World Economic and Financial Surveys

World Economic Outlook

Crisis and Recovery

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WORLD ECONOMIC OUTLOOK
April 2009

Crisis and Recovery

International Monetary Fund

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ASSUMPTIONS AND CONVENTIONS

A number of assumptions have been adopted for the projections presented in the *World Economic Outlook.* It has been assumed that real effective exchange rates remain constant at their average levels during February 25–March 25, 2009, except for the currencies participating in the European exchange rate mechanism II (ERM II), which are assumed to remain constant in nominal terms relative to the euro; that established policies of national authorities will be maintained (for specific assumptions about fiscal and monetary policies for selected economies, see Box A1); that the average price of oil will be $52.00 a barrel in 2009 and $62.50 a barrel in 2010, and will remain unchanged in real terms over the medium term; that the six-month London interbank offered rate (LIBOR) on U.S. dollar deposits will average 1.5 percent in 2009 and 1.4 percent in 2010; that the three-month euro deposit rate will average 1.6 percent in 2009 and 2.0 percent in 2010; and that the six-month Japanese yen deposit rate will yield an average of 1.0 percent in 2009 and 0.5 percent in 2010. These are, of course, working hypotheses rather than forecasts, and the uncertainties surrounding them add to the margin of error in the projections. The estimates and projections are based on statistical information available through mid-April 2009.

The following conventions are used throughout the *World Economic Outlook:*

. . .   to indicate that data are not available or not applicable;

–   between years or months (for example, 2006–07 or January–June) to indicate the years or months covered, including the beginning and ending years or months;

/   between years or months (for example, 2006/07) to indicate a fiscal or financial year.

"Billion" means a thousand million; "trillion" means a thousand billion.

"Basis points" refer to hundredths of 1 percentage point (for example, 25 basis points are equivalent to ¼ of 1 percentage point).

In figures and tables, shaded areas indicate IMF staff projections.

If no source is listed on tables and figures, data are drawn from the World Economic Outlook (WEO) database.

When countries are not listed alphabetically, they are ordered on the basis of economic size.

Minor discrepancies between sums of constituent figures and totals shown reflect rounding.

As used in this report, the term "country" does not in all cases refer to a territorial entity that is a state as understood by international law and practice. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

This version of the *World Economic Outlook* is available in full on the IMF's website, www.imf.org. Accompanying it on the website is a larger compilation of data from the WEO database than is included in the report itself, including files containing the series most frequently requested by readers. These files may be downloaded for use in a variety of software packages.

Inquiries about the content of the *World Economic Outlook* and the WEO database should be sent by mail, e-mail, or fax (telephone inquiries cannot be accepted) to

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PREFACE

The analysis and projections contained in the *World Economic Outlook* are integral elements of the IMF's surveillance of economic developments and policies in its member countries, of developments in international financial markets, and of the global economic system. The survey of prospects and policies is the product of a comprehensive interdepartmental review of world economic developments, which draws primarily on information the IMF staff gathers through its consultations with member countries. These consultations are carried out in particular by the IMF's area departments together with the Strategy, Policy, and Review Department, the Monetary and Capital Markets Department, and the Fiscal Affairs Department.

The analysis in this report was coordinated in the Research Department under the general direction of Olivier Blanchard, Economic Counsellor and Director of Research. The project was directed by Charles Collyns, Deputy Director of the Research Department, and Jörg Decressin, Division Chief, Research Department.

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The analysis has benefited from comments and suggestions by staff from other IMF departments, as well as by Executive Directors following their discussion of the report on April 13, 2009. However, both projections and policy considerations are those of the IMF staff and should not be attributed to Executive Directors or to their national authorities.

Prospects

Even with determined steps to return the financial sector to health and continued use of macroeconomic policy levers to support aggregate demand, global activity is projected to contract by 1.3 percent in 2009. This represents the deepest post–World War II recession by far. Moreover, the downturn is truly global: output per capita is projected to decline in countries representing three-quarters of the global economy. Growth is projected to reemerge in 2010, but at 1.9 percent it would be sluggish relative to past recoveries.

These projections are based on an assessment that financial market stabilization will take longer than previously envisaged, even with strong efforts by policymakers. Thus, financial conditions in the mature markets are projected to improve only slowly, as insolvency concerns are diminished by greater clarity over losses on bad assets and injections of public capital, and counterparty risks and market volatility are reduced. The April 2009 issue of the *Global Financial Stability Report* (GFSR) estimates that, subject to a number of assumptions, credit write-downs on U.S.-originated assets by all holders since the start of the crisis will total $2.7 trillion, compared with an estimate of $2.2 trillion in the January 2009 *GFSR Update.* Including assets originated in other mature market economies, total write-downs could reach $4 trillion over the next two years, approximately two-thirds of which may be taken by banks. Overall credit to the private sector in the advanced economies is thus expected to decline during both 2009 and 2010. Because of the acute degree of stress in mature markets and its concentration in the banking system, capital flows to emerging economies will remain very low.

The projections also assume continued strong macroeconomic policy support. Monetary policy interest rates are expected to be lowered to or remain near the zero bound in the major advanced economies, while central banks continue to explore unconventional ways to ease credit conditions and provide liquidity. Fiscal deficits are expected to widen sharply in both advanced and emerging economies, on assumptions that automatic stabilizers are allowed to operate and governments in G20 countries implement fiscal stimulus plans amounting to 2 percent of GDP in 2009 and 1½ percent of GDP in 2010.[1]

The current outlook is exceptionally uncertain, with risks still weighing on the downside. A key concern is that policies may be insufficient to arrest the negative feedback between deteriorating financial conditions and weakening economies in the face of limited public support for policy actions.

Policy Challenges

The difficult and uncertain outlook argues for continued forceful action both on the financial and macroeconomic policy fronts to establish the conditions for a return to sustained growth. Whereas policies must be centered at the national level, greater international cooperation is needed to avoid exacerbating cross-border strains. Building on the positive momentum created by the April G20 summit in London, coordination and collaboration is particularly important with respect to financial policies to avoid adverse international spillovers from national actions. At the same time, international support, including the additional resources

[1]The Group of 20 comprises 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Republic of Korea, Russia. Saudi Arabia, South Africa, Turkey, United Kingdom, and United States) and the European Union.

being made available to the IMF, can help countries buffer the impact of the financial crisis on real activity and limit the fallout on poverty, particularly in developing economies.

Repairing Financial Sectors

The greatest policy priority for ensuring a durable economic recovery is restoring the financial sector to health. The three priorities identified in previous issues of the GFSR remain relevant: (1) ensuring that financial institutions have access to liquidity, (2) identifying and dealing with distressed assets, and (3) recapitalizing weak but viable institutions and resolving failed institutions.

The critical underpinning of an enduring solution must be credible loss recognition on impaired assets. To that end, governments need to establish common basic methodologies for a realistic, forward-looking valuation of securitized credit instruments. Various approaches to dealing with bad assets in banks can work, provided they are supported with adequate funding and implemented in a transparent manner.

Bank recapitalization must be rooted in a careful evaluation of the prospective viability of institutions, taking into account both write-downs to date and a realistic assessment of prospects for further write-downs. As supervisors assess recapitalization needs on a bank-by-bank basis, they must assure themselves of the quality of the bank's capital and the robustness of its funding, its business plan and risk-management processes, the appropriateness of compensation policies, and the strength of management. Viable financial institutions that are undercapitalized need to be intervened promptly, possibly utilizing a temporary period of public ownership until a private sector solution can be developed. Nonviable institutions should be intervened promptly, which may entail orderly closures or mergers. In general, public support to the financial sector should be temporary and withdrawn at the earliest opportunity. The amount of public funding needed is likely to be large, but the requirements will rise the longer it takes for a solution to be implemented.

Wide-ranging efforts to deal with financial strains in both the banking and corporate sectors will also be needed in emerging economies. Direct government support for corporate borrowing may be warranted. Some countries have also extended public guarantees of bank debt to the corporate sector and provided backstops to trade finance. Additionally, contingency plans should be devised to prepare for potential large-scale restructurings if circumstances deteriorate further.

Supporting Aggregate Demand

In advanced economies, room to further ease monetary policy should be used forcefully to support demand and counter deflationary risks. With the scope for lowering interest rates now virtually exhausted, central banks will have to continue exploring less conventional measures, using both the size and composition of their own balance sheets to support credit intermediation.

Emerging economies also need to ease monetary conditions to respond to the deteriorating outlook. However, in many of those economies, the task of the central bank is further complicated by the need to sustain external stability in the face of highly fragile financing flows and balance sheet mismatches because of domestic borrowing in foreign currencies. Thus, although central banks in most of these economies have lowered interest rates in the face of the global downturn, they have been appropriately cautious in doing so to maintain incentives for capital inflows and to avoid disorderly exchange rate moves.

Given the extent of the downturn and the limits to monetary policy action, fiscal policy must play a crucial part in providing short-term support to the global economy. Governments have acted to provide substantial stimulus in 2009, but it is now apparent that the effort will need to be at least sustained, if not increased, in 2010, and countries with fiscal room should stand ready to introduce new stimulus measures as needed to support the recovery. However, the room to provide fiscal support will be limited

if such efforts erode credibility. In advanced economies, credibility requires addressing the medium-term fiscal challenges posed by aging populations. The costs of the current financial crisis—while sizable—are dwarfed by the impending increases in government spending on social security and health care for the elderly. It is also desirable to target stimulus measures to maximize the long-term benefits to the economy's productive potential, such as spending on infrastructure. Importantly, to maximize the benefits for the global economy, stimulus needs to be a joint effort among the countries with fiscal room.

Looking further ahead, a key challenge will be to calibrate the pace at which the extraordinary monetary and fiscal stimulus now being provided is withdrawn. Acting too fast would risk undercutting what is likely to be a fragile recovery, but acting too slowly could risk inflating new asset price bubbles or eroding credibility. At the current juncture, the main priority is to avoid reducing stimulus prematurely, while developing and articulating coherent exit strategies.

Easing External Financing Constraints

Economic growth in many emerging and developing economies is falling sharply, and adequate external financing from official sources will be essential to cushion adjustment and avoid external crises. The IMF, in concert with others, is already providing such financing for a number of these economies. The G20 agreement to increase the resources available to the IMF will facilitate further support. Also, the IMF's new Flexible Credit Line should help alleviate risks for sudden stops of capital inflows and, together with a reformed IMF conditionality framework, should facilitate the rapid and effective deployment of these additional resources if and when needed. For the poorest economies, additional donor support is crucial lest important gains in combating poverty and safeguarding financial stability be put at risk.

Medium-Run Policy Challenges

At the root of the market failure that led to the current crisis was optimism bred by a long period of high growth and low real interest rates and volatility, together with a series of policy failures. These failures raise important medium-run challenges for policymakers. With respect to financial policies, the task is to broaden the perimeter of regulation and make it more flexible to cover all systemically relevant institutions. Additionally, there is a need to develop a macroprudential approach to both regulation and monetary policy. International policy coordination and collaboration need to be strengthened, including by better early-warning exercises and a more open communication of risks. Trade and financial protectionism should be avoided, and rapid completion of the Doha Round of multilateral trade negotiations would revitalize global growth prospects.

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EXECUTIVE SUMMARY

The global economy is in a severe recession inflicted by a massive financial crisis and acute loss of confidence. While the rate of contraction should moderate from the second quarter onward, world output is projected to decline by 1.3 percent in 2009 as a whole and to recover only gradually in 2010, growing by 1.9 percent. Achieving this turnaround will depend on stepping up efforts to heal the financial sector, while continuing to support demand with monetary and fiscal easing.

Recent Economic and Financial Developments

Economies around the world have been seriously affected by the financial crisis and slump in activity. The advanced economies experienced an unprecedented 7½ percent decline in real GDP during the fourth quarter of 2008, and output is estimated to have continued to fall almost as fast during the first quarter of 2009. Although the U.S. economy may have suffered most from intensified financial strains and the continued fall in the housing sector, western Europe and advanced Asia have been hit hard by the collapse in global trade, as well as by rising financial problems of their own and housing corrections in some national markets. Emerging economies too are suffering badly and contracted 4 percent in the fourth quarter in the aggregate. The damage is being inflicted through both financial and trade channels, particularly to east Asian countries that rely heavily on manufacturing exports and the emerging European and Commonwealth of Independent States (CIS) economies, which have depended on strong capital inflows to fuel growth.

In parallel with the rapid cooling of global activity, inflation pressures have subsided quickly. Commodity prices fell sharply from mid-year highs, causing an especially large loss of income for the Middle Eastern and CIS econo-

mies but also for many other commodity exporters in Latin America and Africa. At the same time, rising economic slack has contained wage increases and eroded profit margins. As a result, 12-month headline inflation in the advanced economies fell below 1 percent in February 2009, although core inflation remained in the 1½–2 percent range, with the notable exception of Japan. Inflation has also moderated significantly across the emerging economies, although in some cases falling exchange rates have dampened the downward momentum.

Wide-ranging and often unorthodox policy responses have made limited progress in stabilizing financial markets and containing the downturn in output, failing to arrest corrosive feedback between weakening activity and intense financial strains. Initiatives to stanch the bleeding include public capital injections and an array of liquidity facilities, monetary easing, and fiscal stimulus packages. While there have been some encouraging signs of improving sentiment since the Group of 20 (G20) meeting in early April, confidence in financial markets is still low, weighing against the prospects for an early economic recovery.

The April 2009 *Global Financial Stability Report* (GFSR) estimates write-downs on U.S.-originated assets by all financial institutions over 2007–10 will be $2.7 trillion, up from the estimate of $2.2 trillion in January 2009, largely as a result of the worsening prospects for economic growth. Total expected write-downs on global exposures are estimated at about $4 trillion, of which two-thirds will fall on banks and the remainder on insurance companies, pension funds, hedge funds, and other intermediaries. Across the world, banks are limiting access to credit (and will continue to do so) as the overhang of bad assets and uncertainty about which institutions will remain solvent keep private capital on the sidelines. Funding strains have spread

well beyond short-term bank funding markets in advanced economies. Many nonfinancial corporations are unable to obtain working capital, and some are having difficulty raising longer-term debt.

The broad retrenchment of foreign investors and banks from emerging economies and the resulting buildup in funding pressures are particularly worrisome. New securities issues have come to a virtual stop, bank-related flows have been curtailed, bond spreads have soared, equity prices have dropped, and exchange markets have come under heavy pressure. Beyond a general rise in risk aversion, this reflects a range of adverse factors, including the damage done to advanced economy banks and hedge funds, the desire to move funds under the "umbrella" provided by the increasing provision of guarantees in mature markets, and rising concerns about the economic prospects and vulnerabilities of emerging economies.

An important side effect of the financial crisis has been a flight to safety and return of home bias, which have had an impact on the world's major currencies. Since September 2008, the U.S. dollar, euro, and yen have all strengthened in real effective terms. The Chinese renminbi and currencies pegged to the dollar (including those in the Middle East) have also appreciated. Most other emerging economy currencies have weakened sharply, despite the use of international reserves for support.

Outlook and Risks

The *World Economic Outlook (WEO)* projections assume that financial market stabilization will take longer than previously envisaged, even with strong efforts by policymakers. Thus, financial strains in the mature markets are projected to remain heavy until well into 2010, improving only slowly as greater clarity over losses on bad assets and injections of public capital reduce insolvency concerns, lower counterparty risks and market volatility, and restore more liquid market conditions. Overall credit to the private sector in the advanced economies is expected

to decline in both 2009 and 2010. Meanwhile, emerging and developing economies are expected to face greatly curtailed access to external financing in both years. This is consistent with the findings in Chapter 4 that the acute degree of stress in mature markets and its concentration in the banking system suggest that capital flows to emerging economies will suffer large declines and recover only slowly.

The projections also incorporate strong macroeconomic policy support. Monetary policy interest rates are expected to be lowered to or remain near the zero bound in the major advanced economies, while central banks continue to explore ways to use both the size and composition of their balance sheets to ease credit conditions. Fiscal deficits are expected to widen sharply in both advanced and emerging economies, as governments are assumed to implement fiscal stimulus plans in G20 countries amounting to 2 percent of GDP in 2009 and 1½ percent of GDP in 2010. The projections also assume that commodity prices remain close to current levels in 2009 and rise only modestly in 2010, consistent with forward market pricing.

Even with determined policy actions, and anticipating a moderation in the rate of contraction from the second quarter onward, global activity is now projected to decline 1.3 percent in 2009, a substantial downward revision from the January *WEO Update.* This would represent by far the deepest post–World War II recession. Moreover, the downturn is truly global: output per capita is projected to decline in countries representing three-quarters of the global economy, and growth in virtually all countries has decelerated sharply from rates observed in 2003–07. Growth is projected to reemerge in 2010, but at just 1.9 percent would be sluggish relative to past recoveries, consistent with the findings in Chapter 3 that recoveries after financial crises are significantly slower than other recoveries.

The current outlook is exceptionally uncertain, with risks weighed to the downside. The dominant concern is that policies will continue to be insufficient to arrest the negative feedback

between deteriorating financial conditions and weakening economies, particularly in the face of limited public support for policy action. Key transmission channels include rising corporate and household defaults that cause further falls in asset prices and greater losses across financial balance sheets, and new systemic events that further complicate the task of restoring credibility. Furthermore, in a highly uncertain context, fiscal and monetary policies may fail to gain traction, since high rates of precautionary saving could lower fiscal multipliers, and steps to ease funding could fail to slow the pace of deleveraging. On the upside, however, bold policy implementation that is able to convince markets that financial strains are being dealt with decisively could revive confidence and spending commitments.

Even once the crisis is over, there will be a difficult transition period, with output growth appreciably below rates seen in the recent past. Financial leverage will need to be reduced, implying lower credit growth and scarcer financing than in recent years, especially in emerging and developing economies. In addition, large fiscal deficits will need to be rolled back just as population aging accelerates in a number of advanced economies. Moreover, in key advanced economies, households will likely continue to rebuild savings for some time. All this will weigh on both actual and potential growth over the medium run.

Policy Challenges

This difficult and uncertain outlook argues for forceful action on both the financial and macroeconomic policy fronts. Past episodes of financial crisis have shown that delays in tackling the underlying problem mean an even more protracted economic downturn and even greater costs, both in terms of taxpayer money and economic activity. Policymakers must be mindful of the cross-border ramifications of policy choices. Initiatives that support trade and financial partners—including fiscal stimulus and official support for international financing

flows—will help support global demand, with shared benefits. Conversely, a slide toward trade and financial protectionism would be hugely damaging to all, a clear warning from the experience of 1930s beggar-thy-neighbor policies.

Advancing Financial Sector Restructuring

The greatest policy priority at this juncture is financial sector restructuring. Convincing progress on this front is the sine qua non for an economic recovery to take hold and would significantly enhance the effectiveness of monetary and fiscal stimulus. In the short run, the three priorities identified in previous GFSRs remain appropriate: (1) ensuring that financial institutions have access to liquidity, (2) identifying and dealing with distressed assets, and (3) recapitalizing weak but viable institutions. The first area is being addressed forcefully. Policy initiatives in the other two areas, however, need to advance more convincingly.

The critical underpinning of an enduring solution must be credible loss recognition on impaired assets. To that effect, governments need to establish common basic methodologies for the realistic valuation of securitized credit instruments, which should be based on expected economic conditions and an attempt to estimate the value of future income streams. Steps will also be needed to reduce considerably the uncertainty related to further losses from these exposures. Various approaches to dealing with bad assets in banks can work, provided they are supported with adequate funding and implemented in a transparent manner.

Recapitalization methods must be rooted in a careful evaluation of the long-term viability of institutions, taking into account both losses to date and a realistic assessment of the prospects of further write-downs. Subject to a number of assumptions, GFSR estimates suggest that the amount of capital needed might amount to $275 billion–$500 billion for U.S. banks, $475 billion–$950 billion for European banks (excluding those in the United Kingdom), and

$125 billion–$250 billion for U.K. banks.[1] As supervisors assess recapitalization needs on a bank-by-bank basis, they will need assurance of the quality of banks' capital; the robustness of their funding, business plans, and risk management processes; the appropriateness of compensation policies; and the strength of management. Supervisors will also need to establish the appropriate level of regulatory capital for institutions, taking into account regulatory minimums and the need for buffers to absorb further unexpected losses. Viable banks that have insufficient capital should be quickly recapitalized, with capital injections from the government (if possible, accompanied by private capital) to bring capital ratios to a level sufficient to regain market confidence. Authorities should be prepared to provide capital in the form of common shares in order to improve confidence and funding prospects and this may entail a temporary period of public ownership until a private sector solution can be developed. Nonviable financial institutions need to be intervened promptly, leading to resolution through closures or mergers. Amounts of public funding needed are likely to be large, but requirements are likely to rise the longer it takes for a solution to be implemented.

Wide-ranging efforts to deal with financial strains will also be needed in emerging economies. The corporate sector is at considerable risk. Direct government support for corporate borrowing may be warranted. Some countries have also extended their guarantees of bank debt to firms, focusing on those associated with export markets, or have provided backstops to trade finance through various facilities—helping to keep trade flowing and limiting damage to the real economy. In addition, contingency plans should be devised to prepare for potential large-scale restructuring in case circumstances deteriorate further.

Greater international cooperation is needed to avoid exacerbating cross-border strains. Coordination and collaboration is particularly important with respect to financial policies to avoid adverse international spillovers from national actions. At the same time, international support, including from the IMF, can help countries buffer the impact of the financial crisis on real activity and, particularly in the developing countries, limit its effects on poverty. Recent reforms to increase the flexibility of lending instruments for good performers caught in bad weather, together with plans advanced by the G20 summit to increase the resources available to the IMF, are enhancing the capacity of the international financial community to address risks related to sudden stops of private capital flows.

Easing Monetary Policy

In advanced economies, scope for easing monetary policy further should be used aggressively to counter deflation risks. Although policy rates are already near the zero floor in many countries, whatever policy room remains should be used quickly. At the same time, a clear communication strategy is important—central bankers should underline their determination to avoid deflation by sustaining easy monetary conditions for as long as necessary. In an increasing number of cases, lower interest rates will need to be supported by increasing recourse to less conventional measures, using both the size and composition of the central bank's own balance sheet to support credit intermediation. To the extent possible, such actions should be structured to maximize relief in dislocated markets while leaving credit allocation decisions to the private sector and protecting the central bank balance sheet from credit risk.

Emerging economies also need to ease monetary conditions to respond to the deteriorating outlook. However, in many of those economies, the task of central banks is further complicated by the need to sustain external stability in the

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

face of highly fragile financing flows. To a much greater extent than in advanced economies, emerging market financing is subject to dramatic disruptions—sudden stops—in part because of much greater concerns about the creditworthiness of the sovereign. Emerging economies also have tended to borrow more heavily in foreign currency, and so large exchange rate depreciations can severely damage balance sheets. Thus, while most central banks in these economies have lowered interest rates in the face of the global downturn, they have been appropriately cautious in doing so to maintain incentives for capital inflows and to avoid disorderly exchange rate moves.

Looking further ahead, a key challenge will be to calibrate the pace at which the extraordinary monetary stimulus now being provided should be withdrawn. Acting too fast would risk undercutting what is likely to be a fragile recovery, but acting too slowly could risk overheating and inflating new asset price bubbles.

Combining Fiscal Stimulus with Sustainability

In view of the extent of the downturn and the limits to the effectiveness of monetary policy, fiscal policy must play a crucial part in providing short-term stimulus to the global economy. Past experience suggests that fiscal policy is particularly effective in shortening the duration of recessions caused by financial crises (Chapter 3). However, the room to provide fiscal support will be limited if efforts erode credibility. Thus, governments are faced with a difficult balancing act, delivering short-term expansionary policies but also providing reassurance about medium-term prospects. Fiscal consolidation will be needed once a recovery has taken hold, and this can be facilitated by strong medium-term fiscal frameworks. However, consolidation should not be launched prematurely. While governments have acted to provide substantial stimulus in 2009, it is now apparent that the effort will need to be at least sustained, if not increased, in 2010, and countries with fiscal room should stand ready to introduce new stimulus measures as needed

to support the recovery. As far as possible, this should be a joint effort, since part of the impact of an individual country's measures will leak across borders, but brings benefits to the global economy.

How can the tension between stimulus and sustainability be alleviated? One key is the choice of stimulus measures. As far as possible, these should be temporary and maximize "bang for the buck" (for example, accelerated spending on already planned or existing projects and time-bound tax cuts for credit-constrained households). It is also desirable to target measures that bring long-term benefits to the economy's productive potential, such as spending on infrastructure. Second, governments need to complement initiatives to provide short-term stimulus with reforms to strengthen medium-term fiscal frameworks to provide reassurance that short-term deficits will be reversed and public debt contained. Third, a key element to ensure fiscal sustainability in many countries would be concrete progress toward dealing with the fiscal challenges posed by aging populations. The costs of the current financial crisis—while sizable—are dwarfed by the impending costs from rising expenditures on social security and health care for the elderly. Credible policy reforms to these programs may not have much immediate impact on fiscal accounts but could make an enormous change to fiscal prospects, and thus could help preserve fiscal room to provide short-term fiscal support.

Medium-Run Policy Challenges

At the root of the market failure that led to the current crisis was optimism bred by a long period of high growth and low real interest rates and volatility, along with policy failures. Financial regulation was not equipped to address the risk concentrations and flawed incentives behind the financial innovation boom. Macroeconomic policies did not take into account the buildup of systemic risks in the financial system and in housing markets.

This raises important medium-run challenges for policymakers. With respect to financial policies, the task now is to broaden the perimeter of regulation and make it more flexible to cover all systemically relevant institutions. In addition, there is a need to develop a macroprudential approach to regulation, which would include compensation structures that mitigate procyclical effects, robust market-clearing arrangements, accounting rules to accommodate illiquid securities, transparency about the nature and location of risks to foster market discipline, and better systemic liquidity management.

Regarding macroeconomic policies, central banks should also adopt a broader macroprudential view, paying due attention to financial stability as well as price stability by taking into account asset price movements, credit booms, leverage, and the buildup of systemic risk. Fiscal policymakers will need to bring down deficits and put public debt on a sustainable trajectory.

International policy coordination and collaboration need to be strengthened, based on better early-warning systems and a more open communication of risks. Cooperation is particularly pressing for financial policies, because of the major spillovers that domestic actions can have on other countries. At the same time, rapid completion of the Doha Round of multilateral trade talks could revitalize global growth prospects, while strong support from bilateral and multilateral sources, including the IMF, could help limit the adverse economic and social fallout of the financial crisis in many emerging and developing economies.

GLOBAL PROSPECTS AND POLICIES

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

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

Figure 1.1. Global Indicators[1]
(Annual percent change unless otherwise noted)

The global economy is undergoing its most severe recession of the postwar period. World real GDP will drop in 2009, with advanced economies experiencing deep contractions and emerging and developing economies slowing abruptly. Trade volumes are falling sharply, while inflation is subsiding quickly.
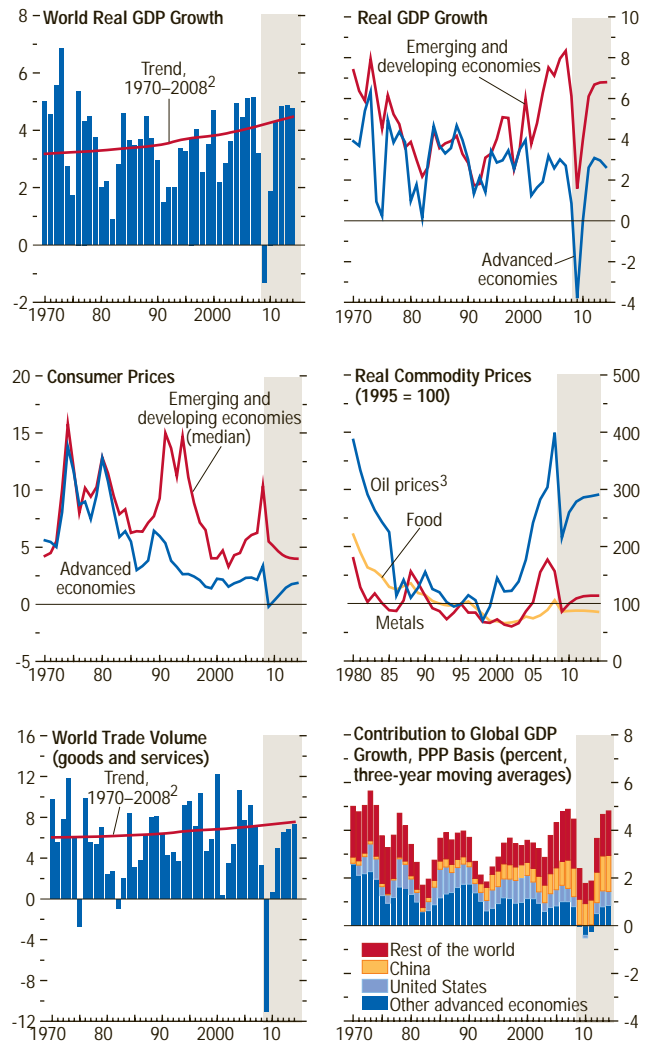
Source: IMF staff estimates.
[1]Shaded areas indicate IMF staff projections. Aggregates are computed on the basis of purchasing-power-parity (PPP) weights unless otherwise noted.
[2]Average growth rates for individual countries, aggregated using PPP weights; aggregates shift over time in favor of faster-growing economies, giving the line an upward trend.
[3]Simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil.

Figure 1.2. Developments in Mature Credit Markets

Conditions in mature credit markets deteriorated sharply after September 2008, and strains remain intense despite policy efforts and some improvements in market sentiment following the G20 meeting in early April. While interbank spreads have been lowered, bank CDS spreads and corporate spreads have remained wide, and equity prices are close to multiyear lows, as adverse linkages between the financial sector and the real economy have intensified.
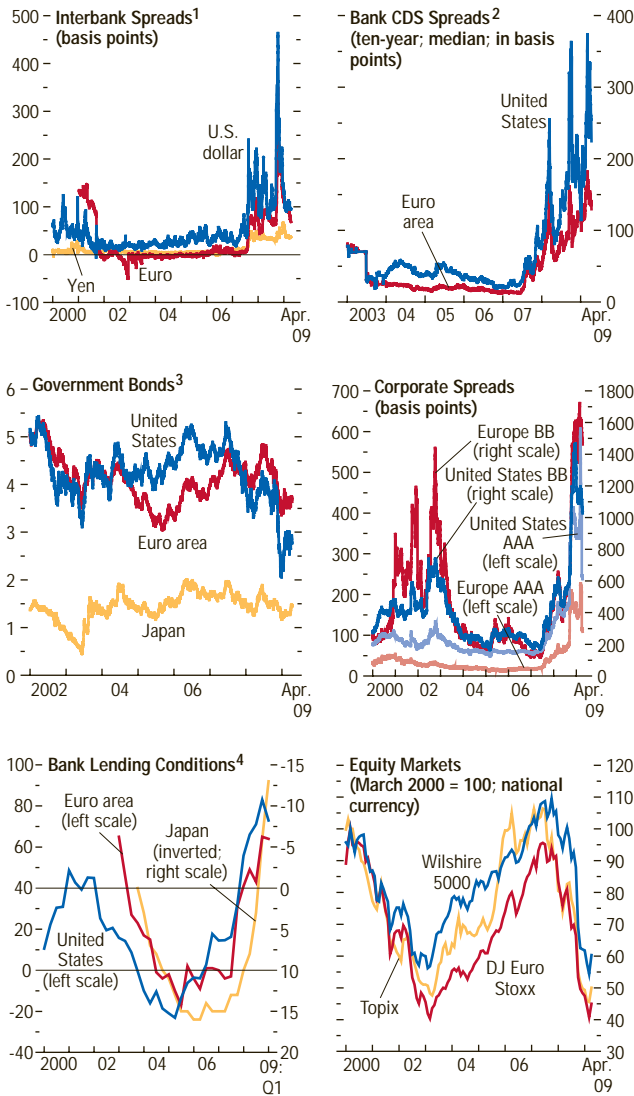
Sources: Bank of Japan; Bloomberg Financial Markets; Federal Reserve Board of Governors; European Central Bank; Merrill Lynch; and IMF staff calculations.
[1]Three-month London interbank offered rate minus three-month government bill rate.
[2]CDS = credit default swap.
[3]Ten-year government bonds.
[4]Percent of respondents describing lending standards as tightening "considerably" or "somewhat" minus those indicating standards as easing "considerably" or "somewhat" over the previous three months. Survey of changes to credit standards for loans or lines of credit to enterprises for the euro area; average of surveys on changes in credit standards for commercial/industrial and commercial real estate lending for the United States; Diffusion index of "accommodative" minus "severe," Tankan lending attitude of financial institutions survey for Japan.

How Did Things Get So Bad, So Fast?

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

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

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

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

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

Figure 1.3. Emerging Market Conditions

Emerging markets were hard hit by the escalation of the financial crisis. Equity prices plummeted, spreads widened sharply, and new securities issues were curtailed. Policy rates were lowered in response to weakening economic prospects, although less aggressively than in mature markets in view of concerns about presure on the external accounts from a reversal in capital flows.
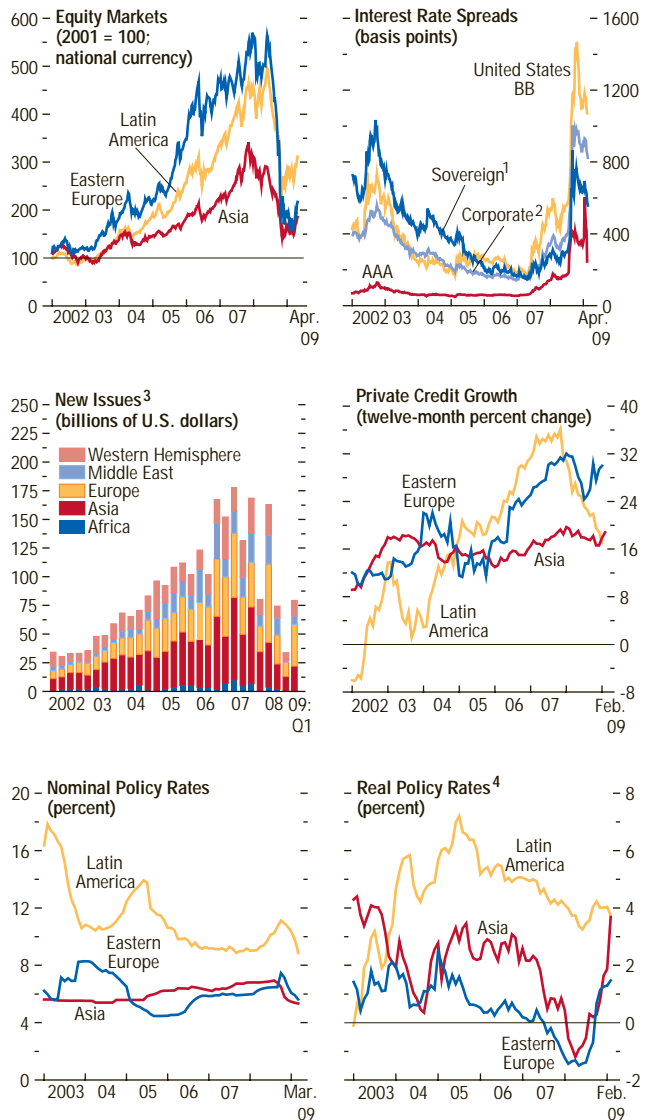
Sources: Bloomberg Financial Markets; Capital Data; IMF, *International Financial Statistics;* and IMF staff calculations.
[1] JPMorgan EMBI Global Index spread.
[2] JPMorgan CEMBI Broad Index spread.
[3] Total of equity, syndicated loans, and international bond issuances.
[4] Relative to headline inflation.

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

Industrial production, trade, and employment have dropped sharply since the blowout in the financial crisis in September 2008. Recent data on business confidence and retail sales provide some tentative signs that the rate of contraction of the global economy may now be moderating.
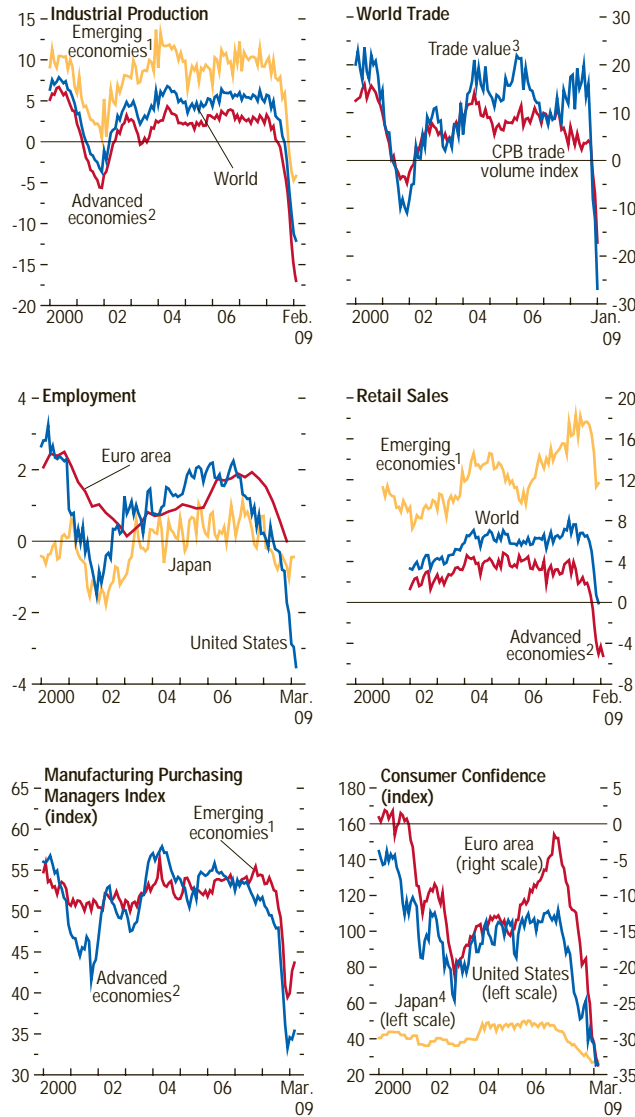
Sources: CPB Netherlands Bureau for Economic Policy Analysis for CPB trade volume index; for all others, NTC Economics and Haver Analytics.

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

[2]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.

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

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

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

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

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

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

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

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

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

Figure 1.5. Global Inflation
(Twelve-month change in the consumer price index unless otherwise noted)

Inflation pressures have subsided quickly, as output gaps have widened and food and fuel prices have dropped. One-year inflation expectations and core inflation have declined below central bank inflation objectives in major advanced economies.
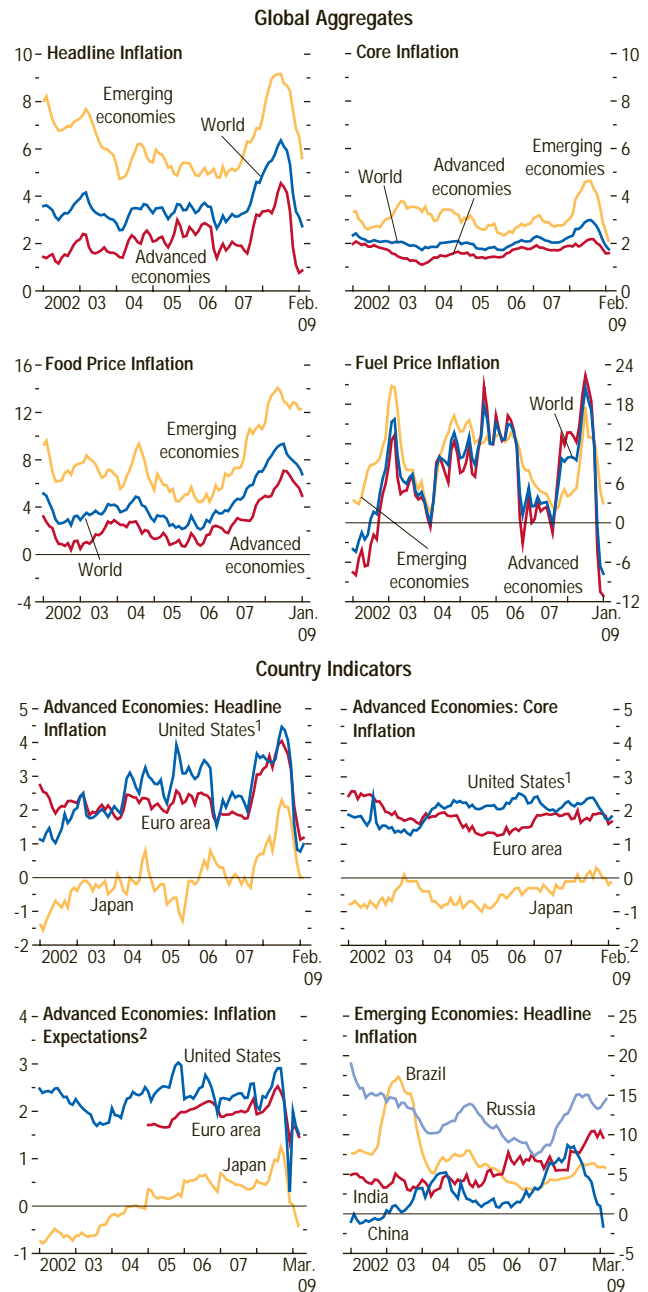
Sources: Bloomberg Financial Markets; Haver Analytics; and IMF staff calculations.
[1]Personal consumption expenditure deflator.
[2]One-year-ahead consensus forecasts.

Figure 1.6. External Developments

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

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

Major Currencies

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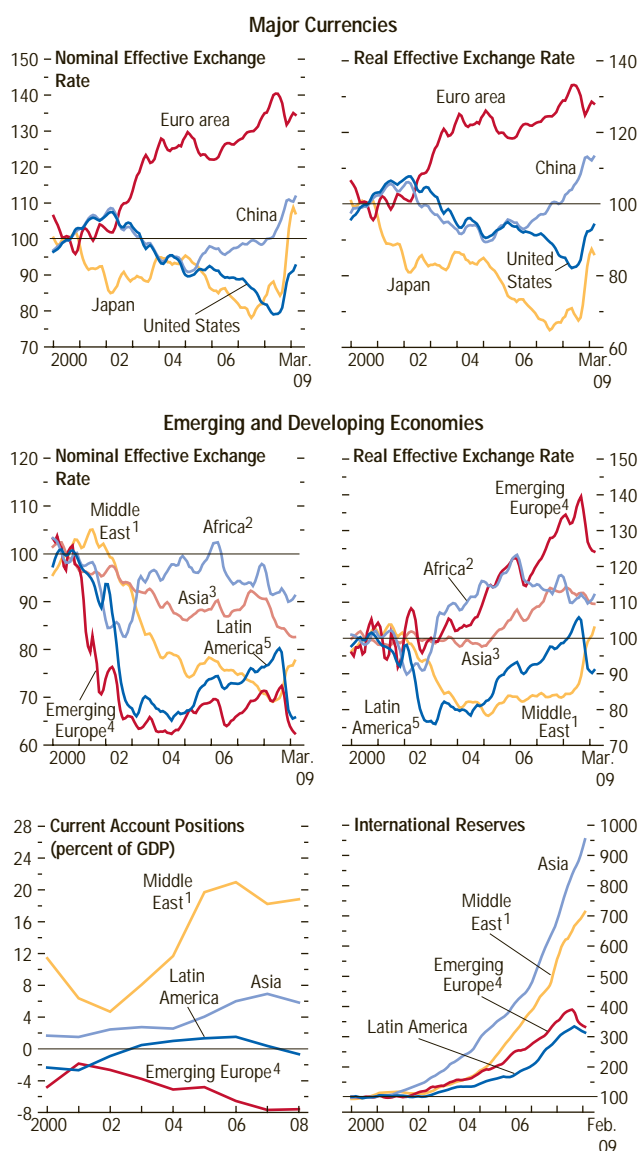
Sources: IMF, *International Financial Statistics;* and IMF staff calculations.

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

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

[3]Asia excluding China.

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

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

Policies Fail to Gain Traction

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

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

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

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

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

Figure 1.7. Measures of Monetary Policy and Liquidity in Selected Advanced Economies
(Interest rates in percent unless otherwise noted)

Policy rates in the major advanced economies have been lowered rapidly as inflation pressures have subsided and economic prospects have deteriorated. With policy rates approaching the zero floor, central banks have increasingly taken steps to support credit creation more directly, leading to the rapid expansion of their balance sheets. Despite these efforts, credit growth to the private sector has slowed sharply.
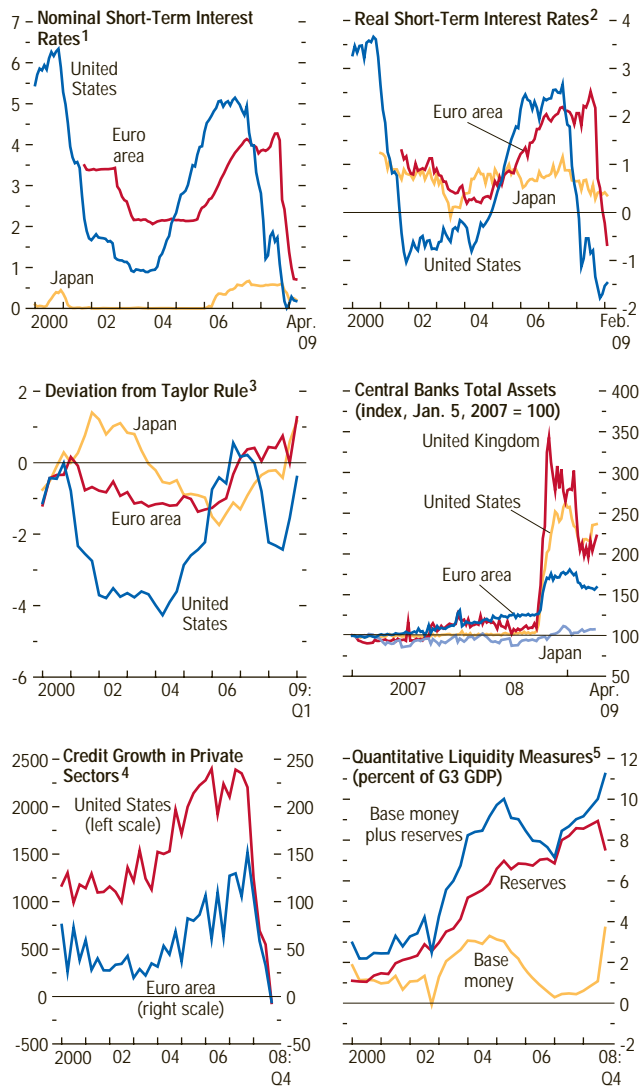
Sources: Bloomberg Financial Markets; Eurostat; Haver Analytics; Merrill Lynch; OECD *Economic Outlook;* and IMF staff calculations.
[1] Three-month treasury bills.
[2] Relative to core inflation.
[3] The Taylor rate depends on (1) the neutral real rate of interest, which in turn is a function of potential output growth; (2) the deviation of expected consumer price inflation from the inflation target; and (3) the output gap. Expected inflation is derived from one-year-ahead consensus forecasts.
[4] Quarter-over-quarter changes; in billions of local currency.
[5] Change over three years for euro area, Japan, and United States (G3), denominated in U.S. dollars.

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

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

The Financial Hole Has Become Even Deeper

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

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

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

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

Short-Term Prospects Are Precarious

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

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

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

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

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

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

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

			Year over Year				Q4 over Q4		
			Projections		Difference from January 2009 WEO Projections		Estimates	Projections	
	2007	2008	2009	2010	2009	2010	2008	2009	2010
World output[1]	**5.2**	**3.2**	**−1.3**	**1.9**	**−1.8**	**−1.1**	**0.2**	**−0.6**	**2.6**
Advanced economies	2.7	0.9	−3.8	0.0	−1.8	−1.1	−1.7	−2.6	1.0
United States	2.0	1.1	−2.8	0.0	−1.2	−1.6	−0.8	−2.2	1.5
Euro area	2.7	0.9	−4.2	−0.4	−2.2	−0.6	−1.4	−3.5	0.6
Germany	2.5	1.3	−5.6	−1.0	−3.1	−1.1	−1.7	−4.4	0.0
France	2.1	0.7	−3.0	0.4	−1.1	−0.3	−1.0	−2.2	1.4
Italy	1.6	−1.0	−4.4	−0.4	−2.3	−0.3	−2.9	−2.9	0.2
Spain	3.7	1.2	−3.0	−0.7	−1.3	−0.6	−0.7	−2.9	0.2
Japan	2.4	−0.6	−6.2	0.5	−3.6	−0.1	−4.3	−2.7	−0.6
United Kingdom	3.0	0.7	−4.1	−0.4	−1.3	−0.6	−2.0	−3.2	0.6
Canada	2.7	0.5	−2.5	1.2	−1.3	−0.4	−0.7	−1.9	1.7
Other advanced economies	4.7	1.6	−4.1	0.6	−1.7	−1.6	−2.7	−1.9	1.7
Newly industrialized Asian economies	5.7	1.5	−5.6	0.8	−1.7	−2.3	−4.8	−1.5	2.0
Emerging and developing economies[2]	8.3	6.1	1.6	4.0	−1.7	−1.0	3.3	2.3	5.0
Africa	6.2	5.2	2.0	3.9	−1.4	−1.0	. . .	. . .	. . .
Sub-Sahara	6.9	5.5	1.7	3.8	−1.8	−1.2	. . .	. . .	. . .
Central and eastern Europe	5.4	2.9	−3.7	0.8	−3.3	−1.7	. . .	. . .	. . .
Commonwealth of Independent States	8.6	5.5	−5.1	1.2	−4.7	−1.0	. . .	. . .	. . .
Russia	8.1	5.6	−6.0	0.5	−5.3	−0.8	1.2	−4.7	1.0
Excluding Russia	9.9	5.3	−2.9	3.1	−3.2	−1.3	. . .	. . .	. . .
Developing Asia	10.6	7.7	4.8	6.1	−0.7	−0.8	. . .	. . .	. . .
China	13.0	9.0	6.5	7.5	−0.2	−0.5	6.8	6.9	7.9
India	9.3	7.3	4.5	5.6	−0.6	−0.9	4.5	4.8	5.9
ASEAN–5	6.3	4.9	0.0	2.3	−2.7	−1.8	2.1	1.2	3.3
Middle East	6.3	5.9	2.5	3.5	−1.4	−1.2	. . .	. . .	. . .
Western Hemisphere	5.7	4.2	−1.5	1.6	−2.6	−1.4	. . .	. . .	. . .
Brazil	5.7	5.1	−1.3	2.2	−3.1	−1.3	1.2	1.1	2.4
Mexico	3.3	1.3	−3.7	1.0	−3.4	−1.1	−1.7	−2.1	2.5
Memorandum									
European Union	3.1	1.1	−4.0	−0.3	−2.2	−0.8	. . .	. . .	. . .
World growth based on market exchange rates	3.8	2.1	−2.5	1.0	−1.9	−1.1	. . .	. . .	. . .
World trade volume (goods and services)	**7.2**	**3.3**	**−11.0**	**0.6**	**−8.2**	**−2.6**	. . .	. . .	. . .
Imports									
Advanced economies	4.7	0.4	−12.1	0.4	−9.0	−1.5	. . .	. . .	. . .
Emerging and developing economies	14.0	10.9	−8.8	0.6	−6.6	−5.2	. . .	. . .	. . .
Exports									
Advanced economies	6.1	1.8	−13.5	0.5	−9.8	−1.6	. . .	. . .	. . .
Emerging and developing economies	9.5	6.0	−6.4	1.2	−5.6	−4.2	. . .	. . .	. . .
Commodity prices (U.S. dollars)									
Oil[3]	10.7	36.4	−46.4	20.2	2.1	0.2	. . .	. . .	. . .
Nonfuel (average based on world commodity export weights)	14.1	7.5	−27.9	4.4	1.2	−2.9	. . .	. . .	. . .
Consumer prices									
Advanced economies	2.2	3.4	−0.2	0.3	−0.5	−0.5	2.1	−0.1	0.4
Emerging and developing economies[2]	6.4	9.3	5.7	4.7	−0.1	−0.3	7.7	4.4	4.0
London interbank offered rate (percent)[4]									
On U.S. dollar deposits	5.3	3.0	1.5	1.4	0.2	−1.5	. . .	. . .	. . .
On euro deposits	4.3	4.6	1.6	2.0	−0.6	−0.7	. . .	. . .	. . .
On Japanese yen deposits	0.9	1.0	1.0	0.5	0.0	0.1	. . .	. . .	. . .

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

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

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

[3]Simple average of prices of U.K. Brent, Dubai, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was $97.03 in 2008; the assumed price based on future markets is $52.00 in 2009 and $62.50 in 2010.

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

Box 1.1. Global Business Cycles

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

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

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

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

Dating Global Business Cycles

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

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

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

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

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

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

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

Box 1.1 *(continued)*

Real per Capita World GDP[1]
(Contractions in purchasing-power-parity (PPP)-weighted global per capita GDP are shaded)

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

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

A Broader Assessment of Turning Points

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

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

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

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

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

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

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

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

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

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

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

Selected Variables around World Recessions
(Annual percent change unless otherwise noted; years on x-axis; trough in output at t = 0*)*
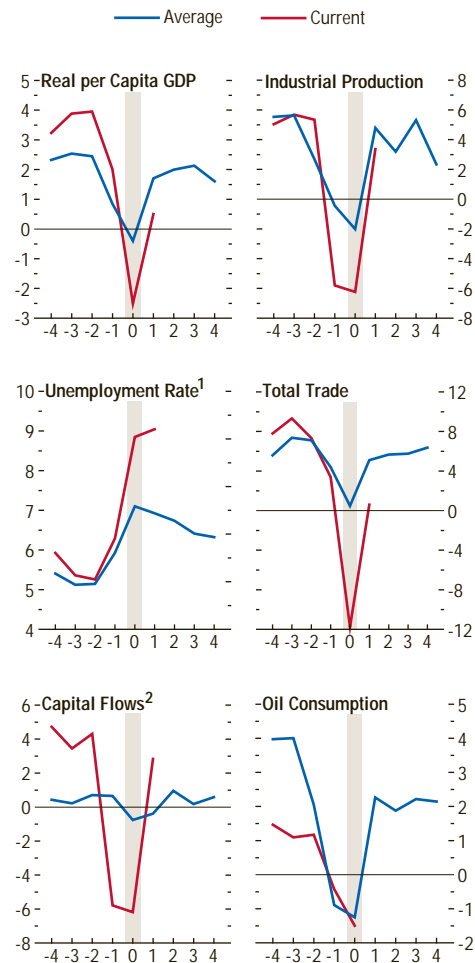
Source: IMF staff calculations.
[1]Unemployment rate in percent. Comprises data in the advanced economies only.
[2]Capital flows refer to the two year rolling window average of the ratio of inflows plus outflows to GDP.

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

Synchronicity of National Recessions

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

Box 1.1 *(concluded)*

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

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

Note: The 1991 recession lasted until 1993, using market weights; all other recessions lasted one year.
[1]PPP = purchasing power parity.
[2]Refers to change in the two-year rolling window average of the ratio of inflows plus outflows to GDP.
[3]Refers to percentage point change in the rate of unemployment.

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

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

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

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

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

Countries Experiencing Recessions[1]
(Purchasing-power-parity (PPP)-weighted percent of countries)
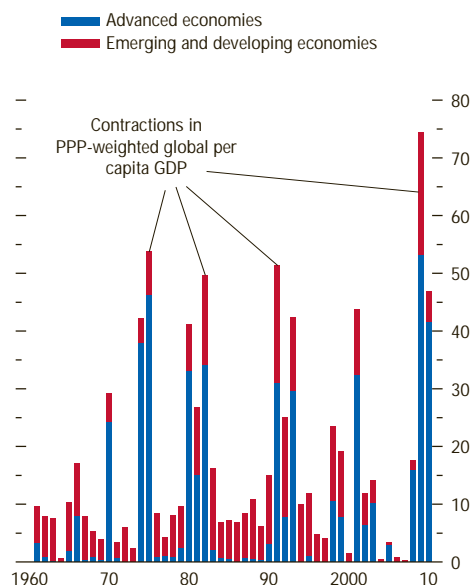
Source: IMF staff estimates.
[1]Data for 2009–10 are based on the WEO forecast.

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

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

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

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

The global economy is projected to undergo a deep and prolonged recession in 2009 with growth only returning at a gradual pace in 2010 based on strong policy actions. A wide range of advanced and emerging economies are projected to suffer substantial contractions in economic activity in 2009.
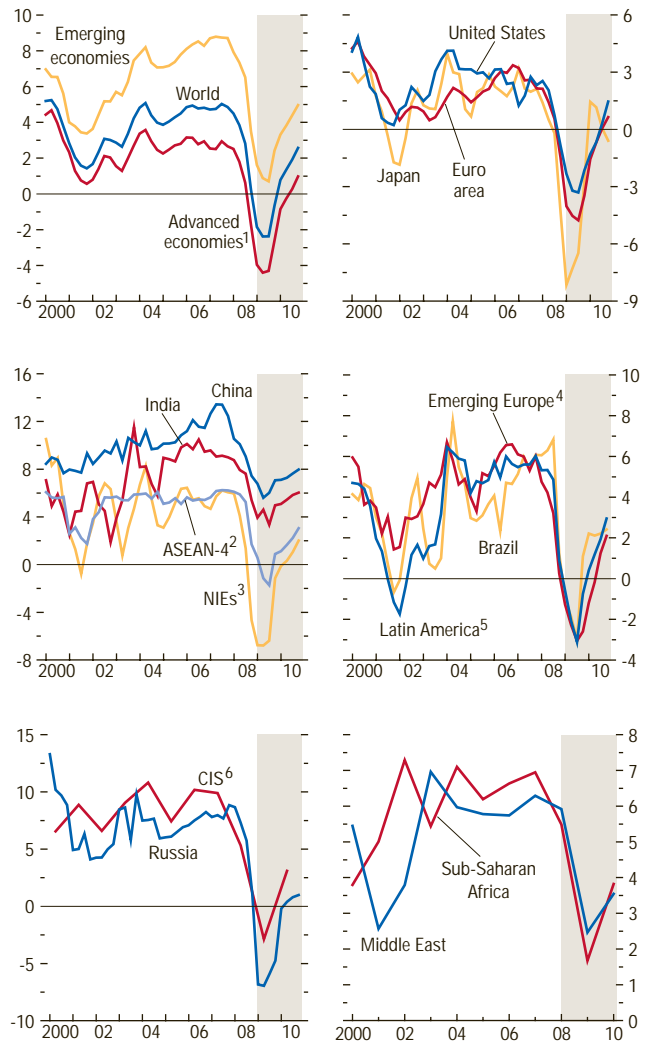
Sources: Haver Analytics; and World Economic Outlook (WEO) database.
[1]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.
[2]Indonesia, Malaysia, Philippines, and Thailand.
[3]Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.
[4]Estonia, Hungary, Latvia, Lithuania, and Poland.
[5]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.
[6]Commonwealth of Independent States.

Figure 1.9. Potential Growth and the Output Gap[1]

The severe global recession will imply a sharp widening in output gaps, particularly in the advanced economies, but will also affect most emerging economies. These gaps are expected to close only slowly over the medium term, implying persistently high levels of unemployment.
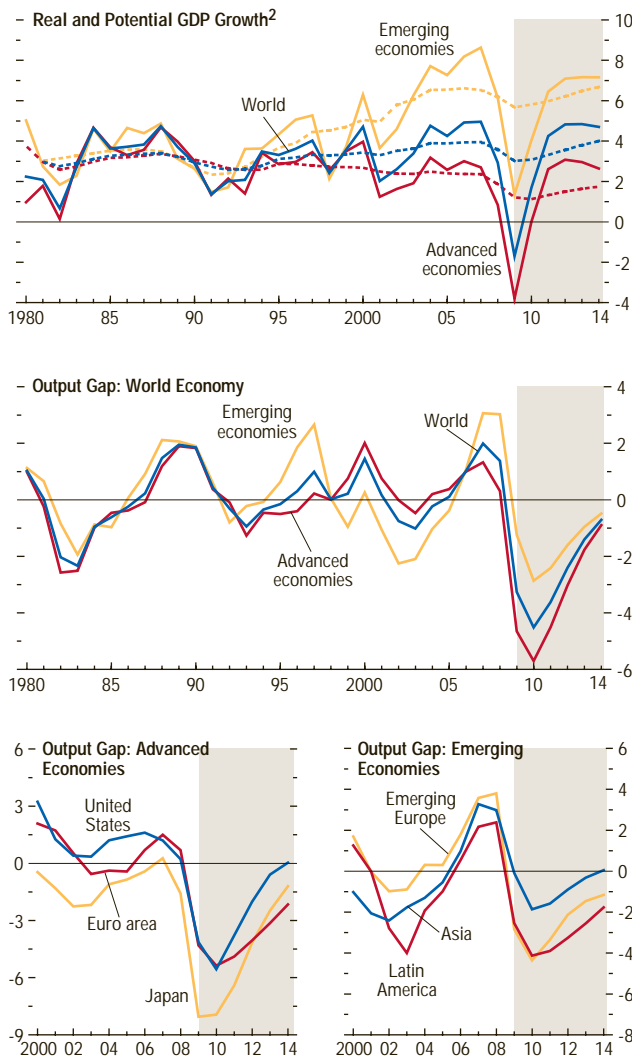
Source: IMF staff estimates.
[1] Estimates of the output gap, in percent of potential GDP, are based on IMF staff calculations.
[2] GDP growth rates of actual (solid line) versus potential (dashed line) for advanced economies. For emerging economies, Hodrick-Prescott filter applied for potential GDP.

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

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

Downside Risks Predominate

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

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

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

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

Figure 1.10. Risks to World GDP Growth[1]
(Percent change)

The outlook is exceptionally uncertain, with risks to the forecast still weighing to the downside. See Appendix 1.2 for details of how the variance and skewness of the fan chart are related to market indicators.
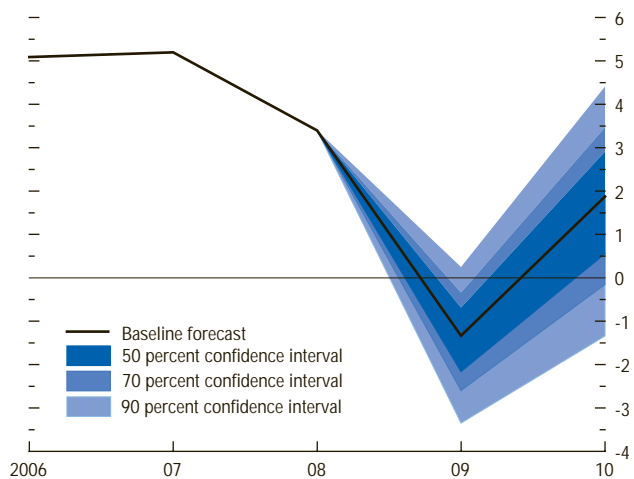
Source: IMF staff estimates.
[1]The fan chart shows the uncertainty around the WEO central forecast with 50, 70, and 90 percent probability intervals. As shown, the 70 percent confidence interval includes the 50 percent interval, and the 90 percent confidence interval includes the 50 and 70 percent intervals.

Figure 1.11. Housing Developments

House prices have decelerated sharply across a broad range of advanced economies and are now falling in a number of markets. Nevertheless, house price misalignments remain substantial in many countries.
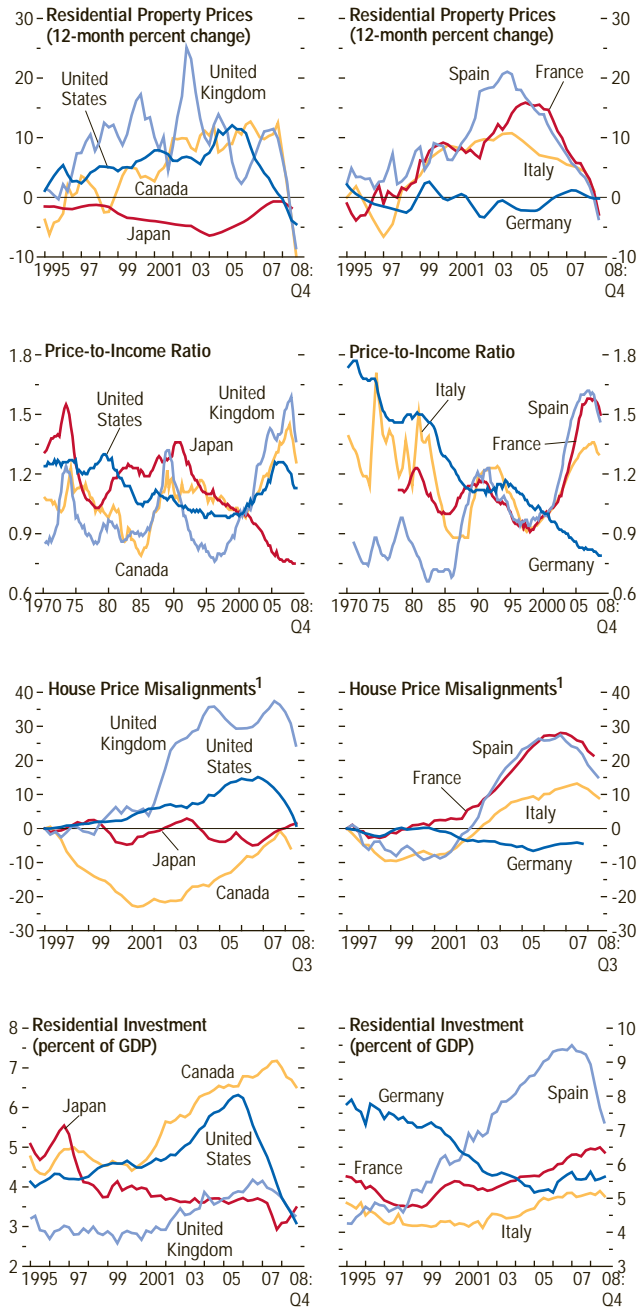
Sources: Haver Analytics; Organization for Economic Cooperation and Development, *Economic Outlook;* and IMF staff calculations.
[1]Estimates based on methodology described in Box 1.2 of the October 2008 *World Economic Outlook.*

funding could fail to slow the momentum of deleveraging.

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

When Will Housing Slumps End?

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

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

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

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

Rising Threat of Emerging Market Corporate Defaults

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

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

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

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

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

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

Box 1.2. How Vulnerable Are Nonfinancial Firms?

