

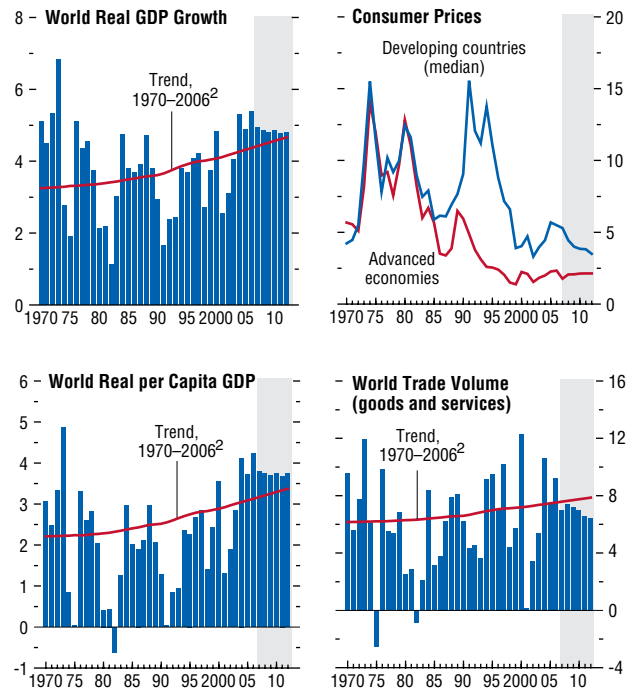
Notwithstanding recent financial market nervousness, the global economy remains on track for continued robust growth in 2007 and 2008, although at a somewhat more moderate pace than in 2006 (Figure 1.1). Moreover, downside risks to the outlook seem less threatening than at the time of the September 2006 World Economic Outlook, as oil price declines since last August and generally benign global financial conditions have helped to limit spillovers from the correction in the U.S. housing market and to contain inflation pressures. Nevertheless, recent market events have underlined that risks to the outlook remain on the downside. Particular concerns include the potential for a sharper slowdown in the United States if the housing sector continues to deteriorate; the risk of a deeper and more sustained retrenchment from risky assets if financial markets continue to be volatile; the possibility that inflation pressures may revive as output gaps continue to close, particularly in the event of another spike in oil prices; and the low probability but high cost risk of a disorderly unwinding of large global imbalances. From a longer-term perspective, a number of trends—including the aging of populations, rising resistance to increasing globalization, and the environmental consequences of rapid growth—could undermine the buoyant productivity that has underpinned recent favorable outcomes. While remaining vigilant to short-term macroeconomic risks, policymakers should take advantage of the continuing strong performance of the global economy to press ahead with more ambitious efforts to tackle deep-seated structural challenges.

Global Economic Environment

The global economy expanded vigorously in 2006, growing 5.4 percent—¼ percentage point faster than anticipated at the time of the September 2006 World Economic Outlook (Table 1.1 and Figure 1.2). Activity in the United States faced strong headwinds from a sharp downturn in the housing market, while corporate investment in plant and equipment has also softened.

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

The global expansion remains above trend, although the pace is moderating, helping to contain inflationary pressures. World trade continues to grow significantly faster than output.



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

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

Table 1.1. Overview of the World Economic Outlook Projections
(Annual percent change unless otherwise noted)

	2005	2006	Current Projections		Difference from September 2006 Projections	
			2007	2008	2007	2008
World output	4.9	5.4	4.9	4.9	—	—
Advanced economies	2.5	3.1	2.5	2.7	-0.2	—
United States	3.2	3.3	2.2	2.8	-0.7	-0.4
Euro area	1.4	2.6	2.3	2.3	0.3	0.3
Germany	0.9	2.7	1.8	1.9	0.6	0.4
France	1.2	2.0	2.0	2.4	-0.2	—
Italy	0.1	1.9	1.8	1.7	0.5	0.3
Spain	3.5	3.9	3.6	3.4	0.6	0.3
Japan	1.9	2.2	2.3	1.9	0.2	-0.1
United Kingdom	1.9	2.7	2.9	2.7	0.1	0.2
Canada	2.9	2.7	2.4	2.9	-0.5	0.1
Other advanced economies	3.9	4.3	3.8	3.8	0.1	0.1
Newly industrialized Asian economies	4.7	5.3	4.6	4.6	0.2	0.2
Other emerging market and developing countries	7.5	7.9	7.5	7.1	0.3	0.2
Africa	5.6	5.5	6.2	5.8	0.3	0.5
Sub-Sahara	6.0	5.7	6.8	6.1	0.5	0.7
Central and eastern Europe	5.5	6.0	5.5	5.3	0.5	0.5
Commonwealth of Independent States	6.6	7.7	7.0	6.4	0.5	0.2
Russia	6.4	6.7	6.4	5.9	-0.1	-0.2
Excluding Russia	6.9	9.7	8.3	7.5	1.9	1.1
Developing Asia	9.2	9.4	8.8	8.4	0.2	0.1
China	10.4	10.7	10.0	9.5	—	—
India	9.2	9.2	8.4	7.8	1.1	0.7
ASEAN-4	5.2	5.4	5.5	5.8	-0.1	-0.2
Middle East	5.4	5.7	5.5	5.5	0.2	—
Western Hemisphere	4.6	5.5	4.9	4.2	0.6	0.4
Brazil	2.9	3.7	4.4	4.2	0.5	0.3
Mexico	2.8	4.8	3.4	3.5	-0.1	—
<i>Memorandum</i>						
European Union	1.9	3.2	2.8	2.7	0.4	0.3
World growth based on market exchange rates	3.3	3.9	3.4	3.5	—	—
World trade volume (goods and services)	7.4	9.2	7.0	7.4	-0.7	0.2
Imports						
Advanced economies	6.1	7.4	4.7	5.7	-1.3	0.1
Other emerging market and developing countries	12.1	15.0	12.5	12.2	0.4	1.1
Exports						
Advanced economies	5.6	8.4	5.5	5.8	-0.5	0.1
Other emerging market and developing countries	11.2	10.6	10.4	9.9	-0.2	—
Commodity prices (U.S. dollars)						
Oil ¹	41.3	20.5	-5.5	6.6	-14.6	8.2
Nonfuel (average based on world commodity export weights)	10.3	28.4	4.2	-8.8	9.0	0.3
Consumer prices						
Advanced economies	2.3	2.3	1.8	2.1	-0.6	-0.1
Other emerging market and developing countries	5.4	5.3	5.4	4.9	0.3	0.3
London interbank offered rate (percent)²						
On U.S. dollar deposits	3.8	5.3	5.3	5.1	-0.2	-0.4
On euro deposits	2.2	3.1	3.8	3.7	0.1	-0.1
On Japanese yen deposits	0.1	0.4	0.9	1.2	-0.2	-0.3

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during January 26–February 23, 2007. See the Statistical Appendix for details on groups and methodologies.

¹Simple average of spot prices of U.K. Brent, Dubai, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was \$64.27 in 2006; the assumed price is \$60.75 in 2007 and \$64.75 in 2008.

²Six-month rate for the United States and Japan. Three-month rate for the euro area.

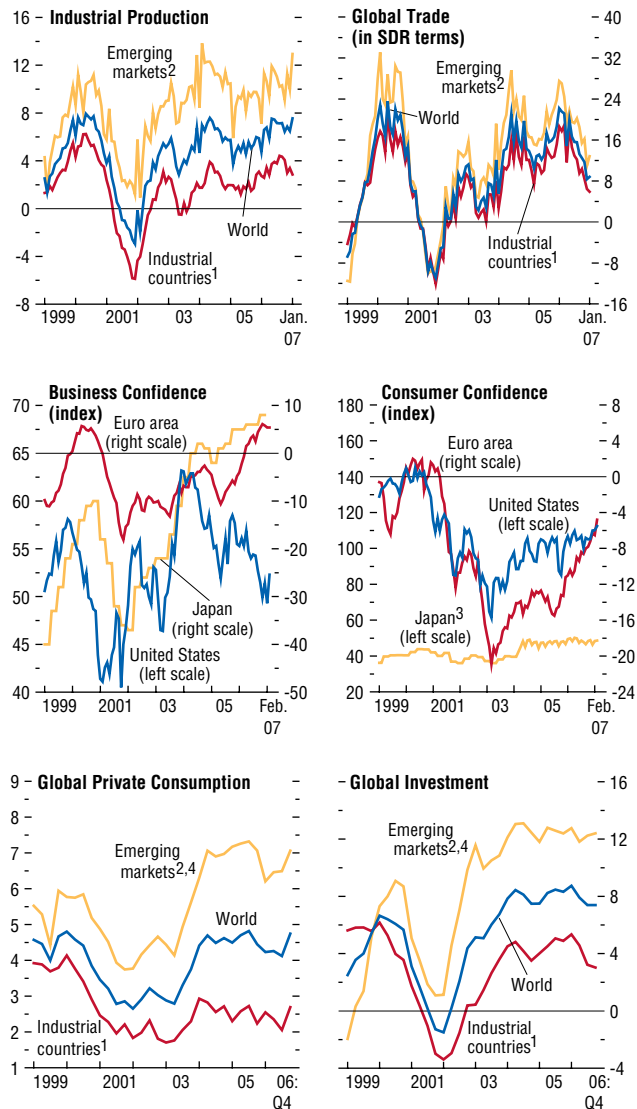
However, consumption was sustained by continued employment growth (especially in the services sector) and oil prices declining from August highs. In the euro area, growth accelerated to its fastest pace in six years as domestic demand was boosted by increasing business confidence and improving labor markets, as well as special factors—including the Soccer World Cup and the boost to consumption in advance of a value-added tax (VAT) increase in Germany in January 2007. Activity in Japan slowed in the middle of the year, but regained traction toward year-end.

Rapid growth in emerging market and developing countries was led by China and India. China's growth rate reached 10¼ percent in 2006, driven by investment and export growth, notwithstanding some easing in the second half as policy tightening helped to cool the pace of fixed asset investment. India's expansion picked up momentum in the course of the year, with year-on-year growth rising to 9¼ percent. Elsewhere, growth was also generally sustained at robust rates, supported by high commodity prices and favorable financial conditions.

Strong growth and rising international oil prices in the first half of 2006 raised concerns about inflation, but pressures moderated in the second half, dampened by monetary policy tightening and the turnaround in oil markets (Figure 1.3). The oil price declines from August largely reflected some easing of security tensions in the Middle East, improved supply-demand balance in oil markets, and favorable weather conditions in the second half of 2006 (Appendix 1.1). In the advanced economies, headline CPI inflation dropped quite sharply after the summer as fuel costs fell. The core CPI inflation rate (excluding food and energy) also eased modestly in the United States, although remaining somewhat above the Federal Reserve's implicit comfort zone. The Fed has kept the Federal funds rate on hold since June, seeking to balance risks from a cooling economy and continuing concerns about inflation. In Japan, downward revision of the CPI series has left inflation readings still uncomfortably close to

Figure 1.2. Current and Forward-Looking Indicators
(Percent change from a year ago unless otherwise noted)

Industrial production and trade indicators suggest that the pace of global expansion has eased somewhat since mid-2006, although generally positive readings on confidence continue to augur well for short-term prospects.



Sources: Business confidence for the United States, the Institute for Supply Management; for the euro area, the European Commission; and for Japan, Bank of Japan. Consumer confidence for the United States, the Conference Board; for the euro area, the European Commission; and for Japan, Cabinet Office; all others, Haver Analytics.

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

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

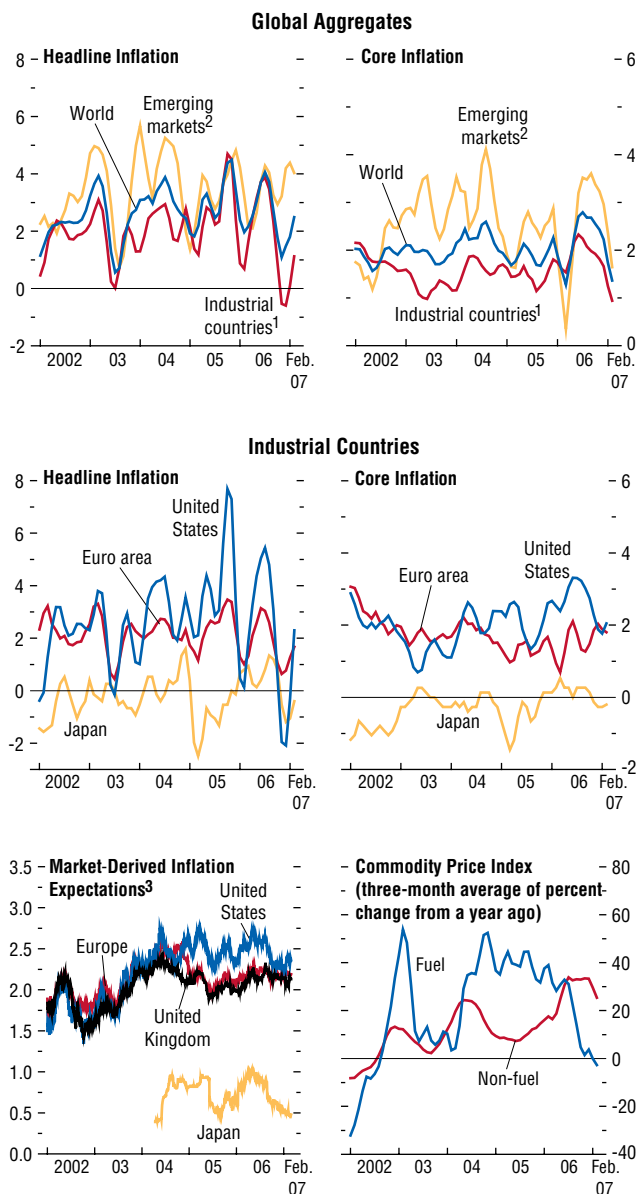
³Japan's consumer confidence data are based on a diffusion index, where values greater than 50 indicate improving confidence.

⁴Data for China, India, Pakistan, and Russia are interpolated.

Figure 1.3. Global Inflation

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

Measures of inflation and inflation expectations have generally moderated since mid-2006, helped by falling oil prices and some tightening of monetary conditions.



Sources: Haver Analytics; and IMF staff calculations.

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

²Brazil, Bulgaria, Chile, China, Estonia, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Poland, Singapore, South Africa, Taiwan Province of China, and Thailand.

³In percent; nominal minus inflation-indexed yields on 10-year securities.

zero, and the Bank of Japan has raised its policy interest rate only very gradually since exiting its zero interest rate policy in July 2006. The European Central Bank (ECB), the Bank of England, and other central banks in Europe have continued to remove monetary accommodation in the context of economic buoyancy. Some emerging market countries—including China, India, and Turkey—have tightened monetary conditions in the face of concerns about over-rapid growth, overheating, and (in the case of Turkey) external pressures, but, overall, inflation outcomes have continued to be favorable.

Expectations of continued solid economic growth and fading inflation concerns contributed to buoyant global financial market conditions over most of the period since mid-2006. Markets have been more volatile since late February, but this recent episode seems to be more of a modest correction after a period of rising asset prices, rather than a fundamental change in market sentiment (see the April 2007 *Global Financial Stability Report* for further details). Notwithstanding recent declines, advanced economy equity markets remain close to all-time highs, supported by strong earnings growth (Figures 1.4 and 1.5). Long-term bond yields have generally receded since mid-2006, spreads on risky assets have narrowed in most market segments, and market volatility was extremely low until recently. Emerging bond and equity markets rebounded robustly from an earlier episode of turbulence in May–June 2006 as concerns about continued tightening of monetary policy in the United States eased, and remain at close to peak levels even after the recent correction (Figure 1.6). Capital flows to emerging markets were maintained at high levels in 2006 as a whole, with Asia and emerging Europe continuing to attract a large share of the flows and corporate borrowers replacing sovereigns as the main source of demand (Table 1.2).

In foreign exchange markets, slower growth in the United States and the robust expansion in western Europe have fed expectations of narrowing interest rate differentials and contributed to a weakening of the U.S. dollar mainly against

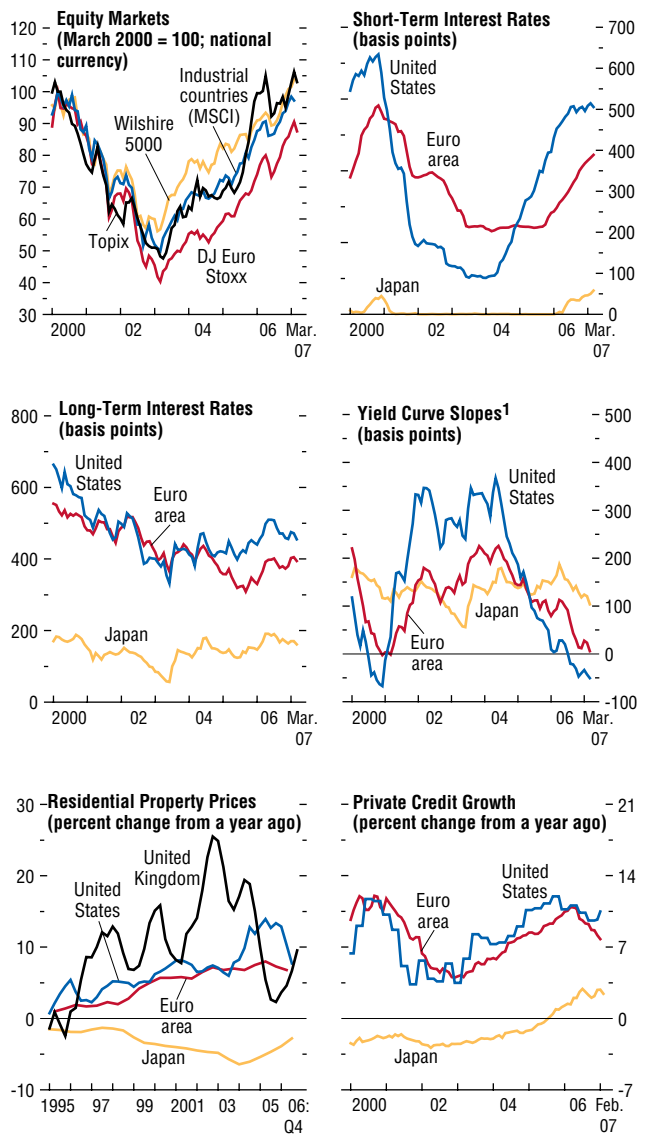
the euro and pound sterling. Over 2006 as a whole, the U.S. dollar depreciated by 4 percent in real effective terms, while the euro and pound sterling appreciated by around 7 percent (Figure 1.7). The yen also weakened further in 2006, notwithstanding Japan's rising current account surplus, as declining "home bias" among domestic investors and low interest rates continued to encourage capital outflows. However, it recovered some ground in early 2007, as heightened market volatility contributed to some unwinding of carry trade outflows. The renminbi depreciated slightly in real effective terms despite a mild acceleration in its rate of appreciation against the dollar in recent months and a further rise in China's current account surplus to 9 percent of GDP (Figure 1.8). The real effective value of Middle Eastern oil exporters' currencies depreciated moderately, although strong growth in oil exports drove the current account surplus of these countries to 21 percent of GDP.

Outlook and Short-Term Risks

The world economy is expected to continue to grow robustly in 2007 and 2008—with a modest deceleration from the rapid pace of 2006 bringing growth more in line with potential and helping to contain inflationary pressures in the fifth and sixth years of the current expansion. Specifically, global growth would moderate to 4.9 percent in 2007, around ½ percentage point less than in 2006 and in line with the rate forecast at the time of the September 2006 *World Economic Outlook*, and maintain this pace in 2008 (Figure 1.9). As discussed in more detail in Chapter 2, among the major advanced economies, the slowdown in year-over-year growth in 2007 would be most pronounced in the United States, although the U.S. economy should gather momentum in the course of the year and into 2008 as the drag from the housing sector moderates. Growth is also projected to ease in the euro area, reflecting in part gradual withdrawal of monetary accommodation and further fiscal consolidation, as well as the unwinding of spe-

Figure 1.4. Developments in Mature Financial Markets

Expectations of continued solid economic growth and moderating price concerns since mid-2006 have encouraged buoyant equity markets and declining long-term interest rates. Credit growth has eased somewhat but remains high.

