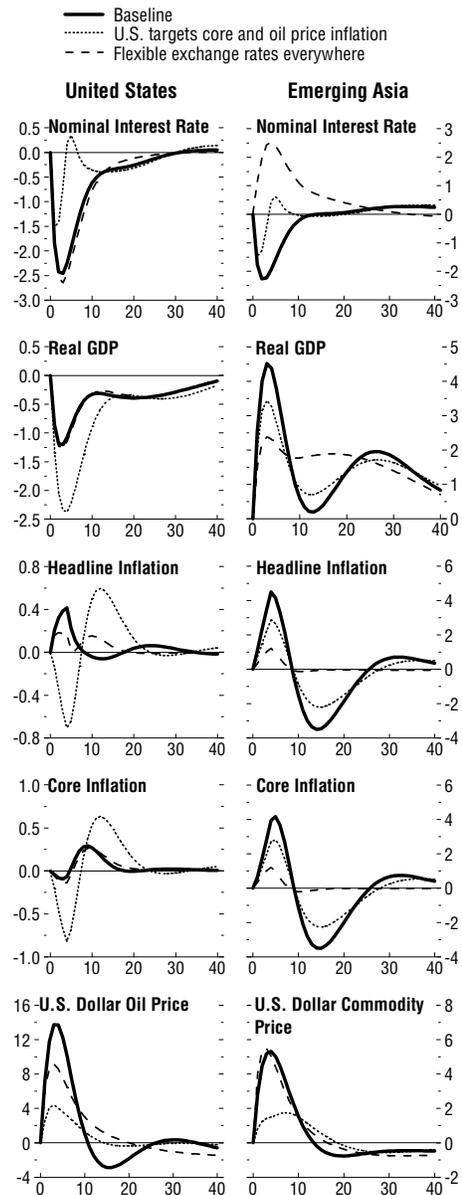
<sup>63</sup>The commodities sector includes but is not limited to food production.

monetary policy is solely concerned with domestic stabilization of price and output volatility, it should not attempt to pursue a strict short-run target that includes oil and commodities inflation, but should instead focus on stabilizing “core inflation” in the remaining sectors, which is therefore our baseline assumption. Finally, given that reduced spare capacity and low supply elasticities appear to have been major factors behind the recent volatility of oil and food prices, the model introduces factor adjustment costs that limit the short-term supply response in these sectors. As a result, following a positive shock that raises global demand, there will first be a spike in prices and only later a significant output response.

Our baseline simulation is shown as the solid lines in the Figure below. In the initial period, the U.S. lowers its interest rate by 2.5 percentage points to respond to a contractionary shock to consumption and investment demand and elevated concern with financial sector stability. This monetary intervention dampens the effects of the demand shock, with output falling up to 1.2 percent below potential in the year following the shock.

At the same time, demand in emerging Asia (EA) and a group of oil exporting countries (GOEC) continues to grow rapidly.<sup>64</sup> Using exchange rate pegs, these regions’ interest rates cannot be raised in a counter-cyclical fashion, and instead fall almost one for one with U.S. rates<sup>65</sup>. Together with the highly inflationary effects of the shocks, this leads to sharply lower real interest rates that amplify rather than dampen the output effects of the shocks. GDP in these regions therefore expands sharply, by 4.5 and 2.8 percent respectively, while inflation, both headline and core, increases by around 4.5 and 2.0 percentage points. This additional demand originates in regions representing only around 20 percent of world GDP<sup>66</sup>, but growth is very commodity-intensive

**Adjustment Scenarios<sup>1</sup>**



Source: IMF staff calculations.  
<sup>1</sup>Plots show deviations from control. Nominal interest rate and inflation are in percentage points. Real GDP and prices are in percent. Quarters on the x-axis

<sup>64</sup>The Figure only shows simulation results for EA. Results for GOEC are very similar.

<sup>65</sup>The small observed difference is due to a foreign exchange risk premium that is increasing in each region’s net foreign liabilities position.

<sup>66</sup>World GDP expands by around 1.4 percent.

in EA and GOEC. It therefore exerts a strong upward pressure on both international oil and commodity prices, which rise by 14 and 5.3 percent. This in turn accounts for the moderate increase in U.S. headline inflation of 0.4 percentage points in the initial period despite the U.S. slowdown. The reason is that these highly flexible prices immediately pass-through into headline inflation. Core inflation does fall with demand on impact, but after about a year picks up as some oil and commodity inflation feeds through into core inflation.

The dynamics of inflation in the baseline are almost entirely due to the underlying demand shocks and their amplification by monetary policy, rather than to the initial large spikes in oil and commodity prices that are due to supply side rigidities.<sup>67</sup> When the underlying shocks are to demand, flexible commodity prices therefore provide a bellwether of underlying imbalances and overheating, rather than being problems in and of themselves. The situation would of course be very different if the underlying shocks were to supply, an issue that we do not address here.

The U.S. Federal Reserve could in principle take account of the effects of its monetary policy on inflation in the rest of the world. Targeting a measure of overall world inflation is not a realistic option for an institution with a mandate for domestic price and output stability. Instead we therefore consider a scenario where the Fed, as well as responding to domestic core inflation, also responds to oil price inflation. The corresponding simulations are shown as the dotted lines in the Figure. Monetary policy now is much less accommodative, with nominal interest rates dropping initially by around 1.5 instead of 2.5 percentage points. They then quickly rise to 0.3 percentage points above the neutral rate in response to upward pressure on oil prices. Relative to the baseline, under this policy rule the U.S. output gap deteriorates by 1.2 percentage points, with a cumulative ten year difference in output losses of 3 percent. On the other hand, a less accommodative U.S. monetary policy significantly mitigates the boom-bust cycle in EA and GOEC, with a 1 percent reduction in excess demand in the first year. The impact on world oil prices is large, with the peak increase reduced from 14 to 4 percent. A U.S. focus on oil price inflation is not only contractionary at home, but it also induces much greater volatility in domestic inflation, with the benefit again accruing to EA and GOEC whose inflation volatility falls by about a third. Adopting a more global measure of inflation, while of significant benefit to EA and GOEC, is therefore highly undesirable for the U.S. But, as we will show, these regions have a far more powerful option at their disposal to help themselves without requiring sacrifices from others—the move from fixed to flexible exchange rates.

The dashed lines in the Figure illustrate a scenario where EA and GOEC also follow an inflation targeting regime with flexible exchange rates, which causes them to sharply increase nominal interest rates in response to their demand shocks. This roughly halves the output expansion in these regions while inflation rates are only a quarter of their baseline values. The effect on U.S. output, through reduced demand for U.S. exports, is less than 0.05

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<sup>67</sup>This requires a simulation, not shown here, that eliminates supply side rigidities in energy and commodities. The only major resulting difference is that the maximum increase in real oil prices is 3.5 percent instead of 14 percent and the maximum increase in commodity prices is 4 percent instead of 5.3 percent.

percent in the first year and virtually zero thereafter. The same is true for U.S. core inflation. But initial U.S. headline inflation rises by only half as much as under a peg, principally because lower demand outside the U.S. causes the oil price to rise much less strongly, by 9 instead of 14 percent. This provides the answer to the second of our questions—under current circumstances flexible exchange rates would indeed make a large difference for countries now pegging to the dollar, with beneficial effects for output and inflation stabilization, including the stabilization of oil and commodity prices.