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

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

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

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

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

Selected Balance Sheet Indicators for Nonfinancial Firms[1]

— Developed Americas   — Emerging Americas
— Developed Europe   — Emerging Europe and Russia
— Developed Asia   — Emerging Asia

Debt-Equity Ratio

Interest Coverage Ratio

Return on Assets

Expected Default Probability One Year Ahead[2]
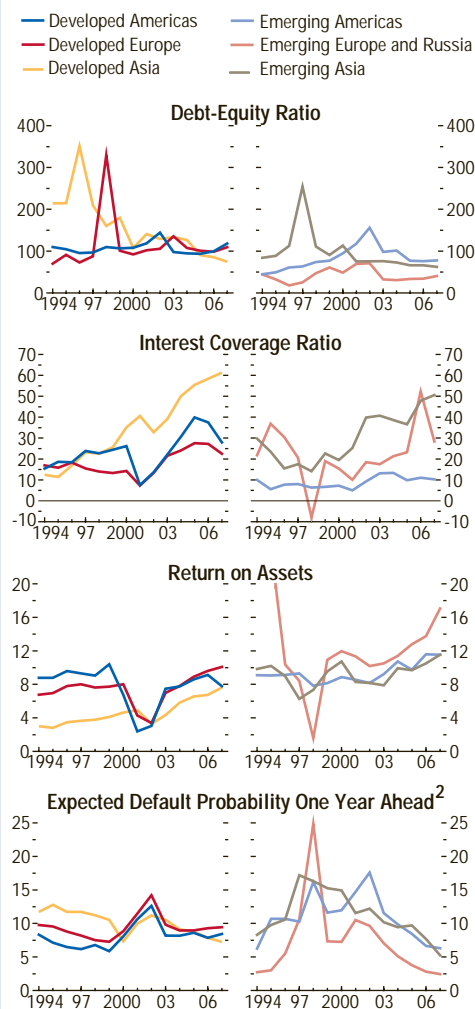
Sources: Worldscope; and IMF staff calculations.
[1]In percent. Regional aggregates are computed by weighing country data by market capitalization valued at market exchange rates. Within countries, firm-level data are also weighed by market capitalization, to focus on the default risk of the largest, economically most important firms.
[2]Default probabilities are calculated based on so-called Z-scores —a weighted sum of the ratio of working capital to total assets, retained earnings to total assets, earnings before interest and taxes, total assets, market value of equity to total liabilities, and sales to total assets. The weights are estimated for a sample of U.S. firms (Altman, 1968).

Selected Market-Based Indicators for Nonfinancial Firms[1]

— United States
— Japan
— Euro area
— East Asia and China
— Emerging Europe and Russia
— Latin America
— South Asia

Expected Default Frequency One Year Ahead
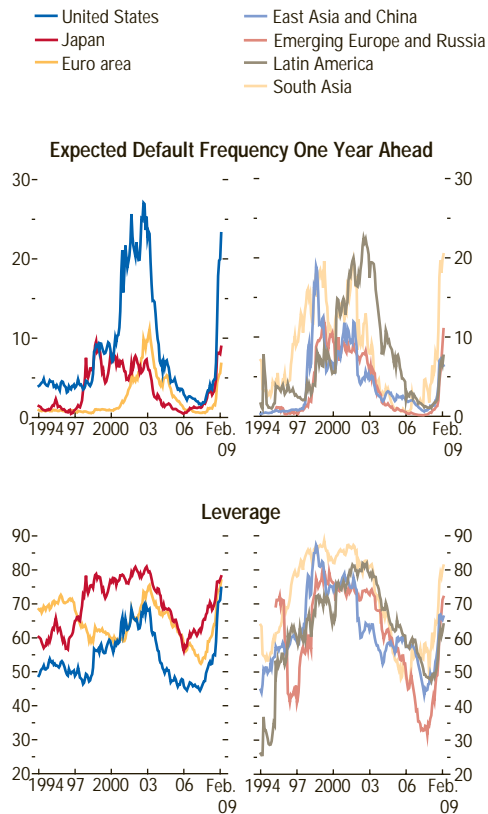
Leverage

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

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

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

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

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

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

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

Box 1.2 *(concluded)*

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

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

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

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

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

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

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

Gauging Risks for Deflation

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

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

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

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

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

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

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

Sovereigns under Stress

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

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

Box 1.3. Assessing Deflation Risks in the G3 Economies

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

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

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

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

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

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

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

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

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

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

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

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

Forecast Confidence Bands for the G3 Economies[1]

— 50th percentile

90, 70, 50, 30, 10 percent confidence bands

United States   **Euro Area**   **Japan**

Policy Rate (percent)

Consumer Price Index Inflation (percent change from a year earlier)

GDP Growth (percent change from a year earlier)

Unemployment Rate (percent)

Source: IMF staff estimates based on Global Projection Model.
[1]Clinton and others (forthcoming).
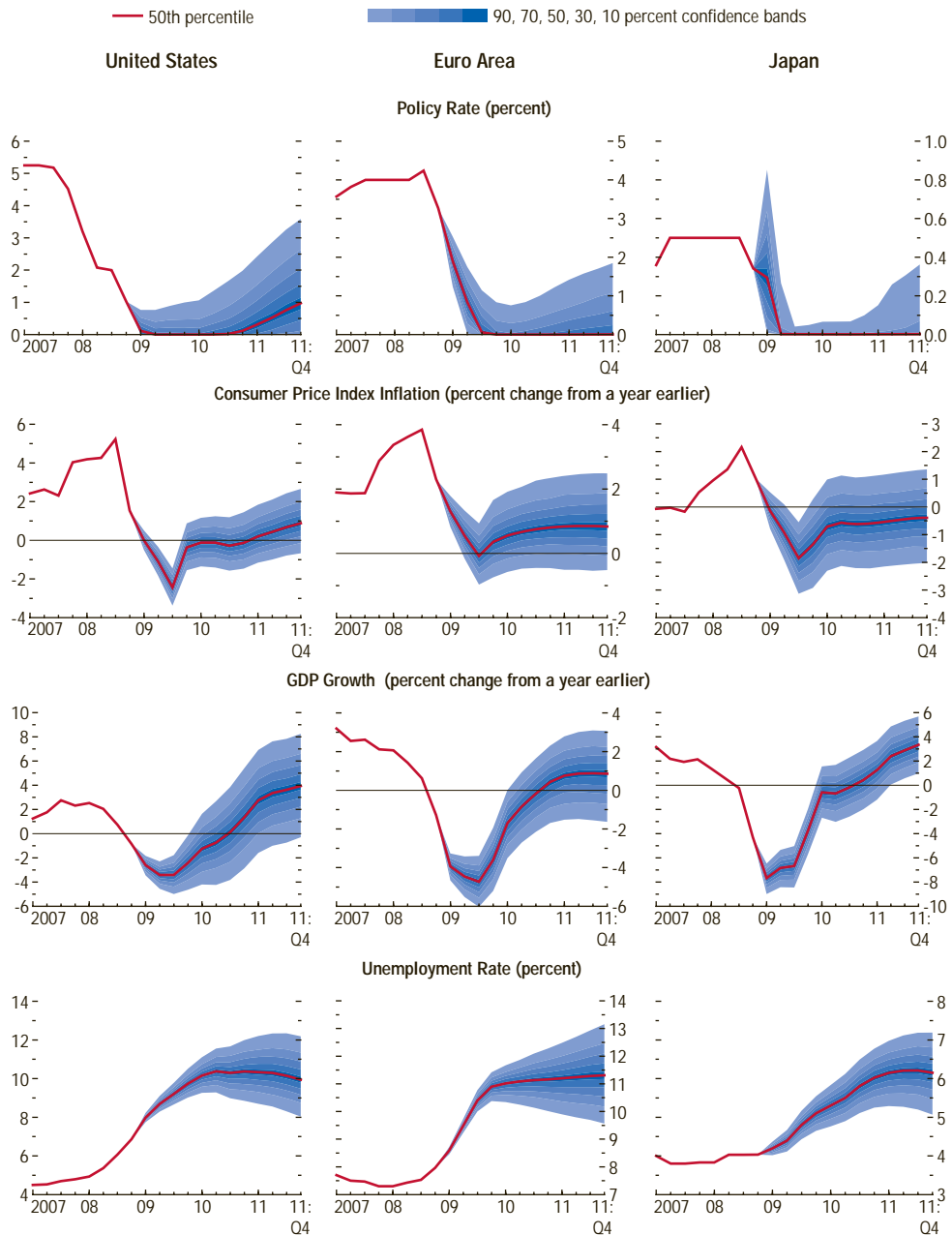
Box 1.3 *(concluded)*

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

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

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

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

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

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

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

Exploring the Downside

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

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

Medium-Term Prospects beyond the Crisis

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

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

Figure 1.12. Downside Scenario
(Percent change in output from a year earlier unless otherwise noted)

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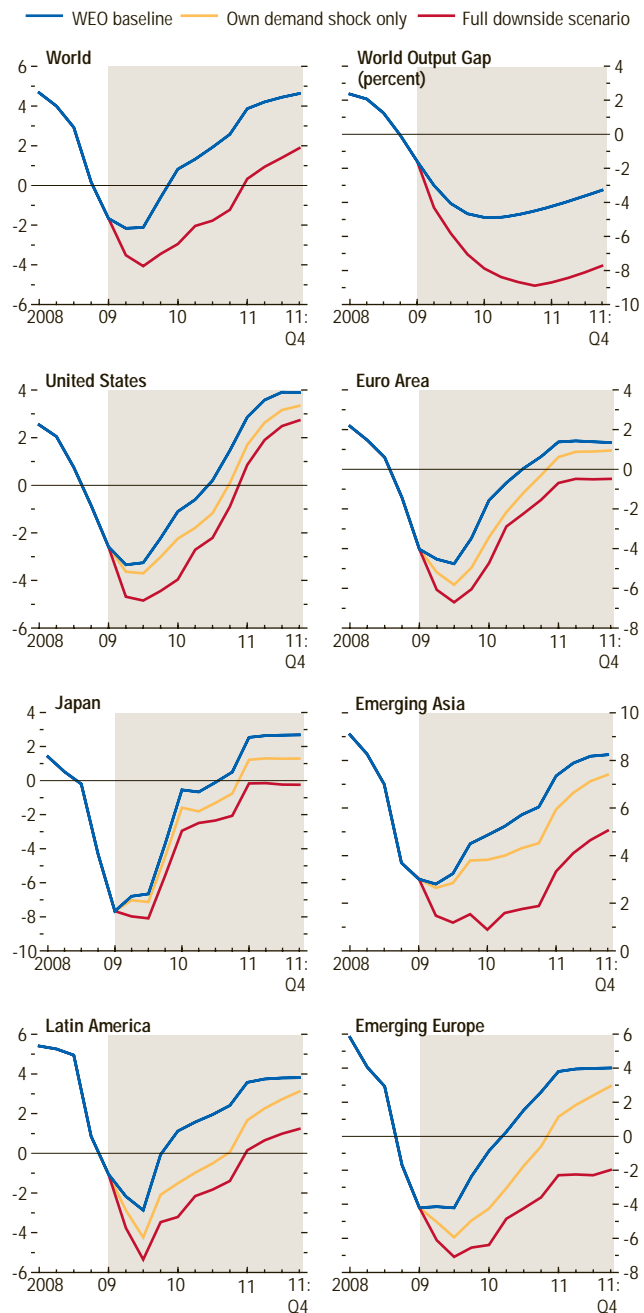
Sources: WEO database; and model simulations.

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

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

Deleveraging Will Continue to Weigh on Credit Creation and Capital Flows

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

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

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

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

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

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

Paths to Fiscal Consolidation

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

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

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

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

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

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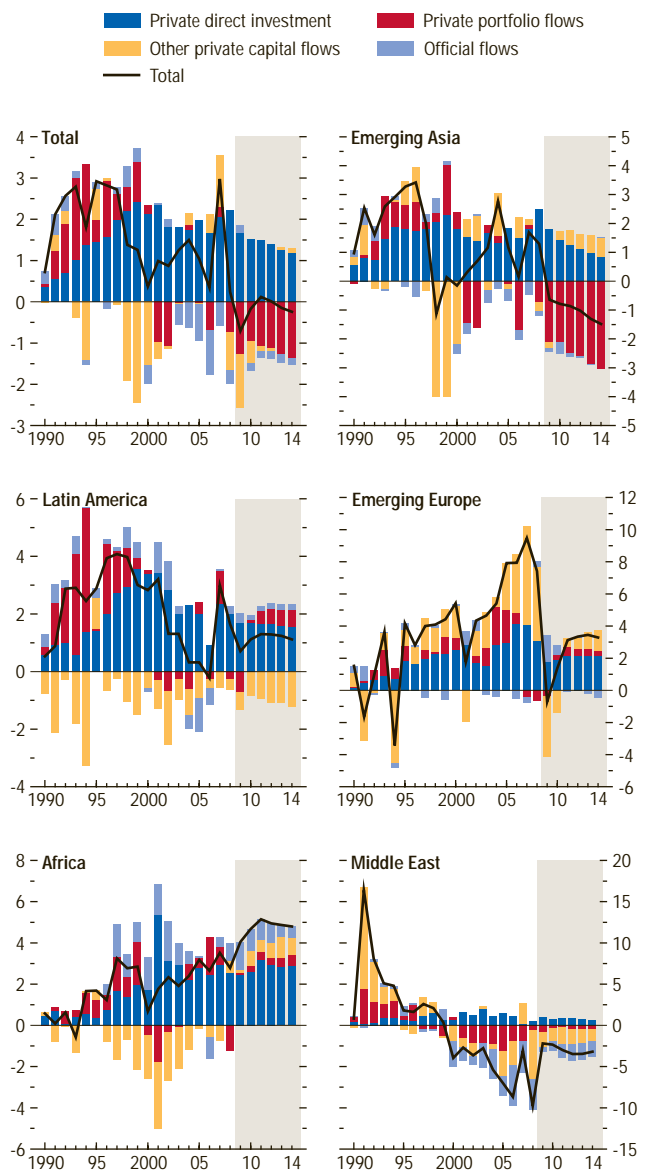
Source: WEO database.

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

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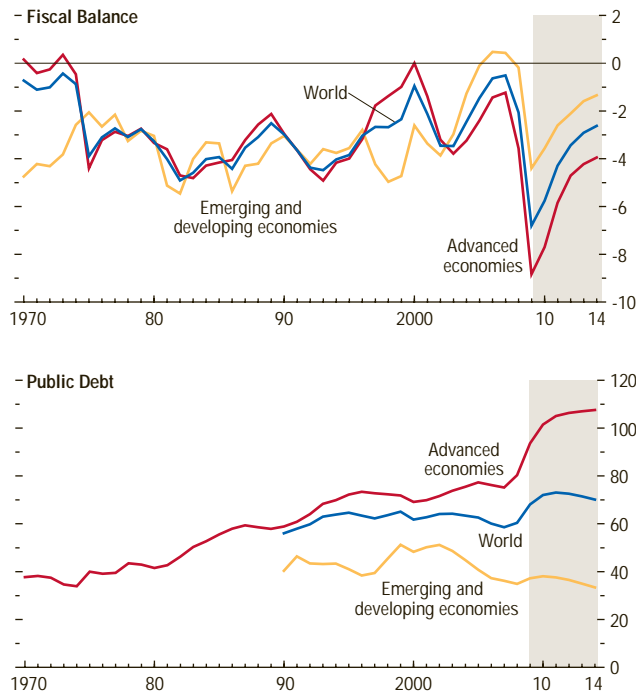
Source: WEO database projections.

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

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

Private Sector Challenges and Responses

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

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

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

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

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

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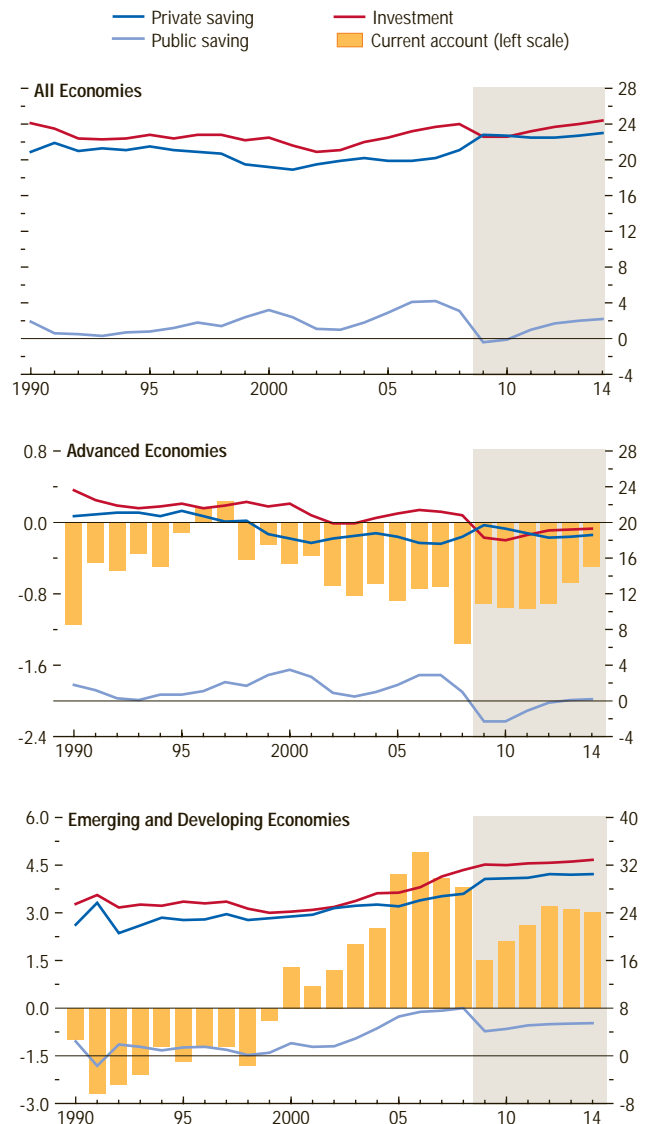
Source: WEO database projections.

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

Alternative Paths Depend on Policy Choices

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

Alternative paths for the global economy are illustrated in Figure 1.16, based on the IMF staff's Global Integrated Monetary and Fiscal Model. The simulations show a benign scenario and a downside scenario. In the benign scenario, policies foster a successful rebalancing of the global economy. Key ingredients include stronger consumption growth in east Asia alongside an appreciating real effective exchange rate facilitated by more flexible exchange rate management, successful implementation of plans to rebuild effective financial intermediation at both the national and international levels, and advances toward financial and trade integration of the global economy (including, for example, completion of the Doha Round of world trade negotiations). Global growth would return to robust rates, allowing output gaps to be closed more quickly and providing room for more rapid fiscal consolidation in the United States and elsewhere. Global imbalances would be reduced as a depreciating dollar continues to lower the U.S. current account deficit, while Asian surpluses moderate.

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

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

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

Figure 1.16. Alternative Medium-Term Scenarios
(All variables in levels; years on x-axis)

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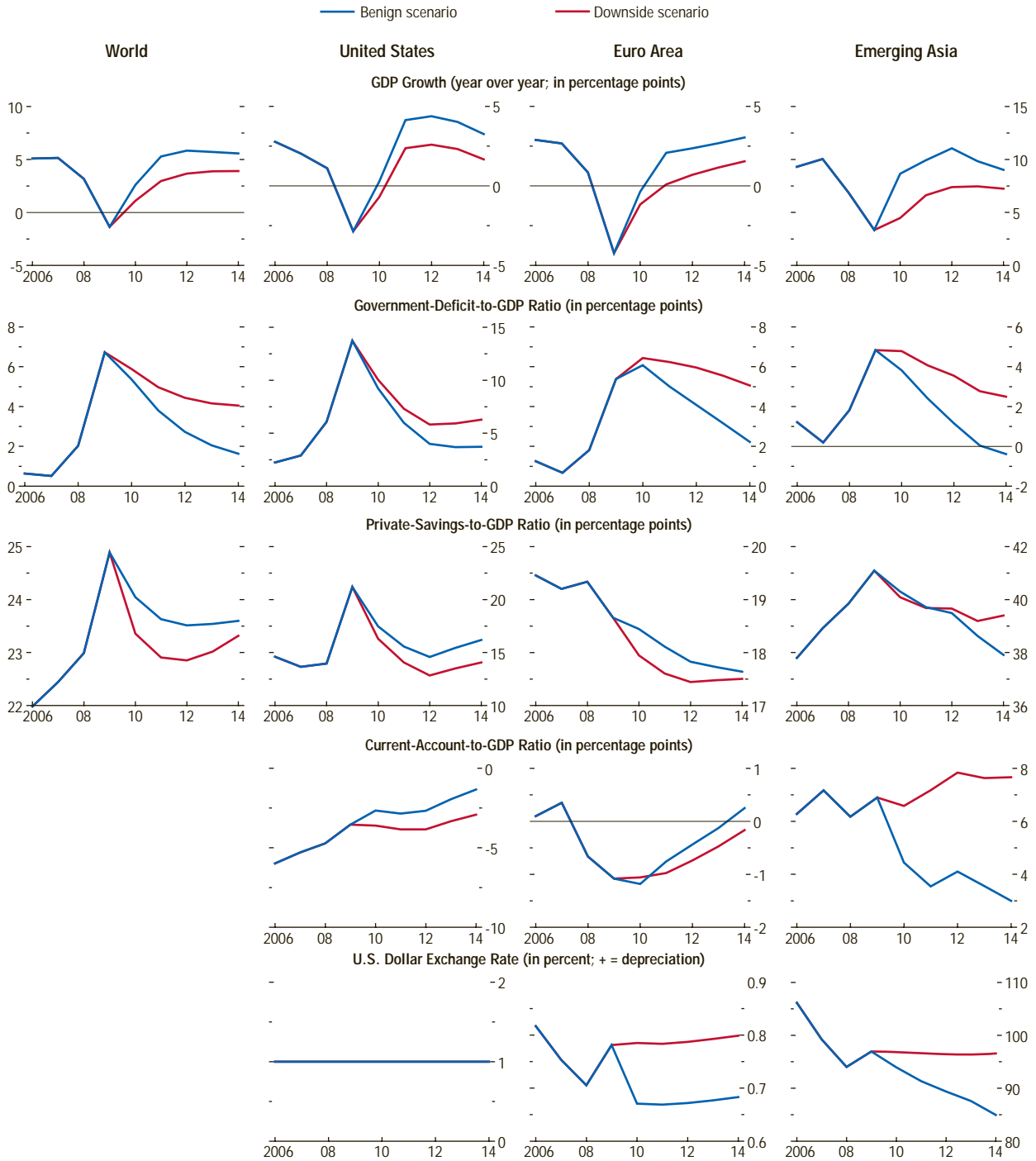
Source: GIMF simulations.

Box 1.4. Global Imbalances and the Financial Crisis

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

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

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

Origin of the Imbalances

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

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

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

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

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

Imbalances and the Crisis

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

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

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

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

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

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

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

U.S. Current Account Deficit and Its Financing
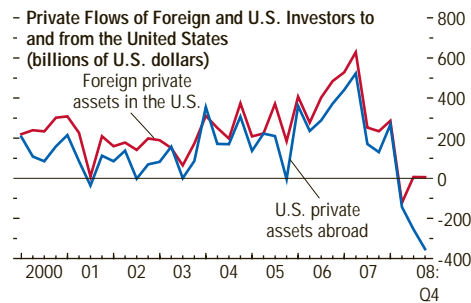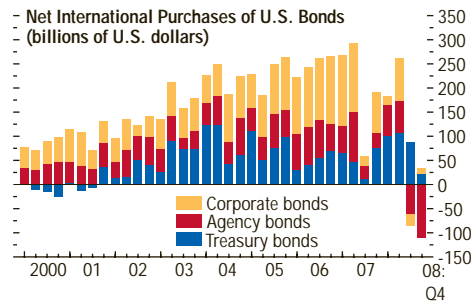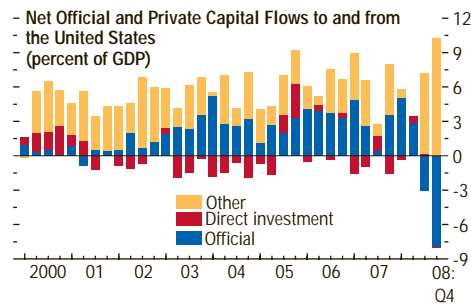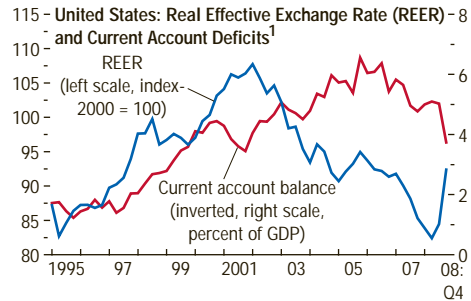
Sources: Haver Analytics; U.S. Treasury; and IMF staff calculations.
[1] Based on consumer price index.

Box 1.4 *(continued)*

Global Imbalances, Liquidity, and U.S. House Prices
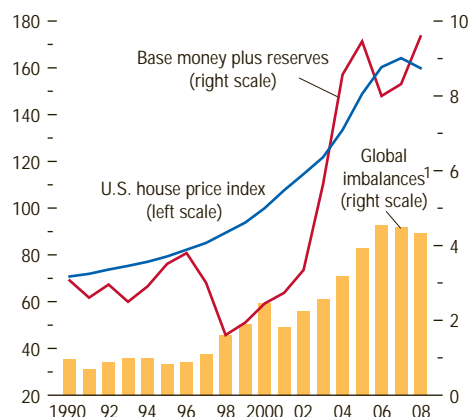
Sources: Haver Analytics; and IMF staff calculations.
[1]Absolute sum of current account balances in percent of world GDP.

even though their current account imbalances were not necessarily large.

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

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

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

In any event, the financial crisis accelerated the adjustment of global current account imbalances. Three channels are playing a key role in this process:
- an increase in private savings, owing to the unwinding of housing and credit bubbles in the United States, with a partly offsetting decline in public savings;
- a tightening of global credit conditions, owing to deleveraging in the financial sector, particularly in the United States, partly offset through the easing of monetary policy, liquidity provision, and bank rescue measures; and
- an improvement in the terms of trade, owing to a decline in oil prices for oil-importing countries, with opposite effects for oil-exporting countries.

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

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

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

Current Account Balances and Net Foreign Assets

(Percent of global GDP)

United States — Euro area
Japan — Oil exporters[1]
Emerging Asia[2]

Current Account Balance

April 2008 WEO

April 2009 WEO

Net Foreign Assets

April 2008 WEO

April 2009 WEO

Global Imbalances
(absolute sum of current account balances in percent of world GDP)

April 2008 WEO

April 2009 WEO
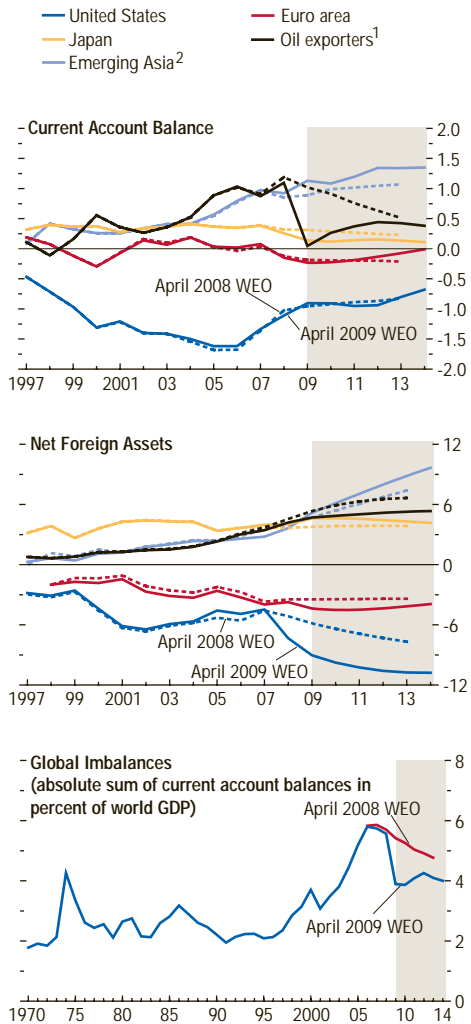
Sources: Lane and Milesi-Ferretti (2006); and IMF staff estimates.

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

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

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

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

Post-Crisis Outlook for Imbalances

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

Box 1.4 *(concluded)*

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

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

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

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

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

Financial Sector Policies—Dealing with the Core of the Problem

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Monetary Policy—Turning to Unconventional Approaches

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

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

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

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

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

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

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

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

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

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

Fiscal Policy—Stimulus with Sustainability

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

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

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

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

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

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

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

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

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

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

Global Responses Will Be Critical

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

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

a stronger basis for international policy collaboration.

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

Appendix 1.1. Commodity Market Developments and Prospects

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

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

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

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

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

How Has Financial Stress Affected Commodity Markets?

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

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

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

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

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

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

Figure 1.17. Commodity and Petroleum Prices
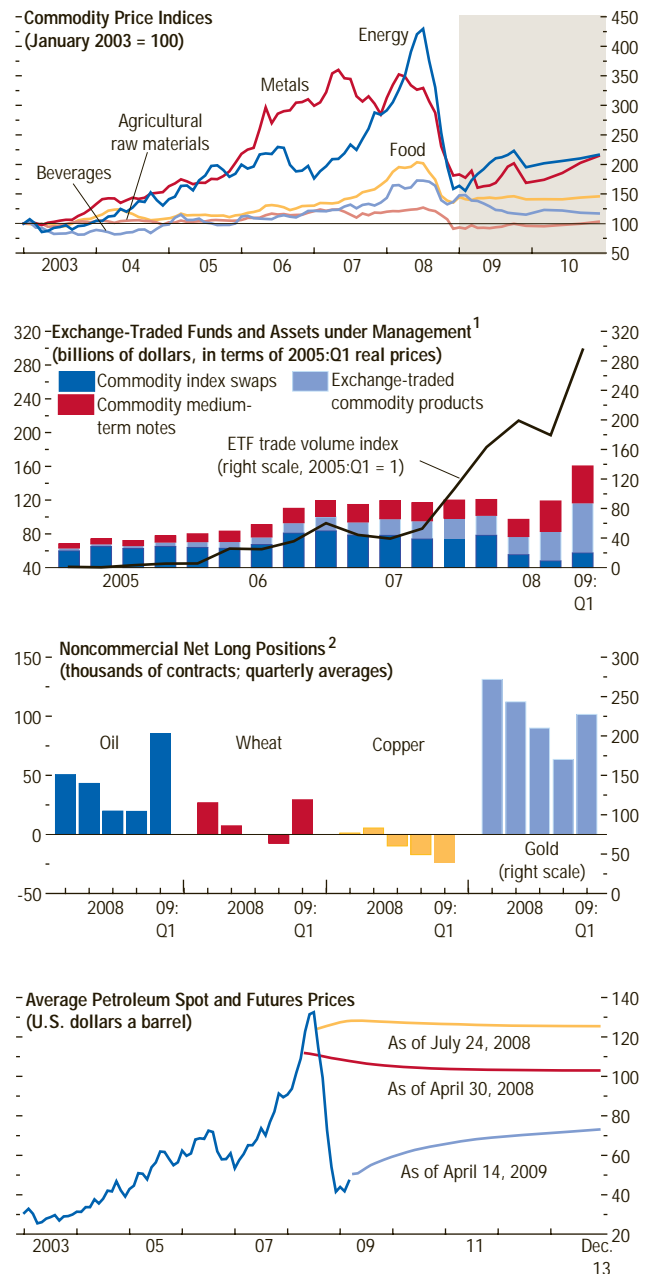
Sources: Barclays Capital; Bloomberg Financial Markets; and IMF staff estimates.
[1]Deflated by IMF Commodity Index.
[2]At the Chicago Board of Trade, New York Mercantile Exchange and Commodity Exchange, respectively.

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

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

Sources: Datastream; and IMF staff calculations.

[1]Standard deviation of weekly changes in commodity prices over a 12-month period.

[2]Data beginning in 1983–2007 for crude oil; 1988–2007 for aluminum; and 1979–2007 for nickel, corn, wheat, and soybeans. With increased financial turmoil in September–October, the price decline accelerated.

[3]WTI = West Texas Intermediate.

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

When Will Commodity Markets Rebound?

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

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

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

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

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

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

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

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

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

Will Prices Resume Their Trend Decline?

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

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

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

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

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

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

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

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

[3]Five-year contracts for wheat are not available.

Box 1.5 *(continued)*

Spot and Futures Price Volatility
(Standard deviations of daily price changes; in percent)

		Futures Prices			
	Spot	Three-month	One-year	Two-year	Five-year
Crude oil (WTI[1])					
1998–2008	8.6	7.9	6.0	5.1	4.7
1998–2003	8.4	7.5	4.3	2.9	2.5
2004–08	8.8	8.4	7.5	6.8	6.5
Aluminum					
1998–2008	4.6	4.4	3.7	3.2	3.3
1998–2003	3.5	3.2	2.4	1.8	0.5
2004–08	5.7	5.5	4.8	4.2	3.7
Copper					
1998–2008	7.0	6.9	6.3	6.0	6.8
1998–2003	4.2	4.2	3.6	3.3	2.7
2004–08	9.4	9.3	8.6	8.1	7.5
Wheat					
1998–2008	8.1	21.6	5.1	4.0	—
1998–2003	5.9	21.3	3.6	2.2	—
2004–08	10.2	22.1	6.5	5.1	—

Sources: Bloomberg Financial Markets; and IMF staff calculations.
[1]WTI = West Texas Intermediate.

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

How Reliable Are Futures Curve Signals?

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

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

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

Trends and Cycles in Commodity Prices
(In logs; in terms of U.S. Consumer price index)
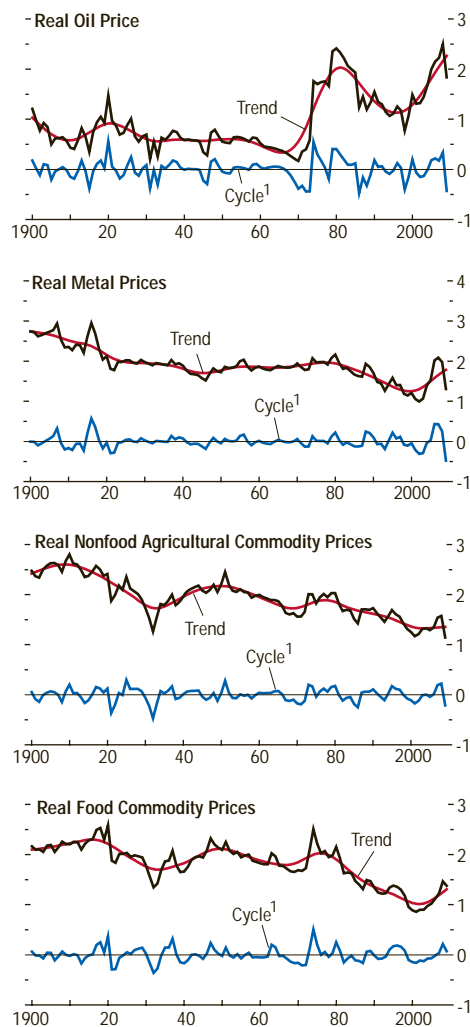
Sources: Grilli and Yang (1988); Pfaffenzeller, Newbold, and Rayner (2007); Bloomberg; and IMF staff calculations.
[1]Deviations from trend (in logs).

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

Success Ratios of Price Forecasts Based on Futures Spreads[1]

	Crude Oil[2]	Aluminum[2]	Copper[2]	Wheat[3]
12-month futures[4]				
1990:M1–2008:M11	0.84 [0.00]			
1998:M1–2008:M11	0.81 [0.00]	0.88 [0.00]	0.93 [0.00]	0.65 [0.00]
24-month futures[4]				
1998:M1–2008:M11	0.87 [0.00]	0.88 [0.00]	0.89 [0.00]	0.68 [0.00]

Sources: Bloomberg Financial Markets; and IMF staff calculations.

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

[2]New York Mercantile Exchange.

[3]Chicago Board of Trade.

[4]Last observation of the month.

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

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

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

[6]See Pesaran and Timmermann (1992).

When Will Commodity Demand Recover?

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

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

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

Box 1.5 *(concluded)*

Demand Growth Projections for Major Commodities[1]
(Annual percent change)
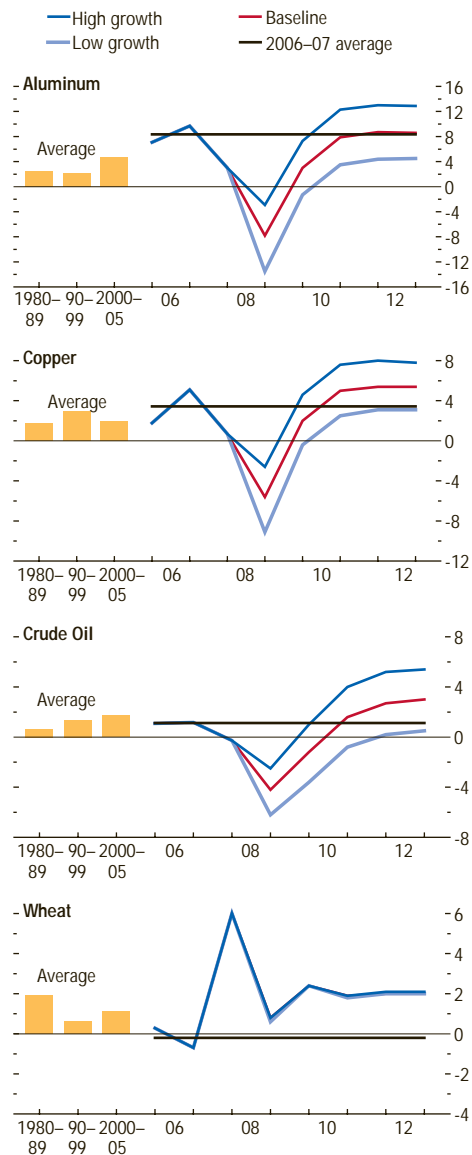
Source: IMF staff estimates.
[1]The charts show projected demand growth under the assumption of unchanged prices. The baseline scenario is based on the April 2009 WEO projections for regional growth; the high- and low-growth scenarios assume GDP growth paths at plus or minus one standard deviation around the baseline case.

and China—and other emerging and developing economies.

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

- Among the four commodities, demand for aluminum and copper respond most strongly to GDP changes, with the income elasticities typically exceeding 1. For crude oil, income elasticities are smaller than those for metals and are typically below 1. For wheat, income elasticities are virtually zero in all country groups. From a demand perspective, market conditions should therefore tighten first in metals markets.

- The model predicts that with unchanged prices, aluminum demand growth will rebound to the high average rates of 2006–07 by 2010 in the high-growth and baseline cases (second figure). In the low-growth scenario, which would represent a more protracted global downturn, demand growth would remain below the 2006–07 average through 2013.

- In the case of copper and crude oil, average growth during 2006–07 would be reached again in 2011 in the baseline scenario and by 2010 in the high-growth scenario. In the low-growth scenario, demand growth would again remain below recent average rates through 2013.

- Comparing the implied path for oil demand with capacity estimates suggests that in the high-growth scenario, spare capacity would again fall to the average level of 3 million barrels a day over 1989–2008 by 2010 and reach recent lows by 2011. In the baseline scenario, spare capacity would decrease more gradually.

- The model predicts that wheat demand will remain relatively buoyant in any scenario, suggesting that wheat prices may remain high throughout the downturn.

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

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

Oil Markets

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

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

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

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

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

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

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

Figure 1.18. World Oil Market Developments
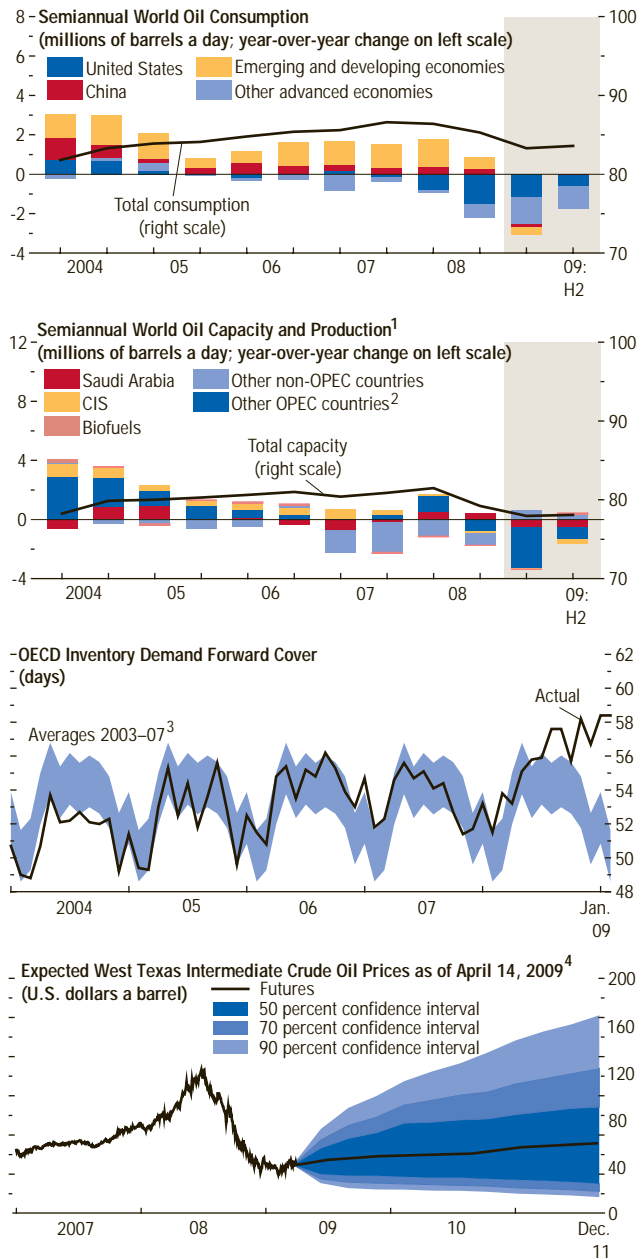
Sources: Bloomberg Financial Markets; International Energy Agency; U.S. Energy
Information Agency; and IMF staff estimates.
[1]CIS is the Commonwealth of Independent States. OPEC is the Organization of
Petroleum Exporting Countries.
[2]Includes OPEC natural gas liquids.
[3]Band is based on averages for each calendar month during 2003–07 and a 40 percent
confidence interval based on deviations during this period.
[4]From futures options.

constellation that is consistent with incentives
for building inventory.

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

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

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

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

	2003–06 Average	2007	2008	2009 Proj.	2007 H2	2008 H1	2008 H2	2007	2008	2009 Proj.	2008 H1	2008 H2
Demand												
OECD[1]	49.4	49.2	47.5	45.3	49.4	48.1	47.0	–0.8	–3.4	–4.9	–1.9	–4.8
North America	25.2	25.5	24.3	23.3	25.5	24.7	23.9	0.4	–4.8	–4.2	–3.4	–6.3
of which												
United States	20.9	21.0	19.9	19.0	20.2	19.5	19.5	0.0	–5.6	–4.4	–7.3	–3.7
Europe	15.6	15.3	15.2	14.6	15.5	15.0	15.4	–2.4	–0.6	–4.0	0.0	–1.1
Pacific	8.6	8.3	8.0	7.3	8.3	8.3	7.7	–1.6	–3.8	–8.9	–0.6	–7.1
Non-OECD	33.5	36.9	38.2	38.3	37.1	38.2	38.1	3.8	3.5	–0.1	4.3	2.7
of which												
China	6.5	7.5	7.9	7.8	7.6	7.9	7.8	4.6	4.3	–0.8	5.0	3.6
Other Asia	8.7	9.3	9.4	9.4	9.2	9.6	9.1	2.8	1.4	–0.6	3.8	–1.1
Former Soviet Union	3.9	4.1	4.2	4.1	4.2	4.1	4.3	1.6	2.3	–2.9	2.4	2.2
Middle East	5.8	6.5	6.9	7.2	6.6	6.8	7.0	4.7	6.4	2.5	5.9	6.8
Africa	2.8	3.1	3.1	3.2	3.1	3.2	3.1	3.8	2.1	0.9	2.4	1.8
Latin America	5.0	5.6	5.9	5.9	5.7	5.8	6.0	5.4	4.4	–0.1	5.1	3.8
World	82.8	86.0	85.7	83.4	86.5	86.3	85.1	1.1	–0.4	–2.8	0.8	–1.6
Production												
OPEC (current composition)[2]	33.6	34.9	35.9	—	35.3	36.0	35.8	–0.9	3.0	—	4.7	1.4
of which												
Saudi Arabia	10.2	10.0	10.4	—	10.1	10.4	10.4	–4.4	4.2	—	5.4	3.0
Nigeria	2.5	2.3	2.2	—	2.4	2.1	2.2	–4.8	–7.9	—	–8.0	–7.9
Venezuela	2.8	2.6	2.6	—	2.6	2.6	2.6	–7.8	–1.2	—	–0.5	–2.0
Iraq	1.8	2.1	2.4	—	2.2	2.4	2.4	9.9	14.0	—	23.9	5.5
Non-OPEC	49.8	50.7	50.6	50.3	50.5	50.8	50.3	0.8	–0.2	–0.7	–0.2	–0.3
of which												
North America	14.4	14.3	13.9	13.9	14.2	14.1	13.8	0.1	–2.3	0.1	–1.7	–2.8
North Sea	5.4	4.6	4.4	3.9	4.5	4.4	4.3	–5.0	–4.8	–10.7	–5.5	–4.1
Russia	9.4	10.1	10.0	9.7	10.1	10.0	10.0	2.4	–0.8	–2.5	–0.8	–0.9
Other former Soviet Union	2.1	2.7	2.8	2.8	2.7	2.9	2.7	12.1	2.5	1.5	6.5	–1.6
Other non-OPEC	18.6	19.1	19.5	19.9	19.1	19.4	19.6	0.4	2.3	1.6	1.7	2.9
World	83.4	85.5	86.5	—	85.8	86.8	86.1	0.1	1.1	—	1.8	0.4
Net demand[3]	**–0.6**	**0.5**	**–0.8**	—	**0.7**	**–0.5**	**–1.0**	—	—	—	—	—

Sources: *Oil Market Report,* International Energy Agency (April 2009); and IMF staff calculations.

[1]OECD = Organization for Economic Cooperation and Development.

[2]Includes Angola (subject to quotas since January 2007) and Ecuador (rejoined Organization of Petroleum Exporting Countries, OPEC, in November 2007, after suspending its membership during December 1992–October 2007).

[3]Net demand is the difference between demand and production. It includes a statistical difference. A positive value indicates a tightening of market balances.

Other Energy Prices

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

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

Figure 1.19. Developments in Metal and Energy Markets
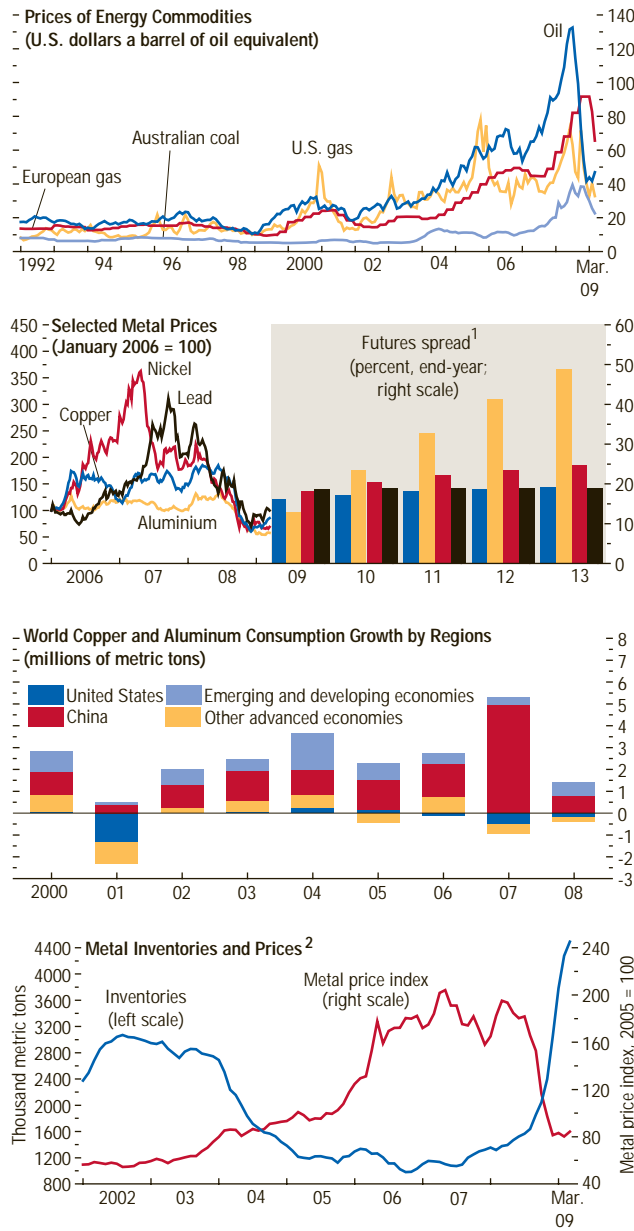
Sources: Bloomberg Financial Markets; World Bureau of Metal Statistics; and IMF staff calculations.
[1]Spread between end-year futures contract and latest available spot price (January 30, 2009) in percent.
[2]Inventories refer to the sum of global stocks of copper, aluminum, tin, zinc, nickel, and lead monitored by the London Metal Exchange. Price refers to a composite index of those metals.

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

Metal Prices

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

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

Food Prices

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

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

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

Appendix 1.2. Fan Chart for Global Growth

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

Since the April 2006 issue of the *World Economic Outlook*, global growth projections have been accompanied by a fan chart, which illustrates the confidence intervals associated with end-year and next-year baseline projections. The fan chart serves primarily as a visual communication device that addresses the following three questions:
- What is the baseline forecast for the current and future years?
- What level of uncertainty surrounds the forecast?
- Where does the balance of risks lie?

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

Figure 1.20. Recent Developments in Markets for Major Food Crops[1]
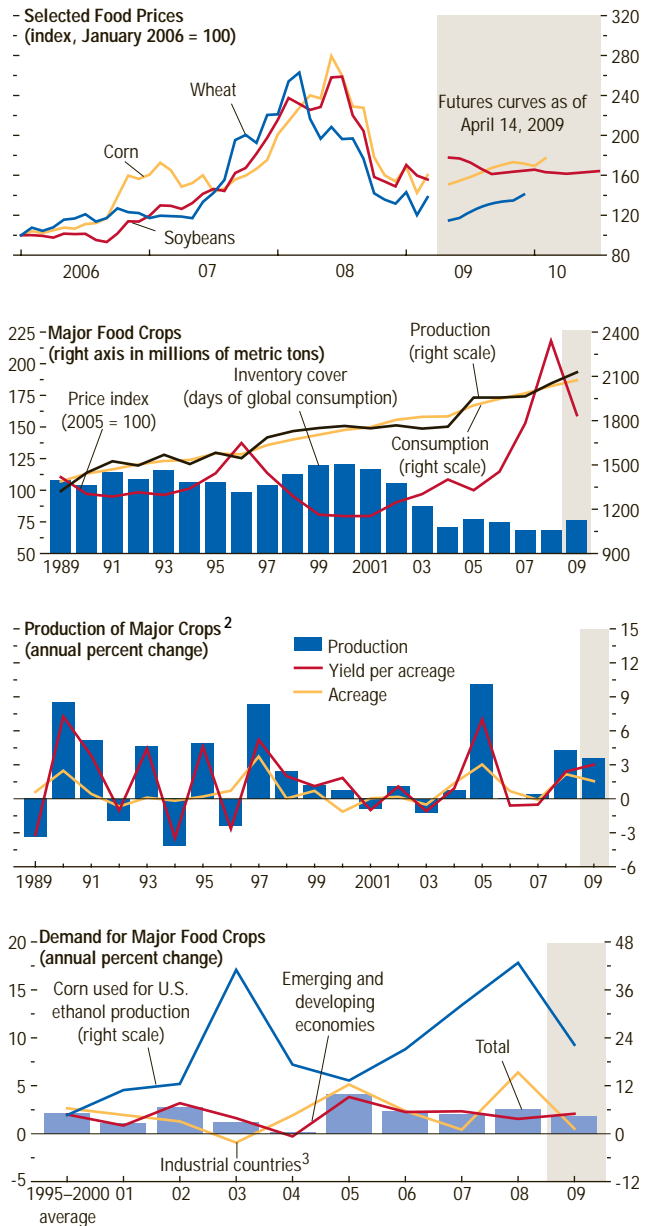
Sources: Bloomberg Financial Markets; U.S. Department of Agriculture; and IMF staff estimates.
[1] Major food crops are wheat, corn, rice, and soybeans.
[2] Yield per acreage includes corn, rice, and wheat.
[3] Excludes corn used in U.S. ethanol production.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Figure 1.21. Dispersion of Forecasts for GDP and Selected Risk Factors[1]
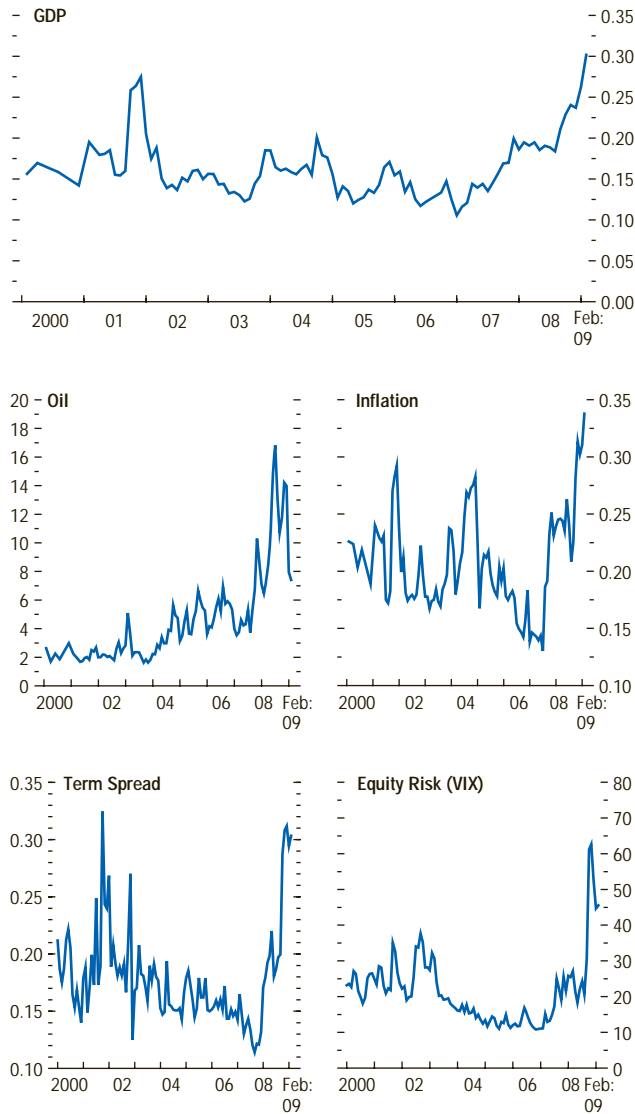
Sources: Consensus Economics; Bloomberg Financial Markets; Chicago Board Options Exchange; and IMF staff calculations.
[1]The series for GDP and inflation measure the dispersion (standard deviation) of GDP and inflation forecasts respectively for the G-7 economies, Brazil, India, China and Mexico, taking into account the covariance of forecasts. The series for term spread measures the dispersion of forecasts of the term spread (10-year government bond yield minus 3-month interest rate) for the United States, the United Kingdom, Germany and Japan. The oil price series measures the dispersion of one-year ahead oil forecasts. Finally, the series for equity risk is the VIX series which measures the implied volatility of the S&P 500.

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

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

Appendix 1.3. Assumptions behind the Downside Scenario

The author of this appendix is Dirk Muir.

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

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

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

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

Source: IMF, *Direction of Trade Statistics.*

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

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

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

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

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

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

United States		Euro Area	
Additional decline	*	Additional decline	*
International spillovers	63%	International spillovers	48%
Domestic factors:		Domestic factors:	
Financial	**	Financial	**
Housing	**	Housing	**
Equity markets	*	Equity markets	*

Japan		Emerging Asia	
Additional decline	*	Additional decline	**
International spillovers	61%	International spillovers	78%
Domestic factors:		Domestic factors:	
Financial	**	Financial	*
Housing	*	Housing	*
Equity markets	*	Equity markets	**

Latin America		Emerging Europe	
Additional decline	**	Additional decline	***
International spillovers	40%	International spillovers	41%
Domestic factors:		Domestic factors:	
Financial	**	Financial	***
Housing	*	Housing	***
Equity markets	**	Equity markets	*

Sources: IMF staff calculations; and National Institute Global Econometric Model simulations.
"Additional decline" is a weighted average of international spillovers and domestic demand shocks.
"International spillovers" is the percentage of decline attributable to the effects of international trade linkages.
***is a severe shock, relative to the WEO baseline.
**is a moderate shock, relative to the WEO baseline.
*is a mild shock, relative to the WEO baseline.

Figure 1.22. Balance of Risks Associated with Selected Risk Factors[1]
(Percentage points)
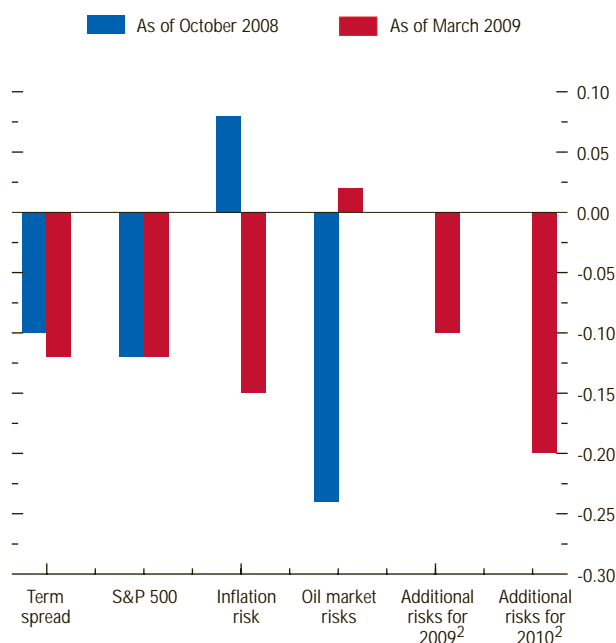
Sources: Consensus Economics; Bloomberg Financial Markets; and IMF staff estimates.
[1] Bar charts show the skew of each risk factor based on either the distribution of analyst forecasts or the distribution implied by option prices.
[2] The additional risks represent a judgement regarding the magnitude of the impact of additional non-quantifiable risks highlighted in the main text of the chapter.

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COUNTRY AND REGIONAL PERSPECTIVES

This chapter discusses how the global crisis is affecting the various regions of the global economy. The United States is at the epicenter of the crisis, and is in the midst of a severe recession that has resulted from a squeeze on credit, sharp falls in housing and equity prices, and high uncertainty. These three shocks are to varying degrees also affecting the rest of the world. Asia had little exposure to U.S. mortgage-related assets but is being badly affected by the slump in global trade, given its heavy dependence on manufacturing exports. In Europe, as in the United States, the financial system has been dealt a heavy blow, housing corrections are intensifying, and industrial production is being hit by the sharp drop in durables demand. Because of their heavy reliance on capital inflows to sustain income growth in order to catch up to Western levels, both the emerging European and Commonwealth of Independent States (CIS) economies are suffering heavily, with the slump in commodity prices adding to the pain in many CIS economies. In Latin America and the Caribbean, the fallout from the crisis is moving through both trade and financial channels, intensified by the drop in commodity prices. The Middle Eastern economies are suffering mainly because of the decline in energy prices, and hard-won gains in African economies are threatened by slumping commodity prices and potentially lower aid inflows.

The United States Is Grappling with the Financial Core of the Crisis

The biggest financial crisis since the Great Depression has pushed the United States into a severe recession. Despite large cuts in policy interest rates, credit is exceptionally costly or hard to get for many households and firms, reflecting severe strains in financial institutions. In addition, households are being hit by large financial and housing wealth losses (Box 2.1), much lower earnings prospects, and elevated uncertainty about job security, all of which have driven consumer confidence to record lows.

These shocks have depressed consumption; the household saving rate, which had been falling for two decades, has risen sharply, to more than 4 percent in February 2009, up from about ¼ percent a year earlier (Figure 2.1).

Progress toward normalization of financial conditions has been much slower than envisaged a few months ago. Financial markets have stabilized somewhat since the failure of Lehman Brothers and the rescue of American International Group (AIG) in September, but they remain under heavy stress, despite unprecedented government actions. Interbank markets are still unsettled, and spreads remain far above normal levels. Despite some relief in recent weeks, equity markets are still down more than 40 percent from their peaks, as economic prospects have darkened and financial stocks have been hammered by heavy losses and questions about solvency. The dollar has strengthened significantly, reflecting flight to safety in government bonds as other economies have become more deeply embroiled in the crisis.

Real GDP contracted by 6.3 percent in the fourth quarter of 2008, and recent data suggest another substantial drop in the first quarter of 2009. There have been some tentative signs of improving business sentiment and firming consumer demand, but employment has continued to fall rapidly—5.1 million jobs have been lost since December 2007—pushing the unemployment rate to 8.5 percent in March. Monetary policy was eased quickly in response to deteriorating economic conditions, and policy rates are now close to zero. But credit market disruptions are undermining the effectiveness of rate cuts. The scope for further conventional monetary policy action is effectively exhausted, so the Federal Reserve has moved aggressively since the fall to use alternative channels to ease credit conditions and has been prepared not only to alter the composition of its balance sheet but

Figure 2.1. United States: The Center of the Crisis

Falling wealth, tight credit markets, and heightened uncertainty about job security and earnings are reining in private demand. Declining output and employment are causing declines in loan repayments. The damage to bank balance sheets is tightening access to credit, feeding back into private investment and consumption.
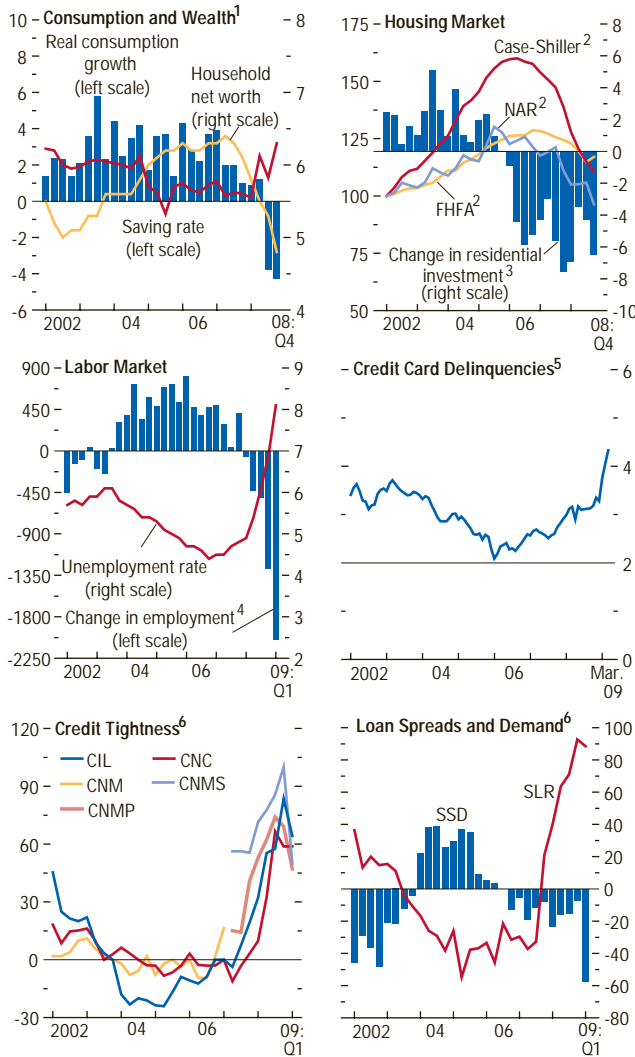
Sources: Haver Analytics; Fitch Ratings; Federal Reserve Board of Governors; and IMF staff estimates.

[1]Real consumption growth and saving rate are in percent; household net worth is ratio to disposable income.

[2]Index: 2002:Q1 = 100. National Association of Realtors (NAR); three-month moving average of 12-month percent change; Federal Housing Finance Agency (FHFA).

[3]Quarterly change in percent.

[4]Quarterly change in total nonfarm payrolls, thousands.

[5]Fitch's Prime Credit Card Delinquency Index.

[6]All series come from Senior Loan Officer Survey. CIL: banks tightening C&I loans to large firms; CNC: banks tightening standards for consumer credit cards; CNM: banks tightening standards for mortgages to individuals; CNMS: banks tightening standards for subprime mortgages to individuals; CNMP: banks tightening standards for prime mortgages to individuals; SSD: net percentage of domestic respondents reporting stronger demand for C&I loans for small firms; SLR: net percentage of domestic respondents increasing spreads of loan rates over banks' cost of funds for small firms.

to expand its size dramatically as well. A broad array of new facilities has been introduced to ensure that credit flows throughout the financial system, including to revive the markets for securities backed by a broad array of consumer credit assets.[1] In mid-March, the Federal Reserve announced plans to purchase long-term U.S. Treasury securities and increase its purchases of agency-backed mortgage-backed securities and agency debentures.

The economy is now projected to contract by 2.8 percent in 2009, even though the rate of decline is expected to moderate in the second quarter and beyond as fiscal easing supports consumer demand and the rate of inventory adjustment eases (Table 2.1). Contingent on fiscal stimulus (equivalent to about 5 percent of GDP) over 2009–11, a continued easy monetary policy stance, measures to stabilize house prices and stem the tide of foreclosures, and new policy measures to heal the financial sector (see below), the economy is projected to start recovering by the middle of 2010. Average GDP growth in 2010 is projected to be zero percent (on a fourth-quarter-to-fourth-quarter basis, growth is projected to reach 1.5 percent). There are upside risks to the forecast, as financial conditions could recover faster than projected. However, there are notable downside risks related to the potential for further intensification of the negative interaction between the real and financial sides of the economy: the housing sector could continue to deteriorate, further declines in asset values could increase insolvency problems for banks and further reduce credit availability, deflation could raise real debt burdens, and demand from other economies could fall more than anticipated.

Prospects depend critically on policy initiatives to mitigate the severity of the recession and spur recovery. The most pressing policy issue

[1]The Federal Reserve has created the Term Asset-Backed Securities Loan Facility (TALF), which allows it to lend on a nonrecourse basis to investors in securities backed by a variety of consumer loans (for example, auto loans and student loans), thus effectively providing both liquidity and protection against loan losses.