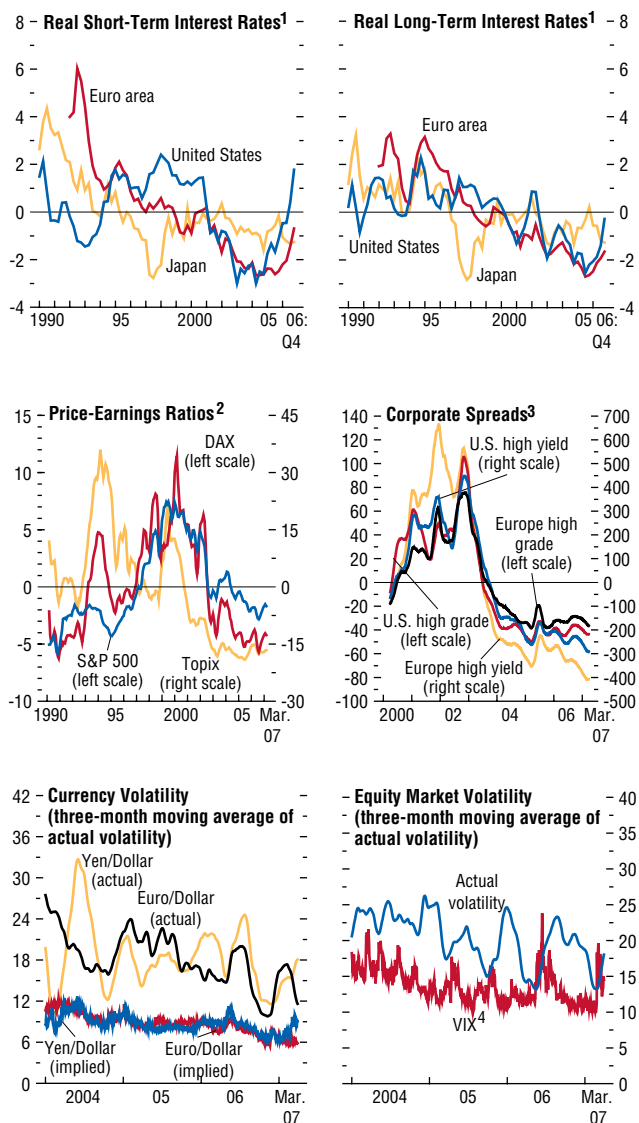


Sources: Bloomberg Financial Markets, LP; CEIC Data Company Limited; Haver Analytics; OECD; IMF, *International Financial Statistics*; national authorities; and IMF staff calculations.

¹Ten-year government bond minus three-month treasury bill rate.

Figure 1.5. Mature Financial Market Indicators

Real interest rates are generally below long-term averages, as are price-earnings ratios in equity markets and corporate spreads. Volatility has generally remained low.



Sources: Bloomberg Financial Markets, LP; Merrill Lynch; Thomson Financial; and IMF staff calculations.
¹Relative to headline inflation. Measured as deviations from 1990–2006 average.
²Twelve-month forward-looking price-earnings ratios measured as three-month moving average of deviations from 1990–2007 (March) average.
³Measured as three-month moving average of deviations from 2000–07 (March) average.
⁴VIX 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.

cial factors, while the expansion would continue at about the same pace in Japan.

Emerging market and developing countries would continue to grow strongly, albeit at a somewhat less torrid pace than in 2006, drawing continued support from benign global financial conditions and commodity prices that would remain high notwithstanding some recent declines. China’s growth would moderate gradually in 2007 and 2008 from its very high rate in 2006, while the pace of expansion would also ease in India, reflecting in part policy tightening in response to overheating concerns. Commodity-rich countries in Africa, the Commonwealth of Independent States (CIS), the Middle East, and Latin America would continue to prosper, with growth in Africa accelerating in 2007 as new oil fields come on stream. Countries in emerging Europe and also Mexico would be somewhat more affected by spillovers from slower growth in Europe and the United States.

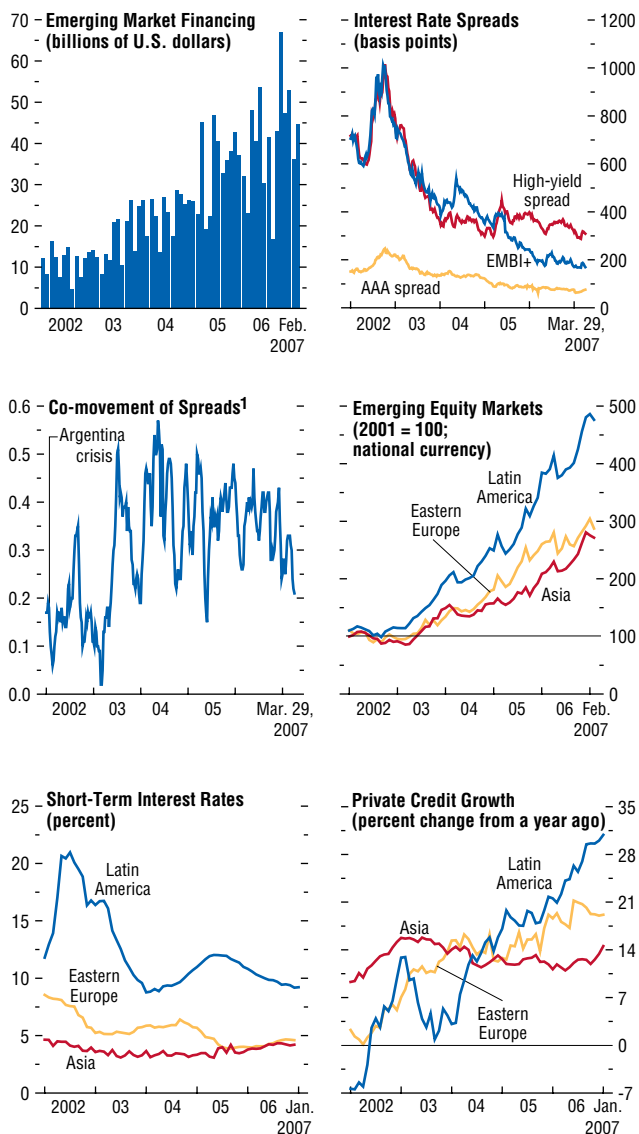
Risks around this “soft landing” scenario seem more evenly balanced than at the time of the September 2006 *World Economic Outlook*, but remain weighted on the downside. As shown in the fan chart (upper panel of Figure 1.10), the IMF staff see about a one in five chance of growth falling below 4 percent in 2008. The accompanying risk factor chart (lower panel of Figure 1.10) depicts the IMF staff’s current assessment of the principal sources of risk to projected output growth over the next 12 months, relative to the assessment at the time of the September 2006 *World Economic Outlook*. Downside risks related to the U.S. housing sector, supply-side inflation pressures, the oil market, and from a possible disorderly adjustment of global imbalances are all seen to have receded somewhat in recent months, but they still raise concerns. Risks related to overextension of financial markets are viewed as moderately increased. There continues to be upside potential that domestic demand in emerging markets could be higher than projected, while domestic demand is also seen as a source of upside potential in western Europe.

U.S. housing market risk. The housing market downturn in the United States has, if anything, been deeper than projected at the time of the September 2006 *World Economic Outlook*, and residential investment was a substantial drag on U.S. GDP in the second half of 2006. Over the past few months, there have been some tentative signs of stabilization at least on the demand side, as sales of existing homes, mortgage applications, and potential homebuyer intentions have generally steadied or improved. However, the housing correction still has a way to run. Housing starts and permits are still heading downward, while inventories of unsold new homes are at their highest levels in 15 years. Moreover, there has been rising stress in the subprime sector of the market—which represents about 12 percent of the total mortgage market—in the form of sharp increases in delinquency and default rates. In this sector, there was clearly an excessive relaxation of lending and underwriting standards. There have also been some signs of deterioration in Alternative-A mortgages, although delinquencies in prime mortgages remain well contained. The intensifying problems in the subprime mortgage market could start having a broader impact on the housing market as rising foreclosures could add further to inventories of unsold homes, and tightening of lending standards could depress housing demand. A turnaround in residential construction is still several quarters away.

The key question is whether the continuing difficulties in the housing sector will begin to have a broader impact on the U.S. economy. House prices have continued to decelerate nationally, with outright price declines in many metropolitan areas. Nonetheless, household finances still look solid. Equity gains over the past year have brought household net worth back up to previous peaks. Moreover, household cash flows continue to be sustained by employment and income growth. With interest rates still low, debt-service obligations generally look reasonable. Overall, the baseline view remains that difficulties in the housing sector will not have major spillovers, provided that employment

Figure 1.6. Emerging Market Financial Conditions

Emerging markets have generally remained buoyant, despite recurrent bouts of market volatility. Equity prices in many emerging markets have recorded new highs, while sovereign risk spreads are close to all-time lows. Credit growth remains rapid.



Sources: Bloomberg Financial Markets, LP; Capital Data; IMF, *International Financial Statistics*; and IMF staff calculations.
¹Average of 30-day rolling cross-correlation of emerging market debt spreads.

Table 1.2. Emerging Market and Developing Countries: Net Capital Flows¹*(Billions of U.S. dollars)*

	1996–98	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total											
Private capital flows, net ²	159.3	74.6	56.7	70.2	88.3	173.3	238.6	257.2	255.8	252.7	259.3
Private direct investment, net	142.3	177.4	168.6	182.8	152.2	165.3	190.0	266.3	266.9	283.7	288.9
Private portfolio flows, net	60.0	60.1	11.4	-80.5	-90.9	-12.1	25.0	29.4	-76.3	-62.0	-52.2
Other private capital flows, net	-43.0	-162.9	-123.4	-32.1	26.9	20.1	23.5	-38.5	65.2	30.9	22.6
Official flows, net ³	20.2	22.4	-34.2	6.6	2.3	-44.5	-57.8	-122.6	-143.8	-96.4	-116.6
Change in reserves ⁴	-72.6	-98.2	-131.2	-120.6	-198.9	-358.9	-508.2	-590.1	-738.4	-715.5	-716.4
<i>Memorandum</i>											
Current account ⁵	-72.1	34.4	123.5	86.8	132.3	229.4	299.7	511.6	638.5	548.6	567.1
Africa											
Private capital flows, net ²	6.5	9.0	-4.2	2.2	0.9	2.7	12.3	18.3	20.2	28.6	39.9
Private direct investment, net	5.8	8.6	7.6	23.1	13.5	15.4	16.8	27.0	19.1	21.9	29.4
Private portfolio flows, net	5.0	9.1	-1.8	-7.9	-1.6	-0.5	5.4	4.1	18.5	12.3	13.6
Other private capital flows, net	-4.3	-8.7	-10.0	-13.0	-11.0	-12.2	-9.8	-12.8	-17.4	-5.7	-3.1
Official flows, net ³	5.0	4.1	7.7	6.5	8.6	6.4	4.3	-1.8	-3.8	10.1	10.8
Change in reserves ⁴	-4.2	-0.4	-12.8	-9.7	-5.5	-11.4	-32.7	-42.3	-48.4	-44.9	-56.3
Central and eastern Europe											
Private capital flows, net ²	27.4	36.3	38.7	10.9	54.0	52.5	74.7	117.5	121.1	109.0	117.7
Private direct investment, net	14.9	22.7	24.1	24.0	24.1	16.2	34.5	50.1	65.8	62.6	62.0
Private portfolio flows, net	1.7	5.3	3.1	0.4	1.7	6.5	26.9	20.9	8.1	12.1	14.4
Other private capital flows, net	10.8	8.3	11.6	-13.4	28.3	29.9	13.3	46.4	47.1	34.3	41.2
Official flows, net ³	-0.5	-2.4	1.6	6.0	-7.5	-5.0	-6.6	-8.3	-4.9	-3.1	-3.3
Change in reserves ⁴	-8.8	-12.1	-6.0	-3.0	-18.5	-11.5	-13.6	-48.2	-21.2	-14.9	-22.1
Commonwealth of Independent States⁶											
Private capital flows, net ²	-5.3	-13.5	-27.6	7.2	15.8	17.9	7.7	37.6	65.7	38.0	28.6
Private direct investment, net	5.5	4.7	2.3	4.9	5.2	5.4	12.9	14.4	33.1	22.2	26.1
Private portfolio flows, net	2.2	-0.9	-10.0	-1.2	0.4	-0.5	8.1	-3.1	13.9	0.4	0.3
Other private capital flows, net	-13.0	-17.3	-19.9	3.5	10.2	13.0	-13.4	26.3	18.8	15.4	2.1
Official flows, net ³	-1.0	-1.8	-5.8	-4.9	-10.4	-8.9	-7.3	-22.1	-32.6	-3.6	-4.3
Change in reserves ⁴	5.1	-6.4	-20.3	-14.5	-15.1	-31.8	-53.8	-75.6	-126.9	-108.4	-98.7
Emerging Asia⁷											
Private capital flows, net ²	36.9	-1.9	4.5	23.5	25.4	69.2	142.5	69.7	53.9	30.7	-5.8
Private direct investment, net	56.0	70.9	59.8	52.0	52.6	73.1	68.0	105.8	102.4	96.1	94.1
Private portfolio flows, net	16.0	54.1	19.6	-50.2	-60.1	7.8	11.2	-8.1	-99.4	-78.9	-88.8
Other private capital flows, net	-35.1	-127.0	-74.8	21.6	32.8	-11.6	63.4	-27.9	50.9	13.5	-11.1
Official flows, net ³	5.9	8.5	-10.9	-12.0	4.1	-16.6	-7.0	-2.8	-9.8	-5.4	-7.5
Change in reserves ⁴	-45.1	-84.8	-59.1	-85.4	-154.3	-234.3	-339.0	-284.1	-365.6	-410.6	-424.0

and income growth remain resilient. But there remain risks that the fallout from the housing correction could be amplified, particularly if tightening lending standards in the subprime sector were to lead to a broader reappraisal of credit availability across the economy or if household cash flows were to weaken. Such a development could imply a deeper and more prolonged slowdown or even a recession in the United States, with potential spillovers to other countries.

Domestic demand in western Europe. Western European economies ended 2006 with a robust fourth quarter, showing potential for

stronger growth than projected in the *World Economic Outlook* baseline projection. The upside potential seems particularly relevant in Germany, where consumption could gather strength more commensurate with improved fundamentals and the stronger growth of employment, especially if wages pick up and the negative impact of the VAT increase on demand in early 2007 turns out to be milder than anticipated. In the United Kingdom too, domestic demand may turn out stronger than forecast despite recent monetary tightening, given the acceleration in house prices over the past year.

Table 1.2 (concluded)

	1996–98	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Middle East⁶											
Private capital flows, net ²	11.8	-3.8	-10.0	-5.5	-19.4	4.7	-12.0	-19.9	-15.5	14.4	34.8
Private direct investment, net	7.0	4.4	4.9	12.3	9.7	17.8	8.8	17.6	12.0	19.6	18.2
Private portfolio flows, net	0.5	-8.6	-1.2	-13.5	-17.4	-14.9	-14.0	-14.9	-5.0	-3.3	4.4
Other private capital flows, net	4.3	0.4	-13.7	-4.3	-11.6	1.8	-6.8	-22.5	-22.5	-1.9	12.2
Official flows, net ³	5.2	8.0	-20.5	-14.2	-9.8	-24.6	-32.5	-57.1	-75.0	-93.2	-112.0
Change in reserves ⁴	-8.1	-2.0	-31.2	-11.6	-3.1	-33.7	-45.7	-106.6	-129.7	-79.4	-75.9
Western Hemisphere											
Private capital flows, net ²	82.0	48.5	55.2	31.9	11.5	26.2	13.3	33.9	10.4	32.0	44.2
Private direct investment, net	53.1	66.1	70.0	66.5	47.2	37.5	49.1	51.4	34.5	61.3	59.1
Private portfolio flows, net	34.6	1.0	1.7	-8.1	-13.9	-10.5	-12.5	30.5	-12.4	-4.6	3.9
Other private capital flows, net	-5.7	-18.6	-16.5	-26.5	-21.8	-0.9	-23.3	-48.0	-11.6	-24.7	-18.8
Official flows, net ³	5.6	6.2	-6.4	25.2	17.4	4.3	-8.7	-30.4	-17.7	-1.2	-0.4
Change in reserves ⁴	-11.4	7.4	-1.8	3.5	-2.4	-36.2	-23.4	-33.4	-46.5	-57.4	-39.3
Memorandum											
Fuel-exporting countries											
Private capital flows, net ²	-5.4	-27.2	-57.0	-12.7	-11.2	12.7	-14.9	-6.8	-2.6	11.1	36.4
Other countries											
Private capital flows, net ²	164.8	101.8	113.6	82.9	99.5	160.6	253.4	264.0	258.4	241.6	223.0

¹Net capital flows comprise net direct investment, net portfolio investment, and other long- and short-term net investment flows, including official and private borrowing. In this table, Hong Kong SAR, Israel, Korea, Singapore, and Taiwan Province of China are included.

²Because of data limitations, flows listed under "private capital flows, net" may include some official flows.

³Excludes grants and includes overseas investments of official investment agencies.

⁴A minus sign indicates an increase.

⁵The sum of the current account balance, net private capital flows, net official flows, and the change in reserves equals, with the opposite sign, the sum of the capital account and errors and omissions. For regional current account balances, see Table 25 of the Statistical Appendix.

⁶Historical data have been revised, reflecting cumulative data revisions for Russia and the resolution of a number of data interpretation issues.

⁷Consists of developing Asia and the newly industrialized Asian economies.

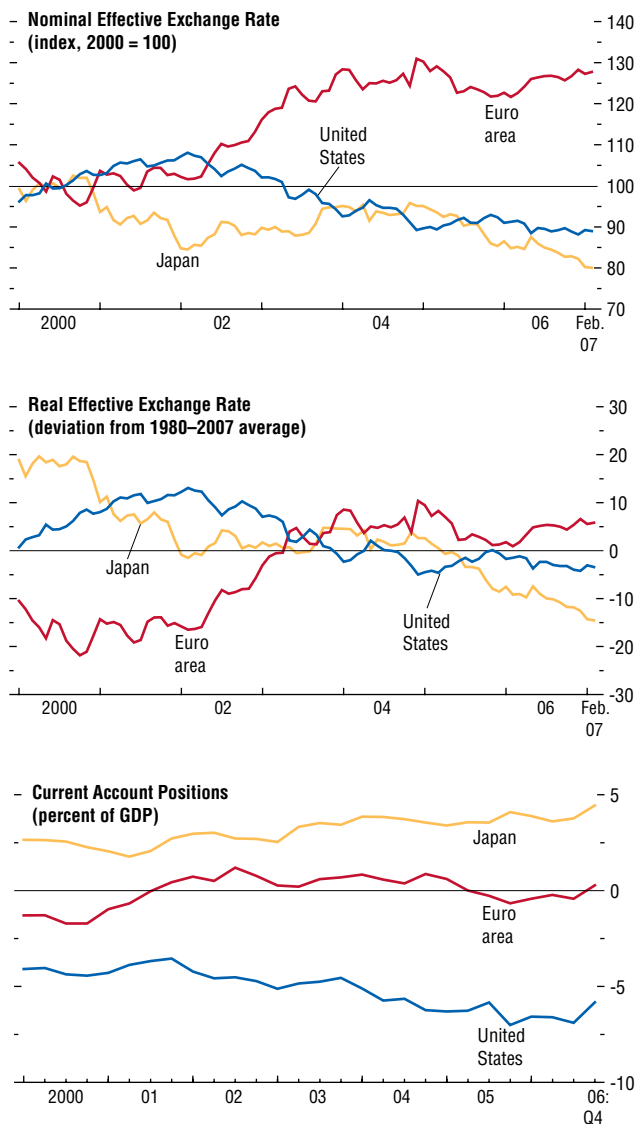
⁸Includes Israel.

Domestic demand in emerging markets. IMF staff projections have consistently underpredicted emerging market growth in recent years, as China and India have continued to outperform expectations. A similar pattern could recur in 2007. It is not clear that the Chinese economy will slow consistently as a result of limited tightening measures introduced in 2006, while in India the strong momentum could be sustained despite recent interest rate increases. Both economies, as well as other emerging market oil importers more generally, will benefit significantly from recent oil price reductions. Among commodity exporters, there would seem to be some downside risk to projections in light of recent softening of their export prices. This risk however, seems contained as prices of oil and metals are still high by historical standards and recent price declines still leave significant fiscal revenue cushions. Therefore, sharp cutbacks in government spending plans seem unlikely at this point.

Inflation risk in advanced economies. Inflation pressures in the advanced economies have generally eased, and the probability that central banks may need to raise interest rates by more than now anticipated by markets seems less than last summer. That said, concerns do remain. In the United States, 12-month core inflation is still somewhat above the Federal Reserve's implicit comfort zone and some measures of wages have risen over the past year. Moreover, a gradual slowing of productivity growth is adding to cost pressures, and there is considerable uncertainty about the extent to which this is a cyclical phenomenon or reflects a moderation of potential growth (Figure 1.11). In the United Kingdom, inflation is now well above the Bank of England's target, despite policy tightening. In the euro area, price and wage increases remain subdued, but unemployment rates have fallen to cyclical lows, capacity utilization rates are high, and inflation pres-

Figure 1.7. External Developments in Major Advanced Economies

The U.S. dollar has depreciated modestly in real effective terms since late 2005, but the U.S. current account deficit has remained wide. The euro area's current account is close to balance, while the euro has appreciated. Japan retains a sizable current account surplus, while the real effective value of the yen has depreciated significantly below its long-term average.



Sources: Haver Analytics; and IMF staff calculations.

surements could emerge in the year ahead if labor markets continue to tighten (Figure 1.12). More generally, after four years of strong global growth and output gaps closing in emerging markets too, there is at least a possibility that the dampening impact of global competition on price- and wage-setting behavior in the advanced economies may start to moderate, while risks remain of commodity price spikes (see discussion in Chapter 3 of the April 2006 *World Economic Outlook*).