### Appendix 3.1. Recent Commodity Market Developments<sup>68</sup>

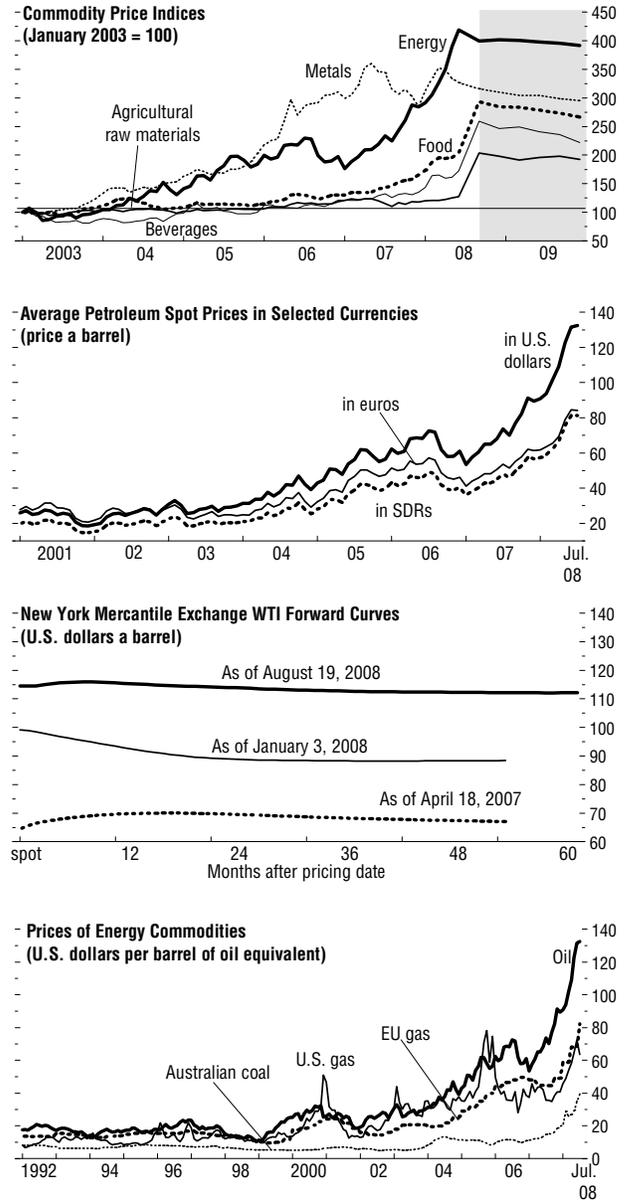
Commodity prices rose by 33 percent in the first 6 months of 2008, led by soaring fuel prices, before softening in July and August. Oil prices continued to rise rapidly over most of this period and remain at high levels by historical standards, notwithstanding some recent declines. Food prices surged in the first quarter of 2008, led by wheat and rice, but stabilized thereafter, as prices of these two grains started to decline. Prices of agricultural raw materials and beverages increased only moderately overall, while base metals prices broadly stabilized (Figure 3.17, top panel).

#### Fuel Prices Leading the Surge

Oil prices reached an all-time record high (in both nominal and real terms) of US\$143 a barrel on July 11 and then declined to \$114 by end-August.<sup>69</sup> Oil prices in Euros also reached record-highs, although the rise was 24 percentage points less than in dollar terms in the first 6 months of 2008 (Figure 3.17, second panel).

While rising slightly from their lows in late 2007 in terms of forward cover, OECD stocks remained at relatively low levels in the first half of 2008. Reflecting this and the recent easing of broad market conditions (see below), the futures price curve moved from backwardation in the first quarter to a mild contango in recent weeks, a constellation that provides incentives for further near-term inventory build (Figure 3.17, third panel).

Figure 3.17. Commodity and Petroleum Prices



Sources: Bloomberg Financial Markets; and IMF staff estimates.  
<sup>1</sup>Based on a unit value index for industrial countries' exports of manufactures.

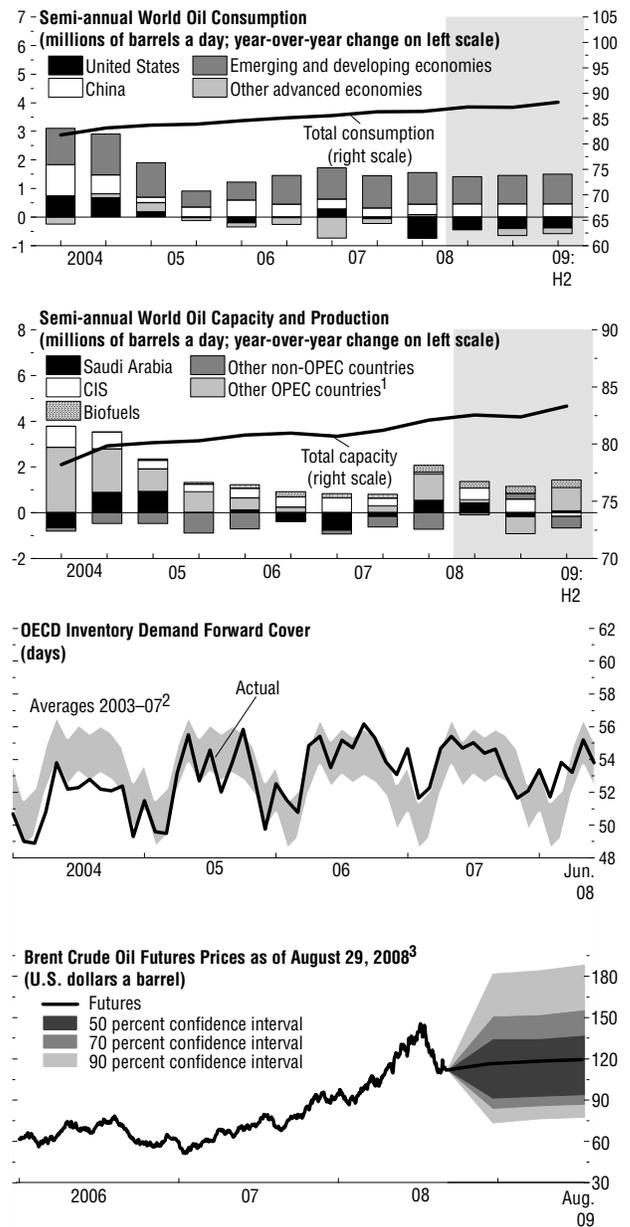
<sup>68</sup>The main author of this appendix is Valerie Mercer-Blackman, with contributions from To-Nhu Dao and Nese Erbil.