Table 2.1. Advanced Economies: Real GDP, Consumer Prices, and Unemployment[1]
(Annual percent change and percent of labor force)

	Real GDP				Consumer Prices				Unemployment			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Advanced economies	**2.7**	**0.9**	**−3.8**	**0.0**	**2.2**	**3.4**	**−0.2**	**0.3**	**5.4**	**5.8**	**8.1**	**9.2**
United States	2.0	1.1	−2.8	0.0	2.9	3.8	−0.9	−0.1	4.6	5.8	8.9	10.1
Euro area[2]	2.7	0.9	−4.2	−0.4	2.1	3.3	0.4	0.6	7.5	7.6	10.1	11.5
Germany	2.5	1.3	−5.6	−1.0	2.3	2.8	0.1	−0.4	8.4	7.3	9.0	10.8
France	2.1	0.7	−3.0	0.4	1.6	3.2	0.5	1.0	8.3	7.8	9.6	10.3
Italy	1.6	−1.0	−4.4	−0.4	2.0	3.5	0.7	0.6	6.1	6.8	8.9	10.5
Spain	3.7	1.2	−3.0	−0.7	2.8	4.1	0.0	0.9	8.3	11.3	17.7	19.3
Netherlands	3.5	2.0	−4.8	−0.7	1.6	2.2	0.3	1.1	3.2	2.8	4.1	5.0
Belgium	2.6	1.1	−3.8	0.3	1.8	4.5	0.5	1.0	7.5	6.8	9.5	10.5
Greece	4.0	2.9	−0.2	−0.6	3.0	4.2	1.6	2.1	8.3	7.6	9.0	10.5
Austria	3.1	1.8	−3.0	0.2	2.2	3.2	0.5	1.3	4.4	3.8	5.4	6.2
Portugal	1.9	0.0	−4.1	−0.5	2.4	2.6	0.3	1.0	8.0	7.8	9.6	11.0
Finland	4.2	0.9	−5.2	−1.2	1.6	3.9	1.0	1.1	6.8	6.4	8.5	9.3
Ireland	6.0	−2.3	−8.0	−3.0	2.9	3.1	−0.6	1.0	4.5	6.1	12.0	13.0
Slovak Republic	10.4	6.4	−2.1	1.9	1.9	3.9	1.7	2.3	11.0	9.6	11.5	11.7
Slovenia	6.8	3.5	−2.7	1.4	3.6	5.7	0.5	1.5	4.9	4.5	6.2	6.1
Luxembourg	5.2	0.7	−4.8	−0.2	2.3	3.4	0.2	1.8	4.4	4.4	6.8	6.0
Cyprus	4.4	3.7	0.3	2.1	2.2	4.4	0.9	2.4	3.9	3.7	4.6	4.3
Malta	3.6	1.6	−1.5	1.1	0.7	4.7	1.8	1.7	6.4	5.8	6.9	7.6
Japan	2.4	−0.6	−6.2	0.5	0.0	1.4	−1.0	−0.6	3.8	4.0	4.6	5.6
United Kingdom[2]	3.0	0.7	−4.1	−0.4	2.3	3.6	1.5	0.8	5.4	5.5	7.4	9.2
Canada	2.7	0.5	−2.5	1.2	2.1	2.4	0.0	0.5	6.0	6.2	8.4	8.8
Korea	5.1	2.2	−4.0	1.5	2.5	4.7	1.7	3.0	3.3	3.2	3.8	3.6
Australia	4.0	2.1	−1.4	0.6	2.3	4.4	1.6	1.3	4.4	4.3	6.8	7.8
Taiwan Province of China	5.7	0.1	−7.5	0.0	1.8	3.5	−2.0	1.0	3.9	4.1	6.3	6.1
Sweden	2.6	−0.2	−4.3	0.2	1.7	3.3	−0.2	0.0	6.1	6.2	8.4	9.6
Switzerland	3.3	1.6	−3.0	−0.3	0.7	2.4	−0.6	−0.3	2.5	2.7	3.9	4.6
Hong Kong SAR	6.4	2.5	−4.5	0.5	2.0	4.3	1.0	1.0	4.0	3.5	6.3	7.5
Czech Republic	6.0	3.2	−3.5	0.1	2.9	6.3	1.0	1.6	5.3	4.2	5.5	5.7
Norway	3.1	2.0	−1.7	0.3	0.7	3.8	1.5	1.9	2.5	2.6	3.7	4.7
Singapore	7.8	1.1	−10.0	−0.1	2.1	6.5	0.0	1.1	2.1	3.1	7.5	8.6
Denmark	1.6	−1.1	−4.0	0.4	1.7	3.4	−0.3	0.0	2.7	1.7	3.2	4.5
Israel	5.4	3.9	−1.7	0.3	0.5	4.7	1.4	0.8	7.3	6.0	7.5	7.7
New Zealand	3.2	0.3	−2.0	0.5	2.4	4.0	1.3	1.1	3.6	4.1	6.5	7.5
Iceland	5.5	0.3	−10.6	−0.2	5.0	12.4	10.6	2.4	1.0	1.7	9.7	9.3
Memorandum												
Major advanced economies	2.2	0.6	−3.8	0.0	2.1	3.2	−0.4	0.0	5.4	5.9	8.0	9.3
Newly industrialized Asian economies	5.7	1.5	−5.6	0.8	2.2	4.5	0.4	2.0	3.4	3.5	4.9	4.9

[1]When countries are not listed alphabetically, they are ordered on the basis of economic size.
[2]Based on Eurostat's harmonized index of consumer prices.

is to restore the health of the core financial institutions. At the same time, it is important to stimulate private demand (not just for the direct effects but also to break the cycle of falling asset prices, rising losses in financial institutions, and tighter credit); lower the risk of asset price overshooting on the downside, especially for house prices; and reduce uncertainty facing households, firms, and financial markets. In this regard, the main burden will fall on fiscal policy since the scope for monetary policy has become limited on multiple fronts.

Crucially, policies must address the problems at the core of the financial system: the growing burden of problem assets and uncertainty about banks' solvency. Balance sheets need to be restored, both by removing bad assets and by injecting new capital in a transparent manner, so as to convince markets of these institutions' return to solvency. The strategy for banks has

Box 2.1. The Case of Vanishing Household Wealth

The financial crisis has erased household wealth in many advanced economies. The precipitous fall in asset prices—across equity, bond, and housing markets—has eroded the value of financial and housing assets and the net worth of households.[1] For instance, during the first three quarters of 2008 alone, the value of household financial assets decreased by about 8 percent in the United States and the United Kingdom, by close to 6 percent in the euro area, and by 5 percent in Japan. As global equity markets plunged in the last quarter of 2008, household financial wealth declined further—for example, by an additional 10 percent in the United States. At the same time, the value of housing assets also deteriorated in line with falling house prices, especially in the United States and the United Kingdom.

The sharp deterioration in household wealth prompts a number of questions: How vulnerable were household balance sheets across countries before the crisis? What are the main channels through which balance sheet developments could affect real activity? What are the likely effects on the economy this time around? The purpose of this box is to address the above questions using available data and evidence on the topic.

What Was the Starting Position?

In advanced economies, households faced the financial crisis with higher net worth but also with more vulnerable, leveraged balance sheets.

- Household net worth rose substantially in the four largest advanced economies during 2002–06 (first figure).[2] On the asset side, in tandem with asset prices, gross financial and housing wealth (as a percentage

of disposable income) increased by more than 100 percentage points in the United States, euro area, and United Kingdom. On the liability side, gross financial obligations increased in these three economies by about 20–40 percentage points and remained broadly unchanged in Japan.

Household Assets, Liabilities, and Net Worth[1]
(In percent of gross disposable income)
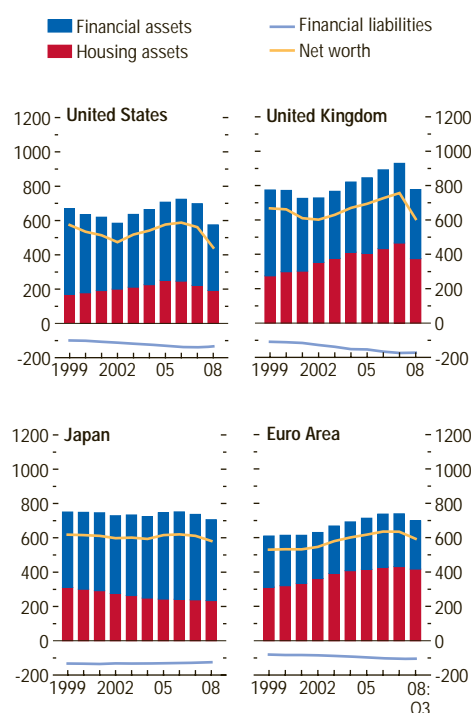
Sources: Bank of Japan, Cabinet Office (Japan), European Central Bank, Eurostat, Office of National Statistics, Haver Analytics, and IMF staff estimates.

[1]Data cover households and non-profit organizations in the United States, and households and non-profit institutions serving households in the Euro area, the United Kingdom, and Japan. The housing wealth data refer to the value of residential buildings in the United States; the value of real estate holdings in the United Kingdom; housing wealth at current replacement value in the Euro area; and tangible non-produced assets (excluding fisheries) of households and private unincorporated enterprises in Japan. The housing wealth data are estimated for 2007 and 2008 in Japan and for 2008 in the Euro area and the United Kingdom, based on observed changes in house prices. Data for United States, the United Kingdom, and Japan are up to 2008:Q4; data for the Euro area are up to 2008:Q3.

The main author of this box is Petya Koeva Brooks.
[1]Net worth is defined as total assets (housing and financial) minus financial liabilities.
[2]As a percentage of disposable income, net worth increased during 2002–06 by 114 percentage points in the United States, 90 percentage points in the euro area, 125 percentage points in the United Kingdom, and 23 percentage points in Japan during 2002–06.

- The increased size of household assets, coupled with their composition, implied higher overall vulnerability to equity and house price shocks, with notable differences across countries. The broad composition of assets reveals that gross household wealth is more dependent on housing assets in the United Kingdom and euro area and on financial assets in the United States and Japan (see first figure). As far as the composition of financial assets is concerned, most notable is the large share of deposits held by Japanese households. Taken together, these observations suggest that in relative terms, U.S. households were more vulnerable to equity price shocks and U.K. and euro area households to house price shocks.
- Household balance sheets generally became more leveraged (second figure). In the advanced economies other than Japan, financial liabilities rose—as a percentage of disposable income, net financial assets, net worth, and household deposits. But the leverage ratios also indicate substantial differences across countries. For instance, although household financial liabilities relative to net worth remained broadly unchanged in Japan and rose moderately in the euro area, they increased substantially in the United Kingdom and the United States— from about 17 percent of net worth in 1999 to more than 28 percent at end-2008.

How Do Household Balance Sheets Affect Economic Activity?

In theory, there are several possible channels of transmission.

- The most traditional channel is through *wealth effects*. In response to an unexpected loss in net worth, consumers are likely to cut their current spending by a fraction of the change in wealth and maintain the new level of spending over time. The existence of a housing wealth effect is somewhat controversial, however. Some have argued that even if house prices fall, the houses are all still there, and the services they provide for the

Household Leverage Ratios[1]
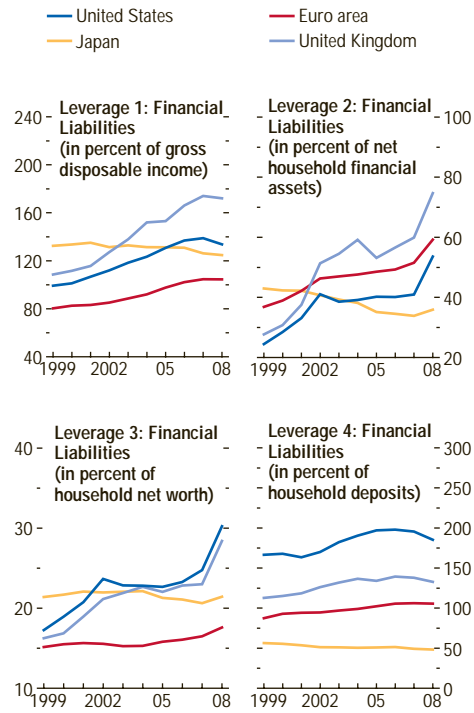
United States — Euro area
Japan — United Kingdom

Leverage 1: Financial Liabilities (in percent of gross disposable income)

Leverage 2: Financial Liabilities (in percent of net household financial assets)

Leverage 3: Financial Liabilities (in percent of household net worth)

Leverage 4: Financial Liabilities (in percent of household deposits)

Sources: Bank of Japan, Cabinet Office (Japan), European Central Bank, Eurostat, Office of National Statistics, Haver Analytics, and IMF staff estimates.
[1]For the Euro area, data refer to 2008:Q3.

future (in terms of shelter) are unchanged. Therefore, one could think about the fall in price as a mere change in relative prices (between houses/housing services and all other goods and services) that makes those long in housing poorer but those short in housing richer, with no obvious aggregate wealth effect.[3] This argument does not hold, however, if there is a bubble in the housing market, if the marginal propensity to consume differs between the two groups, or if housing wealth can be collateralized (see below).[4]

[3]For example, King (1998) and Buiter (2008).
[4]See Buiter (2008).

Box 2.1 *(concluded)*

- Another possible channel is through *credit/ collateral effects*. Households can borrow against the equity in their homes and use it to finance consumption. If households face liquidity constraints, a decrease in their net worth could lead to higher costs for and reduced availability of borrowing, further lowering consumption.
- A third channel is through possible *distributional effects*. Because households may respond differently to shocks depending on their debt levels, aggregate consumption could also be affected by the amount of debt outstanding and by its distribution. In addition, the composition of household assets and their relative (il)liquidity may play a role in determining how consumption responds to shocks.

Disentangling and assessing the empirical importance of the various channels of transmission have been extremely hard, given the difficulties in controlling for the effects of income expectations and other unobserved factors.[5] Therefore, it may be more appropriate to treat the estimates of wealth effects (marginal propensity to consume out of financial and housing assets) as capturing a more broad (reduced-form) relationship between wealth and consumption, rather than a pure wealth effect. These estimates generally vary between 0 and 0.10, depending on the type of asset (housing, financial), data (micro, macro), financial system (bank based, market based), country, and so forth.[6]

Furthermore, there is no consensus on how wealth effects differ between housing and financial wealth, although some studies find a stronger housing wealth effect, despite theoretical arguments to the contrary.[7] Estimates of housing wealth effects tend to be larger in the United States and the United Kingdom than in the euro area and Japan.[8] In policymaking, the FRB/US model used by the Federal Reserve incorporates a 0.038 long-run marginal propensity to consume out of housing wealth, which is identical to that of financial wealth, whereas the Bank of England's model contains no such long-run effect.

What Are the Likely Effects of Household Balance Sheet Developments in the Current Circumstances?

Although its exact contribution is hard to assess, the recent destruction of wealth is likely to contribute to a rise in the household saving rate and weakness in consumption in advanced economies, especially in the United States and the United Kingdom, where the decline in net worth has been the largest so far. For instance, as shown in the table, the losses in household wealth during 2008 were about $11 trillion in the United States ($8.5 trillion in financial assets and $2.5 trillion in housing assets) and were estimated at £1 trillion in the United Kingdom (£0.4 trillion in financial assets and

chapter 3 in the April 2008 *World Economic Outlook*. The magnitude in the Federal Reserve FRB/US model is 0.0375.

[7]See Ludwig and Sløk (2004); and Case, Quigley, and Shiller (2005).

[8]For the euro area, Slacalek (2006) finds that the marginal propensity to consume out of housing wealth is zero, although there appears to be substantial variation across euro area countries, with positive effects in Italy and France (Sierminska and Takhtamanova, 2007; Grant and Peltonen, 2008; Paiella, 2004; and Boone and Girouard, 2002). For the United States and the United Kingdom, the estimates tend to be larger (in the range of 0.03–0.10). See Bertaut (2002); Carroll, Otsuka, and Slacalek (2006); Slacalek (2006); Skinner (1993); Lehnert (2004); Campbell and Cocco (2007); and Boone and Girouard (2002).

[5]Quantifying the importance of the distributional channel has been particularly challenging, although there is some evidence suggesting that responses to shocks were stronger when indebtedness was higher (Balke, 2000). Based on the experience of the United Kingdom and the Scandinavian countries in the early 1990s, Debelle (2004) also argues that high household indebtedness amplified the transmission of other shocks.

[6]For advanced economies, the marginal propensity to consume out of financial wealth is typically estimated in a range between 0.00 and 0.09—if wealth rises by $1, spending rises by between zero and nine cents. For example, see Catte and others (2004) and

Illustrative Long-Run Effects of Wealth Destruction on Household Saving Rate

	2007:Q4–2008:Q4		2008:Q4–2009:Q4		Cumulative Long-Run Effect	
	United States	United Kingdom	United States	United Kingdom	United States	United Kingdom
(in percent)						
Change in housing wealth[1]	–11	–16	–10	–10		
Change in financial wealth[1,2]	–10	–9	–4	–3		
(in percentage points)						
Long-run effect on saving rate (low MPC = 0.02)[3,4]	2.6	3.2	0.7	1.2	3.3	4.5
Long-run effect on saving rate (high MPC = 0.07)[4]	8.9	11.2	2.5	4.1	11.5	15.6

Sources: U.K. Office for National Statistics; Haver Analytics; and IMF staff estimates.
[1]For the United Kingdom, housing wealth data are currently available until 2007:Q4. The assumed changes in housing wealth during 2007:Q4–2008:Q4 correspond to the average change in the Nationwide and Halifax price indices during the same period.
[2]The assumed changes in financial wealth during 2008:Q4–2009:Q4 are based on (1) the observed changes in equity markets (Wilshire 5000 Index for the United States and FTSE All Share Index for the United Kingdom) between December 31, 2008, and March 31, 2009, and (2) the assumption that the change in the value of nondeposit financial assets is one-half the change in equity prices.
[3]The marginal propensity to consume out of wealth (MPC) is assumed to be the same for housing and financial assets.
[4]The impact on the saving rate is computed by multiplying the MPC and the shortfall in wealth (relative to a scenario in which wealth grows in line with disposable income) and dividing by the initial level of disposable income. Nominal disposable income growth was 2.9 percent in the United States and 4.7 percent in the United Kingdom during 2007:Q4–2008:Q4 and is assumed to be 0 percent in the United States and 1 percent in the United Kingdom during 2008:Q4–2009:Q4.

£0.6 trillion in housing assets).[9] The long-run impact on the saving rate of these losses could be in the range of 2½–9 percentage points in the United States and 3¼–11¼ percentage points in the United Kingdom, depending on the assumed marginal propensity to consume.[10]

Equity and house prices have already adjusted significantly, especially in the United States. But they may continue to decline and—given the increased vulnerability of household balance sheets to asset price shocks—reduce household net worth and consumption further. For example, let us suppose that the value of household financial wealth decreases by

[9]For the United Kingdom, housing wealth as of end-2008 is derived under the assumption that the value of housing assets declines in line with the change in nominal house prices (see also footnote 1 of the table).
[10]These estimates should be treated as illustrative only, since their inputs are subject to a large degree of uncertainty. Moreover, they do not capture the effects of all the other factors that are affecting private saving at the same time.

3–4 percent during 2008:Q4–2009:Q4—which is consistent with the observed decline in equity markets during the first quarter of 2009—and that there are no further changes in financial wealth during the rest of 2009 and the value of housing assets decreases by 10 percent. This could be associated with an additional increase in the household saving rate of about ¾–2½ percentage points in the United States and 1¼–4 percentage points in the United Kingdom over the coming years (see table). As a result, over the long run, the cumulative effect of the declines in housing and financial wealth on the household saving rate could be in the range of 3¼–11½ percentage points for the United States and 4½–15½ percentage points for the United Kingdom. In sum, household savings in these countries are expected to rise and remain substantially higher than in the past decade, even after the impact wanes of other factors that now constrain consumption (such as tighter restrictions on credit availability, concerns about unemployment, and precautionary saving).

two aspects, both designed to improve the quality of banks' balance sheets and enable them to increase lending activity. First, banks with more than $100 billion in assets face a mandatory stress test to assess whether their existing levels of capital are robust to further declines in asset prices and economic activity. Banks that cannot raise additional capital from private investors to fill identified capital shortfalls will receive additional government funds. Second, the Public-Private Investment Program (PPIP) was announced to clear bank balance sheets of troubled assets. The multipronged plan intends to leverage private capital within public-private partnerships to purchase distressed assets, potentially allowing purchases of $500 billion to $1 trillion. Bank participation in the plan, however, is entirely voluntary, as banks are not required to sell their assets. The underlying idea behind the plan is that if financial institutions are purged of bad assets, they will be more likely to attract new capital from the private sector. Furthermore, creating a viable market in assets that are currently nearly impossible to price will reduce uncertainty over the solvency of financial institutions. Moreover, recognizing that further declines in the price of mortgage-backed securities will also hurt banks, the administration is applying $75 billion in public funds toward curbing foreclosures by offering cash incentives for lenders to modify loans, allowing borrowers with high loan-to-value mortgages to refinance into new, government-backed mortgages with a lower interest rate, and increasing the capacity of Fannie Mae and Freddie Mac to buy mortgages.

The challenge for any public attempt to remove bad assets is to induce banks to sell them—shareholders will be unwilling to accept "fire-sale" prices—while not paying too high a price, which would amount to a taxpayer subsidy to bank owners and bondholders and could quickly exhaust Troubled Asset Relief Program (TARP) funds.[2] The recently announced PPIP

[2]The new budget proposal sent to Congress would add $250 billion to these funds on a net basis.

should be a useful step in improving liquidity and transparency in the underlying markets, but its effectiveness in removing problem assets will depend crucially on the willingness of the banks that hold these assets to sell them at a price consistent with the available resources under the program. The approach to recapitalization is also not without potential problems. At present, evaluating the long-term viability of financial institutions is a daunting task: the assessment must take into account the prospects for their future profitability and business model, as well as the quality of capital and management. Once a benchmark is established for the appropriate level of regulatory capital that reflects the need for buffers to absorb future losses, the recapitalization of viable banks with insufficient capital should proceed quickly, with public money if necessary. To improve confidence and funding prospects, the capital infusion should be in the form of common shares, even if the government becomes a majority shareholder. At the same time, nonviable institutions would need to be intervened promptly, leading to orderly resolution through closure or merger.

Much hinges on the ability of the strategy to restore financial stability, both in terms of direct effects and in terms of underlying monetary and fiscal policy measures. Although the political economy of policy implementation is complicated by the public's doubts about the wisdom of bailing out financial players, there is a grave danger that further delays, piecemeal action, and uncertainty could mean worsening conditions in the real economy, increasing the large collateral damage inflicted by the correction of past mistakes and thus the ultimate cost of bank resolution.

Fiscal policy must play an important part in supporting demand in the presence of restrictions on credit availability (see Chapter 3). Tax rebates helped boost consumption modestly in mid-2008, but their effects have now dissipated. A much larger discretionary stimulus package has now been passed into law, combining further tax relief with federal assistance to states and additional expenditures (mainly on social programs and infrastructure), which is expected

to provide a 2.0 percent of GDP stimulus in 2009 and 1.8 percent in 2010. This spending, together with the expected losses from financial system support operations, the impact of the cycle, and the fall in asset prices, is projected to bring the federal budget deficit to about 10 percent of GDP in 2010. Against this backdrop, it will be important to develop strategies to reverse the buildup of debt over the medium run. The current proposed budget is transparent about this issue but is based on growth assumptions that are more optimistic than contained in these projections. More may need to be done to ensure long-term fiscal sustainability. Otherwise, there is a risk of upward pressure on interest rates that will slow a recovery of the private sector.

Although there is no further room for interest rate cuts, the Federal Reserve should continue its efforts to use its balance sheet to support credit markets, mindful of the need for an exit strategy. Some positions could be quickly unwound once conditions normalize, but it may be more difficult to divest long-term assets, and thus there is a need to consider new instruments to absorb liquidity, for example, issuance of Federal Reserve paper. In addition, the authorities must be clear about the goals of unconventional policy measures.

Asia Is Struggling to Rebalance Growth from External to Domestic Sources

The impact of the global crisis on economies in Asia has been surprisingly heavy. There were many reasons to expect Asia to be relatively shielded from the crisis: unlike Europe, the region was not heavily exposed to U.S. securitized assets, and improved macroeconomic fundamentals and (with a few exceptions) relatively sound bank and corporate balance sheets were expected to provide buffers. Nevertheless, since September 2008, the crisis has spread quickly to Asia and has dramatically affected its economies. Japan's economy contracted at a 12 percent (annualized) rate in the fourth quarter. The newly industrialized economies (Hong Kong

SAR, Korea, Singapore, Taiwan Province of China) declined at rates between 10 percent and 25 percent, and southeast Asian emerging economies have also been badly damaged. These falls resulted mostly from the collapse in demand for consumer durable goods and capital goods in (non-Asian) advanced economies and, to a lesser degree, the deterioration in global financial conditions. China and India have also been affected by contraction in the export sector, but their economies have continued to grow because trade is a smaller share of the economy and policy measures have supported domestic activity. Also, there were some signs of a turnaround in economic activity in China in the first quarter of 2009. At the same time, inflation pressures are subsiding quickly in most economies, owing to weaker growth and lower commodity prices.

The impact on the real economy through the trade channel has been severe and similar across Asia. The drop in global demand has been particularly focused on automobiles, electronics, and other consumer durable goods that are an integral part of the production structure across east Asia. As a result, exports and industrial production have plummeted (Figure 2.2).

Spillovers from the global financial crisis to domestic financial markets across Asia have also been substantial. Equity and bond prices have plummeted, sovereign and corporate spreads have increased, and interbank spreads have risen. Real estate markets have remained under pressure in a number of economies (Singapore, China). Currencies have depreciated in most of the region's emerging economies, although the yen has appreciated considerably since September 2008 (as carry trades have been unwound), and the renminbi has remained broadly unchanged relative to the dollar. Portfolio and other flows have dwindled, implying tighter domestic credit conditions. As a result, many banks and firms have begun to experience serious stress.

Growth projections for Asia have been marked down to varying degrees, in line with weaker global demand and tight external finan-

Figure 2.2. Advanced and Emerging Asia: Suffering from the Collapse of Global Trade[1]

Asia has been hit hard by the global crisis, mainly through the trade channel, as production and exports have plummeted across the region. Advanced economies in the region are among the most affected, due to their high export dependence and large exposure to the drop in global demand for automobiles, electronics, and other consumer durable goods. Also constrained by lower capital inflows and tighter credit conditions, real activity in emerging Asia is slowing sharply too, despite a considerable boost from monetary and fiscal policies.
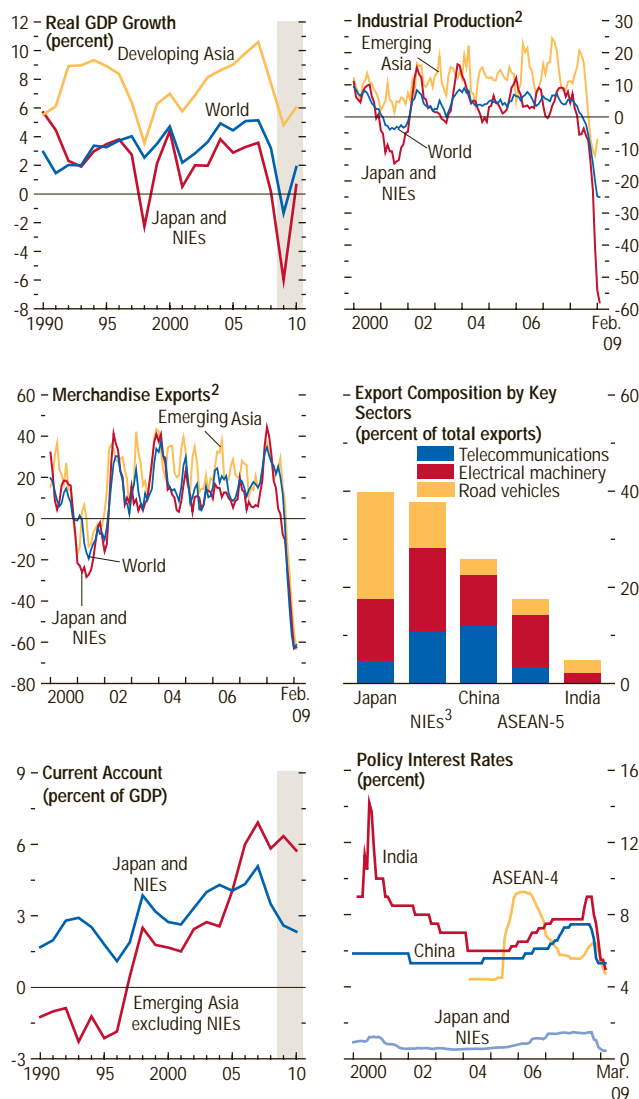
Sources: Bloomberg Financial Markets; Dealogic; Haver Analytics; United Nations Comtrade Database; and IMF staff estimates.

[1]Newly industrialized Asian economies (NIEs) comprise Hong Kong SAR, Korea, Singapore, and Taiwan Province of China. ASEAN-4 countries comprise Indonesia, Malaysia, Philippines, and Thailand. ASEAN-5 countries comprise ASEAN-4 countries and Vietnam. Emerging Asia comprises China, India, Indonesia, Malaysia, Philippines, and Thailand.

[2]Annualized percent change of three-month moving average over previous three-month average.

[3]Excluding Taiwan Province of China.

cial conditions and despite countercyclical macroeconomic policies. Activity in advanced Asia is expected to drop sharply, and some economies could even experience deflation. Emerging Asia is expected to continue to grow, led by China and India (Table 2.2). A modest recovery is projected in 2010, underpinned by a pickup in global growth and a boost from expansionary fiscal and monetary policies. Despite the collapse in exports, the current account surplus for Asia is projected to remain broadly unchanged at about 4¾ percent of GDP, with significant improvements in the current account positions of Korea and Taiwan Province of China in 2009 (Table 2.3).

The exact channels of transmission of the external shocks and the severity of their impact vary considerably across economies. The advanced economies in the region are taking the hardest hit, given their greater exposure to the decline in external demand in other advanced economies, especially for automobiles, electronics, and investment goods. For the group as a whole, real GDP is projected to contract by about 6 percent in 2009, after expanding by about 3½ percent before the crisis in 2007. The Japanese economy is projected to contract by 6¼ percent in 2009, since the yen's strength and tighter credit conditions more generally have added to the problems of the export sector; mild deflation is expected to persist at least through 2010. Given their extreme openness and high dependence on external demand, the other advanced economies in the region––Hong Kong SAR, Korea, Singapore, Taiwan Province of China––will also suffer. Among these economies, Singapore and Hong Kong SAR are particularly exposed, given their importance as global financial centers. Vulnerable corporate and household balance sheets will exacerbate the impact of external shocks in Korea.

Growth in China is expected to slow to about 6½ percent in 2009, half the 13 percent growth rate recorded precrisis in 2007 but still a strong performance given the global context. Two factors are helping sustain the momentum despite the collapse in exports. First, the export sector

Table 2.2. Selected Asian Economies: Real GDP, Consumer Prices, and Current Account Balance
(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Emerging Asia[3]	**9.8**	**6.8**	**3.3**	**5.3**	**4.9**	**7.0**	**2.5**	**2.4**	**6.6**	**5.5**	**6.3**	**5.8**
China	13.0	9.0	6.5	7.5	4.8	5.9	0.1	0.7	11.0	10.0	10.3	9.3
South Asia[4]	**8.7**	**7.0**	**4.3**	**5.3**	**6.9**	**9.0**	**7.7**	**4.5**	**−1.4**	**−3.4**	**−2.6**	**−2.7**
India	9.3	7.3	4.5	5.6	6.4	8.3	6.3	4.0	−1.0	−2.8	−2.5	−2.6
Pakistan	6.0	6.0	2.5	3.5	7.8	12.0	20.0	6.0	−4.8	−8.4	−5.9	−4.9
Bangladesh	6.3	5.6	5.0	5.4	9.1	8.4	6.4	6.1	1.1	0.9	0.9	−0.1
ASEAN–5	**6.3**	**4.9**	**0.0**	**2.3**	**4.3**	**9.2**	**3.6**	**4.5**	**4.9**	**2.8**	**2.2**	**1.5**
Indonesia	6.3	6.1	2.5	3.5	6.0	9.8	6.1	5.9	2.4	0.1	−0.4	−0.7
Thailand	4.9	2.6	−3.0	1.0	2.2	5.5	0.5	3.4	5.7	−0.1	0.6	0.2
Philippines	7.2	4.6	0.0	1.0	2.8	9.3	3.4	4.5	4.9	2.5	2.3	1.6
Malaysia	6.3	4.6	−3.5	1.3	2.0	5.4	0.9	2.5	15.4	17.4	12.9	10.7
Vietnam	8.5	6.2	3.3	4.0	8.3	23.1	6.0	5.0	−9.8	−9.4	−4.8	−4.2
Newly industrialized Asian economies	**5.7**	**1.5**	**−5.6**	**0.8**	**2.2**	**4.5**	**0.4**	**2.0**	**5.7**	**4.4**	**6.3**	**6.1**
Korea	5.1	2.2	−4.0	1.5	2.5	4.7	1.7	3.0	0.6	−0.7	2.9	3.0
Taiwan Province of China	5.7	0.1	−7.5	0.0	1.8	3.5	−2.0	1.0	8.6	6.4	9.7	10.7
Hong Kong SAR	6.4	2.5	−4.5	0.5	2.0	4.3	1.0	1.0	12.3	14.2	7.2	5.2
Singapore	7.8	1.1	−10.0	−0.1	2.1	6.5	0.0	1.1	23.5	14.8	13.1	11.2

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

[2]Percent of GDP.

[3]Consists of developing Asia, the newly industrialized Asian economies, and Mongolia.

[4]Includes Maldives, Nepal, and Sri Lanka.

is a smaller share of the economy, particularly after factoring in its high import content. Second, the government has acted aggressively to provide major fiscal stimulus and monetary easing, which are helping boost consumption and infrastructure investment.

Association of Southeast Asian Nations (ASEAN) economies are being severely hit by the combined effects of lower global demand and tighter credit conditions, although not as harshly as the advanced economies. For the group as a whole, growth is expected to decline from more than 6 percent in 2007 to zero percent in 2009. Although these economies have also been hurt by the drop in global trade, the composition of their exports is less concentrated in the durable goods that have been most affected by the global downturn.

With trade comprising a smaller share of the economy, India, like China, is less exposed to the decline in global demand. Nevertheless, its economy is still suffering from more difficult external financing for firms and banks. Because

India has less room to ease macroeconomic policies, growth is expected to decline sharply from more than 9 percent in 2007 to 4½ percent in 2009. The slowdown is primarily a result of weaker investment, reflecting tighter financing conditions and a turn in the domestic credit cycle.

The risks to the outlook for the region remain tilted squarely to the downside. A key concern is that a deeper or longer recession in advanced economies outside Asia will reduce external demand even further, with negative repercussions for exports, investment, and growth. In addition, further deterioration in global financial conditions may additionally tighten financing constraints, hurting financial and corporate sectors in the region. Moreover, the impact of external shocks on the corporate and financial sectors could be larger than currently envisaged because of feedback effects: a combination of slower global demand and difficult external funding conditions would exert growing pressure on corporate Asia, which in turn would

**Table 2.3. Advanced Economies:
Current Account Positions**
(Percent of GDP)

	2007	2008	2009	2010
Advanced economies	**−1.0**	**−1.1**	**−1.0**	**−1.0**
United States	−5.3	−4.7	−2.8	−2.8
Euro area[1]	0.2	−0.7	−1.1	−1.2
Germany	7.5	6.4	2.3	2.4
France	−1.0	−1.6	−0.4	−0.9
Italy	−2.4	−3.2	−3.0	−3.1
Spain	−10.1	−9.6	−5.4	−4.4
Netherlands	6.1	4.4	2.4	2.1
Belgium	1.7	−2.5	−2.4	−3.0
Greece	−14.1	−14.4	−13.5	−12.6
Austria	3.2	2.9	1.3	1.3
Portugal	−9.5	−12.0	−9.1	−8.8
Finland	4.1	2.5	1.0	0.6
Ireland	−5.4	−4.5	−2.7	−1.8
Slovak Republic	−5.4	−6.3	−5.7	−5.0
Slovenia	−4.2	−5.9	−4.0	−5.0
Luxembourg	9.8	9.1	7.6	7.0
Cyprus	−11.6	−18.3	−10.3	−10.1
Malta	−6.1	−6.3	−5.1	−5.2
Japan	4.8	3.2	1.5	1.2
United Kingdom	−2.9	−1.7	−2.0	−1.5
Canada	0.9	0.6	−0.9	−0.7
Korea	0.6	−0.7	2.9	3.0
Australia	−6.3	−4.2	−5.8	−5.3
Taiwan Province of China	8.6	6.4	9.7	10.7
Sweden	8.6	8.3	6.9	7.4
Switzerland	10.1	9.1	7.6	8.1
Hong Kong SAR	12.3	14.2	7.2	5.2
Czech Republic	−3.2	−3.1	−2.7	−3.0
Norway	15.9	18.4	11.0	12.6
Singapore	23.5	14.8	13.1	11.2
Denmark	0.7	0.5	−1.2	−1.1
Israel	2.8	1.2	1.1	0.3
New Zealand	−8.2	−8.9	−7.8	−7.0
Iceland	−15.4	−34.7	0.6	−2.1
Memorandum				
Major advanced economies	−1.4	−1.4	−1.2	−1.3
Euro area[2]	0.4	−0.7	−1.1	−1.1
Newly industrialized Asian economies	5.7	4.4	6.3	6.1

[1]Calculated as the sum of the balances of individual euro area countries.

[2]Corrected for reporting discrepancies in intra-area transactions.

reduce bank credit quality and put further strain on the banking sector.

The principal policy challenges are to cushion the effects of the crisis and achieve a sustained reduction in the region's reliance on exports as a source of growth. These objectives will require rebalancing the region's economies from exports and investment toward private consumption. The first line of defense is to provide vigorous countercyclical support to aggregate demand, along with strong policy actions to ensure financial and corporate sector health. Much has already been done across the region, but in many economies the policy measures introduced thus far may be insufficient to counteract the global slump, and more action may be needed.

Faced with a quickly deteriorating outlook, most economies have aggressively loosened monetary conditions. In Japan, to address the slowdown in growth and the tightening financial conditions, the central bank has cut rates to virtually zero, increased liquidity provision, broadened the range of eligible collateral, and started purchasing commercial paper and bonds to ease corporate funding pressures. In China, the central bank has reduced interest rates and reserve requirements and loosened credit ceilings. In India, the policy rate and reserve requirements have been cut, and large liquidity injections have eased pressure in money markets; foreign exchange liquidity shortages have been alleviated by easing controls on capital inflows and introducing foreign exchange swaps for banks. Other central banks in the region––in Cambodia, Korea, Malaysia, the Philippines, Singapore, and Thailand–– have also cut policy (or other relevant) rates or decreased reserve requirements. In addition, they have injected liquidity into strained money markets, drawn on reserves, and boosted available liquidity buffers. Notably, Korea has arranged for foreign exchange swaps with the United States, Japan, and China.

Despite these actions, there is room for additional monetary easing in a number of economies. Policy rates remain high in real terms in India, and further rate cuts would help bolster credit growth. Given the sharp deterioration in activity, additional monetary easing also seems appropriate in economies including China, Korea, and Malaysia. In Japan, with the constraint of zero interest rates, the challenge will be to implement further easing by expanding and broadening the range of instruments that support credit to address tightening financial conditions.

Most economies in Asia have already implemented expansionary fiscal policies. The most ambitious plans have been announced in China and Japan. Nonetheless, there is scope to do more to bolster domestic demand in a number of economies that have fiscal room. In China, further measures to boost consumption would be helpful to rebalance the economy over the medium run as well as to offer short-term support. These could include improvements in public provision of health care and education, pension reform, transfers to lower-income groups, further investments for rural development, and reduction in consumption and income taxes. There is also ample room for additional fiscal support in Singapore and Korea. Room to maneuver is more limited in economies such as India and the Philippines, which already have high levels of public debt. In Japan, the government announced a substantial new stimulus package in early April, which should support activity in 2009 and 2010. With the deficit projected to be close to 10 percent of GDP in 2009 and net debt to exceed 100 percent of GDP, room for additional stimulus is close to being exhausted. Attention should shift now to putting in place an ambitious medium-term plan to secure fiscal sustainability.

In the financial sector, policies need to ensure that systems in the region remain well capitalized and that the risks of a credit crunch are minimized. To preserve financial stability, some economies have extended deposit guarantees (Hong Kong SAR, Malaysia, Singapore, Thailand) or have raised deposit insurance limits (Indonesia, Philippines). A number of economies have announced measures to boost capital in the financial system (India, Japan) and provide credit support to the corporate sector (China, Korea). However, the authorities should be prepared to do more if necessary. More generally, it will be important to ensure that sufficient tools exist to inject public capital into troubled institutions and that the incentive framework encourages early loss recognition, so that difficulties are resolved before they spread to healthy banks. Furthermore, frameworks for

corporate restructuring need to be strengthened to deal with corporate stress.

Europe Is Searching for a Coherent Policy Response

Economic activity in much of advanced Europe had begun to contract already before the September 2008 financial blowout, owing mainly to rising oil prices. Nonetheless, the initial perception was that advanced European economies would escape a full-blown recession, while the emerging economies would continue to grow at a lower but still healthy pace, despite their vulnerabilities. As in Asia, healthier house-hold balance sheets in most major economies and different housing and financial market structures were considered protective factors. However, financial systems suffered a much larger and more sustained shock than expected, macroeconomic policies were slow to react, confidence plunged as households and firms drastically scaled back their expectations about future income, and global trade plummeted (Figure 2.3).

In the advanced economies, fears about growing losses on U.S.-related assets at major European banks caused wholesale markets to freeze in September 2008, with a number of failing banks requiring state intervention. Initially, problems were concentrated in a few banks, and their causes varied. The macroeconomic implications were generally not considered large, and thus fiscal and monetary policy responses were initially limited. But the problems quickly caused broad repercussions because of the close linkages between Europe's major financial institutions and their high leverage.[3] With funding markets frozen, the financial crisis rapidly transformed into a crisis for the real economy during the fourth quarter of 2008. Remedial

[3]Some 16 key cross-border players account for about one-third of European Union (EU) banking assets, hold on average 38 percent of their EU banking assets outside their home countries, and operate in just under half of the other EU countries (see Trichet, 2007).

Figure 2.3. Europe: Developing a Common Response[1]

Economic sentiment has plunged, and borrowing costs have risen sharply, despite widespread monetary easing. Soaring fiscal deficits have led to widening sovereign risk premiums. Amid the flight from risk, exchange rates in emerging Europe have generally depreciated. A key challenge is to avoid a disorderly unwinding of leverage, including for western European banks, given their large cross-border exposure to emerging Europe.
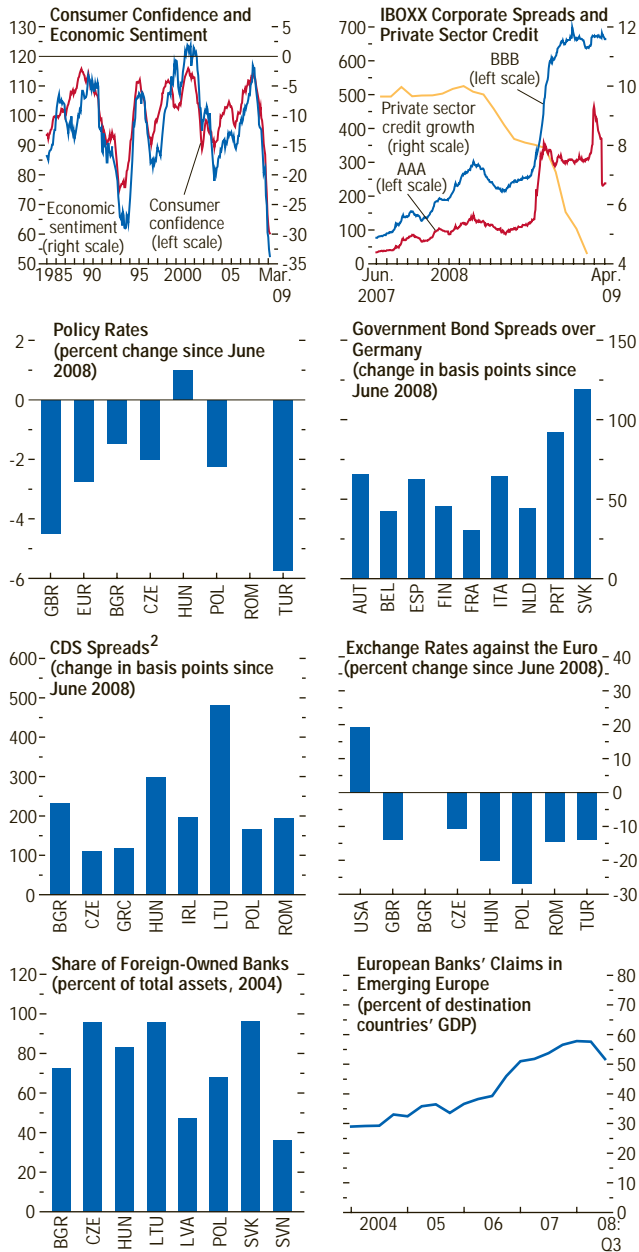
Sources: Bank for International Settlements; European Central Bank; European Commission; Eurostat; Haver Analytics; Thomson Datastream; and IMF staff estimates.
[1]AUT: Austria; BEL: Belgium; BGR: Bulgaria; CZE: Czech Republic; ESP: Spain; EUR: euro area; FIN: Finland; FRA: France; GBR: United Kingdom; GRC: Greece; HUN: Hungary; ITA: Italy; LVA: Latvia; LTU: Lithuania; NLD: Netherlands; POL: Poland; PRT: Portugal; ROM: Romania; SVK: Slovak Republic; SVN: Slovenia; TUR: Turkey; USA: United States.
[2]CDS: Credit default swap.

financial policies were put in place quickly but, as elsewhere, have not been (and still are not) sufficiently comprehensive and coordinated, undermining rather than reinforcing their cross-country effectiveness. Equity prices took a steep fall, and business investment has been slashed. In addition, residential investment has fallen in countries with housing booms (for example, Ireland, Spain, and the United Kingdom). Despite significant support from the large fall in oil prices, consumption declined toward end-2008, and further cutbacks are likely as unemployment spreads.

As a result, most advanced economies have suffered sharp contractions since mid-2008 (see Table 2.1). Real GDP fell at an annual rate of about 6 percent during the fourth quarter in both the euro area and the United Kingdom.

Real GDP is forecast to drop by more than 4 percent in the euro area in 2009, accelerating only gradually thereafter and continuing to fall for several more quarters, making this the worst recession since World War II. Growth is expected to contract by about ½ percent on an annual average basis in 2010; on a fourth-quarter-to-fourth-quarter basis, the turnaround is more apparent, from a drop of more than 3½ percent in real GDP in 2009 to an increase of about ½ percent in 2010. The recession is projected to be particularly severe in Ireland, as its construction boom is painfully reversed. Outside the euro area, the recession is expected to be exceptionally deep in Iceland, which is receiving IMF support following the collapse of its overextended financial sector, and quite severe in the United Kingdom, which is being hit by the end of the boom in real estate and financial activity. As a result of the broad-based fall in output, unemployment rates in the advanced economies are projected to reach more than 10 percent in late 2009 and climb further through 2011.

Economic activity has taken a particularly sharp turn for the worse in many emerging European economies (Table 2.4 and Figure 2.4). Because of their heavy reliance on all kinds of capital inflows—notably funding from Western banks to sustain local credit booms—these econ-

omies have been much more severely affected by the financial crisis than emerging economies in Asia. During the early stages, they held up well, and sovereign credit default swap spreads moved up only gradually. However, as Western export markets contracted and the flight from risk became generalized during fall 2008, the outlook for local exports, growth, and government revenues worsened drastically, causing sovereign spreads to jump from levels of about 50–100 basis points to 150–900 basis points. Hungary, Latvia, and Serbia have received IMF support to sustain their balance of payments, Romania has asked for such support, and Turkey is discussing the issue with the IMF. In addition, Poland is seeking access to a Flexible Credit Line from the IMF. Other countries with smaller exposures to Western short-term capital, including Bulgaria and Lithuania, have struggled with the loss of funding and foreign direct investment (FDI) but, thus far, have not needed IMF support.[4]

Accordingly, real GDP in the emerging economies is projected to contract by about 3¾ percent in 2009 and recover to about 1 percent in 2010, down from growth rates of 4–7 percent during 2002–07. The reasons for the sharp reversal in performance include, to varying degrees, overheating during pre-recession booms, excessive reliance on short-term foreign capital that funded these booms, ownership of banks by distressed foreign financial institutions, and a large share of manufacturing in activity. The fall in activity is expected to be especially large in the Baltic economies, where fixed exchange rate regimes leave limited the room to maneuver (Box 2.2).

The downside risks around the projections for both advanced and emerging economies are large, particularly for the latter, where external financial constraints could worsen further. The key risk is a disorderly deleveraging of large intra-European cross-border bank exposures.

[4]The European Investment Bank, European Bank for Reconstruction and Development, and World Bank have teamed up to provide financial assistance to strengthen banks and support lending to the real economy.

Figure 2.4. Europe: Subdued Medium-Run Growth Prospects[1]

Emerging European countries have grown faster than their western European peers during 2003–08. This convergence has been helped by significant capital inflows, which have supported large current account deficits in the less rich economies. However, current account deficits and capital inflows will diminish appreciably over the medium run. Growth is expected to be noticeably lower and income convergence slower in all European economies, as illustrated by the smaller intercept and flatter slope of the regression in the bottom panel compared with the top one.
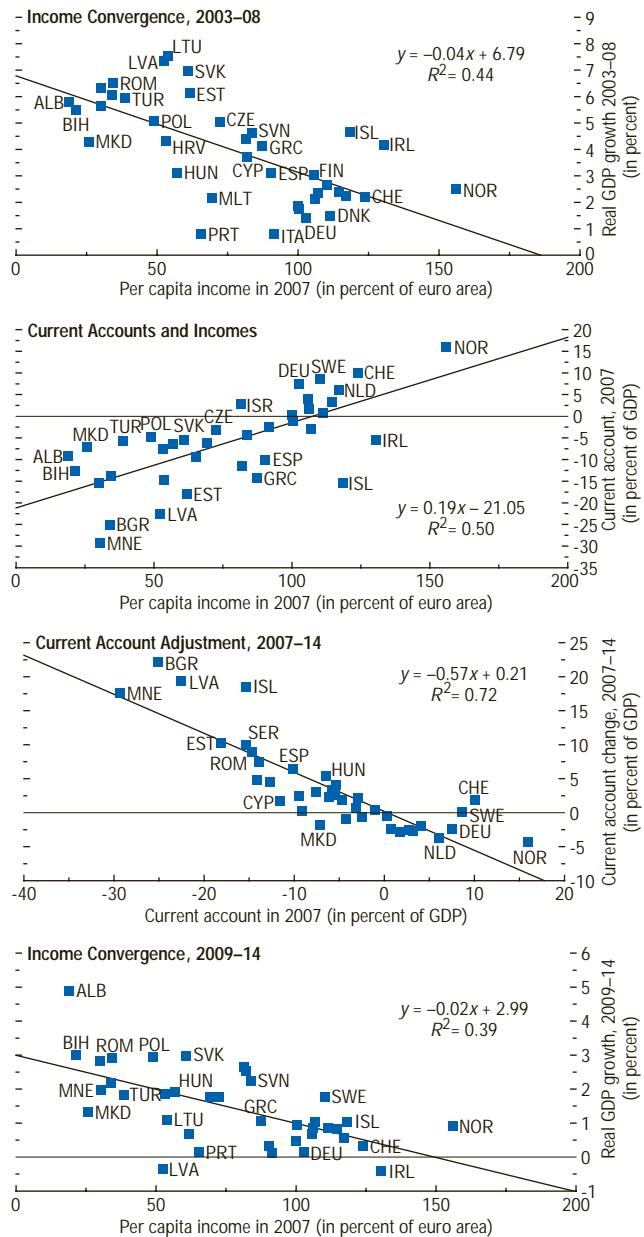
Source: IMF staff calculations.
[1]See Figure 2.3 for country abbreviations. ALB: Albania; BIH: Bosnia and Herzegovina; CHE: Switzerland; CYP: Cyprus; DEU: Germany; DNK: Denmark; EST: Estonia; HRV: Croatia; MKD: Macedonia, FYR; IRL: Ireland; ISL: Iceland; MLT: Malta; MNE: Montenegro; NOR: Norway; SER: Serbia; SWE: Sweden.

Table 2.4. Selected Emerging European Economies: Real GDP, Consumer Prices, and Current Account Balance

(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Emerging Europe	**5.4**	**2.9**	**–3.7**	**0.8**	**6.2**	**8.0**	**4.7**	**4.2**	**–7.7**	**–7.6**	**–3.9**	**–3.4**
Turkey	4.7	1.1	–5.1	1.5	8.8	10.4	6.9	6.8	–5.8	–5.7	–1.2	–1.6
Excluding Turkey	5.9	4.1	–2.9	0.3	4.5	6.5	3.3	2.5	–9.0	–8.8	–5.6	–4.4
Baltics	**8.7**	**–0.7**	**–10.6**	**–2.3**	**7.3**	**12.2**	**3.6**	**–1.0**	**–18.0**	**–11.6**	**–5.4**	**–5.4**
Estonia	6.3	–3.6	–10.0	–1.0	6.6	10.4	0.8	–1.3	–18.1	–9.2	–6.5	–5.4
Latvia	10.0	–4.6	–12.0	–2.0	10.1	15.3	3.3	–3.5	–22.6	–13.2	–6.7	–5.5
Lithuania	8.9	3.0	–10.0	–3.0	5.8	11.1	5.1	0.6	–14.6	–11.6	–4.0	–5.3
Central Europe	**5.4**	**3.8**	**–1.3**	**0.9**	**3.7**	**4.6**	**2.4**	**2.6**	**–5.2**	**–6.1**	**–4.3**	**–3.8**
Hungary	1.1	0.6	–3.3	–0.4	7.9	6.1	3.8	2.8	–6.4	–7.8	–3.9	–3.4
Poland	6.7	4.8	–0.7	1.3	2.5	4.2	2.1	2.6	–4.7	–5.5	–4.5	–3.9
Southern and south-eastern Europe	**6.1**	**6.1**	**–3.6**	**–0.2**	**5.1**	**8.4**	**4.9**	**3.2**	**–14.2**	**–13.8**	**–8.2**	**–5.5**
Bulgaria	6.2	6.0	–2.0	–1.0	7.6	12.0	3.7	1.3	–25.1	–24.4	–12.3	–3.6
Croatia	5.5	2.4	–3.5	0.3	2.9	6.1	2.5	2.8	–7.6	–9.4	–6.5	–4.1
Romania	6.2	7.1	–4.1	0.0	4.8	7.8	5.9	3.9	–13.9	–12.6	–7.5	–6.5
Memorandum												
Slovak Republic	10.4	6.4	–2.1	1.9	1.9	3.9	1.7	2.3	–5.4	–6.3	–5.7	–5.0
Czech Republic	6.0	3.2	–3.5	0.1	2.9	6.3	1.0	1.6	–3.2	–3.1	–2.7	–3.0

[1]Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.
[2]Percent of GDP.

Such an event could make it impossible for many emerging economies to roll over large amounts of short-term debt and could potentially have a similar effect on some advanced economies that have seen a significant widening of sovereign risk premiums. The result could be a financial and real sector collapse in most emerging and a few advanced economies, with major feedback effects on the other economies. However, there are also some upside risks: if EU countries manage to put in place a forceful, comprehensive, and coordinated response to the financial sector travails, confidence and risk-taking might recover faster than expected.

Inflation pressures are subsiding fast, and risks for sustained deflation, although still low, are rising in advanced economies as oil prices have plummeted and demand is slumping. Inflation in 2010––the relevant horizon for policymakers today––is expected to be between ½ and 1½ percent in most advanced economies (see Table 2.1). This is down from 3–4 percent rates in 2008. Accordingly, monetary policy has been eased. The Bank of England moved early,

cutting policy rates in successive steps from 5.75 percent in 2007 to 0.5 percent in 2009, and is now moving to less conventional credit-easing measures. The response of the Swedish Riksbank has been similarly aggressive, with the policy rate now also at 1 percent and further cuts expected. The reaction of the European Central Bank (ECB) came later but has since been sizable. Concerned about high inflation pressure, it raised rates in July 2008 to 4.25 percent but then changed its tack, lowering rates on its main refinancing operations to 1.25 percent. However, the effective overnight rate is closer to the 0.25 percent rate charged on the deposit facility. With inflation projected to stay well below the "below but close to 2 percent" objective over the medium run, there is room to further cut the main refinancing rate.

In emerging Europe, inflation rates are also projected to drop notably, from about 8 percent in 2008 to close to 4 percent in 2010. Consistent with the flight from risk, exchange rates have already depreciated sharply in emerging economies with floating currencies, but the effects on

Box 2.2. Vulnerabilities in Emerging Economies

Housing and Credit Boom and Bust

Numerous emerging economies, including several in the central and eastern Europe (CEE) area, are experiencing large increases in country risk premiums and a collapse in property prices. Such a combination can have harsh economic effects, with limited and more expensive access to loans and foreign funds by households and businesses considerably undermining economic activity. If the shocks are accompanied by large currency depreciations, the situation may deteriorate even more in countries that have sizable balance sheet mismatches. Furthermore, even though balance sheets are currently sheltered by managed exchange rate regimes in some countries, uncertainty about the sustainability of these exchange rate policies may be driving up risk premiums. We illustrate this by plotting increases in the credit default swap spreads[1] against the percentage of loans held in foreign currencies[2] for seven CEE countries (first figure).

This box describes the mechanisms underlying the boom-bust cycle in response to changes in finance premiums using an open-economy model structured to represent a generic CEE economy.[3] We consider two types of finance premiums. First, the domestic interbank rates embody an exogenous premium over the world rates when adjusted for expected depreciation or appreciation. Second, households, which are net debtors, use housing wealth as collateral for loans, and the retail lending spread rises in the loan-to-value ratio.

The authors of this box are Jaromir Benes, Kevin Clinton, and Douglas Laxton.

[1] Increases in five-year corporate euro CDS spreads (Bulgaria: five-year corporate U.S. dollar CDS spreads) between January 2008 and February 2009, based on data from Bloomberg Financial Markets and IMF staff estimates.

[2] Bank loans to the nonfinancial sector, including households, as of December 2008 (Hungary: 2008: Q4), based on data from the national central banks and IMF staff estimates.

[3] The details of the model can be found in Benes, Clinton, and Laxton, forthcoming.

Foreign Exchange Exposure is Strongly Linked to Market Perceived Default Risk, Regardless of the ER Regime
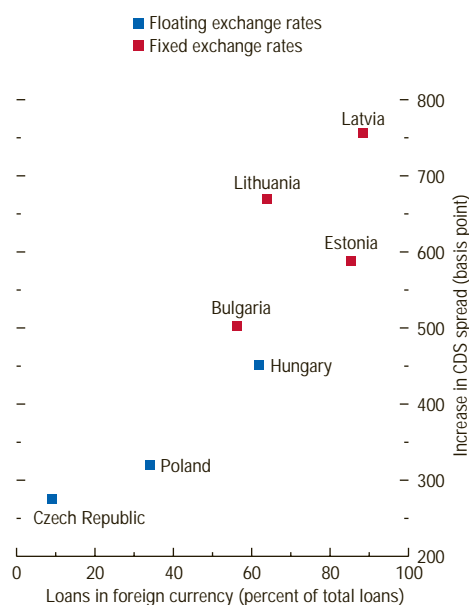
Source: IMF staff calculations.

Furthermore, the economy has a sizable foreign debt and a financial system that relies heavily on refinancing from abroad. The import-to-GDP ratio is high because a significant share of imported goods are used to produce goods that are exported. Prices and wages are assumed to be more flexible than in advanced economies. A couple of differences among CEE economies make them more or less vulnerable to external shocks. The severity of the problems may be affected, in particular, by (1) the proportion of debt in foreign currencies, and (2) the monetary policy regime. We show how performance might change as the two characteristics vary.

To set relevant initial conditions, we first simulate a housing boom. Real estate prices rise above their fundamental levels and are believed to stay high permanently. This results in lower loan-to-value ratios and reduced risk premiums on household borrowing. Both lower financing

Box 2.2 *(continued)*

costs and expectations of future capital gains boost consumption, further investment in real estate, and thereby GDP. Increases in demand cause a rise in imports, which is financed by foreign capital inflows. Foreign debt, therefore, builds up over time. The economy eventually becomes vulnerable to domestic and foreign disturbances. In the simulations, a country risk premium shock is imposed during the collapse in house prices. A house prices collapse triggered by a world financial crises reduces the value of collateral and raises the households' finance premium. At the same time, the country as a whole faces increases in the risk premium in international financial markets.

House Price Correction

We first show the simulated response to a correction in house prices under a fixed and a flexible exchange rate (second figure, first column). The economy starts with a stock of external liabilities equal to 100 percent of GDP, of which 75 percent is denominated in foreign currency. At the peak, house prices are, by assumption, 20 percent above the pre-shock level, and the correction occurs over the next four quarters.[4] GDP declines for a prolonged period as the increased cost of credit, arising from the increase in the loan-to-value ratio, amplifies the effect on spending of the perceived loss in wealth. This financial sector feedback is known as the *financial accelerator*.[5] Lower demand translates into a drop in inflation. Because the decline in income reduces demand for imports, the trade balance improves. These changes apply whether the exchange rate is fixed or flexible. The currency regime nevertheless makes a difference in other aspects of the adjustment process. The house price correction implies a depreciation under the floating rate regime, since the central bank would reduce

[4] For instance, apartment prices in Riga, Latvia, fell by 35 percent year over year in 2008, compared with a 62 percent rise in 2006, according to Global Property Guide (available at www.globalpropertyguide.com).
[5] See, for example, Bernanke (2007).

Model Simulations
(Deviations from control; x-axis in quarters)

Housing Shock Only	Housing and Premium Shocks
— Exchange rate peg	— Exchange rate peg
— Inflation targeting (IT)	— IT: 75 percent of debt in foreign currency
	— IT: No debt in foreign currency

GDP (percent deviation)

Inflation (percentage point deviation)

Trade Balance to GDP (percentage point deviation)

Nominal Exchange Rate (percent deviation)

Real Exchange Rate (percent deviation)

Consumer Lending Rate (percentage point deviation)

Source: IMF staff estimates.

its interest rate, given the lower level of output and inflation.[6] Improvements in the trade balance work to balance the increased cost of debt service implied by currency depreciation. The depreciation also results in a smaller decline in inflation, such that inflation does not move far below target.

In the fixed rate case, there can be no inflation target as such, and there is a substantial drop in inflation below the control value. This is reflected in a steady real depreciation while the nominal exchange rate remains fixed. In effect, the real exchange rate has to decline for a while. This happens quickly with the flexible rate, but slowly, via the inflation differential, under the fixed exchange rate. Wages and prices in the CEE economies are relatively flexible; if they were as inflexible as in advanced economies, the decline in the real rate and output would be more prolonged.[7] The lending rate rises immediately under the peg, as it fully reflects the increased finance premium after the collateral value falls. In the flexible case, a drop in the policy rate moderates the initial increase in the cost of credit. As output recovers, policy tightens, and for a while the rates overshoot the long-run levels.

House Price Correction Combined with Country Risk Premium Shock

To illustrate the impact of a shock to the confidence of international lenders, occurring at the same time as the housing bust, we simulate an increase in the country risk premium of 500 basis points for a period of four quarters;[8]

the increase then tapers off gradually (second figure, second column).

For the flexible exchange rate, two cases are shown: 75 percent of external debt in foreign currency versus all debt in local currency only. The bottom panel of the second column shows the effects on the consumer lending rate. Under the flexible exchange rate, the increase is greatly moderated by a cut in the policy rate, which responds to the weakening economy.

In the first case, the decline in GDP, aggravated by higher lending rates, is very large. At the trough, after four quarters, it is almost 6 percent below its control value. The recovery takes almost four years. Inflation dips for a few quarters, and then fluctuates around the target rate. The trade balance as a proportion of GDP moves into a large and prolonged surplus relative to the control. This is a necessary part of the adjustment process. The depreciation raises the domestic currency cost of foreign debt service and erodes the services account of the balance of payments. At the same time, the deleveraging process reduces the capital inflow. To maintain balance of payments equilibrium in the face of these changes, net receipts from trade must rise. The increase is brought about by the decline in domestic spending and by currency depreciation.

The real exchange rate drops by almost 10 percent relative to the control after two quarters. This reflects Dornbusch-type overshooting, in response to the increased country risk premium and the cut in the policy rate.[9] The currency then appreciates slowly, remaining below the control for many quarters. The initial depreciation implies a sharp deterioration in the national balance sheet such that the domes-

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[6]The household risk premium does not affect the wholesale interbank market or the exchange market in this model.

[7]For instance, the model-implied sacrifice ratio is about 1.4. For the evidence on real and nominal rigidities in new EU member states, see, for example, Gray and others (2007).

[8] This compares well, for example, to the increases observed in the levels of CDS spreads for some of the CEE countries. The five-year spreads have recently risen to as high as 300 basis points (Czech Republic), 600 basis points (Hungary), and more than 1,000

basis points (Latvia) from single- or double-digit levels in 2007, according to data from Bloomberg Financial Markets.

[9]The model contains an uncovered interest parity condition, which requires the exchange rate to fall below its long-run value when monetary policy keeps the interbank rate below its equilibrium value. Expectations that the domestic currency will rise provide the necessary incentive to hold it.

Box 2.2 *(concluded)*

tic currency value of the foreign debt rises by about 7.5 percent of annual GDP.

When all debt is denominated in local currency only, there are no adverse valuation effects on domestic wealth. The decline in GDP is much milder—about 4 percent at the trough. The implications for inflation and the trade balance are also less pronounced.

Under the pegged exchange rate, there is no immediate impact on the value of the debt, regardless of its currency composition. An important assumption of the simulation is that the peg is fully credible; absent credibility, the shock would be more damaging. Even with perfect credibility, the negative impact of the combined shock on GDP is larger than under the flexible exchange rate with high foreign currency debt. And the effect on inflation is much larger, as the fixed exchange rate forces the required real depreciation to take place through a decline in prices.

The difference between the two exchange rate regimes is much more marked for the combined shock than for the housing shock alone. This is because the cost of household borrowing bears the full weight of the increase in the country risk premium: the decision to maintain the level of the exchange rate fixed does not allow a reduction in the policy rate.

Policy Implications

The simulation experiments suggest that key macroeconomic variables respond to finance premium shocks better under the flexible exchange rate than under the fixed rate. This does not mean, however, that flexibility is necessarily the better option.

Following an adverse shock in the foreign exchange market, the central bank faces a choice between stabilizing the exchange rate and controlling interest rates. Under the first option, the high interest rates raise the cost of borrowing and increase the intertemporal price of expenditures today relative to tomorrow. This reduces domestic demand, with expenditures cut back both on domestic output and imports. Under the other option, the intratemporal price of domestic output relative to foreign goods drops, redirecting demand away from imports and toward domestic products, which improves export competitiveness. Judged this way, control of interest rates outperforms stabilization of the exchange rate.

This analysis, however, does not consider possible sources of instability that a flexible rate might encounter, particularly if the adjustment is large and rapid. Thin markets, currency mismatches in the balance sheets of households and businesses, or a preponderance of short-term foreign debt are cases in point.

In this sense, the model simulations are more informative about preventive measures than about actions that might be taken once a crisis starts. One of the main lessons for the future is to encourage more prudent behavior by avoiding rapid accumulation of debt and by discouraging asset-liability mismatches. The negative results for the exogenous shocks to risk premiums emphasize the role the advanced industrialized world will play in the resolution of the crisis: restoration of financial stability in the major financial centers will help ease the current severe financing constraints facing emerging market economies.

inflation are being contained by widening output gaps. Because pressures for currencies to depreciate have been (and remain) high and could destabilize household or corporate balance sheets in countries with significant foreign-currency-denominated lending, some central banks have opted to keep rates unchanged or have lowered

interest rates only gradually (for example, Hungary). In Turkey, where household balance sheets are relatively less exposed to exchange rate depreciations, the central bank has lowered rates quite forcefully.