Supply-side risk from oil markets. The overall decline in oil prices since August 2006 has provided welcome relief to the global economy, particularly by supporting household spending power and alleviating inflation concerns. However, a rebound in prices since early 2007, as geopolitical tensions have risen, has provided a reminder that the oil market remains an important source of potential volatility. Prospects for substantial price declines from recent levels should be contained as long as the present global expansion is sustained, given the commitment by the Organization of the Petroleum Exporting Countries (OPEC) to implement production cuts in response to price weakness. At the same time, spare capacity remains quite tight (notwithstanding a modest increase in recent months), and a deterioration in security in the Middle East or supply-side disruptions could still lead to another oil price spike. This concern is reflected in oil options pricing, which suggests that markets see price risk as clearly skewed upward. On April 2, options markets indicated a 1 in 6 chance that oil prices could rise above \$88 a barrel by the end of 2007. Box 1.1 looks in more detail at the consequences of such a spike for the global economy, underlining that the negative economic impact from an adverse supply-side event would be significantly larger than from a demand-led surge in oil prices.

Financial stability risk. Although the recent episode of financial market turbulence in February–March 2007 appears to be contained in magnitude, it does serve as a healthy reminder of underlying financial risks. Recent

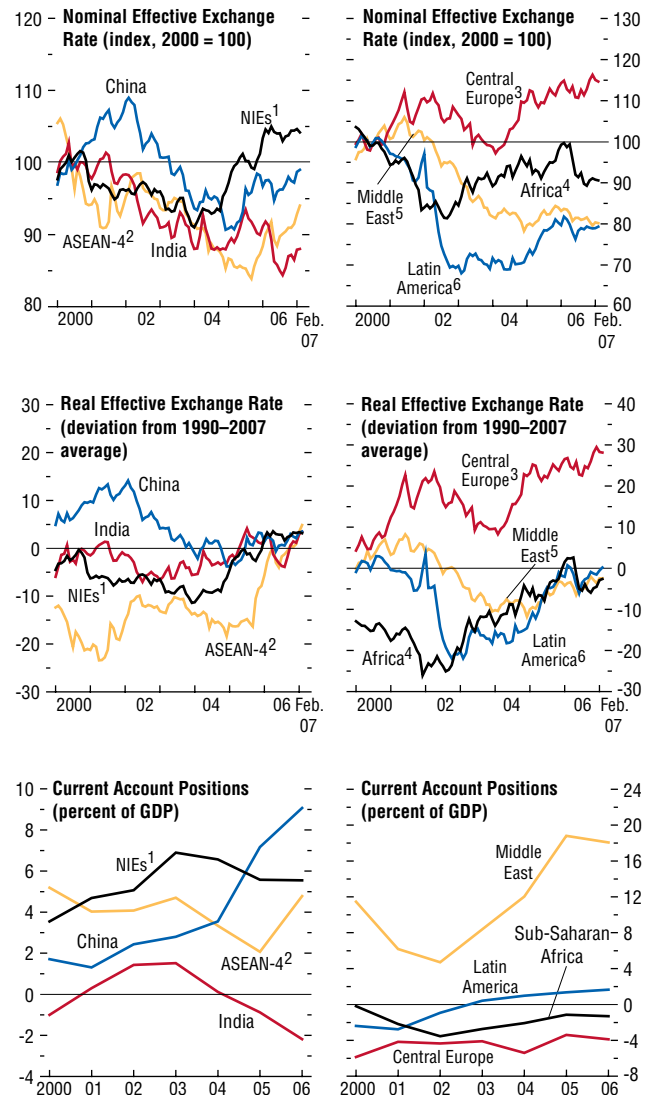
years have been an unusual period for markets, with relatively low real interest rates and very low volatility, despite monetary tightening by major central banks. The concern is that, as discussed in the April 2007 *Global Financial Stability Report*, the drive for yield has led to greater risk taking in less-well-understood markets and instruments. While this strategy has been successful when markets remain buoyant, price setbacks, rising volatility, and emerging loan losses could lead to a reappraisal of investment strategies and a pull-back from positions that have become overextended. Such an unwinding could have serious macroeconomic repercussions.

The recent difficulties in the U.S. subprime mortgage market illustrate this concern. While the direct impact appears contained (in part reflecting this segment's limited size in the overall market), the indirect effect could be larger. For example, financial institutions with exposure to the U.S. subprime mortgage markets, notably as arrangers of structured credit instruments backed by subprime lending, are experiencing adverse effects. There is also concern that the emergence of loose lending practices and rising delinquencies in subprime loans foreshadow similar trends in other market segments—including prime mortgages, consumer credit, high-yield corporate paper, and other new collateralized products. A general tightening of lending standards and credit conditions in the United States would have more pervasive effects. So far, at least, there has been little contagion to either the prime mortgage market or high-yield corporate paper, but this is an area that bears close watching.

Another area of concern discussed in the April 2007 *Global Financial Stability Report* relates to the recent surge in leveraged buyouts and share buybacks, often led by private equity firms. While overall corporate leverage remains very low, leverage is rising in certain sectors, and there are concerns that a failure of one of these operations could raise doubts about these deals more generally. Also, there are concerns about the increasing role of hedge funds, whose activities are little regulated and not transpar-

Figure 1.8. External Developments in Emerging Market Countries

Movements in nominal exchange rates over the past year have generally moved real effective exchange rates in emerging market countries closer to historical averages. Current account surpluses in China and the Middle East have continued to rise.



Source: IMF staff calculations.

¹Newly industrialized economies (NIEs) include Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

²Indonesia, Malaysia, the Philippines, and Thailand.

³Czech Republic, Hungary, and Poland.

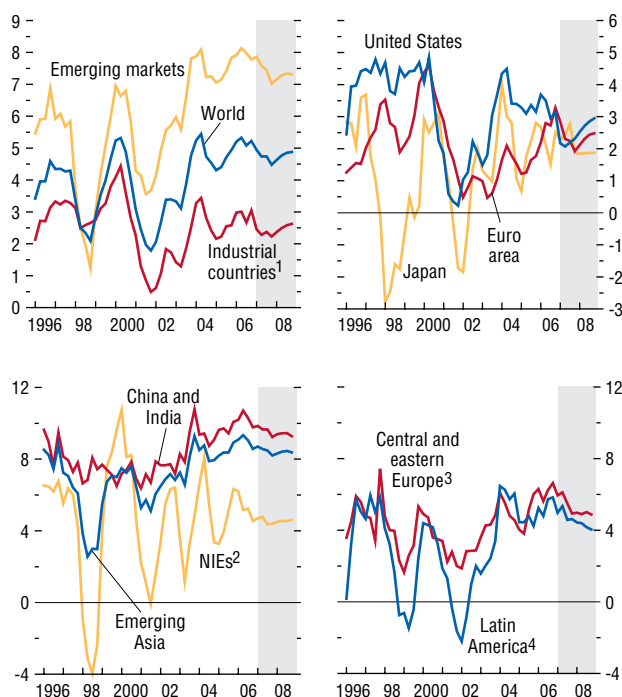
⁴Botswana, Burkina Faso, Cameroon, Chad, Republic of Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Uganda, and Zambia.

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

⁶Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

Figure 1.9. Global Outlook
(Real GDP; percent change from four quarters earlier)

Following a banner year in 2006, world growth is expected to ease in 2007 and 2008, but remain at high levels.



Sources: Haver Analytics; and IMF staff estimates.

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

²Newly industrialized economies (NIEs) include Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.

³Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Poland.

⁴Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

ent. To some degree, risks may be contained by structural improvements in markets, including the improved risk management made possible by the increasingly sophisticated and liquid derivatives markets, but new structures have not been fully tested under stressful financial conditions. Thus, vigilance is required to ensure that rising leverage and risk taking do not lead to the buildup of serious vulnerabilities.

Emerging market risks deserve particular attention since history offers numerous examples of boom conditions followed by devastating busts. The good news is that emerging market countries have generally continued to take advantage of the benign global environment. They strengthened public balance sheets, including further reductions in ratios of public debt to GDP; improved currency and maturity composition of debt stocks; and increased levels of international reserves. Credibility of policy management has also been enhanced through timely actions to address emerging concerns—such as steps in China to cool the rapid growth of investment, a fiscal package to lower Hungary’s large fiscal deficit, and monetary tightening in Turkey in the face of rising inflationary pressures. Responsible policy management has been reflected in continued improvement of credit ratings and the decline of sovereign spreads to near all-time lows.

Nevertheless, the recent increases in asset prices and compression in risk spreads in emerging markets may not be fully justified by improving fundamentals. Potential vulnerabilities include still-high public debt ratios in some countries, especially in Latin America, and the rapid buildup of bank lending and private debt, particularly in emerging Europe and the CIS countries. Events in May–June 2006, when rising interest rates and increased volatility in the advanced economies sparked a period of turbulence in emerging markets, provided a healthy reminder of the pressures that can occur. Moreover, the possibility of a disorderly reversal of carry trade capital outflows from Japan has raised concern, although any reversal would be unlikely to be as abrupt as what occurred in

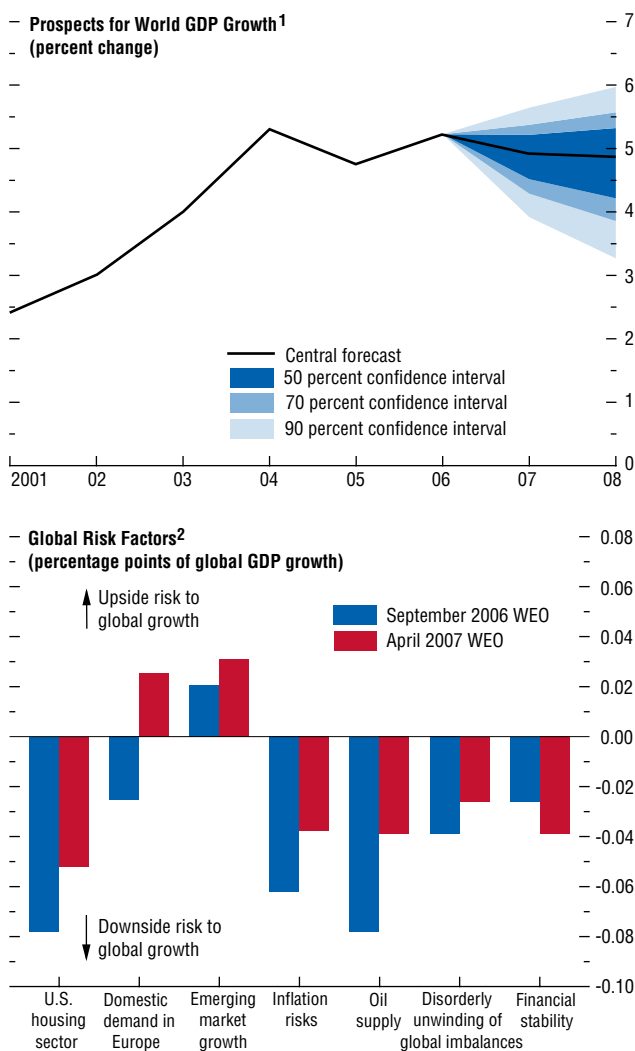
1998, given the greater currency diversification and the broadening of the investor base since that time. Countries that could come under particular pressure in a more testing external financial environment include those that remain heavily dependent on capital inflows, those where balance sheet vulnerabilities may have been allowed to build, or those where macro-economic management may not yet have full credibility.

Risks from global imbalances. Over the past six months, there has been some welcome movement toward containing large global imbalances and the associated risk that a disorderly unwinding would have a highly disruptive impact on the world economy. Relevant developments include a further reduction in the real effective value of the U.S. dollar, some increase in flexibility in the currencies of surplus countries in Asia, lower international oil prices, and a somewhat more balanced pattern of domestic demand growth in the global economy. The U.S. non-oil trade deficit was reduced as a percent of GDP in 2006 as exports accelerated, while the U.S. net external liabilities are estimated to have again declined modestly, reflecting the depreciation of the U.S. dollar and substantial capital gains on foreign equity holdings (see discussion in Chapter 3). Against this, as mentioned earlier, the downward movement of the dollar has been largely focused against the euro and pound sterling, while currencies of the main surplus countries—China, Japan, and the Middle Eastern oil exporters—have tended to depreciate in real effective terms.

Nevertheless, the sum of these developments has not substantially changed the outlook. Projections based on the current constellation of real exchange rates and policies suggest that global imbalances would still remain large over the foreseeable future (Figure 1.13). The U.S. current account deficit is projected to be about 1 percentage point of GDP lower than at the time of the September 2006 *World Economic Outlook*, but would still remain around 6 percent of GDP in 2012, as a deteriorating net income balance offsets continued improvement on the

Figure 1.10. Risks to the Global Outlook

Risks to global growth now seem more balanced than six months ago, as downside risks related to the U.S. housing sector, inflationary pressures, and oil supply seem less threatening.



Source: IMF staff estimates.

¹The 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 *World Economic Outlook* for details.

²The 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 *World Economic Outlook*). The bars for each forecast vintage sum up to the difference between the expected value of world growth implied by the distribution of outcomes (the probability density) shown in the fan chart and the central forecast for global GDP growth. This difference and the extent of asymmetry in the probability density in the fan chart also depend on 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.

Figure 1.11. Productivity and Labor Cost Developments in Selected Advanced Economies¹
(Percent change from four quarters earlier)

Slowing productivity and rising compensation have put upward pressure on unit labor costs in the United States. However, unit labor cost increases have moderated in Europe—as productivity performance has strengthened—and continue to fall in Japan.



Sources: Haver Analytics; OECD, *Economic Outlook*; and IMF staff calculations.
¹Estimates are for the nonfarm business sector for the United States, and the whole economy for the euro area and Japan.

trade balance. As a result, the U.S. net external liability position would deteriorate substantially in the absence of further valuation gains. Rapidly increasing domestic absorption and a lower oil price trajectory have lowered the path of projected surpluses in the oil-exporting countries, but China's projected surplus has risen to around 10 percent of GDP in 2012, reflecting recent rapid export growth that has continued to outpace rising imports.

Thus far, the capital inflows needed to finance the large U.S. current account deficit have been forthcoming, but over time the composition of the flows has shifted from equity to debt, and within debt away from treasuries to riskier forms. These shifts suggest an increasing vulnerability to changes in market sentiment, particularly if returns on U.S. assets continue to underperform returns elsewhere. Hence, the concern remains that at some point more substantial adjustments will be needed to ensure that the global pattern of current account positions remains consistent with the willingness of international wealth-holders to build up net claims on the United States. The challenge is to ensure that this process occurs relatively smoothly, rather than through a much more disruptive disorderly adjustment (see Box 1.3 of the September 2006 *World Economic Outlook*).

Shifting patterns of saving and investment would play an important part in an orderly adjustment process. Over time, U.S. consumption growth can be expected to moderate to allow savings out of current income to return to more normal levels after a period in which capital gains on housing and equity substituted for such saving. Elsewhere, consumption in China should rise from its present low share of GDP as consumer finance becomes more easily available and precautionary savings motives are reduced by stronger social safety nets and increasing prosperity, while absorption by oil exporters should continue to rise as investment plans are advanced.

Changes in real effective exchange rates potentially could play a substantial supportive role to facilitate a smooth unwinding in global

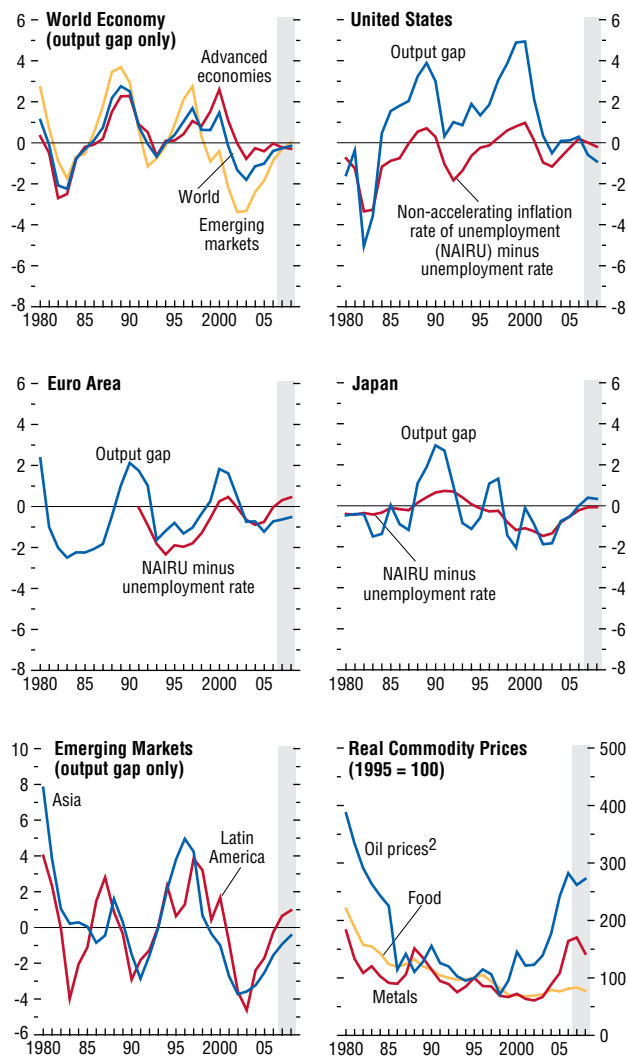
imbalances without large cyclical swings or overshooting of aggregate output. Supporting this point, Chapter 3 presents evidence showing that exchange rate movements have been important contributors to past episodes of external adjustment, by facilitating a shift in resources across sectors. It also finds that concern about “elasticity pessimism” in the United States—that is, that trade flows are unresponsive to exchange rate changes—is exaggerated. While short-term exchange rate movements respond to conjunctural factors and are hard to predict, over a medium-term horizon market-led exchange rate movements that could support a smooth reduction of imbalances in combination with rebalancing of demand across countries would include a significant further real effective depreciation of the U.S. dollar, and real effective appreciations of the renminbi, yen, and currencies of Middle Eastern oil exporters.

Cross-Country Spillovers: Can the Global Economy Decouple from a U.S. Slowdown?

While analyzing individual sources of downside risk, it must be borne in mind that shocks can be quickly transmitted across countries through trade and financial channels, leading to a complex pattern of interactions and spillovers. The increasing integration of the global economy over the past 20 years would seem likely to increase the scope for such spillovers. Moreover, there is always particular concern about the potential for spillovers from the United States, still the dominant global economy, accounting for 20 percent of global imports and having the world’s deepest, most sophisticated financial markets. The potential for such spillovers was underlined by the experience in 2000–01 when the collapse of the “hi-tech” stock market bubble in the United States quickly spread across the globe as stock market valuations and business investment dropped sharply in the context of a broader reappraisal of prospects. Thus, a key question for the present conjuncture has been whether the global economy would be able to

Figure 1.12. Measures of the Output Gap and Capacity Pressures¹

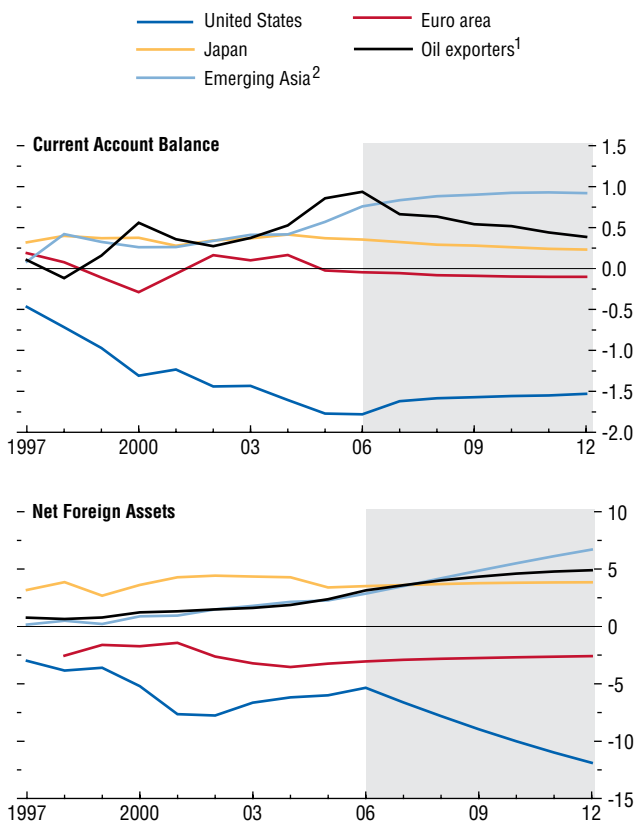
Sustained growth has reduced output gaps and lowered unemployment rates. Tighter capacity constraints in commodities sectors have contributed to sharp increases in oil and metals prices.



Sources: OECD, *Economic Outlook*; and IMF staff estimates.
¹Estimates of the non-accelerating inflation rate of unemployment (NAIRU) come from the OECD. Estimates of the output gap, expressed as a percent of potential GDP, are based on IMF staff calculations.
²Simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil.