<sup>69</sup>Unless otherwise stated, oil prices refer to the Average Petroleum Spot Price, which is a simple average of the prices for the West Texas Intermediate, Dated Brent and Dubai Fateh grades.

Diesel prices have risen much faster than gasoline prices, reflecting strong demand growth for this product relative to global refining capacity. Consequently, refining margins for diesel have been much higher than for gasoline. Prices of other fuel products have followed crude oil prices, albeit with a lag (Figure 3.17, bottom panel). Coal prices in particular rose by 70 percent in the first 6 months of 2008, the largest increase among all energy products. This reflected short-term factors (such as supply disruptions early in the year), bottlenecks in major shipping ports, and the gradual substitution from coal in power generation away from more expensive fuel oil.

World oil consumption moderated slightly after seven consecutive years of rising prices, rising by roughly 0.7 million barrels a day (mbd) during the first half of 2008 (year-on-year), compared to 1 mbd during 2005-07. Consumption in OECD countries declined by 0.7 mbd during this period, primarily in the United States, but rose by 1.4 mbd in non-OECD countries, led by China, the Middle East, and Latin America (Table 3.3 and Figure 3.18, first panel). Across different products, demand for transportation fuels (gasoline and diesel) has grown the most, driven by increased vehicle ownership in emerging and developing economies amid continued fuel subsidies and price controls.<sup>70</sup> However, gasoline consumption in the United States fell by 1.5 percent in 2008 H1—the first drop in at least 15 years—reflecting constrained incomes amid weakening economic activity and, increasingly, a demand response to one of the sharpest pick-up in gasoline prices in recent U.S. history.

**Figure 3.18. World Oil Market Balances and Oil Futures Price**



Sources: Bloomberg Financial Markets; International Energy Agency; U.S. Energy Information Agency; and IMF staff estimates.  
<sup>1</sup>Includes OPEC natural gas liquids.  
<sup>2</sup>Band is based on averages for each calendar month during 2003-07 and a 40 percent confidence interval based on deviations during this period.  
<sup>3</sup>From futures options.

<sup>70</sup>In many economies that have limited the fuel price pass-through, the fiscal burden from fuel subsidies has been increasing. Indeed, major product importers such as Malaysia, Pakistan, and Iran have increased domestic prices by about 20 percent in response to this rising burden.

**Table A.3.3. Global Oil Demand and Production by Region**  
(Millions of barrels per day)

	2006	2007	2008	Year-on-year Percent Change								
				2007			2008	2007			2008	
				Proj.	H1	H2		H1	H2	H1		
<b>Demand</b>												
OECD	49.6	49.2	48.6	49.0	49.3	48.3	-0.5	-0.8	-1.3	-1.0	-0.6	-1.5
North America	25.4	25.5	24.9	25.5	25.5	24.8	-0.6	0.5	-2.6	1.2	-0.2	-2.9
<i>Of which:</i>												
United States	7.3	7.4	7.7	7.5	7.4	7.7	0.2	1.4	2.9	2.0	0.7	3.6
Europe	15.7	15.3	15.2	15.1	15.5	15.0	0.1	-2.4	-0.4	-3.6	-1.2	-0.4
Pacific	8.5	8.3	8.4	8.4	8.3	8.5	-1.4	-1.6	1.1	-2.4	-0.8	0.9
Non-OECD	35.5	36.9	38.3	36.6	37.1	38.1	4.0	3.8	3.8	3.7	3.9	4.0
<i>Of which:</i>												
China	7.2	7.5	8.0	7.5	7.6	7.9	7.8	4.6	5.6	4.8	4.3	4.9
Other Asia	9.0	9.3	9.5	9.3	9.2	9.6	2.3	2.8	2.2	2.2	3.5	3.4
Former Soviet Union	4.1	4.1	4.2	4.0	4.2	4.1	3.4	1.7	2.5	2.1	1.3	2.2
Middle East	6.2	6.5	6.9	6.5	6.6	6.8	4.0	4.7	5.7	5.5	4.0	5.5
Africa	3.0	3.1	3.1	3.1	3.1	3.2	0.9	3.9	1.7	3.0	4.7	2.2
Latin America	5.3	5.6	5.9	5.5	5.7	5.8	4.6	5.2	4.3	4.8	5.7	4.8
World	85.1	86.1	86.9	85.7	86.5	86.4	1.3	1.1	0.9	1.0	1.3	0.9
<b>Production</b>												
OPEC (Current Composition) <sup>1</sup>	36.3	35.9		35.5	36.4	37.2	0.8	-1.0		-2.2	0.2	4.7
<i>Of which:</i>												
Saudi Arabia	10.4	10.0		9.9	10.1	10.4	-1.5	-4.4		-7.0	-1.8	5.5
Nigeria	2.5	2.3		2.3	2.4	2.1	-5.2	-4.8		-4.4	-5.1	-8.2
Venezuela	2.8	2.6		2.6	2.6	2.6	-5.8	-7.8		-9.6	-5.9	-0.7
Iraq	1.9	2.1		2.0	2.2	2.4	4.9	9.9		5.3	14.3	23.9
Non-OPEC	49.2	49.6	50.1	49.8	49.4	49.7	1.1	0.9	0.9	1.6	0.1	-0.2
<i>of which:</i>												
North America	14.3	14.4	14.1	14.1	14.1	14.2	0.6	0.4	-1.6	-0.3	-0.4	0.9
North Sea	4.8	4.6	4.2	4.7	4.5	4.4	-7.6	-5.0	-7.1	-5.6	-4.4	-5.7
Russia	9.8	10.1	10.1	10.1	10.1	10.0	2.2	2.4	0.0	3.2	1.6	-0.8
Other Former Soviet Union	2.4	2.7	2.9	2.7	2.7	2.9	11.1	12.0	7.6	16.9	7.5	6.5
Other Non-OPEC	17.9	17.9	18.7	18.3	18.0	18.3	2.3	0.4	4.5	2.3	-0.2	-0.3
World	85.5	85.6		85.3	85.8	86.9	1.0	0.1		0.0	0.1	1.9
<b>Net Demand<sup>2</sup></b>	-0.4	0.5		0.3	0.7	-0.5						

Source: *Oil Market Report*, International Energy Agency (July 2008); and IMF staff calculations.

<sup>1</sup>Includes Angola (subject to quotas since January 2007) and Ecuador (rejoined OPEC in November 2007 after suspending its membership from December 1992 to October 2007).

<sup>2</sup>Net demand is the difference between demand and production. It includes a statistical difference. A positive value indicates a tightening of market balances.