Fiscal policy has now joined monetary policy in combating the recession in many advanced

economies, even though a number are facing constraints from tough capital market conditions. Beyond the operation of automatic stabilizers, the European Economic Recovery Plan calls for discretionary fiscal measures to be taken mostly at the national level and is targeted to provide stimulus of about 1½ percent of EU GDP, with roughly 1 percent foreseen for 2009 and ½ percent in 2010. Thus far, EU countries have generally lived up to their commitments under this plan, which are conditional on initial deficits, public debt levels, and other factors. Hence, the general government deficit of euro area countries is projected to rise from about ¾ percent of GDP in 2007 to 5½ percent in 2009 and 6 percent in 2010 (Table A8). Stimulus is coming mainly from euro area countries that took advantage of the previous cyclical upswing to move their budgets close to balance or into surplus by 2007, for example, Cyprus, Finland, Germany, and Spain. Meanwhile, Belgium, Ireland, and Spain have seen a sharp widening of sovereign spreads—reflecting (to varying degrees) concern about contingent liabilities related to policies to support the financial sector––which limits their future fiscal options. Stimulus is expected to be small or nonexistent in Greece, Italy, and Portugal––countries with deficits close to 3 percent of GDP in 2008 and high public debt or elevated country risk premiums. Advanced economies outside the euro area are projected to record small deficits or surpluses, with the exception of Iceland and the United Kingdom. The U.K. deficit is projected to reach 11 percent of GDP in 2010, reflecting mainly automatic stabilizers and asset-price-related revenue shortfalls rather than discretionary stimulus.

In emerging Europe, countries are faced with an unprecedented widening of their sovereign risk premiums. With access to funding heavily restricted, most are not allowing automatic stabilizers to play freely, and none are implementing major stimulus.

Financial policies have generally been forceful and innovative in addressing liquidity strains but have lagged with respect to addressing solvency concerns and cross-country coordination. As elsewhere, this reflects a challenging political economy. Central banks are providing liquidity at longer maturities and are accepting a wide range of collateral in repurchase operations, including assets for which markets have essentially ceased to operate. In addition, most countries have adopted measures to guarantee wholesale funding and provide support for recapitalizing banks deemed viable. However, U.S.-originated toxic assets still must be cleaned off bank balance sheets, which is key to rebuilding confidence in banking systems. To achieve this, countries will need to devise and coordinate pricing mechanisms, and the European Commission and the ECB have offered guidance on how to achieve this. However, coordination has been far from optimal. Policymakers were repeatedly surprised by the virulence of the crisis and succumbed to national reflexes to "go it alone" in cobbling together responses that undermined rather than enhanced other countries' interventions, failing to live up to the May 2008 Economic and Financial Affairs Council (ECOFIN) commitments for crisis prevention, management, and resolution.[5]

Stanching the much broader problems that are building in Europe's financial systems—notably those related to deteriorating prospects for loan books, particularly for exposures to emerging Europe—requires a far more forceful and coordinated financial policy response to the crisis. There is an urgent need to build new or enhance existing EU schemes for mutual assistance so as to facilitate a rapid, common

[5]For example, blanket guarantees or public money for bank recapitalization provided by some European governments undermined bank business prospects in other countries, thus compelling their authorities to implement similar measures, putting severe strain on sovereign balance sheets and risk premiums. At present, pressure on banks is building to serve national markets first. These come in various guises: statements by the authorities, limits on the dividends subsidiaries are permitted to pay their parent companies abroad, threats to exclude subsidiaries or branches of foreign banks from participation in domestic monetary policy operations if credit lines are not maintained, and the establishment of national interbank clearinghouses.

response to emerging payment difficulties in all EU countries and ideally in any country in the neighborhood of the European Union. This is essential to avoid disorderly adjustment in one country that can drag down others. The recent EU decision to double the limit on its emergency lending (to 50 billion euros) for member countries from emerging Europe is a welcome step in this direction.

Looking further ahead, the current crisis has underlined the importance of strengthening institutional mechanisms for economic policy coordination and integration across the European Union. A key lesson is that the EU financial stability framework needs to be revamped. Useful steps in this direction were proposed in the February 25, 2009, report of the de Larosière Group. Ultimately, what is needed is an institutional structure for regulation and supervision that is firmly grounded on the principle of joint responsibility and accountability for financial stability, including the sharing of crisis-related financial burdens. Otherwise, deleterious national reflexes will continue to prevail during crises.

The CIS Economies Are Suffering a Triple Blow

Among all the regions of the global economy, the CIS countries are forecast to experience the largest reversal of economic fortune over the near term. The reason is that their economies are being badly hit by three major shocks: the financial turbulence, which has greatly curtailed access to external funding; slumping demand from advanced economies; and the related fall in commodity prices, notably for energy.

The large direct impact of the financial market turmoil on CIS economies reflects the abrupt reversal of foreign funding to their largest nonfinancial firms and, more important, their banking systems (Figure 2.5). Prior to the crisis, all but a few economies with less externally linked financial sectors (Azerbaijan, Tajikistan, Turkmenistan, Uzbekistan) relied significantly on external funding to sustain

domestic borrowing that far outstripped domestic demand for bonds or deposits. Soon after the crisis struck, both nonfinancial firms and banks found it very difficult to renew funding from investors, who steered clear of anything but the safest assets. Adding to the pressure, households began to switch from domestic- to foreign-currency-denominated assets. Russia, Kazakhstan, Belarus, and Ukraine were hit hard, with the first two drawing down large amounts of foreign currency reserves to buffer the impact of the shock on the exchange rate. These economies are expected to have only very limited access to external financing over the near term, with the exception of Russia, which should be able to better sustain rollover rates. Belarus and Ukraine have faced difficulties meeting their external obligations and have received IMF financing; Armenia and Georgia are also receiving IMF support, although Georgia's arrangement predates the financial crisis.

The beginning of the financial crisis coincided with slumping prospects for exports and commodity prices because of rapidly weakening activity in the advanced economies. This has added to the pressure faced by CIS economies with open banking systems and severely undercut growth prospects for the commodity exporters, including Russia, Kazakhstan, and Ukraine, but also the less open economies, for example, Turkmenistan. Other countries, including the Kyrgyz Republic, Tajikistan, and Uzbekistan, are expected to suffer from falling foreign remittances, particularly from migrant workers in Russia. The current account balance for the area as a whole is expected to run a zero balance in 2009, a major switch from posting a large current account surplus in 2007–08 (Table 2.5). However, prospects differ noticeably between energy exporters and importers: the former are projected to see large current account surpluses evaporate because of falling commodity prices, while the latter see a sharp narrowing of their external deficits because of tightening financing conditions.

Although many CIS economies are better positioned to weather a crisis than they were

in the aftermath of Russia's 1998 debt default, the fallout will nonetheless be severe. Real GDP in the region, which expanded by 8½ percent in 2007, is projected to contract by just over 5 percent in 2009, the lowest rate among all emerging regions. In 2010, growth is expected to rebound to more than 1 percent. With currencies under pressure, inflation is expected to remain close to double digits in the net energy exporters, despite slowing activity. Inflation pressures are expected to recede more quickly for the net energy importers.

The key challenge facing policymakers in the CIS is to strike the right balance between using macroeconomic policies to buffer the effects of net capital outflows on activity and maintaining confidence in local currencies. With most countries operating under pegged exchange rate regimes, monetary policymakers have had to choose between drawing down reserves, raising policy rates to defend pegs, and allowing exchange rates to depreciate. Countries that could afford to, including Russia and Kazakhstan, initially drew down foreign exchange reserves. Faced with very strong pressures, however, they have since changed their tack: Russia has allowed the ruble to depreciate substantially below its earlier band and has raised interest rates, while Kazakhstan has opted for a step devaluation of some 18 percent (see Figure 2.5). Other countries, including Ukraine and Belarus, experienced large currency depreciations early in the crisis.

The problem these economies face is that rapid currency depreciation raises the effective debt burden on nonfinancial firms that have borrowed in foreign currency. In fact, the share of foreign-currency-denominated credit in domestic bank credit stretches from close to 30 percent in Belarus and Russia, to about 50 percent in Kazakhstan and Ukraine, and to some 70 percent in Georgia. Meeting these foreign currency obligations as exchange rates depreciate has required major cutbacks in investment and employment in several of these economies. By the same token, defaults would further exacerbate already intense strains on

Figure 2.5. Commonwealth of Independent States (CIS): Struggling with Capital Outflows[1]

Financial stress has seriously hit most CIS economies. Even those with current account and budget surpluses have suffered, mainly because of their external debt liabilities and slumping prices for energy exports. Countries that have room to do so are loosening fiscal policy. But with rising sovereign spreads, the room for fiscal stimulus has become limited. Exchange rates are depreciating. Capital flows will take many years to recover from the shock of the crisis.
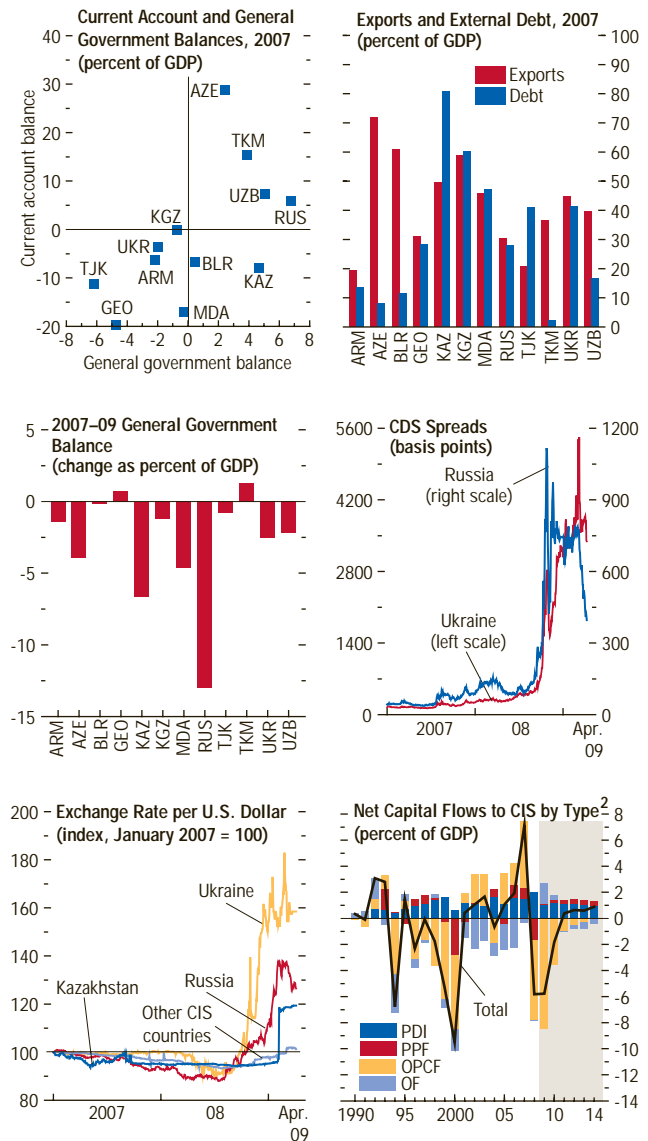
Sources: Thomson Datastream; and IMF staff estimates.
[1]ARM: Armenia; AZE: Azerbaijan; BLR: Belarus; GEO: Georgia; KAZ: Kazakhstan; KGZ: Kyrgyz Republic; MDA: Moldova; RUS: Russia; TJK: Tajikistan; TKM: Turkmenistan; UKR: Ukraine; UZB: Uzbekistan.
[2]PDI: private direct investment; PPF: private portfolio flows; OPCF: other private capital flows; OF: official flows.

Table 2.5. Selected Commonwealth of Independent States Economies: Real GDP, Consumer Prices, and Current Account Balance
(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Commonwealth of Independent States	**8.6**	**5.5**	**−5.1**	**1.2**	**9.7**	**15.6**	**12.6**	**9.5**	**4.2**	**5.0**	**0.1**	**1.5**
Russia	8.1	5.6	−6.0	0.5	9.0	14.1	12.9	9.9	5.9	6.1	0.5	1.4
Ukraine	7.9	2.1	−8.0	1.0	12.8	25.2	16.8	10.0	−3.7	−7.2	0.6	1.4
Kazakhstan	8.9	3.2	−2.0	1.5	10.8	17.2	9.5	8.7	−7.8	5.3	−6.4	1.1
Belarus	8.6	10.0	−4.3	1.6	8.4	14.8	12.6	6.0	−6.8	−8.4	−8.1	−5.6
Turkmenistan	11.6	9.8	6.9	7.0	6.3	15.0	10.0	8.0	15.4	19.6	15.7	9.2
Azerbaijan	23.4	11.6	2.5	12.3	16.6	20.8	4.0	7.0	28.8	35.5	10.8	18.4
Low-income CIS countries	**14.3**	**8.8**	**2.7**	**7.2**	**12.6**	**15.9**	**7.4**	**7.9**	**8.1**	**12.0**	**1.5**	**5.2**
Armenia	13.8	6.8	−5.0	0.0	4.4	9.0	3.6	7.2	−6.4	−12.6	−11.5	−11.0
Georgia	12.4	2.0	1.0	3.0	9.2	10.0	5.0	6.5	−19.6	−22.6	−16.4	−16.7
Kyrgyz Republic	8.5	7.6	0.9	2.9	10.2	24.5	12.4	8.6	−0.2	−6.5	−6.3	−8.4
Moldova	4.0	7.2	−3.4	0.0	12.4	12.7	2.6	4.7	−17.0	−19.4	−19.4	−16.6
Tajikistan	7.8	7.9	2.0	3.0	13.2	20.4	11.9	11.5	−11.2	−8.8	−9.7	−8.3
Uzbekistan	9.5	9.0	7.0	7.0	12.3	12.7	12.5	9.5	7.3	13.6	7.7	6.8
Memorandum												
Net energy exporters[3]	8.6	5.8	−4.9	1.2	9.4	14.5	12.3	9.7	5.6	7.0	0.7	2.2
Net energy importers[4]	8.4	4.3	−6.1	1.3	11.4	21.3	14.2	8.7	−5.5	−8.7	−4.1	−2.8

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

[2]Percent of GDP.

[3]Includes Azerbaijan, Kazakhstan, Russia, Turkmenistan, and Uzbekistan.

[4]Includes Armenia, Belarus, Georgia, Kyrgyz Republic, Moldova, Tajikistan, and Ukraine.

bank balance sheets and diminish prospects for renewed credit growth.

In these circumstances, public support for the banking system is critical. Countries whose banking sectors are struggling with the need to roll over foreign debt––for example, Belarus, Georgia, Kazakhstan, Russia, and Ukraine––have already deployed remedial measures. These include provision by the central banks of ample liquidity, public guarantees, funding for recapitalization (including from international financial institutions), and nationalization. It will be crucial to carefully assess bank balance sheets with a view to writing off bad assets in a proactive manner, determining which banks have sound medium-run prospects, and replenishing their capital as needed, drawing on budgetary resources rather than central bank support.

With significant public support needed for banks and difficult conditions in capital markets, room for fiscal policy stimulus is limited in most CIS countries. Belarus and Ukraine have needed

to tighten. Georgia and the Kyrgyz Republic can afford to let automatic stabilizers work, provided sufficient donor support is forthcoming. Azerbaijan, Kazakhstan, Russia, and Uzbekistan––all of which posted fiscal surpluses ahead of the crisis––have allowed automatic stabilizers to operate and have eased fiscal policy to sustain growth.

Other Advanced Economies Are Dealing with Adverse Terms-of-Trade Shocks

The slump in demand in the United States and Asia and the drop in commodity prices are weighing on activity in Canada, Australia, and New Zealand. Households are also suffering wealth reduction, as equity markets and, to a lesser extent, house prices have fallen after rapid rises through 2007. These economies have benefited in recent years from highly favorable terms of trade, owing mainly to high prices for energy, minerals, and food exports. This has

allowed these economies to grow strongly: average growth rates in the five years before 2008 typically were in the range of 2½–4 percent.

With lower commodity prices, diminished household wealth, and prospects for weak export demand from the United States, Europe, and Asia, projections for 2009 envisage that output in Canada, Australia, and New Zealand will decline moderately in 2009 before picking up in 2010 (see Table 2.1). Downside risks include the possibility of more severe declines in world demand and elevated spreads on external finance, owing to increased risk aversion by foreign lenders. Risks seem greater in Australia and New Zealand, due to their relatively high levels of external liabilities: by end-2008, net foreign liabilities for Australia and New Zealand were over 60 and 90 percent of income, respectively, although most debt is in local currency or hedged.

Fortunately, conservative monetary and fiscal policy management in these economies now leave policymakers better placed than those in other economies to mitigate further declines in demand. Policy rates have been cut rapidly and can be cut still further. These cuts and terms-of-trade losses have led the exchange rates to depreciate substantially in nominal terms, so that commodity revenues in domestic currency have not declined nearly as much as world prices (Figure 2.6). Initiatives by central banks and governments, in the form of guarantees on deposits and other bank funding, have so far supported foreign credit flows, as have other measures to stabilize the financial systems. After years of running surpluses, fiscal positions are robust, and substantial fiscal stimulus is being provided. However, owing to relatively high dependence on demand from the United States and Asia and on external financing, there are limits to what domestic policy measures can achieve.

Latin America and the Caribbean Face Growing Pressures

As in the other emerging regions, financial sector stress and deleveraging in advanced econ-omies are raising borrowing costs and reducing capital inflows across Latin America and the Caribbean. In addition, the decline in commodity prices is pounding large economies in the region—Argentina, Brazil, Chile, Mexico, and Venezuela, which are among the world's major exporters of primary products. Moreover, the economic slump in advanced economies—especially the United States, the region's largest trading partner—is depressing external demand and lowering revenues from exports, tourism, and remittances. Hence, the region is suffering from the same trifecta of shocks as the CIS economies. In contrast, however, public and private balance sheets were relatively strong at the outset of the crisis in these economies, which were also less financially linked to advanced economies' banking systems. Thus, the decline in growth is generally projected to be less extreme than in the CIS or emerging European economies.

The global financial crisis spread quickly to Latin American and Caribbean markets after mid-September 2008. Local equity markets have sold off heavily, with the largest losses (about 25 percent) in Argentina (Figure 2.7). Domestic currencies have depreciated sharply, especially in Brazil and Mexico, which are large commodity-exporting countries with flexible exchange rate regimes. Local banks' funding costs have increased, particularly for small and medium-size banks. The cost of external borrowing has also risen, since higher spreads on sovereign and corporate debt have been only partially offset by lower yields on U.S. Treasury bills, and capital flows to the region dwindled in the last quarter of 2008. Nonetheless, financial markets have differentiated between borrowers: the cost of financing has increased substantially for some countries (for example, Argentina, Ecuador, and Venezuela) but remains relatively low for other countries with better initial positions and larger policy buffers, including Brazil, Chile, Colombia, Mexico, and Peru. Some of the latter have successfully issued foreign debt in recent months.

Adverse effects on real activity did not take long to surface. The slump in commodity

Figure 2.6. Canada, Australia, and New Zealand: Dealing with Terms-of-Trade Shocks

World commodity prices have fallen substantially from recent highs, but the effects have been mitigated by exchange rate depreciation. Governments have built up considerable room for fiscal stimulus, but larger net private external debt makes Australia and New Zealand more vulnerable to external financing shocks.

Commodity Price Indices
(percent change since July 2008)

Public and External Debt Positions, 2008
(selected advanced economies)[1]
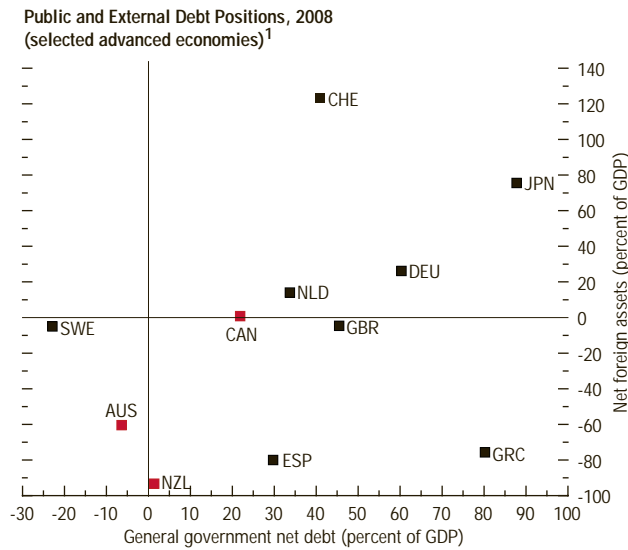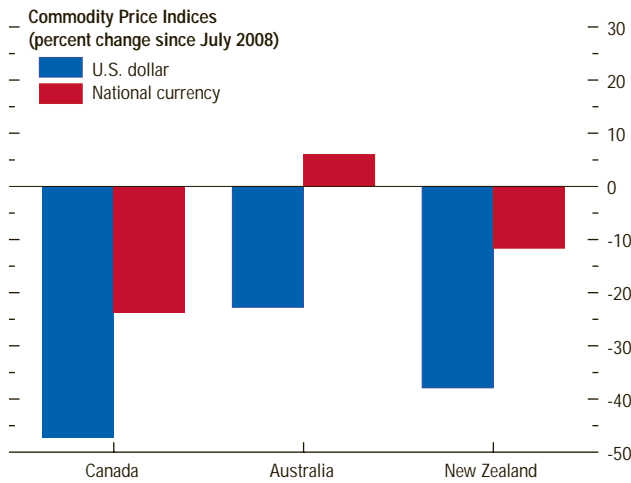
Sources: Haver Analytics and IMF staff calculations.
[1]Advanced economies for which 2008 data are available include: Australia (AUS), Canada (CAN), Germany (DEU), Greece (GRC), Japan (JPN), Netherlands (NLD), New Zealand (NZL), Spain (ESP), Sweden (SWE), Switzerland (CHE), and United Kingdom (GBR).

prices has dampened growth prospects for the region's commodity producers (mainly Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Trinidad and Tobago, Uruguay, and Venezuela), although it has helped commodity importers in the Caribbean and Central America. Furthermore, the collapse in growth in advanced economies, particularly in the United States, has lowered demand for exports, weakened tourism, and lowered workers' remittances—key supports in the Caribbean and Central America. With all these factors playing out, credit growth has slowed abruptly, industrial production and exports have collapsed, and consumer confidence has plummeted across the region.

Considering the very challenging external environment, most countries are weathering the storm well relative to earlier experiences with global turbulence, thanks to improvements in policy frameworks and balance sheet positions. Nonetheless, real GDP is forecast to contract by 1½ percent in 2009, before staging a modest recovery in 2010 (Table 2.6). Domestic demand would shrink by about 2¼ percent in 2009, due to more expensive and scarce foreign financing, as well as lower demand for domestic products. With the exchange rate acting as a shock absorber, activity is projected to decline modestly or even expand in a number of inflation-targeting economies (Brazil, Chile, Peru, Uruguay).[6] The contraction is expected to be more severe in Mexico, given its close linkages with the U.S. economy, notwithstanding the mitigating effect of a flexible exchange rate, in Venezuela, and in some very small economies dependent on tourism (Antigua and Barbuda, The Bahamas, Barbados, Jamaica).

As output gaps widen, inflation pressures are expected to subside, despite the pass-through effects of currency depreciation in a number of countries. For the region as a whole, inflation is projected to decline from 8 percent in 2008

[6]However, corporate sectors in some of these countries have experienced large losses on off-balance-sheet positions owing to currency depreciation.

to about 6½ percent in 2009. At the same time, the region's current account deficit is projected to widen to slightly more than 2 percent in 2009 (from about ¾ percent in 2008), owing to negative terms-of-trade effects.

The risks to this outlook are firmly planted to the downside. The main danger is that a protracted financial deleveraging in advanced economies will lead to a prolonged halt in capital inflows, which would require an even sharper domestic adjustment. Given sizable rollover requirements, the corporate and public sectors would be particularly vulnerable in a number of countries. Moreover, a further drop in commodity prices would have a deleterious effect on exports and growth in most countries in the region.

The overarching policy challenge is to cushion the adjustment to the external shocks. Given the region's high degree of openness and dependence on capital flows, however, the potential benefits of countercyclical policies need to be balanced against the potential costs of destabilizing foreign investor confidence, raising external borrowing costs, and reducing capital flows further. Room for policy action differs greatly across countries: economies with better frameworks and larger buffers will be able to offset the effects of the global crisis to varying degrees, whereas other economies may be forced to tighten policies to avoid instability.

The task of monetary and exchange rate policy is particularly difficult. The region came into the crisis with relatively high inflation. For the inflation-targeting regimes, inflation was above the target ranges in all cases except Brazil. Faced with negative shocks to capital flows and demand pressure on exchange rates, central banks in these countries refrained from cutting rates until December, when Colombia's central bank lowered its policy rate by 50 basis points. As the sharp deterioration in real activity became increasingly evident and inflation started to decelerate, the central banks of Brazil, Chile, Mexico, and Peru followed suit. Across the region, existing reserve buffers have been used to alleviate currency pressures and smooth the adjustment to the shocks. Balancing

Figure 2.7. Latin America: Pressures Are Growing[1]

The global financial crisis spread quickly to Latin America and the Caribbean, as local equity markets sold off heavily and domestic currencies depreciated. External borrowing costs rose sharply, especially for countries with weaker fundamentals. It did not take long for the crisis to affect real activity. With external demand and commodity prices slumping at the same time, industrial production and exports have plummeted.
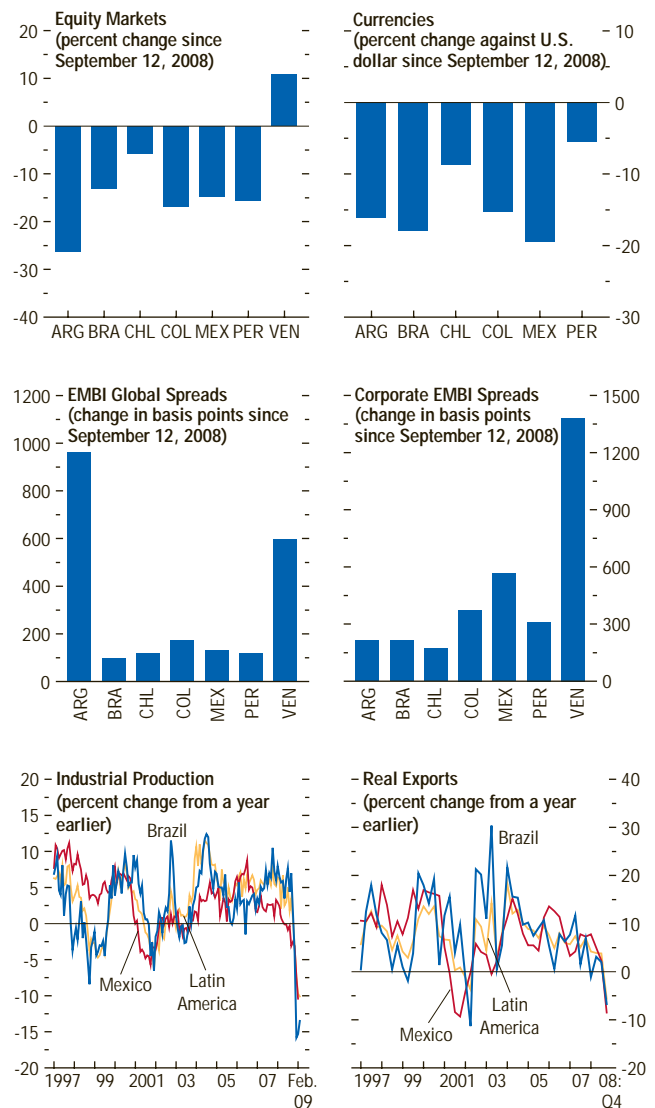
Sources: Bloomberg Financial Markets; Haver Analytics; and IMF staff estimates.
[1]ARG: Argentina; BRA: Brazil; CHL: Chile; COL: Colombia; MEX: Mexico; PER: Peru; VEN: Venezuela.

Table 2.6. Selected Western Hemisphere Economies: Real GDP, Consumer Prices, and Current Account Balance

(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Western Hemisphere	5.7	4.2	−1.5	1.6	5.4	7.9	6.6	6.2	0.4	−0.7	−2.2	−1.6
South America and												
Mexico[3]	5.7	4.2	−1.6	1.6	5.3	7.7	6.7	6.3	0.7	−0.3	−1.9	−1.3
Argentina[4]	8.7	7.0	−1.5	0.7	8.8	8.6	6.7	7.3	1.6	1.4	1.0	1.8
Brazil	5.7	5.1	−1.3	2.2	3.6	5.7	4.8	4.0	0.1	−1.8	−1.8	−1.8
Chile	4.7	3.2	0.1	3.0	4.4	8.7	2.9	3.5	4.4	−2.0	−4.8	−5.0
Colombia	7.5	2.5	0.0	1.3	5.5	7.0	5.4	4.0	−2.8	−2.8	−3.9	−3.3
Ecuador	2.5	5.3	−2.0	1.0	2.3	8.4	4.0	3.0	2.3	2.4	−3.5	−2.3
Mexico	3.3	1.3	−3.7	1.0	4.0	5.1	4.8	3.4	−0.8	−1.4	−2.5	−2.2
Peru	8.9	9.8	3.5	4.5	1.8	5.8	4.1	2.5	1.4	−3.3	−3.3	−3.2
Uruguay	7.6	8.9	1.3	2.0	8.1	7.9	7.0	6.7	−0.8	−3.6	−1.7	−2.4
Venezuela	8.4	4.8	−2.2	−0.5	18.7	30.4	36.4	43.5	8.8	12.3	−0.4	4.1
Central America[5]	6.9	4.3	1.1	1.8	6.8	11.2	5.9	5.5	−7.0	−9.2	−6.1	−7.1
The Caribbean[5]	5.8	3.0	−0.2	1.5	6.7	11.9	4.0	5.8	−1.5	−2.8	−5.1	−4.1

[1]Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Includes Bolivia and Paraguay.
[4]Private analysts estimate that consumer price index (CPI) inflation has been considerably higher.
[5]The country composition of these regional groups is set out in Table F in the Statistical Appendix.

domestic and external pressures could become more difficult, especially if global financial conditions deteriorate further. Nevertheless, central banks in countries with more flexible exchange rates anchored in credible inflation-targeting frameworks (for example, Brazil, Chile, Colombia, and Mexico) would have room to cut policy rates further, particularly if inflation continues to decelerate rapidly.

Room for fiscal policy to mitigate the adverse effects of the external shocks differs greatly across countries. Slowdowns in activity and declines in commodity prices are projected to weaken fiscal positions across the region in 2009. In countries with high external borrowing costs and large financing requirements, policymakers' ability to conduct countercyclical fiscal policy will be severely limited. In fact, such efforts could backfire through higher borrowing costs and greater loss of reserves. In other countries, existing fiscal room is already being partly used, with stimulus packages announced in a number of countries with lower debt levels, including Brazil, Chile, Mexico, and Peru.

In light of the challenging external environment, the premium is high on preserving the smooth functioning of domestic financial markets. As global banks and foreign investors reduce their exposure to economies in the region, the relative importance of domestic financing will increase. To avoid a full-blown credit crunch, it will be important to maintain stable funding conditions (in domestic currency) and facilitate the flow of credit. Many countries have already taken steps to provide liquidity and support credit flows, especially to the corporate sector (notably in Brazil and Mexico). Several have sought IMF support, including under precautionary arrangements (Costa Rica, El Salvador), and Mexico has secured access to the new Flexible Credit Line. Although domestic financial systems are now more resilient than in the past, the possibility of bank problems cannot be discounted in some cases, given the unfavorable external environment. This calls for continued work on improving financial safety nets and bank resolution frameworks.

Middle Eastern Economies Are Buffering Global Shocks

The global crisis has not spared the Middle East. The extremely large fall in the price of oil is hitting the region hard (Figure 2.8). The deterioration in external financing conditions and reversal of capital inflows are also taking a toll: local property and equity markets have come under intense pressure across the region, domestic liquidity conditions have deteriorated, credit spreads have soared for some firms, financial system strains have emerged in a number of countries, and sovereign wealth funds have suffered losses from investments in global markets. Furthermore, the substantial decline in external demand (including from countries in the Gulf region) is dampening export growth, workers' remittances, and tourism revenues (Egypt, Jordan, Lebanon).

Although highly expansionary policies are set to mitigate their impact, these adverse shocks are expected to have severe negative effects on economic activity. In the region as a whole, growth is projected to decline from 6 percent in 2008 to 2½ percent in 2009 (Table 2.7). The slowdown in growth is expected to be broadly similar in oil-producing and non-oil-producing countries,[7] even though the forces behind it are quite different. Among the oil-producing countries, the sharpest slowdown is expected in the United Arab Emirates (UAE), where the exit of external funds (which had entered the country on speculation of a currency revaluation) has contributed to a large contraction in liquidity, a sizable fall in property and equity prices, and substantial pressure in the banking system. A major financial center, UAE will also suffer from the contraction in global finance and merger and acquisition activity. At the other end of the spectrum is Qatar, which is projected to grow by 18 percent in 2009 (up from 16½ percent in 2008), since its production of natural gas is expected to double this year. Among the non-oil-producing coun-

[7]The group includes Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, United Arab Emirates, and Republic of Yemen.

Figure 2.8. Middle East: Coping with Lower Oil Prices[1]

The steep decline in the price of oil is hitting the region hard. As external financing conditions have deteriorated and capital inflows reversed, many equity and property markets have suffered substantial losses. Despite supportive policies, growth is projected to slow and inflation pressures to subside considerably in 2009. At the same time, the external and fiscal balances are set to worsen sharply, as oil-exporting countries utilize the buffers accumulated during the boom years to cushion the impact of the crisis.
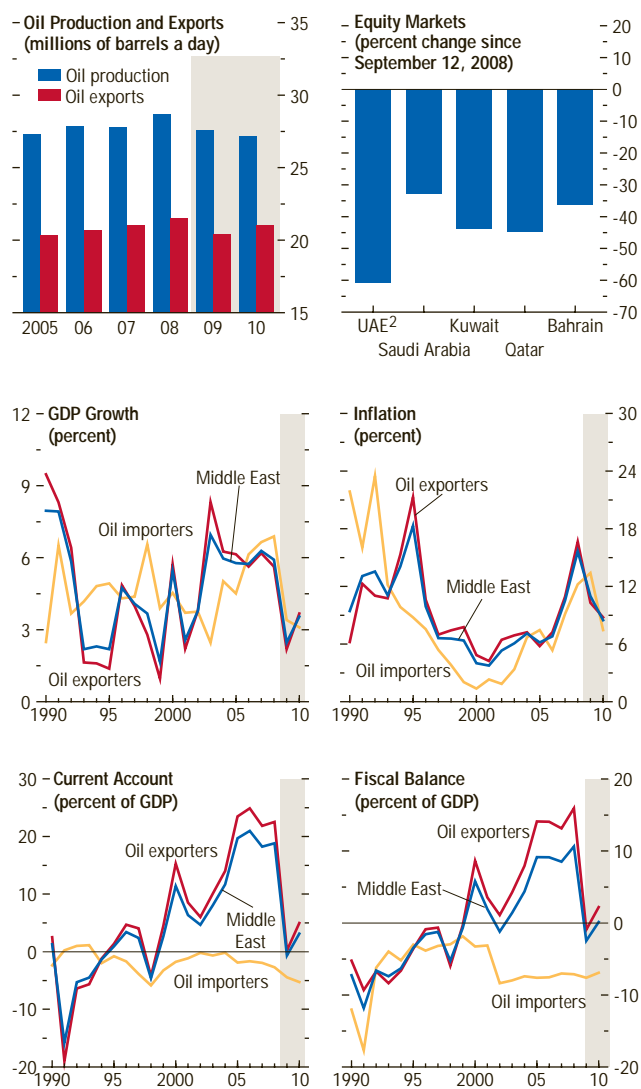
Sources: Bloomberg Financial Markets; and IMF staff estimates.
[1]Oil exporters include Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, United Arab Emirates, and Republic of Yemen. Oil importers include Egypt, Jordan, Lebanon, and Syrian Arab Republic.
[2]United Arab Emirates.

Table 2.7. Selected Middle Eastern Economies: Real GDP, Consumer Prices, and Current Account Balance

(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Middle East	**6.3**	**5.9**	**2.5**	**3.5**	**10.5**	**15.6**	**11.0**	**8.5**	**18.2**	**18.8**	**−0.6**	**3.2**
Oil exporters[3]	**6.2**	**5.6**	**2.2**	**3.7**	**10.9**	**16.7**	**10.3**	**8.8**	**21.9**	**22.5**	**0.2**	**5.0**
Iran, I.R. of	7.8	4.5	3.2	3.0	18.4	26.0	18.0	15.0	11.9	5.2	−5.2	−3.6
Saudi Arabia	3.5	4.6	−0.9	2.9	4.1	9.9	5.5	4.5	25.1	28.9	−1.8	4.5
United Arab Emirates	6.3	7.4	−0.6	1.6	11.1	11.5	2.0	3.1	16.1	15.8	−5.6	−1.0
Kuwait	2.5	6.3	−1.1	2.4	5.5	10.5	6.0	4.8	44.7	44.7	25.8	29.3
Mashreq	**6.7**	**6.9**	**3.4**	**3.1**	**9.1**	**12.2**	**13.4**	**7.5**	**−1.9**	**−2.7**	**−4.4**	**−5.3**
Egypt	7.1	7.2	3.6	3.0	11.0	11.7	16.5	8.6	1.4	0.5	−3.0	−4.1
Syrian Arab Republic	4.2	5.2	3.0	2.8	4.7	14.5	7.5	6.0	−3.3	−4.0	−3.1	−4.4
Jordan	6.6	6.0	3.0	4.0	5.4	14.9	4.0	3.6	−16.8	−12.7	−11.2	−10.6
Lebanon	7.5	8.5	3.0	4.0	4.1	10.8	3.6	2.1	−7.1	−11.4	−10.5	−10.0
Memorandum												
Israel	5.4	3.9	−1.7	0.3	0.5	4.7	1.4	0.8	2.8	1.2	1.1	0.3

[1]Movements in consumer prices are shown as annual averages. December/December changes can be found in Table A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Includes Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, United Arab Emirates, and Republic of Yemen.

tries, Lebanon is set to experience the steepest slowdown, as difficult external liquidity conditions raise the cost of debt servicing and the downturn in the Gulf reduces remittances. At the same time, for the region as a whole, inflation pressures are projected to subside quickly, owing to lower commodity prices, rents, and economic activity. The current account balance of the region is expected to swing into a small deficit. With dwindling surpluses in oil-producing countries, fiscal balances are set to deteriorate substantially, as revenues decline and governments use the buffers accumulated during the recent boom to sustain domestic demand by maintaining ongoing investment projects.

As in the other regions, downside risks to the outlook are considerable. First, a prolonged period of global economic turmoil could prompt oil exporters to reassess their long-term oil price expectations and, consequently, curtail their infrastructure spending plans and oil-production-field investment, which would cloud growth prospects for the entire region. Second, deepening asset price corrections would feed through to corporate and, ultimately, bank balance sheets, placing even greater stress on financial institutions in the region. Third, a

more protracted global recession would imply even weaker exports, tourism, and remittances for countries in the region.

Utilizing the buffers accumulated during the boom years, supportive policies are set to cushion the impact of the global crisis. In many countries, high government expenditures are filling the void left by the retrenchment of private sector activity (Kuwait, Libya, Oman, Qatar, Saudi Arabia) and will be essential for growth in the entire region. Regarding monetary policy, central banks across the region have reacted appropriately by providing liquidity, cutting reserve requirements, and lowering interest rates (Egypt, Jordan, Kuwait, Saudi Arabia, UAE). In this respect, countries with pegged exchange rates (Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, UAE) have benefited from the continued monetary easing in the United States. In the financial sector, pressures are building to varying degrees across the region, owing to banks' credit exposure to slumping property and stock markets and tightening external liquidity conditions. In countries that have been most affected so far, policy responses have been relatively swift, with authorities implementing a myriad of measures to shore up confidence

and prevent a systemic banking crisis. These have included introducing blanket deposit insurance (Kuwait, UAE), providing liquidity, and injecting capital into banks (Qatar, Saudi Arabia, UAE). However, additional government support in this area may be needed in a number of countries.

Hard-Won Economic Gains in Africa Are Being Threatened

Relatively weak financial linkages with advanced economies have not shielded African countries from the global economic storm (Figure 2.9). The main shock buffeting the continent is severe deterioration in external growth, which is reducing demand for African exports and curtailing workers' remittances. The sharp fall in commodity prices is also hitting the resource-rich countries in the region hard.[8] Moreover, the tightening of global credit conditions is reducing FDI and reversing portfolio flows, especially to emerging and frontier markets (Ghana, Kenya, Nigeria, South Africa, Tunisia). These external shocks are causing a severe slowdown in economic activity. For the region as a whole, growth is projected to decline from 5¼ in 2008 to 2 percent in 2009 (Table 2.8). On average, the downturn is most pronounced in oil-exporting countries (Angola, Equatorial Guinea) and in key emerging and frontier markets (Botswana, Mauritius, South Africa), which have suffered from all three shocks that are hitting the continent. South Africa's economy, for example, is projected to contract by about ¼ percent in 2009, its lowest growth rate in a decade, as capital outflows are forcing a sharp adjustment in asset prices (mainly in equity, bond, and currency markets) and in real activity.

[8]The group of oil-exporting countries includes Algeria, Angola, Cameroon, Chad, Republic of Congo, Equatorial Guinea, Gabon, Nigeria, and Sudan. The group of non-fuel-exporting countries includes Burkina Faso, Burundi, Democratic Republic of Congo, Guinea, Guinea-Bissau, Malawi, Mali, Mauritania, Mozambique, Namibia, and Sierra Leone.

Figure 2.9. Africa: Hard-Won Gains at Risk

The global financial crisis has not spared Africa, as external demand and commodity prices have plummeted and global credit conditions have tightened, thereby raising the cost of external borrowing and reducing capital inflows to the continent. As a result, growth and inflation are expected to slow considerably. Fiscal and external balances are set to deteriorate sharply, mainly for commodity exporters.
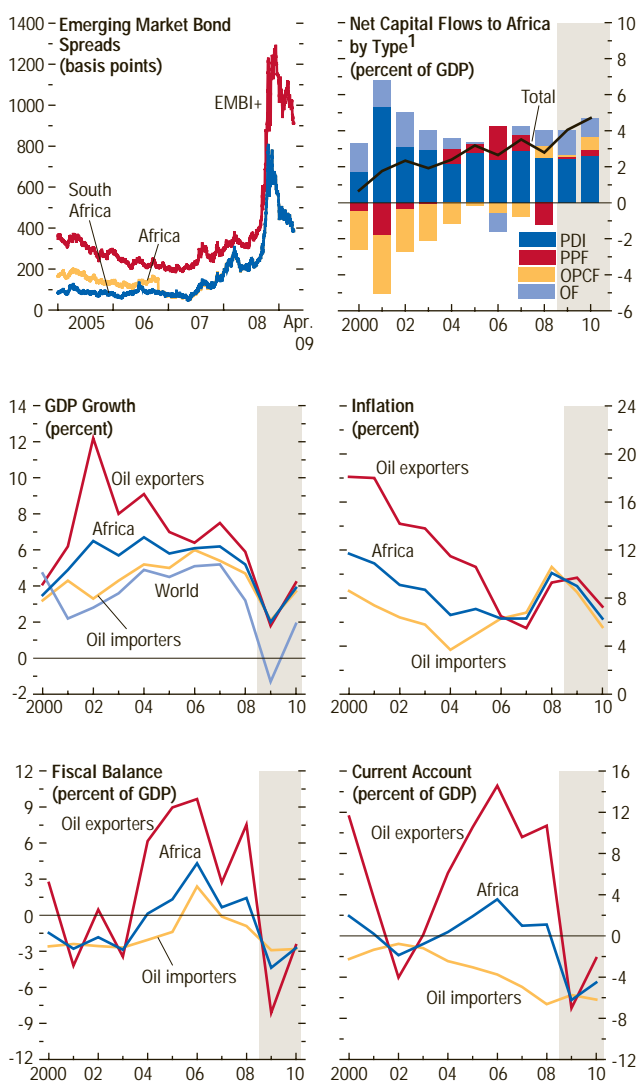
Sources: Bloomberg Financial Markets; and IMF staff calculations.
[1]PDI: private direct investment; PPF: private portfolio flows; OPCF: other private capital flows; OF: official flows.

Table 2.8. Selected African Economies: Real GDP, Consumer Prices, and Current Account Balance
(Annual percent change, unless noted otherwise)

	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Africa	**6.2**	**5.2**	**2.0**	**3.9**	**6.3**	**10.1**	**9.0**	**6.3**	**1.0**	**1.0**	**−6.5**	**−4.7**
Maghreb	**3.5**	**4.0**	**3.0**	**4.0**	**3.0**	**4.4**	**3.9**	**3.2**	**12.1**	**10.6**	**−2.1**	**−0.8**
Algeria	3.0	3.0	2.1	3.9	3.6	4.5	4.6	3.4	22.6	23.2	−1.7	1.4
Morocco	2.7	5.4	4.4	4.4	2.0	3.9	3.0	2.8	0.2	−5.6	−2.5	−3.0
Tunisia	6.3	4.5	3.3	3.8	3.1	5.0	3.2	3.4	−2.6	−4.5	−2.9	−4.3
Sub-Sahara	**6.9**	**5.5**	**1.7**	**3.8**	**7.2**	**11.7**	**10.4**	**7.1**	**−2.2**	**−1.8**	**−7.7**	**−5.9**
Horn of Africa[3]	**10.7**	**8.9**	**5.1**	**5.7**	**11.3**	**18.9**	**22.1**	**10.2**	**−10.3**	**−8.6**	**−9.4**	**−8.5**
Ethiopia	11.5	11.6	6.5	6.5	15.8	25.3	42.2	13.3	−4.5	−5.8	−5.8	−5.8
Sudan	10.2	6.8	4.0	5.0	8.0	14.3	9.0	8.0	−12.5	−9.3	−11.6	−10.0
Great Lakes[3]	**7.3**	**6.1**	**4.3**	**5.1**	**9.1**	**11.9**	**13.1**	**7.5**	**−4.8**	**−8.1**	**−8.6**	**−9.2**
Congo, Dem. Rep. of	6.3	6.2	2.7	5.5	16.7	18.0	33.9	19.9	−1.5	−15.4	−26.1	−28.7
Kenya	7.0	2.0	3.0	4.0	9.8	13.1	8.3	5.0	−4.1	−6.7	−3.6	−4.6
Tanzania	7.1	7.5	5.0	5.7	7.0	10.3	10.9	5.7	−9.0	−9.7	−8.7	−8.8
Uganda	8.6	9.5	6.2	5.5	6.8	7.3	13.7	7.4	−3.1	−3.2	−6.2	−6.5
Southern Africa[3]	**11.8**	**9.4**	**−1.7**	**7.2**	**10.1**	**11.6**	**10.3**	**7.6**	**7.0**	**8.1**	**−8.5**	**−4.0**
Angola	20.3	14.8	−3.6	9.3	12.2	12.5	12.1	8.9	15.9	21.2	−8.1	0.1
Zimbabwe[4]	−6.1	. . .	. . .	. . .	10,452.6	. . .	. . .	. . .	−1.4	. . .	. . .	. . .
West and central Africa[3]	**5.6**	**4.9**	**2.8**	**3.1**	**4.7**	**10.0**	**10.0**	**7.1**	**1.0**	**0.9**	**−8.2**	**−4.9**
Ghana	6.1	7.2	4.5	4.7	10.7	16.5	14.6	7.6	−11.7	−18.2	−10.9	−14.0
Nigeria	6.4	5.3	2.9	2.6	5.5	11.2	14.2	10.1	5.8	4.5	−9.0	−3.5
CFA franc zone[3]	**4.6**	**4.1**	**2.6**	**3.4**	**1.5**	**7.0**	**3.9**	**3.1**	**−3.3**	**−1.1**	**−6.8**	**−5.4**
Cameroon	3.5	3.4	2.4	2.6	1.1	5.3	2.3	2.0	0.8	0.4	−5.8	−5.1
Côte d'Ivoire	1.6	2.3	3.7	4.2	1.9	6.3	5.9	3.2	−0.7	2.4	1.6	−1.6
South Africa	**5.1**	**3.1**	**−0.3**	**1.9**	**7.1**	**11.5**	**6.1**	**5.6**	**−7.3**	**−7.4**	**−5.8**	**−6.0**
Memorandum												
Oil importers	5.4	4.7	2.1	3.7	6.8	10.6	8.5	5.6	−5.0	−6.9	−6.1	−6.6
Oil exporters[5]	7.5	5.9	1.8	4.2	5.5	9.3	9.7	7.3	9.6	10.7	−7.0	−2.2

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

[2]Percent of GDP.

[3]The country composition of these regional groups is set out in Table F in the Statistical Appendix.

[4]No data are shown for 2008 and beyond. The inflation figure for 2007 represents an estimate.

[5]Includes Chad and Mauritania in this table.

The deep downturn in economic activity across the region and the sharp decline in food and fuel prices will temper inflation pressures. Nevertheless, for the region as a whole, inflation is projected to decrease only gradually from 10 percent in 2008 to 9 percent in 2009, since the pass-through of commodity price changes to consumer prices is more limited than in advanced economies.

At the same time, fiscal and external balances are expected to deteriorate substantially. As commodity-based revenues dwindle, the overall fiscal position of the region is projected

to deteriorate by about 5¾ percentage points, to a deficit of 4½ percent of GDP in 2009. This is mainly as a result of a large swing in the fiscal balances of some oil-exporting countries (Angola, Republic of Congo, Equatorial Guinea, Nigeria). The current account balance of the region is also projected to worsen, from a surplus of 1 percent in 2008 to a deficit of 6½ percent of GDP in 2009. Again, the deterioration is projected to be most pronounced (in double digits) for many commodity exporters (Algeria, Angola, Gabon, Equatorial Guinea, Nigeria), as both export volumes and prices suffer. With

global credit conditions remaining tight, the financing of external deficits is expected to remain strained in a number of emerging and frontier markets (Ghana, Nigeria, South Africa, Tanzania).

As in all other regions, the risks to the outlook remain tilted to the downside. The main danger stems from a deeper and more prolonged slump in global growth, which would lower export demand, decrease tourism revenues, and further dampen workers' remittances. The global credit crunch could also reduce FDI and portfolio inflows much more than currently expected. Moreover, domestic banking systems could be weakened over time from a deterioration in credit quality (owing to the growth slowdown), losses on financial assets, and capital repatriations by (foreign-owned) parent banks. Most important, in the absence of well-functioning safety nets, the crisis could lead to a significant increase in poverty in a number of countries.

Against this backdrop, the key priority for policymakers must be to contain the adverse impact of the crisis on economic growth and poverty, while preserving the hard-won gains of recent years, including macroeconomic stability and debt sustainability. Specifically,

- Fiscal policy should, to the extent possible, cushion the pernicious effects of the crisis. Circumstances vary considerably across countries: some have the fiscal room for additional policy stimulus, as debt levels are quite low; others would be in a position to maintain (or adjust gradually) existing spending plans, letting automatic stabilizers operate at least to some degree.
- Monetary and exchange rate policy can play a supportive role in some cases. Although currency arrangements limit policy options in many countries, monetary policy can stimulate domestic demand in others with more exchange rate flexibility, especially if inflation pressures continue to subside. In fact, the South African Reserve Bank has already cut its policy rate by a cumulative 200 basis points since early December. Even in countries with

less exchange rate flexibility—in the West Africa Economic Monetary Union (WAEMU) and the Economic Union of Central African Countries (CEMAC), for instance—there could be some limited room for policy easing, given the ECB's policy decisions, falling inflation, weakening demand, and, especially regarding the CEMAC, existing reserve buffers. In this regard, the new facility set up by the central bank in the WAEMU area has been helpful in alleviating the liquidity squeeze in domestic markets.

- In the financial sector, given the potential for knock-on effects from the slowdown in real activity, efforts should focus on monitoring closely the balance sheets of financial institutions and preparing to act promptly if necessary. In this regard, it will be important to clarify bank intervention powers and be ready to introduce deposit insurance schemes as needed.

Although a number of countries have policy room to maneuver, others face very tight external and domestic financing constraints. For the latter group, additional donor support is critical to limit the social fallout of the crisis and preserve the hard-won gains in macroeconomic stability.

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FROM RECESSION TO RECOVERY: HOW SOON AND HOW STRONG?

This chapter examines recessions and recoveries in advanced economies and the role of countercyclical macroeconomic policies. Are recessions and recoveries associated with financial crises different from others? What are the main features of globally synchronized recessions? Can countercyclical policies help shorten recessions and strengthen recoveries? The results suggest that recessions associated with financial crises tend to be unusually severe and their recoveries typically slow. Similarly, globally synchronized recessions are often long and deep, and recoveries from these recessions are generally weak. Countercyclical monetary policy can help shorten recessions, but its effectiveness is limited in financial crises. By contrast, expansionary fiscal policy seems particularly effective in shortening recessions associated with financial crises and boosting recoveries. However, its effectiveness is a decreasing function of the level of public debt. These findings suggest the current recession is likely to be unusually long and severe and the recovery sluggish. However, strong countercyclical policy action, combined with the restoration of confidence in the financial sector, could help move the recovery forward.

The global economy is experiencing the deepest downturn in the post–World War II period, as the financial crisis rapidly spreads around the world (see Chapters 1 and 2). A large number of advanced economies have fallen into recession, and economies in the rest of the world have slowed abruptly. Global trade and financial flows are shrinking, while output and employment losses mount. Credit markets remain frozen as borrowers are engaged in a drawn-out deleveraging process and banks struggle to improve their financial health.

Many aspects of the current crisis are new and unanticipated.[1] Uniquely, the current disruption combines a financial crisis at the heart of the world's largest economy with a global downturn. But financial crises—episodes during which there is widespread disruption to financial institutions and the functioning of financial markets—are not new.[2] Nor are globally synchronized downturns. Therefore, history can be a useful guide to understanding the present.

To put the current cycle in historical perspective, this chapter addresses some broad questions about the nature of recessions and recoveries and the role of countercyclical policies. In particular,

- Are recessions and recoveries associated with financial crises different from other types of recessions and recoveries?
- Are globally synchronized recessions different?
- What role do policies play in determining the shape of recessions and recoveries?

To shed light on these questions, this chapter examines the dynamics of business cycles over the past half century. It complements existing literature on the business cycle along several dimensions.[3] These include a comprehensive study of recessions and recoveries in 21 advanced economies,[4] a classification of

[1]For detailed accounts of the financial aspects of this crisis, see IMF (2008), Greenlaw and others (2008), and Brunnermeier (2009).

[2]A classic analysis of financial crises is Kindleberger (1978). Reinhart and Rogoff (2008b) show that financial crises have occurred with "equal opportunity" in advanced and less advanced economies.

[3]In particular, this work builds on Chapter 3 of the April 2002 *World Economic Outlook*, Chapter 4 of the October 2008 *World Economic Outlook*, and Claessens, Kose, and Terrones (2008).

[4]The sample includes the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

recessions based on their underlying sources, and an assessment of the impact of fiscal and monetary policies in recessions and recoveries. Similar to most other studies in this area, the chapter makes extensive use of event analysis and statistical associations.

The main findings of the chapter related to common elements across business cycles are as follows:

- Recessions in the advanced economies over the past two decades have become less frequent and milder, whereas expansions have become longer, reflecting in part the "Great Moderation" of advanced economies' business cycles.
- Recessions associated with financial crises have been more severe and longer lasting than recessions associated with other shocks. Recoveries from such recessions have been typically slower, associated with weak domestic demand and tight credit conditions.
- Recessions that are highly synchronized across countries have been longer and deeper than those confined to one region. Recoveries from these recessions have typically been weak, with exports playing a much more limited role than in less synchronized recessions.

The implications of these findings for the current situation are sobering. The current downturn is highly synchronized and is associated with a deep financial crisis, a rare combination in the postwar period. Accordingly, the downturn is likely to be unusually severe, and the recovery is expected to be sluggish. It is not surprising, therefore, that many commentators looking for historical parallels for the current episode focus on the Great Depression of the 1930s, by far the deepest and longest recession in the history of most advanced economies (discussed further in Box 3.1).

Regarding policies, these are the main findings:

- Monetary policy seems to have played an important role in ending recessions and strengthening recoveries. Its effectiveness, however, is weakened in the aftermath of a financial crisis.

- Fiscal stimulus appears to be particularly helpful during recessions associated with financial crises. Stimulus is also associated with stronger recoveries; however, the impact of fiscal policy on the strength of the recovery is found to be smaller for economies that have higher levels of public debt.

This suggests that in order to mitigate the severity of the current recession and to strengthen the recovery, aggressive monetary and particularly fiscal measures are needed to support aggregate demand in the short term, but care must be taken to preserve public debt sustainability over the medium run. Even with such measures, a return to steady economic growth depends on restoring the health of the financial sector. Indeed, one of the most important lessons from the Great Depression, and from more recent episodes of financial crisis, is that restoring confidence in the financial sector is key for recovery to take hold (see Box 3.1).

The chapter is structured as follows. The first section presents key stylized facts on recessions and recoveries for the advanced economies during the past 50 years. The second section reviews the key differences across recessions and recoveries resulting from different types of shocks and different degrees of synchronization. Particular attention is paid to the influence of financial crises. The third section analyzes the effects of discretionary monetary and fiscal policies on the severity of recessions and on the strength of recoveries. It also examines how the level of public debt conditions the effectiveness of fiscal policy. The last section places the current downturn in historical perspective and discusses some policy implications.

Business Cycles in the Advanced Economies

To put the current recession in historical perspective, we first identify the features of prior cycles. Each cycle is divided into two main phases: a recession phase, characterized by a

Box 3.1. How Similar Is the Current Crisis to the Great Depression?

The current global crisis is the most severe financial crisis since the Great Depression, which invites comparisons with this historical precedent. This box compares the current crisis with the Great Depression, with a particular focus on the unique financial conditions prevailing at the onset of each event.[1]

From a U.S. Recession to the Great Depression

The Great Depression remains the most severe recession on record in the United States and many other countries (first figure). Output fell sharply, unemployment skyrocketed, and prices fell in a deflationary spiral. There is broad agreement about the process by which a severe recession in the United States evolved into a global depression:[2]

- A recession began in the United States in August 1929. A tightening of monetary policy during the previous year, aimed at stemming stock market speculation, is widely seen as the initial cause. The stock market crashed in October 1929, which prompted a sharp decline in consumption, partly because of increased uncertainty about future income.

- The recession intensified and turned into a depression over the course of 1931–32. Pernicious feedback loops between the financial sector and the real economy emerged, leading to entrenched debt deflation[3] and four waves of bank runs and failures between 1930 and 1933. Private consumption and investment contracted sharply.

Activity and Prices during the Great Depression
(1929 = 100)
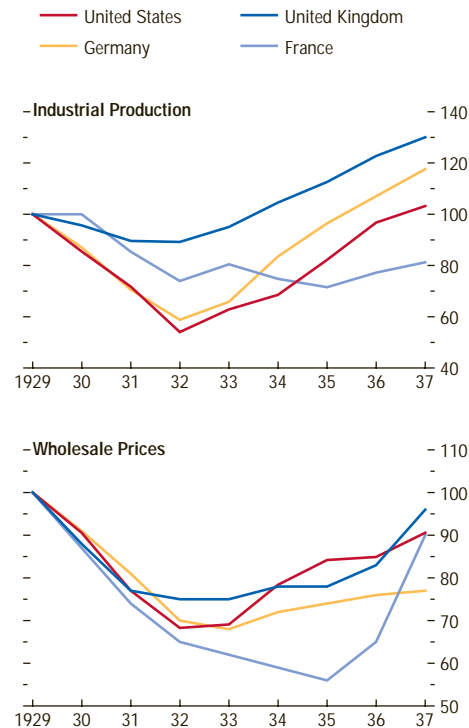
Sources: Mitchell (2003, 2007).

The main author of this box is Thomas Helbling.
[1]Bordo (2008), Eichengreen (2008), and Romer (2009) also undertake historical comparisons.
[2]See Bernanke (1993), Romer (1993), Calomiris (1993), Eichengreen (1992), and Temin (1989, 1993).
[3]Declining prices of goods and services increase the real burden of nominal debt and impair the creditworthiness of borrowers, which reduces their ability to borrow (or refinance) and spend, thereby reinforcing the contraction in aggregate demand and downward pressure on prices (Fisher, 1933). This, in turn, also reduces the creditworthiness of financial intermediaries because of increased credit risk.

- The U.S. downturn exerted contractionary effects on a worldwide scale. The stock market crash led to price falls and wealth losses elsewhere, while declining U.S. aggregate demand had an adverse international effect through trade channels. Moreover, the financial crisis in the United States spread directly to the rest of the world through a number of channels, including diminished U.S. capital outflows. The gold exchange standard prevailing at the time is widely seen as a major transmission channel, as gold outflows into the United States led to a tightening of domestic monetary conditions in other countries.

There is broad agreement that the lack of a coherent macroeconomic policy response in the United States and many other countries was

Box 3.1 *(continued)*

an important contributing factor to the severity and duration of the global depression.[4] Policies helped to generate a recovery when, in early 1933, the administration of the newly elected president, Franklin Roosevelt, embarked on reflationary policies that succeeded in turning around deflation expectations and bolstering confidence in the banking system (see below).[5]

Comparisons with the Current Crisis

In comparing the current crisis with the Great Depression, it is useful to distinguish between initial conditions, transmission, and policy responses. An important common feature is that the U.S. economy is the epicenter of both crises. Given its weight, a downturn in the United States has all but guaranteed a global impact. This sets the current crisis and the Great Depression apart from many other financial crises, which have typically occurred in smaller economies and had more limited global impact.

In both episodes, rapid credit expansion and financial innovation led to high leverage and created vulnerabilities to adverse shocks.[6] How-

ever, while the credit boom in the 1920s was largely specific to the United States, the boom during 2004–07 was global, with increased leverage and risk-taking in advanced economies and in many emerging economies. Moreover, levels of economic and financial integration are now much higher than during the interwar period, so U.S. financial shocks have a larger impact on global financial systems than in the 1930s.[7]

On the other hand, global economic conditions were weaker in mid-1929. Germany was already in a recession, and wholesale and, to a lesser extent, consumer prices had stagnated or were already falling in Germany, the United Kingdom, and the United States before the onset of the U.S. recession. Downward pressure on prices from slowing activity thus led almost immediately to deflation. In contrast, inflation in mid-2008 was above target in most economies, thereby providing some initial cushion.

Liquidity and funding problems of banks and other financial intermediaries play a key role in the financial sector transmission in both episodes. The specific mechanics differ, though, given the evolution in the structure of the financial system since the 1930s.

In the Great Depression, liquidity and funding pressures arose from the erosion of the deposit base. Depositors were concerned about the declining net worth of their banks, and in the absence of deposit insurance, they withdrew their deposits—the banks' main external funding source. There were four waves of bank runs. Overall, about a third of all U.S. banks failed during 1930–33. Such bank failures and losses also played an important role in other economies.[8] In particular, the failure of the Austrian bank Creditanstalt in 1931, which had more

[4]Friedman and Schwartz (1963) famously argued that the severity of the Great Depression could be attributed to monetary policy mistakes—the Federal Reserve failed to counter the tightening in monetary conditions from bank failures and increased cash-to-deposit ratios. Although subsequent research has qualified some of Friedman and Schwartz's findings, the thrust remains relevant (see, for instance, Calomiris, 1993).

[5]See, for example, Eggertsson (2008), Romer (1990), and Temin and Wigmore (1990).

[6]In both cases, financial innovation accompanied the boom. In the 1920s, household credit expanded more rapidly than personal income in the United States, because the rapid diffusion of mass consumer durables was associated with rapid growth in installment credit provided by nonbank financial institutions (Eichengreen and Mitchener, 2003). At the same time, new marketing techniques for stocks helped to broaden equity ownership, while investment trusts and individuals increasingly used margin loans to leverage their equity market investment. In the current episode, financial innovation centered on mortgage-related products, both in origination and distribution (securitization, structured products).

[7]There was room, however, for cross-border financial feedback from the precarious international financial conditions in mid-1929. Major European economies depended on capital inflows from the United States to maintain fixed exchange rates under the gold standard prevailing at the time. U.S. monetary policy tightening in 1928 had already led to some slowing of these flows (Kindleberger, 1993).

[8]See Kindleberger (1993) and Temin (1993).

Financial Factors at Work in the United States, Now and Then[1]
(Months from business cycle peak on x-axis)

July 1929 ——— December 2007

Baa Corporate Bond Spread[2]
(percent)

October 1930, first wave of bank failures

Net Credit Extension[3]
(percent of personal income)

Loan Ratios[4]
(percent)

Stock Prices (S&P)
(business cycle peak = 100)
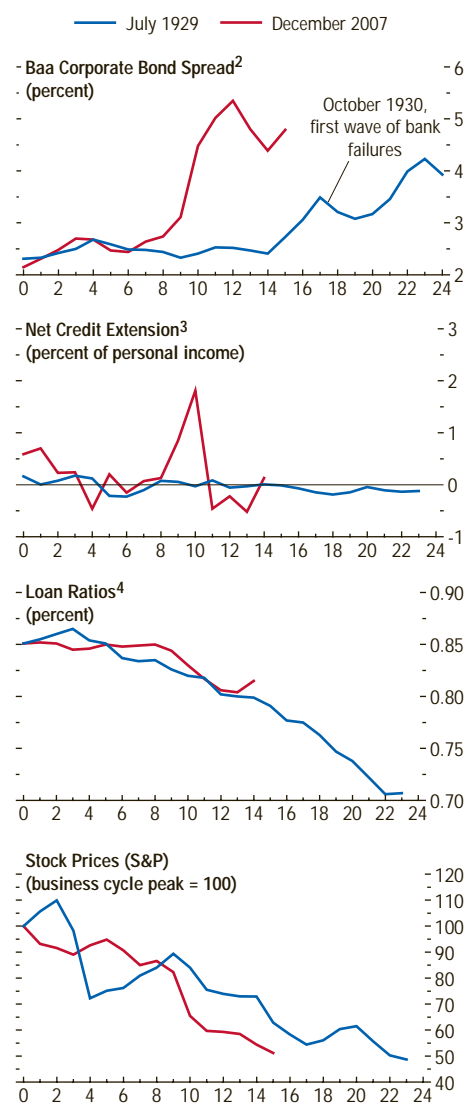
Sources: Bernanke (1983); Federal Reserve Board; and Haver Analytics.

[1] Business cycle peaks as determined by the National Bureau of Economic Research.

[2] Average yield on Baa-rated corporate bonds over yield on long-term treasuries.

[3] Monthly changes in commercial bank loans.