Figure 1.13. Current Account Balances and Net Foreign Assets
(Percent of world GDP)

Under the baseline forecast, which assumes unchanged real effective exchange rates, global current account imbalances remain sizable through the projection period, with the U.S. current account deficit staying above 1.5 percent of world GDP. As a result, the U.S. net foreign liability position would deteriorate further in the absence of the valuation gains that have reduced U.S. net foreign liabilities in recent years.



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

¹Algeria, 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, Venezuela, and the Republic of Yemen.

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

decouple from a sharper-than-projected slowdown in the United States.

So far the cooling of U.S. activity seems to have had a limited impact beyond its immediate neighbors, Canada and Mexico. As discussed in Chapter 4 of this report, which takes up the issue of cross-country spillovers in detail, the recent experience may reflect a variety of ingredients. First, the U.S. slowdown has been focused on the residential sector, which has a relatively low imported-goods content. Second, spillovers have typically been muted in the context of a midcycle slowdown, compared with the impact of a full-blown recession. Third, to date at least, the housing downturn has been a U.S.-specific event as housing markets elsewhere have remained buoyant, unlike the common disturbances across many countries (such as an oil price shock or the bursting of the IT bubble in 2000–01) that have typically been the source of previous synchronized global downturns. Fourth, the increasing strength of corporate balance sheets and improved labor market conditions in Europe have boosted domestic demand and reduced reliance on growth of net exports.

However, a further cooling of the U.S. economy that increasingly spreads to weakness in consumption and business investment in 2007 would be challenging, particularly since the euro area economy is likely to be slowing. There would also be important risks of spillovers in emerging Asia and elsewhere, particularly if growth in China were to slow more abruptly. A key message from the analysis in Chapter 4 is that in the face of such spillovers, it would be important that policymakers respond in a flexible, forward-looking, and timely fashion to help cushion the impact of weaker external demand.

A particular concern relates to possible interactions between slowing economies, exchange rate swings, and protectionist pressures. A further sharp decline in the value of the U.S. dollar in the face of weak economic data could be problematic, particularly if upward pressures were concentrated in a few currencies—as happened in late 2006. The situation would be

Box 1.1. Understanding the Link Between Oil Prices and the World Economy

While oil prices are below their August 2006 peaks, there are still concerns that unless measures are taken to curtail demand for oil and create additional capacity, oil price variability may continue to pose significant risks for the global economy. A common notion based on the experience of the 1970s is that oil price shocks trigger recessions. However, the recent past does not fit this view—oil prices are about 2½ times their 2002 levels—but this increase has apparently not had much impact on the global economy. This seeming paradox has brought attention to the need to identify the sources of the oil price increase, in particular, to distinguish the role of supply and demand factors.

This box investigates these issues using an extended version of the Global Economy Model (GEM) to analyze the causes and consequences of changes in oil prices.¹ It also looks at the global macroeconomic impact of higher taxes on petroleum products. It should be said at the outset that the analysis does not attempt to assess the relative importance of demand and supply factors in the recent run-up in oil prices. Rather, it focuses on modeling the channels through which oil prices and growth interact.²

Global Macroeconomic Implications of a Supply-Induced Oil Price Hike

First, consider the case where oil-exporting economies restrict the supply of oil (as in the 1970s). Oil prices rise sharply (100 percent at the peak of the simulation) and this results in a global slowdown as income is redistributed to the oil-exporting economies, which have a lower propensity to spend than the oil-importing economies. In addition, higher oil prices raise the cost

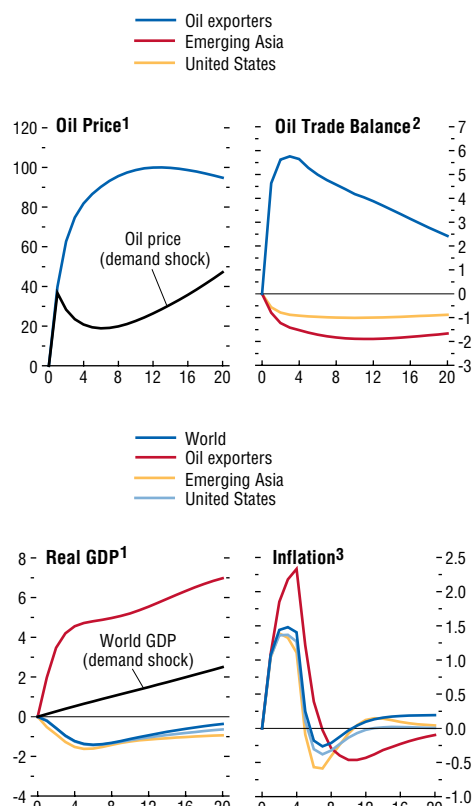
Note: The authors of this box are Selim Elekdag and Douglas Laxton, with support from Susanna Mursula. This work builds on some previous joint work with Dirk Muir, Rene Lalonde, and Paolo Pesenti.

¹For a description of the model, see Elekdag and others (2006). The regions in the model are oil exporters, United States, emerging Asia, and a residual block of oil-importing countries.

²For a discussion of the role of supply and demand factors during the recent increase in oil prices, see Chapter 4 of the April 2005 *World Economic Outlook*.

Oil Prices and World GDP

(Supply-induced oil price increase unless otherwise noted)



Source: IMF staff estimates.

¹Percent deviation from baseline.

²Percent of GDP, percentage point deviation from baseline.

³Percentage points, deviation from baseline.

of production and put upward pressure on the aggregate price level. This would cause central banks to increase interest rates, which—together with the direct impact on production costs—would further decrease activity in the short run. As a result, world GDP falls 1.4 percent below the baseline at the trough and global inflation rises by about 1.5 percentage points (first figure).

The regional macroeconomic consequences of higher oil prices depend on whether a coun-

Box 1.1 (concluded)

try is a net oil exporter or importer, and on its oil intensity. Oil exporters run a large trade surplus, peaking at around 6 percent of GDP above the baseline, and also enjoy a vigorous expansion. In contrast, the oil-importing economies suffer a deterioration in their external balances and a slowdown in activity. The impact is more significant in emerging Asian economies primarily because of their higher oil intensities relative to advanced economies.

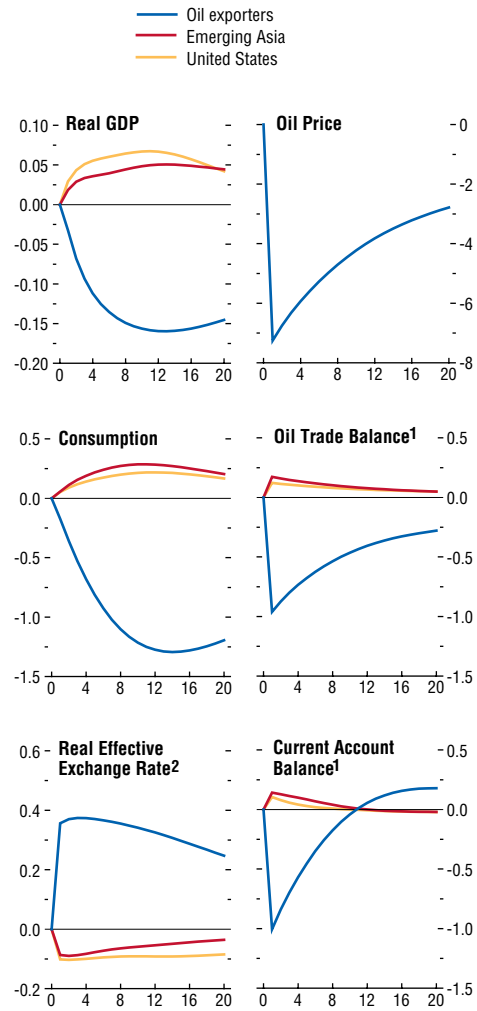
On balance, the effects on inflation and GDP in this scenario are significantly smaller than observed in many industrial countries in the 1970s. First, this partly reflects the lower oil intensities of consumption and production, which reduce both the direct effects on inflation and the medium- and long-term effects on GDP. Second, these simulations assume that forward-looking inflation targeting central banks raise interest rates promptly to prevent a ratcheting up of inflation expectations and a spillover into wages and other prices, unlike what happened in the 1970s. Third, many countries have implemented reforms that have increased flexibility in both labor and product markets, facilitating more rapid adjustment in relative prices in response to oil price shocks. Combined with credible monetary policies that have anchored longer-term inflation expectations, these structural improvements have allowed the containment of inflationary pressures caused by the higher oil prices without overly dampening output. However, the simulations do not account for possible business and consumer confidence effects or capital market disruptions, including difficulties in financing individual countries' current account deficits.³

Persistent Productivity Shocks with Low Oil Capacity

Macroeconomic responses are very different in a situation in which oil prices are being boosted by a demand shock. Consider

³Also, these projections do not take into full account the potential impact of higher oil prices on other energy substitutes, or the role of speculative factors that may exacerbate the associated risk premium.

Impact of Higher Worldwide Gasoline Taxes
(Percent deviation from baseline unless otherwise noted)



Source: IMF staff estimates.
¹Percent of GDP, percentage point deviation from baseline.
²Negative numbers indicate an appreciation.

a situation of low spare oil production capacity in which the responsiveness of supply to oil price changes is very limited over the short to medium term. In this case, a significant increase in productivity growth in oil-importing countries

that permanently raises global growth by $\frac{1}{2}$ of a percentage point generates a significant short-run surge in oil prices that is sustained over the medium term (see first figure). This response of oil prices reflects the low short-term elasticity of supply as new capacity has to be brought on stream to satisfy higher levels of current and future demand. However, the short-run path for world GDP is opposite to that resulting from a supply-induced increase in the price of oil because higher prices are being caused by stronger growth.⁴

What Difference Would Higher Gasoline Taxes Make?

Low spare capacity and higher oil prices have heightened the awareness of the consequences of growing oil usage both now and in the future. Moreover, the consumption of hydrocarbons, particularly petroleum products, is a key source of climate-changing carbon emissions—a cost that is not internalized by the market. Given these concerns, a number of observers have suggested raising taxes on oil consumption, and it is useful to look at the macroeconomic consequences of such a policy shift.

Consider the implications of a worldwide increase of gasoline taxes by 10 percentage points accompanied by a corresponding reduc-

⁴If the same increase in productivity is considered in a version of the model that does not include oil, world GDP expands by slightly more in the short and medium term than in the model with oil. This suggests that while high oil prices have resulted in a drag on world growth, these effects are relatively minor.

tion in labor taxes that keeps the fiscal stance unchanged (second figure).⁵ The gasoline tax encourages a gradual substitution away from energy consumption that builds steadily over time owing to the low short-run oil demand elasticities. In contrast, oil prices decline by about 7 percent on impact, creating a wealth transfer away from oil-exporting countries. The macroeconomic implications are the mirror image of the supply-induced rise in oil prices, now benefiting the oil-importing economies instead of the oil-exporting economies. The United States and emerging Asia experience improvements in growth, external positions, and consumption, which are further enhanced by an appreciation in their real exchange rates and a reduction in distortionary labor taxes made possible by higher fuel taxes.⁶ In contrast, oil-exporting countries experience a deterioration in their external balances and slower growth. On balance, however, world GDP is modestly higher—as taxation has shifted from a factor of production (labor) to a less price-elastic good (gasoline)—suggesting that it may be possible to design a framework that could share the income gains from such a policy in an equitable way across regions.

⁵The structure of GEM explicitly differentiates energy inputs (crude oil) and refined petroleum products (gasoline) directly consumed by households, allowing a thorough investigation of the impact of higher gasoline taxes.

⁶Similar medium-term effects on world GDP would be obtained if the additional tax revenue was used to finance productive government investment.

further complicated if abrupt exchange rate movements occurring in an environment of slowing activity and rising unemployment triggered a resurgence of protectionist sentiment. Such a risk is more salient given rising popular concerns about the impact of increasingly global markets on those less well-placed to take advantage of new opportunities. This issue is returned to below.

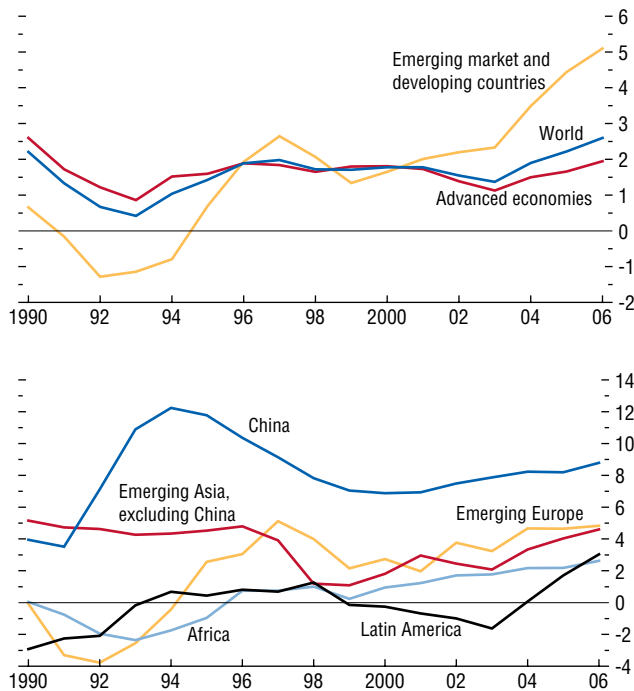
Medium-Term Challenges: Can the Productivity Boom Be Sustained?

Recent years have been a remarkable period for the world economy, as global output growth has reached its highest sustained rate since the early 1970s, with strong increases in virtually all regions. Inflation has generally been contained at the low levels achieved by the end of the 1990s, while a series of shocks

Figure 1.14. Global Productivity Performance¹

(Annual percent increase; three-year moving average)

Global productivity has accelerated in recent years, led by emerging market and developing countries. While China's sustained performance since the early 1990s is particularly impressive, productivity growth has also been strong in emerging Asia and emerging Europe for a number of years.



Sources: World Bank, *World Development Indicators* (2006); and IMF staff calculations.
¹Measured as real GDP divided by working-age population.

and periods of turbulence—including sharp increases in oil and other commodity prices, and corrections in some richly valued equity and housing markets—have been largely weathered without major spillovers across sectors or regions.

What have been the sources of this global prosperity, and can the momentum be sustained? Rajan (2006) argues that a central arch of support for recent exceptional performance has been strong productivity growth. Buoyant productivity has made possible healthy growth in profits in combination with rising real wages, has allowed sharp increases in commodity prices to be absorbed without derailing inflation performance, and has contributed to rising asset values that have supported consumption and investment.

It is well known that productivity growth accelerated in the United States in the mid-1990s, in substantial part in response to increasing use of new information and communications technology (ICT), but productivity growth has also been strong and increasing in emerging market and developing countries over the same period. Figure 1.14 illustrates this point on the basis of a crude but readily available broad measure of productivity—output relative to working-age population. Detailed studies with more precise measures of total factor productivity confirm this trend, particularly for countries and regions that have undergone major structural transformations—notably China, India, and emerging Europe, which have made dramatic progress in opening their economies and advancing market reform.¹

In turn, strong productivity growth has been supported by a combination of technological developments, an increasingly open global trading system, rising cross-country capital flows, and more resilient macroeconomic policy frameworks and financial systems. Chapter 5 of this report discusses how the rapid growth

¹See, for example, Schadler and others (2007); the September 2006 *World Economic Outlook*; and Conference Board (2006).

of international trade and the introduction of new technologies have allowed the production process to be unbundled, with both manufacturing and services activities being offshored to lower-cost locations in an increasingly global market, thus providing productivity gains both in source and in host countries. This process has been supported by important trade liberalization initiatives, including the entry of former Eastern bloc countries in Europe into a free trade zone with the European Union in 1994, Mexico's participation in the North American Free Trade Agreement from 1994, China's entry into the World Trade Organization (WTO) in 2001, and India's progressive unilateral reduction in trade barriers since the early 1990s. The shifting production structure has also been supported by the increasing international mobility of capital, especially rising rates of foreign direct investment into emerging market countries, that has not only provided a conduit for financing but also embodied diffusion of new technologies and management skills.

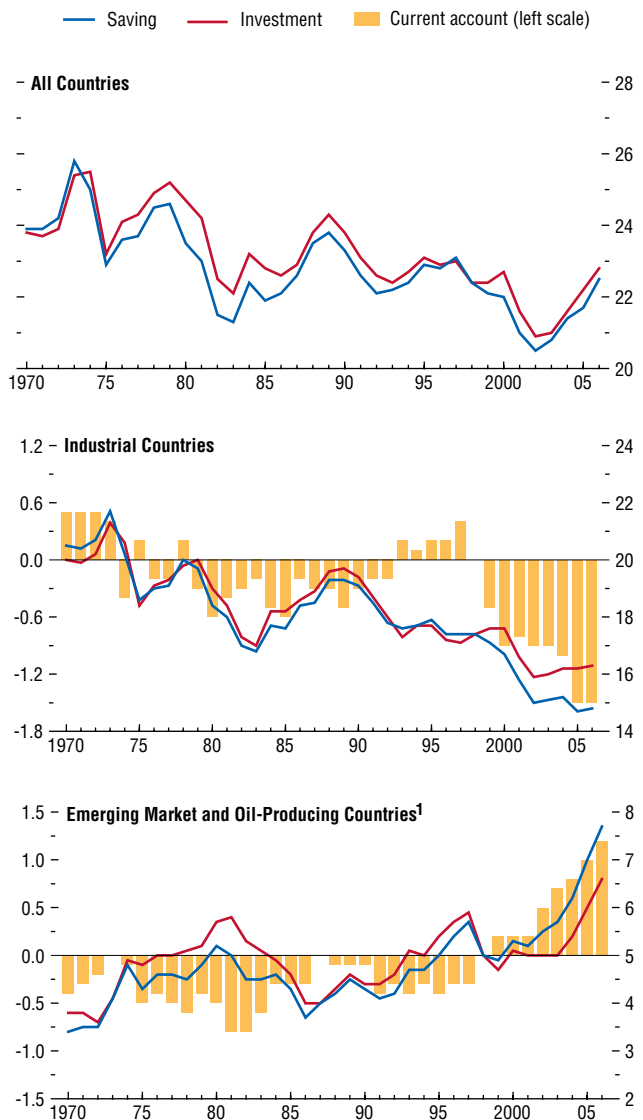
Another central feature of the recent past has been that strong productivity growth has been achieved even while investment has remained relatively subdued around the world. Chapter 2 of the September 2005 *World Economic Outlook* looked at global investment and saving patterns in more detail. Since that report, there has been a modest rise in global investment relative to GDP, but this ratio remains low by historical standards (Figure 1.15). It is interesting to note that the recent increase in investment is focused almost entirely in China, where economic transformation has created such large opportunities (Figure 1.16). Meanwhile, saving outside the advanced economies has continued to rise, mainly attributable to increasing savings (public and private) in China and higher public savings in oil-producing countries, although plans to boost government spending are now well under way.

These investment and saving trends have contributed to the generally supportive global financial environment, with low long-term real interest rates and low volatilities, even as

Figure 1.15. Global Saving, Investment, and Current Accounts

(Percent of world GDP)

Global investment has risen during the present economic cycle but remains low by historical standards, particularly in the industrial countries. The corresponding rise in saving has been exclusively in emerging market and oil-producing countries, which are building up high current account surpluses.



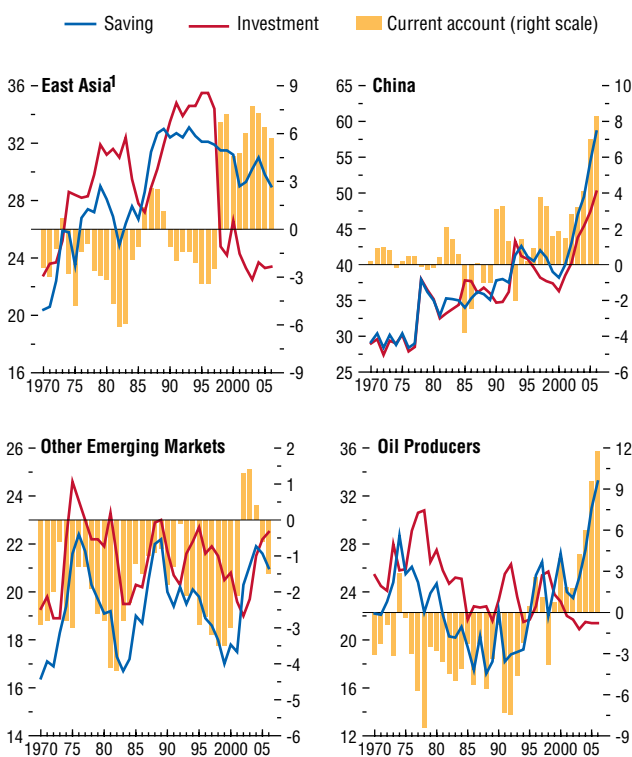
Sources: OECD Analytical Database; World Bank, *World Development Indicators* (2006); and IMF staff calculations.

¹Includes Norway.

Figure 1.16. Saving and Investment in Emerging Market and Oil-Producing Economies

(Percent of each subregion's GDP)

Although investment-to-GDP ratio has risen substantially in China in recent years, the rise in the savings ratio has been even more dramatic. Elsewhere in East Asia, investment has remained generally quite low. Rising oil prices have propelled a sharp increase in savings in oil-producing countries.