Oil production increased by 1.6 mbd in the first half of 2008, as OPEC production increased by 1.8 mbd (year-on-year), partly on account of the organization's September 2007 decision to raise output as of November 2007. Within OPEC, production increases in Saudi Arabia, a pick-up in Iranian exports, and production recovery in Iraq more than offset output losses in Nigeria (from continued attacks on production facilities), and sluggish Venezuelan output. In contrast, non-OPEC crude oil supply fell by 0.2 mbd, reflecting mostly unexpected falls in Russian output and field declines in the North Sea and Mexico. In addition, liquid fuel supply has benefited from important increases in OPEC natural gas liquids (NGLs, not subject to quotas), and biofuels, which contributed one quarter of the net increase in supply in the first half of 2008 (Figure 3.18, second panel).

In the near term, oil market conditions may ease further. On an annual basis, the IEA forecasts global demand growth at 0.8 mbd in 2008 and 0.9 mbd in 2009, down from 1 mbd in 2007. Non-OPEC supply is expected to pick up by 1 mbd during the second half of 2008 before decreasing again gradually in 2009. The completion of a host of new projects, particularly from Saudi Arabia, should lift OPEC spare capacity levels temporarily. The easing may not be lasting, however. In its recent *Medium-Term Oil Market Report*, the IEA expects OPEC spare capacity (as a share of global consumption) to fall to below 2008 levels by 2012, as OECD demand recovers in the outer years and supply growth trends remains limited.

With the moderate easing of market conditions—at least through end-2009—but with inventories and spare capacity still low, prices are expected to remain high, albeit below recent peaks. Oil futures options prices suggest a much wider range of uncertainty about price prospects than in recent years. As shown in the fan chart (Figure 3.18, bottom panel), the 90 percent confidence interval for end-2008 oil prices range from around \$75 a barrel to over \$180 a barrel, a much wider range than typically observed.

### **Rising Food Prices Driven by Prices of Major Crops**

Grain and vegetable oils prices picked up sharply in the first half of 2008 amid trade restrictions and tight supplies, leading to a 23 percent increase in the IMF's food price index during the first six months of 2008. Wheat prices reached record-high nominal levels in early March of this year following poor, drought-related crops in 2006 and 2007 but have declined since, as more favorable weather conditions led to a bumper crop this year. Rice prices began to rise in late 2007, as consumers in developing economies switched from high-priced wheat and corn in consumption towards cheaper rice. Price increases accelerated in early 2008, when major exporters started to impose trade bans (Figure 3.19, first panel).<sup>71</sup>

Corn and soybean prices have remained high so far in 2008, with a short-lived spike in June when floods in the U.S. Midwest (the largest producing region in the world) led to fears of crop damage. Other agricultural products prices have also risen, although much more

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<sup>71</sup>Rice is mostly consumed domestically, as the share of global trade to consumption is very small (with large importers receiving the bulk of rice from only one or two producers).

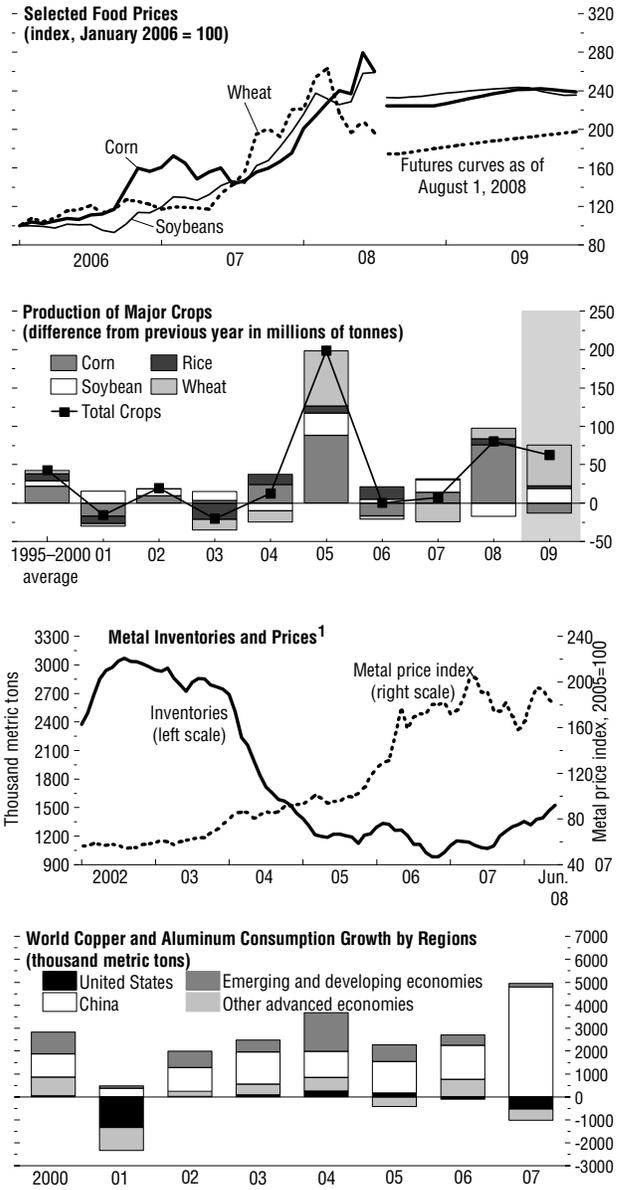
gradually, partly because supplies and inventory levels have so far remained more comfortable. Meat and poultry prices have risen due to higher animal feed costs. Food prices are expected to remain high going forward, given continued demand pressures, particularly for corn-based ethanol. As limited acreage moves from corn to wheat and soybeans on the margin in response to relative price movements, corn production is expected to fall slightly in 2009 from 2008 (Figure 3.19, second panel). Moreover, high oil prices will affect agricultural production costs more broadly in the coming years, in particular through the effect on higher fertilizer prices.

**Metals Prices Stabilized**

Divergent trends in fundamentals explain the widely varying performance of base metals markets through 2008. Iron ore prices increased by 66 percent and copper and aluminum prices rebounded by 17 and 21 percent, respectively, but zinc and nickel prices declined sharply. While demand for copper and aluminum, which are more widely traded than the other metals, has weakened, supply in key producers (China, South Africa and Chile) has been adversely affected by disruptive power shortages. In contrast, zinc and nickel inventory levels at the London Metals Exchange have recovered with declining demand and rising production (Figure 3.19, third panel).

Looking ahead, base metals prices should ease slightly in 2008 and 2009, as demand growth in China is expected to moderate with the end of the Olympic games construction run-up (Figure 3.19, fourth panel). However, continued supply side problems will likely provide for tight copper and aluminum market balances for some time.

**Figure 3.19. Developments in Food and Metal Markets**



Sources: Bloomberg Financial Markets; World Bureau of Metal Statistics; and IMF staff calculations.  
 ¹Inventories refer to the sum of global stocks of copper, aluminum, tin, zinc, nickel, and lead monitored by the London Metal Exchange. Price refers to a composite index of those metals.