[4] Loan-to-deposit ratio in 1929–31, loan-to-asset ratio in 2007–09 (adjusted by a constant to match the June 2009 initial value).

than half of all the deposits in the country's banking system on its books, set the scene for bank runs in other European countries, including Germany. These failures were related to earlier gold losses and fears that countries would exit from the gold standard in an environment where nonresident deposits were an important funding source for many European banks.

In the current crisis, the reassurance provided by deposit insurance has largely prevented bank runs by retail depositors. However, funding problems have arisen for banks and other intermediaries reliant on wholesale funding in short-term money markets, particularly those issuing or holding (directly and indirectly) U.S. mortgage securities and derivatives.[9] The main reason for the erosion of the funding base was concern about the net worth of intermediaries after losses from increasing mortgage defaults in the United States, especially after Lehman Brothers' closure implied significant losses for its creditors. With large cross-border linkages in short-term money markets, these funding problems were international in reach early on in this crisis.

Despite the differences in mechanics, the effects on the behavior of financial intermediaries are similar. Funding problems have led to balance sheet contraction (deleveraging), fire sales of assets (adding to downward pressure on prices), increased holdings of liquid assets, and decreased lending (or holdings of risky assets) as a share of total assets. Moreover, with today's highly interconnected financial system, there has been gridlock because of network effects in a world of multiple trading and large gross positions.

The ultimate effects of these financial factors on the real economy are similar in the two episodes. They reduce the availability of external funds for borrowers and raise the marginal costs of funds (see, for instance, Bernanke, 1983). At the same time, losses from falling asset prices, together with losses from business operations,

[9] See Brunnermeier (2009) and Gorton (2008).

Box 3.1 *(concluded)*

lower the net worth of borrowers, thereby reducing their creditworthiness as well as that of related financial intermediaries.

In the U.S. financial system, the paths of several financial variables are remarkably similar in both events (second figure).[10] Bond spreads for average borrowers increase; the net extension of bank credit slows, partly reflecting declining loan-to-deposit or loan-to-asset ratios with balance sheet adjustment; and stock prices decline at a similar pace.

Policy Responses Then and Now

Countercylical policy responses were virtually absent in the early stages of the Great Depression, reflecting in part a "gold standard mentality" focused on traditional policies for stability (stable gold reserves and balanced budgets). Over time, however, a growing number of countries ended gold convertibility and/or changed the gold parity of their currencies—including Great Britain in September 1931 and the United States in April 1933. These regime changes set the stage for significant monetary expansions and are widely credited for initiating the recoveries. In the United States, the Emergency Banking Act of March 1933 allowed for the closing of insolvent banks and the restructuring of solvent banks, which boosted confidence in the financial sector. The Banking Act of June 1933 introduced federal deposit insurance. Economic historians generally do not see an important role for fiscal policy in the recovery because it was not used on a large scale, except in Germany and Japan.[11]

In the current downturn, there has been strong, swift recourse to macroeconomic policy support. Major central banks have intervened massively to provide financial systems with

[10]Comparisons in this figure extend data analysis for the United States by Bernanke (1983) to the current crisis.

[11]Romer (2009) notes that while the U.S. federal fiscal deficit rose by 1½ percentage points in 1934, the stimulus at the federal level was not sustained into 1935 and was in any case largely offset by the procyclical stance at the state and local levels.

Countercyclical Policies and Output-Inflation Dynamics
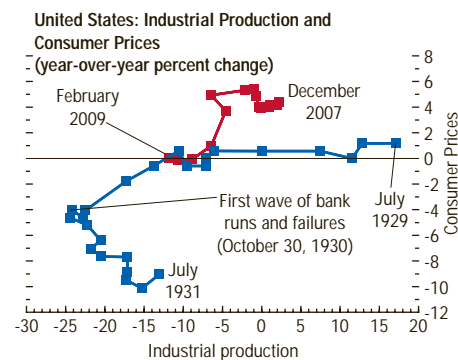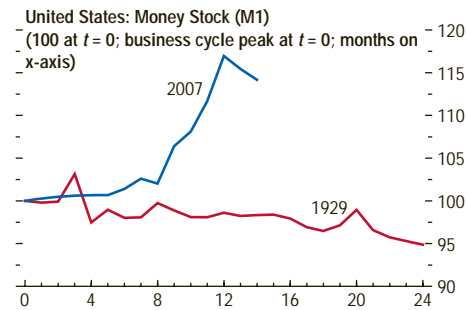
Sources: Bernanke (1983); Friedman and Schwarz (1963); and Haver Analytics.

liquidity and lowered policy interest rates. Reflecting these policy efforts, the U.S. money stock has expanded rapidly, rather than contracting as during the Great Depression (third figure, first panel), and for the most part, funding problems have not been allowed to cause the failure of systemically important financial intermediaries.

In the current crisis, the international monetary system is not an impediment to effective policy responses, unlike in the early 1930s, when the gold exchange standard fostered deflationary adjustment. At that time, the scope for expansionary monetary policy and lender-of-last-resort operations in many European countries was hampered by the potential loss of gold

reserves and exit from gold convertibility, given balance of payments deficits. Conversely, in the major surplus countries, the United States and France, the existing scope for reflationary adjustment from rising gold inflows was not exploited.[12] Moreover, in contrast with today, there was little international cooperation, given political tension among the major countries, and increasing protectionism—including tariff wars set off by the passage of the U.S. Smoot-Hawley Tariff Act in 1930—increased the drag from falling external demand.

In sum, unprecedented policy support, an international monetary system that provides for reflationary adjustment, and more favorable initial macroeconomic conditions are the key features that distinguish the current crisis from the Great Depression. The traumatic finan-

cial sector adjustment seen in the early 1930s has been avoided, and declines in activity and inflation in the United States and other major economies have so far been less virulent than during 1929–31 (third figure, second panel). Debt deflation has thus been avoided so far.

Nevertheless, there are worrisome parallels. There is continued pressure on asset prices, lending remains constrained by financial sector deleveraging and widespread lack of confidence in financial intermediaries, financial shocks have affected real activity on a global scale , and inflation is decelerating rapidly and is likely to approach values close to zero in a number of countries. Moreover, declining activity is begin-ning to create feedback effects that affect the solvency of financial intermediaries, which risks of debt deflation have increased. As discussed in Chapter 1, further policy action is needed to restore confidence in the financial sector, stop damaging asset price deflation, and support an early global recovery.

[12]See Temin (1989, 1993), Eichengreen (1992), and Kindleberger (1993). The Federal Reserve sterilized the effects of gold inflows on the money stock.

decline in economic activity, and an expansion phase. Following the long-standing tradition of Burns and Mitchell (1946), this chapter employs a "classical" approach to dating turning points in a large sample of advanced economies from 1960 to the present. It focuses on quarterly changes in real GDP to determine cyclical peaks and troughs (Figure 3.1).[5]

[5]The procedure used to date business cycles in this chapter has been referred to as BBQ (Bry-Boschen procedure for quarterly data; see Harding and Pagan, 2002). It identifies local maximums and minimums of a given series, here the logarithm of real GDP, that meet the conditions for a minimal duration of a cycle and of each phase (in this chapter, these are set at five and two quarters, respectively). Alternative dating algorithms, such as those developed by Chauvet and Hamilton (2005) and Leamer (2008), are more difficult to implement for a large sample of countries. The National Bureau of Economic Research (NBER), which dates business cycles in the United States, uses several measures of economic activity to determine peaks and troughs. These measures include—in addition to real GDP—employment, real

The chapter considers the two main proper-ties of the cycle:

- Duration: the number of quarters from peak to trough in a recession, or from trough to the next peak in an expansion.
- Amplitude: the percent change in real GDP from peak to trough in a recession, or from trough to the next peak in an expansion.

The chapter also examines the slope of a recession (or expansion), that is, the ratio of amplitude to duration, which indicates the steepness of each cyclical phase.

Recessions and Expansions: Some Basic Facts

On average, advanced economies have experienced six complete cycles of recession

income, industrial production, and sales. NBER dating is, however, subjective and not replicable internationally.

Figure 3.1. Business Cycle Peaks and Troughs

Each cycle has two phases: a recession phase (from peak to trough) and an expansion phase (from trough to the next peak).
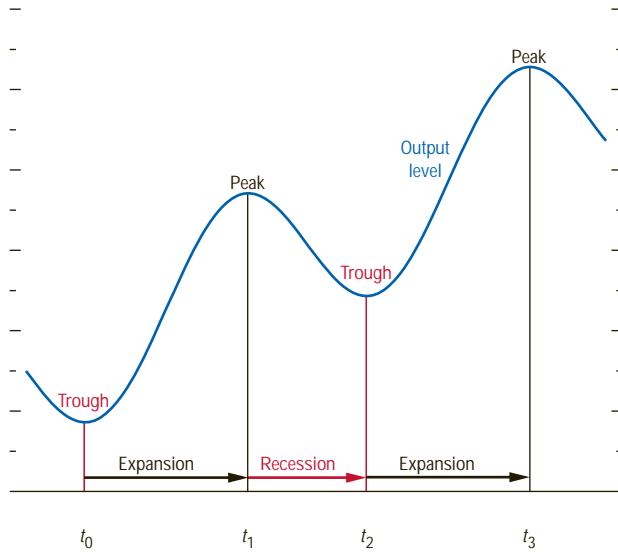
Source: IMF staff calculations.

Figure 3.2. Business Cycles Have Moderated over Time

Recessions have become less frequent and milder, whereas expansions have become longer.
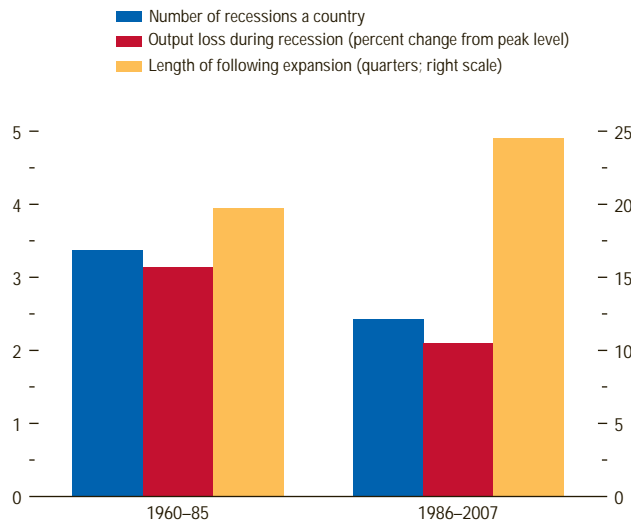
Source: IMF staff calculations.

and expansion since 1960.[6] The number of recessions, however, varies significantly across countries, with some (Canada, Ireland, Japan, Norway, Sweden) experiencing only three recessions and others (Italy, New Zealand, Switzerland) experiencing nine or more.

Recessions are distinctly shallower, briefer, and less frequent than expansions. In a typical recession, GDP falls by about 2¾ percent (Table 3.1).[7] In contrast, during an expansion, GDP tends to rise by almost 20 percent. This illustrates mainly the importance of trend growth; the higher the long-run growth rate of an economy, the shallower the recession and the greater the amplitude of expansions. Some recessions, however, are severe, with peak-to-trough declines in output exceeding 10 percent. These episodes are often called depressions (April 2002 *World Economic Outlook*). Since 1960, there have been six depression episodes in the advanced economies; the latest was observed in Finland in the early 1990s. In contrast, some expansions witness trough-to-peak output increases larger than 50 percent—the "Irish miracle" being a recent example.

A typical recession persists for about a year, whereas an expansion often lasts more than five years. As a result, advanced economies are in a recession phase of the cycle only 10 percent of the time. The longest episodes of recessions and expansions in these countries lasted more than 3 years and 15 years, respectively. Finland and Sweden experienced two of the longest recessions, and Ireland and Sweden experienced two of the longest expansions.

Since the mid-1980s, recessions in advanced economies have become less frequent and milder, while expansions have become longer lasting, a development associated with the Great Moderation (Figure 3.2).[8] A host of factors

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[6]In the sample period, there are 122 completed and 15 ongoing recessions.

[7]Related findings are reported in the April 2002 *World Economic Outlook*.

[8]This phenomenon has been documented in several papers, including McConnell and Perez-Quiros (2000) and Blanchard and Simon (2001). During this period the

Table 3.1. Business Cycles in the Industrial Countries: Summary Statistics

	Duration[1]			Amplitude[2]		
	Recession	Recovery[3]	Expansion	Recession	Recovery[4]	Expansion
All						
Mean (1)	3.64	3.22	21.75	−2.71	4.05	19.56
Standard deviation (2)	2.07	2.72	17.89	2.93	3.12	17.50
Coefficient of variation (2)/(1)	0.57	0.84	0.82	1.08	0.77	0.89
Number of events	122	109	122	122	112	122
By driver of recession						
Financial crises						
Mean (1)	5.67**	5.64**	26.40**	−3.39	2.21***	19.47
Standard deviation (2)	3.15	3.32	24.74	3.25	1.18	20.46
Coefficient of variation (2)/(1)	0.56	0.59	0.94	0.96	0.53	1.05
Number of events	15	11	15	15	13	15
Other[5]						
Mean (1)	3.36**	2.95**	21.09**	−2.61	4.29***	19.58
Standard deviation (2)	1.71	2.52	16.77	2.89	3.22	17.15
Coefficient of variation (2)/(1)	0.51	0.85	0.79	1.11	0.75	0.88
Number of events	107	98	107	107	99	107
By extent of synchronization						
Highly synchronized						
Mean (1)	4.54***	4.19*	19.97***	−3.45*	3.66**	16.24*
Standard deviation (2)	2.50	3.59	15.32	2.96	1.72	11.85
Coefficient of variation (2)/(1)	0.55	0.86	0.77	0.86	0.47	0.73
Number of events	37	32	37	37	34	37
Other[6]						
Mean (1)	3.25***	2.82*	22.52***	−2.39*	4.21**	21.01*
Standard deviation (2)	1.73	2.16	18.94	2.88	3.56	19.33
Coefficient of variation (2)/(1)	0.53	0.77	0.84	1.21	0.85	0.92
Number of events	85	77	85	85	78	85
Memorandum:						
Recessions associated with financial crises that are highly synchronized						
Mean	7.33	6.75	24.33	−4.82	2.82	18.83

Note: The symbols *, **, and *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively. Statistical significance for recessions associated with financial crises (highly synchronized recessions) is calculated versus other recessions.
[1]Number of quarters.
[2]Percent change in real GDP.
[3]Number of quarters before recovery to the level of previous peak.
[4]Percent increase in real GDP after one year.
[5]Recessions not associated with a financial crisis.
[6]Recessions that are not highly synchronized.

may explain this, including global integration, improvements in financial markets, changes in the composition of aggregate output toward the service sector and away from manufacturing, and better macroeconomic policies (see Blanchard and Simon, 2001; and Romer, 1999). Another possibility is that the Great Moderation is the result of good luck, primarily reflecting the absence of large shocks to the world economy.

average slope of a recession—a proxy for how steep or abruptly output contracts—is about –0.6 percent, which is lower in absolute value than the average –1 percent for other recession periods.

The recovery phase of the cycle has been an object of constant interest in policy circles.[9] An economy typically recovers to its previous peak output in less than a year (see Table 3.1). Perhaps more important, recoveries are typically steeper than recessions—the average growth

[9]There is no common definition of recovery. Whereas some define it as the time it takes for the economy to return to the peak level before the recession, others measure it by the cumulative growth achieved after a certain time period, say a year, following the trough. In this chapter, both definitions are used. These two definitions are complementary and display a sort of duality—the first one determines the time it takes to achieve a given amplitude, and the second one determines the amplitude observed after a given time.

per quarter during a recovery exceeds the rate of contraction during a recession by more than 25 percent. In fact, there is evidence of a bounce-back effect: output growth during the first year of recovery is significantly and positively related to the severity of the preceding recession. A number of factors can drive an economy to bounce back, including fiscal and monetary policies (this possibility is explored later in the chapter), technological progress, and population growth.[10]

Does the Cause of a Downturn Affect the Shape of the Cycle?

This section associates recessions and their recoveries with different types of shocks: financial, external, fiscal policy, monetary policy, and oil price shocks.[11] The objective of this exercise is to determine whether there have been important differences between the recessions associated with financial crises and those associated with other shocks. In addition, this section examines whether there is a difference between highly synchronized and nonsynchronized recessions.

We find that different shocks are associated with different patterns of macroeconomic and financial variables during recessions and recoveries. In particular, recessions associated with financial crises have typically been severe and protracted, whereas recoveries from recessions associated with financial crises have typically been slower, held back by weak private demand and credit. In addition, highly synchronized recession episodes are longer and deeper than other recessions, and recoveries from these recessions are typically weak. Moreover, develop-

ments in the United States often play a pivotal role both in the severity and duration of these highly synchronized recessions.

Categorizing Recessions and Recoveries

We begin categorizing recessions and recoveries by first defining financial crises as episodes during which there is widespread disruption to financial institutions and the functioning of financial markets. Financial crises are identified using the narrative analysis of Reinhart and Rogoff (2008a, 2008b, 2009),[12] which in turn draws on the work of Kaminsky and Reinhart (1999).[13] Next, a recession is said to be associated with a financial crisis if the recession episode starts at the same time or after the beginning of the financial crisis.[14] Of the 122 recessions in the sample, 15 are associated with financial crises (Table 3.2).[15] The other disturbances are identified using simple statistical rules of thumb (see the appendix).[16] More than half of the 122

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[10]Sichel (1994) and Wynne and Balke (1993) provide evidence of a bounce-back effect in U.S. business cycles. Romer and Romer (1994) report that monetary policy has been instrumental in ending U.S. recessions and helping recoveries during the postwar period.

[11]Term spreads, which have often been used as an indicator of monetary policy stance and as a predictor of short-run output growth—see, for example, Estrella and Mishkin (1996)—were also analyzed and found to give results very similar to those for monetary policy shocks.

[12]An alternative method of defining financial crises is to use a time series or some combination of series as an indicator, based on some threshold (the method used for the other shocks). An advantage of using a narrative-based method is that it avoids having to define episodes according to characteristics of the very things one is interested in—for example, a financial crisis could be defined as an episode in which there is a large reduction in credit, but that would preclude assessing the behavior of credit during and following financial crises.

[13]We are particularly interested in banking crises, which are defined by Kaminsky and Reinhart (1999, p. 476) as episodes leading to bank runs or large-scale government assistance to financial institutions.

[14]On these grounds, we omit Reinhart-Rogoff episodes not immediately associated with recessions—for example, the savings and loan crisis of the early 1980s in the United States.

[15]In principle, there is a potential endogeneity problem here, because the financial crisis could lead to a recession and vice versa. To address this issue, the dating of crises and cyclical turning points has been done using two different methods, as explained in the chapter.

[16]These rules have the advantage that they are transparent and can easily and consistently be applied to the GDP series for the 21 countries in the sample. There will always be cases that are not well identified by simple rules. However, a more thorough analysis of the nonfinancial shocks for each country is outside the scope of this chapter.

Table 3.2. Financial Crises and Associated Recessions

Australia	1990:Q2–1991:Q2
Denmark	1987:Q1–1988:Q2
Finland	1990:Q2–1993:Q2*
France	1992:Q2–1993:Q3
Germany	1980:Q2–1980:Q4
Greece	1992:Q2–1993:Q1
Italy	1992:Q2–1993:Q3
Japan	1993:Q2–1993:Q4*
Japan	1997:Q2–1999:Q1
New Zealand	1986:Q4–1987:Q4
Norway	1988:Q2–1988:Q4*
Spain	1978:Q3–1979:Q1*
Sweden	1990:Q2–1993:Q1*
United Kingdom	1973:Q3–1974:Q1
United Kingdom	1990:Q3–1991:Q3

Note: * denotes the "Big Five" financial crises (Reinhart and Rogoff, 2008a).

recessions in the sample are associated with one or more of these shocks.[17] Oil shocks are the most widespread type, affecting 17 economies in the sample. Monetary and fiscal policy shocks are less common, and external demand shocks are the least common of all, affecting only a handful of the smaller and more open economies (see Table 3.5 in the appendix). Although recessions have become less common overall during the Great Moderation, those associated with financial crises have become more common (Figure 3.3).

Summaries of the stylized facts of these different categories of recessions and recoveries are presented in Table 3.1 and Figure 3.4. With the notable exception of oil shocks, the amplitude of a recession is closely related to its duration.[18] Recessions associated with financial crises are longer and generally more costly than others; those associated with the "Big Five" financial crises identified by Reinhart and Rogoff (2008a) were particularly costly (Figure 3.4, upper

[17]The scores often coincide, with 105 scores for the 65 recessions that are associated with these shocks, which indicates how misleading it can be to talk about a recession as a result of a single "cause."

[18]Overall, oil shocks typically lead to recessions that are very costly but relatively short lived. This is particularly true of the 1973–74 oil shocks, after which GDP growth bounced back relatively quickly.

Figure 3.3. Temporal Evolution of Recessions by Shock

Recessions have become less common in recent years. But recessions associated with financial crises have become more common.

Source: IMF staff calculations.

Figure 3.4. Average Statistics for Recessions and Recoveries

The severity of most recessions is closely related to their duration. Recessions following financial crises are longer than average. Recessions following oil shocks are relatively severe but not very long. The bounce-back from financial crises is weaker than average. The time for output to recover to the level of the previous peak is longer.

Recessions

- ■ (red) Duration (quarters)
- ■ (blue) Output loss (percent from peak)

Fiscal policy contractions

Monetary policy tightening

Oil shocks

External demand shocks

Financial crises

"Big Five" financial crises

(axis: 0 1 2 3 4 5 6 7)

Recoveries

- ■ (orange) Output gain after four quarters (percent from trough)
- ■ (dark) Time until recovery to previous peak (quarters)

Fiscal policy contractions

Monetary policy tightening

Oil shocks

External demand shocks

Financial crises

"Big Five" financial crises

(axis: 0 1 2 3 4 5 6 7)

Source: IMF staff calculations.

panel).[19] Financial crises are also followed by weak recoveries: the time taken to recover to the level of activity reached in the previous peak is as long as the recession itself, whereas cumulative GDP growth in the four quarters after the trough is typically lower than following other types of recessions (Figure 3.4, lower panel).[20] Note that the cumulative growth one year after the trough for a financial crisis is 2½ percentage points lower than in other cases, after controlling for the severity and duration of the previous recession.

Why Are Financial Crises Different?

What are the mechanisms that differentiate recessions and recoveries associated with financial crises? An answer to this question needs to take into account the nature of the expansions that preceded these recessions. Narrative evidence indicates that these episodes have often been associated with credit booms involving overheated goods and labor markets, house price booms, and, frequently, a loss of external competitiveness.[21] This can be seen in Figure 3.5, which shows median values of macroeconomic variables during the eight quarters before the peak in GDP. Credit growth during the expansions preceding financial crises is higher than during other expansions, and this is associated with higher-than-usual consumption as a share of GDP leading up to the peak. Relative to other expansions, labor market participation is high, nominal wage growth is high, and unemployment is low. Price increases—for example, the GDP deflator, house prices, and equity prices—are all noticeably higher than

[19]The Big Five financial crisis episodes include Finland (1990–93), Japan (1993), Norway (1988), Spain (1978–79), and Sweden (1990–93).

[20]Recessions and recoveries are clearly different in terms of their severity, depending on the type of shock associated with them. But, for the same shock, they are also roughly symmetric—the slope of the recession phase is closely matched by the slope of the recovery phase.

[21]For a comprehensive analysis of credit booms in the advanced and emerging economies, see for instance Mendoza and Terrones (2008).

usual. Credit booms have frequently followed financial deregulation.[22] There is some evidence of asset price bubbles: in the period leading up to financial crisis episodes, the ratio of house prices to housing rental rates rises above that during other recession episodes, starting from levels well below (Figure 3.6).

Rapid credit growth has typically been associated with shifts in household saving rates and a deterioration of the quality of balance sheets.[23] The upper panel of Figure 3.7 shows that household saving rates out of disposable income have been noticeably lower in expansions before financial crises. However, after a financial crisis strikes, saving rates increase substantially, especially during recessions. In the Big Five episodes, the turnaround in household saving rates was larger still. Data for net lending paint a complementary picture (Figure 3.7, lower panel). Although these data cover only a few of the financial crisis episodes under consideration here, patterns from some of the most relevant episodes—Denmark (1985–89), Finland (1988–92), Norway (1986–90), and the United Kingdom (1988–92)—show that households' net lending balances increased substantially during recessions.

Taken together, the behavior of these variables suggests that expansions associated with financial crises may be driven by overly optimistic expectations for growth in income and wealth.[24] The result is overvalued goods, services, and, in particular, asset prices. For a

[22]For example, Table 3.6 in the appendix shows that almost all of the 15 financial crises considered here followed deregulation in the mortgage market.

[23]Unfortunately, comprehensive balance sheet data are not available for most of the financial crisis episodes. But, as an example, analysis of data for the United Kingdom shows a pronounced deterioration in the ratio of total household liabilities to liquid assets in the years before the recession of 1990–91, with a gradual recovery in the quality of household balance sheets during and after the recession.

[24]In fact, real GDP growth rates before recessions associated with financial crises have not been exceptionally high compared with those before other recessions. Similarly, the relationship between the average level of the output gap in the four quarters before the peak and

Figure 3.5. Expansions in the Run-Up to Recessions Associated with Financial Crises and Other Shocks
(Median = 100 at t *= –8; peak in output at* t *= 0; quarters on the x-axis)*

Expansions associated with financial crises show overheating in goods, labor, and asset markets.
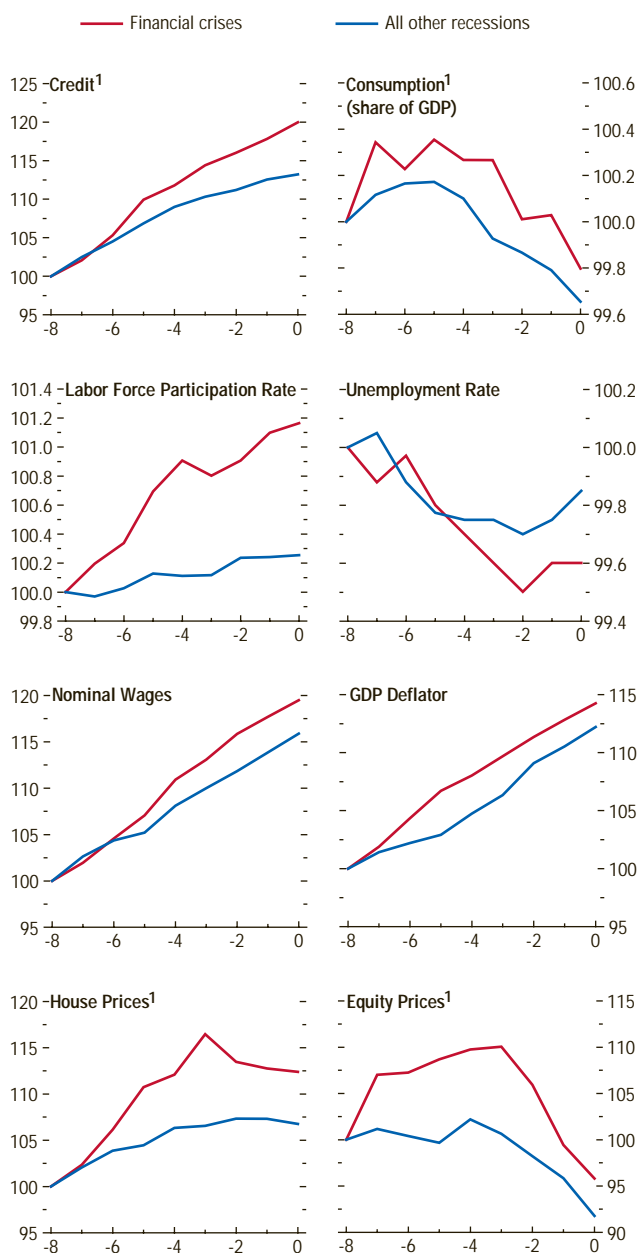
Source: IMF staff calculations.
[1]Data in real terms.

Figure 3.6. House Price-to-Rental Ratios for Recessions Associated with Financial Crises and Other Shocks
(Peak in output at t *= 0; quarters on the x-axis)*

Expansions before recessions associated with financial crises show rapid rises in house price-to-rental ratios. The ratio declines steeply in recessions.
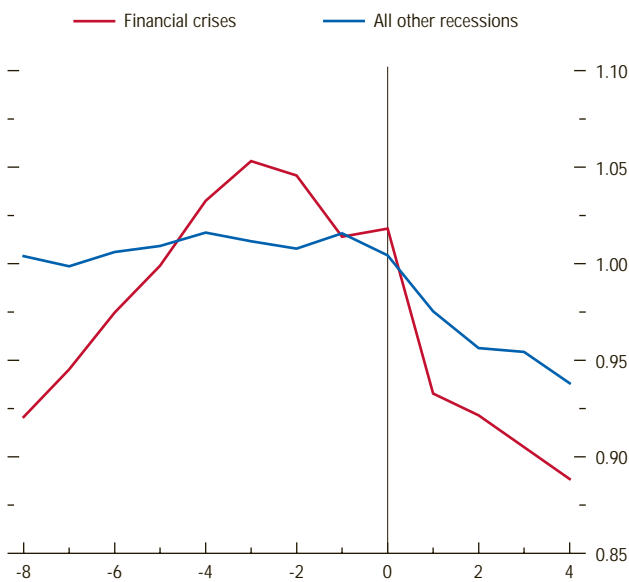
Source: Organization for Economic Cooperation and Development.

period, this overheating appears to confirm the optimistic expectations, but when expectations are eventually disappointed, restoring household balance sheets and adjusting prices downward toward something approaching fair value require sharp adjustments in private behavior. Not surprisingly, a key reason recessions associated with financial crises are so much worse is the decline in private consumption.

Turning to the recovery phase, the weakness in private demand tends to persist in upswings that follow recessions associated with financial crises (Figure 3.8). Private consumption typically grows more slowly than during other recoveries. Private investment continues to decline after the recession trough; in particular, residential investment typically takes two years merely to stop declining. Thus, output growth is sluggish, and the unemployment rate continues to rise by more than usual. Credit growth is faltering, whereas in other recoveries it is steady and strong. Asset prices are generally weaker; in particular, house prices follow a prolonged decline. On the other hand, although the recovery of domestic private demand from financial crises is weaker than usual, economies hit by financial crises have typically benefited from relatively strong demand in the rest of the world, which has helped them export their way out of recession.

What do these observations tell us about the dynamics of recovery after a financial crisis? First, households and firms either perceive a stronger need to restore their balance sheets after a period of overleveraging or are constrained to do so by sharp reductions in credit supply. Private consumption growth is likely to be weak until households are comfortable that they are more financially secure. It would be a mistake to think of recovery from such episodes as a process in which an economy simply reverts to its previous state.

Second, expenditures with long planning horizons—notably real estate and capital invest-

the output loss in the ensuing recession is positive, but financial crises do not stand out.

ment—suffer particularly from the after-effects of financial crises. This appears to be strongly associated with weak credit growth. The nature of these financial crises and the lack of credit growth during recovery indicate that this is a supply issue. Further, as elaborated in Box 3.2, industries that conventionally rely heavily on external credit recover much more slowly after these recessions.

Third, given the below-average trajectory of private demand, an important issue is how much public and external demand can contribute to growth. In many of the recoveries following financial crises examined in this section, an important condition was robust world growth. This raises the question of what happens when world growth is weak or nonexistent.

Are Highly Synchronized Recessions and Their Recoveries Different?

The current downturn is global, implying that the recovery cannot in the aggregate be driven by a turnaround in net exports (although this could be true for individual economies). An examination of the features of synchronized recessions may therefore help in gauging the evolution of the current recession and prospective recovery.

To address this issue, highly synchronized recessions are defined as those during which 10 or more of the 21 advanced economies in the sample were in recession at the same time.[25] In addition to the current cycle, there were three other episodes of highly synchronized recessions: 1975, 1980, and 1992 (Figure 3.9).[26] As seen in Table 3.1, highly synchronized recessions are longer and deeper than others: the average duration (amplitude) of a synchronous

[25]Alternatively, synchronized recessions could be defined as recession events whose peaks coincide within a given time window, say a year. The results reported in the text are robust to this definition.

[26]Note that current recessions are excluded from this analysis. Almost one-third of all recessions were highly synchronized.

Figure 3.7. Household Saving Rate and Net Lending before and after Business Cycle Peaks
(Peak in output at t *= 0)*

In episodes of financial crisis, households dissave during expansions and restore balance sheets during recessions.

Household Saving Rate
(median year-over-year difference; percentage points)
— "Big Five" financial crises
— Financial crises
— All other recessions

Change in Household Net Lending in Selected Financial Crisis Episodes
(percent of gross disposable income; positive denotes increase in saving)
— Denmark
— Finland
— Norway
— United Kingdom

Source: IMF staff calculations.

Figure 3.8. Recessions and Recoveries Associated with Financial Crises and Other Shocks

(Median = 100 at t = 0; peak in output at t = 0; data in real terms unless otherwise noted; quarters on the x-axis)

Recessions associated with financial crises are longer and more severe than other recessions. During recoveries, private demand, credit growth, and asset prices are particularly weak. Historically, net exports have led the recovery.
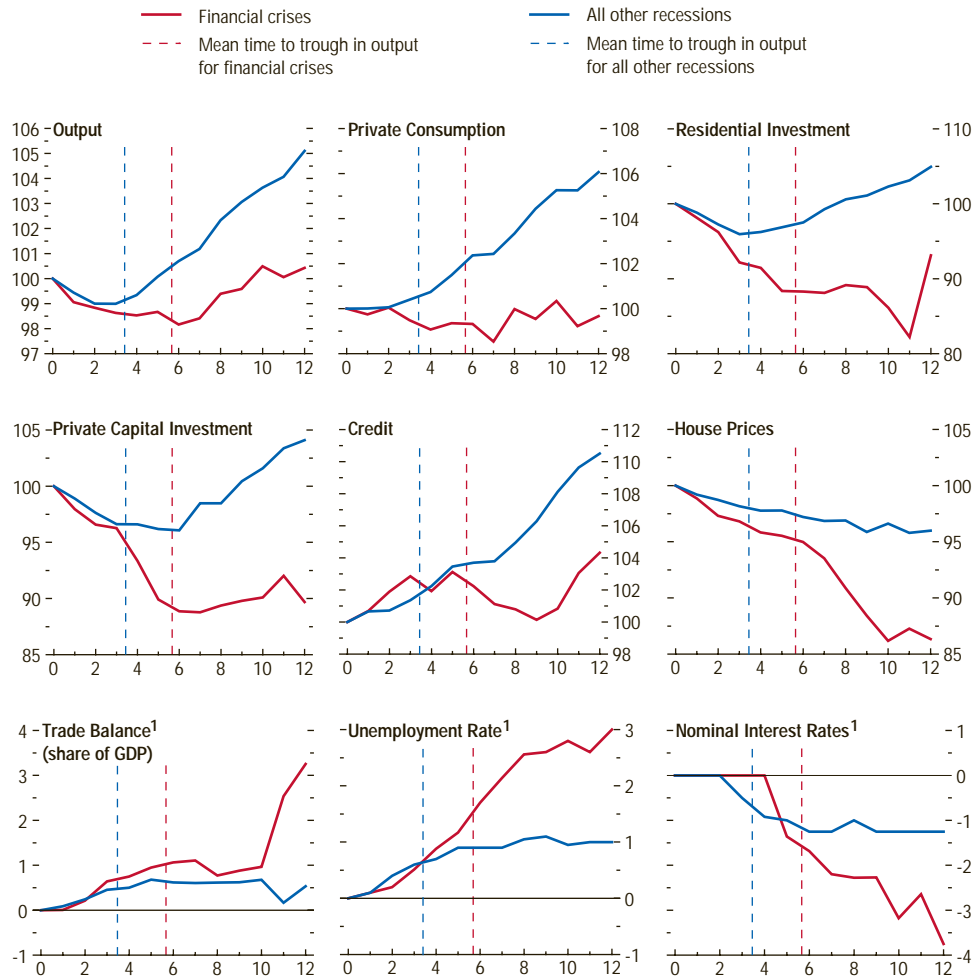
Source: IMF staff calculations.
[1] Difference from level at *t* = 0, in percentage points.

recession is 40 (45) percent greater than that of other recessions.

What are the distinctive features of highly synchronized recessions? The most obvious is that they are severe, as seen in Figure 3.10. Moreover, recoveries from synchronous recessions are, on average, very slow, with output taking 50 percent longer on average to recover its previous peak

than after other recessions. Credit growth is also weak, in contrast to recoveries from nonsynchronous recessions, during which credit and investment recover rapidly. As with financial crises, investment and asset prices continue to decline after the trough in GDP. However, a key difference from the recoveries following localized financial crises is that net trade is much

weaker. When compared with nonsynchronous recessions, exports are typically more sluggish in synchronous recessions.

The United States has often been at the center of synchronous recessions. Three of the four synchronous recessions (including the current cycle) were preceded by, or coincided with, a recession in the United States. During both the 1975 and 1980 recessions, sharp falls in U.S. imports caused a significant contraction in world trade.[27] In addition to strong trade linkages, downward movements in U.S. credit and equity prices are likely to be transmitted to other economies.

Does Bad Plus Bad Equal Worse?

Recessions that are associated with both financial crises and global downturns have been unusually severe and long-lasting. Since 1960, there have been only 6 recessions out of the 122 in the sample that fit this description: Finland (1990), France (1992), Germany (1980), Greece (1992), Italy (1992), and Sweden (1990). On average, these recessions lasted almost two years (Table 3.1, final row). Moreover, during these recessions GDP fell by more than 4¾ percent. Reflecting in part the severity of these recessions, recoveries from synchronized recessions are weak.

Can Policies Play a Useful Countercyclical Role?

Up to this point, this chapter has examined the dynamics of recessions and recoveries, without accounting for economic policy responses. Policymakers, however, generally try to reduce fluctuations in output. Narrative studies of the policy decision-making process, such as Romer

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[27]In these two recessions, U.S. imports fell by 11 percent and 14 percent, respectively. In the other five U.S. recessions, imports contracted by 3 percent, on average. These cases are picked up as recessions associated with external demand shocks for some countries, but not all, owing to the threshold that the identification imposes (see the appendix).

Figure 3.9. Highly Synchronized Recessions
(Percent of countries in recession; shaded areas denote U.S. recession)

Highly synchronized recessions are rare events that typically are preceded by or coincide with a U.S. recession.
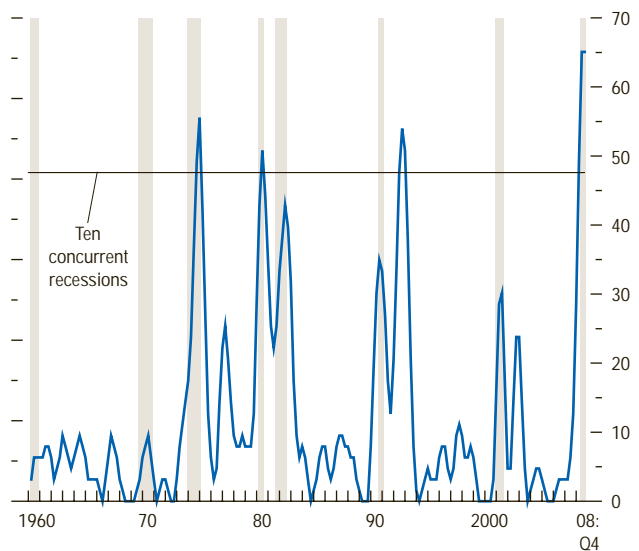
Source: IMF staff calculations.

Figure 3.10. Are Highly Synchronized Recessions Different?

(Median = 100 at t *= 0; peak in output at* t *= 0; data in real terms unless otherwise noted; quarters on the x-axis)*

Highly synchronized recessions are more protracted and severe than other recessions. Recoveries from these recessions are typically weak.
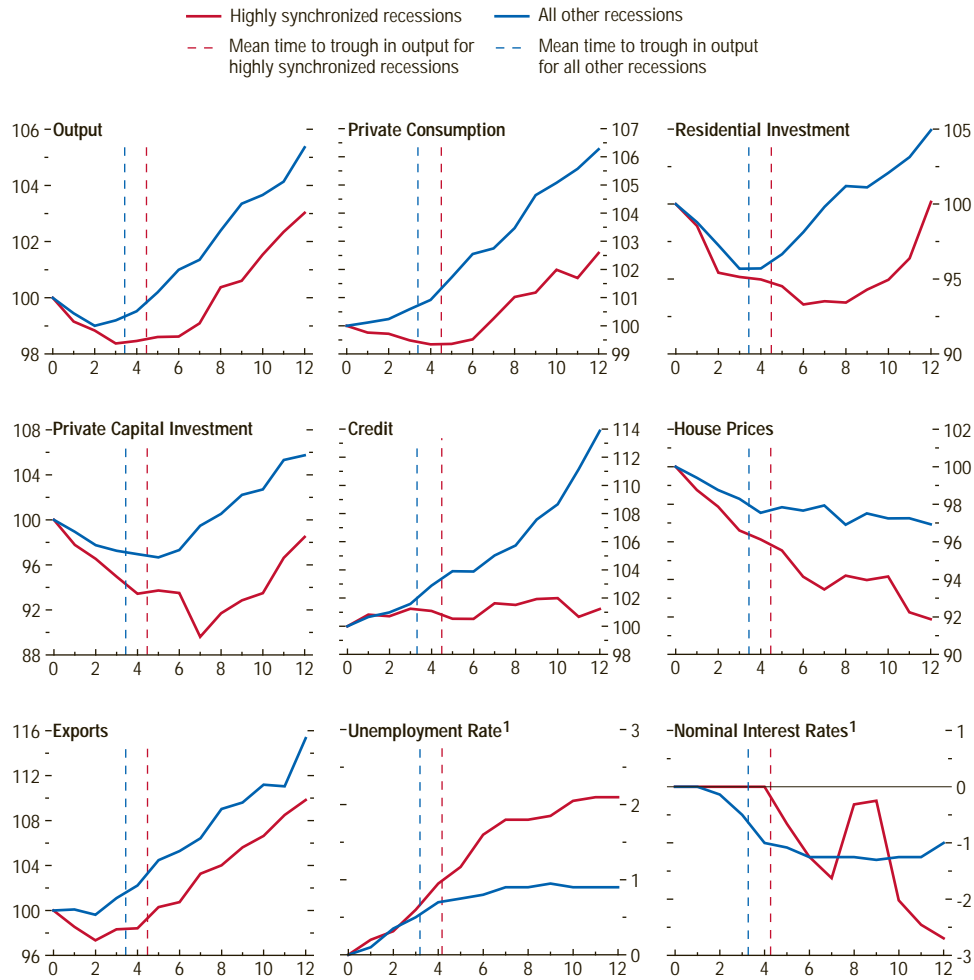
Source: IMF staff calculations.
[1]Difference from level at *t* = 0, in percentage points.

and Romer (1989, 2007), show that concerns about the state of the economy are a key input to the formulation of policy.

This section examines how monetary and fiscal policies have been used as a countercyclical tool during business cycle downturns. The effectiveness of policy interventions in smoothing the business cycle is a topic of long debate

in the academic literature. Much of the debate centers on the impact of active, or discretionary, policies rather than the component of policies that automatically responds to the business cycle. The debate over the role of fiscal policy has been particularly intense, and estimates of how output responds to discretionary changes in policy vary dramatically depending on the

Box 3.2. Is Credit a Vital Ingredient for Recovery? Evidence from Industry-Level Data

One of the most striking features of recoveries from recessions associated with financial crises is the "creditless" nature of these recoveries (first figure). Credit growth typically turns positive only seven quarters after the resumption of output growth. Although the demand for credit is generally lower in the aftermath of a financial crisis as households and firms deleverage, the stress experienced by the banking sector during these episodes suggests that restrictions in the supply of credit are also important. This raises an important question, which is addressed in this box: To what extent do restrictions in the supply of credit constrain the strength of economic recovery? In the absence of financial friction, firms should be able to costlessly compensate for the decrease in bank credit with other forms of credit, such as the issuance of debt, leaving their investment and output decisions unchanged. The presence of market imperfections, however, implies that these different forms of credit are not perfect substitutes, and the result is a slower recovery for firms and industries that are more reliant on credit.[1]

Methodology

To examine the impact of credit on the strength of recovery, this box uses annual production data from manufacturing industries in advanced economies during 1970–2004.[2] Recessions associated with financial crises are identified in the same way as in the chapter, which is through the interaction of crises identified by Reinhart and Rogoff (2008a, 2008b) with business cycle peaks and troughs. Industries are ranked according to the degree to which they typically finance their activities with outside funds (as opposed to retained earnings) using a measure introduced by Rajan and Zingales

The main author of this box is Prakash Kannan.
[1]See Bernanke (1983) and Bernanke and Gertler (1989) for more detailed discussions on the role of market imperfections in credit markets.
[2]Data for value added at the three-digit industry level are obtained from the *IndStat* database produced by the United Nations Industrial Development Organization. The data cover the 21 advanced economies studied in this chapter.

The Behavior of Credit during Recoveries from Recessions Associated with Financial Crises
(Median = 100 at t *= 0; trough in output at* t *= 0; quarters on the x-axis)*
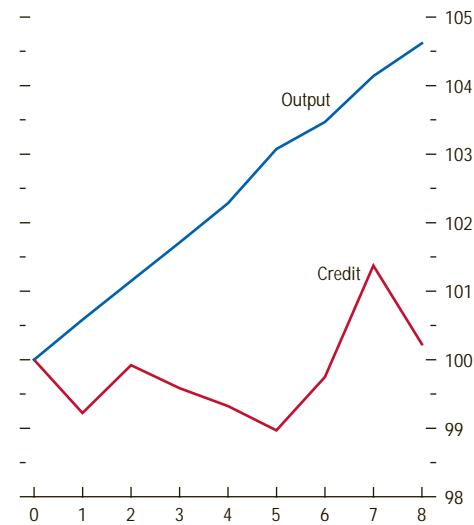
Source: IMF staff calculations.

(1998). The differential performance of growth in value-added output during recoveries across these industries within a particular country is the main channel through which the real impact of credit is identified.

The focus on the variation in growth during recoveries from recessions associated with financial crises across different industries leads to the following empirical specification:[3]

$$Growth_{i,c,t} = \alpha_1 Size_{i,c,t-1} + \alpha_2 (Recovery_{c,t} \times Dependence_i) + \sum_{ic}\beta_{i,c} \times d_{i,c}$$

$$+ \sum_{i,t}\gamma_{i,t} \times d_{i,t} + \sum_{c,t}\delta_{c,t} \times d_{c,t} + \varepsilon_{i,c,t},$$

where the subscripts *i, c,* and *t* represent observations for a particular industry, country, and time period, respectively.

[3]This specification closely follows that of Dell'Ariccia, Detragiache, and Rajan (2008).

Box 3.2. *(concluded)*

Impact of External Funding Dependency on the Strength of Recovery across Industries[1]
(Percent)
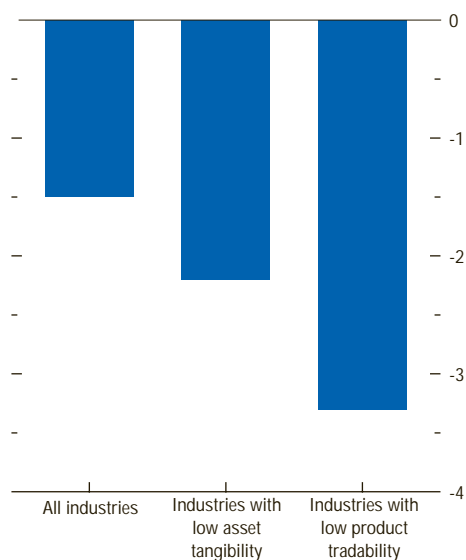
Source: IMF staff calculations.
[1]Difference between growth rates of industries with "high" and "low" dependency on external funding, where "high" and "low" dependency refer to the 85th and 15th percentile industry, respectively.

The coefficient on the interaction between an indicator variable for recovery ($Recovery_{c,t}$) and the measure of dependence on outside funding ($Dependence_i$), α_2, captures the extent to which credit conditions during recovery affect economic growth. If $\alpha_2 < 0$, industries that rely more on outside funding, including bank credit, feature lower value-added growth relative to other industries during recoveries, suggesting that restrictions in the supply of credit have a significant impact on the strength of the recovery. The growth rate of value added for an industry ($Growth_{i,c,t}$), however, also depends on a variety of other factors. To capture these broadly, the specification includes three sets of dummy variables that control for country-industry, industry-time, and country-time fixed effects. This combination of dummy variables allows us to account for a broad range of effects, such as the severity of the preceding recession, aggregate country characteristics, global industry shocks, and country-specific regulations that vary by industry. Finally, growth effects that are related to the size of the industry as a result of convergence effects, among other things, are accounted for by including the lagged share of value-added output of a particular industry ($Size_{i,c,t-1}$).

Growth and Credit during Recoveries

The results based on the empirical specification above provide evidence that firms in industries that depend more on outside funding do indeed grow more slowly after the end of a recession associated with a financial crisis (see table, first column). This suggests that disruptions to the availability of credit have significant real effects. The estimates presented in the table suggest that a typical firm in an industry that has a high dependence on outside funds grows about 1.5 percentage points more slowly than one that relies more on internal funds (second figure).[4]

Are there any mitigating factors that could potentially offset the harmful effects of a slowdown in the supply of credit? As noted in the chapter, one key factor that helped economies recover from a recession associated with a financial crisis was the fact that they were able to benefit from strong external demand. This suggests that disruptions to the supply of credit may not matter much for firms that are highly dependent on outside funding if they produce goods that are highly tradable.

To investigate this hypothesis, industries are sorted into those that produce goods that are highly tradable (those above the median value of the fraction of an industry's output that is exported or imported) and those that produce goods that are less tradable.[5] The empirical specification used above is also used on these two subsamples. The results from this exercise

[4]"High" and "low" refer to the 85th and 15th percentile industry, respectively, in the distribution of dependency on outside funds.
[5]The degree of tradability is obtained from measurements by Braun and Larrain (2005), who utilize Bureau of Economic Analysis tables to compute the proportion of an industry's product that is exported or imported.

External Finance Dependency and Recoveries from a Financial Crisis

	All (1)	Asset Tangibility		Tradability	
		High (2)	Low (3)	High (4)	Low (5)
Lagged size	−2.255***	−2.766***	−1.830***	−2.353***	−2.260***
	(0.206)	(0.344)	(0.241)	(0.280)	(0.285)
Recovery × external dependency	−0.038**	−0.028	−0.057**	−0.020	−0.085*
	(0.018)	(0.023)	(0.029)	(0.017)	(0.046)
N	15,204	8,071	7,133	8,192	7,012
R^2	0.35	0.38	0.37	0.47	0.31

Note: Dependent variable is growth in value added. Robust standard errors are reported in parentheses. ***, **, and * refer to significance at the 1, 10, and 5 percent level, respectively. "Lagged size" refers to the share of value added of industry i in period t–1. "Recovery" is an indicator variable that takes on a value of 1 for the first two years following the trough of a recession associated with financial crisis. All specifications above include country-industry, country-time, and industry-time fixed effects.

confirm the importance of external trade as a mitigating factor during recovery from recessions associated with a financial crisis (see table, second and third columns). For firms in industries that produce goods with low tradability, growth in value added is significantly affected by the extent of their dependency on outside funds. For these firms, the difference in the growth rates between those with high dependency on outside funds and those with low dependency is around 3.3 percentage points—more than twice the difference in the full sample. For firms in industries that produce highly tradable goods, the degree of dependency on outside funding does not matter.

Do other industry characteristics, such as asset tangibility, help offset the effects of tight credit on growth? In principle, industries that have a higher proportion of tangible assets should be better able to obtain outside funding, since these assets can be pledged as collateral, thus reducing spreads charged to the firm. To address this question, industries are once again sorted into two groups—those with a high degree of tangibility (above the median level of our measure of tangibility) and those with low tangibility.[6] An interesting result emerges: growth in value-added output during recoveries for firms in industries that have a high degree of asset tangi-

bility are not significantly affected by the extent of their dependency on outside funding (see table, fourth column). However, as anticipated, firms in industries that have relatively fewer tangible assets and that rely more on outside funding grow much more slowly in the recovery from a financial crisis (see table, fifth column)

These findings suggest that the availability of credit plays an important role in recovery from recessions associated with financial crises, especially for industries that produce goods that are relatively less tradable and whose assets are less tangible. Apart from industries that fall into the "other manufactured products" classification, the professional and scientific equipment and machinery industries appear to be particularly vulnerable, as they exemplify industries that rely heavily on outside funding, whose goods are traded relatively less, and whose assets are less tangible.[7] The findings are also a reminder of the importance of policies aimed at restoring the health of the banking system and financial markets so that the flow of credit can be resumed quickly. This message takes on additional weight during episodes of financial crisis characterized by a high degree of synchronization, because there is no room for external demand to support recovery as it has in the past.

[6]Braun and Larrain (2005) have assembled a measure of asset tangibility by looking at the average ratio of plant and production equipment to total assets in a given industry.

[7]Although all the industries covered in the study fall within the manufacturing sector and, therefore, produce goods that are largely tradable, the measure of interest here is the *relative* degree of tradability within the sector.

methodology employed, the sample of countries, and the time period examined. Indeed, there is evidence that the multipliers can at times be negative. The consensus, however, is that discretionary fiscal policy does have a positive impact on growth, though the magnitude is fairly small.[28]

A common challenge faced in empirical research on macroeconomic policies is the appropriate measurement of discretionary policy. In general, any measure of macroeconomic policy is interrelated with output, making causal inference difficult. To address this problem, this section distinguishes the automatic response of policy (which depends on economic activity) from the discretionary one by using a simple regression framework. The discretionary component of fiscal policy is proxied by the cyclically adjusted primary fiscal balance as well as by cyclically adjusted real government consumption.[29] Similarly, the discretionary component of monetary policy is proxied by the nominal interest rate and real interest rate deviations from a Taylor rule, which attempts to capture how the central bank responds to fluctuations in the output gap and deviations from an explicit, or implicit, inflation target. For each recession phase, the baseline measure of policy response is the peak-to-trough change, a cumulative measure of the degree of loosening or tightening of policy over the whole recession.[30]

Discretionary fiscal and monetary policies have typically been expansionary during recessions (Figure 3.11).[31] The mean increase in the discretionary component of government consumption during a recession is about 1.1 percent a quarter, while the average decline in real interest rates, beyond that implied by a Taylor rule, is about 0.2 percentage point a quarter.[32] The G7 economies have historically responded more aggressively with regard to monetary policy than other countries.[33] Some European economies, on the other hand, have been unable to lower interest rates independently during recessions, because of their commitment to the European exchange rate mechanism and membership in the euro area.

Do Policies Help Mitigate the Duration of Recessions?

The impact of discretionary monetary and fiscal policies on the duration of recessions is examined by looking at the cross-country experience across various recession episodes using duration analysis. Duration analysis seeks to model the probability that an event will occur, such as the end of a recession. Previous studies have used these models to address the question of whether recessions are more likely or less

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[28]See chapter 5 of the October 2008 *World Economic Outlook* for a summary. See also Blanchard and Perotti (2002), Ramey (2008), and Romer and Romer (2007) for recent attempts at identifying the impact of discretionary fiscal policy.

[29]To check for the robustness of these results, an alternative measure of fiscal policy is also used. This measure—the percentage change in non-cyclically-adjusted real government consumption—is based on the premise that changes in real government expenditures are largely independent of the cyclical fluctuations in output. As discussed in the appendix, most of the results are preserved. Public investment spending would have been another option. However, its size is much smaller than that of government consumption, and its association with economic recovery is often limited, owing to significant implementation lags (see Spilimbergo and others, 2008).

[30]Details are presented in the appendix to this chapter. For the measures of monetary policy, we compute the

policy stimulus as the sum of the deviations in each quarter that the economy is in recession. Most empirical studies, including those cited previously, do not discriminate among the various phases of the business cycle. Exceptions include Peersman and Smets (2001) and Tagkalakis (2008), who show respectively that monetary policy and fiscal policy tend to have larger effects during recessions than during expansions.

[31]Lane (2003) finds that current government spending, excluding interest payments, is countercyclical for a sample of Organization for Economic Cooperation and Development (OECD) countries, though he claims that automatic stabilizers are the main driving force behind the countercyclicality.

[32]Note that these figures show our measures of the discretionary component of policy. Direct measures of policy, such as changes in interest rates or the primary balance, show more marked reductions during recessions.

[33] The G7 comprises Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

likely to end as they grow older.[34] The chapter adds to this analysis by looking at the impact of policies on the likelihood that an economy exits a recession.

Across all types of recessions, there is evidence that expansionary monetary policy is typically associated with shorter recessions, whereas expansionary fiscal policy is not. A 1 percent reduction in the real interest rate beyond that implied by the Taylor rule increases the probability of exiting a recession in a given quarter by about 6 percent. On the other hand, fiscal policy, measured either by changes in the primary balance or in government consumption, is not found to have a significant impact on the duration of recessions when examined across all recessions.

However, during recessions associated with financial crises, both expansionary fiscal and monetary policies tend to shorten the duration of recessions, although the effect of monetary policy is not statistically significant (Table 3.3). During these episodes, a 1 percent increase in government consumption is associated with an increase in the probability of exiting a recession of about 16 percent. The stronger impact of fiscal policy in these events is consistent with evidence that fiscal policy is more effective when economic agents face tighter liquidity constraints.[35] The lack of a statistically significant effect from monetary policy could be a result of the stress experienced by the financial sector during financial crises, which hampers the effectiveness of the interest-rate and bank-lending channels of the transmission mechanism of monetary policy.[36]

A useful way of visualizing the impact of monetary and fiscal policies on the duration of reces-

Figure 3.11. Average Policy Response during a Recession
(Real rate in percentage points; government consumption in percent)

Discretionary monetary and fiscal policies are typically expansionary during recessions.
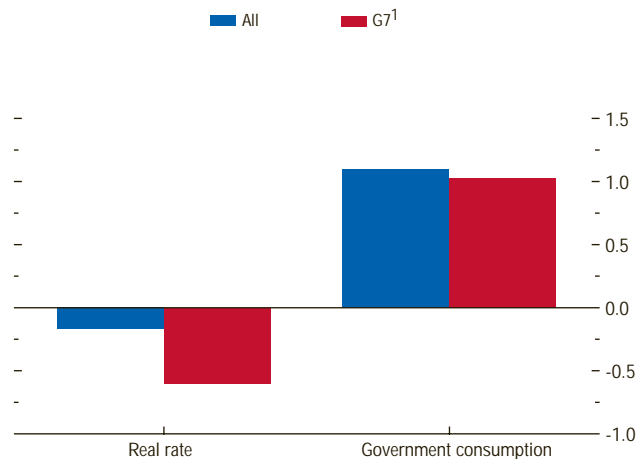
Source: IMF staff calculations.
[1]G7 includes Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

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[34]Previous studies find that postwar recessions in the United States are more likely to end the longer they progress (see Diebold and Rudebusch, 1990; and Diebold, Rudebusch, and Sichel, 1993).

[35]See Tagkalakis (2008). Bernanke and Gertler (1989) suggest that liquidity constraints are more prevalent in recessions than expansions.

[36]See Bernanke and Gertler (1995) for a detailed discussion on the credit channel of the monetary transmission mechanism.

Figure 3.12. Impact of Policies during Financial Crisis Episodes[1]

Recessions associated with financial crises tend to be more protracted. The duration of these recessions, however, can be mitigated by expansionary fiscal and monetary policies.

Survivor Functions for Advanced Economies' Recessions[2]

Financial crisis episodes

Full sample

Financial crisis episodes with high fiscal response[3]

Financial crisis episodes with high monetary response[3]

Quarters

Estimated Median Duration of Recessions (quarters)

Full sample

Financial crisis episodes

Financial crisis episodes with high fiscal response[3]

Financial crisis episodes with high monetary response[3]

Source: IMF staff calculations.
[1]Recessions associated with financial crises, as described in the text.
[2]Survivor functions show the probability of remaining in a recession beyond a certain number of quarters.
[3]Refers to a one-standard-deviation increase in government consumption or decrease in real interest rates, respectively.

sions is to look at estimates of the probability that an economy will stay in a recession beyond a certain number of quarters (Figure 3.12, upper panel). The estimated probabilities are significantly higher for recessions associated with financial crises relative to the average recession, indicating that the former type lasts longer than the latter. The implementation of expansionary policies clearly helps reduce the median duration of the recession (Figure 3.12, lower panel). For instance, a one-standard-deviation increase in government consumption reduces the median duration of a recession associated with a financial crisis from 5.1 quarters to 4.1 quarters. In contrast, the effect of monetary policy, while still helping to reduce the duration of a recession associated with financial crisis, is insignificant.

Do Policies Help Boost Recoveries?

As noted in previous sections, recessions are typically followed by a swift recovery. Although factors such as technological progress and population growth help the economy eventually recover, as discussed earlier, this section investigates whether fiscal and monetary policies undertaken during the recession also contribute to the strength of the economic recovery, using an event study to exploit the cross-country variation in the data. The variable of interest in this case is the cumulative output growth one year after the cyclical trough, which is used as a proxy for the strength of the recovery. An economy emerging from recession has typically surpassed its previous peak output by this time. The measures of policy used are the same as in the duration analysis, which were measured as cumulative changes during the recession phase. In addition to the policy variables, both the duration and amplitude of the preceding recession are included as controls.

The results suggest that both fiscal and monetary expansions undertaken during the recession are associated with stronger recoveries (Table 3.4). In particular, increases in government consumption, and reductions in

both nominal and real interest rates beyond that implied by the Taylor rule, have a positive effect on the strength of economic recovery (Figure 3.13).[37] Table 3.4 shows the quantitative impact of each policy measure separately and in combination. The coefficient on the govern- ment consumption variable, which is about 0.2, implies that a one-standard-deviation increase in government consumption during a recession is associated with an increase in the cumulative growth rate during the recovery phase of about 0.7 percent. The response to a one-standard- deviation reduction in real interest rates, beyond that implied by the Taylor rule, is about 0.4 per- cent. Changes in the cyclically adjusted primary balance during a recession, on the other hand, are not significantly associated with output growth during recovery.[38]

The aggressive use of discretionary fiscal policy raises concern about the sustainability of public finances. For instance, Perotti (1999), using a sample of 19 OECD countries, finds that a fiscal stimulus reduces private consumption in periods during which the level of government debt is particularly high.[39] Do concerns about fiscal sustainability detract from the effectiveness of fiscal stimulus during recoveries? To address this question, the levels of public debt relative to GDP that were prevalent at the beginning of the recession are introduced into the benchmark regression framework interacted with the proxy of fiscal policy. The results, shown in Table 3.4, suggest that the degree of public indebtedness reduces the effectiveness of fiscal policy.

To show the nature of this relationship more clearly, Figure 3.14 plots the marginal relation-

[37]This positive impact of policy continues to remain statistically significant even after policies that were under- taken in the early stages of recovery are included.

[38]There is no evidence that the impact of policies is any different in strengthening recoveries from recessions associated with financial crises as compared with other recoveries.

[39]The procyclicality of fiscal policy in emerging econo- mies is also largely attributable to the fact that constraints on the financing of government debt are usually tighter during recessions (see Gavin and Perotti, 1997, for a discussion on Latin America).

Figure 3.13. Effect of Policy Variables on the Strength of Recovery[1]

After controlling for the amplitude and duration of the preceding recession as well as fixed country characteristics, expansionary policies are associated positively with the strength of recovery.
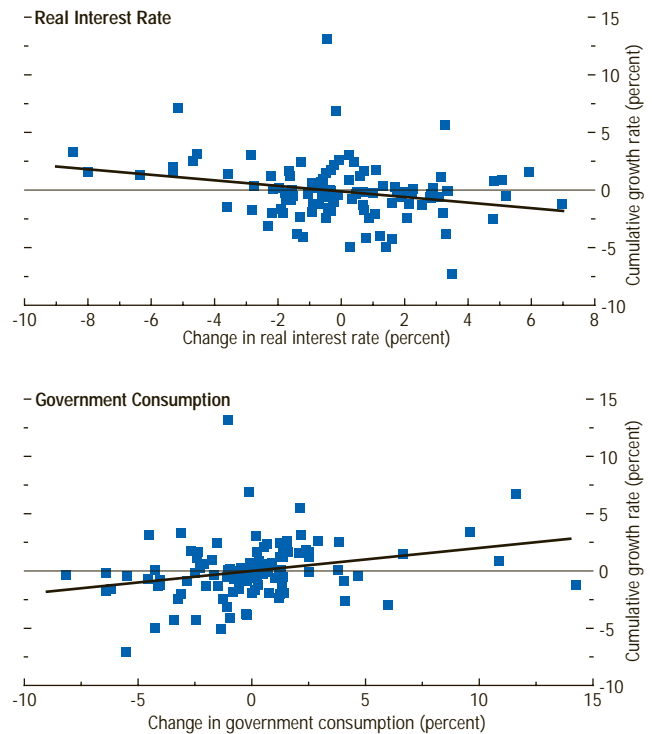
Source: IMF staff calculations.
[1]Scatter plots shown here are conditional plots that take into account the effect of several other controlling variables, as noted in the appendix.

Figure 3.14. Relationship between the Impact of Fiscal Policy on the Strength of Recovery and the Debt-to-GDP Ratio

The impact of fiscal policy on the strength of recovery is weaker for economies that have higher levels of public debt relative to GDP.
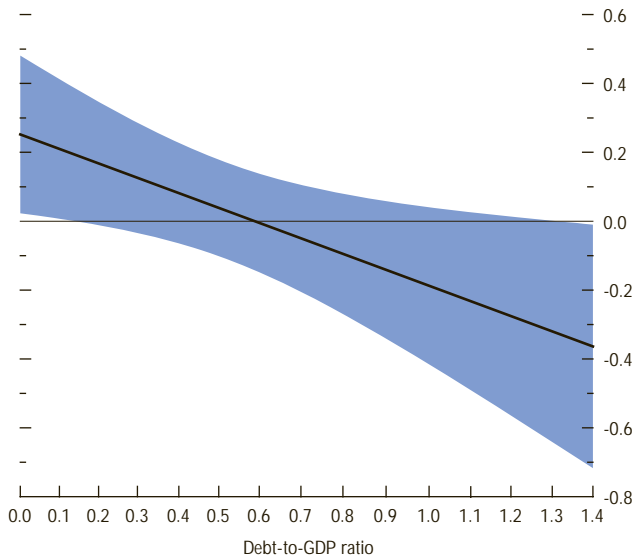
Source: IMF staff calculations.

ship between the impact of fiscal policy on the strength of recovery and the debt-to-GDP ratio. The downward-sloping line indicates that fiscal stimulus in economies that have low levels of public debt has a higher impact on the strength of the recovery relative to economies that have higher levels of public debt. The point estimate for the impact becomes negative for debt levels that exceed about 60 percent of GDP. However, as suggested by the blue 90 percent confidence interval bands, there is high uncertainty in the estimation of the threshold debt levels.[40]

These findings point to the need for a commitment to medium-term fiscal sustainability to accompany any short-term fiscal stimulus. Doubts about debt sustainability can slow the recovery process through lower consumer spending and higher long-term real interest rates. It is crucial that the implementation of temporary stimulus measures occur in a framework that guarantees fiscal sustainability in order to ensure policy effectiveness.[41]

This section has focused on fiscal and monetary policy; however, previous experiences of recessions associated with financial crises strongly suggest that the effectiveness of monetary and fiscal policies is substantially reduced without the implementation of prompt and well-targeted financial policies. Many observers consider the policies undertaken by Sweden in the early 1990s to have been highly effective in restoring the health of the financial sector, paving the way for strong recovery.[42] A key component of those measures was the establishment of independent asset management companies,

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[40] Similar results are obtained when fiscal policy is proxied using discretionary primary balance. In this case, however, the confidence bands are tighter, separating more clearly the threshold debt levels.