Sources: OECD Analytical Database; World Bank, *World Development Indicators* (2006); and IMF staff calculations.

¹East Asia emerging markets excluding China.

monetary conditions have been tightened. Thus, the U.S. expansion has continued to benefit from robust consumption growth despite the housing downturn, with the resultant widening current account deficit financed without upward pressure on long-term interest rates. Developments in the global financial system have played an important role, including the ability of the United States to generate assets with attractive liquidity and risk management features, as well as the continuing role of the U.S. dollar as an international reserve currency (see Chapter 4 of the September 2006 *World Economic Outlook*).

What factors could threaten the continuation of this benign combination of trends? There are a number of reasons to think that global productivity growth may decelerate in the period ahead. The recent slowdown in productivity growth in the United States may reflect to some degree a diminishing of the boost from advances in the ICT sector, as well as normal cyclical factors. Most other countries have lagged the United States in reaping the benefits from ICT advances, and therefore should be able to achieve continuing gains. However, doing so will depend in part on sustained reforms to reduce regulatory impediments and increase competition, particularly in service sectors such as wholesale distribution and finance, where the U.S. productivity performance has been very strong.²

A second source of concern is that global productivity growth may receive less support from trade liberalization in the years ahead. The recent revival in the Doha Round of multilateral liberalization is very welcome—a successful conclusion of the round could provide significant efficiency gains, particularly in agricultural sectors. The process of bilateral and regional trade liberalization may continue, but it is not a substitute: such agreements—which already cover around one-third of global trade—are

²See, for example, a discussion of productivity performance in the services sector in western Europe (Chapter 2) and emerging Asia (Chapter 3 of the September 2006 *World Economic Outlook*).

inherently less beneficial than liberalization on a “most favored nation” basis, and can be counter-productive if not well designed.

Moreover, there is a serious danger that protectionist forces could rise in the years ahead, reversing some of the gains from an increasingly integrated global economy. Already there are concerns about recent resort to anti-dumping and “safeguards” actions around the world—and anti-trade measures could intensify in the context of a cyclical downturn and rising unemployment that would give added force to popular concerns about the impact of globalization on the distribution of income, particularly in advanced economies. Chapter 5 discusses how the rapid growth of international trade and the increasingly global labor market, combined with the introduction of new technologies, have produced important gains for income levels in both advanced and developing countries, as well as had an impact on income distribution. The chapter presents evidence suggesting that recent declines in the share of labor in advanced economies reflect more technological change than increasing competition from a burgeoning global labor force. Nonetheless, more could be done to help those whose jobs may be particularly affected by recent trends in technology and trade, including through better education systems, more flexible labor markets, and welfare systems that cushion the impact of, but do not obstruct, economic change.

Third, global environmental and resource constraints are likely to impose increasing costs. Efforts to date to address the long-term problem of global warming have been limited and partial—few countries are expected to meet the goals for control of carbon emissions over 2008–12 set out in the Kyoto Protocol. The potential long-term economic consequences of climate change are increasingly recognized, leading to rising interest across countries to take actions to control carbon emissions that would inevitably add to the costs of doing business even while averting much graver long-term consequences. For example, the recent *Stern Review on the Economics of Climate Change* estimates that

it would cost about 1 percent of GDP a year to stabilize carbon dioxide concentrations in the atmosphere, while the consequences of taking no action would be long-term damage of 5 percent or more of global consumption, concentrated in lower-income countries in the tropics.³ Beyond such environmental consequences, the marginal costs of energy production are already rising, as easier-to-exploit oil reserves outside a few very large producers are being depleted and a rising share of non-OPEC production will take place in much more expensive offshore facilities or from low-grade, hard-to-extract deposits such as tar sands.

Fourth, aging populations, especially in advanced economies, pose challenges for maintaining productivity growth. As the share of new entrants to the labor force declines, it will become harder to continually raise the knowledge base, particularly related to the technological frontier, and there are risks of mismatches between specific labor skills and needs. A rising ratio of dependents to working-age population will also impose fiscal strains as pension and health care costs to governments rise. As discussed in Box 1.2, achieving fiscal sustainability in the face of these rising costs will require substantial adjustments of the order of 4 percent of GDP in the G-7 countries. In turn, this will put pressure to raise tax rates that will have an efficiency cost. To some degree, more open immigration policies and steps to encourage higher birth rates may help to address such concerns, but they would only be able to partially compensate for aging trends.

Slowing productivity would have implications for investment and consumption trends and the unwinding of global imbalances. Maintaining GDP growth rates in the face of slower growth

³See Stern (2006). While some precise numbers provided in the report may depend on particular assumptions (such as the time discount rate used to weight consequences in the future) and have been challenged, the report provides a useful framework for the assessment of the economic consequences of global warming and provides a sense of the order of magnitude of the costs that may be involved.

Box 1.2. Ensuring Fiscal Sustainability in G-7 Countries

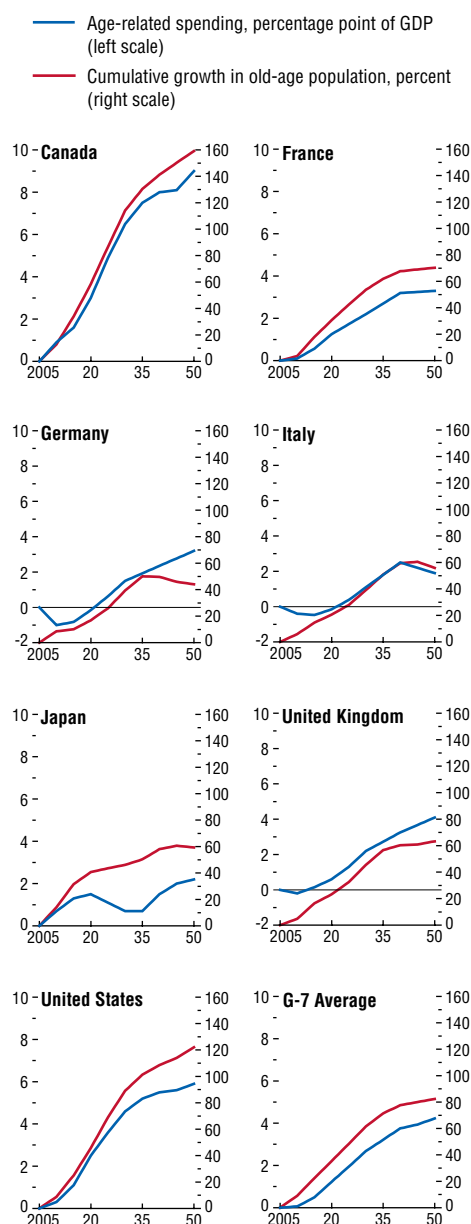
In the coming decades, rising longevity, falling fertility rates, and the retirement of the baby boom generation will substantially raise age-related government spending in G-7 countries. By 2050, the populations in most G-7 countries are expected to be smaller and considerably older, with old-age dependency ratios projected to double. These trends will put national fiscal positions under substantial additional pressure. According to the projections submitted by national authorities, general government age-related spending in these countries is expected to rise by an average of 4 percentage points of GDP over the next 45 years with substantial cross-country variation (see the figure).¹ Estimates vary substantially across countries—from Canada at the high end, where age-related spending is projected to rise by 9 percentage points by 2050, to Italy at the low end, where such spending is projected to rise by just 2 percentage points. The bulk of the spending increase is expected to come from additional health costs, with long-term care and pension spending accounting for the remainder.

Assessing the impact of these demographic changes on the sustainability of public finances is complicated by uncertainties about long-term technological, demographic, labor supply, and productivity growth projections. A key issue is the strength of the link between aging and the cost of health care. The more traditional “expansion of morbidity” hypothesis (aging implies longer periods of illness and thus higher costs) is often contrasted with the “compression of morbidity” hypothesis (aging delays, but does

Note: The main author of this box is Daniel Leigh. The box draws on a study prepared by Hauner, Leigh, and Skaarup (2007).

¹See Economic Policy Committee of the European Union (2006) for France, Germany, Italy, and the United Kingdom; and OECD (2001) for Canada, Japan, and the United States. More recent long-run age-related spending projections for Canada, Japan, and the United States produced by national authorities are broadly consistent with the OECD (2001) projections.

Projected Cumulative Growth in Old-Age Population and Increase in Age-Related Spending Relative to 2005



Sources: Economic Policy Committee of the European Union (2006); OECD (2001); UN (2006); and IMF staff estimates.

not extend, the periods of illness and the associated costs).

A comparison of age-related spending pressures across countries is complicated further by differences in methodology across age-related spending projections. The absence of a fully standardized projection framework is rooted in the complexity of preparing population-cohort-based long-term projections for countries with different old-age and health insurance systems. Nonetheless, there is a fairly close relationship between the projected old-age population growth rates and projected age-related expenditure (see the figure). Obtaining a more consistent set of cross-country estimates for future age-related spending pressures is an important priority for future research.

This box uses a standard indicator, the *inter-temporal primary gap*, to assess the evolution of fiscal sustainability for each of the G-7 countries, and to evaluate the contribution of policy initiatives.² The intertemporal primary gap measures the change in the primary balance required to equate the present discounted value of future primary balances to the current level of debt. This measure thus indicates the adjustment required to stabilize debt at a level that is *permanently* sustainable (not just *attained* in a certain year).

The indicator consists of three components:

- the primary deficit component—the initial cyclically adjusted general government primary deficit;
- the debt component—the debt-servicing costs of the initial debt stock (evaluated using either gross debt or net debt data); and
- the aging component—the net present value of the projected increase in age-related expenditures times the growth-adjusted interest rate (nominal interest rate minus nominal growth), assumed, for ease of comparability,

²This indicator belongs to the family of primary gap indicators (as discussed in Chalk and Hemming, 2000) that is based on the European Commission's (2004) approach to assessing fiscal sustainability. A similar approach is used in HM Treasury (2006).

to be 2 percent per year in the baseline scenario for all countries.³

The first table presents the data for the three components used to evaluate the indicator as of 2005.

The estimated fiscal adjustment required to ensure long-run fiscal sustainability is substantial for all G-7 countries. In particular, as the second table reports, closing the intertemporal primary gap would require an average adjustment estimated at 3.9 to 4.5 percentage points of GDP (depending on whether net debt or gross debt is used to evaluate the indicator).⁴ Almost two-thirds of this adjustment need reflects the expected increase in age-related spending (aging component), while the remaining one-third reflects the interest on public debt (debt component). The largest primary gaps are shown for Japan and the United States. In the case of Japan, this reflects the largest primary deficit, high debt level, and the assumed interest rate–growth differential.⁵ In the case of the United States, the large gap is due to a combination of high primary deficits and high projected increases in age-related spending. The smallest primary gap is shown for Canada, where a primary surplus of 5.5 percent of GDP helps to offset the impact of the very large pro-

³While a 2 percent interest rate–growth differential is broadly in line with the historical experience of major industrial countries, it is higher than the figure used in the debt sustainability analyses of a number of IMF Staff Country Reports. Lowering the interest rate–growth differential can substantially reduce the adjustment need for countries with high debt levels.

⁴While using net debt to evaluate fiscal sustainability is preferable in principle, methodological inconsistencies, notably in the evaluation of pension system assets, imply that net debt figures are not readily comparable across countries.

⁵The estimated adjustment need is highly sensitive to the interest rate–growth differential assumed. In the case of Japan in particular, a 10-year historical average spanning the deflation period is probably higher than the interest rate–growth differential going forward. Lowering this differential to $\frac{3}{4}$ of 1 percent would yield a required adjustment in line with the analysis and recommendations made in the context of the IMF's 2006 Article IV Consultation with Japan.

Box 1.2 (concluded)**G-7: Fiscal Positions as of 2005***(In percent of GDP unless otherwise stated)*

	Gross Debt (end-2005)	Net Debt (end-2005)	Structural Primary Balance (2005)	Projected Increase in Age-Related Spending, 2005–50 (in percentage points of GDP)
Canada	70.8	30.2	5.5	9.0
France	76.1	43.7	–0.2	3.3
Germany	71.1	51.5	0.1	3.2
Italy	120.4	95.1	1.4	1.9
Japan	173.1	86.4	–3.0	2.2
United Kingdom	46.7	40.0	–1.5	4.1
United States	61.8	43.5	–1.8	5.9
Average	88.6	55.8	0.1	4.2

Sources: OECD, Economic Outlook database for debt and primary balance data; and EPC (2006) and OECD (2001) for age-related spending data.

Note: All data are for general government. Differences between OECD and *World Economic Outlook* debt data may arise due to (1) different definitions of general government; (2) alternative treatment of government assets and liabilities, notably pension liabilities; and (3) alternative government account consolidating methods.

jected increase in age-related spending. Without any fiscal adjustment, the expected increases in age-related spending imply explosive debt dynamics in all seven countries.

While the overall adjustment required to achieve long-run fiscal sustainability in G-7 countries is large, there are significant growth benefits to putting public finances on a sustainable footing in the near term versus delayed adjustment. The following two scenarios illustrate this important point:

- *Near-term adjustment scenario.* This scenario involves closing the intertemporal primary gap over a period of five years.
- *Delayed adjustment scenario.* This scenario involves no changes in fiscal policy for 10 years, during which age-related spending pressures are allowed to build up. The intertemporal primary gap is then reassessed on the basis of as-of-then public debt and primary balance levels, and closed over the following five years.

G-7: Estimation Results—Primary Gaps in 2005*(Percent of GDP)*

	Intertemporal Primary Gap ¹		Contributions to Intertemporal Primary Gap (Gross Debt) from: ²			Intertemporal Primary Gap ³	
	(Net debt)	(Gross debt)	Primary balance	Debt service	Aging costs	(Net debt)	(Gross debt)
Canada	–1.4	–2.2	5.5	–1.4	–6.3	–2.3	–2.7
France	–3.4	–4.0	–0.2	–1.5	–2.3	–3.4	–3.7
Germany	–2.7	–3.0	0.1	–1.4	–1.7	–2.8	–3.0
Italy	–1.7	–2.2	1.4	–2.4	–1.2	–1.0	–1.3
Japan	–6.2	–7.9	–3.0	–3.4	–1.6	–5.6	–6.5
United Kingdom	–4.8	–4.9	–1.5	–0.9	–2.5	–5.1	–5.1
United States	–6.9	–7.3	–1.8	–1.3	–4.2	–7.2	–7.4
Average	–3.9	–4.5	0.1	–1.8	–2.8	–3.9	–4.2

Sources: Economic Policy Committee of the European Union (2006); OECD (2001); OECD, Economic Outlook database; and IMF staff calculations.

¹2 percent interest rate–growth differential.

²The contributions are presented for calculations using the baseline 2 percent interest rate–growth differential.

³1 percent interest rate–growth differential.

The effects of these two policy scenarios on economic activity—both in the short term and in the medium to long term—are assessed using the IMF’s Global Fiscal Model (GFM), calibrated to replicate the key empirical features of each G-7 country.⁶ Two main conclusions emerge from the analysis. First, delaying fiscal consolidation and allowing debt to increase implies the need to run perma-

⁶GFM is a general equilibrium model developed at the IMF to examine macroeconomic and structural fiscal policy issues, including pension reform, in a multicountry setting.

nently higher primary surpluses to service the higher interest costs. On average, the primary balance adjustment required to stabilize debt on a sustainable basis is 1.1 percentage points of GDP higher in the delayed compared with the near-term adjustment scenario. Second, early adjustment also brings significant long-run output gains. Early adjustment is estimated to deliver a total output gain of 1.8 percent of GDP on average. Given the upside risks to spending pressures, early fiscal adjustment would also provide greater fiscal space to absorb any higher-than-expected age-related expenditure needs.

of total factor productivity would require higher rates of capital accumulation than over the present expansion. At the same time, consumption growth could be dampened by lower expectations of future income growth, although aggregate consumption is likely to be boosted as a rising share of population in advanced countries retire and as populations in fast-growing countries in East Asia—especially in China—adjust to new levels of affluence and precautionary savings dwindle. The balance of these complex forces affecting saving and investment is hard to predict with any precision, but it does seem likely that the recent period of “savings glut” or “investment dearth” (depending on perspective) may come to an end, implying rising pressure on financial resources and increasing real long-term interest rates.

In this context, countries with large current account deficits, such as the United States, may face greater difficulties in attracting continuing large-scale foreign financing as needed—particularly as other countries’ financial systems start closing the gap with the United States by offering a similar array of financial vehicles for savings. In such circumstances, prospects for a smooth unwinding of imbalances would benefit from trade reforms and other initiatives to remove obstacles to the smooth reallocation of

resources in response to exchange rate movements, a point supported by the findings in Chapter 3.

Anticipating and modeling these long-term forces is a complex task, and it is hard to be confident about the outcomes. Nevertheless, the potentially large costs involved in dealing with such problems as climatic change, population aging, and the unwinding of global imbalances argue for forward-looking and well-calibrated policy responses to mitigate the risks involved.

Policy Issues

The immediate challenge for policymakers is to continue to steer the global economy on a sustainable path that is consistent with low inflation as the global expansion enters its fifth year. The major central banks face distinct challenges in managing monetary policy, reflecting differing cyclical positions and degrees of inflation pressure in their economies.

- In the *United States*, the Fed continues to face a tricky task of balancing concerns of slowing activity against inflation risks, and the policy of holding rates steady remains appropriate for now. Financial markets are now pricing in a rate cut by September, following a string of weaker data. But the Fed has appropri-

ately kept its options open, stressing that the path of monetary policy will depend on how incoming data affect the balance of risks between growth and inflation.

- Inflation in the *euro area* has been more closely aligned with objectives, and a strengthening economy has provided a context for the ECB to progressively raise short-term interest rates to more neutral levels to forestall pressures on wages and prices. With the area's growth projected to remain close to or above potential, and the possibility of some further upward pressure on factor utilization and prices, a further interest rate increase to 4 percent by the summer would seem warranted. Beyond this, additional policy action could still be required if growth momentum remains above trend and risks to wages and prices intensify.
- In *Japan*, a very easy monetary stance has been key to the country's exit from a decade-long stagnation—although it is likely to also have been a factor contributing to carry trade outflows and the weakness of the yen, which has raised some concerns about the impact on competitiveness in other countries as well as a possible disorderly reversal as policy is tightened. While the growth outlook is favorable, inflation readings have remained uncomfortably close to zero. With this background, the primary focus should remain on ensuring robust growth and a decisive departure from deflation. Thus, monetary accommodation should be removed only at a gradual pace, and on the basis of evidence confirming the continuing strength of the expansion.

The thrust of fiscal policy in the advanced economies should be directed at necessary consolidation and reform to maintain viability in the face of aging populations, while leaving room for automatic stabilizers to work as needed. Strong revenue growth has helped to strengthen fiscal positions in a number of major economies over the past three years (Table 1.3). However, it remains uncertain how much of this improvement is cyclical—boosted by high profits, rapid growth of earnings at the upper end of

the income spectrum, and rising asset prices—and how much will be permanent. Attention must be paid to containing expenditure growth, which experience has shown provides a more durable path to fiscal consolidation. Among the major advanced economies, further sustained progress toward fiscal consolidation would seem particularly important in the United States—especially in view of low private savings, concerns about the wide current account deficit, and the projected high fiscal cost of population aging; Japan, where deficit and debt levels remain particularly high and population aging is occurring rapidly; and Italy, where modest growth and weakening competitiveness reinforce concerns about fiscal sustainability.

Sustained progress toward fiscal consolidation will depend on more ambitious progress with fundamental fiscal reforms to contain increasing outlays as populations age, particularly in areas such as health care and pensions, and to avoid the erosion of revenue bases. Tax and spending policies should also be geared to dealing with the medium-term growth challenges. Price-based incentives could help to foster energy conservation and control of hydrocarbon emissions (Box 1.3). Pension system reforms could encourage longer working lives as well as ensure fiscal viability, while social safety nets could be geared to provide greater support for workers adjusting to increasingly global markets, without obstructing the process of change. Gaining support for such reforms is never easy in view of distributional consequences, but the present period of sustained growth should provide an ideal opportunity. Moreover, reform momentum could be galvanized by efforts to increase fiscal transparency and responsibility, including more intensive independent oversight, greater accountability, and fiscal frameworks to guide policy in line with clearly stated long-term objectives.