<sup>72</sup>Iron ore prices are determined by annual contracts among producers and steel-makers. The April 2008 increase largely reflected soaring mining costs over the previous year and strong demand.

### Appendix 3.2. Accounting for Food Price Increases, 2006-08<sup>73</sup>

This section describes the methodology used in estimating the impact of the various demand and supply factors on the prices of the six key commodities discussed in the main text (as shown in Figure 3.4, third panel). For tractability, the analysis is based on simple partial equilibrium approaches.

(i) The amount of weather-related supply shortfalls  $q_i^{sh}$  were determined by the deviation of global production from trend, based on annual crop data since 1990.<sup>74</sup> The percentage change in the global price of commodity  $i$ , as a result of the supply shortfall  $q_i^{sh}$  was calculated as:

$$p_i = \% \Delta P_i = \varepsilon_i^m * q_i^{sh} = \sum_c w_c [(\varepsilon_{i,c}^D * (C_{i,c} / M_{i,c}) - \varepsilon_i^S * (Q_{i,c} / M_{i,c}))] * q_i^{sh}$$

where  $\varepsilon_i^m$ , the global import demand elasticity of commodity  $i$ , is a weighted average of the import elasticities of demand of the main importing countries (where  $w_c$  is the import weight of country  $c$ ). This depends on the elasticities of supply ( $\varepsilon_{i,c}^S$ ), and demand ( $\varepsilon_{i,c}^D$ ) of country  $c$ , respectively.  $M_{i,c}$  is total imports,  $C_{i,c}$  is total consumption, and  $Q_{i,c}$  is total production of the commodity  $i$  in country  $c$ .

(ii) The price impact of higher energy prices was calculated using the contribution of fuel and fertilizers to the production cost of each food commodity, as reported in the U.S. Department of Agriculture's *Production Annual Survey*. For the 2007 and 2008 crop years, the costs were estimated based on the IMF commodity price projections, assuming that other costs grow at trend. The emerging cost shares for palm oil and rapeseed oil are based on Fedepalma (2008) and North Carolina Solar Center (2008) estimates, respectively. The calculations assume full pass-through of higher costs to prices, and a similar cost structure in crop production across the globe.

(iii) The price impact of increased biofuels demand was calculated for food items where more than 1 percent of the crop was used as biofuels feedstock (which excluded wheat).<sup>75</sup> The expansion of demand attributed to biofuels is then expressed as the percentage difference between the growth in total demand for the crop ( $d_i$ ) and demand growth excluding biofuels (denoted as  $d_i^b$ ).<sup>76</sup> The price impact (in percent) was then calculated as:

<sup>73</sup>The main author of this appendix is Valerie Mercer-Blackman, with contributions from Stephen Tokarick.

<sup>74</sup>Typically, shortfalls (negative deviations) were the result of lower yields, not reductions in planted acreage, including for wheat and rapeseed oil, thereby corroborating the approach.

<sup>75</sup>The shares of biofuels feedstocks were calculated using USDA data on the share of each crop used for industrial purposes and IEA data on biofuels production.

<sup>76</sup>This definition takes into account two competing aspects. On the one hand, it is demand change, not levels, that have the greatest impact on prices. On the other hand, it does not measure the change from such a low base

(continued)

$$\% \Delta P_i = (d_i - d_i^b) * (1 / \varepsilon_i^D),$$

where  $\varepsilon_i^D$ , is the own price elasticity of demand for the crop. A range of elasticity estimates from various sources were used (see table below). Moreover, since a by-product of corn-based ethanol is DDGS, which is used for animal feed (about 30 percent of every bushel of corn used in production), this additional supply was deducted from the demand for biofuels use.

(iv) To measure the impact of trade restrictions, a slightly modified version of the trade model in Tokarick (2003) was used. Supply and demand are modeled as constant elasticity functions, using elasticities from Gardiner et. al. (1989). Data on commodity trade values were taken from the U.N. COMTRADE database. Production value data were estimated using volume data from the U.S. Department of Agriculture's FAS database and IMF price indices.

These direct effects, which can be considered initial shocks, together explain about half of the total price increase of these foods during the period considered (2006 and 2007 crop years). It would be impossible to account fully for the indirect effects of the shocks. However, it is possible to get a sense of the relative magnitude of the cross-effects due to supply and demand substitution and comovements. Two indicators are considered (reported in table 3.2):

- **For substitution across commodities:** Assuming symmetry and no second-order effects, the impact of a price increase in commodity  $j$ ,  $\Delta P_j$ , on commodity price  $i$ ,  $\Delta P_i$ , is given by:

$$\frac{\Delta P_i}{P_i} = \frac{\varepsilon_{i,j}}{\varepsilon_i} * \left( \frac{\Delta P_j}{P_j} \right),$$

where  $\varepsilon_{i,j}$  is the cross-price elasticity of supply (demand) between commodity  $i$  and  $j$ , and  $\varepsilon_j$  is the own-price elasticity of supply (demand) of commodity  $j$ , assuming commodities  $i$  and  $j$  are substitutes in production (consumption).

- **Comovement across time was determined using:** the concordance statistic. The statistic was estimated for all commodity price pairs using monthly data from January 1957 to May 2008 (starting in 1980 for rapeseed oil), using the methodology of Cashin et al.(1999). The concordance statistic between commodities  $i$  and  $j$ , defined as the proportion of time two commodities are on the same phase of the cycle, is

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(given that biofuels are a small share of total demand), which would exaggerate the impact of demand growth for biofuels use on price.

denoted as:  $C_{i,j} = T^{-1} \left\{ \sum_{t=1}^T (S_{i,t} * S_{j,t}) + \sum_{t=1}^T (1 - S_{i,t})(1 - S_{j,t}) \right\}$ , where  $S_{i,t}$  is a binary

random variable taking the value unity when the price of commodity  $i$ ,  $P_i$ , is in a boom phase and zero when it is in a slump phase. The same definition for  $S_j$ .  $T$  is the sample size and  $C_{ij} \in \{0,1\}$  measures the proportion of time the two series are in the same phase.

The elasticity estimates used in the calculation were weighted, global composites of individual country elasticities taken from Gardiner et. al.(1989). Plausible elasticity ranges for soybean oil and rapeseed oil (only for Europe) were also taken from the FAPRI/GOLD model estimates in Westhoff and Young (2000) and Arnade, Kelch and Leetmaa (2002). Estimates and ranges used are shown in the table below.