[41]See Spilimbergo and others (2008) for further details on the design of appropriate policies that address sustainability concerns. Reinhart and Rogoff (2008b) find that financial crisis episodes are often associated with sharp increases in the level of public debt, potentially raising concerns about medium-term debt sustainability. However, they do not examine the behavior of long-term interest rates following such crises.

[42]See Jackson (2008) and references therein.

Table 3.3. Impact of Policies on the Probability of Exiting a Recession

	(1)	(2)	(3)	(4)
Recession associated with financial crisis[1]	−1.275***	−2.238***	−0.454	−1.391**
	(0.381)	(0.602)	(0.612)	(0.763)
Government consumption[2]		−0.110***		−0.131***
		(0.027)		(0.029)
Government consumption × financial crisis		0.278**		0.284**
		(0.143)		(0.139)
Real rate[3]			−0.024***	−0.033***
			(0.008)	(0.009)
Real rate × financial crisis			−0.028	−0.024
			(0.031)	(0.031)
Constant	−3.224***	−3.269***	−3.571***	−3.742***
	(0.449)	(0.459)	(0.499)	(0.514)
Ln p[4]	0.900***	0.983***	0.960***	1.070***
	(0.069)	(0.069)	(0.072)	(0.072)
Fixed effects	Yes	Yes	Yes	Yes
N	121	120	117	117

Note: The baseline hazard function is assumed to follow a Weibull distribution. Coefficient values of the individual covariates in the hazard function are reported. Standard errors are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

[1]"Recession associated with financial crisis" is an indicator variable that takes on a value of 1 when the recession is identified as one related to a financial crisis as described in the text.

[2]"Government consumption" refers to the change in discretionary government consumption during a recession.

[3]"Real rate" refers to the cumulative deviations of real interest rates from a Taylor rule during a recession.

[4]Ln p reports the value of the (logged) Weibull parameter that governs the shape of the hazard function.

which removed bad assets from the balance sheets of banks so that the latter could resume normal lending activities. In Japan, slow recognition of the extent of the bad-loan problem contributed to the slow recovery from the financial crises of the 1990s (see, for instance, Hoshi and Kashyap, 2008).

Financial sector support typically entails fiscal costs. However, a substantial part of the upfront gross cost is usually recovered, through asset sales, over the medium term. For example, in the case of the Scandinavian countries and Japan, the gross cost of recapitalization averaged some 5 percent of GDP, whereas the average recovery rate in the first five years was about 30 percent.[43] The speed of the economic recov-

ery and associated improvement in financial conditions are important factors in determining the recovery rate. In the case of Sweden, for example, more than 90 percent of the initial outlay was recovered within the first five years. The equivalent rate for the Japanese recession in the late 1990s, however, was just above 10 percent; it reached almost 90 percent by 2008.

Lessons for the Current Recession and Prospects for Recovery

Data through the fourth quarter of 2008 indicate that 15 of the 21 advanced economies considered in this chapter are already in recession. Based on output turning points, Ireland has been in decline for seven quarters; Denmark for five; Finland, New Zealand, and Sweden for four; Austria, Germany, Italy, Japan, the Netherlands, and the United Kingdom for three; and Portugal, Spain, Switzerland, and the United States for two (although the U.S. recession is

[43]This rate is relatively low compared with the 55 percent recovery rate that advanced economies typically experience from the sale of assets acquired through interventions. Detailed data on financial policy responses for several of the financial crisis episodes studied in this chapter are available in Laeven and Valencia (2008).

Table 3.4. Impact of Policies on the Strength of Recoveries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recession duration	−0.044 (0.121)	0.111 (0.126)	−0.248 (0.156)	−0.208 (0.211)	−0.201* (0.110)	−0.056 (0.144)	−0.406 (0.251)	−0.342 (0.286)
Recession amplitude	0.155 (0.116)	0.092 (0.102)	0.446*** (0.082)	0.426*** (0.103)	0.415*** (0.069)	0.353*** (0.082)	0.358*** (0.117)	0.323** (0.137)
Government consumption[1]	0.201** (0.080)	0.173** (0.082)	0.252** (0.119)	0.236* (0.131)				
Government consumption × debt			−0.437** (0.186)	−0.415* (0.209)				
Primary balance[2]					−0.040 (0.070)	−0.041 (0.071)	−0.567** (0.247)	−0.575** (0.236)
Primary balance × debt							1.029*** (0.354)	1.056*** (0.340)
Real rate[3]		−0.035*** (0.011)		−0.010 (0.025)		−0.028* (0.016)		−0.015 (0.025)
Public debt[4]			−1.505** (0.647)	−1.468** (0.670)			−3.890*** (0.797)	−3.755*** (0.885)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	112	109	75	75	96	93	72	72
R^2	0.10	0.13	0.34	0.34	0.12	0.16	0.46	0.46

Note: Dependent variable is the cumulative growth one year into the recovery phase. Robust standard errors clustered by country are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

[1]"Government consumption" refers to the change in discretionary government consumption during the preceding recession.

[2]"Primary balance" refers to the change in the cyclically adjusted primary balance during the preceding recession.

[3]"Real rate" refers to the cumulative deviations of real interest rates from a Taylor rule during a recession.

[4]"Public debt" refers to the ratio of public debt to GDP at the start of the recession.

already four quarters old using NBER dating).[44] This section looks at the prospects for recovery from these recessions in light of the findings of this chapter.

Many of the economies currently in recession saw expansions that closely resemble those preceding previous episodes of financial stress, as discussed in the chapter, exhibiting similarly overheated asset prices and rapid expansions in credit.[45] There are clear signs that, consistent with previous experiences of financial stress (October 2008 *World Economic Outlook*), these recessions are already more severe and longer than usual. Figure 3.15 plots median growth rates of key macroeconomic variables for all 122 previous recessions, along with upper and lower quartile bands. Overlaid on each are data for the current U.S. recession and the median for all other current recessions.[46] GDP data indicate that these economies have been deteriorating at a relatively rapid pace. In particular, declines in goods, labor, and asset markets in the United States have been steep. Three aspects of these developments are especially notable.

First, there is evidence of negative feedback between asset prices, credit, and investment, which, as seen in the previous sections, is common in severe recessions associated with financial crises. The most recent evidence shows exceptional reductions in credit. The deterioration in financial wealth, as represented by equity prices, has been sharp. The decline in U.S. house prices is as steep as those in the Big Five episodes discussed previously. Residential

[44]The NBER has declared that the most recent peak in U.S. output was in December 2007.

[45]Notable exceptions include Germany and Japan, as discussed in Chapter 2, although their economies are also experiencing financial stress.

[46]The calculation of the median is limited to at least four observations, which is why the series for recent recessions does not extend to six quarters.

Figure 3.15. Economic Indicators around Peaks of Current and Previous Recessions
(Median log differences from one year earlier unless otherwise noted; peak in output at t *= 0; data in real terms unless otherwise noted; quarters on the x-axis)*

Compared with previous recessions, the current U.S. recession is already severe. Sharp falls in wealth, restrictions in credit, and the extent of the downturn imply that quick recoveries in private demand are unlikely.
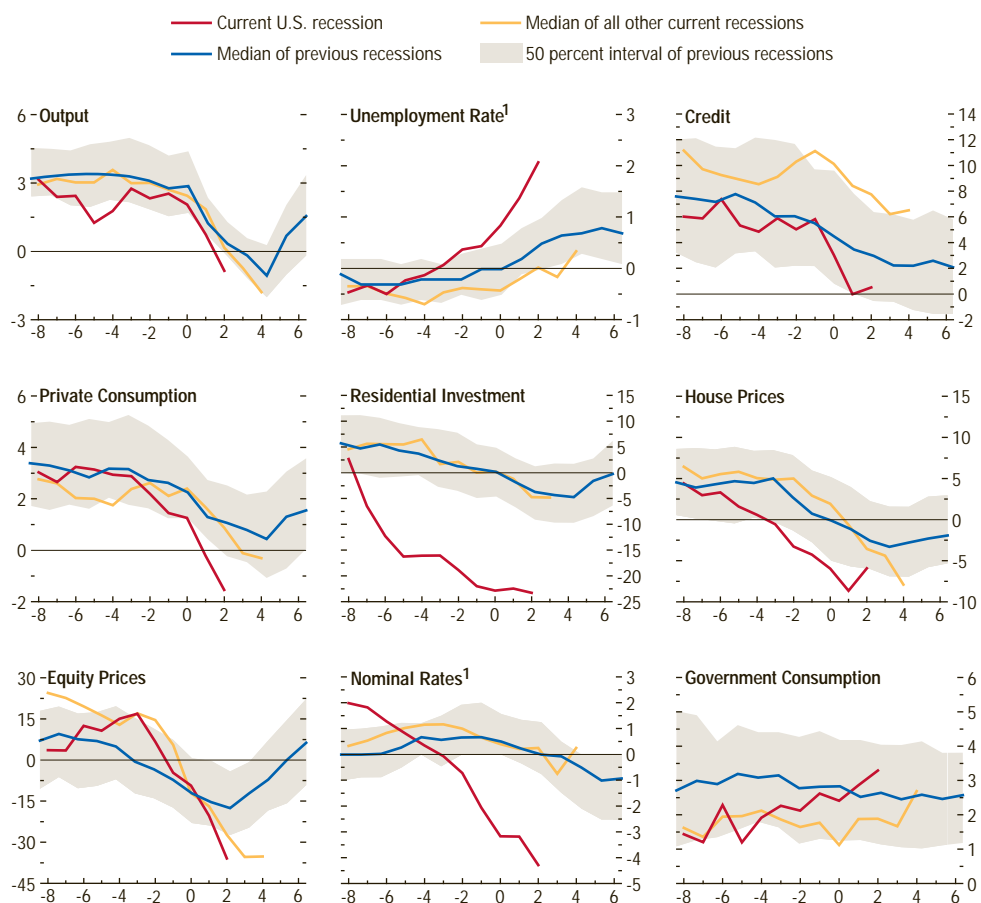
Source: IMF staff calculations.
[1]Median percentage point difference from one year earlier.

investment clearly shows exceptional declines compared with previous recessions.

Second, the evidence from the chapter indicates that the sharp falls in household wealth seen in several economies and the need to rebuild household balance sheets will result in larger-than-usual declines in private consumption. Indeed, the reduction in U.S. consumption in the most recent quarters is clearly atypical. Consumer confidence in all economies has been steadily weakening, suggesting that

declines in private demand and confidence will make for a protracted recession.

Finally, the current recessions are also highly synchronized, further dampening prospects for a normal recovery. In particular, the rapid drop in consumption in the United States represents a large decline in external demand for many other economies.

Hence, it is unlikely that overleveraged economies will be able to bounce back quickly via strong growth in domestic private demand—

fundamentally, a prolonged period of above-average saving is required. In many previous cases of banking system stress, net exports led the recovery, facilitated by robust demand from the United States and by exchange rate depreciations or devaluations. But that option will not be available to all economies currently in recession, given the extent of the downturn.

Given the likely shortfalls in both domestic private demand and external demand, policy must be used to arrest the cycle of falling demand, asset prices, and credit. Monetary policy has been loosened quickly in most advanced economies, much more so than in previous recessions, and extraordinary measures have been taken to provide liquidity to markets. Further effective easing is possible, even as nominal interest rates approach zero. However, evidence from the chapter indicates that interest rate cuts are likely to have less of an impact during a financial crisis. In view of the continued distress in the financial sector, authorities should not rely solely on standard policy measures.

The evidence in this chapter shows that fiscal policy can make a significant contribution to reducing the duration of recessions associated with financial crises. In effect, governments can break the negative feedback between the real economy and financial conditions by acting as "spender of last resort." But this presupposes that public stimulus can be delivered quickly. Moreover, as the chapter shows, the sustainability of the eventual debt burden constrains the scope of expansionary fiscal policy, and it will not be possible to support demand for an extended period in economies that have entered recession with weak fiscal balances and large levels of public debt. In the event of severe and prolonged recessions during which deflation is an important risk, fiscal and monetary policies should be tightly coordinated to contain downward demand pressures. Furthermore, given the globally synchronized nature of the current recession, fiscal stimulus should be provided by a broad range of countries with fiscal room to do so, so as to maximize the short-term impact on global economic activity, as discussed in Chapter 1.

Restoring the health of the financial sector is an essential component of any policy package.[47] Experiences with previous financial crises—especially those involving deleveraging, such as in Japan in the 1990s—strongly signal that coherent and comprehensive action to restore financial institutions' balance sheets, and to remove uncertainty about funding, is required before a recovery will be feasible. Even then, recovery is likely to be slow and relatively weak.

Appendix 3.1. Data Sources and Methodologies

The main authors of this appendix are Prakash Kannan and Alasdair Scott.

This appendix provides details on the data and briefly reviews the methodologies utilized to identify "large shocks" and discretionary fiscal and monetary policies. The appendix also reports robustness exercises on the measure of fiscal policy.

Data Sources

The main data source for this chapter is Claessens, Kose, and Terrones (2008), from here denoted as CKT.

Variable	Source
Output	CKT, Haver Analytics
Real private consumption	CKT, Haver Analytics
Real government consumption	CKT, Haver Analytics
Real private capital investment	CKT

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[47]See, for instance, Decressin and Laxton (2009) for a discussion of unconventional monetary policy options, fiscal policy, synergies with financial sector policy, and lessons from the experience of Japan.

Real residential investment	CKT, Haver Analytics
Real exports	CKT
Real net exports	Organization for Economic Cooperation and Development (OECD) Analytical Database
GDP deflator	OECD Analytical Database
Consumer price index (CPI)	CKT, International Financial Statistics (IFS) database
Oil prices	IMF Primary Commodity Prices database
Real house prices	CKT, Bank for International Settlements (BIS), OECD
Stock prices	CKT, IFS database
Credit	CKT, IFS database
Nominal interest rate	CKT, IFS database, Thomson Datastream
Unemployment rate	CKT, Haver Analytics
Labor force participation rate	OECD Analytical Database
Nominal wages	IFS database, OECD Analytical Database
House price-to-rental ratio	OECD
Household saving rate	OECD Analytical Database
Household net lending	OECD Analytical Database
Public debt	International Monetary Fund

Note: Nominal house prices from Bank for International Settlements; stock prices, credit, and interest rates are deflated using consumer price indices.

Methodology Used to Categorize Recessions and Recoveries

The statistical rules for the nonfinancial shocks pick out large changes in macroeconomic variables, as follows:

- Oil shocks: An indicator of oil price movements records, at a given date and for each country, the maximum change in nominal local oil prices in the preceding 12 quarters.[48] Oil shocks are defined as those in which the indicator is greater than the mean plus 1.75 standard deviations of this index.
- External demand shocks: The indicator of external demand is constructed as percentage deviations from trend of the trade-weighted GDP for each economy.[49] External demand shocks are defined as those in which the indicator is less than the mean minus 1.75 standard deviations of the indicator.
- Fiscal policy shocks: For the indicator of discretionary fiscal policy, a measure of the cyclically adjusted primary balance is constructed.[50] Fiscal contractions are those in

[48]This is a version of Hamilton's (2003) proposed filter for identifying oil shocks in the United States. The local price is defined as the world average U.S. dollar spot price times the nominal exchange rate for the country in question. In addition, results using year-over-year changes in real and nominal local currency oil prices and vector-autoregression-based identifications of oil supply shocks were also examined (see Kilian, 2006).

[49]The trend is implemented using the Hodrick-Prescott (H-P) filter with λ set to 1600. Two key assumptions are, first, that domestic absorption is well approximated by GDP, and, second, that the trade weights are of the other advanced economies alone. Some economies have significant trade relationships with nonadvanced economies that have suffered sharp declines in demand (for example, New Zealand exports to east Asia during 1997–98). Robustness to using terms of trade and world GDP has been explored.

[50]This follows standard IMF methodology (see Heller, Haas, and Mansur, 1986). The H-P(1600) filter is used to estimate potential. OECD estimates of income elasticities for revenues and expenditures are used to construct measures of discretionary changes in the fiscal stance and to filter out passive changes from preset targets and automatic stabilizers. There are a number of important assumptions, notably that the H-P filter estimates potential output well; that the income elasticities of expenditures and revenues are constant; that revenue shares (used to construct aggregate income elasticity of

Table 3.5. Results from Categorizing Recessions

	Number	Percent
Episodes with positive overall "pre-peak" scores (total of all indicators—at least one indicator is > 0 during pre-peak period)	56	46
Episodes with scores greater than zero (by indicator)		
Oil	23	19
External demand	6	5
Fiscal policy	8	7
Monetary policy	15	12
Financial crisis	15	12

	Number of Recessions	Number of Recessions with Positive Pre-Peak Score by Country and Indicator				
		Oil	External demand	Fiscal policy	Monetary policy	Financial crisis
Australia	6	0	1	0	1	1
Austria	6	1	1	0	1	0
Belgium	7	1	0	1	2	0
Canada	3	1	0	0	1	0
Denmark	7	1	0	1	1	1
Finland	5	0	0	2	0	1
France	4	2	0	1	0	1
Germany	8	2	0	0	2	1
Greece	8	2	0	2	1	1
Ireland	3	0	0	0	0	0
Italy	9	1	0	0	0	1
Japan	3	0	0	0	0	2
Netherlands	5	2	1	0	2	0
New Zealand	12	1	1	0	1	1
Norway	3	1	0	0	1	1
Portugal	4	1	1	1	1	0
Spain	4	1	0	0	0	1
Sweden	3	1	1	0	0	1
Switzerland	9	1	0	0	0	0
United Kingdom	5	2	0	0	0	2
United States	6	2	0	0	1	0

which the year-over-year difference of the cyclically adjusted primary balance is greater than the mean plus 1.75 standard deviations of the cyclically adjusted primary balance.[51]

- Monetary policy shocks: For the indicator of discretionary monetary policy, the residuals from estimated Taylor rules are employed. Monetary policy contractions are those in which the residual is greater than 1.75 standard deviations. We also examine term spreads (the difference between yields on 3-month government bills and 10-year government bonds), recording as contractionary

those instances where the spread is greater than 1.75 standard deviations above trend.

The next step is to associate recessions with these shocks. A shock in the four quarters preceding a peak in GDP is assigned one point for correctly calling the downturn ahead. This leads to the results in Table 3.5. Finally, Table 3.6 provides some evidence on the association between financial crises and the deregulation of mortgage markets.

Methodology Used to Identify Fiscal and Monetary Policies

Two measures of fiscal policy are used: cyclically adjusted government consumption and cyclically adjusted primary balances. In instances where only one measure is discussed or presented, it is cyclically adjusted government

revenues) are constant; and that the GDP deflator (used to deflate nominal government expenditures) is a good proxy for the true government expenditures deflator.

[51]A positive value corresponds to fiscal tightening because the primary balance is defined as tax revenues minus expenditures.

Table 3.6. Financial Crises and Deregulation in the Mortgage Market

Country	Year	Measure
Australia	1986	Removal of ceiling on mortgage interest rates
Denmark	1982	Liberalization of mortgage contract terms; deregulation of interest rates
Finland	1986–87	Deregulation of interest rates; removal of guidelines on mortgage lending
France	1987	Elimination of credit controls
Germany	1967	Deregulation of interest rates
Italy	1983–87	Deregulation of interest rates; elimination of credit ceilings
Japan	1993–94	Reduction of bank specialization requirements; deregulation of interest rates
New Zealand	1984	Removal of credit allocation guidelines; deregulation of interest rates
Norway	1984–85	Abolition of lending controls; deregulation of interest rates
Sweden	1985	Abolition of lending controls for banks; deregulation of interest rates
United Kingdom	1980–86	Elimination of credit controls; banks allowed to compete with building societies for housing finance; building societies allowed to expand lending activities; removal of guidelines on mortgage lending

Source: Debelle (2004).

consumption. In all cases, changes in policy are measured as changes in the respective variable from the peak of a particular cycle to the trough.

The cyclically adjusted primary balance is computed using OECD elasticities on the different tax and expenditure components. For government consumption, however, such elasticities are not readily available and thus have to be estimated. The elasticity of government consumption with respect to the business cycle is computed as follows:

$$\ln gc_t = \beta_0 + \beta_1 \times gap_t + \beta_2 \times trend + e_t,$$

where gc_t is government consumption at time t, gap_t is a measure of the output gap at time t, where "potential output" is measured using the Hodrick-Prescott (H-P) filter and $trend$ is a time trend. In estimating the equation above, the lagged value of the output gap is used as an instrument. Cyclically adjusted government consumption ($cagc_t$) is then computed as

$$cagc_t = gc_t (1 - \beta_1 \times gap_t).$$

Two measures of monetary policy are used: nominal and real interest rates. Both of these variables are measured as deviations from a "policy rule." When only one measure is used, it is the real rate. The policy response over the course of a recession is measured as the sum of the impulse relative to the policy rule for each quarter over the recession period. A policy rule of the following form is estimated:

$$i_t = \beta_2 + \beta_3 \times dummy\_85 + \beta_4 \times \pi_t + \beta_5 \times gap_t + \upsilon_t,$$

where i_t is the nominal interest rate, $dummy\_85$ is a dummy for periods after 1985 (to allow for a shift in the equilibrium real rate), π_t is the inflation rate, and gap_t is a measure of the output gap (where "potential GDP" is measured using the H-P filter). The measure of monetary policy that is used in the analysis is

$$i^{MP} = i - \hat{i},$$

where $\hat{i}$ is the fitted value of the regression.

We measure real rates simply as $i_t - \pi_t$, and the steps taken to get the measure of monetary policy are the same as above.

Robustness Test Using Government Consumption as a Proxy for Fiscal Policy

Apart from the two measures of fiscal policy presented in the chapter, the same set of regressions were also run using changes in real government consumption during the preceding recession, without any cyclical adjustment. Table 3.7 contains the results of regressions using the alternative measure of fiscal policy. While most of the main results in the chapter are preserved, the interaction term with public debt is statistically significant only at the two- and three-quarter horizon during the recovery phase. The limitations of the data may be one possible cause.

Table 3.7. Impact of Policies on the Strength of Recoveries Using an Alternative Measure of Fiscal Policy

Dependent Variable	Cumulative Growth Four Quarters into Recovery Phase				Cumulative Growth Three Quarters into Recovery Phase			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recession duration	−0.027 (0.110)	−0.209 (0.194)	−0.179 (0.217)	0.090 (0.123)	−0.076 (0.092)	−0.040 (0.145)	0.015 (0.174)	0.009 (0.107)
Recession amplitude	0.203** (0.083)	0.439*** (0.080)	0.421*** (0.096)	0.154* (0.086)	0.217* (0.085)	0.283*** (0.093)	0.254** (0.103)	0.176** (0.077)
Government consumption[1]	0.289*** (0.088)	0.203 (0.157)	0.177 (0.178)	0.269** (0.098)	0.261*** (0.042)	0.489*** (0.129)	0.414*** (0.117)	0.229*** (0.050)
Public debt[2]		−2.066** (0.829)	−2.047** (0.851)			−0.801 (0.672)	−0.807 (0.694)	
Government consumption × debt		−0.224 (0.285)	−0.200 (0.302)			−0.714*** (0.180)	−0.638*** (0.175)	
Real rate[3]			−0.009 (0.026)	−0.026* (0.013)			−0.022 (0.018)	−0.022* (0.012)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	112	75	75	109	117	80	80	114
R^2	0.12	0.33	0.33	0.14	0.14	0.40	0.42	0.15

Note: Robust standard errors clustered by country are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

[1]"Government consumption" refers to the change in government consumption during the preceding recession.

[2]"Public debt" refers to the ratio of public debt to GDP at the start of the recession.

[3]"Real rate" refers to the cumulative deviations of real interest rates from a Taylor rule during a recession.

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HOW LINKAGES FUEL THE FIRE: THE TRANSMISSION OF FINANCIAL STRESS FROM ADVANCED TO EMERGING ECONOMIES

Against the backdrop of the biggest financial crisis since the Great Depression, this chapter studies how financial stress in advanced economies is transmitted to emerging economies. Crises in advanced economies have a large common effect on the banking sectors, stock markets, and foreign exchange markets of emerging economies. There is also a sizable country-specific effect, which appears to be magnified by the intensity of financial linkages. In more normal times, reducing individual countries' vulnerabilities, such as current account and fiscal deficits, can lower the level of financial stress in emerging economies, but such improvements provide little insulation from the transmission of a major financial shock from the advanced economies. Given the current banking crises in advanced economies, reductions in banking flows to emerging economies could be large and long-lasting. The major negative spillovers and repercussions of this for both advanced and emerging economies argue for a coordinated policy response.

The financial turmoil that erupted in the U.S. subprime mortgage market in 2007 has mutated into a full-blown global financial crisis. Indeed, the extraordinary intensification of the crisis since the collapse of Lehman Brothers in September 2008 has raised the specter of another Great Depression.

 After an initial period of resilience, the turmoil has reached the emerging economies. In the final quarter of 2008, many emerging economies experienced major stress in their foreign exchange, stock, and sovereign debt markets (Figure 4.1). Exchange rates came under pressure in all regions, leading to a combination of

Note: The main authors of this chapter are Stephan Danninger, Ravi Balakrishnan, Selim Elekdag, and Irina Tytell. Menzie Chinn provided consultancy support, and Stephanie Denis and Murad Omoev provided research assistance.

depreciation and depletion of foreign reserves. Concerns about dwindling capital inflows and external sustainability drove up sovereign spreads, particularly in emerging Europe and Latin America. Moreover, the deteriorating economic outlook hit stock markets hard.

Significant withdrawals from emerging economy equity and debt funds suggest that investors in mature markets began to retract from emerging economies around the third quarter of 2008 (Figure 4.2, top panel). A broader high-frequency measure of private capital flows is issuance data on bonds, equity, and loans, which confirm the marked slowdown in funding in the third and fourth quarters of 2008 (middle panel). Borrowers in emerging Europe and Asia were especially affected. At the same time, bank lending was scaled back: liabilities shrunk by 10 to 20 percent of the receiving countries' GDP by the end of September, compared with their peak in late 2007 (bottom panel).[1]

Abrupt slowdowns in capital inflows ("sudden stops") have typically had dire consequences for activity in emerging economies. In fact, industrial production had already dropped precipitously during the last few months of 2008. The latest reading from February 2009 shows that the steepest decline—an annual contraction of 17.6 percent—was recorded in emerging Europe, reflecting waning import demand from advanced economies as a result of the credit crunch. During similar large-scale crises in emerging economies—notably the Latin American debt crisis and the 1997–98 Asian crisis—private capital inflows dried up for a substantial period of time, and output recovered only slowly to the levels prevailing before the crisis (Figure 4.3). Although the main trigger for these

[1]The decline was partly driven by exchange rate appreciation vis-à-vis the U.S. dollar during the first half of 2008.

Figure 4.1. Indicators of Financial Stress in Emerging Economies

(Purchasing-power-parity-weighted average)

Financial turmoil began to severely affect emerging economies in the second half of 2008, leading to exchange rate depreciations, reserve losses, a sharp rise in sovereign bond spreads, and heightened stock market volatility.

— Emerging Europe and Middle East and Africa[1]
— Emerging Asia[2]
— Latin America[3]

Exchange Rates[4]
(month-to-month percent change)

Foreign Reserves
(month-to-month percent change)

JPMorgan EMBI Stripped Spreads
(basis points)

Stock Index Volatility[5]
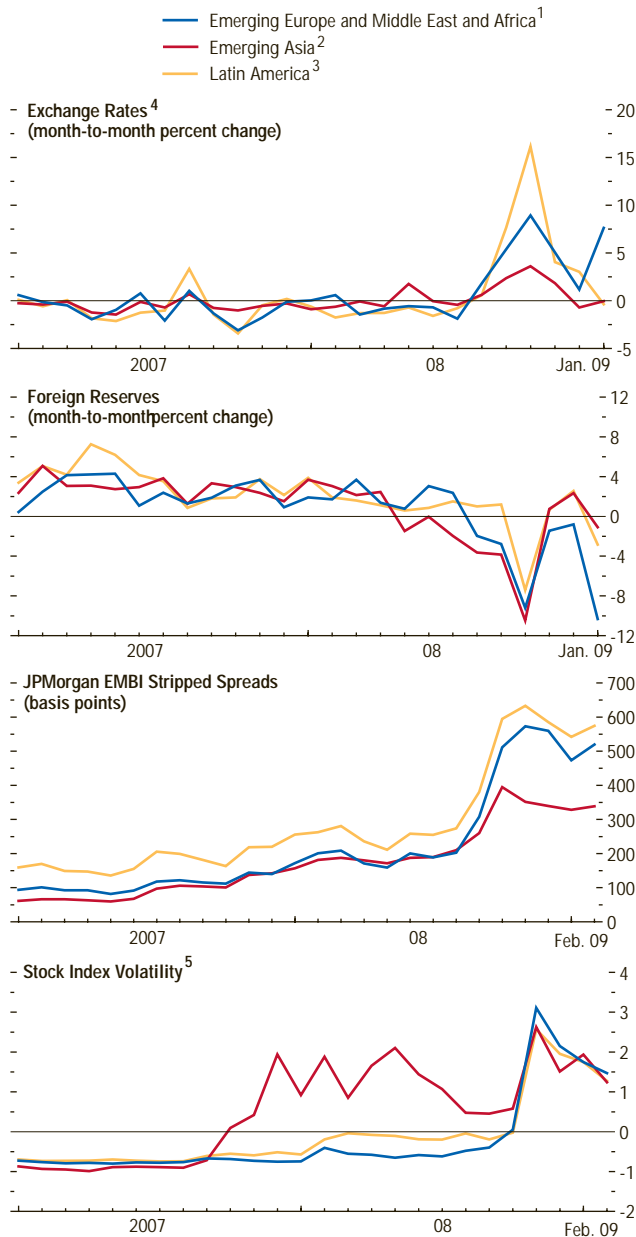
Sources: Datastream; IMF, *International Financial Statistics*; and IMF staff calculations.
[1]Emerging Europe and Middle East and Africa: Czech Republic, Egypt, Hungary, Israel, Morocco, Poland, Romania, Russia, Slovak Republic, Slovenia, South Africa, and Turkey.
[2]Emerging Asia: China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, and Thailand.
[3]Latin America: Argentina, Brazil, Chile, Colombia, Mexico, and Peru.
[4]Exchange rate is a nominal bilateral exchange rate of national currency against anchor currency.
[5]De-meaned volatility of monthly stock returns estimated using a GARCH (1,1) model.

two crises was not widespread financial stress in advanced economies—as explored in greater detail below—both crises overlapped with severe strains in the U.S. and Japanese banking sectors.

Given the potentially large implications of financial stress for the real economy and with the current crisis in mind, this chapter assesses the transmission of financial stress from advanced to emerging economies. The following questions are addressed:

• How severe is the current level of financial stress in advanced and emerging economies compared with past episodes?

• How strong is the link between stress in advanced economies and stress in emerging economies, and how do financial linkages affect the transmission? In particular, what is the impact on emerging economies of banking stress in advanced economies?

• What makes emerging economies more prone to stress, and can they protect themselves from the transmission of stress when advanced economies undergo a major financial crisis?

To answer these questions, this chapter analyzes episodes of financial stress since the early 1980s in 18 emerging economies. It employs a financial stress index, building on an index created for advanced economies in the October 2008 *World Economic Outlook*, to study transmission of stress from advanced to emerging economies. The chapter differentiates between *common* effects and *country-specific* effects, the latter depending on specific linkages and individual vulnerabilities, such as current account and budget deficits.[2]

These are the main findings of this chapter:

• The current crisis in advanced economies is much more severe than any since 1980, affecting *all* segments of the financial system in *all* major regions. For emerging economies, the current level of financial stress is already at the peaks seen during the 1997–98 Asian crisis.

[2]This chapter does not explicitly address the impact of advanced economy stress on trade financing.

- There is a strong link between financial stress in advanced and emerging economies, with crises tending to occur at the same time in both. The large common impact of the current crisis, across all regions of emerging economies, is therefore not unexpected.
- Transmission is stronger to emerging economies with tighter financial links to advanced economies. In the current crisis, bank lending ties appear to have been particularly important.
- The current level of advanced economy stress and the fact that it is rooted in systemic banking crises suggest that capital flows to emerging economies will suffer large declines and will recover slowly, especially banking-related flows.
- Emerging economies obtain some protection against financial stress from lower current account and fiscal deficits and higher foreign reserves during calm periods in advanced economies. However, during periods of widespread financial stress in advanced economies, they cannot prevent its transmission, although they may limit the implications of financial stress for the real economy (for example, reserves can be used to buffer the effects from a drop in capital inflows). Moreover, once financial stress recedes in the advanced economies, lower current account and fiscal deficits can help reestablish financial stability and foreign capital inflows.

Although this chapter does not directly study the efficacy of various policies in mitigating the impact of financial stress on the *real economy*, it is clear that under current circumstances, policies will need to focus on averting further escalation of stress in emerging economies. This would not only limit the impact on the real economy in these countries, but also would thwart a second round of global deleveraging in the wake of damage to lenders' balance sheets in mature markets.

In light of cross-country spillovers, there is a strong case for a coordinated policy approach. Advanced economies need to continue efforts to stabilize their financial systems not just for

Figure 4.2. Capital Flows to Emerging Economies

High-frequency indicators show a drying up of capital flows to emerging economies reflected in lower debt, equity, and loan issuances. Bank lending from advanced economies began to shrink at around the same time, but indicators do not yet capture developments in the fourth quarter of 2008.
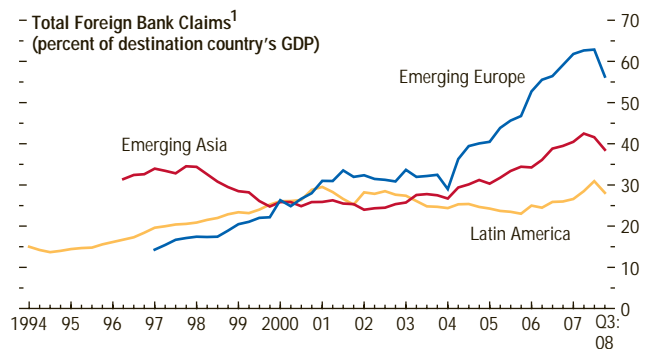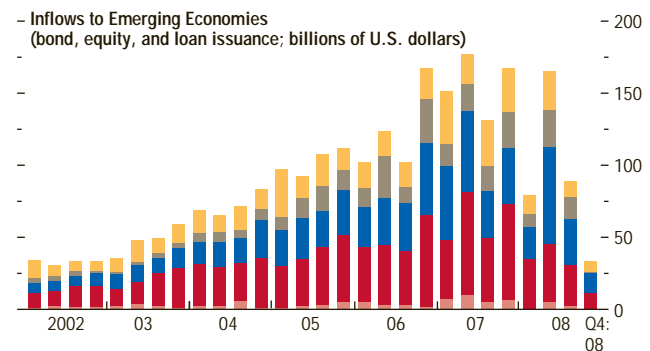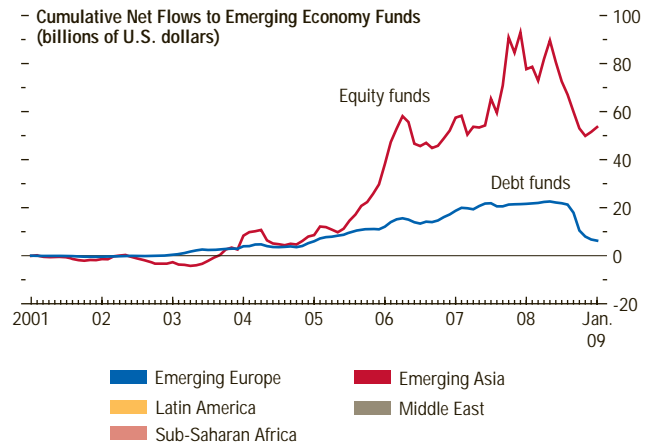
Sources: Bloomberg Financial Markets; EmergingPortfolio.com; Bank for International Settlements; and IMF staff calculations.

[1] Latin America consists of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. Emerging Europe contains Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Slovenia, and Turkey. Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand.

their own benefit, but also to foster a reduction of stress in emerging economies. Moreover, increased official access to external funding would help emerging economies avoid further sharp downturns or currency crises. Examples include the swap lines opened by the U.S. Federal Reserve and the European Central Bank with various emerging economies. These initiatives could be expanded and would complement financial support from international financial institutions, including the IMF.

Taking a longer-term perspective, financial integration is an essential part of a prospering world economy. As growing financial linkages increase the transmission of stress, there is a need to enhance multilateral insurance against external financial shocks, especially to well-governed countries that have opened their economies to the rest of the world.

The rest of this chapter is structured as follows. The next section discusses the financial stress measure for advanced economies and its recent trends. It then elaborates on how this measure is adapted to construct a measure of financial stress for emerging economies and documents important trends in the index across regions. The section that follows discusses the relationship between the two indices and why one would expect them to be linked. The chapter then presents a comprehensive analysis of stress transmission, by conducting an econometric analysis of factors driving financial stress in emerging economies—focusing on developments in the past decade—and by studying the impact on emerging economies of previous systemic banking crises in advanced economies. The concluding section outlines what can be expected from the current crisis and what policies can be implemented to alleviate its impact on emerging economies.

Measuring Financial Stress

A first step in gauging the impact of the current financial crisis on emerging economies is quantifying the intensity and scope of financial stress in both advanced and emerging economies.

Figure 4.3. Sudden Stops and Activity
(Purchasing-power-parity-weighted average)

In the past, widespread financial stress in advanced economies was followed by reduced capital inflows—often abruptly through sudden stops—and lower growth. In the aftermath, capital inflows did not recover for a long time.

Sources: IMF, *Balance of Payments Statistics;* and IMF staff calculations.
[1] Includes Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru, Uruguay, and Venezuela.
[2] Includes Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam.

How High Is Stress in Advanced Economies?

For advanced economies, the October 2008 *World Economic Outlook* introduced a monthly, market-based Financial Stress Index (AE-FSI). The index was calculated for 17 economies, covering about 80 percent of advanced economy GDP, for the years since 1981.[3] It comprises seven subindices, related to banking sectors, securities markets, and foreign exchange volatility.[4]

An update of the index to February 2009 illustrates the unprecedented breadth and intensity of the current crisis. Since the first quarter of 2008, nearly all the advanced economies have experienced unrelieved, exceptionally high stress (Figure 4.4, top panel).[5]

Some historical comparisons put the situation in perspective. In seven previous episodes, high stress affected at least 50 percent of advanced economies, weighted by GDP (Table 4.1). All but one of these episodes (the exchange rate mechanism, ERM, crisis) included the United States. Several large stress events were associated with severe banking sector dislocations (for example, the Latin American debt crisis of the early 1980s and the Japanese and Scandinavian banking crises of the 1990s). Given their potential relevance for understanding the current crisis, these episodes are the subject of a case study later in this chapter. More recent stress episodes in advanced economies have tended to be more related to securities markets (for example,

[3] *World Economic Outlook*, October 2008, Chapter 4, "Financial Stress and Economic Downturns."

[4] The AE-FSI for each advanced economy is a weighted average of the following indicators: three banking-related variables (banking-sector stock price volatility, the spread between interbank rates and the yield on treasury bills, and the slope of the yield curve); three securities-markets-related variables (corporate bond spreads, stock market returns, and stock return volatility); and exchange rate volatility. For further details, see Cardarelli, Elekdag, and Lall (forthcoming).

[5] The top panel reports only high-stress events, which are defined as periods of financial stress in which the measured stress level is more than one standard deviation above the Hodrick-Prescott trend level.

Figure 4.4. Financial Stress in Advanced Economies

Financial stress in advanced economies is currently more widespread across countries and sectors of the financial system than in earlier stress episodes.

Share of Advanced Economies in High Stress[1]
(GDP-weighted sum)

- United States and Canada
- United Kingdom
- Western Europe
- Japan and Australia

Intensity of Stress during Episodes of Widespread Financial Stress[3]
(deviation from mean value in standard deviations; GDP-weighted sum)

- Before[4]
- Peak[4]
- After[4]

LIBOR – TED Spreads

Corporate Spreads

Equity Market Returns

Exchange Market Volatility

Source: IMF staff calculations.
Note: DBL = Drexel Burnham Lambert; ERM = European exchange rate mechanism; LIBOR = London interbank offered rate; LTCM = Long-Term Capital Management.
[1] High stress defined as a stress index level of one standard deviation above its trend.
[2] WorldCom, Enron, and Arthur Andersen.
[3] Widespread stress is defined as periods during which 50 percent of advanced economies' GDP was in high stress. A total of seven episodes were identified with peak stress dates in 1982, 1987, 1990, 1992, 1998, 2000, 2002, and 2008. See Table 4.1 for a description.
[4] Non-overlapping averages of three quarters before, around, and following peak stress. The peak in the 2008 episode is assumed to be quarter four.

Table 4.1. Episodes of Widespread Financial Stress in Advanced Economies[1]

1982	U.S. Banking Sector Stress	
	Canada	United States	
	Belgium France Germany	Italy Netherlands	Following sovereign defaults in Latin America, a number of large U.S. banks experienced stress. During the 1970s, the largest U.S. banks became increasingly exposed to Latin America via syndicated loans to sovereign borrowers. By the end of 1978, such loans accounted for more than twice the capital and reserves of the major banks. Higher interest rates in advanced economies, a global downturn, and the attendant collapse in commodity prices severely affected emerging economies and in turn U.S. banks. Mexico declared a debt service moratorium. With the exceptions of Chile, Colombia, and Costa Rica, all Latin American countries defaulted. The U.S. savings and loan crisis began at about the same time, though it was largely unrelated to the Latin American debt crisis.

1987	U.S. Stock Market Crash	
	Canada	United States	
	Belgium Germany Netherlands Norway	Spain Sweden Switzerland United Kingdom	The October 1987 U.S. stock market crash was the largest-ever one-day decline in stock market values. The Dow Jones Industrial Average fell by 23 percent. Repercussions were felt in virtually all advanced economies' equity markets. Brazil declared a debt service moratorium. At about the same time, the Louvre Accord was signed, prior to which the U.S. dollar hit record lows (a 50 percent decline from the 1985 peak).
	Australia	Japan	

1990	Nikkei Crash	
	Canada	United States	
	Austria Belgium Germany	Netherlands Switzerland United Kingdom	The junk bond market collapsed in the United States, and the Nikkei index for the Tokyo stock market crashed, falling by 50 percent. There were other sources of financial stress. The continuing bailout of U.S. savings and loan institutions reached $150 billion. Drexel Burnham Lambert—the fifth-largest U.S. investment bank at the time—filed for bankruptcy. Systemic banking crises affected Argentina, Brazil, Hungary, and Romania.
	Australia	Japan	

1992	European Exchange Rate Mechanism (ERM) Crisis and Scandinavian Banking Crises	
	Canada		
	Austria Denmark Finland Germany Italy	Norway Spain Sweden	The ERM collapsed and the Japanese asset price bubble burst. Moreover, equity and commodity markets were rattled by the start of the First Gulf War. At about the same time, the Scandinavian banking crises affected Finland, Norway, and Sweden. There was a systemic banking crisis in India (1993) and debt restructuring arrangements in Argentina, Egypt, Jordan, Paraguay, the Philippines, Poland, and South Africa.
	Japan		

1998	Long-Term Capital Management (LTCM) Collapse	
	Canada		
	Austria Denmark France Germany Netherlands	Norway Spain Switzerland United Kingdom	The collapse of U.S.-based hedge fund LTCM rattled stock markets. Even though it was preceded by the Russian default, LTCM had already experienced financial woes prior to that event. In May and June 1998, LTCM recorded losses of 6.4 percent and 10.1 percent, reducing its capital by $461 million. Margin calls and leveraged hedge funds fueled sell-offs in many risky asset classes, including emerging market instruments. Financial stress increased strongly in Mexico, and Brazil suffered a currency crisis that culminated in a 70 percent depreciation of the real starting in January 1999.
	Japan		

2000	Dot-Com Crash	
	Canada	United States	
	Finland Netherlands	United Kingdom	Large declines in the U.S. Standard & Poor's stock market index began in August 2000, led by the technology sector. There was debt restructuring in Ecuador and Russia and a systemic banking crisis in Turkey.

2002	WorldCom, Enron, and Arthur Andersen Defaults	
	Canada	United States	
	Belgium Germany	Netherlands	Scandals wreaked havoc across global financial markets. The turmoil started with the demise of Arthur Andersen (then one of the "Big Five" international accounting firms), which was convicted on June 15, 2002, of obstruction of justice in conjunction with the Enron scandal. WorldCom filed for bankruptcy on July 21, 2002—the largest in U.S. history at the time. One of the most severe crises in emerging markets was experienced by Argentina, which abandoned its 10-year currency board.

Source: IMF staff.

[1]Widespread financial stress defined as periods during which at least 50 percent of advanced economies' GDP is in high financial stress measured by a stress index exceeding one standard deviation above its trend.

equity market crises in 1998, 2000, and 2002).[6] Ominously, the current crisis affects *all* financial segments, in *all* major regions, and it has already shown unusual persistence.

An analysis of components of the AE-FSI underlines the pervasiveness of the crisis. The bottom four panels of Figure 4.4 compare selected indicators before, during, and after the peak of various stress episodes. In 2008, banking stress––measured by the deviation from trend of the TED spread––reached levels previously seen only during the peak of the U.S. banking sector stress in 1982. During that year, however, securities markets were orderly, whereas they currently suffer major dislocations. Recent corporate spreads have been at unprecedented levels, reflecting the tight linkages between banking and securities markets. The collapse in equity markets has been larger than during the 2000 crash of the dot-com bubble and the corporate debacle of 2002 (which involved WorldCom, Enron, and Arthur Andersen). Finally, ballooning imbalances and uncertainty in international capital markets have raised exchange market volatility to the levels seen during the 1990 Nikkei/junk bond collapse and the 1992 ERM crisis.

Measuring Financial Stress in Emerging Economies

An abundant literature has sought to identify the occurrence and determinants of currency, banking, and debt crises in emerging economies. Academic studies have largely relied on historical narratives of well-known systemic banking crises, when bank capital was eroded, lending was disrupted, and public intervention was required (for a comprehensive survey, see Laeven and Valencia, 2008).[7] However, financial

stress attributed primarily to securities markets has been examined less comprehensively, especially those episodes that involved multiple emerging economies.

These previous studies provide a rich database of financial stress episodes in emerging economies, but they are less well suited to the purposes of this chapter for two reasons. First, econometric work often uses *zero-one* binary variables: either *no crisis* or *crisis*. Such variables do not provide a measure of the intensity of stress and ignore the ambiguity of "near-miss" events.[8] Second, even the most comprehensive databases focus on banking, currency, and debt crises, and pay little attention to securities market stress. With banking sectors and securities markets more intertwined, it is important to simultaneously analyze the entire financial system.

To complement the indicators used in the literature, this chapter identifies episodes of financial stress in emerging economies using a composite variable—the *"Emerging Markets Financial Stress Index" (EM-FSI).* This is the first such measure providing comparable high-frequency data on stress for emerging economies. It builds on the methodologies used to construct the AE-FSI. One important refinement for the EM-FSI is the inclusion of a measure of exchange market pressures, which are a more common source of stress in emerging economies than in advanced economies. [9,10]

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[6]Given the better data coverage on the more recent stress events, their effect on transmitting stress to emerging economies is explored econometrically below.

[7]To identify currency crises, event narratives may be complemented with data on foreign exchange reserves, exchange rate fluctuations, and interest rate volatility, among others (see, for example, Eichengreen, Rose, and Wyplosz, 1996). Sovereign debt crises are relatively clear-

cut because default and rescheduling dates are officially announced (Reinhart and Rogoff, 2008). Countries often suffer from a combination of the two—a "twin crisis" (Kaminsky and Reinhart, 1999)—that may be associated with contagion (Kannan and Köhler-Geib, forthcoming).

[8]Some episodes do not mutate into full-scale crises or have little macroeconomic impact. One such example includes the emerging market sell-off in June 2006. Although the macroeconomic implications were minor, it did raise asset price volatility in countries with large current account deficits.

[9]A depletion of reserves may indicate exchange market pressures, although the exchange rate appears stable. Calvo and Reinhart (2002) show that many emerging economies with officially flexible exchange rate regimes often allow only minimal exchange rate movement—the "fear of floating" hypothesis.

[10]One caveat in interpreting the exchange market pressure component is that the impact of stress in this

Construction of the stress index for emerging economies

Financial stress events have two elements in common: they occur suddenly, and they usually involve multiple sectors of a country's financial system. The overall level of stress experienced in a country depends on the economic importance of the stressed financial sector. This has two implications for the construction of a stress index: first, the indicator should cover developments in a broad set of financial markets and, second, the aggregation of the subindices should reflect the relative importance of the various financial sectors.

Based on these principles, the EM-FSI for each country comprises the following five indicators:

- an exchange market pressure index (EMPI), which increases as the exchange rate depreciates or as international reserves decline;[11]
- emerging economy sovereign spreads, whereby rising spreads indicate increased default risk;
- the "banking-sector beta," based on the standard capital asset pricing model (CAPM) computed over a 12-month rolling window. A beta greater than 1—indicating that banking stocks are moving more than proportionately with the overall stock market—suggests that the banking sector is relatively risky and is associated with a higher likelihood of a banking crisis;
- stock price returns, calibrated such that falling equity prices correspond to increased market stress; and
- time-varying stock return volatility, wherein higher volatility captures heightened uncertainty.

One difference between the EM-FSI and the stress index for advanced economies is the absence of a subindex capturing corporate bond spreads. Although this segment of emerging economies' capital markets has developed rapidly over the past few years, it is still small in most emerging economies. Most important, comparable data were not available for a sufficiently large pool of emerging economies.[12]

The aggregation of the subindices into the EM-FSI is based on variance-equal weighting. Under this method each component is computed as a deviation from its mean and weighted by the inverse of its variance. This approach gives equal weight to each stress subindex, allows a simple decomposition of stress components, and is also the most common weighting method in the literature.[13]

Using the components described above, the EM-FSI is constructed for 18 emerging economies from 1997 to 2008 using monthly data.[14] In addition to capturing the most important episodes of financial stress experienced by emerging economies, the EM-FSI performs well when contrasted to previous academic studies.[15] A narrative analysis later in this chapter examines well-known financial stress episodes before 1997.

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component depends on the degree of dollarization and currency mismatches in domestic public and private balance sheets. In particular, countries with relatively high foreign currency liabilities on balance sheets may experience a greater impact on the real economy through balance sheet effects from a given exchange rate depreciation.

[11]For similar measures, see Ramakrishnan and Zalduendo (2006) and Batini and Laxton (2005).

[12]The index does not cover interest rate changes, since these could be the result of policy measures unrelated to financial stress.

[13]Although economic weights, such as the size of each financial market sector, would have been preferable, such weights were not available on a comparable basis across countries. However, variance-equal weighting has been shown to perform as well in signaling stress episodes as weighting based on economic fundamentals (Illing and Liu, 2006). Moreover, robustness tests indicated that equal-variance weights are very similar to weights identified by a principal components analysis of the stress subindices.

[14]The EM-FSI was constructed for countries for which data were available for all subcomponents. See Appendix 4.1 for a list of countries.

[15]Subcomponents of the EM-FSI capture crises identified in the literature. Following the literature, an episode of high financial stress was identified when the index for a country exceeds 1.5 standard deviations above its mean. See Appendix 4.1 for details.

Patterns of financial stress in emerging economies

Broadly speaking, four systemic financial stress episodes can be identified using this new index (Figure 4.5, top panel).[16] The first spike in the EM-FSI signals the intensification of the Asian crisis during the last quarter of 1997, a severe, but primarily regional episode. The second occurs toward the end of 1998 and was felt more intensely across emerging economies. This episode reflected the financial turmoil owing to the default of Russian external obligations and the collapse of Long-Term Capital Management (LTCM), and culminated in the Brazilian currency crisis. The third rise in the EM-FSI peaked around the dot-com crash of 2000. The fourth increase in the EM-FSI is more differentiated across regions, with the largest rise occurring in Latin America during the Argentine default in 2002.[17]

The new index also captures well the recent eruption of stress. Signs of crisis first appeared in Asia and multiplied quickly across all other regions. In the final quarter of 2008, all regions showed exceptionally high levels of stress, at exactly the same time that advanced economies experienced stress. The lower panels of Figure 4.5––using monthly data—show a regional decomposition of stress. The synchronized increase in stress in 2008 is marked and shows peaks in all regions in October, although experiences within regions varied (for example, some central European economies, such as Poland and the Czech Republic, experienced less stress). The composition of the jump in stress is explored in more depth below.

Links between Advanced and Emerging Economies

The strong comovement of stress across emerging economies suggests that common factors play a role. One of these factors could be financial

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[16]To facilitate comparisons, each regional EM-FSI was standardized.

[17]Similarly, Latin America seems to have been sensitive to the sell-off in emerging assets around June 2006.

Figure 4.5. Financial Stress Indices in Emerging Economies
(Purchasing-power-parity-weighted average)

Current levels of financial stress are at historical highs. Stress increased in all regions in the third quarter of 2008 and showed strain in all parts of the financial sector.
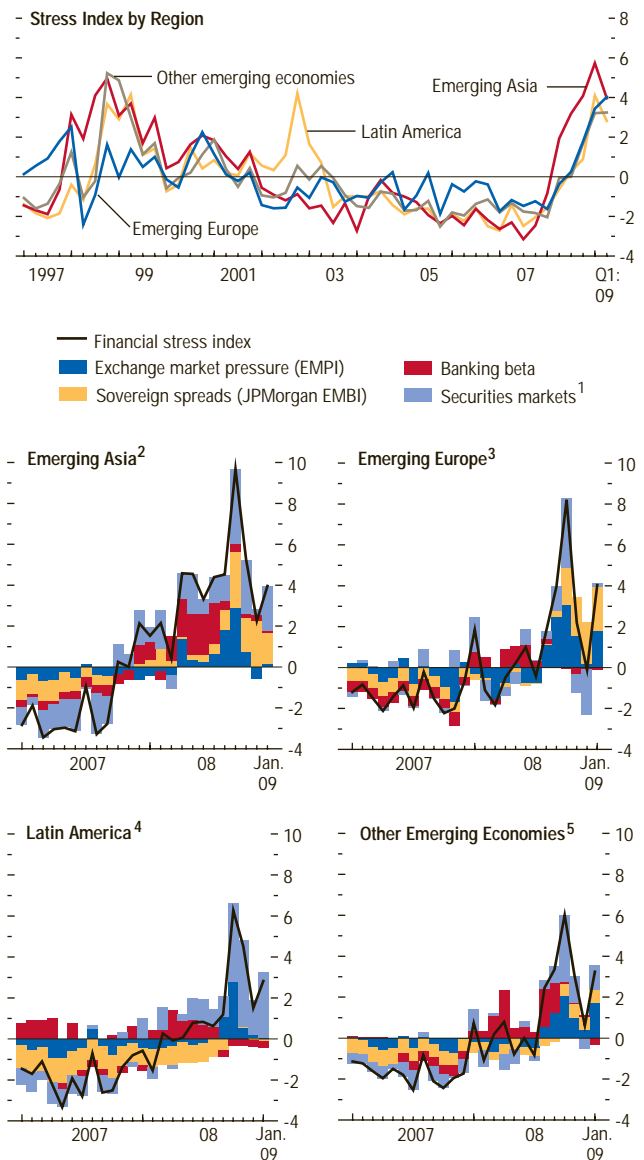
Source: IMF staff calculations.
[1]Includes stock returns and volatility.
[2]Emerging Asia: China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, and Thailand.
[3]Emerging Europe: Czech Republic, Hungary, Poland, Romania, Slovak Republic, and Slovenia.
[4]Latin America: Argentina, Brazil, Chile, Colombia, Mexico, and Peru.
[5]Other emerging economies: Egypt, Israel, Morocco, Russia, South Africa, and Turkey.

Figure 4.6. Financial Stress in Emerging and Advanced Economies
(Level of index, GDP weighted)

There is a strong visual link between stress in advanced and emerging economies, with peaks and troughs roughly coinciding. The increase in emerging economy stress is larger this time when compared with past episodes and involves all segments of the financial sector.

Comparison of Financial Stress Levels

Legend:
- Emerging economies (left scale)
- Advanced economies (right scale)

Stress in Emerging Economies during Episodes of Widespread Stress in Advanced Economies[1]
(stacked and centered around peak of financial stress in advanced economies; quarters)

Legend:
- Exchange market pressure
- Sovereign spreads (JPMorgan EMBI)
- Equity market profitability
- Bank beta
- Equity market volatility

Past Stress Episodes[2]   Current Stress Episodes[3]

Source: IMF staff calculations.
[1] See Figure 4.5. Refer to Appendix 4.1 for definitions of stress components.
[2] Peak in 1998:Q4, 2000:Q4, and 2002:Q3. See Table 4.1.
[3] Peak assumed in 2008:Q4.

stress in advanced economies. We first briefly present empirical evidence indicating that *stress in advanced and emerging economies is closely linked* and then discuss the *reasons they may be linked.*

Does Stress Comove?

The top panel of Figure 4.6 compares aggregate financial stress indices for advanced economies (AE-FSI) and emerging economies (EM-FSI). There is a strong visual link, with local peaks in the two indices broadly coincident. Particularly notable is that the EM-FSI is currently higher than at any previous time, as is the AE-FSI. Moreover, the second-highest peak in the EM-FSI occurs in the same quarter as the collapse of LTCM, an event that led to significant financial stress in advanced economies.[18] The strong links are also apparent from looking at calm periods in emerging economies (when the EM-FSI is below zero), as they tend to overlap with calm periods in advanced economies (when the AE-FSI is below zero).

During the current crisis, there is an evident "decoupling" and subsequent "recoupling." The AE-FSI turned positive in the second quarter of 2007 and then rose rapidly. In contrast, the EM-FSI stayed significantly negative until the first quarter of 2008. It turned positive only in the second quarter of 2008 and then blew up in the third quarter and particularly in the fourth. Thus, in this episode, there was a limited early response in emerging economies but then a sharp catch-up.

To investigate further how the current crisis differs from previous ones, the lower two panels of Figure 4.6 decompose the EM-FSI into its components. The bottom left panel shows the average of each component centered around three previous crises since 1997; the bottom

[18]Some commentators have argued that the Russian default in 1998 led to the demise of LTCM. However, LTCM had already reported losses prior to the Russian default, weakening the argument that the stress event was purely emerging economy driven. The sharp widening of risk premiums following the August default was the final blow.

right panel shows the current crisis. There are clear differences. First, financial stress in emerging economies is much stronger in the current episode, in line with the larger impulse from advanced economies. Second, the composition differs. In previous crises, the main driver was wider risk premiums (the EMBI sovereign bond index), compounded by stock market volatility. Perhaps surprisingly, the index of exchange market pressure was barely visible in the three previous crises.[19]

In the current crisis, stress first became visible in the second quarter of 2008 in the banking sector. Subsequently, exchange market pressures increased, and by the last quarter of 2008 the turmoil also included widened sovereign spreads (EMBI) and heightened stock market volatility. In sum, the current crisis differs from previous episodes in that it involves all components—banking, foreign exchange, debt, and equity. Banking stress (as picked up by the banking beta) seems to be an especially important catalyst in the present turmoil.

How Does Stress Get Transmitted?

What factors drive the relationship between financial stress in advanced economies and emerging economies? In broad terms, there are *common* factors that produce similar effects across all emerging economies and *country-specific* factors that underlie differences between individual emerging economies. Figure 4.7 provides a schematic presentation of these effects.

Common factors

The presence of common factors is apparent from the comovement of stress across emerging regions and between emerging and advanced economies, which was noted previously. Common factors can be global shocks (for example,

[19]The reason for the relatively moderate response around the Asian crisis is that there were offsetting effects between countries afflicted by the crisis and other countries that experienced a reduction in stress, such as India and China.

Figure 4.7. The Transmission of Stress: Schematic Depiction of Effects

Source: IMF staff.

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Figure 4.8. Financial Integration of Emerging and Developing Economies

(Percent of emerging and developing economies' GDP)

Foreign liabilities of emerging economies have grown rapidly over the past 30 years, driven by direct and portfolio investment. Bank lending has remained a major source of financing, with the composition shifting from foreign to domestic currency lending. Gross external investment positions have increased especially strongly in emerging Europe.

Total Gross Foreign Assets and Liabilities

- Direct investment liabilities
- Portfolio equity liabilities
- Debt liabilities
- Total assets[1]

Liabilities to Advanced Economies' Banks

- Foreign currency liabilities to advanced economies
- Local currency liabilities to advanced economies
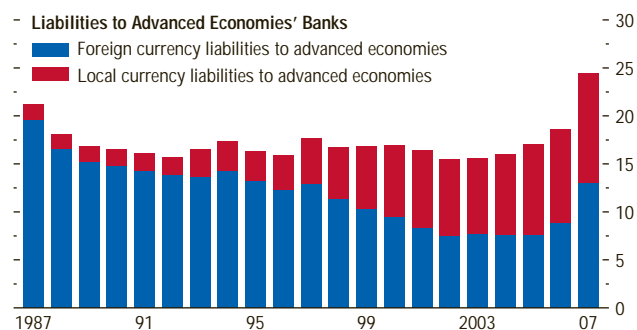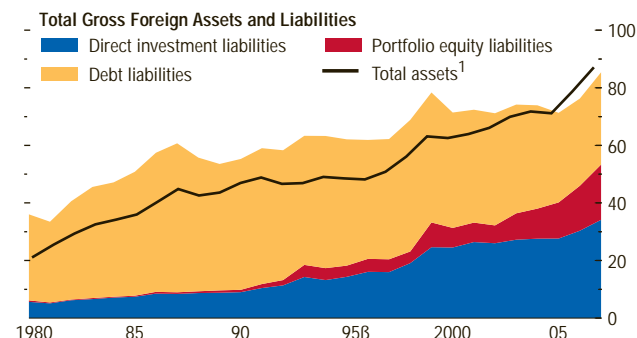
Changes in Total Gross Foreign Assets and Liabilities over GDP, 1985–2007[2,3]

- Emerging Europe
- Emerging Asia
- Latin America
- Middle East and North Africa
- Sub-Saharan Africa
- Commonwealth of Independent States and Russia

Percentage points
- Less than 0
- From 0 to 50
- From 50 to 100
- More than 100

Number of countries
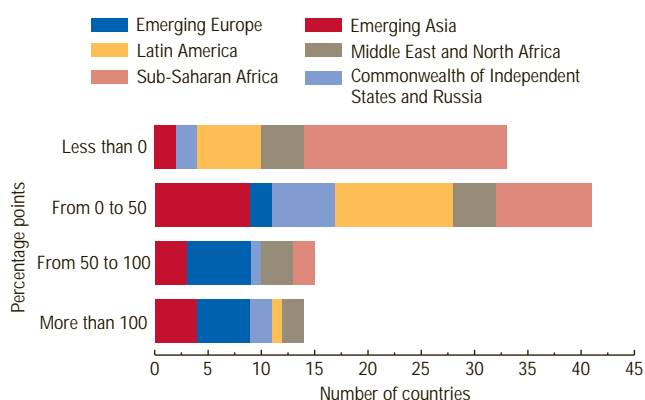
Sources: Bank for International Settlements; Lane and Milesi-Ferretti (2006); and IMF staff calculations.

[1] Includes foreign exchange reserves.
[2] Total foreign assets excludes foreign exchange reserves.
[3] 1995–2007 in the case of emerging Europe and Commonwealth of Independent States and Russia.

global shifts in market sentiment or risk aversion) and may manifest themselves through herd behavior in markets, cross-country contagion, and common-lender effects (that is, the blanket withdrawal of funds by highly exposed financial institutions).[20] The role of such common factors is likely related to the increasing financial integration of the majority of emerging economies in the past decades—in other words, financial globalization.

Indeed, total foreign liabilities of emerging economies have been growing swiftly over the past 30 years (Figure 4.8).[21] The increase is largely related to rising portfolio equity and direct investment. Although debt liabilities have declined somewhat over time, debt to advanced economy *banks* on a consolidated basis (with accounts of foreign affiliates consolidated along with those of the headquarters) has risen in recent years relative to GDP, and the composition has shifted from foreign to domestic currency debt (middle panel). Part of this process is attributed to the rapid increase in foreign bank ownership, especially in emerging Europe (Claessens and others, 2008; and Goldberg, 2008).

Financial integration has, however, increased unevenly across regions (bottom panel). Over the past couple decades, approximately 70 percent of countries have increased their gross external positions, but others have seen declines, particularly in Africa.[22] Some countries have seen large increases, notably those in emerging Europe, where most countries' gross external positions rose by more than 50 percent of annual GDP in just over a decade.

Country-specific factors can be grouped into two broad categories: financial and economic linkages between emerging and advanced econ-

[20] See Broner, Gelos, and Reinhart (2006); Calvo (2005); and Pons-Novell (2003).
[21] Foreign assets, notably official reserves, also rose. Gross positions, however, are more appropriate than net positions for gauging integration. Indeed, a measure commonly used in the literature is the *sum* of foreign assets and liabilities (see, for example, Kose and others, 2006; and IMF, 2007).
[22] The declines in external positions often were the result of debt relief.

omies; and domestic vulnerabilities, deriving from policies or from structural characteristics.

Country-specific linkages

How do linkages to advanced economies facilitate the transmission of financial stress? The two channels of transmission emphasized in the literature are trade and financial channels.[23]

Financial stress can rise in response to actual or incipient *capital outflows* initiated by investors in advanced economies following a financial shock. The importance of this channel of stress transmission can be measured by foreign liabilities to advanced economies divided by domestic GDP. In addition, financial stress can increase as a result of losses incurred on emerging economy assets invested in advanced economies experiencing a crisis. This channel of transmission could be significant in some countries, notably in the Middle East, and can be captured by the ratio of assets held in advanced economies to domestic GDP. Overall, financial linkages can be quantified as a sum of gross foreign assets and liabilities vis-à-vis advanced economies relative to GDP.[24]

Financial stress can also occur through trade linkages in response to actual or incipient *declines in exports* to advanced economies in crisis, reflecting current or expected slowdowns in demand. The importance of this linkage can be measured by exports to advanced economies divided by domestic GDP. By this measure, trade linkages have become increasingly important over the past 20 years, with exports to advanced

economies up from less than 10 percent to nearly 20 percent of emerging economies' GDP. Almost half of these exports now come from emerging Asia, especially China.[25] In addition, crisis transmission via both trade and financial linkages can be compounded by second-round effects. These work through spillovers from affected emerging economies back to advanced economies and also through spillovers within the group of emerging economies.[26]

Figure 4.9 compares the size and composition of financial linkages across emerging economies.[27] The top panel shows how over the past 10 years or so, liabilities to advanced economy banks have grown rapidly in emerging Europe, while declining somewhat in emerging Asia following the 1997–98 crisis. In parallel, portfolio liabilities (and assets) in emerging Asia have increased markedly.[28] As a result, emerging Europe may now be more vulnerable to exter-

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[23]Eichengreen and Rose (1999), Glick and Rose (1999), and Forbes (2001) stress trade linkages. Kaminsky and Reinhart (2003); Caramazza, Ricci, and Salgado (2000); Fratzscher (2000); and Van Rijckeghem and Weder (2001) emphasize financial channels as well as trade. A survey of this literature is in Chui, Hall, and Taylor (2004). In a recent study, Forbes and Chinn (2004) attribute the main role in the transmission of financial shocks to trade, with bank lending of lesser but increasing importance.