In a similar vein, the advanced economies need to make more ambitious progress with market-based reforms that would help to raise potential growth. A particular challenge is to ensure the creation of adequate employment opportunities within the increasingly global

Table 1.3. Major Advanced Economies: General Government Fiscal Balances and Debt¹
(Percent of GDP)

	1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2012
Major advanced economies										
Actual balance	-3.0	-1.7	-4.0	-4.8	-4.2	-3.5	-2.7	-2.4	-2.4	-1.6
Output gap ²	0.9	1.3	—	-0.8	-0.2	-0.4	-0.1	-0.4	-0.5	—
Structural balance ²	-3.2	-2.2	-3.9	-4.4	-4.1	-3.3	-2.7	-2.3	-2.2	-1.6
United States										
Actual balance	-2.2	-0.4	-3.8	-4.8	-4.6	-3.7	-2.6	-2.5	-2.5	-1.6
Output gap ²	2.4	2.1	0.3	-0.5	0.1	0.1	0.3	-0.6	-0.9	—
Structural balance ²	-2.9	-1.2	-3.9	-4.6	-4.5	-3.6	-2.7	-2.4	-2.4	-1.6
Net debt	49.4	35.5	38.3	41.1	42.8	43.6	43.4	44.2	44.6	43.7
Gross debt	65.4	53.7	56.1	59.3	60.1	60.3	59.6	60.3	60.6	59.1
Euro area										
Actual balance	-3.8	-1.9	-2.6	-3.1	-2.8	-2.4	-1.6	-1.2	-1.1	-0.7
Output gap ²	-0.2	1.4	0.3	-0.8	-0.7	-1.3	-0.6	-0.3	—	—
Structural balance ²	-3.4	-2.3	-2.6	-2.7	-2.4	-1.9	-1.3	-1.0	-1.0	-0.7
Net debt	56.0	57.3	57.3	58.8	60.0	60.9	59.8	58.6	57.6	53.3
Gross debt	69.2	68.3	68.2	69.3	69.7	70.5	69.3	67.9	66.7	61.7
Germany³										
Actual balance	-2.2	-2.8	-3.7	-4.0	-3.7	-3.2	-1.7	-1.3	-1.3	-1.3
Output gap ²	0.3	1.7	0.5	-0.9	-0.9	-1.2	0.1	0.6	1.1	—
Structural balance ^{2,4}	-2.0	-2.8	-3.2	-3.4	-3.4	-2.8	-1.8	-1.4	-1.4	-1.3
Net debt	43.6	52.1	54.3	57.8	60.1	62.4	62.4	62.1	61.6	61.0
Gross debt	52.4	57.9	59.6	62.8	64.8	66.4	66.8	66.5	65.9	64.9
France										
Actual balance	-3.6	-1.6	-3.2	-4.2	-3.7	-2.9	-2.6	-2.6	-2.4	-1.1
Output gap ²	-1.4	1.0	—	-0.9	-0.9	-1.7	-1.8	-1.9	-1.6	—
Structural balance ^{2,4}	-2.7	-2.2	-3.2	-3.5	-3.0	-2.2	-1.4	-1.4	-1.5	-1.1
Net debt	42.0	48.2	48.5	52.6	54.8	57.0	55.0	54.2	53.7	49.5
Gross debt	51.2	56.3	58.2	62.3	64.5	66.7	64.7	63.9	63.4	59.2
Italy										
Actual balance	-6.3	-3.1	-2.9	-3.5	-3.4	-4.1	-4.4	-2.2	-2.4	-2.3
Output gap ²	-0.9	1.2	0.3	-0.8	-0.8	-1.9	-1.4	-0.9	-0.6	—
Structural balance ^{2,4}	-6.0	-3.8	-3.9	-3.3	-3.4	-3.4	-3.8	-1.8	-2.0	-2.3
Net debt	107.7	107.0	103.9	103.3	102.6	105.1	105.2	104.5	103.8	101.6
Gross debt	113.4	108.7	105.6	104.3	103.8	106.2	106.8	106.0	105.3	103.1
Japan										
Actual balance	-3.8	-6.3	-8.0	-8.0	-6.2	-4.8	-4.3	-3.8	-3.5	-2.7
Excluding social security	-5.6	-6.5	-7.9	-8.1	-6.6	-5.1	-4.3	-3.8	-3.7	-3.8
Output gap ²	—	-0.9	-1.9	-1.8	-0.7	-0.5	—	0.4	0.3	—
Structural balance ²	-3.8	-5.8	-7.2	-7.2	-5.8	-4.6	-4.3	-3.9	-3.7	-2.7
Excluding social security	-5.6	-6.3	-7.4	-7.7	-6.4	-5.0	-4.3	-3.9	-3.8	-3.9
Net debt	31.7	66.0	72.5	77.3	81.8	93.3	96.4	98.2	99.4	99.5
Gross debt	100.3	151.6	160.8	167.7	177.8	182.9	184.8	185.0	184.3	177.8
United Kingdom										
Actual balance	-3.3	1.1	-1.6	-3.2	-3.1	-3.0	-2.5	-2.4	-2.2	-1.6
Output gap ²	-0.6	0.6	-0.1	-0.2	0.5	-0.2	-0.2	—	—	—
Structural balance ²	-2.9	0.6	-1.8	-3.1	-3.4	-3.0	-2.7	-2.2	-2.0	-1.6
Net debt	34.2	32.7	32.7	34.5	36.1	38.0	38.5	39.0	39.1	38.6
Gross debt	39.8	38.4	37.9	39.3	40.8	42.7	43.2	43.6	43.7	43.2
Canada										
Actual balance	-3.6	0.7	-0.1	-0.4	0.5	1.4	0.9	0.6	0.7	0.9
Output gap ²	-0.5	0.5	0.4	-0.5	—	0.2	0.2	-0.2	-0.1	—
Structural balance ²	-3.1	0.3	-0.2	-0.1	0.6	1.3	0.8	0.7	0.8	0.8
Net debt	61.0	43.7	42.6	38.5	34.4	30.2	27.9	26.3	24.3	17.1
Gross debt	105.2	91.5	89.4	85.2	80.2	78.6	74.1	70.7	66.5	51.9

Note: The methodology and specific assumptions for each country are discussed in Box A1 in the Statistical Appendix.

¹Debt data refer to end of year. Debt data are not always comparable across countries.

²Percent of potential GDP.

³Beginning in 1995, the debt and debt-service obligations of the Treuhandanstalt (and of various other agencies) were taken over by general government. This debt is equivalent to 8 percent of GDP, and the associated debt service to ½ to 1 percent of GDP.

⁴Excludes one-off receipts from the sale of mobile telephone licenses (the equivalent of 2.5 percent of GDP in 2000 for Germany, 0.1 percent of GDP in 2001 and 2002 for France, and 1.2 percent of GDP in 2000 for Italy). Also excludes one-off receipts from sizable asset transactions, in particular 0.5 percent of GDP for France in 2005.

Box 1.3. Oil Consumption Across Major Countries: Is the United States Different?

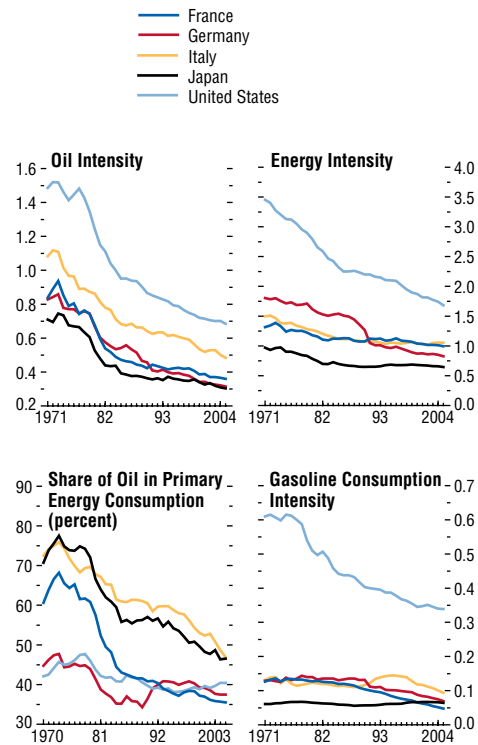
Oil prices remain about 2½ times their 2002 levels. While overall demand in major countries has weakened—with OECD consumption falling in 2006 for the first time in 20 years—performance has not been even, with U.S. consumption growth less responsive. This box compares the historical response of oil demand with prices in major oil-importing advanced economies—United States, Japan, Germany, France, and Italy—and assesses recent performance in that context. The box suggests that energy policy (in particular relating to gasoline use) has likely been an important contributor to the differences in behavior between the United States and other countries.

While oil intensity (the ratio of oil consumption to real GDP) has declined dramatically in all of the five countries since 1970 (figure), it remains much higher in the United States, as does overall energy intensity. Furthermore, oil consumption has broadly retained its share of about 40 percent in total energy use in the United States, whereas in other countries there has been a substitution away from oil—albeit from generally much higher initial shares—to other energy sources, especially natural gas and (with the exception of Italy) nuclear energy. The U.S. “addiction” to oil comes largely from gasoline consumption, which as a share of GDP is nearly five times that in other major industrial countries (see figure). Its share in total U.S. oil consumption is a staggering 43 percent, compared with an average of 15 percent in other countries. (The difference is less pronounced when diesel and gasoline are lumped together: 59 percent for the United States versus an average of 38 percent for others.) Low U.S. gasoline prices and weaker fuel efficiency standards likely explain these differences. Fuel efficiency in the United States is 25 percent lower than the EU average and 50 percent lower than that of Japan (An and Sauer, 2004).

Over the past 20 years, U.S. oil consumption has grown on average by 1.4 percent a

Oil Consumption in Selected Countries

(Million barrels of oil equivalent per GDP in billions of 1995 dollars, unless otherwise noted)



Sources: *British Petroleum Statistical Review* (2006); International Energy Agency; and IMF staff calculations.

year, compared with a range of -0.5 percent (Italy) to 0.6 percent (Japan) in the other major advanced economies (see the table). It also remained strong during the current hike in prices until mid-2005, growing on average by 1.3 percent a year during 2003–06. By comparison, over the same period, consumption in the other countries *fell* between 0.3 percent a year (France) and 2.8 percent a year (Italy).

What explains these differences? Higher U.S. GDP growth (especially in the recent period) has clearly been a major factor. However, the

Note: The author of this box is S. Hossein Samiei.

Oil Consumption in Selected Countries: Elasticities and Forecast Errors¹

	France	Germany	Italy	Japan	United States
Oil consumption growth (average annual)					
1983–2006	0.2	–0.1	–0.5	0.6	1.4
2003–06	–0.3	–0.9	–2.8	–1.1	1.3
Long-run income elasticity	0.36*	0.26*	0.75*	1.16*	0.99*
Long-run price elasticity	–0.06*	–0.04*	–0.10*	–0.09*	–0.01
Time trend	0.0	–0.002*	–0.003*	–0.003*	–0.004*
Forecast error (in percent)					
2004	0.1	0.4	–1.6	–2.2	3.0
2005	0.4	0.1	–1.4	–0.2	2.5
2006	0.0	–0.2	0.1	–1.8	1.1

¹The estimation utilizes the auto-regressive distributed-lag (ARDL) approach to cointegrating relationships. See Pesaran and Pesaran (1997). This method allows a simultaneous estimation of short-run and long-run coefficients. The order of lag is determined using the Schwarz-Bayesian criterion. All variables are in natural logarithms. The estimations use quarterly data over the period 1984:Q1–2003:Q4. The projection period is 2004:Q1–2006:Q4. Forecast errors are defined as excess of actual over projected in percent, averaged over four quarters. An * indicates significance at 5 percent.

much higher oil intensity in the United States suggests that other factors must be at work too. To assess this issue, individual oil demand equations are estimated using quarterly data over the period 1984:Q1–2003:Q4, with GDP, real oil prices, seasonal dummies, and time trend as explanatory variables.¹ The period 2004:Q1–2006:Q4 is used for projection to examine how performance in the recent period compares with that in the past.² The objective of the exercise is to illustrate differences across countries using the same simple framework rather than estimate detailed demand equations. The table shows the estimated long-run income and price elasticities, the time trend, and forecast errors for the projection period.

The remarkable result is that the United States has the lowest (and an insignificant)

estimated long-run price elasticity (–0.01) and the second highest income elasticity following Japan—although the time trend has a slightly higher coefficient. The estimated price elasticities are somewhat on the low side (especially compared with studies that use panel data sets), possibly reflecting the absence of large price movements during 1984–2003. The insignificant U.S. price elasticity since 1984 is likely explained by low U.S. gasoline prices (and taxes) and the presence of threshold effects associated with the share of consumer expenditure on fuel in total expenditure, which remains well below that of the 1970s. Indeed, large increases in prices did lower demand in the 1970s and early 1980s, in large part because they made a dent in consumer budgets.

Using the estimation results to project consumption over the 2004–06 period, the United States is the only country where actual consumption exceeds projections by a sizable margin, *despite the very low historical price elasticity used in the projections in a period of rising prices*. In other words, the projections assume little response to rising prices and still they are below actual consumption. The excess of consumption over projections is 2.5–3.0 percent during 2004–05 (well above the average U.S. oil consumption growth) and around 1 percent in 2006—notwithstanding the slight fall in actual

¹The data on oil consumption are from the International Energy Agency and are available only from 1984. GDP and price data (real international prices) are from the World Economic Outlook database. Detailed results are not reported here but are available on request.

²Extending the data to cover the 1970s (which requires using annual data for estimation) did not deliver meaningful results, especially for the United States, possibly suggesting a structural break in the relationship.

Box 1.3 (concluded)

consumption in 2006.³ In contrast, consumption has been mostly well below projections in Japan and Italy, and modestly different from projections in France and Germany.

Admittedly, these results should be interpreted with caution, given the relatively short duration of the available quarterly data and given that the model does not incorporate the role of factors such as weather, vehicle ownership, and geography—which contributes to higher gasoline use in the United States.⁴ Nevertheless, the results are consistent with the stylized facts discussed above and the more significant efforts made in major European countries and Japan relative to the United States to reduce oil consumption, in particular in transportation. These include higher taxes on gasoline, more stringent fuel efficiency standards, a gradual switch to diesel (which has increased efficiency), and heavier investment in public transportation. In power generation, serious steps have been taken to switch to renewable energy and natural gas.⁵ These policies also reflect generally stronger efforts to tackle environmental problems: all these countries have ratified the Kyoto Protocol and are acting to achieve a 6–8 percent reduction in carbon dioxide emissions relative to 1990 levels by 2012.

In contrast, in the United States, while the share of oil in power generation has become negligible, the transport sector remains heavily reliant on oil, despite efforts to increase ethanol use. Gasoline consumption taxes remain low⁶

³The higher-than-projected consumption could in part reflect the strong demand for sport utility vehicles in the United States.

⁴For alternative approaches to estimating oil demand, see, for example, Gately and Huntington (2002) and Chapter 4 of the April 2005 *World Economic Outlook*.

⁵For example, in France nuclear energy is the source of 80 percent of electricity generation. Italy has greatly increased the use of natural gas. Germany has made extensive efforts to encourage renewable fuels—but also coal through undesirable heavy subsidies. Japan has taken the lead in encouraging solar energy.

⁶For evidence that U.S. gasoline taxes are likely too low, see, for example, Parry and Small (2005).

and prices are about a third of those in major European countries. More generally, as a major producer, U.S. policies have largely focused on increasing supply—for example, through tax and royalty relief for oil exploration—rather than on efforts to curb consumption and increase fuel efficiency in automobiles, notwithstanding the declining oil reserves in the United States and the adverse environmental implications of high oil consumption. Finally, the United States is the only G-7 country that has not ratified the Kyoto Protocol at a federal level, despite accounting for about half of total OECD greenhouse gas emissions—although some states have adopted the protocol’s requirements. Emissions per unit of GDP remain about 50 percent higher in the United States than the G-7 average (excluding the United States and Canada), even though they have declined more rapidly since 1990.

The U.S. administration has recently announced the objective of reducing gasoline consumption by 20 percent over the next 10 years, but most of this is expected to be achieved by raising ethanol production, which may not be feasible without significant technological advances (see Appendix 1.1). To effectively tackle the country’s “addiction to oil” would require strong policy measures, including market-based incentives and judicious regulations to contain consumption (in particular, of gasoline) and increase fuel efficiency. Higher gasoline taxes (which would likely increase price responsiveness in view of the threshold effects discussed above), the introduction of a carbon tax, and strengthened Corporate Average Fuel Economy standards—which helped improve fuel efficiency during the 1970s and 1980s—could be central components of such a strategy (see also Box 1.1 for an assessment of the impact of higher gasoline taxation).⁷ Continued investment in research on renewable energy and strengthened collaboration with global initiatives (such as the Kyoto Protocol) should also contribute to reduce oil consumption.

⁷Higher gasoline and carbon taxes would also contribute to lowering the fiscal and trade deficits.

economy and to ensure that the less well-off share more in the prosperity created by rising trade and new technologies. Previous issues of the *World Economic Outlook* have emphasized the scope for productivity-boosting structural reforms in the euro area and Japan, particularly in the services and financial sectors. Some progress has been made on these fronts, for example, the revised Services Directive and Financial Sector Action Plan in the European Union and steps to encourage a more flexible labor force and to reduce the government's role in the financial sector in Japan, but implementation remains a question mark and there is still considerable scope for additional measures. There would also be scope for steps to improve the flexibility of the U.S. economy, including, for example, to increase labor mobility by reducing the close links between health care coverage and employment, and to improve efficiency more generally in the health care sector.

The emerging market and developing countries face a similar set of challenges of continuing to provide a stable macroeconomic policy environment, while advancing reforms that promote growth and at the same time ensuring that the fruits of growth are well shared. As noted already, many of these countries have taken advantage of benign global financial conditions to make good progress toward consolidating the credibility of sound macroeconomic frameworks that would provide bulwarks against a return to more turbulent external conditions. Nevertheless, the following issues remain prominent:

- While exchange rates in several Asian countries have appreciated markedly over the past six months, China would benefit from a more flexible exchange rate regime that provided a more secure basis for monetary policy management in the face of large foreign exchange inflows.
- Many emerging market and developing countries around the world face the challenge of taking advantage of strong capital inflows to support investment, while avoiding large swings in competitiveness and a buildup of balance sheet vulnerabilities. There is no

simple recipe that can be uniformly applied: policymakers need to develop balanced and flexible approaches to macroeconomic management suitable for their circumstances, while avoiding steps that could undermine confidence in or distort markets. Steps to strengthen domestic financial systems and to liberalize restrictions on capital outflows could help to alleviate risks and pressures from foreign exchange inflows and allow wealth-holders to benefit from asset diversification.

- Commodity exporters—particularly large oil producers in the Middle East, Latin America, and Russia—face the challenge of using wisely the rapid buildup in revenues to build and diversify growth potential, while avoiding overheating and overcommitment.
- Countries in Latin America and elsewhere need to consolidate recent progress toward strengthening public sector balance sheets and providing a secure basis for fiscal management.

Recent progress on structural reforms in these countries has generally been patchy. Encouraging advances have been made toward market-based reform in Africa that underpin the major improvement of this region's growth performance, former Eastern bloc countries have generally made good progress in strengthening the business environment as part of joining the European Union, while a number of countries in Latin America have shown how targeted support programs can be successful in addressing poverty problems. Nevertheless, the "to-do" list remains a long one. The following particular concerns are highlighted:

- Further progress in liberalizing service sectors in Asia and elsewhere would help to sustain and extend productivity improvements (see Chapter 3 of the September 2006 *World Economic Outlook*).
- Accelerating labor reforms in Latin America and elsewhere would discourage the rapid growth of the informal sector that has lowered productivity, weakened worker protection, and reduced opportunities for improving skills.

- Establishing stable, transparent, and balanced regimes for infrastructure provision and for the exploitation of natural resources would help to reduce risks of bottlenecks, corruption, and lack of investment that could prove a serious impediment to long-term growth.

Sustaining a global environment conducive to sustained growth will also depend on joint actions across countries. An ambitious outcome of the Doha Round of multilateral trade liberalization would provide a major boost to medium-term prospects and reduce risks of protectionism. In its absence, the recent trend toward bilateral trade arrangements could provide some benefits, but this process should be subject to greater discipline to minimize costs to third countries from trade diversion and to avoid creating a spaghetti bowl of diverse regulatory requirements from such agreements, thus ensuring that it provides a stepping stone rather than a stumbling block toward global free trade. In particular, it would be important to encourage transparent rules-of-origin requirements that are easier to meet, to foster “open regionalism” that would allow the countries to join agreements on similar terms, to find ways to harmonize the multiplicity of standards and rules, and to strengthen oversight by the WTO.

Joint actions are also important to ensure an environment conducive for the smooth unwinding of global imbalances. While the necessary policy steps are in each country’s long-term self-interest, concurrent actions across a range of fronts would generate synergies, since adjustment that may bring some short-term costs or have distributional consequences should be easier to advance in an environment of continued global prosperity and one in which countries are seen to be acting cooperatively toward common goals. As has been emphasized in previous issues of the *World Economic Outlook*, important elements of such an approach—which are being discussed in the context of the IMF’s Multilateral Consultations—include efforts to raise saving in the United States, including through more ambitious fiscal consolidation and steps to reduce disincentives to private savings; advanc-

ing growth-enhancing reforms in the euro area and Japan; measures to boost consumption and increase upward exchange rate flexibility in some parts of emerging Asia, especially China; and continuing efforts to boost absorption by oil exporters, especially in the Middle East, consistent with absorptive capacity constraints.

Appendix 1.1. Recent Developments in Commodity Markets

The authors of this appendix are Valerie Mercer-Blackman, S. Hossein Samiei, and Kevin Cheng, with contributions from To-Nhu Dao and Nese Erbil.

Commodity price developments over the past year have been dominated by a further surge in metals prices and sharp movements in oil prices. Metals prices were the major contributor to the 22 percent increase in the IMF commodities and energy price index in 2006. Oil prices rose sharply in the first part of 2006, reaching a record nominal high in August, but then dropped significantly, showing only a moderate rise for the year as a whole. After a short-lived dip at the beginning of 2007, prices recovered and rose sharply at end-March. Food prices have also showed strength, particularly since end-2006.