#### Elasticity Estimates Used for Price Calculations

	Own price- demand elasticity	Own price-supply elasticity	Cross-price elasticity of supply with wheat	Cross-price elasticity of demand with soybean <sup>1</sup>
Corn	-.21 to -.43	0.50	-.08 to -.1	0.36 to 0.54
Rice	-0.38	0.32	Na	Na
Wheat	-0.3	0.48		Na
Soybean/soybean oil	-0.31 to -0.48	0.23	-0.03	
Rapeseed oil	-1.2	0.58	-0.62 to -0.8	0.57
Palm oil	-0.47	0.21	Na	Na

<sup>1</sup> Soybeans are important substitutes for corn on the supply and demand side. The cross supply of corn and soybean estimates range between -0.27 to -0.3.

### Appendix 3.3. Commodity Price Shocks and Inflation: Data and Methodology<sup>77</sup>

#### Commodity Price Pass-through

The pass-through coefficients shown on Figure 3.11 in the text are obtained using quarterly data for 25 emerging economies and 21 advanced economies (9 for the 1970-95 period). First, the pass-through from international to domestic prices of food and fuel is estimated using country-by-country bivariate regressions of the following form:

$$\pi_t^{domestic} = \alpha + \sum_{i=1}^4 \beta_i \pi_{t-i}^{domestic} + \sum_{i=0}^4 \delta_i \pi_{t-i}^{world} + \varepsilon_t$$

In these equations  $\pi$  stands for annualized quarter-on-quarter log difference (in percent), in, respectively, food or fuel prices (the equations also include seasonal dummies). The reported pass-through coefficients reflect the full long-term pass-through from international to domestic prices:

$$price\ pass - through = \frac{\sum_{i=0}^4 \delta_i}{1 - \sum_{i=1}^4 \beta_i}$$

Second, the pass-through from domestic food and fuel prices to core inflation is estimated using the following generalized Phillips curve equations for each individual country:<sup>78</sup>

$$\pi_t = \alpha + \sum_{i=1}^4 \beta_i \pi_{t-i} + \sum_{i=0}^4 \gamma_i (y_{t-i} - y_{t-i}^*) + \sum_{i=0}^4 \phi_i \pi_{t-i}^{food} + \sum_{i=0}^4 \varphi_i \pi_{t-i}^{fuel} + \varepsilon_t$$

$$food\ price\ pass - through = \frac{\sum_{i=0}^4 \phi_i}{1 - \sum_{i=1}^4 \beta_i}$$

$$fuel\ price\ pass - through = \frac{\sum_{i=0}^4 \varphi_i}{1 - \sum_{i=1}^4 \beta_i}$$

<sup>77</sup>The main author of this Appendix is Irina Tytell.

<sup>78</sup>This approach is similar to the one used by De Gregorio, Landerretche, and Neilson (2007) to estimate pass-through from the world oil price to domestic inflation. See also Blanchard and Gali (2007).

As above,  $\pi$  stands for annualized quarter-on-quarter log difference (in percent) in core, food, and fuel price, while  $y$  and  $y^*$  denote annualized quarter-on-quarter log difference (in percent) in, respectively, real and potential GDP (the equations also include seasonal dummies).<sup>79</sup> In order to avoid contaminating the estimates by endogenous factors, the pass-through from domestic commodity prices to core inflation is estimated using predicted values of domestic food and fuel inflation from the first-stage bivariate regressions. In this way, domestic food and fuel prices reflect only the variation that is due to changes in international prices, rather than movements in labor, transportation, and retailing costs that may have common origins with overall inflation.

The resulting pass-through coefficients are aggregated across countries using weighted averages, with weights inversely proportional to the standard errors of the corresponding country-specific coefficients.<sup>80</sup> Given considerable variation across individual - especially emerging - economies that reflect in part differences in data quality, measurement of inflation, and sample periods, this approach is designed to give more weight to more precisely estimated pass-through coefficients.

### Expectations and Actual Inflation

The responses of expectations to actual inflation shown on Figure 3.12 in the main text are based on a semi-annual panel dataset for 14 advanced and 21 emerging economies that covers the period starting in 2003. The exercise links changes in expected inflation to changes in actual headline inflation and disaggregates the latter into core inflation and changes in domestic inflation rates for food and fuel.<sup>81</sup>

$$\begin{aligned}\Delta \pi_{i,t}^{\text{expected}} &= \lambda_i + \theta \Delta \pi_{i,t}^{\text{headline}} + \varepsilon_{i,t} \\ &= \mu_i + \alpha \Delta \pi_{i,t}^{\text{core}} + \beta \Delta \pi_{i,t}^{\text{food}} + \gamma \Delta \pi_{i,t}^{\text{fuel}} + \nu_{i,t}\end{aligned}$$

In these equations,  $\Delta \pi$  denotes first differences in expected inflation at various horizons (1, 3, 5, and 6-10 years ahead) and actual inflation (headline, as well as its core, food, and fuel components) in percentage points. The data on inflation expectations are obtained from Consensus Economics and are based on surveys of professional forecasters published twice yearly in March/April and September/October. To correspond to these frequencies, the data on actual inflation refer to the first and third quarter of each year and are

<sup>79</sup>Core inflation is based on the consumer price index excluding food and energy prices. OECD data on potential GDP are used for OECD countries and Hodrick- Prescott filtered trend is employed to estimate potential GDP for non-OECD countries.

<sup>80</sup>In dynamic models, aggregating country-by-country estimates is preferable to aggregating the underlying data or using pooled panel regressions, as shown by Pesaran and Smith (1995).

<sup>81</sup>See Goretta and Laxton (2005) and Levin, Natalucci, and Piger (2004) for similar analyses, although without the disaggregation of headline inflation into core, food, and fuel components.

measured in year-on-year terms. To better disentangle the impact of food and fuel from core inflation, a residual from a regression of core on food and fuel inflation (in first differences) is used in place of actual core inflation. The equations also include country and year fixed effects. The reported results include only the coefficients that are statistically significant at the 10 percent level.

The sample of emerging economies is further split by the weight of food in the CPI and by the type of the monetary policy regime. Countries are grouped into those with high (low) food weights if the weight of food in their CPI is above (below) 25 percent. By this definition, Chile, China, Colombia, Hong Kong, India, Indonesia, Peru, Romania, Russia, Taiwan, Turkey, and Ukraine have a high weight of food in the CPI, while Brazil, Czech Republic, Hungary, Korea, Mexico, Poland, Singapore, Slovak Republic, and Thailand have a low food weight. With respect to the type of the monetary policy regime, inflation targeters are defined as countries that introduced this regime prior to the beginning of the sample period and excludes more recent inflation targeters. Therefore, Brazil, Chile, Colombia, Czech Republic, Hungary, Korea, Mexico, Peru, Poland, and Thailand are classified as inflation targeters, while China, Hong Kong, India, Indonesia, Romania, Russia, Singapore, Slovak Republic, Taiwan, Turkey, and Ukraine are classified as non-inflation-targeters.