[24]Because of data limitations, foreign assets could not be included in all measures of financial linkages. Specifically, although data on nonreserve foreign portfolio assets of emerging economies are available, data on foreign bank assets of these economies are generally lacking. For more information about these data, see Appendix 4.2.

[25]The trade and financial channels of crisis transmission may also interact, because the availability of trade credit is linked to trade volume. Indeed, recent declines in international trade are at least in part a result of collapsing trade credit.

[26]Losses on foreign investments can further increase the strain on advanced economies' financial systems and cause further pullout from emerging economies (along the lines of the common-lender effect emphasized in the contagion literature). In the same vein, falling external demand could intensify the real stress experienced by advanced economies and further depress their own demand and, as a result, the exports of emerging economies (a broadly similar multiplier effect is analyzed by Abeysinghe and Forbes, 2005). For countries that are not directly linked to advanced economies—because trade linkages among themselves have become more significant over time—falling demand and depreciating currencies could spread the stress.

[27]Because trade and direct investment linkages have been discussed extensively elsewhere, the focus here is on bank lending and security holdings. See recent issues of the World Trade Organization's *World Trade Report* and the United Nations' Conference on Trade and Development's *World Investment Report,* as well as past issues of the *World Economic Outlook,* including Chapter 5 of the April 2008 issue and Chapter 4 of the October 2007 issue.

[28]Although nonreserve portfolio assets are sizable in emerging Asia relative to the other regions, they are significantly smaller than portfolio liabilities. The dynamics of overall portfolio exposures in emerging Asia, as well as in other regions, are driven mainly by portfolio liabilities to advanced economies.

Figure 4.9. Financial Exposures of Emerging to Advanced Economies
(Percent of emerging economies' GDP)

Exposures to advanced economies have risen in emerging Europe via bank lending and in emerging Asia via portfolio holdings.

- ■ Emerging Europe
- ■ Latin America
- ■ Sub-Saharan Africa
- ■ Emerging Asia
- ■ Middle East and North Africa
- ■ Commonwealth of Independent States and Russia

Liabilities to Advanced Economies' Banks [1]

Portfolio Exposure to Advanced Economies [1,2,3]

Sources: Bank for International Settlements; IMF, Coordinated Portfolio Investment Survey; and IMF staff calculations.
[1] See Appendix 4.2 for the list of advanced economies.
[2] Including liabilities and nonreserve assets.
[3] The data for 1998, 1999, and 2000 are based on interpolations.

nal bank crises, whereas emerging Asia may be more susceptible to external securities- market disturbances.

Over the same period, western European banks have increasingly dominated banking flows, whereas North America has been the main source for portfolio investments (Figure 4.10). This implies that western Europe has become the most likely source of common-lender effects, and the United States and Canada have become more important sources of securities market disturbances.

Recent data underline the different regional patterns in financial integration. Data from the end of 2007 (bottom panels) show that emerging Europe has bank liabilities to advanced economies exceeding 50 percent of GDP, which is about three times that of the other regions. Emerging Europe is also most dependent on western Europe and therefore particularly liable to common-lender effects. In comparison, emerging Asia and Latin America appear somewhat less at risk, with broadly similar exposures via bank lending and portfolio holdings to, respectively, western Europe and the United States and Canada.[29]

Country-specific vulnerabilities

Country-specific sources of vulnerability to external shocks include solvency and liquidity problems, weaknesses in domestic balance sheets, and factors related to openness.[30] These factors heighten susceptibility to capital account crises and currency crises and potentially increase the rate of transmission of stress originating in investor economies. By signaling higher risks—for example, through sovereign default—they may cause investors to pull out more forcefully and thereby create self-fulfilling investor expectations.

[29] For an extensive discussion on the role of financial linkages in Latin America, see Mühleisen (2008).
[30] See Kaminsky and Reinhart (1999); Calvo (2005); Edwards (2005); Ghosh (2006); Calvo, Izquierdo, and Mejia (2004); Ramakrishnan and Zalduendo (2006); and Eichengreen, Gupta, and Mody (2006).

Figure 4.11 compares standard indicators of vulnerability across different emerging regions. The top two panels show the current account and fiscal balances.[31] Over the past few years, current account balances have become more divergent. Emerging Europe has seen large and sustained deficits, while many countries in Asia, the Middle East, and the Commonwealth of Independent States (CIS) have shifted to surpluses—partly because of the commodity price boom. Fiscal balances show a more homogenous picture, having in general improved across all regions. Looking at the two indicators in combination shows twin deficits—on the current account and the budget—mainly in emerging Europe.

A second (inverse) measure of vulnerability is the level of foreign exchange reserves (bottom panel). Following the Asian crisis, many countries strengthened their reserve positions, as judged by months of import coverage. Commodity exporters and economies in emerging Asia—especially China—achieved large increases; other countries in Latin America and emerging Europe saw moderate increases. Overall, although reserve buffers have risen strongly in dollar terms, the increase in terms of import coverage has been less impressive as trade volumes have grown markedly.

The Transmission of Financial Stress: An Overall Analysis

Periods of widespread financial stress in advanced economies appear to have significant effects on emerging economies. Data constraints limit, however, the ability to systematically explore these interactions over a long time horizon, which is why this section takes a two-pronged approach. The first part presents results from an econometric exercise using the financial stress indices, covering the period

[31]Although sustainability refers to a stock concept, empirical studies find that current account and fiscal balances—the corresponding flow variables—are important determinants of crisis events.

Figure 4.10. Financial Linkages between Advanced and Emerging Economies

Western Europe dominates bank lending; portfolio investments come mainly from North America. The largest respective recipients of these two investing regions (relative to recipients' GDP) are emerging Europe and Latin America.
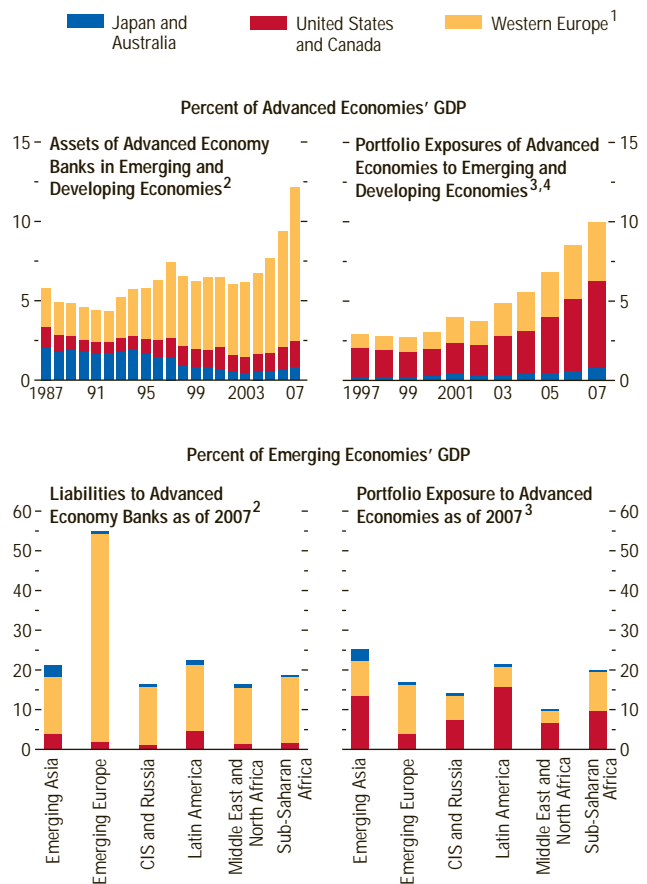
Sources: Bank for International Settlements; IMF, Coordinated Portfolio Investment Survey; and IMF staff calculations.
Note: CIS = Commonwealth of Independent States.
[1]See Appendix 4.2 for the list of economies.
[2]Excluding Australia for lack of data.
[3]Including liabilities and non-reserve assets.
[4]The data for 1998, 1999, and 2000 are based on interpolations.

Figure 4.11. Vulnerability Indicators by Region, 1990–2007

Current account balances have become more dispersed across emerging economies, while fiscal balances have generally moved in tandem and improved. Reserve coverage of imports has increased in all regions during the past decade.

- Emerging Europe
- Latin America
- Sub-Saharan Africa
- Emerging Asia
- Middle East and North Africa
- Commonwealth of Independent States

Current Account Balance (percent of GDP)

Fiscal Balance (percent of GDP)

Foreign Exchange Reserves (months of imports covered)
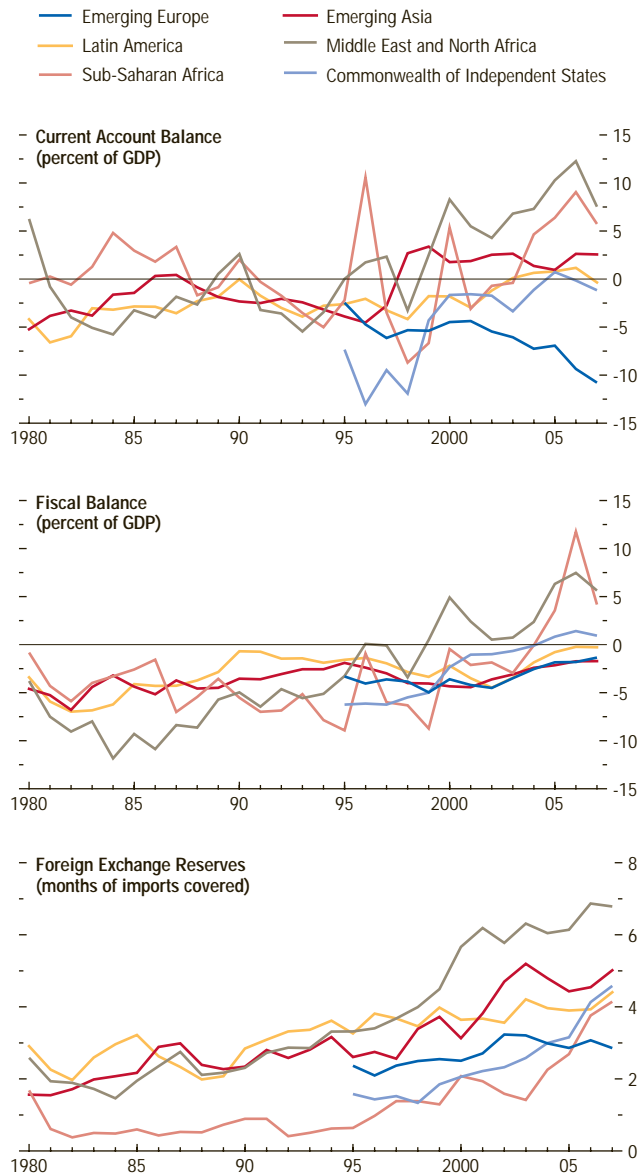
Sources: IMF, *Balance of Payments Statistics;* and IMF staff calculations.

1997–2008. However, apart from the current crisis, there have been no systemic banking crises during the past decade, for which the EM-FSI is available. In light of this, the second part presents a case study analyzing the effects on emerging economies of previous systemic banking crises in advanced economies.

Econometric Analysis Using Stress Indices

The econometric analysis assesses more formally the respective roles of common and country-specific factors in the transmission of financial stress from advanced to emerging economies. Based on the above discussion, financial stress in emerging economies (EM-FSI) is related to three sets of variables: (1) stress in advanced economies (AE-FSI), (2) country-specific characteristics and vulnerabilities (X), and (3) general global factors (GF). One important assumption in the analysis is that financial stress in advanced economies is exogenous to financial stress in emerging economies.[32] Indeed, the narrative analysis of widespread financial stress episodes in advanced economies did not indicate stress triggers in emerging economies. Moreover, formal empirical tests on the direction of causality support the assumption of independence of advanced economy stress for the majority of emerging economies.[33]

The equation below provides a compact description of how these variables may be related (*i* and *t* denote countries and time, respectively; ε_{it} is an error term). This equation is meant to convey the thrust of the analysis, with more details provided in Appendix 4.2. In particular, some of the estimated specifications include lags of dependent and/or independent

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[32]See Table 4.1 for a discussion of the triggers for financial stress episodes in advanced economies since the 1980s.

[33]Granger causality tests for the 18 available emerging economies showed that financial stress in advanced economies "Granger-caused" stress in emerging economies in 11 cases; tests were inconclusive in five cases. In one case, causality went in both directions, and only in two cases did it go from emerging to advanced economies.

variables, which are suppressed in equation (1) for ease of exposition.[34]

$$EMFSI_{it} = \alpha_i + \beta_i AEFSI_t + \delta X_{it} + \gamma_i\, GF_t + \varepsilon_{it}. \quad (1)$$

The relative roles of common and country-specific factors can be disentangled in a fairly straightforward manner:

- A key variable of interest is the size of the comovement parameters β_i, which measure how financial stress in emerging economy i responds to stress in advanced economies. A value of zero implies no comovement, whereas a value of 1 represents one-to-one transmission. The common effect of stress in advanced economies on emerging economies is measured by the average of the comovement parameters: $\beta = 1/n\Sigma_i\beta_i$ (n is the number of emerging economies).

- The country-specific component driving stress in emerging economies has two parts, a direct effect and an indirect effect. The indirect effect captures the impact of country-specific factors on the comovement parameters ($\beta_i = f(X_{it})$). For example, economies with high foreign liabilities to advanced economies may be expected to have a high comovement parameter. The direct effect captures the independent effect that country-specific factors have on emerging markets (δ). For example, countries that have more open capital accounts may be more prone to experience stress regardless of what is happening in advanced economies.

- Finally, stress may be driven by other global developments (such as commodity prices, interest rates, real activity), captured by GF_t and the coefficient γ.

Estimates of the parameters of interest are obtained through two related exercises. First, using *monthly* time series, equation (1) is estimated on a country-by-country basis identifying individual country comovement parameters β_i. The parameters β_i are allowed to vary across

subperiods and by lending region (Japan and Australia, United States and Canada, and western Europe). The β_is that are obtained are then related to measures of financial and trade linkages and other country-specific variables, building on Forbes and Chinn (2004), to examine what drives differences in comovements.

Second, to assess the importance of other country-specific factors—which are mostly available at an annual frequency—the above equation is also estimated using *annual* panel data. This approach allows more systematic testing of the role of country-specific variables (vulnerabilities) in generating stress. Both exercises were carried out on a sample of 18 emerging economies for which the EM-FSI was available.

Uncovering the Common Element and Differences in Comovements

Before estimating the financial stress equation, one way of gauging the importance of the common element in emerging economy stress is to relate its common time trend to the financial stress index in advanced economies. An empirical measure of the common time trend can be obtained by estimating fixed-time effects in emerging economy stress (Appendix 4.2). About 40 percent of this time trend, which represents shared emerging economy stress, is explained by the overall AE-FSI. Other global factors (interest rates, industrial production, commodity prices) explain another 18 percent.

The country-specific comovement parameter estimates confirm the importance of the common component in stress transmission. On average, close to 70 percent of stress in advanced economies is transmitted to emerging economies (average $\beta=0.7$: Figure 4.12, top panel).[35] Moreover, transmission is fast: it takes only one to two months to reach emerging economies.[36]

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[34]Although nonlinear specifications are conceivable, the goodness of statistical fit of the linear model suggests that if offers useful insights.

[35]Because both the AE-FSI and the EM-FSI are subject to measurement error, estimates of β_i are potentially biased downward.

[36]To capture possible lags in stress transmission, the comovement parameters were estimated using a dynamic model. Standard lag length criteria recommended one or

Figure 4.12. Comovement in Financial Stress between Emerging and Advanced Economies

The common, or systemic, element of stress transmission (mean β_i) is large, but variation across countries is significant. In the current crisis, transmission has been lower than in the past for most sample countries, possibly reflecting the weak initial response. Transmission of stress from western Europe appears strongest during the current crisis.
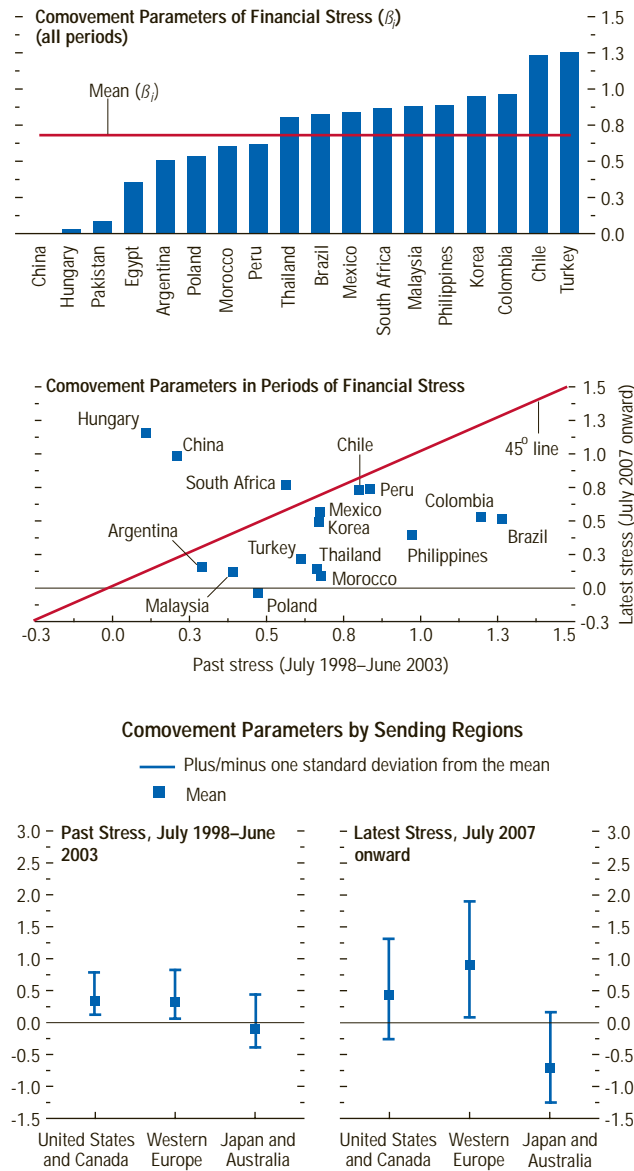
Source: IMF staff calculations.

The comovement parameters, β_i, however, vary substantially across countries, ranging from close to zero for China, to more than 1 for Chile and Turkey.

The strength of comovement varies also over time and, more specifically, between the current crisis (from mid-2007 onward) and previous ones in advanced economies (from mid-1998 to mid-2003, Figure 4.12, middle panel).[37] It appears that different countries (such as Brazil, Colombia, Philippines) experienced stronger financial spillovers in the past, relative to those seeing more intense transmission during the current crisis (such as China, Hungary, and South Africa). It should be noted, however, that the results for the current crisis should be interpreted with some caution, since it is still unfolding. The strength of comovement also depends on which advanced economies are involved. In particular, financial spillovers from the United States and Canada and from western Europe were similar, on average, during previous stress episodes. In the current crisis, spillovers from western Europe appear somewhat stronger (bottom panels).

These findings point to the importance of *country-specific* factors in determining the impact of financial turbulence on individual emerging economies. As discussed, the comovement parameters, β_i, could be shaped by financial and trade linkages between emerging and advanced

two lags for the model, indicating rapid transmission. The reported results are based on the specification with one lag, following the Schwartz information criterion.

[37]These episodes of stress were identified as periods during which at least some advanced economies were almost always in high stress, in contrast to the calm period, when almost no advanced economies experienced high stress. Thus, from mid-1998 to mid-2003, and from mid-2007 onward, the AE-FSI indicated high stress for at least one country in all but a few months. This compares with a period of relative calm between mid-2003 and mid-2007. Accordingly, the model included period-specific comovement parameters: from July 2007 onward for the current crisis and from July 1998 to June 2003 for the previous period of stress across advanced economies (the latter includes, in particular, the LTCM collapse, the dot-com crash, and the defaults of WorldCom, Enron, and Arthur Andersen).

economies and by domestic vulnerabilities in emerging economies. To investigate these channels of transmission, three comovement parameters were estimated for each country, reflecting comovements with different regions (Japan and Australia, western Europe, and the United States and Canada). These were regressed on measures of trade linkages and financial linkages, including bank lending, portfolio holdings, and direct investment.[38] Because western Europe dominates bank linkages, whereas the United States and Canada dominate portfolio linkages (with the exception of emerging Europe), a specification including dummy variables for the United States and Canada and western Europe was also explored. The estimations were run separately for the previous episode of financial stress in advanced economies (from mid-1998 through mid-2003) and for the latest episode (from mid-2007 onward).

An analysis of the variation in the transmission coefficients, β_i, suggests important differences in the transmission of stress across the two episodes (Table 4.2):

• Although all the linkages were individually significant determinants of stress transmission in *previous crises*, it was hard to pinpoint the most important linkage, in part because of positive correlations among the different types of linkages. Although the coefficient on portfolio linkages was largest, it was not statistically significant at usual threshold levels after controlling for other linkages. The strength of comovement was similar with the United States and Canada, on the one hand, and with western Europe on the other, consistent with broadly similar roles of portfolio and bank linkages. In contrast, bank linkages emerge as the primary transmission channel during *the*

current crisis. For instance, an increase in bank liabilities to western Europe from 15 percent to 50 percent of GDP (approximately the difference between emerging Europe and the other emerging regions) raises the comovement parameter by about 1. Comovement with western Europe is somewhat stronger than with the United States and Canada, consistent with the dominant role of bank linkages in the current crisis.

• Including dummy variables for advanced regions improves the statistical fit but makes coefficients on the linkages insignificant. More specifically, including the dummy for the United States and Canada weakens the coefficient on portfolio linkages, whereas including the dummy for western Europe, whose banks were actively lending to all emerging regions, weakens the coefficient on bank linkages. These findings suggest that the regional dummies pick up the regional patterns in bank lending and portfolio holdings.[39]

Further testing of the monthly model shows that country-specific vulnerabilities (such as current account or fiscal deficits) do not seem to influence the transmission of stress (that is, they are not significantly associated with the β_is). However, country-specific vulnerabilities could have direct effects on financial stress, and since these variables are not available at a monthly frequency, an additional empirical exercise is carried out to investigate their role in financial stress.

Do Country-Specific Vulnerabilities Matter?

To explore this hypothesis, equation (1) is estimated on annual data to include a broader set of country-specific variables.[40] In addition to vulner-

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[38]Trade linkages were measured as total exports to advanced regions (as reported by advanced economies) relative to the domestic GDP of each emerging economy. Financial linkages were measured using total liabilities to advanced regions (and total assets in these regions in the case of portfolio holdings). These measures were averaged over the periods corresponding to the current and previous financial stress episodes.

[39]It should be noted that the results are not driven by the overall trade and financial openness of emerging economies, which, in fact, do not seem to play any significant role in the transmission of financial stress (see the far-right column of Table 4.2).

[40]The annual aggregation of the monthly stress data is performed in two steps. First, average quarterly stress levels are calculated. In the second step, the *quarter with*

Table 4.2. The Role of Linkages as Determinants of Comovement[1]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Past stress in advanced economies (July 1998–June 2003)							
Dependent variable: comovement parameters of financial stress							
Bank linkages	0.014**				0.005	−0.016	0.006
	(0.006)				(0.009)	(0.010)	(0.008)
Portfolio linkages		0.060***			0.045	−0.018	0.034
		(0.017)			(0.031)	(0.036)	(0.023)
Direct investment linkages			0.044***		0.009	0.030	0.003
			(0.009)		(0.026)	(0.027)	(0.024)
Trade linkages				0.023**	0.000	0.008	0.005
				(0.009)	(0.017)	(0.015)	(0.013)
United States and Canada dummy						0.469***	
						(0.141)	
Western Europe dummy						0.584***	
						(0.165)	
Trade openness[2]							−0.001
							(0.001)
Financial openness[3]							−0.003
							(0.002)
Country effects	yes	yes	yes	yes	yes	yes	no
Observations	48	48	48	48	48	48	48
R^2	0.17	0.31	0.29	0.21	0.34	0.53	0.25
Latest stress in advanced economies (July 2007 onward)							
Dependent variable: comovement parameters of financial stress							
Bank linkages	0.029*				0.033**	−0.005	0.025*
	(0.017)				(0.014)	(0.027)	(0.013)
Portfolio linkages		0.055***			0.033	0.006	0.027
		(0.020)			(0.026)	(0.019)	(0.016)
Direct investment linkages			0.144***		0.105	0.053	0.069
			(0.044)		(0.083)	(0.064)	(0.077)
Trade linkages				0.047	−0.063	−0.021	−0.031
				(0.030)	(0.047)	(0.047)	(0.041)
United States and Canada dummy						1.201**	
						(0.537)	
Western Europe dummy						1.819***	
						(0.630)	
Trade openness[2]							0.001
							(0.003)
Financial openness[3]							−0.005
							(0.003)
Country effects	yes	yes	yes	yes	yes	yes	no
Observations	48	48	48	48	48	48	48
R^2	0.14	0.19	0.16	0.09	0.26	0.52	0.20

Source: IMF staff calculations.
[1]Robust standard errors in parentheses; ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.
[2]Exports plus imports divided by GDP.
[3]Foreign assets plus liabilities divided by GDP.

ability indicators, measures of trade and capital account openness are included to account for

the highest stress level is selected for the annual index. An alternative specification using 12-month averages yielded similar results in terms of significance but implies lower transmission levels (betas). It appears that the process of averaging hides relevant information in the data.

their potential role in increasing volatility. The estimation results are reported in Table 4.3. In general, estimates of the average stress comovement coefficient, β, are close to levels found in the monthly model. Also consistent with the monthly model, the size of comovement of stress between emerging and advanced economies was

Table 4.3. Emerging Economy Stress: Country-Specific Effects[1]
(Annual panel, 1997–2008)

	Financial Stress Index in Emerging Economies					
	(1)	(3)	(4)	(5)	(6)	(7)
Financial stress (advanced economies)	0.49***	0.52***	0.53***	0.56***	0.58***	0.62***
	(0.07)	(0.07)	(0.06)	(0.08)	(0.06)	(0.06)
Financial openness (t-1)[2]		0.02**	0.03***	0.02*	0.02***	0.02**
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Trade openness (t-1)[3]		−0.11***	−0.10**	−0.10***	−0.08**	−0.07*
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Current account (t-1)[4]			−0.14***			−0.13***
			(0.04)			(0.04)
Fiscal balance (t-1)[4]				−0.11		−0.18*
				(0.10)		(0.09)
Foreign reserves (t-1)[5]					−0.12*	−0.09
					(0.06)	(0.06)
R^2	0.55	0.60	0.62	0.60	0.62	0.63
R^2 (between)	0.26	0.18	0.18	0.19	0.18	0.20
R^2 (within)	0.39	0.47	0.49	0.47	0.50	0.52
Observations	210	210	210	210	210	210
Countries	18	18	18	18	18	18

Source: IMF staff calculations.

[1]Robust standard errors in parentheses; ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively. All regressions include country-fixed effects and control for global factors. Global controls comprise the concurrent three-month London interbank offered rate (LIBOR), global real output growth, and the change in commodity terms of trade.

[2]Foreign assets plus liabilities divided by GDP.

[3]Exports plus imports divided by GDP.

[4]In percent of GDP.

not affected by the country-specific variables (interactions with AE-FSI).[41]

The annual model uncovers important *direct* effects that country-specific characteristics have on stress in emerging economies. Among country-specific variables, the two openness variables have opposite effects on financial stress. Higher de facto capital account openness—measured by foreign assets plus liabilities divided by GDP—is associated with higher stress levels. Trade openness has the opposite effect and reduces the level of financial stress. This finding is broadly consistent with the notion that one cost of capital account openness is higher volatility. This trade-off is attenuated by the degree of international economic integration as measured by trade openness

[41]A dynamic specification of the model using a dynamic generalized method of moments estimator generated very similar results. For a discussion of the panel model results, see Appendix 4.2.

(Imbs, 2006; and Kose, Prasad, and Terrones, 2005).

By far the most important specific risk factors for financial stress in emerging economies are the presence of sizable current account or fiscal deficits. Countries with higher current account or fiscal balances tend to experience less stress, with about the same marginal impact from the two variables on financial stress (Table 4.3, columns 4 and 5). A 1 percentage point of GDP higher deficit is associated with an average stress index increase of about 0.15 percentage point in the subsequent year. For comparison, during past stress events, the index for emerging economies increased between 1 and 2 percentage points in a year and by significantly more in the most recent episode.

High levels of foreign reserves also dampen stress experienced in emerging economies (column 6), but their effect becomes borderline (*p*-value of 12 percent) when all control variables

are included in the model (column 7).[42] One reason for the small effect is that reserve buffers moderate stress in some segments (sovereign spreads) but not in others (equity markets). In general, these results are robust to the inclusion of other control variables.[43]

Figure 4.13 gauges the relative size of the common effect and of vulnerabilities on stress in emerging economies. It depicts the estimated contributions, distinguishing between periods of calm in advanced economies and periods of widespread financial stress (1998, 2000, 2002, 2008).[44] During high-stress periods, the largest single factor driving stress increases in emerging economies is the financial stress impulse in advanced economies. Global factors have a mitigating effect—mainly through offsetting commodity price changes—but their impact is relatively modest. The effect of improving current account and fiscal balances prior to such high-stress events in advanced economies is comparatively small.[45]

In contrast, during calm times in advanced economies, improvements in current account and fiscal balances and reserve accumulation all lower stress levels. Together, they explain a substantial share (about 60 percent) of the decline in average emerging economy stress during the calm periods. In sum, the identified country vulnerability indicators matter, but their impact is small when advanced economies are in stress.

Figure 4.13. Explaining Financial Stress in Emerging Economies

The combined contributions from improvements in current account and fiscal balances and from higher reserves explain a large share of the decline in financial stress during calm periods in advanced economies. In contrast, during periods of high stress in advanced economies such efforts cannot offset stress transmission.
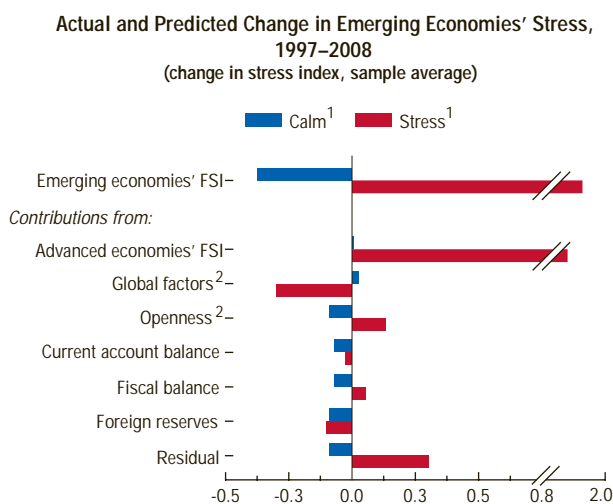
Actual and Predicted Change in Emerging Economies' Stress, 1997–2008
(change in stress index, sample average)

Legend: ■ Calm[1]   ■ Stress[1]

Categories (top to bottom):
- Emerging economies' FSI
- Contributions from:
- Advanced economies' FSI
- Global factors[2]
- Openness[2]
- Current account balance
- Fiscal balance
- Foreign reserves
- Residual

Axis: -0.5, -0.3, 0.0, 0.3, 0.5, 0.8, 2.0

Sources: Bank for International Settlements; IMF, *Balance of Payments Statistics;* and IMF staff calculations.
Note: FSI = Financial Stress Index.
[1] Stress years are 1998, 2000, 2002, and 2008; calm periods are all others. See Table 4.1.
[2] Based on Table 4.3, last column; global factors include three-month London interbank offered rate, global output growth, and change in commodities terms of trade. "Openness" combines financial and trade factors.

[42]The effects of these variables do not differ for the last period and do not affect the size of the transmission rate.

[43]Other variables were included but had no significant effect, including exchange rate regime, country governance, democratic institutions, and per capita income levels.

[44]The estimated contributions of explanatory variables to emerging economy financial stress are computed by multiplying annual changes of each explanatory variable by the estimated coefficient from the econometric model, based on column 7 in Table 4.3.

[45]Gonzalez-Hermosillo (2008) finds similarly that, during periods of stress, bond spreads in advanced and developing economies are driven by global market risk factors, whereas idiosyncratic factors matter during more calm periods.

Lessons from Previous Advanced Economy Banking Crises

The current crisis has involved systemic banking crises in many of the advanced economies. Yet, as noted at the beginning of this section, the sample period for the econometric analysis (1997–2008) provides limited coverage of systemic banking crises in advanced economies. Consequently, to complement the econometric analysis, this subsection studies the impact of two well-known banking crises in advanced economies.

With increasing banking globalization (in terms of cross-border flows and penetration of foreign bank subsidiaries and affiliates), a banking crisis in advanced economies could lead to significant common-lender effects and a marked reduction in capital flows. Yet few crises in the past decade have involved advanced economies that are also big lenders to emerging economies. For instance, the Scandinavian banking crisis of the early 1990s is considered to be systemic, but Scandinavian banks were not big players in emerging economies. This section presents case studies of two crises in which stressed banks in advanced economies were heavily involved in lending to emerging economies: the Latin American debt crisis of the 1980s and the Japanese banking crisis of the 1990s.

Latin American Debt Crisis

Many commentators associate the Latin American debt crisis with severe banking stress in the United States. It is true that many of the largest U.S. and European banks were heavily exposed to Latin America via syndicated loans to sovereign borrowers. By the end of 1978, such loans accounted for more than twice the capital and reserves of the major U.S. banks. However, the initial trigger of defaults in emerging economies was not a large-scale withdrawal by U.S. banks, but rather a combination of sharply rising U.S. interest rates and collapsing oil prices (Kaminsky, Reinhart, and Végh, 2004).[46]

Nonetheless, given their exposure to Latin America, the debt crisis hit large U.S. banks hard and led them to reduce lending to the region. Even after concerted rescheduling of debt, loans outstanding to the region decreased by more than 20 percent from 1983 to 1989. Lending to the region from other advanced economy banks also fell (Figure 4.14, top and middle panels).[47] Perhaps unsurprisingly, in relative terms, U.S. banks significantly retrenched from all emerging economies during the second half of the 1980s (bottom panel).

Although the protracted decline in bank lending is linked to stress in U.S. banks, it is not clear how applicable this episode is to the current crisis. In particular, in the Latin American debt crisis the trigger was default by the emerging economy borrowers, whereas the trigger for the current crisis is advanced economy lenders' losses, which have caused these lenders to deleverage and withdraw credit from emerging economies. Moreover, a systemic banking crisis was avoided in the United States in the 1980s—as opposed to currently—in part as a result of regulatory forbearance granted to the largest banks.

[46]In the 1970s, the largest U.S. banks expanded into Latin America in a search for yield, as structural changes (such as the expansion of the commercial paper market) reduced margins on domestic operations. Mexico was the first to default, in August 1982, and over the next few years 16 other Latin American countries rescheduled their debts to U.S. banks. The U.S. savings and loan crisis happened at about the same time, but it was not directly related to the Latin American debt crisis.

[47]Consolidated banking data (Figure 4.14, top panel) that combine liabilities of foreign affiliates with those of the headquarters (netting out interoffice lending) go back only to 1983 and show that lending from the United States to emerging economies in Latin America declined during the 1980s in line with bank lending to other countries. The longer series of bank liabilities using locational data (which includes interoffice lending but excludes claims of foreign affiliates) shows a more pronounced withdrawal by U.S. banks, right after the Latin American debt crisis erupted.

Figure 4.14. Impact of the Latin American Debt Crisis on Banking Liabilities[1]
(Percent of destination region's GDP)

The Latin American debt crisis of the early 1980s had a major impact on the largest U.S. banks, which withdrew from Latin America and emerging economies more generally.
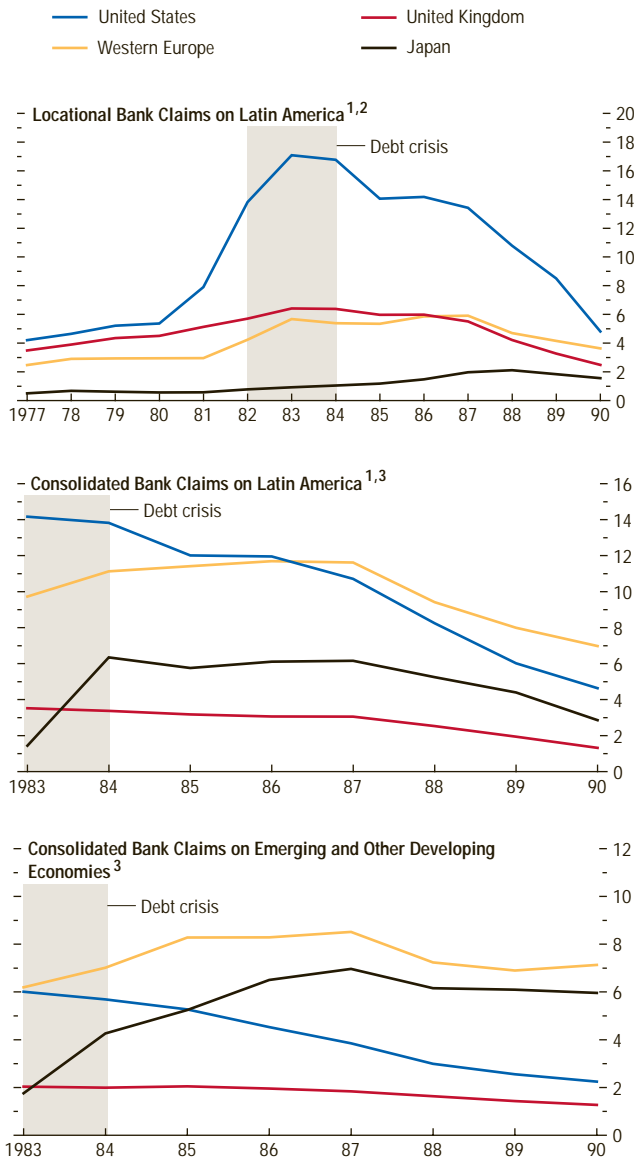
United States
Western Europe
United Kingdom
Japan

Locational Bank Claims on Latin America[1,2]

Debt crisis

Consolidated Bank Claims on Latin America[1,3]

Debt crisis

Consolidated Bank Claims on Emerging and Other Developing Economies[3]

Debt crisis

Sources: Bank for International Settlements (BIS); and IMF staff calculations.
[1]Includes Argentina, Brazil, Chile, Mexico, and Venezuela.
[2]BIS-reported locational claims comprising cross-border claims of resident banks.
[3]BIS-reported consolidated bank claims include claims of all branches and subsidiaries in foreign countries.

Japanese Banking Crisis

Japan undoubtedly suffered a systemic banking crisis during the 1990s, resulting from collapses in stock and commercial real estate markets and rising corporate stress. At the time, Japanese banks were big players in emerging economies, especially in Asia.

Banking claims on offshore Asia (Hong Kong SAR and Singapore) started declining in the early 1990s, and the decline accelerated after 1994 (Figure 4.15). However, for east Asia, where Japanese banks were particularly exposed to Thailand and Indonesia, claims continued to rise until 1997, when the Asian crisis erupted. During the next two years, as a deteriorating Japanese economy exerted more pressure on its banking system, Japanese banks cut back on their exposure to east Asia, and even today claims remain significantly below the peak of a decade ago.[48] Reflecting the weakness of the Japanese banking sector, nominal claims to east Asia fell about the same time domestic lending in Japan started to decline, although the former fell by more relative to the peaks (claims on east Asia fell by about two-thirds and domestic claims fell by about one-quarter).[49]

The degree of retrenchment is even more striking when the claims of Japanese banks are compared with those from other advanced economy banks. This clearly shows that the Japanese withdrawal was not part of a general pullout from east Asia, given that all other regions continued to maintain claims significantly above those levels at the time of the Asian crisis.

Interpreting these trends, Japanese banks at first pulled out of low-margin wholesale markets in the United States and offshore Asia, when their cost of funding spiked (the London interbank offered rate, LIBOR, spread shot up) and they came under pressure to improve their capi-

[48]Although these results are in terms of destination country GDP, they also largely hold in dollar terms and if normalized by Japan's GDP.

[49]In fact, Peek and Rosengren (1997 and 2000) show that Japanese banks transmitted the shocks that hit their own capital bases even to the U.S. real estate market through their U.S. branches.

tal ratios. At this time, Japanese banks switched to higher-margin markets in Asia, where lending relationships were more important and the presence of Japanese firms was pervasive. However, the Asian crisis, a weakening domestic economy, and heightened pressure to increase capital ratios led to a reversal of this strategy.[50] What followed was a massive and protracted decline in lending to east Asia, which only began to reverse partially following the economic recovery in Japan in 2002.

The drawn-out impact of the Japanese banking crisis underlines the importance of *common-lender* effects, which have grown even larger in recent years. For example, for emerging Europe, Aydin (2008) demonstrates that interbank market conditions in western Europe have had an impact on bank lending in central and eastern Europe. Similarly, for U.S. banks, Cetorelli and Goldberg (2008) find that foreign offices of U.S. banks have less access to their parent banks' balance sheets in times of tighter liquidity conditions in the United States.[51] Clearly, foreign bank ownership can increase financial fragility, but it can also be a stabilizing force when emerging economies experience stress—provided conditions in the parent banks' home countries are calm (Box 4.1).

Implications for the Current Crisis

What Have We Learned?

In the past, advanced economy crises have been transmitted to emerging economies rapidly and with a high pass-through. In line with this pattern, the unprecedented spike in financial stress in advanced economies in the third quarter of 2008 had a major effect on emerging

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[50]Laeven and Valencia (2008) argue that the Japanese crisis became systemic only in November 1997.

[51]For example, their calculations show that internal borrowing by U.S. banks from foreign offices doubled from the average before the current crisis (that is, before summer 2007) and financed more than 20 percent of domestic asset growth of U.S. banks during the second half of 2007.

Figure 4.15. Impact of the Japanese Banking Crisis on Bank Lending[1]
(Percent of destination region's GDP, unless otherwise indicated)

There was a large and protracted retrenchment from east Asia by Japanese banks in the 1990s. However, this took place only after the Asian crisis and when banking woes became so severe that Japan entered a systemic banking crisis.
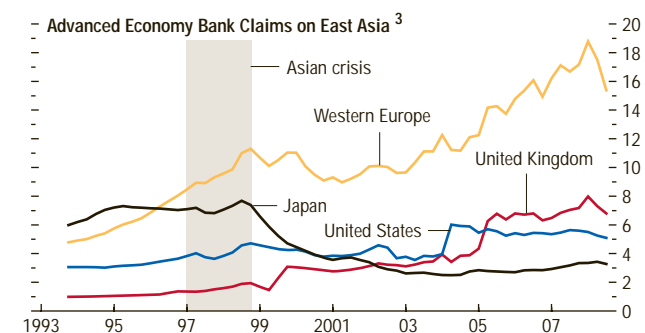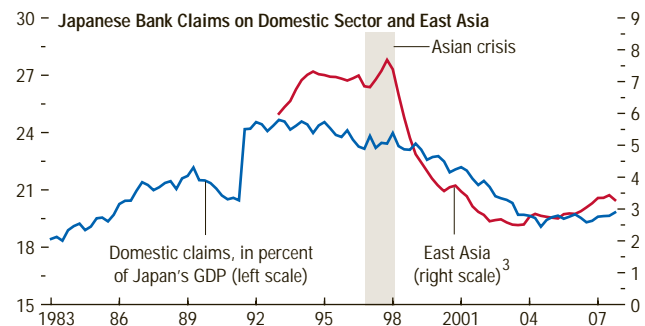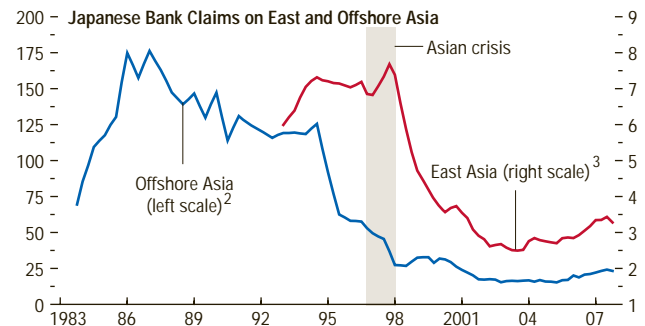
Sources: Bank for International Settlements (BIS); and IMF staff calculations.
[1]BIS-reported consolidated bank claims include claims of all branches and subsidiaries in foreign countries.
[2]Offshore Asia includes Hong Kong SAR and Singapore.
[3]East Asia includes Indonesia, Korea, Malaysia, Philippines, Taiwan POC, and Thailand.

Box 4.1. Impact of Foreign Bank Ownership during Home-Grown Crises

Banking globalization has increased in recent years, in terms of both cross-border flows and penetration of foreign bank subsidiaries and affiliates. Indeed, foreign entry has generally been pervasive across all regions, particularly in emerging Europe, where more than 70 percent of banks are now foreign owned. This could have a marked effect on capital flows from advanced to emerging economies.

On the negative side, foreign banks have sometimes pulled out and been associated with financial fragility, as evidenced during the Argentine crisis. At that time, Citibank sold its subsidiary (Bansud), and Credit Agricole chose not to bring in new capital, allowing the government to take over its subsidiaries Bersa, Bisel, and Suquia. Similarly, stress in parent banks' financial systems can also impair the stabilizing effects of foreign bank ownership, as shown by the recent example of Hungary's OTP in its Ukrainian subsidiaries.

However, there is also some evidence that foreign entry can help stabilize emerging economies' financial systems during home-grown crises. For example, Demirgüç-Kunt, Levine,

The main author of this box is Ravi Balakrishnan.

and Min (1998) use cross-country regressions to demonstrate that foreign bank entry reduces the probability of crises in emerging markets. However, the estimates do not appear to fully control for endogeneity—in particular, the decision not to enter a foreign market can be influenced by anticipation of crisis, not only by its realization. Detragiache and Gupta (2004) show that in Malaysia during the Asian crisis, non-Asian foreign banks performed better in terms of profitability and loan quality than domestic banks or foreign banks operating mainly in Asia.

Why might foreign banks perform better in periods of generalized distress in emerging economies? First, they might be more profitable, efficient, and well capitalized, and thus better able to deal with a major shock. Second, subsidiaries of large global groups might find it easier to raise capital or liquid funds on international financial markets, by virtue of informational advantages or reputation. Third, even if external financing dries up because of increasing risk aversion, foreign bank subsidiaries might still have access to financial support from their parent bank, particularly if the latter is well diversified and only marginally affected by the difficulties in the host country.

economies. In the fourth quarter, financial stress was elevated in all emerging regions and, on average, exceeded levels seen during the Asian crisis.

Financial links appear to be a main conduit of transmission: emerging economies with higher foreign liabilities to advanced economies have been more affected by financial stress in advanced economies than emerging economies that are less linked. In the most recent period, bank lending ties have been a major channel of transmission, with western European banks the main source of stress.

In the past, emerging economies were able to obtain some protection against financial stress from lower current account and fiscal deficits during calm periods in advanced economies.

However, during periods of widespread financial stress in advanced economies, these conditions did not prevent its transmission. Lower deficits may, however, limit the *real* implications of financial stress (for example, by using reserves to buffer the effects from a drop in capital inflows) and the duration of the crisis,[52] links that were not studied in this chapter. Moreover, lower current account and fiscal deficits also matter once financial stress in advanced economies recedes, because they help reestablish financial stability and foreign capital inflows.

[52]Mecagni and others (2007) show that improvements in precrisis conditions can reduce the duration of capital account crises.

What Are the Implications for the Current Crisis?

The current crisis in advanced economies is unique in its depth, breadth, and impact on all segments of advanced economy financial systems. Compared with stress episodes in the past decade, banking stress is a prominent feature and has spread from the United States to western Europe and from there to other financial centers and emerging economies. Although the crisis is still unfolding, some conclusions can be drawn:

- Emerging economies that have large bank lending exposures are most likely to experience stress. Moreover, the degree of current account and fiscal deficits will likely determine how quickly economies can reestablish financial stability, once stress in advanced economies recedes. Figure 4.16 maps where emerging economies lie along these two dimensions. The area in the lower right depicts countries (emerging Europe is prominent) with both high bank lending exposure and high twin deficits.
- Banking flows to emerging economies are likely to take a severe hit, as evidenced by the experience of south Asian economies during the Japanese banking crisis in the 1990s. Since then, banking globalization has continued, and risks associated with the common-lender effect have risen. Thus, systemic banking crises in advanced economies and their lengthy resolution are likely to presage a protracted decline in banking flows to emerging economies—especially in emerging Europe.

Which Policies Can Help?

Because it is too late to prevent the transmission of this crisis, policies should focus on limiting the risk of further escalation of financial stress through second-round effects. The rapid deleveraging of financial institutions in advanced economies and the rapidly deteriorating global economic outlook have imposed tight liquidity constraints in emerging economies. Some of these economies have benefited in dealing with these shocks from their recent strong

Figure 4.16. Exposure to Bank Lending Liabilities and Twin Deficits in Emerging Economies, 2002–06
(Percent of GDP)

Emerging Europe appears currently most at risk of experiencing stress, since these countries have high bank liabilities. These countries also have large fiscal and current account deficits, which limit their ability to soften the implications of financial stress on the real economy.
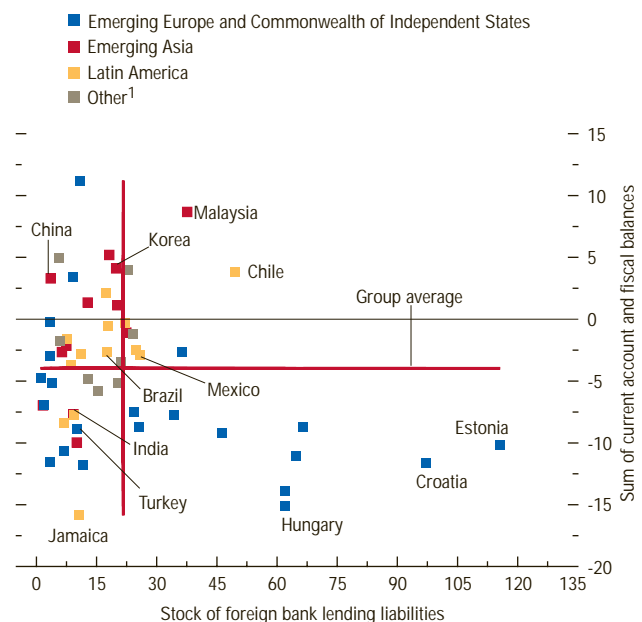
Sources: Bank for International Settlements; IMF, *Balance of Payments Statistics;* and IMF staff calculations.
[1]Includes Middle East and Africa.

growth performance and relatively large policy buffers. But many economies have suffered severe strain, as discussed in Chapters 1 and 2.

As the crises in advanced economies continue to deepen, and trade and capital flows decline further, exchange rates and financial systems in emerging economies could come under more severe pressure. In turn, a broad-based economic and financial collapse in emerging economies would have a significant negative impact on the portfolios of advanced economies. This could further exacerbate financial deleveraging in mature markets (especially in economies with large exposures, such as Austria and Belgium) and lead to further stress transmission, capital outflows, and economic slumps.

In light of such cross-country spillovers, there is a strong case for a coordinated approach to a range of policies, which is discussed in more detail in Chapter 1. Advanced economies should recognize the adverse feedback that will come from second-round effects caused by the decline of capital flows to emerging economies. By stabilizing domestic financial systems, advanced economies can help reduce stress in emerging economies. Support for advanced economy banks, notably those with a large presence in emerging economies, should help, provided it does not come with conditions that discourage foreign lending. More generally, enhanced coordination and collaboration between home- and host-country financial supervisors will be crucial for avoiding adverse cross-border spillovers from domestic actions.

Moreover, as the financial crisis plays out, there is a need to strengthen official support for emerging economies' access to external funding in order to limit adverse feedback loops caused by second-round effects. Examples include the swap lines opened with various emerging economies by the U.S. Federal Reserve and the European Central Bank, the extension of the Chiang Mai initiative, and the increase in available resources of the IMF and other multilateral institutions.

Consistent with these efforts, emerging economies need to protect their financial systems and follow prudent macroeconomic policies that provide countercyclical support to the extent possible, but they must also uphold confidence in the sustainability of their policies. For many affected countries in emerging Europe, membership in the European Union and the anchoring role of planned euro adoption have offered some stability. But, as discussed in Chapter 2, such policies need to be complemented by plans for mutual assistance to enhance a fast and targeted response to any new emerging crises.

More broadly, growing financial integration is an essential part of a prospering world economy. However, as international financial linkages increase, they also raise the likelihood of the transmission of financial stress. It is therefore desirable to offer enhanced multilateral insurance against external crises to well-governed countries that are opening their economies to the rest of the world (see IMF, 2009).

Appendix 4.1. A Financial Stress Index for Emerging Economies

The main author of this appendix is Selim Elekdag.

This appendix describes the components and the methodology used to construct the financial stress index for emerging economies (EM-FSI). The EM-FSI is composed of four market-based price indicators and an exchange market pressure index (EMPI). Each component is demeaned, scaled by the inverse of its standard deviation, and then added together to yield the index. This equal-variance-weighted combination has the advantage that large fluctuations in one component do not dominate the overall index. The additive feature also allows for a straightforward decomposition into contributions by subindex. Dates of peaks and troughs of the index are robust to other weighting schemes, including, for example, those based on principal components analysis.

The five components of the EM-FSI are the EMPI, sovereign spreads, the "banking sector beta," denoted with β, stock returns, and time-varying stock return volatility, which can be combined as follows:

$$EMFSI = EMPI + Sovereign\ Spreads + \beta$$
$$+\ stock\ returns + stock\ volatility.$$

Further details on the five components are listed below:

The EMPI for country *i* for month *t* is calculated as follows:

$$EMPI_{i,t} = \frac{(\Delta e_{i,t} - \mu_{\Delta e})}{\sigma_{\Delta e}} - \frac{(\Delta RES_{i,t} - \mu_{\Delta RES})}{\sigma_{\Delta RES}}\ ,$$

where Δe and ΔRES denote the month-over-month percent changes in the exchange rate and total reserves minus gold, respectively. The exchange rate is vis-à-vis an anchor country, as discussed in Levy-Yeyati and Sturzenegger (2005). The symbols μ and σ denote the mean and the standard deviation, respectively, of the relevant series; in other words, each component of the EMPI is standardized. A further refinement allows the index to accommodate episodes of hyperinflation, defined as annual inflation exceeding 150 percent. In such cases, the mean and standard deviations were computed for episodes with and without the prevalence of hyperinflation.

Sovereign spreads are calculated using JPMorgan EMBI Global spreads and defined as the bond yield minus the 10-year U.S. Treasury yield. When EMBI data were not available, five-year credit default swap spreads were used.

The banking sector beta is the standard capital asset pricing model (CAPM) beta, and is denoted with β, defined as follows:

$$\beta_t = \frac{COV(r_t^M, r_t^B)}{\sigma_M^2},$$

where *r* represents the year-over-year banking or market returns, computed over a 12-month rolling window. In line with CAPM, a beta greater than 1—indicating that banking stocks move more than proportionately with the overall stock market—suggests that the banking sector is relatively risky, and would be associated with a higher likelihood of a banking crisis. A further refinement of this measure was to record a value only when banking returns were lower than overall market returns, in an effort to better capture banking-related financial stress.

Stock returns are the month-over-month change in the stock index multiplied by –1, so that a decline in equity prices corresponds to increased securities-market-related stress.

The final component is the time-varying stock return volatility derived from a GARCH(1,1) specification, using month-over-month real returns modeled as an autoregressive process with 12 lags. Increased volatility captures heightened uncertainty and thus increased financial stress.

The EM-FSI is constructed for 26 countries spanning the January 1997 to December 2008 period; these countries are Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, Slovak Republic, Slovenia, South Africa, Sri Lanka, Thailand, and Turkey. However, because the series is too short for some, only 18 countries (listed in the text) are used in the econometric analysis.

In addition to capturing the most important episodes of financial stress experienced by emerging economies, the EM-FSI also performs well when contrasted to previous academic studies. Specifically, the subcomponents of the EM-FSI accurately indicate the type of crisis they were intended to signal.[53] For example, the EMPI component (which is available from 1980 onward and is available for many more countries) captures more than 80 percent of the currency crises noted in the literature. Recalling that the EM-FSI starts in end-1996, in line with

[53]Following the literature, an episode of financial stress is identified as a period when the index for a country exceeds 1.5 standard deviations above its mean. The main papers surveyed are Chamon, Manasse, and Prati (2007); Calvo, Izquierdo, and Mejía (2008); Rothenberg and Warnock (2006); Kaminsky and Reinhart (1999); Edison (2003); Reinhart and Reinhart (2008); Eichengreen and Bordo (2002); Demirgüç-Kunt, Detragiache, and Gupta (2006); Laeven and Valencia (2008); Honohan and Laeven (2005); and Reinhart and Rogoff (2008, 2009).

expectations, the sovereign spread component of the index signals correctly all debt-related crises (Argentina 2002, 2005; Korea 1998; Mexico 1995; Russia 1998). Last, the securities-market-related component (based on the banking sector beta, stock returns, and volatility) flags eight of the nine post-1996 banking-related crises determined by the studies surveyed.

Appendix 4.2. Financial Stress in Emerging Economies: Econometric Analysis

The main authors of this appendix are Stephan Danninger and Irina Tytell.

The econometric findings discussed in the chapter are based on three complementary exercises:
- an estimation of a common time-varying component in the EM-FSI and its relationship to the AE-FSI and other global factors;
- an analysis of comovement in financial stress between emerging and advanced economies in a panel data set based on monthly data; and
- an analysis of determinants of financial stress in emerging economies in a panel data set based on annual data.

Analysis of the Common Time-Varying Component in EM-FSI

The first exercise explores in a more rigorous way the degree of comovement of financial stress across emerging economies displayed in Figure 4.5. In the first step of this exercise, the monthly panel is regressed on country and time-fixed effects, where $Month_t$ denotes a dummy variable for month t in the data set.

$$EMFSI_{it} = \alpha_i + \sum_t \rho^t Month_t + \varepsilon_{it}.$$

The obtained coefficient time series $\{\rho^t\}$ measures the common time-varying element in emerging economy stress. This component has significant explanatory power and explains 50 percent of the overall variation in EM-FSI.

Figure 4.17. Emerging Economy Stress: Common Time Component and Stress in Advanced Economies
(Level of index)

Source: IMF staff calculations.

A visual comparison of the $\{\rho^t\}$ time series and the aggregate stress index for advanced economies (AE-FSI) shows a strong degree of comovement (Figure 4.17). In a second step, this relationship is explored in more depth by estimating the following model:

$$\rho^t = \alpha + \beta AEFSI_t + \sum_g \gamma^g GF_t^g + \varepsilon_t.$$

The model relates the common time component, ρ^t, to the stress index in advanced economies and to global factors. The latter include year-over-year changes in world industrial production and aggregate commodity prices and the three-month London interbank offered rate (LIBOR). Table 4.4 summarizes the results. The most important explanatory variable of the common time-varying component, ρ^t, is stress in advanced economies (explaining 42 percent of the variation in ρ^t). Global factors also matter, but they have comparatively less explanatory power. In sum, the model has a good statistical fit, with a total R^2 of 0.57, suggesting that stress in advanced economies plays an important role in predicting stress in emerging economies.

Analysis of Comovement in Financial Stress

The second exercise builds on the two-step approach laid out by Forbes and Chinn (2004). In the first step, the financial stress index for each emerging economy i (EM-FSI) is modeled as a function of the financial stress index for advanced economies (AE-FSI), a number of global factors (GF), and a country-specific constant:

$$EMFSI_{it} = \alpha_i + \sum_c \beta_i^c AEFSI_t^c + \sum_g \gamma_i^g GF_t^g + \varepsilon_{it}.$$

The global factors include the same variables as outlined above. Depending on the specification, AE-FSI is either (1) an aggregate of 17 major advanced economies or (2) three separate aggregates for the United States and Canada, western Europe, and Japan and Australia, and uses purchasing-power-parity GDP weights in both cases. The coefficient of interest in this model is β_i —parameters of comovement in financial stress between emerging and advanced economies.

Table 4.4. Emerging Economy Stress: Determinants of Common Time Trend[1]

Financial stress (advanced economies)	0.49***	0.47***
	(0.04)	(0.05)
Industrial production growth (advanced economies)		–0.05
		(0.08)
Commodity price growth		–0.03***
		(0.01)
LIBOR (three-month)		0.06
		(0.08)
Constant	–0.11	0.18
	(0.11)	(0.28)
Observations	156	131
R^2	0.45	0.57

Source: IMF staff calculations.
[1]Robust standard errors in parentheses; ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively. Common time trend is obtained from time-fixed coefficients of a monthly panel model of emerging economy stress during 1997–2008.

Because comovement parameters vary over time, especially between periods of financial stress and periods of financial tranquility, β_i is allowed to differ across periods. There are two episodes of financial stress in advanced economies that fall within the estimation sample, identified as periods during which at least some advanced economies were almost always in high stress. The first episode runs from July 1998 to June 2003 and includes the Long-Term Capital Management collapse, the dot-com crash, and the collapses of WorldCom, Enron, and Arthur Andersen. The second episode runs from July 2007 onward and spans the current financial turmoil.[54] To allow β_i to vary between these two episodes, the model is modified as follows:

$$EMFSI_{it} = \alpha_i + \sum_c (\beta_i^c AEFSI_t^c + \beta_{1i}^c D_1 AEFSI_t^c$$
$$+ \beta_{2i}^c D_2 AEFSI_t^c) + \sum_g \gamma_i^g GF_t^g + \varepsilon_{it}.$$

[54]The Asian crisis of 1997–98 also falls within the sample. However, because it was not associated with financial stress in advanced economies, comovement parameters specific to this episode are not of particular interest for this analysis. Instead, to allow higher levels of financial stress in emerging economies during this period, a dummy variable for the period January 1997 to June 1998 is included in the model.

Here, D_1 and D_2 denote dummy variables for the two stress episodes. Accordingly, comovement parameters for these episodes can be computed as $\beta_i^c + \beta_{1i}^c$ and $\beta_i^c + \beta_{2i}^c$, respectively.

Transmission of financial stress may not be instantaneous, and so lags of all the variables are included in the model in addition to contemporaneous values. Standard lag-length criteria recommend one or two lags for the model, indicating rapid transmission. Following the Schwartz information criterion, the model is augmented with one lag, as follows:

$$EMFSI_{it} = \alpha_i + \sum_c \sum_{l=0,1} (\beta_i^{cl} AEFSI_{t-1}^c + \beta_{1i}^{cl} D_1 AEFSI_{t-1}^c$$
$$+ \beta_{2i}^{cl} D_2 AEFSI_{t-1}^c) + \sum_g \sum_{l=0,1} \gamma_i^{gl} GF_{t-1}^g$$
$$+ \lambda_i EMFSI_{it-1} + \varepsilon_{it}.$$

The overall comovement effect on emerging economy stress after one month is the parameter of primary interest. Its computation must account for the lag structure of the model. In particular, the overall transmission of advanced economy stress is the sum of a *direct* effect (concurrent and lagged) plus an *indirect* effect via lagged emerging economy stress (via λ_i). For the full sample period, this combined transmission effect after one lag can be computed as $\beta_{ji}^c = \beta_i^{c0} + \beta_i^{c1} + \beta_i^{c0} \lambda_i$. It is $\beta_{1i}^c = (\beta_i^{c0} + \beta_{1i}^{c0}) + (\beta_i^{c1} + \beta_{1i}^{c1}) + (\beta_i^{c0} + \beta_{1i}^{c0}) \lambda_i$ for the first stress episode and $\beta_{1i}^c = (\beta_i^{c0} + \beta_{2i}^{c0}) + (\beta_i^{c1} + \beta_{2i}^{c1}) + (\beta_i^{c0} + \beta_{1i}^{c0}) \lambda_i$ for the second stress episode.

This dynamic specification of the model is estimated separately for each of the 18 countries for which EM-FSI is available from January 1997 through November 2008, using monthly data. The countries are Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, the Philippines, Poland, South Africa, Thailand, and Turkey. For some countries, the EM-FSI series is shorter, including China (ending in April 2008), Colombia (starting in March 1997), Peru (starting in April 1997), Thailand (starting in June 1997), Korea and the Philippines (starting in December 1997), Hungary (starting in January 1999), Chile (starting in May 1999), Pakistan (starting in July 2001), and Egypt (starting in

August 2001).[55] The model fits the data well for all countries, with R^2 between 0.5 and 0.8. The estimated comovement parameters are highlighted in Figure 4.11.

In the second step, comovement parameters are modeled as a function of trade (TL) and financial (FL) linkages between emerging economies and advanced regions, other relevant factors (X), and country-specific fixed effects:

$$\beta_i^c = \alpha_i + \sum_k \alpha_k FL_{ik}^c + \sum_l \alpha_l TL_{il}^c + \sum_m \alpha_m X_{im}^f + \varepsilon_{ic}.$$

This model is estimated on a two-dimensional data set of 16 emerging economies and three advanced regions (United States and Canada, western Europe, and Japan and Australia).[56]

FLs include bank lending, portfolio investment, and direct investment. For each emerging economy, they are measured as total liabilities to each of the advanced regions (and total assets in these regions in the case of portfolio holdings) relative to GDP. The data sources are Consolidated Banking Statistics of the Bank for International Settlements, Coordinated Portfolio Investment Survey of the IMF, and International Direct Investment Statistics of the Organization for Economic Cooperation and Development. The definitions of advanced regions vary for each of these three linkages owing to differences in the data available for the period of interest. The advanced economies used in this chapter comprise Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and United States. Bank linkages exclude Australia, Denmark, and Norway. Portfolio linkages exclude Finland and also exclude Germany and Switzerland prior to 2001 (these countries did not participate in the survey of 1997, although they reported for the annual surveys that began

[55]For Pakistan and Egypt, the comovement parameters during the first stress episode could not be estimated.

[56]Because the comovement parameters during the first stress episode could not be estimated for Pakistan and Egypt, these two countries are excluded from the second-stage estimations.

in 2001). Direct investment linkages exclude Belgium, Spain, and Sweden.[57,58]

The TL is measured as total exports to each of the advanced regions (as reported by advanced economies) relative to the GDP of each emerging economy. The data source for this linkage is the IMF's *Direction of Trade Statistics.* Other relevant factors (X) include trade and financial openness, respectively measured as exports plus imports divided by GDP and foreign assets plus foreign liabilities divided by GDP. These data are obtained from the IMF's World Economic Outlook database and External Wealth of Nations Database (see Lane and Milesi-Ferretti, 2006). In addition, some specifications include dummy variables for the United States and Canada and for western Europe.