This appendix assesses recent trends in oil and commodity markets. As a special topic, Box 1.4 examines the extent of hedging by oil market participants against oil price volatility, suggesting that while firms seem to do a fair amount of financial hedging, governments tend to rely largely on self-insurance. It reviews obstacles to financial hedging and measures that could lead to greater use of such instruments.

Crude Oil and Energy Products

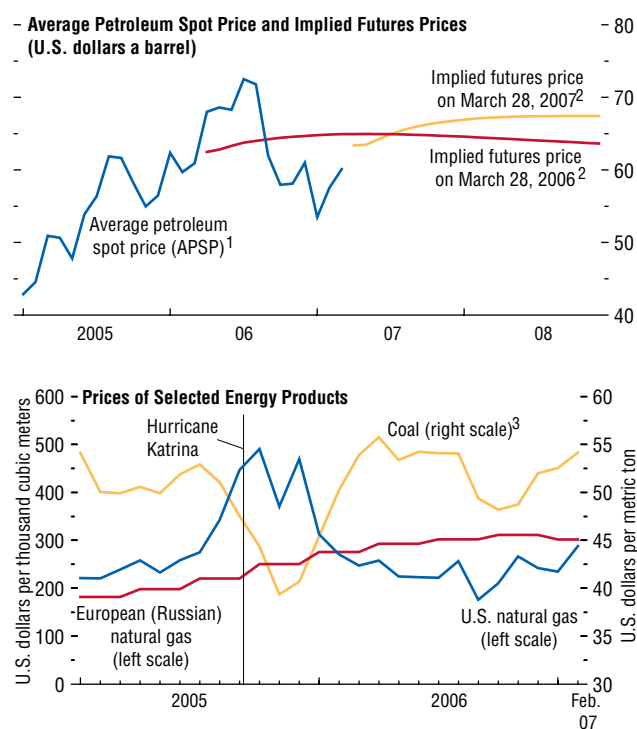
Oil prices continue to be volatile and sensitive to geopolitical developments, and the market remains tight. The decline in oil prices in August–September 2006 reflected a combination of slowing OECD demand, a recovery in the second half of 2006 in non-OPEC supply, and some easing of geopolitical tensions in September. OPEC’s

production cuts since November 2006, together with a recovery in demand in the first quarter of 2007, caused OECD inventories to decline and prices to strengthen. Prices surged further in late March with the resurfacing of geopolitical tensions. Looking ahead, analysts expect a better balance in the market as both demand and non-OPEC supply growth would pick up. Nevertheless, the risks to prices remain on the upside, given the recurrent geopolitical tensions, still-limited spare capacity, and the possibility that non-OPEC supply may again fall below projections. Downside risk should be limited by active OPEC quota adjustments to price softening.

Price Developments

After reaching a record high of \$76 a barrel in August 2006, the average petroleum spot price (APSP)⁴ declined sharply to around \$55–\$60 during October–December. In early 2007, oil prices experienced a short-lived dip, falling to just over \$50 a barrel, before rebounding in late March to almost \$65 (Figure 1.17, top panel). The decline in the third quarter of 2006 reflected temporarily lower geopolitical tensions (in particular, tensions relating to Lebanon), the absence of a major hurricane in the fall season, more comfortable inventory levels, and rising perceptions of slowing growth in global GDP and oil demand. The short-lived drop in December–January was fostered by the warm winter weather amid initial skepticism about OPEC’s ability to sustain production cuts and diminishing investor interest in oil sector derivatives (in part reflecting losses suffered during 2006).⁵ Prices recovered with a strengthening of demand due to colder weather, further OPEC production cuts, and declining inventories in

Figure 1.17. Average Petroleum Spot and Futures Prices, and Selected Energy Product Prices



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

¹Average unweighted petroleum spot price of West Texas Intermediate, U.K. Brent, and Dubai Fateh crude.

²Five-day weighted average of NYMEX light sweet crude, IPE Dated Brent, and implied Dubai Fateh.

³Average of Australian and South African coal prices.

⁴The IMF average petroleum spot price is an equally weighted average of the West Texas Intermediate, Brent, and Dubai crude oil prices. Unless otherwise noted, all subsequent references to the oil price are to the APSP.

⁵Improved returns have since brought some investors back. Note that while speculative activity may have had some influence on prices over this short period, IMF staff’s analysis shows that its effect on prices is not systematic or long term (see Box 5.1 of the September 2006 *World Economic Outlook*).

Box 1.4. Hedging Against Oil Price Volatility

Volatility in oil prices—which exceeds that of other commodities (first table)—can complicate budgetary, financial, and investment plans of both companies and governments, thus providing oil market participants with obvious incentives to hedge. This box attempts to assess the extent of hedging in the oil market.

Hedging is a form of insurance, involving financial or nonfinancial activities that help reduce risks. Financial hedging involves the use of derivatives, which directly transfer risks to others. An airline company, for example, could reduce the volatility of its cash flows by locking in an agreed price for its purchase of jet fuel through a forward or swap contract.¹ An oil-exporting country could ensure a minimum stream of revenue by buying a series of put options on oil. Agents may also carry out nonfinancial hedging by adjusting their normal operations to provide some self-insurance. For example, a company could reduce the impact of price volatility by diversifying its activities. An oil-exporting government could smooth expenditure and build liquidity cushions to help reduce its vulnerability to sudden oil market shifts, thereby providing an element of self-insurance.

Do oil market participants hedge enough? Available data and anecdotal evidence may suggest that financial hedging is not used extensively. Total open positions of commercial traders in oil derivatives traded in NYMEX have increased considerably in the past 10 years, but remain low as a share of total U.S. consumption (see top panel of first figure). Furthermore, the use of oil derivatives in organized exchanges in the United States seems less extensive (as a share of global production) than some other commodities (see lower panel of first figure), in part reflecting the predominance of public sector involvement in energy production that does not favor the use of financial instruments for transactions or hedging (see discussion below).

Note: The authors of this box are Kevin Cheng, Valerie Mercer-Blackman, and S. Hossein Samiei.

¹Notable recent examples of hedging in the airline industry include Lufthansa and Southwest.

Volatility of Commodities Prices

(January 1980–January 2007)

(In standard deviations of monthly percentage change)

Crude oil	8.25
Coal	4.03
Aluminum	5.53
Copper	5.98
Lumber	6.65
Cotton	5.03
Coffee	7.94
Fish	5.24
Soybeans	5.47
Wheat	4.78

Source: IMF staff calculations.

However, a thorough assessment of hedging activities is seriously complicated by a number of considerations, in particular the following:

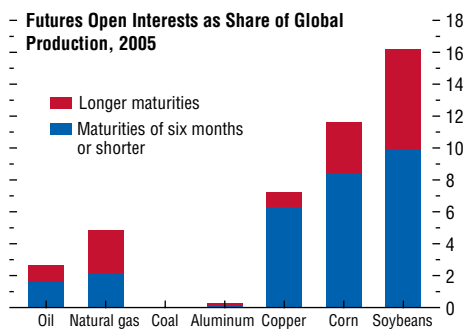
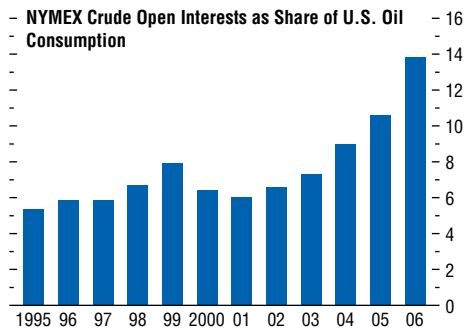
- The use of derivatives in organized exchanges is only the tip of the iceberg. Over-the-counter (OTC) transactions are estimated to be five to 10 times the size of organized exchanges markets, but definitive information is limited (Campbell, Orskaug, and Williams, 2006). Moreover, the use of nonfinancial hedging is hard to observe and quantify.
- Even if information on hedging estimates were available, without knowing an agent's risk appetite and risk profile, inferring whether hedging is optimal would be a challenging task.

Subject to these limitations, the following analysis examines hedging activities by private companies and governments, obstacles to financial hedging, and measures to overcome these obstacles.

Hedging by Firms

For a risk-averse firm, hedging could reduce risks by diversifying away the risks associated with oil. Hedging may also be warranted for a risk-neutral firm if it increases the present value of its expected net cash flows. This can happen in the presence of asymmetries in the tax system or in credit markets, or large transaction costs associated with financial distress. However, a firm's shareholders may prefer exposure to the oil price risks in order to diversify their portfolios.

Hedging in the Oil Sector and Other Commodities (Percent)



Sources: Bloomberg Financial Markets, LP; Commodities Futures Trading Commission; International Energy Agency; World Metal Statistics; U.S. Department of Agriculture; and IMF staff calculations.

A number of practical considerations underpin a firm's decision regarding financial hedging. Firms feel more comfortable hedging short-period price risks than long-term risks, given the likelihood of extensive shifts (especially in technology) over the long term. Smaller firms are more likely to use financial hedging than larger firms, which are better able to use their normal operations or cash reserves to safeguard against volatility. Producers and consumers are likely to hedge when they are concerned about adverse movements in prices. Furthermore, oil-producing firms are more likely to hedge when the profit margin between the product sale price and the marginal cost is

small. Finally, credit rating and the health of balance sheets are important factors in hedging decisions, because they affect the firm's ability to borrow to smooth a volatile cash flow.

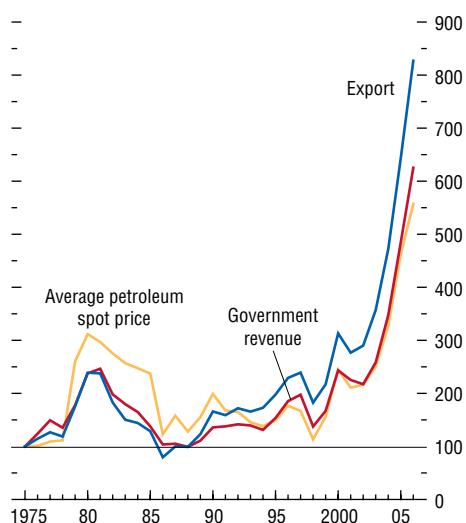
Impediments to more extensive financial hedging range from governance issues within firms to inadequacies of the derivatives markets. First, a business manager's hedging activities may often be inappropriately judged based on whether the hedge is profitable *ex post* rather than whether it was a good insurance policy *ex ante*. Furthermore, the costs related to margin requirements, transaction costs, and premiums can be high and even prohibitive.² Finding a counterparty can also be difficult, especially at the long end, given the thinness of the oil derivatives markets. Finally, inadequate oil market data, incomplete markets (e.g., for jet fuel), and inappropriate hedge accounting rules can also impede hedging activities.

In some situations, nonfinancial hedging provides a good alternative to the derivatives markets. One example is the presence of natural hedges. An oil refinery, for example, with risk exposures to both crude oil purchases and retail product sales is protected by a natural hedge to the extent that the price risks at the revenue and expenditure ends move in the same direction. A firm can also reduce risks through diversification of its activities, for example, by expanding its business and taking on additional risks that have negative correlation with its original risk profile. Finally, risks can be reduced by issuing claims that securitize volatile cash flows in exchange for a constant cash inflow.

Hedging by Governments

Assessing governments' hedging decisions is even harder, given their complex incentive structures and the political constraints they face,

²This is amply illustrated by the experience of the German company, Metallgesellschaft, in the early 1990s. It attempted to offset the risks associated with its forward contracts by using futures and swaps but, in the face of unexpected adverse price movements, was unable to fund the margin calls and went bankrupt.

Box 1.4 (concluded)**Export and Government Revenue of OPEC Members, and Average Petroleum Spot Price**
(Index, 1975 = 100)

Source: IMF staff calculations.

but the potential value of hedging is not any less.³ For example, fiscal and export revenues for members of the Organization of Petroleum Exporting Countries are not only strongly correlated with oil prices (see second figure), but also are much more volatile than for other countries. Governments have, in general, tended to use nonfinancial hedging—albeit with limited success—to deal with the impact of oil price volatilities on export and fiscal revenues (see second table).⁴

Mechanisms to tackle shocks to export revenues include contingent loans from inter-

³For a discussion of hedging by governments, see Swidler, Buttimer, Jr., and Shaw (2005); and Daniel (2001).

⁴Blattman, Hwang, and Williamson (2007) find that volatility in the terms of trade of commodity exporters accounts for a substantial degree of their divergence in incomes per capita compared with other countries. The channel through which growth is affected is via a reduction in investment incentives.

Volatility of GDP, Exports, and Government Revenue (1976–2006)

(Standard deviations of annual percentage change)

	GDP	Export	Government Revenue
OPEC	12.7	21.3	19.7
Advanced economies	6.2	7.9	7.3
Emerging market and developing countries			
Africa (excl. OPEC countries)	9.5	11.2	10.7
Asia	7.4	9.4	10.1
Of which:			
China	10.9	12.7	14.9
India	7.7	9.2	7.9
Middle East (excl. OPEC countries)	11.0	12.6	14.9
Central and eastern Europe	10.4	12.1	16.0

Source: IMF staff calculations.

national financial institutions and commodity stabilization schemes to protect producers' incomes—though these schemes have generally failed in the past because of design flaws or bankruptcy. A flexible exchange rate regime can also in some cases serve as a mechanism to mitigate the impact of terms-of-trade volatility.⁵

To manage fiscal revenue risks, a number of oil producers have set up oil stabilization funds. The experience with these funds, however, has been mixed at best, if judged by their ability to smooth expenditures, although some (such as Norway and Russia) have been successful in increasing savings.⁶ Some governments use a conservative price assumption in the budget to reduce risks, but often artificially low prices cannot be sustained and may eventually lead to

⁵The choice of the exchange rate regime, of course, also depends on other considerations, in particular the extent of flexibility in domestic prices and wages. For example, allowing the exchange rate to appreciate in response to a positive shock to oil prices may adversely impact competitiveness of non-oil exports when domestic prices/wages are not flexible.

⁶See World Bank (2006). There are often several objectives for which these funds are utilized. Some funds, such as Norway's, largely act as vehicles to channel savings rather than smoothing expenditure.

spending inefficiencies when excess revenues are spent in a relatively short time period.⁷

Despite the limited success of nonfinancial hedging to protect budgeted expenditures, financial derivatives are sparsely used by oil-producing governments.⁸ Of course, a large oil producer such as Saudi Arabia with plentiful liquid financial assets can withstand a negative price shock without the need to hedge. For smaller, poorer countries, in addition to the constraints faced by firms (see discussion above), they also face institutional impediments specific to governments. The ex post cost of unfavorable price movements, for example, may affect not only the hedging manager (as with

⁷Importantly, an appropriate medium-term framework could help not only link annual budgets to longer-term policies and fiscal sustainability objectives, but also enhance risk analysis.

⁸Examples include Mexico (where Pemex is obligated to transfer a minimum amount to the budget), Norway's state oil company, the state of Texas, and the province of Alberta. Texas, for example, hedged state oil tax revenues by using a "straddled costless collar," but abandoned the program in 2000 when the state coffers became more diversified. Some U.S. municipal transport authorities have also become active hedgers as the regulatory frameworks have increasingly permitted it. Indeed, many state commissions in the U.S. require public utilities to hedge against product price risk. Information about other governments is virtually nonexistent. Chile, an oil importer, reportedly recently purchased an oil derivative.

key OECD economies. Renewed geopolitical tensions in the Middle East pushed prices up further at end-March. The correction of equity markets, which began in March, has so far not had a noticeable effect on commodity markets.

Natural gas prices have followed different trends across the Atlantic.⁶ In the United States, prices in February 2007 remained only slightly above their level 13 months earlier (when prices had reverted to pre-Hurricane Katrina levels), as

⁶Such divergence is not abnormal given the difficulties of transporting natural gas.

firms), but also the government in power—a risk it may not be willing to take given its short election-related planning horizon. In addition, the legislature is likely to oppose a hedging program that effectively takes away its control over a portion of the budget. Finally, because of its complexity, it may be difficult to muster public support for a hedging program.

Measures to Facilitate Greater Use of Financial Derivatives

All in all, firms appear to do a fair amount of financial hedging—subject to the constraints they face—while governments tend to rely more on nonfinancial hedging. However, scope for financial hedging is likely to expand. The recent increased interest in oil derivatives by institutional investors is providing additional liquidity in these markets and increased potential for hedging. Further deepening of these markets, an increase in the range of products they offer at reasonable costs, and improvements in the quality and reporting of data would increase their potential usefulness for hedging purposes. At the same time, as these markets expand, there would be a need for better data, especially for OTC transactions. Steps to improve the governance structure, particularly for governments, tackle the agency problem, provide sufficient safeguards, and strengthen expertise would also help improve hedging decisions.

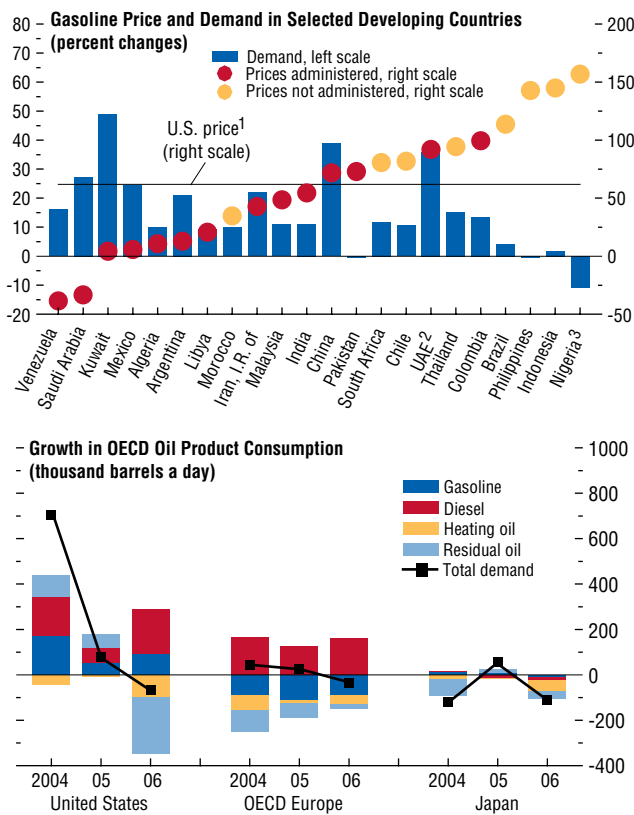
warm winter weather up to January 2007 allowed inventories to return to more comfortable levels. Natural gas prices in Europe have risen steadily.⁷ Coal prices rose 5 percent in 2006 and continued rising in early 2007 (Figure 1.17, bottom panel).

Oil Consumption

Global oil demand in 2006 grew by 0.8 million barrels a day (mbd), less than expected

⁷These refer to contractual western European prices paid in Germany and would not reflect the recent hikes in domestic prices in Belarus and Ukraine.

Figure 1.18. Demand and Prices of Petroleum Products in Selected Developing and OECD Countries



Sources: Bloomberg Financial Markets, LP; International Energy Agency; and IMF staff calculations.
 1The U.S. gasoline price change is a good way for the market-driven price to change, given the size and competitive level of its domestic market and the relatively low taxation.
 2United Arab Emirates.
 3Although gasoline prices are generally regulated, de facto many parts of the country face liberalized prices.

and below the 1.3 mbd growth in 2005. Demand growth in developing country regions rose to 1.3 mbd, but was partially offset by a 0.5 mbd fall in OECD demand (Table 1.4). Consumption was stronger than projected in China and India, and surged in many Middle Eastern oil-producing countries where growth has been strong. Demand growth in emerging markets was generally stronger in countries with administered prices, which typically have been lower than market prices in recent years (Figure 1.18, top panel).

Consumption in many OECD countries over the past year or so has been dampened by high oil prices, although temporary weather-related factors have also contributed (with the United States experiencing the warmest year ever recorded in 2006, coupled with a mild hurricane season in the Gulf of Mexico). In Europe and Japan, conservation measures and increased utilization of nuclear and coal power plants, along with some fuel switching to natural gas, have helped reduce oil demand. In the United States, while substitution to natural gas in power generation contributed significantly to a 25 percent drop in residual fuel oil demand, transportation fuel (gasoline and diesel) demand posted significant increases in the second half of 2006 and the first two months of 2007. This is in contrast with the continued weak demand for gasoline in other OECD countries (Figure 1.18, bottom panel).⁸

Medium-term consumption trends in selected advanced economies suggest that less rigorous oil conservation efforts in the United States, compared with four other advanced countries, could explain the more limited observed response of U.S. demand to higher prices (see Box 1.3).

Oil Production and Inventories

In line with weakening demand, overall oil output growth in 2006 fell to 0.8 mbd in 2006

⁸The move to greater use of diesel over gasoline for passenger transportation in Europe has also contributed to increase overall fuel efficiency.