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## Issues for Discussion

### Chapter 1. Global Prospects and Policies

- Do Directors agree with staff's assessment that the global economy is likely to slow substantially in 2008, before a gradual recovery gets underway in 2009? How do Directors see the relative cyclical positions of advanced economies and emerging and developing economies?
- Do Directors agree that risks to the global outlook are modestly to the downside? Do they share the view that the principal downside risks relate to the possibility of further deterioration in financial conditions? Do high inflation and the potential need for further dampening of demand present important downside risks? What are significant upside risks? How do Directors see risks related to global imbalances?
- How should the macroeconomic policy priorities be balanced at the current juncture between supporting growth and combating inflation? How do these priorities differ across various regions of the world and depending on their roles in commodities markets?
- What are the lessons from the current global downturn for monetary, exchange rate, and fiscal policy frameworks? What adjustments in these frameworks would be warranted to address challenges posed by housing booms and busts and commodity price shocks? In what areas would greater multilateral collaboration and policy coordination be needed and how could this be achieved?

### Chapter 2. Country and Regional Perspectives

- **United States.** How do Directors see the growth outlook and how should U.S. monetary and fiscal policies evolve over the near term? What are the main policy challenges regarding the financial and housing sector travails? What are the main priorities for reforms in the area of financial regulation and supervision?
- **Western Europe.** What risks do Directors see to growth from the financial and housing sectors? How should monetary policies evolve? Are fiscal policies rightly emphasizing medium-run objectives? What are the structural reform priorities?
- **Japan.** Do Directors agree that the monetary policy stance should remain highly accommodative given that underlying price pressures remain well contained? Do medium-term considerations remain the priority for fiscal policy?
- **Emerging Asia.** Do Directors agree that prospects for growth and inflation are still relatively strong and risks to the upside? Do macroeconomic policies need to be tightened, including, in some cases, by allowing more exchange rate appreciation?

- **Latin America.** Are Directors of the view that economies are pushing against their capacity constraints and that the priority for monetary policies is to quell the surge in inflation? Do Directors also see the need for tighter fiscal policies?
- **Emerging Europe.** How do Directors see prospects and risks to growth and inflation? Is there a need for more monetary and fiscal tightening or will the slowdown in partner country demand suffice to cool off overheating economies?
- **Commonwealth of Independent States.** Would Directors agree that combating mounting inflationary pressures is the main policy priority? Do Directors agree that food and fuel subsidies need to be better targeted?
- **Sub-Saharan Africa.** Do Directors agree that sub-Saharan Africa is the most vulnerable of all regions to increases in food and fuel prices? How can the progress with respect to macroeconomic stability and lowering poverty be sustained?
- **Middle East.** How should policymakers balance the cyclical considerations of stemming inflationary pressures with the need to cater to rapidly growing populations, increase investment in the oil sector, and diversify economies?

### **Chapter 3. Commodity Prices and Inflation**

- Do Directors agree that commodity markets, particularly oil markets, are likely to remain exceptionally tight? Does this reflect mainly sector-specific bottlenecks? What policies can be adopted to dampen demand pressures and improve the supply response to rising oil and food prices?
- Do Directors share the view that emerging market economies might be more susceptible to second round effects from rising fuel and food prices than advanced economies? If so, what are the macroeconomic policy implications?

### **Chapter 4. Financial Stress and Economic Downturns**

- Do Directors agree that financial stress in the banking sector is more likely to be associated with severe output losses than stress in stock or exchange markets? Are large run ups in house prices key indicators for emerging vulnerabilities? Is this a function of the exposure of households to credit markets? Does the greater degree of procyclicality in arms' length financial systems compared with relationship-based systems make them more vulnerable to sharper deleveraging?
- Should priority be given to identifying regulatory approaches that can help to reduce procyclicality? How should the need to use the public balance sheet to recapitalize stressed financial institutions to support activity be balanced with moral hazard considerations?

**Chapter 5. Fiscal Policy as a Countercyclical Tool**

- What do Directors see as the main prerequisites for discretionary fiscal policy stimulus to be effective?
- Do Directors consider that it would be useful to explore whether it is possible to design explicitly countercyclical fiscal policy rules that would operate symmetrically through the business cycle while respecting longer-term sustainability objectives?

**Chapter 6. Divergence of Current Account Balances across Emerging Economies**

- How do Directors view the main factors explaining large and persistent divergence in current account balances in emerging economies, notably between emerging Europe and Asia? Do Directors agree that financial liberalization and capital account openness are key determinants? Could undervalued exchange rates be important in explaining the large surpluses in emerging Asia?
- What policy strategies would help countries to maintain sustainable current account positions? How important is avoiding the undervaluation of exchange rates for minimizing the risk of capital misallocation in countries with large and persistent current account surpluses?

### **Box A1. Economic Policy Assumptions Underlying the Projections for Selected Economies**

The short-term *fiscal policy assumptions* used in the *World Economic Outlook* are based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions and projected fiscal outturns. The medium-term fiscal projections incorporate policy measures that are judged likely to be implemented. In cases where the IMF staff has insufficient information to assess the authorities' budget intentions and prospects for policy implementation, an unchanged structural primary balance is assumed, unless otherwise indicated. Specific assumptions used in some of the advanced economies follow (see also Tables B5–B7 in the Statistical Appendix for data on fiscal and structural balances).<sup>1</sup>

*United States.* The fiscal projections are based on the Administration's FY2009 mid-session review and Congressional Budget Office estimates of the cost of the housing legislation package enacted in July 2008. Adjustments are made to account for differences in macroeconomic projections as well as IMF staff assumptions about (1) additional defense spending based on analysis by the Congressional Budget Office, (2) slower compression in the growth rate of discretionary spending, and (3) continued alternative minimum tax relief beyond fiscal year 2009. Projections also assume that proposed Medicare savings are achieved only partially and that personal retirement accounts are not introduced.

*Japan.* The medium-term fiscal projections assume that expenditure and revenue of the general government (excluding social security) are adjusted in line with the current government target to achieve primary fiscal balance (excluding social security) by fiscal year 2011.

*Germany.* Projections reflect the measures announced in the Stability Program Update 2007. Projections for 2008 include a loss in revenue owing to corporate tax reform and a cut in social security contribution rates (unemployment insurance). Over the medium term, health expenditures accelerate because of population aging and the fact that health care reform measures have not been taken.

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<sup>1</sup>The output gap is actual less potential output, as a percent of potential output. Structural balances are expressed as a percent of potential output. The structural budget balance is the budgetary position that would be observed if the level of actual output coincided with potential output. Changes in the structural budget balance consequently include effects of temporary fiscal measures, the impact of fluctuations in interest rates and debt-service costs, and other noncyclical fluctuations in the budget balance. The computations of structural budget balances are based on IMF staff estimates of potential GDP and revenue and expenditure elasticities (see the October 1993 *World Economic Outlook*, Annex I). Net debt is defined as gross debt less financial assets of the general government, which include assets held by the social security insurance system. Estimates of the output gap and of the structural balance are subject to significant margins of uncertainty.

*France.* For 2008, the fiscal projections are based on the budget law and assume higher social security spending growth, largely owing to higher-than-targeted increases in health care outlays. Medium-term projections reflect the authorities' official tax revenue forecast but assume different spending (less deceleration) and nontax revenue profiles, consistent with an unchanged policy assumption.

*Italy.* For 2008, the deficit projection is based on the IMF staff's assessment of this year's budget, adjusted for recent developments, including the additional measures adopted in the summer of 2008. For the medium term, a constant structural primary balance (net of one-off measures) is assumed.

*United Kingdom.* The medium-term revenue projections are consistent with the IMF staff's macroeconomic assumptions. The expenditure projections assume that after the planned consolidation, set out in the 2008 Budget, will continue in terms of the percent of GDP through 2012–13.

*Canada.* Projections use the baseline forecasts in the 2008 Federal Budget and the 2007 Economic Statement. The IMF staff makes some adjustments to this forecast for differences in macroeconomic projections. The IMF staff forecast also incorporates the most recent data releases from Statistics Canada, including provincial and territorial budgetary outturns through the first quarter of 2008.

*Australia.* The fiscal projections through 2011/12 are based on the Budget published in May 2008. For the remainder of the projection period, the IMF staff assumes unchanged policies.

*Austria.* Projections for 2008 are based on current policies. For the medium term, fiscal policy assumptions take into account announced future policy measures, including tax cuts, that are judged likely to be implemented.

*Brazil.* The fiscal projections for 2008 are based on the 2008 budget guidelines law and recent pronouncements by the authorities regarding their policy intentions. For the outer years, the IMF staff assumes unchanged policies, with a further increase in public investment in line with the authorities' intentions.

*Belgium.* After the June 2007 federal elections, disagreements on reforms of fiscal federalism arrangements have led to more than six months of political division. At the time of preparing the WEO forecast, the Budget Report for 2008 was not yet available. Projections for 2008 and 2009 are IMF staff estimates adjusted for macroeconomic assumptions and assuming unchanged policies.

*China.* Projections for 2008 are based on IMF staff estimates and data for the first three months, with some adjustment for the IMF staff's definition of overall budget balance. For 2009–13, IMF staff projections assume that spending, especially in social sectors, will

increase, with the deficit roughly constant at its projected 2008 level (about 1 percent of GDP).

*Denmark.* Projections for 2008 and 2009 are aligned with the latest official budget estimates and the underlying projections, adjusted where appropriate for the IMF staff's macroeconomic assumptions. For 2009–13, the projections incorporate key features of the prior medium-term fiscal plan as embodied in the authorities' November 2007 Convergence Program submitted to the European Union (EU). The projections imply convergence of the budget toward a close-to-balanced position from an initial surplus position. This is consistent with the authorities' projection of a closure of the output gap over the medium term, as well as being in line with their objectives for long-term fiscal sustainability and debt reduction.

*Greece.* Projections are based on the 2008 budget, the latest Stability Program, and other forecasts and data provided by the authorities.

*Hong Kong SAR.* Fiscal projections for 2007–10 are consistent with the authorities' medium-term strategy as outlined in the fiscal year 2007/08 budget, with projections for 2011–13 based on the assumptions underlying the IMF staff's medium-term macroeconomic scenario.

*India.* Estimates for 2007 are based on data on budgetary execution. Projections for 2008 and beyond are based on available information on the authorities' fiscal plans, with some adjustments for the IMF staff's assumptions.

*Korea.* The fiscal projections reflect the 2008 budget, and the five-year medium-term budget for 2009–13, with some adjustment for measures announced since the passage of the budget as well as the IMF staff's assumptions and macroeconomic projections.

*Mexico.* Fiscal projections for 2008 build on the authorities' budget and also take into consideration higher than budgeted oil prices. Projections for 2009 and beyond are based on IMF staff calculations in line with the Federal Government Fiscal Responsibility Law, requiring a zero overall balance on the traditional budget definition.

*Netherlands.* The fiscal projections build on the 2007 budget, the latest Stability Program, and other forecasts provided by the authorities.

*New Zealand.* The fiscal projections through fiscal year 2011/12 are based on the Budget 2008 released in May 2008. For the remainder of the projection period, the IMF staff assumes unchanged policies. The New Zealand fiscal account switched to new Generally Accepted Accounting Principles beginning in fiscal year 2006/07, with no comparable historical data.

*Portugal.* Fiscal projections for 2008–2010 are based on unchanged policies specified in the 2008 "Budgetary Policy Steering Report." They take into account the envisaged

savings from the reforms that have already been introduced (for example, of the social security system and public sector administration reform). Beyond 2011, no further consolidation is assumed, and the structural primary balance is kept unchanged.

*Russia.* Fiscal projections for Russia are based on the 2008 budget, the authorities' proposed medium-term budget for 2009–11 and, for later years, the ceiling for the non-oil deficit of the federal government as imposed by the budget code. Differences in expenditure projections between staff and the authorities for 2009 and beyond reflect mainly different assumptions for real GDP, inflation and revenues.

*Singapore.* For the fiscal year 2007/08, expenditure projections are based on budget numbers, whereas revenue projections reflect the IMF staff's estimates of the impact of new policy measures, including an increase in the goods and services tax. Medium-term revenue projections assume that capital gains on fiscal reserves will be included in investment income.

*Spain.* Fiscal projections through 2010 are based on the 2008 budget; policies outlined in the authorities' updated Stability Program 2007–10, adjusted for the IMF staff's macroeconomic assumptions, information from recent statistical releases, and official announcements. In subsequent years, fiscal projections assume unchanged policies.

*Sweden.* Fiscal projections are based on information provided in the 2009 Fiscal Policy Bill (April 2008), with adjustments reflecting incoming fiscal data and the IMF staff's views on the macroeconomic environment.

*Switzerland.* Projections for 2008–13 are based on IMF staff calculations, which incorporate measures to restore balance in the federal accounts and strengthen social security finances.

***Monetary policy assumptions*** are based on the established policy framework in each country. In most cases, this implies a nonaccommodative stance over the business cycle: official interest rates will increase when economic indicators suggest that inflation will rise above its acceptable rate or range, and they will decrease when indicators suggest that prospective inflation will not exceed the acceptable rate or range, that prospective output growth is below its potential rate, and that the margin of slack in the economy is significant. On this basis, the LIBOR on six-month U.S. dollar deposits is assumed to average 2.8 percent in 2008 and 3.6 percent in 2009 (see Table 1.1). The rate on three-month euro deposits is assumed to average 5.0 percent in 2008 and 5.3 percent in 2009. The interest rate on six-month Japanese yen deposits is assumed to average 1.1 percent in 2008 and 1.5 percent in 2009.