Table 1.4. Global Oil Demand by Region*(Millions of barrels a day)*

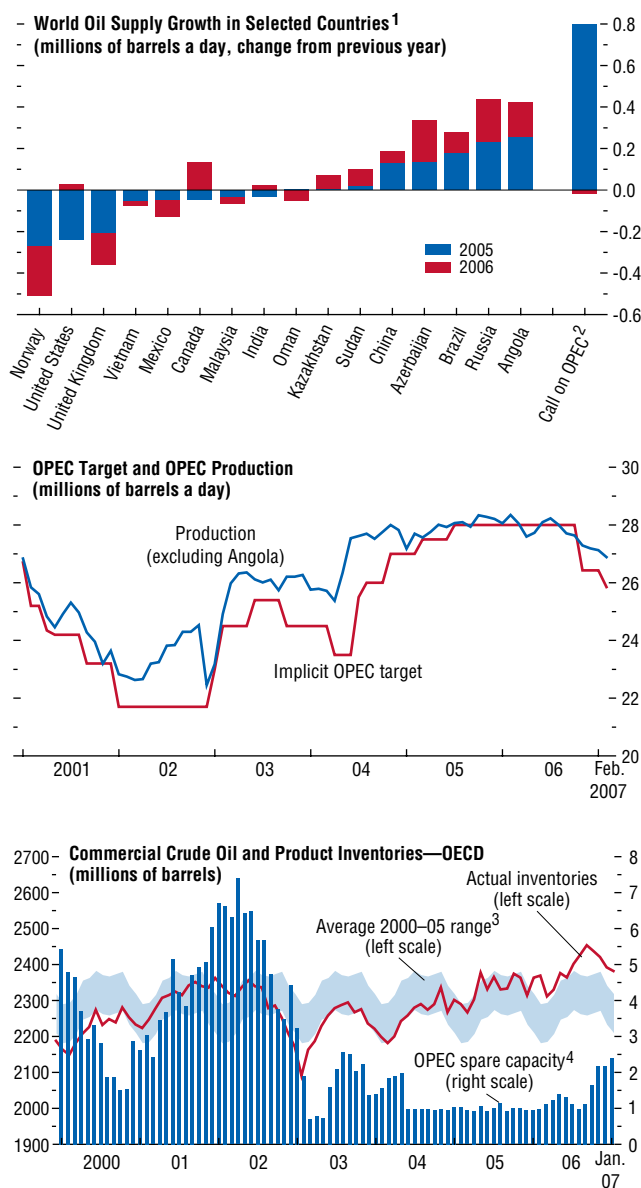
	Demand		Annual Change			
			mbd ¹		percent	
	2005	2006	2005	2006	2005	2006
OECD	49.63	49.16	0.30	-0.47	0.6	-0.9
North America	25.52	25.26	0.15	-0.26	0.6	-1.0
Of which:						
United States	21.15	21.03	0.08	-0.13	0.4	-0.6
Europe	15.52	15.45	0.05	-0.07	0.3	-0.5
Pacific	8.59	8.46	0.10	-0.13	1.2	-1.5
Non-OECD	34.06	35.32	1.01	1.26	3.1	3.7
Of which:						
China	6.69	7.16	0.27	0.47	4.2	7.0
Other Asia	8.76	8.86	0.14	0.10	1.6	1.1
Former Soviet Union	3.80	3.98	0.04	0.18	1.1	4.7
Middle East	6.12	6.45	0.32	0.33	5.5	5.4
Africa	2.88	2.94	0.09	0.06	3.2	2.1
Latin America	5.09	5.20	0.13	0.11	2.6	2.2
World	83.68	84.48	1.30	0.80	1.6	1.0

Source: International Energy Agency, *Oil Market Report*, January 2007.¹Millions of barrels a day.

(from 1.3 mbd in 2005). Non-OPEC supply grew by a less-than-expected 0.6 mbd in 2006, but accelerated in the second half as new capacity came on board in Brazil, Angola, and Azerbaijan. In addition, output in the United States and Russia recovered slightly, more than offsetting declines in the United Kingdom, Mexico, and Norway (Figure 1.19, top panel). OPEC's output declined in late 2006 reflecting the 0.7 mbd production cut (mostly by Saudi Arabia, Islamic Republic of Iran, and Kuwait) in the fourth quarter following OPEC's decision to cut quotas by 1.2 mbd starting in November.⁹ After announcing an additional 0.5 mbd cut in quotas starting in February, in early March the group suggested that there would be no further cuts below concurrent production for the time being. Spare capacity has increased, but remains limited, despite some replenishing of facilities following the recent production cuts (Figure 1.19, middle panel).

OECD commercial inventories grew marginally in the 12 months ending in January 2007 to a near-normal level of 2.67 million barrels (mb)

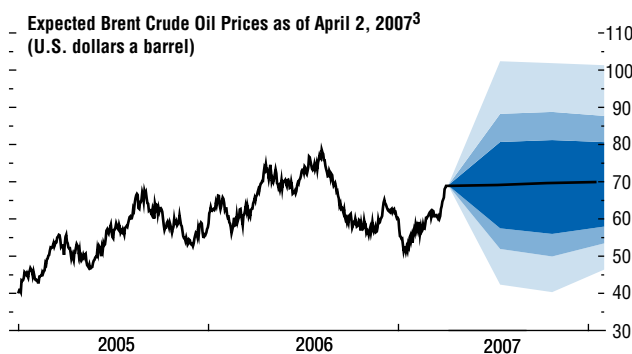
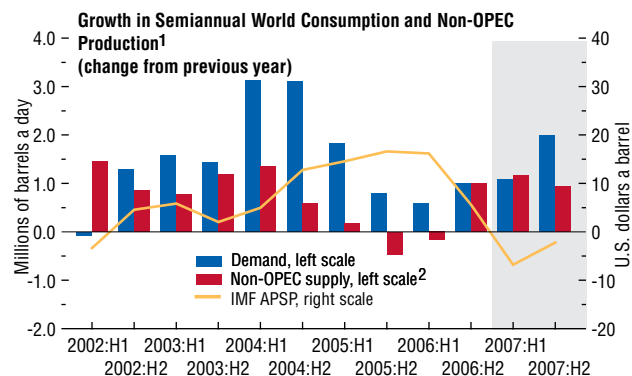
⁹Angola became the twelfth member of OPEC in January 2007, but it will not need to participate in the cuts yet.

Figure 1.19. Oil Supply, OECD Inventories, and OPEC Spare Capacity

Sources: Bloomberg Financial Markets, LP; Energy Information Agency, U.S. Department of Energy; International Energy Agency; and IMF staff calculations.

¹Includes crude oil and synthetic crude oil from tar sands, oil shale, etc.²The "call on OPEC" is defined as OPEC production. Given the group's spare capacity, OPEC supplies the excess of demand not met by non-OPEC production.³Average of each calendar month during 2000-05, with a 40 percent confidence interval based on past deviations.⁴OPEC-11 spare capacity refers to production capacity that can be brought online within 30 days and sustained for 90 days.

Figure 1.20. Actual and Expected Semiannual World Consumption and Non-OPEC Production Growth, and Brent Crude Oil Prices



Sources: Bloomberg Financial Markets, LP; International Energy Agency; and IMF staff calculations.
¹2007:H1 and 2007:H2 supply and demand projections are from the International Energy Agency.
²Includes non-crude production.
³From futures options.

(53 days of forward cover). Stocks were built up early in 2006, reflecting precautionary demand and expectations of continuing price increases, but this trend was reversed starting in September as fears of future shortages eased (Figure 1.19, bottom panel). Preliminary data based on U.S. and Japanese inventories suggest that there has been an unseasonably large inventory draw down in the first quarter of 2007 reflecting continued strong demand and possibly a reaction to OPEC cuts.

Short-Term Prospects and Risks

Looking forward, the International Energy Agency (IEA) is projecting global consumption growth of 1.6 mbd in 2007 owing to continued robust demand from emerging markets such as China and in the Middle East, and a planned buildup of official stocks by China and the United States (Figure 1.20, top panel).¹⁰ On the supply side, capacity growth is expected to be boosted as investment projects (such as Saudi Aramco’s) come on stream by year-end. However, this projection is subject to downside risk, especially if declines in capacity in mature fields exceed expectations and costs and technical constraints delay projects further (as they have in the past few years). The IEA has already revised down its 2007 non-OPEC oil supply projections from August 2006 by about 0.3 mbd to 1.1 mbd (excluding Angola). Moreover, recent moves to increase state control of the oil sectors in Venezuela, Russia, and Ecuador, along with continued violence in Iraq and Nigeria, have further undermined prospects for a speedy global output recovery.

As of April 2, futures and options markets indicated that oil prices will average \$65 a barrel in 2007 and \$68 a barrel in 2008, with risks on the upside. Options markets indicated that there was a 1 in 6 chance that Brent crude

¹⁰According to the IEA, China aims to raise its reserves to 400 mb (about 4½ months of imports), purchasing 100 mb by end-2008. The United States recently announced that it aims to double its strategic reserves capacity by 2027 to almost 1,500 mb (equivalent to just under 4 months of imports).

prices could rise above \$88 a barrel by end-2007 (Figure 1.20, bottom panel). The upside risks for 2007 reflect the still-limited global spare capacity, and the potential for heightened geopolitical tensions, as illustrated by developments in late March. At the same time, OPEC's commitment to defend prices through production cutbacks as necessary should limit further downward price pressures.

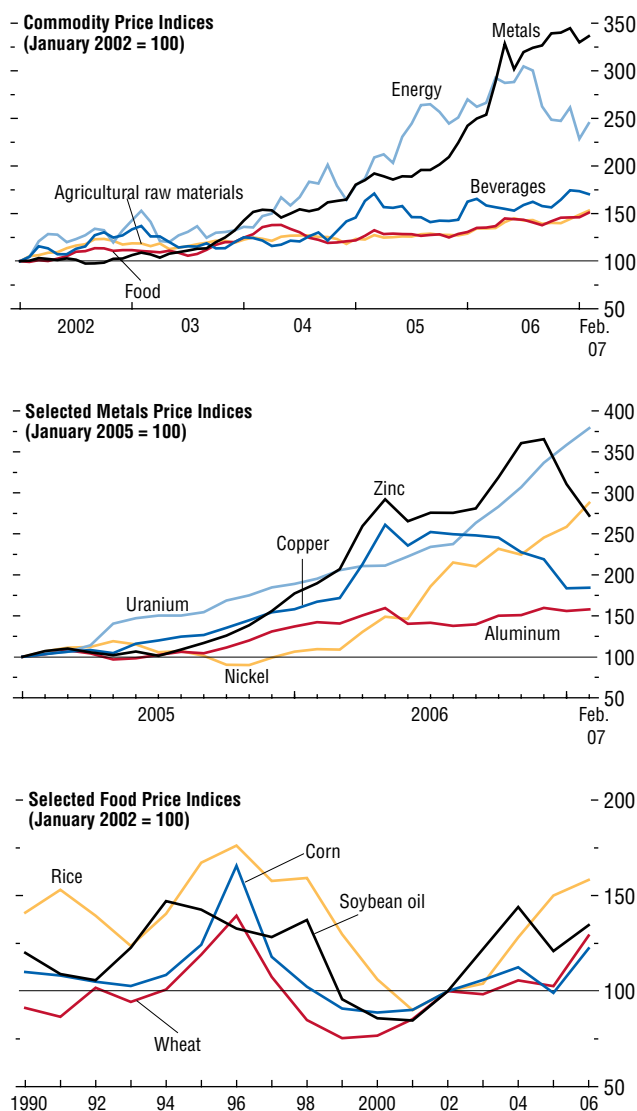
Nonenergy Commodities

The IMF nonfuel commodity index rose by 28 percent in 2006, ending the year at a new record high, driven by a surge in metals prices and a strengthening of agricultural prices (Figure 1.21, top panel). In the first three months of 2007, metals prices fluctuated, but generally remained strong, while agricultural prices continued to rise, albeit at a slower pace. The nonfuel commodity index is expected to increase further in 2007 as the strength of food and metals prices should carry forward. The rest of this section discusses the factors behind rising metals and selected food prices, and considers the extent to which recent high price levels are likely to be sustained.

Metals

Metals prices rose by 57 percent during 2006, by far the largest increase among the main categories in the IMF commodity index. This reflected continued strong demand growth, increased labor disputes, and unplanned disruptions to supply (Figure 1.21, middle panel). Strong growth of demand for stainless steel and automotive production, particularly in China, contributed to sharp price increases in nickel, zinc, and lead. Uranium prices rose by 71 percent, spurred by the recent revival of interest in nuclear energy. Copper prices have come down from their mid-2006 record-high levels, in part reflecting the slowdown in the U.S. housing market and weaker Chinese demand in the second half of 2006. Looking forward, copper and zinc prices are expected to weaken as new capacity comes on line. In contrast, nickel, tin, and ura-

Figure 1.21. Commodity Price Indices and Selected Metals and Food Price Indices



Source: IMF staff calculations.

mium still face more serious supply constraints and, therefore, higher possibility of upward price movements. Over the longer term, all base metals prices should weaken from their current highs as output continues to catch up with demand, although higher long-term production costs (wages, fuel costs, and equipment costs) are likely to keep prices above historical averages.¹¹

Food and Biofuels

Food prices rose by 10 percent in 2006, driven mainly by surging prices of corn, wheat, and soybean oil in the second part of the year (Figure 1.21, bottom panel). Recent price increases have reflected a poor wheat crop in major producing countries (which pushed wheat stocks to their lowest levels in 26 years) and rising U.S. demand for ethanol (which uses corn as an input) and prospects of higher biodiesel demand (which uses soybean oil and other edible oils).¹²

Looking ahead, rising demand for biofuels will likely cause the prices of corn and soybean oil to rise further, and to move more closely with the price of crude oil, as has been the case with sugar.¹³ For 2007, the United States Department of Agriculture is estimating a record corn crop, as planting areas increase by 10 percent from 2006 at the expense of soybeans and cotton. Still, demand fueled by the increase in domestic ethanol production capacity is expected to outpace the production rise. Higher prices of corn and soybean oil will also likely push up the price of partial substitutes, such as wheat and rice, and other edible oils, and exert upward pressure on meat, dairy, and poultry prices by raising

¹¹The Chilean Copper Commission of experts, for example, has raised long-term copper price projections by more than 20 percent in the last year. See also Chapter 5 of the September 2006 *World Economic Outlook*.

¹²Prices of rapeseed oil (used to make biodiesel in Europe and Canada) and palm oil (used in Malaysia) have also risen.

¹³The early adoption of sugar-based ethanol in Brazil for flex-fuel cars has led to increasingly strong movements of sugar, ethanol, and crude oil prices. The exception was the fall in sugar prices in mid-2006, reflecting an abundant Brazilian sugar crop in combination with import protection of U.S. ethanol, which to some extent has segmented the ethanol market.

Table 1.5. Effects of Petroleum Products on Production of Selected Grains in the United States

(Percent of total)

	Wheat	Corn	Soybeans
Energy-related costs as percent of total cost—2005			
Fertilizer	12.6	13.9	3.8
Fuel, lube, and electricity	8.4	9.2	5.2
Total fertilizer and energy costs	21.0	23.1	9.0
Share of total consumption used in the production of biofuels (percent)			
2005–06 marketing year		17.6	5.6
2006–07 marketing year ¹		22.4	8.5
2009–10 marketing year (forecast)		35.3	
USDA projections for price change, 2005/06–2009/10 (percent)	24.3	87.5	29.0

Sources: U.S. Department of Agriculture (USDA); U.S. Census Bureau; and IMF staff.

¹Estimate using the first quarter for soybeans.

animal rearing costs, given the predominant use of corn and soybean meal as feedstock, particularly in the United States (more than 95 percent). Furthermore, since corn is more energy intensive than soybean in production,¹⁴ high crude oil prices could also raise corn production costs (Table 1.5).

Recent proposals to increase biofuel production in the United States and Europe will likely put additional upward pressure on corn, wheat, and edible oil prices. Plans to double the minimum mandated biofuels consumption in the United States—the largest ethanol consumer—by 2017 would require an estimated 30 percent rise in corn production (or a corresponding reduction in exports) over the next five years to increase ethanol capacity, unless the higher demand is partially met by easing restrictions on imported ethanol—a plan that is currently not being considered.¹⁵ In addition, the European Union's adoption of a mandate to have a mini-

¹⁴The most common crop rotation in the United States is between corn and soybeans, the latter providing a replenishing source of nutrients to the soil. The United States is the largest global producer of the two grains.

¹⁵Ethanol produced in the United States enjoys ample protection through a producer subsidy (\$0.51/gallon) and a tariff (\$0.54/gallon) on more efficiently produced imported ethanol. There is no such tariff on imported biodiesel.

mum of 10 percent of transport fuels replaced by biofuels by 2020 is estimated to require about 18 percent of the total agricultural land area to be set aside for rapeseed (to be used for biodiesel production), and wheat and sugar beet (to be used in ethanol), unless tariffs on imported ethanol are reduced and other financial supports continue.

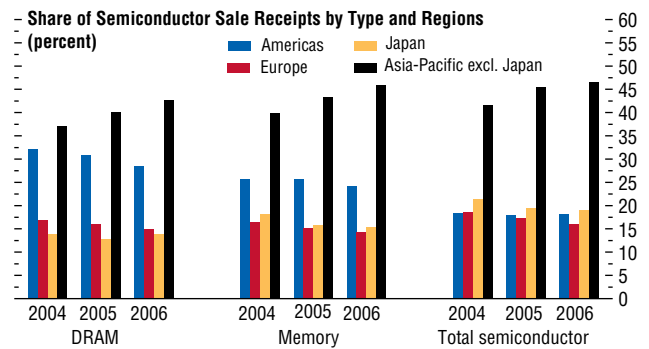
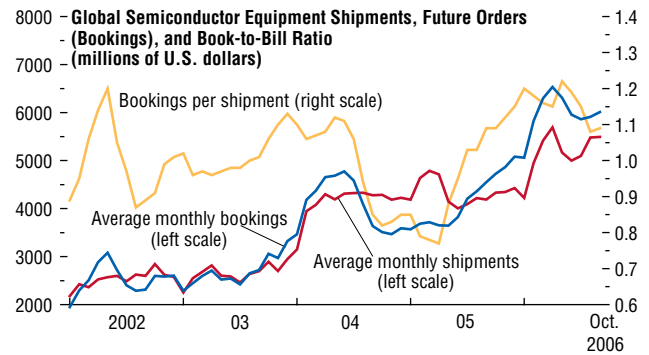
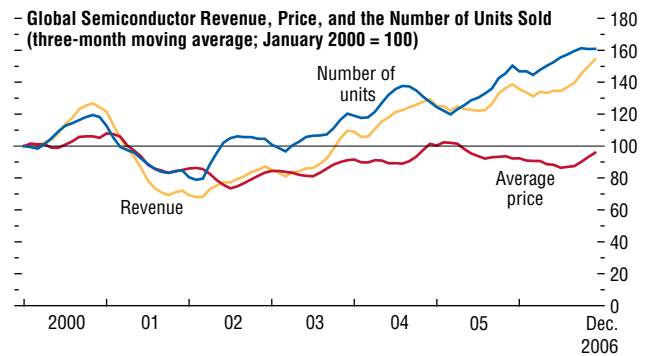
While on a small scale biofuels may be beneficial by supplementing fuel supply, promoting their use to unsustainable levels under current technology is problematic, and long-term prospects for biofuels depend heavily on how quickly and efficiently second-generation substitutes (such as plant waste) can be adopted. Many energy market analysts also question the rationality of large subsidies that benefit farmers more than the environment. While new technology is being developed, a more efficient solution from a global perspective would be to reduce tariffs on imports from developing countries (for example, Brazil) where biofuels production is cheaper and more energy efficient (see Table 1.5).

Semiconductors

Global semiconductor sales revenue grew by 8.9 percent in 2006 (compared with 6.8 percent in 2005), driven by strong growth in volumes (mainly reflecting growth in demand for cell phones and other consumer electronics) amid largely stable prices (Figure 1.22, top panel). Sales growth was particularly strong in the memory segment (especially DRAM), more than offsetting a decline in microprocessor revenue as weak demand and fierce competition pushed prices lower.

Global capital spending by semiconductor producers rose by 19 percent in 2006, after declining slightly in 2005. The bulk of the expansion was in memory manufacturing and occurred mainly in Asia, which accounted for 43 percent of global capital spending. Semiconductor inventories started to build up in the second half of 2006 as new equipment came on line amid weakened demand, possibly creating some overhang. The global book-to-bill ratio for

Figure 1.22. Semiconductor Market



Sources: Semiconductor Industry Association; VLSI Research; and IMF staff calculations.

semiconductor equipment sales stood at over 1.1 in 2006 (Figure 1.22, middle panel).

Analysts expect semiconductor sales revenue to grow at around 10 percent in 2007, although risks are on the downside. Semiconductor demand—in particular from cell phones, MP3 players, and digital television sets—should remain strong, while the introduction of Microsoft's VISTA operating system should spur demand for memory chips, particularly DRAM (Figure 1.22, bottom panel). However, prices for chips are expected to decline in 2007 amid intensified competition and the lingering excess in inventory levels. In addition, investment expenditures should level off, while capacity utilization is expected to decline marginally.

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