The model is estimated separately for the two episodes of financial stress in advanced economies, using averages of the right-hand-side variables over the relevant periods. The main results are shown in Table 4.2.

While linkages appear to play an important role in crisis transmission, further testing showed that country-specific vulnerabilities (such as current account or fiscal deficits) are not an essential part of the transmission mechanism (that is, they are not associated with the β_js).[59]

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[57]In addition, the composition of advanced regions varies somewhat, owing to differences in reporting by specific countries. It should also be noted that missing values in measured linkages are interpolated (notably in the case of portfolio linkages between the surveys of 1997 and 2001). More information about these data sets can be found at www.bis.org/statistics/consstats.htm, www.imf.org/external/np/sta/pi/datarsl.htm, and www.oecd.org/document/19/0,3343,en_2649_33763_37296339_1_1_1_1,00.html.

[58]Portfolio investment data were adjusted for the offshore center bias using an adjustment method based on the portfolio allocation of source countries (see Lane and Milesi-Ferretti, 2008). This adjustment is based on the assumption that the funds invested in an offshore center by a source country are invested by the offshore center in the same way as the funds invested abroad directly by the source country.

[59]One explanation is that large financial linkages, for example through bank lending, go hand in hand with heightened vulnerabilities such as chronic current

Analysis of Other Country-Specific Effects Using Annual Data

The third exercise aggregates the financial stress index into annual data and merges it with country-specific variables, which are available only at an annual frequency. The annual aggregation of the monthly stress data is performed in two steps. First, average quarterly stress levels are calculated. Then, the quarter with the largest stress level is selected for the annual index. An alternative specification using 12-month averages yielded similar results in terms of significance but implied a lower transmission (β).

As above, the EM-FSI is modeled as a function of the financial stress index for advanced economies (AE-FSI$_t$), global factors (GF$_t$), and country-specific variables (X$_{it}$). In addition, the model tests for the presence of interaction effects between stress in advanced economies and country-specific characteristics (AE-FSI$_t \times$ X$_{it}$). This latter term is included to assess whether the finding from the monthly model that country-specific vulnerabilities do not influence the transmission process is also borne out in the annual panel:

$$EMFSI_{it} = \alpha_i + \beta AEFSI_t + \delta X_{it} + \lambda AEFSI_t \times X_{it} + \gamma GF_t + \varepsilon_{it}.$$

The global factors include a similar set of variables as in the monthly panel model, namely the year-over-year changes in world real output, changes in the commodity terms of trade, and the three-month LIBOR.[60] In contrast to the monthly series, the transmission coefficients are fixed across countries and time periods, because annual data limit the precision for differentiating coefficients by individual countries, time periods, or investor regions. The coefficients of interest are β, the average comovement param-

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account deficits. Empirically, the size of financial linkages and current account deficits are positively correlated. Therefore, the observation that financial stress has spread first to more vulnerable economies is consistent with the finding that linkages drive the transmission of stress.

[60]The commodity terms of trade is the ratio of trade-weighted commodity export prices to trade-weighted commodity import prices (see Spatafora and Tytell, forthcoming).

Table 4.5. Emerging Economy Stress: Country-Specific Effects and Interactions with Stress in Advanced Economies[1]

	Financial Stress Index in Emerging Economies			
	(1)	(2)	(3)	(4)
Financial stress (advanced economies)	0.62***	0.63***	0.64***	0.65***
	(0.06)	(0.06)	(0.06)	(0.10)
LIBOR (three-month)	0.12	0.12	0.13	0.12
	(0.10)	(0.10)	(0.10)	(0.10)
Global growth	−0.55**	−0.55**	−0.56**	−0.55**
	(0.19)	(0.20)	(0.20)	(0.21)
Commodity terms of trade (growth)	−0.03	−0.03	−0.03	−0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Financial openness $(t–1)$[2]	0.02**	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Trade openness $(t–1)$[3]	−0.07*	−0.08**	−0.07**	−0.07*
	(0.04)	(0.04)	(0.03)	(0.04)
Current account $(t–1)$[4]	−0.13***	−0.12**	−0.14***	−0.13***
	(0.04)	(0.05)	(0.04)	(0.04)
Fiscal balance $(t–1)$[4]	−0.18*	−0.18*	−0.20**	−0.18*
	(0.09)	(0.09)	(0.09)	(0.09)
Foreign reserves $(t–1)$[5]	−0.09	−0.09	−0.09	−0.09
	(0.06)	(0.06)	(0.06)	(0.07)
Current account $(t–1)$[4] × financial stress (advanced economies)		−0.01		
		(0.01)		
Fiscal balance $(t–1)$[4] × financial stress (advanced economies)			0.01	
			(0.02)	
Foreign reserves $(t–1)$[5] × financial stress (advanced economies)				−0.00
				(0.00)
Constant	5.37***	5.54***	5.28**	5.38***
	(1.79)	(1.86)	(1.85)	(1.79)
Observations	210	210	210	210
R^2 (overall)	0.63	0.62	0.62	0.62
R^2 (between)	0.20	0.20	0.20	0.20
R^2 (within)	0.52	0.52	0.52	0.52
Countries	18	18	18	18

Source: IMF staff calculations.

[1]Robust standard errors in parentheses; ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively. All regressions include country-fixed effects.
[2]Foreign assets plus liabilities divided by GDP.
[3]Exports plus imports divided by GDP.
[4]In percent of GDP.
[5]Gross foreign reserves in percent of GDP.

eter; δ, the direct effect of country-specific variables on stress; and λ, the coefficient measuring indirect effects of these variables on the transmission of stress.

Table 4.5 summarizes the findings from the annual panel regressions. The average comovement parameter β is highly significant and ranges between 0.60 and 0.65, in line with the estimates of β uncovered by the monthly exercise. The final three models test whether transmission is influenced by country-specific vulnerabilities (current account, fiscal balance,

and reserve coverage) by including interaction effects. None of the interaction terms are significant, consistent with the result from the monthly exercise, which found that only linkages mattered for the transmission.

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IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, APRIL 2009

The following remarks by the Acting Chair were made at the conclusion of the Executive Board's discussion of the World Economic Outlook *on April 13, 2009.*

Executive Directors noted that the global economy is in the grip of a severe recession inflicted by a massive financial crisis and an acute loss of confidence. The world economic outlook has worsened significantly since the October 2008 *World Economic Outlook,* as a dramatic escalation of the financial crisis has provoked an unprecedented contraction in global economic activity and trade. Shrinking activity, synchronized across countries, has added to pressure on balance sheets of financial institutions as asset values have continued to decline, discouraging lending to households and corporations. The adverse feedback between economic activity and the financial sector has thus intensified. While wide-ranging and often unorthodox policy responses have helped to diminish the most dangerous systemic risks, financial market stabilization is taking considerably longer than previously envisaged. Moreover, the crisis, which originated in the advanced economies, has now spread to emerging market economies. Emerging and developing economies are expected to face greatly curtailed access to external financing.

Against this backdrop, the *World Economic Outlook* projects that world output will contract by about 1.3 percent in 2009, which would represent by far the deepest post–World War II recession. Growth is expected to reemerge in 2010 but to be sluggish relative to past recoveries. Inflation pressures are projected to subside, and some advanced economies are expected to experience periods of consumer price declines. The IMF staff assesses the current outlook to be exceptionally uncertain and subject to considerable downside risks. A number of Directors suggested that the recession could be more protracted, given the principal concern that policies may not succeed in arresting the adverse feedback between deteriorating financial conditions and weakening economies. A number of others, however, pointed to some tentative, encouraging signs in financial sector and real economy data, which could presage an earlier recovery. In light of these significant uncertainties and amid unprecedented circumstances, Directors underscored the need for balanced and nuanced assessments. Directors welcomed the efforts to closely integrate the conclusions of the *Global Financial Stability Report* and the *World Economic Outlook* analyses and stressed the need to reflect such integration in a coherent and consistent communication strategy for the public presentation of the documents.

Directors stressed that the grim and uncertain outlook calls for forceful action on the financial and macroeconomic policy fronts, with careful consideration of their cross-border implications. Directors also recognized that additional measures need to reflect varying country circumstances, the policies implemented to date, and medium-term policy objectives.

Directors agreed that the greatest policy priority at this juncture is financial sector restructuring, particularly to deal with distressed assets and to recapitalize weak but viable institutions. Directors welcomed the various initiatives announced in many advanced economies to address the serious difficulties in financial sectors. However, recognizing that market strains remain acute and that confidence is far from being restored, they stressed the need for firm policy implementation. An enduring solution

must be underpinned by credible loss recognition of impaired assets, supported with adequate funding and implemented in a transparent manner. Regarding recapitalization, Directors emphasized that efforts must be rooted in a careful evaluation of the long-term viability of institutions and that viable banks with insufficient capital should be recapitalized quickly. Nonviable financial institutions need to be resolved promptly through closures, mergers, or possibly a temporary period of public ownership until a private sector solution can be developed. Regarding financial sector policies in emerging economies, Directors were encouraged that some countries have taken steps to keep trade flowing and support credit to the corporate sector.

Turning to macroeconomic policies, Directors welcomed the concerted policy actions taken by many countries. They recommended that monetary policy needs to continue to respond to the deteriorating outlook. Although policy rates are already near the zero floor in many advanced economies, whatever policy room remains should be used quickly. At the same time, central bankers should underline their determination to avoid deflation by sustaining easy monetary conditions for as long as necessary. To this end, most Directors supported recourse to less conventional measures, including using the central bank's own balance sheet to support intermediation, especially in dislocated credit markets.

In view of the extent of the downturn and the limits to the effectiveness of monetary policy, Directors stressed that fiscal policy must continue to play a crucial part in providing short-term stimulus to the global economy. Considering that the room to provide fiscal support will be limited if credibility is eroded, Directors recognized that governments are facing a difficult balancing act of delivering short-term expansionary policies but also providing reassurance about medium-term prospects. However, this tension could be alleviated by focusing on temporary, high-impact stimulus measures that raise the economy's productive potential. Gov-

ernments should complement short-term initiatives with reforms to strengthen medium-term fiscal frameworks, particularly through credible actions to tackle the fiscal challenges posed by aging populations. Also, coordinated stimulus across countries with fiscal room will maximize benefits to the global economy. Accordingly, Directors welcomed the fact that many countries are contributing to fiscal expansion in 2009, and most Directors thought that continued fiscal support would be needed for 2010. Some Directors considered it premature to pursue further discretionary fiscal easing, pointing to uncertain fiscal policy lags and multipliers and the risk of such policies becoming procyclical once the recovery begins.

Directors expressed concern at the widening impact of the global financial crisis on emerging market economies, while recognizing the significant differences both across and within regions. Several Directors noted that many emerging markets are better positioned to weather the crisis than in earlier episodes of financial stress, owing to improved fundamentals and strengthened macroeconomic policy frameworks. Emerging European economies have, however, been hit hardest, reflecting some countries' large domestic and external imbalances. Directors also acknowledged that monetary policy actions to support activity may be complicated by the need to sustain external stability in the face of highly fragile financing flows in a number of emerging markets. To the extent that domestic central banks are unable to supply the needed foreign exchange, advanced economy central banks, the IMF, and other international agencies could play a useful role through their various credit lines and other facilities. Directors noted that the IMF is well equipped to support such efforts, including through the recent modernization of its lending toolkit, including the new Flexible Credit Line.

Looking further ahead, Directors observed that policymakers face important medium-term challenges. As financial regulation has proved ill equipped to address the risk concentrations and flawed incentives behind the financial innova-

tion boom, Directors generally agreed that the perimeter of regulation should be broadened to cover all systemically relevant institutions. Regarding macroeconomic policies, the significant ongoing expansion of central bank balance sheets and fiscal spending calls for careful consideration of exit strategies and orderly unwinding of outstanding positions as the situation improves. A number of Directors considered that central banks may need to adopt a broader macroprudential view, paying due attention to financial stability as well as price stability. Fiscal policymakers will need to bring down deficits and put public debt on a sustainable trajectory. Another challenge will be to sustain productivity growth as economies recover, which will depend on continued product and labor market reforms and integration into global markets. Low-income countries should undertake structural reforms to diversify sources of growth and improve resilience to economic shocks. Considering the weaker prospects for exports, Directors also noted that stronger consumption growth in east Asia could play a useful role in supporting output growth. Some Directors considered that this could be facilitated by more flexible exchange rate management. This, together with actions in advanced economies to rebuild effective financial intermediation and to strengthen saving in

deficit countries, should foster a successful rebalancing of the global economy. Careful attention to the size and composition of spending will be important, especially given the uncertainties regarding the pace of a return of output to trend as the recovery begins.

Directors agreed that international policy coordination and collaboration need to be strengthened. Cooperation is particularly pressing for financial policies, because of the major spillovers that domestic actions can have on other countries. The specific design of policies would appropriately vary from country to country, but policymakers should avoid policies—such as favoring domestic over foreign lending—that could lead to distortions. More generally, trade and financial protectionist pressures should be resisted. The G20 member countries' agreed moratorium over the next 12 months on introducing any new trade barriers is welcome. The stark collapse in world trade in the present crisis only heightens the importance of a rapid completion of the Doha Round to help open up markets and revitalize global growth prospects. Finally, strong support from bilateral and multilateral sources, including the IMF, could help limit the adverse economic and social fallout of the financial crisis in many emerging and developing economies.

STATISTICAL APPENDIX

The Statistical Appendix presents historical data, as well as projections. It comprises five sections: Assumptions, What's New, Data and Conventions, Classification of Countries, and Statistical Tables.

The assumptions underlying the estimates and projections for 2009–10 and the medium-term scenario for 2011–14 are summarized in the first section. The second section presents a brief description of changes to the database and statistical tables. The third section provides a general description of the data and of the conventions used for calculating country group composites. The classification of countries in the various groups presented in the *World Economic Outlook* is summarized in the fourth section.

The last, and main, section comprises the statistical tables. Data in these tables have been compiled on the basis of information available through mid-April 2009. The figures for 2009 and beyond are shown with the same degree of precision as the historical figures solely for convenience; because they are projections, the same degree of accuracy is not to be inferred.

Assumptions

Real effective *exchange rates* for the advanced economies are assumed to remain constant at their average levels during the period February 25–March 25, 2009. For 2009 and 2010, these assumptions imply average U.S. dollar/SDR conversion rates of 1.484 and 1.470, U.S. dollar/euro conversion rates of 1.310 and 1.306, and yen/U.S. dollar conversion rates of 96.3 and 101.5, respectively.

It is assumed that the *price of oil* will average $52.00 a barrel in 2009 and $62.50 a barrel in 2010.

Established *policies* of national authorities are assumed to be maintained. The more specific policy assumptions underlying the projections for selected advanced economies are described in Box A1.

With regard to *interest rates*, it is assumed that the London interbank offered rate (LIBOR) on six-month U.S. dollar deposits will average 1.5 percent in 2009 and 1.4 percent in 2010, that three-month euro deposits will average 1.6 percent in 2009 and 2.0 percent in 2010, and that six-month Japanese yen deposits will average 1.0 percent in 2009 and 0.5 percent in 2010.

With respect to *introduction of the euro*, on December 31, 1998, the Council of the European Union decided that, effective January 1, 1999, the irrevocably fixed conversion rates between the euro and currencies of the member states adopting the euro are as follows.

See Box 5.4 of the October 1998 *World Economic Outlook* for details on how the conversion rates were established.

1 euro	=	13.7603	Austrian schillings
	=	40.3399	Belgian francs
	=	0.585274	Cyprus pound[1]
	=	1.95583	Deutsche mark
	=	5.94573	Finnish markkaa
	=	6.55957	French francs
	=	340.750	Greek drachma[2]
	=	0.787564	Irish pound
	=	1,936.27	Italian lire
	=	40.3399	Luxembourg francs
	=	0.42930	Maltese lira[3]
	=	2.20371	Netherlands guilders
	=	200.482	Portuguese escudos
	=	30.1260	Slovak koruna[4]
	=	239.640	Slovenian tolars[5]
	=	166.386	Spanish pesetas

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[1]Established on January 1, 2008.
[2]Established on January 1, 2001.
[3]Established on January 1, 2008.
[4]Established on January 1, 2009.
[5]Established on January 1, 2007.

Box A1. Economic Policy Assumptions Underlying the Projections for Selected Economies

The short-term ***fiscal policy assumptions*** used in the *World Economic Outlook* are based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions and projected fiscal outturns. The medium-term fiscal projections incorporate policy measures that are judged likely to be implemented. In cases where the IMF staff has insufficient information to assess the authorities' budget intentions and prospects for policy implementation, an unchanged structural primary balance is assumed, unless otherwise indicated. Specific assumptions used in some of the advanced economies follow (see also Tables B5–B7 in the Statistical Appendix for data on fiscal and structural balances).[1]

United States. The fiscal projections are based on the administration's fiscal year 2009 budget, mid-session review, and the baseline budget outlook of the Congressional Budget Office for the years 2009–19. Adjustments are made to account for differences in macroeconomic projections as well as differences in assumptions regarding the costs of financial system stabilization measures.

The structural fiscal balance is calculated by removing the effect of the economic cycle

[1]The output gap is actual less potential output, as a percent of potential output. Structural balances are expressed as a percent of potential output. The structural budget balance is the budgetary position that would be observed if the level of actual output coincided with potential output. Changes in the structural budget balance consequently include effects of temporary fiscal measures, the impact of fluctuations in interest rates and debt-service costs, and other noncyclical fluctuations in the budget balance. The computations of structural budget balances are based on IMF staff estimates of potential GDP and revenue and expenditure elasticities (see the October 1993 *World Economic Outlook*, Annex I). Net debt is defined as gross debt less financial assets of the general government, which include assets held by the social security insurance system. Estimates of the output gap and of the structural balance are subject to significant margins of uncertainty.

on the fiscal balance, as well as the impact of outlays associated with support to the financial system and other idiosyncratic factors (mostly driven by the temporary changes in the timing of tax receipts, capital gains taxes, receipts from the sale of assets, and the like). Accordingly, the decline in the adjusted structural balance from 2007 to 2008 primarily reflects the 2008 fiscal stimulus. The change from 2008 to 2009 primarily reflects the increase in discretionary spending (mainly defense related). The further decline in the balance in 2010 is largely due to the effects of the projected fiscal stimulus package, as well as continued increases in other discretionary spending. The improvement in 2011 is driven mostly by the withdrawal of the stimulus.

Japan. The fiscal projections assume that fiscal stimulus will be implemented in 2009 and 2010, as announced by the government. The medium-term projections also assume that expenditures by and revenues of the general government (excluding social security) are adjusted in line with the current government commitment (3 percent cut a year in public investment).

Germany. Projections for 2009 are based on the 2009 budget and fiscal stimulus measures announced since the budget was passed. This amounts to a fiscal stimulus of 1.5 percent of GDP in 2009 and an additional fiscal stimulus of 0.5 percent of GDP in 2010. Over the medium term, health expenditures accelerate as a result of aging and cost increases, because significant health care reform measures have not been taken.

France. New stimulus measures estimated at about 0.7 percent of GDP in 2009, comprising (1) temporary suspension of personal income tax in 2009 for €1.1 billion; (2) investment expenditures for 2009 for €5.2 billion; (3) various expenditure or revenue measures for €6.3 billion. The fiscal projection reflects the impact of new stimulus measures totaling 0.7 percent of GDP in 2009.

Italy. For 2009, fiscal projections incorporate the effects of the 2009 budget, as presented in the Italy's Stability Program of 2008 Update, submitted in February, including the fiscal stimulus package announced in late November 2008, with further adjustments for the IMF staff's macroeconomic projections. For outer years, a broadly constant structural primary balance is assumed.

United Kingdom. The projections incorporate a fiscal stimulus of about 1.4 percent of GDP in 2009 (1 percent represented by revenue measures, and 0.2 percent by expenditure measures).

Canada. Projections use the baseline forecasts in the 2009 Budget Statement. The IMF staff adjusts this forecast for differences in macroeconomic projections. The IMF staff forecast also incorporates the most recent data releases from Statistics Canada, including provincial and territorial budgetary outturns through the end of 2008.

Australia. The fiscal projections are based on the Updated Economic and Fiscal Outlook published in February 2009 and on IMF staff projections.

Austria. Projections for 2009 and 2010 incorporate two separate fiscal stimulus packages, a tax reform, and other decisions taken in parliament. These measures are estimated to amount to 1.5 percent of GDP in 2009 and 1.7 percent of GDP in 2010.

Belgium. Projections for 2009 are IMF staff estimates based on the 2009 budgets voted by the federal, community, and regional parliaments and adjusted for macroeconomic assumptions. Projections for the outer years are IMF staff estimates, assuming unchanged policies.

Brazil. The 2009 forecasts are based on the budget law and IMF staff assumptions. For the outer years, the IMF staff assumes unchanged policies, with a further increase in public investment in line with the authorities' intentions.

China. For 2009-10, the government has announced a large fiscal stimulus (although there is a lack of clarity on the precise size,

which complicates analysis). IMF staff assumes a total fiscal stimulus of 2 percent of GDP on budget in 2009 (of which 0.5 percent is revenue, 0.5 percent is automatic stabilizers, and 1 percent is spending), as well as 1 percent in support for state-owned enterprises in 2009. For 2010, the assumption is that the stimulus is not withdrawn.

Denmark. Projections for 2009 and 2010 are aligned with the latest official budget estimates and the underlying projections, adjusted where appropriate for the IMF staff's macroeconomic assumptions. For 2011–14, the projections incorporate key features of the medium-term fiscal plan as embodied in the authorities' November 2007 Convergence Program submitted to the European Union (EU) and obtained during the 2008 Article IV discussions with authorities. The projections imply convergence of the budget toward a close-to-balance position from an initial surplus position. This is consistent with the authorities' projection of a closure of the output gap over the medium term, as well as being in line with their objectives for long-term fiscal sustainability and debt reduction.

Greece. Projections are based on the 2009 budget, the latest Stability Program, and other forecasts and data provided by the authorities.

Hong Kong SAR. Fiscal projections for 2007–10 are consistent with the authorities' medium-term strategy as outlined in the fiscal year 2007/08 budget, with projections for 2011–13 based on the assumptions underlying the IMF staff's medium-term macroeconomic scenario.

India. Estimates for 2007 are based on budgetary execution data. Projections for 2008 and beyond are based on available information on the authorities' fiscal plans, with some adjustments for the IMF staff's assumptions. For 2008/09, the fiscal projections incorporate the estimated provisions under the 2008/09 budget, as well as the cost of fiscal stimulus measures in relation to the crisis (about 0.6 percent of GDP). Beyond 2008/09, the IMF staff projects that the government will not return to its fiscal rules target of 3 percent deficit in 2009/10 or

Box A1 *(continued)*

in 2010/11, in order to provide some counter-cyclical stimulus to sagging economic activity. However, the central government will remain relatively prudent in its fiscal management and will not utilize the entire fiscal room created by falling commodity prices, taking into account the slower growth in revenues and worsening subnational fiscal situation. This fiscal stance would result in a gradual reduction in the overall fiscal deficit and a sustainable medium-term debt path.

Indonesia: The 2009 fiscal projections—in particular, the overall balance, total revenue, and expenditure—are based on the authorities' estimates of the available adjustment to the original 2009 budget. IMF staff projections are adjusted for changes in the authorities' macroeconomic assumptions as well as introduction of additional fiscal stimulus measures. Because the authorities were still in the process of finalizing the budget adjustment at the time of the WEO data submission, the following elements of the additional fiscal stimulus were identified and reflected in the 2009 projections: (1) the original 2009 budget included Rp 12.5 trillion in tax subsidies (import duties and value-added taxes paid by the government for selected industries), and (2) additional stimulus of Rp 15 trillion (Rp 10.2 trillion yet to be allocated, Rp 1.4 trillion for lower electricity tariffs for industry, Rp 2.8 trillion for lower domestic fuel prices, and Rp 0.6 trillion for a carry over of poverty reducing programs from 2008 budget). The financing of the budget was based on an assumption of splitting the additional financing costs between further drawdown of government deposits and additional bond issuance.

Ireland: The fiscal projections are based on the budget of October 2008, but partly adjusted in light of the most recent stability program update, in which the authorities announce their intention to take measures to bring the deficit down to 2.6 percent of GDP by 2013, although they have yet to determine those measures.

Korea. The fiscal projections assume that fiscal stimulus will be implemented in 2009 and 2010,

as announced by the government. The discretionary stimulus measures announced amount to 3.9 percent of GDP in 2009 and 1.2 percent of GDP in 2010. They also reflect a supplementary stimulus package for 2009 recently proposed by the government. Expenditure numbers for 2009 correspond to the budget numbers, and it is assumed that about two-thirds of the supplementary budget will be executed this year. Revenue projections reflect the IMF staff's macroeconomic assumptions, adjusted for the estimated costs of tax measures included in the original stimulus package. The medium-term projections assume that the government will resume its consolidation plans and balance the budget by the end of the forecast horizon.

Mexico. Fiscal projections for 2009 are based on budgeted discretionary spending, and revenues and nondiscretionary spending are driven by IMF staff macroeconomic projections. Projections for 2010 and beyond are based on: (1) IMF staff macroeconomic projections, (2) modified balanced budget rule under the Fiscal Responsibility Legislation, and (3) authorities' projections of the spending pressures in pensions and healthcare and of the wage bill restraint. A fiscal stimulus package of about 1 percent of GDP was introduced in the context of the 2009 budget (hence effective early 2009). The main elements were (1) an increase in infrastructure spending (0.4 percent of GDP), (2) an increase in net lending by development banks (0.2 percent of GDP), and (3) an increase in current spending on public security,

Netherlands. Fiscal projections for the period 2009/11 are based on the authorities' multiannual budget projections, after adjusting for differences in macroeconomic assumptions. For the remainder of the projection period, the IMF staff assumes unchanged policies.

New Zealand. The fiscal projections are based on the authorities' December 2008 update and IMF staff estimates. The New Zealand fiscal account switched to new Generally Accepted Accounting Principles beginning in fiscal year 2006/07, with no comparable back data.

Portugal. For the period 2008–10, the fiscal projections take into account the impact of discretionary measures taken so far in response to the downturn. In addition, automatic stabilizers are assumed to be allowed to play out fully. For 2011–14, the deficits are projected to decline gradually, assuming that the government will contain further current spending to achieve structural adjustment of at least 0.5 percent of GDP a year in compliance with the EU's Stability and Growth Pact (SGP) rule.

Russia. The deficit projection for 2009 is based on the draft supplementary budget currently under consideration by the government. The projection takes into account expected expenditure underexecution, based on historical trends. Consolidated regional budgets are expected to be broadly balanced, reflecting strict deficit and debt limits at the local government level. In the medium term, fiscal projections assume unchanged policies, implying a broadly stable nonoil deficit in percent of GDP. Over the course of the past few months, the authorities have announced a number of fiscal stimulus measures amounting to over 3 percent of GDP to be included in the supplementary budget. Half of the measures are on the revenue side, primarily focused on permanently reducing profit taxation. The remainder includes temporary expenditure measures, including support to strategic sectors (defense, airlines, automakers, agriculture, construction) and social and labor market measures.

Saudi Arabia: The authorities systematically underestimate revenues and expenditures in the budget compared with actual outturns. The WEO baseline oil prices are discounted by 5 percent reflecting the higher sulfur context in Saudi crude. Regarding nonoil revenues, customs receipts are assumed to grow in line with imports, investment income in line with London interbank offered rate (LIBOR), and fees and charges grow as a function of nonoil GDP. On the expenditure side, wages are assumed to rise above the natural rate of increase reflecting a salary increase of 15 percent distributed

over 2008–10, and goods and services are projected to grow in line with inflation over the medium term. Interest payments are projected to decline in line with the authorities' policy of repaying public debt. Capital spending in 2009 is projected to be higher than in the budget by 40 percent and in line with the authorities' announcements to maintain spending. The pace of spending is projected to slow over the medium term.

Singapore. For the fiscal year 2007/08, expenditure projections are based on budget numbers, whereas revenue projections reflect the IMF staff's estimates of the impact of new policy measures, including an increase in the goods and services tax. Medium-term revenue projections assume that capital gains on fiscal reserves will be included in investment income.

Spain. For the period 2008–10, the fiscal projections take into account the impact of discretionary measures taken so far in response to the downturn. In addition, automatic stabilizers are assumed to be allowed to play out fully. For 2011–14, the deficits are projected to decline gradually to 3 percent of GDP as spending declines (the stimulus has sunset clauses) and the government contains further current spending to bring the deficit back into compliance with the SGP limit of 3 percent.

Sweden. Fiscal projections are based on information provided in the 2009 Budget Bill (November 2008), with adjustments reflecting incoming fiscal data and the IMF staff's views on the macroeconomic environment.

Switzerland. Projections for 2008–13 are based on IMF staff calculations, which incorporate measures to restore balance in the federal accounts and strengthen social security finances.

Turkey: Fiscal projections are mostly based on the 2009 budget and assume unchanged policies, with revenues driven by the IMF staff's macroeconomic projections. Projections for local governments, social security institutions, and extrabudgetary funds are adjusted for the IMF staff's macroeconomic assumptions. Projec-

Box A1 *(concluded)*

tions for the outer years are IMF staff estimates, with some additional adjustment assumed in 2010–11 to ensure favorable debt dynamics in the medium-term.

Monetary policy assumptions are based on the established policy framework in each country. In most cases, this implies a non-accommodative stance over the business cycle: official interest rates will increase when economic indicators suggest that inflation will rise above its acceptable rate or range, and they will decrease when indicators suggest that prospective inflation

will not exceed the acceptable rate or range, prospective output growth is below its potential rate, and the margin of slack in the economy is significant. On this basis, the LIBOR on six-month U.S. dollar deposits is assumed to average 1.5 percent in 2009 and 1.4 percent in 2010 (see Table 1.1). The rate on three-month euro deposits is assumed to average 1.6 percent in 2009 and 2.0 percent in 2010. The interest rate on six-month Japanese yen deposits is assumed to average 1.0 percent in 2009 and 0.5 percent in 2010.

What's New

On January 1, 2009, the Slovak Republic became the 16th country to join the euro area; tables presenting projections for the euro area countries have been revised to display each country according to its weight within the group; the Czech Republic is now included in the advanced economy group; Iraq projections are now presented in the real GDP, consumer prices, and current account tables; the country composition of the fuel-exporting group and the analytical composition of the net external position group have been revised to reflect the periodic update of the classification criteria; and country weights calculated as nominal GDP valued at purchasing-power-parity (PPP) exchange rates as a share of world total have been updated to reflect revisions to countries' historical GDP data and projections.

Data and Conventions

Data and projections for 182 countries form the statistical basis for the *World Economic Outlook* (the World Economic Outlook database). The data are maintained jointly by the IMF's Research Department and area departments, with the latter regularly updating country projections based on consistent global assumptions.

Although national statistical agencies are the ultimate providers of historical data and definitions, international organizations are also involved in statistical issues, with the objective of harmonizing methodologies for the national compilation of statistics, including the analytical frameworks, concepts, definitions, classifications, and valuation procedures used in the production of economic statistics. The WEO database reflects information from both national source agencies and international organizations.

The comprehensive revision of the standardized *System of National Accounts 1993 (SNA),* the IMF's *Balance of Payments Manual, Fifth Edition (BPM5),* the *Monetary and Financial Statistics Manual (MFSM),* and the *Government Finance Statistics Manual 2001 (GFSM 2001)* represented significant improvements in the standards of economic statistics and analysis.[1] The IMF was actively involved in all these projects, particularly the *Balance of Payments, Monetary and Financial*

[1]Commission of the European Communities, International Monetary Fund, Organization for Economic Cooperation and Development, United Nations, and World Bank, *System of National Accounts 1993* (Brussels/Luxembourg, New York, Paris, and Washington, 1993); International Monetary Fund, *Balance of Payments Manual, Fifth Edition* (Washington, 1993); International Monetary Fund, *Monetary and Financial Statistics Manual* (Washington, 2000); and *International Monetary Fund, Government Finance Statistics Manual* (Washington, 2001).

Statistics, and *Government Finance Statistics* manuals, which reflects the IMF's special interest in countries' external positions, financial sector stability, and public sector fiscal positions. The process of adapting country data to the new definitions began in earnest when the manuals were released. However, full concordance with the manuals is ultimately dependent on the provision by national statistical compilers of revised country data, and hence the *World Economic Outlook* estimates are still only partially adapted to these manuals.

In line with recent improvements in standards for reporting economic statistics, several countries have phased out their traditional *fixed-base-year* method of calculating real macroeconomic variables levels and growth by switching to a *chain-weighted* method of computing aggregate growth. Recent dramatic changes in the structure of these economies have caused these countries to revise the way in which they measure real GDP levels and growth. Switching to the chain-weighted method of computing aggregate growth, which uses current price information, allows countries to measure GDP growth more accurately by eliminating upward biases in new data.[2] Currently, real macroeconomic data for Albania, Australia, Austria, Azerbaijan, Belgium, Bulgaria, Canada, Cyprus, the Czech Republic, Denmark, Estonia, the euro area, Finland, France, Georgia, Germany, Greece, Guatemala, Hong Kong SAR, Iceland, Ireland, Israel, Italy, Japan, Kazakhstan, Lithuania, Luxembourg, Malta, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, and the United States are based on chain-weighted methodology. However, data before 1996 (Albania), 1994 (Azerbaijan), 1995 (Belgium), 2000 (Bulgaria), 1995 (Cyprus), 1995 (Czech Republic), 1995 (Estonia), 1995 (euro area), 1996 (Georgia),

2000 (Greece), 1990 (Iceland), 1995 (Ireland), 1994 (Japan), 1994 (Kazakhstan), 1995 (Luxembourg), 2000 (Malta), 1995 (Poland), 2000 (Republic of Korea), 1995 (Russia), 1995 (Slovenia), and 1995 (Spain) are based on unrevised national accounts and subject to revision in the future.

The members of the European Union have adopted a harmonized system for the compilation of national accounts, referred to as ESA 1995. All national accounts data from 1995 onward are presented on the basis of the new system. Revision by national authorities of data prior to 1995 to conform to the new system has progressed but, in some cases, has not been completed. In such cases, historical *World Economic Outlook* data have been carefully adjusted to avoid breaks in the series. Users of EU national accounts data prior to 1995 should nevertheless exercise caution until such time as the revision of historical data by national statistical agencies has been fully completed. See Box 1.2 of the May 2000 *World Economic Outlook.*

Composite data for country groups in the *World Economic Outlook* are either sums or weighted averages of data for individual countries. Unless otherwise indicated, multiyear averages of growth rates are expressed as compound annual rates of change.[3] Arithmetically weighted averages are used for all data except inflation and money growth for the emerging and developing economies group, for which geometric averages are used. The following conventions apply.

- Country group composites for exchange rates, interest rates, and the growth rates of monetary aggregates are weighted by GDP converted to U.S. dollars at market exchange rates (averaged over the preceding three years) as a share of group GDP.
- Composites for other data relating to the domestic economy, whether growth rates or

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[2]Charles Steindel, 1995, "Chain-Weighting: The New Approach to Measuring GDP," *Current Issues in Economics and Finance* (Federal Reserve Bank of New York), Vol. 1 (December).

[3]Averages for real GDP and its components, employment, per capita GDP, inflation, factor productivity, trade, and commodity prices are calculated based on the compound annual rate of change, except for the unemployment rate, which is based on the simple arithmetic average.

ratios, are weighted by GDP valued at PPPs as a share of total world or group GDP.[4]

- Composites for data relating to the domestic economy for the euro area (16 member countries throughout the entire period unless otherwise noted) are aggregates of national source data using GDP weights. Annual data are not adjusted for calendar day effects. For data prior to 1999, data aggregations apply 1995 European currency unit exchange rates.
- Composite unemployment rates and employment growth are weighted by labor force as a share of group labor force.
- Composites relating to the external economy are sums of individual country data after conversion to U.S. dollars at the average market exchange rates in the years indicated for balance of payments data and at end-of-year market exchange rates for debt denominated in currencies other than U.S. dollars. Composites of changes in foreign trade volumes and prices, however, are arithmetic averages of percent changes for individual countries weighted by the U.S. dollar value of exports or imports as a share of total world or group exports or imports (in the preceding year).

All data refer to calendar years, except for the following countries, which refer to fiscal years: Australia (July/June), Egypt (July/June), Haiti (October/September), Islamic Republic of Afghanistan (April/March), Islamic Republic of Iran (April/March), Mauritius (July/June), Myanmar (April/March), Nepal (July/June), New Zealand (July/June), Pakistan (July/June), Samoa (July/June), and Tonga (July/June).

Classification of Countries

Summary of the Country Classification

The country classification in the *World Economic Outlook* divides the world into two major groups: advanced economies and emerging and developing economies.[5] Rather than being based on strict criteria, economic or otherwise, this classification has evolved over time with the objective of facilitating analysis by providing a reasonably meaningful organization of data. Table A provides an overview of these standard groups in the *World Economic Outlook*, showing the number of countries in each group and the average 2008 shares of groups in aggregate PPP-valued GDP, total exports of goods and services, and population.

A few countries are currently not included in these groups, either because they are not IMF members and their economies are not monitored by the IMF or because databases have not yet been fully developed. Because of data limitations, group composites do not reflect the following countries: the Islamic Republic of Afghanistan, Bosnia and Herzegovina, Brunei Darussalam, Eritrea, Iraq, Liberia, Montenegro, Serbia, Timor-Leste, and Zimbabwe. Cuba and the Democratic People's Republic of Korea are examples of countries that are not IMF members, whereas San Marino, among the advanced economies, and Aruba, Marshall Islands, the Federated States of Micronesia, and Palau, among the developing economies, are examples of countries for which databases have not been completed.

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[4]See Box A2 of the April 2004 *World Economic Outlook* for a summary of the revised PPP-based weights and Annex IV of the May 1993 *World Economic Outlook.* See also Anne-Marie Gulde and Marianne Schulze-Ghattas, "Purchasing Power Parity Based Weights for the World Economic Outlook," in *Staff Studies for the World Economic Outlook* (Washington: International Monetary Fund, December 1993), pp. 106–23.

[5]As used here, the term "country" does not in all cases refer to a territorial entity that is a state as understood by international law and practice. It also covers some territorial entities that are not states, but for which statistical data are maintained on a separate and independent basis.

Table A. Classification by *World Economic Outlook* Groups and Their Shares in Aggregate GDP, Exports of Goods and Services, and Population, 2008[1]
(Percent of total for group or world)

	Number of Economies	GDP		Exports of Goods and Services		Population	
		Advanced economies	World	Advanced economies	World	Advanced economies	World
Advanced economies	**33**	**100.0**	**55.3**	**100.0**	**65.1**	**100.0**	**15.3**
United States		37.4	20.7	14.3	9.3	30.3	4.6
Euro area	16	28.5	15.7	43.9	28.6	32.4	5.0
Germany		7.6	4.2	13.4	8.7	8.2	1.2
France		5.6	3.1	5.9	3.8	6.2	0.9
Italy		4.8	2.6	5.3	3.4	5.9	0.9
Spain		3.7	2.0	3.4	2.2	4.5	0.7
Japan		11.5	6.4	7.0	4.5	12.7	1.9
United Kingdom		5.8	3.2	6.0	3.9	6.1	0.9
Canada		3.4	1.9	4.1	2.7	3.3	0.5
Other advanced economies	13	13.3	7.4	24.6	16.0	15.3	2.3
Memorandum							
Major advanced economies	7	76.2	42.1	56.1	36.5	72.6	11.1
Newly industrialized Asian economies	4	6.7	3.7	13.1	8.5	8.3	1.3
		Emerging and developing economies	World	Emerging and developing economies	World	Emerging and developing economies	World
Emerging and developing economies	**139**	**100.0**	**44.7**	**100.0**	**34.9**	**100.0**	**84.7**
Regional groups							
Africa	47	6.9	3.1	7.8	2.7	15.2	12.9
Sub-Sahara	44	5.5	2.4	5.7	2.0	13.8	11.7
Excluding Nigeria and South Africa	42	2.8	1.3	3.1	1.1	10.3	8.7
Central and eastern Europe	11	7.8	3.5	10.3	3.6	2.9	2.5
Commonwealth of Independent States[2]	13	10.3	4.6	11.5	4.0	5.0	4.3
Russia		7.4	3.3	7.6	2.7	2.6	2.2
Developing Asia	23	46.9	21.0	39.5	13.8	62.4	52.9
China		25.5	11.4	24.1	8.4	23.8	20.2
India		10.7	4.8	3.9	1.4	21.4	18.1
Excluding China and India	21	10.8	4.8	11.5	4.0	17.2	14.5
Middle East	13	8.7	3.9	16.2	5.6	4.4	3.7
Western Hemisphere	32	19.3	8.6	14.7	5.1	10.0	8.5
Brazil		6.4	2.9	3.3	1.2	3.4	2.9
Mexico		5.0	2.2	4.5	1.6	1.9	1.6
Analytical groups							
By source of export earnings							
Fuel	24	19.3	8.6	30.0	10.5	10.9	9.3
Nonfuel	115	80.7	36.1	70.0	24.4	89.1	75.5
of which, primary products	19	1.6	0.7	1.9	0.7	4.0	3.4
By external financing source							
Net debtor countries	113	51.1	22.9	40.9	14.3	61.1	51.7
of which, official financing	30	3.4	1.5	2.5	0.9	12.2	10.3
Net debtor countries by debt-servicing experience							
Countries with arrears and/or rescheduling during 2003–07	44	6.5	2.9	4.7	1.6	12.2	10.3
Other net debtor countries	69	44.6	19.9	36.2	12.6	48.8	41.4
Other groups							
Heavily indebted poor countries	32	1.9	0.8	1.3	0.5	8.7	7.3
Middle East and North Africa	19	10.5	4.7	18.4	6.4	6.5	5.5

[1]The GDP shares are based on the purchasing-power-parity (PPP) valuation of country GDPs. The number of countries comprising each group reflects those for which data are included in the group aggregates.

[2]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

General Features and Composition of Groups in the World Economic Outlook Classification

Advanced Economies

The 33 advanced economies are listed in Table B. The seven largest in terms of GDP—the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada—constitute the subgroup of *major advanced economies,* often referred to as the Group of Seven (G7). The 16 members of the *euro area* and the four *newly industrialized Asian economies* are also distinguished as subgroups. Composite data shown in the tables for the euro area cover the current members for all years, even though the membership has increased over time.

Table C lists the member countries of the European Union, not all of which are classified as advanced economies in the *World Economic Outlook*.

Emerging and Developing Economies

The group of emerging and developing economies (139 countries) includes all countries that are not classified as advanced economies.

The *regional breakdowns* of emerging and developing economies—*Africa, central and eastern Europe, Commonwealth of Independent States, developing Asia, Middle East, and Western Hemisphere*—largely conform to the regional breakdowns in the IMF's *International Financial Statistics.* In both classifications, Egypt and Libya are included in

Table C. European Union

Austria	Finland	Latvia	Romania
Belgium	France	Lithuania	Slovak Republic
Bulgaria	Germany	Luxembourg	Slovenia
Cyprus	Greece	Malta	Spain
Czech Republic	Hungary	Netherlands	Sweden
Denmark	Ireland	Poland	United Kingdom
Estonia	Italy	Portugal	

the *Middle East* region rather than in Africa. In addition, the *World Economic Outlook* sometimes refers to the regional group of Middle East and North African countries, also referred to as the MENA countries, whose composition straddles the Africa and Middle East regions. This group is defined as the Arab League countries plus the Islamic Republic of Iran (see Table D).

Table D. Middle East and North African Countries

Algeria	Jordan	Morocco	Syrian Arab Republic
Bahrain	Kuwait	Oman	Tunisia
Djibouti	Lebanon	Qatar	United Arab Emirates
Egypt	Libya	Saudi Arabia	Yemen, Rep. of
Iran, I.R. of	Mauritania	Sudan	

Emerging and developing economies are also classified according to *analytical criteria.* The analytical criteria reflect countries' composition of export earnings and other income from abroad; exchange rate arrangements; a distinction between net creditor and net debtor countries; and, for the net debtor countries, financial criteria based on external financing sources and experience with external debt servicing. The

Table B. Advanced Economies by Subgroup

	Other Subgroups				
Major Currency Areas	Euro area		Newly industrialized Asian economies	Major advanced economies	Other advanced economies
United States	Austria	Italy	Hong Kong SAR[1]	Canada	Australia	New Zealand
Euro area	Belgium	Luxembourg	Korea	France	Czech Republic	Norway
Japan	Cyprus	Malta	Singapore	Germany	Denmark	Singapore
	Finland	Netherlands	Taiwan Province	Italy	Hong Kong SAR[1]	Sweden
	France	Portugal	of China	Japan	Iceland	Switzerland
	Germany	Slovak Rep.		United Kingdom	Israel	Taiwan Province
	Greece	Slovenia		United States	Korea	of China
	Ireland	Spain				

[1]On July 1, 1997, Hong Kong was returned to the People's Republic of China and became a Special Administrative Region of China.

detailed composition of emerging and developing economies in the regional and analytical groups is shown in Tables E and F.

The analytical criterion, by *source of export earnings*, distinguishes between categories *fuel* (Standard International Trade Classification—SITC 3) and *nonfuel* and then focuses on *nonfuel primary products* (SITCs 0, 1, 2, 4, and 68).

The financial criteria focus on *net creditor countries, net debtor countries,* and *heavily indebted poor countries (HIPCs).* Net debtor countries are further differentiated on the basis of two additional financial criteria: by *official external financing* and by *experience with debt servicing.*[6] The HIPC group comprises the countries considered by the IMF and the World Bank for their debt initiative, known as the HIPC Initiative, with the aim of reducing the external debt burdens of all the eligible HIPCs to a sustainable level in a reasonably short period of time.[7]

[6]During 2003–07, 44 countries incurred external payments arrears or entered into official or commercial bank debt-rescheduling agreements. This group of countries is referred to as *countries with arrears and/or rescheduling during 2003–07.*

[7]See David Andrews, Anthony R. Boote, Syed S. Rizavi, and Sukwinder Singh, *Debt Relief for Low-Income Countries: The Enhanced HIPC Initiative,* IMF Pamphlet Series, No. 51 (Washington: International Monetary Fund, November 1999).

Table E. Emerging and Developing Economies by Region and Main Source of Export Earnings

	Fuel	Nonfuel Primary Products
Africa	Algeria Angola Chad Congo, Rep. of Equatorial Guinea Gabon Nigeria Sudan	Burkina Faso Burundi Congo, Dem. Rep. of Guinea Guinea-Bissau Malawi Mali Mauritania Mozambique, Rep. of Namibia Sierra Leone Zambia
Commonwealth of Independent States[1]	Azerbaijan Kazakhstan Russia Turkmenistan	Mongolia Uzbekistan
Developing Asia		Papua New Guinea Solomon Islands
Middle East	Bahrain Iran, I.R. of Kuwait Libya Oman Qatar Saudi Arabia United Arab Emirates Yemen, Rep. of	
Western Hemisphere	Ecuador Trinidad and Tobago Venezuela	Chile Guyana Suriname

[1]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table F. Emerging and Developing Economies by Region, Net External Position, and Status as Heavily Indebted Poor Countries

	Net External Position		Heavily Indebted Poor Countries
	Net creditor	Net debtor[1]	
Africa			
Maghreb			
Algeria	*		
Morocco		*	
Tunisia		*	
Sub-Sahara			
South Africa		*	
Horn of Africa			
Djibouti		*	
Ethiopia		•	*
Sudan		*	
Great Lakes			
Burundi		•	*
Congo, Dem. Rep. of		•	*
Kenya		*	
Rwanda		•	*
Tanzania		•	*
Uganda		*	*
Southern Africa			
Angola	*		
Botswana	*		
Comoros		•	
Lesotho		*	
Madagascar		•	*
Malawi		•	*
Mauritius		*	
Mozambique, Rep. of		•	*
Namibia	*		
Seychelles		*	
Swaziland		*	
Zambia		*	*
West and Central Africa			
Cape Verde		*	
Gambia, The		*	*
Ghana		•	*
Guinea		•	*
Mauritania		*	*
Nigeria	*		
São Tomé and Príncipe		*	*
Sierra Leone		•	*
CFA franc zone			
Benin		*	*
Burkina Faso		•	*
Cameroon		*	*
Central African Republic		•	*
Chad		*	*
Congo, Rep. of		•	*
Côte d'Ivoire		*	
Equatorial Guinea		*	
Gabon	*		
Guinea-Bissau		*	*
Mali		*	*
Niger		•	*
Senegal		*	*
Togo		•	*

	Net External Position		Heavily Indebted Poor Countries
	Net creditor	Net debtor[1]	
Central and eastern Europe			
Albania		*	
Bulgaria		*	
Croatia		*	
Estonia		*	
Hungary		*	
Latvia		*	
Lithuania		*	
Macedonia, FYR		*	
Poland		*	
Romania		*	
Turkey		*	
Commonwealth of Independent States[2]			
Armenia		•	
Azerbaijan	*		
Belarus		*	
Georgia		*	
Kazakhstan		*	
Kyrgyz Republic		*	
Moldova		*	
Mongolia		•	
Russia	*		
Tajikistan		*	
Turkmenistan	*		
Ukraine	*		
Uzbekistan	*		
Developing Asia			
Bhutan		•	
Cambodia		•	
China	*		
Fiji		*	
Indonesia	*		
Kiribati	*		
Lao PDR		*	
Malaysia	*		
Myanmar		*	
Papua New Guinea	*		
Philippines		*	
Samoa		*	
Solomon Islands		•	
Thailand		*	
Tonga		•	
Vanuatu		*	
Vietnam		•	
South Asia			
Bangladesh		•	
India		*	
Maldives		*	
Nepal		•	
Pakistan		*	
Sri Lanka		*	

	Net External Position		Heavily Indebted Poor Countries		Net External Position		Heavily Indebted Poor Countries
	Net creditor	Net debtor[1]			Net creditor	Net debtor[1]	
Middle East				Peru		*	
Bahrain	*			Uruguay		*	
Iran, I.R. of	*			Venezuela	*		
Kuwait	*			**Central America**			
Libya	*			Costa Rica		*	
Oman	*			El Salvador		•	
Qatar	*			Guatemala		*	
Saudi Arabia	*			Honduras		*	*
United Arab Emirates	*			Nicaragua		*	*
Yemen, Rep. of		*		Panama		*	
Mashreq				**Caribbean**			
Egypt		*		Antigua and Barbuda		*	
Jordan		*		Bahamas, The		*	
Lebanon		*		Barbados		*	
Syrian Arab Republic		•		Belize		*	
Western Hemisphere				Dominica		*	
Mexico		*		Dominican Republic		*	
South America				Grenada		*	
Argentina		*		Guyana		*	*
Bolivia		•	*	Haiti		•	*
Brazil		*		Jamaica		*	
Chile		*		St. Kitts and Nevis		*	
Colombia		*		St. Lucia		*	
Ecuador		*		St. Vincent and the Grenadines		*	
Paraguay		*		Suriname		*	
				Trinidad and Tobago	*		

[1]Dot instead of star indicates that the net debtor's main external finance source is official financing.

[2]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

List of Tables

Table A1. Summary of World Output[1]

(Annual percent change)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
World	**3.1**	**2.2**	**2.8**	**3.6**	**4.9**	**4.5**	**5.1**	**5.2**	**3.2**	**–1.3**	**1.9**	**4.8**
Advanced economies	**2.8**	**1.2**	**1.6**	**1.9**	**3.2**	**2.6**	**3.0**	**2.7**	**0.9**	**–3.8**	**0.0**	**2.6**
United States	3.3	0.8	1.6	2.5	3.6	2.9	2.8	2.0	1.1	–2.8	0.0	2.4
Euro area	. . .	1.9	0.9	0.8	2.2	1.7	2.9	2.7	0.9	–4.2	–0.4	2.3
Japan	1.3	0.2	0.3	1.4	2.7	1.9	2.0	2.4	–0.6	–6.2	0.5	2.5
Other advanced economies[2]	3.5	1.8	3.2	2.5	4.0	3.3	3.9	4.0	1.2	–3.9	0.4	3.5
Emerging and developing economies	**3.6**	**3.8**	**4.8**	**6.3**	**7.5**	**7.1**	**8.0**	**8.3**	**6.1**	**1.6**	**4.0**	**6.8**
Regional groups												
Africa	2.4	4.9	6.5	5.5	6.7	5.8	6.1	6.2	5.2	2.0	3.9	5.4
Central and eastern Europe	2.0	0.0	4.4	4.9	7.3	6.0	6.6	5.4	2.9	–3.7	0.8	4.0
Commonwealth of Independent States[3]	. . .	6.1	5.2	7.8	8.2	6.7	8.4	8.6	5.5	–5.1	1.2	5.3
Developing Asia	7.4	5.8	6.9	8.2	8.6	9.0	9.8	10.6	7.7	4.8	6.1	8.8
Middle East	4.0	2.6	3.8	7.0	6.0	5.8	5.7	6.3	5.9	2.5	3.5	4.5
Western Hemisphere	3.3	0.7	0.6	2.2	6.0	4.7	5.7	5.7	4.2	–1.5	1.6	4.3
Memorandum												
European Union	2.2	2.1	1.4	1.5	2.6	2.2	3.4	3.1	1.1	–4.0	–0.3	2.6
Analytical groups												
By source of export earnings												
Fuel	–0.1	4.4	4.8	7.1	7.9	6.9	7.2	7.5	5.6	–1.4	2.3	4.5
Nonfuel	4.7	3.6	4.8	6.1	7.4	7.2	8.1	8.5	6.2	2.3	4.4	7.3
of which, primary products	3.6	3.8	3.2	4.4	6.1	5.7	5.5	5.7	4.9	2.3	4.1	5.4
By external financing source												
Net debtor countries	3.5	2.1	3.2	4.5	6.4	6.0	6.8	6.5	4.9	0.4	2.8	5.7
of which, official financing	4.2	5.0	4.8	4.6	6.3	6.9	6.9	6.8	6.2	3.6	4.3	6.4
Net debtor countries by debt-servicing experience												
Countries with arrears and/or rescheduling during 2003–07	3.0	1.7	0.5	6.0	7.6	7.7	7.4	7.3	6.3	0.9	2.6	5.1
Memorandum												
Median growth rate												
Advanced economies	3.1	1.9	1.9	1.9	3.8	2.9	3.4	3.6	1.1	–3.8	0.2	2.8
Emerging and developing economies	3.4	3.6	4.0	5.0	5.5	5.6	6.2	6.3	5.0	1.9	2.9	5.0
Output per capita												
Advanced economies	2.1	0.6	1.0	1.3	2.6	1.9	2.4	2.0	0.3	–4.4	–0.6	2.0
Emerging and developing economies	2.0	2.4	3.4	4.9	6.1	5.8	6.6	7.1	4.8	0.3	2.5	5.3
World growth based on market exchange rates	**2.5**	**1.5**	**1.9**	**2.7**	**4.0**	**3.4**	**3.9**	**3.8**	**2.1**	**–2.5**	**1.0**	**3.9**
Value of world output in billions of U.S. dollars												
At market exchange rates	28,297	31,707	32,988	37,087	41,728	45,090	48,761	54,841	60,690	54,864	55,921	70,601
At purchasing power parities	33,443	43,711	45,693	48,310	52,074	56,017	60,716	65,490	68,997	68,651	70,211	89,356

[1]Real GDP.

[2]In this table, "other advanced economies" means advanced economies excluding the United States, euro area countries, and Japan.

[3]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A2. Advanced Economies: Real GDP and Total Domestic Demand[1]
(Annual percent change)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	Fourth Quarter[2] 2008	2009	2010
Real GDP															
Advanced economies	**2.8**	**1.2**	**1.6**	**1.9**	**3.2**	**2.6**	**3.0**	**2.7**	**0.9**	**−3.8**	**0.0**	**2.6**	**−1.7**	**−2.6**	**1.0**
United States	3.3	0.8	1.6	2.5	3.6	2.9	2.8	2.0	1.1	−2.8	0.0	2.4	−0.8	−2.2	1.5
Euro area	. . .	1.9	0.9	0.8	2.2	1.7	2.9	2.7	0.9	−4.2	−0.4	2.3	−1.4	−3.5	0.6
Germany	2.1	1.2	0.0	−0.2	1.2	0.8	3.0	2.5	1.3	−5.6	−1.0	2.2	−1.7	−4.4	0.0
France	2.0	1.8	1.1	1.1	2.2	1.9	2.4	2.1	0.7	−3.0	0.4	2.3	−1.0	−2.2	1.4
Italy	1.6	1.8	0.5	0.0	1.5	0.7	2.0	1.6	−1.0	−4.4	−0.4	1.9	−2.9	−2.9	0.2
Spain	2.9	3.6	2.7	3.1	3.3	3.6	3.9	3.7	1.2	−3.0	−0.7	2.0	−0.7	−2.9	0.2
Netherlands	3.1	1.9	0.1	0.3	2.2	2.0	3.4	3.5	2.0	−4.8	−0.7	2.5	−0.7	−4.7	0.3
Belgium	2.3	0.8	1.5	1.0	2.8	2.2	3.0	2.6	1.1	−3.8	0.3	2.4	−0.8	−3.0	1.2
Greece	2.3	4.2	3.4	5.6	4.9	2.9	4.5	4.0	2.9	−0.2	−0.6	2.5	2.4	−2.2	1.4
Austria	2.4	0.5	1.6	0.8	2.5	2.9	3.4	3.1	1.8	−3.0	0.2	2.3	0.5	−3.4	2.3
Portugal	3.0	2.0	0.8	−0.8	1.5	0.9	1.4	1.9	0.0	−4.1	−0.5	1.5	−1.8	−4.1	2.4
Finland	2.0	2.7	1.6	1.8	3.7	2.8	4.9	4.2	0.9	−5.2	−1.2	3.5	−1.8	−5.6	0.6
Ireland	7.1	5.8	6.4	4.5	4.7	6.4	5.7	6.0	−2.3	−8.0	−3.0	2.6	−7.4	−4.8	−2.0
Slovak Republic	0.0	3.4	4.8	4.7	5.2	6.5	8.5	10.4	6.4	−2.1	1.9	4.2	2.4	−6.1	5.9
Slovenia	. . .	2.8	4.0	2.8	4.3	4.3	5.9	6.8	3.5	−2.7	1.4	3.5	−0.9	0.4	1.5
Luxembourg	5.0	2.5	4.1	1.5	4.5	5.2	6.4	5.2	0.7	−4.8	−0.2	2.9	−0.9	−2.6	1.7
Cyprus	4.2	4.0	2.1	1.9	4.2	3.9	4.1	4.4	3.7	0.3	2.1	3.3	3.1	−0.7	5.0
Malta	4.4	−1.6	2.6	−0.3	1.3	3.7	3.2	3.6	1.6	−1.5	1.1	3.0	−1.2	−0.8	2.0
Japan	1.3	0.2	0.3	1.4	2.7	1.9	2.0	2.4	−0.6	−6.2	0.5	2.5	−4.3	−2.7	−0.6
United Kingdom	2.5	2.5	2.1	2.8	2.8	2.1	2.8	3.0	0.7	−4.1	−0.4	2.8	−2.0	−3.2	0.6
Canada	2.9	1.8	2.9	1.9	3.1	2.9	3.1	2.7	0.5	−2.5	1.2	2.5	−0.7	−1.9	1.7
Korea	6.1	4.0	7.2	2.8	4.6	4.0	5.2	5.1	2.2	−4.0	1.5	4.5	−3.4	0.0	2.4
Australia	3.4	2.1	4.3	3.0	3.8	2.8	2.8	4.0	2.1	−1.4	0.6	3.0	0.3	−1.1	1.1
Taiwan Province of China	6.5	−2.2	4.6	3.5	6.2	4.2	4.8	5.7	0.1	−7.5	0.0	5.0	−8.4	−1.6	1.0
Sweden	2.1	1.1	2.4	1.9	4.1	3.3	4.2	2.6	−0.2	−4.3	0.2	4.2	−4.4	−2.5	1.8
Switzerland	1.1	1.2	0.4	−0.2	2.5	2.5	3.4	3.3	1.6	−3.0	−0.3	1.5	−0.1	−3.7	1.2
Hong Kong SAR	3.9	0.5	1.8	3.0	8.5	7.1	7.0	6.4	2.5	−4.5	0.5	5.0	−2.5	−3.3	3.2
Czech Republic	0.2	2.5	1.9	3.6	4.5	6.3	6.8	6.0	3.2	−3.5	0.1	4.0	0.5	−2.3	0.9
Norway	3.7	2.0	1.5	1.0	3.9	2.7	2.3	3.1	2.0	−1.7	0.3	1.7	0.8	−3.0	1.7
Singapore	7.6	−2.4	4.1	3.8	9.3	7.3	8.4	7.8	1.1	−10.0	−0.1	5.4	−4.0	−6.9	1.9
Denmark	2.6	0.7	0.5	0.4	2.3	2.4	3.3	1.6	−1.1	−4.0	0.4	2.2	−3.8	−2.7	2.4
Israel	5.7	−0.3	−0.6	1.8	5.0	5.1	5.2	5.4	3.9	−1.7	0.3	4.1	1.9	−2.2	0.3
New Zealand	2.9	2.6	4.9	4.1	4.5	2.8	1.9	3.2	0.3	−2.0	0.5	3.2	−1.9	−1.1	1.1
Iceland	2.5	3.9	0.1	2.4	7.7	7.4	4.5	5.5	0.3	−10.6	−0.2	3.8	−1.5	−14.5	8.4
Memorandum															
Major advanced economies	2.5	1.0	1.2	1.8	2.9	2.3	2.6	2.2	0.6	−3.8	0.0	2.4	−1.7	−2.6	0.9
Newly industrialized Asian economies	6.1	1.2	5.6	3.1	5.9	4.7	5.6	5.7	1.5	−5.6	0.8	4.8	−4.8	−1.5	2.0
Real total domestic demand															
Advanced economies	**2.8**	**1.2**	**1.7**	**2.1**	**3.3**	**2.6**	**2.8**	**2.3**	**0.4**	**−3.3**	**0.0**	**2.4**	**−1.6**	**−2.4**	**0.8**
United States	3.6	0.9	2.2	2.8	4.1	3.0	2.6	1.4	−0.3	−3.3	0.2	2.2	−1.9	−2.3	1.6
Euro area	. . .	1.3	0.4	1.4	1.9	1.9	2.8	2.4	0.9	−2.9	−0.6	1.9	−0.1	−3.2	0.6
Germany	2.0	−0.5	−2.0	0.6	−0.1	0.0	2.1	1.1	1.7	−3.0	−1.6	1.7	2.0	−4.3	−0.3
France	1.8	1.7	1.2	1.7	3.2	2.7	2.6	3.0	1.0	−2.0	0.6	1.9	−0.1	−1.6	1.4
Italy	1.4	1.6	1.3	0.8	1.3	0.9	2.0	1.4	−1.7	−3.3	0.0	1.7	−2.4	−2.2	0.6
Spain	2.8	3.8	3.2	3.8	4.8	5.1	5.1	4.2	0.2	−6.3	−1.7	1.8	−2.8	−5.5	−0.6
Japan	1.2	1.0	−0.4	0.8	1.9	1.7	1.2	1.3	−0.8	−2.9	0.5	2.4	−1.6	−1.5	−0.8
United Kingdom	2.6	3.0	3.2	2.9	3.4	1.9	2.6	3.5	0.6	−4.8	−1.0	2.7	−2.9	−3.6	0.0
Canada	2.4	1.2	3.2	4.6	4.2	4.8	4.7	4.3	2.4	−3.2	1.3	2.2	−1.0	−2.2	1.6
Other advanced economies	4.0	0.6	4.1	1.8	4.7	3.4	3.9	4.5	1.7	−3.6	0.6	3.8	−3.2	−1.1	1.0
Memorandum															
Major advanced economies	2.6	1.1	1.3	2.1	3.1	2.3	2.4	1.7	0.0	−3.2	0.0	2.2	−1.4	−2.4	0.9
Newly industrialized Asian economies	5.7	0.1	4.9	0.7	4.9	2.9	4.2	4.5	1.7	−5.4	0.7	4.2	−4.8	−1.4	1.4

[1]When countries are not listed alphabetically, they are ordered on the basis of economic size.

[2]From the fourth quarter of the preceding year.

Table A3. Advanced Economies: Components of Real GDP
(Annual percent change)

	Ten-Year Averages		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	1991–2000	2001–10										
Private consumer expenditure												
Advanced economies	**2.9**	**1.6**	**2.4**	**2.3**	**1.9**	**2.8**	**2.5**	**2.7**	**2.5**	**0.6**	**−1.4**	**0.3**
United States	3.5	2.1	2.5	2.7	2.8	3.6	3.0	3.0	2.8	0.2	−0.9	1.0
Euro area	. . .	1.0	2.0	0.9	1.2	1.6	1.8	2.0	1.6	0.5	−1.3	−0.5
Germany	2.3	−0.1	1.9	−0.8	0.1	0.1	0.2	1.0	−0.4	−0.1	−1.1	−1.8
France	1.7	1.8	2.6	2.3	2.0	2.4	2.5	2.5	2.4	1.3	−0.4	0.4
Italy	1.7	0.3	0.7	0.2	1.0	0.7	1.1	1.2	1.2	−0.9	−1.9	−0.1
Spain	2.7	2.2	3.4	2.8	2.9	4.2	4.2	3.9	3.5	0.1	−3.1	−0.1
Japan	1.6	0.8	1.6	1.1	0.4	1.6	1.3	1.5	0.7	0.5	−1.0	0.3
United Kingdom	2.8	1.5	3.1	3.5	3.0	2.9	1.9	2.1	3.1	1.4	−3.8	−1.5
Canada	2.4	2.6	2.3	3.6	3.0	3.3	3.7	4.3	4.5	3.0	−2.3	0.7
Other advanced economies	4.1	2.3	2.8	4.0	1.5	3.6	3.5	3.7	4.4	1.2	−2.1	0.5
Memorandum												
Major advanced economies	2.7	1.5	2.2	2.0	2.0	2.6	2.3	2.4	2.1	0.5	−1.2	0.3
Newly industrialized Asian economies	5.8	2.3	3.7	5.6	0.1	2.7	3.9	4.0	4.7	0.8	−3.1	0.6
Public consumption												
Advanced economies	**1.8**	**2.1**	**2.8**	**3.3**	**2.4**	**1.8**	**1.2**	**1.8**	**2.2**	**2.4**	**2.6**	**0.4**
United States	1.0	1.8	3.1	4.3	2.5	1.5	0.3	1.6	1.9	2.8	2.4	−2.5
Euro area	. . .	2.0	2.1	2.4	1.7	1.6	1.5	1.9	2.3	2.0	2.3	2.1
Germany	1.7	1.4	0.5	1.5	0.4	−0.7	0.4	0.6	2.2	2.0	3.1	4.0
France	1.6	1.6	1.1	1.9	2.0	2.2	1.3	1.4	1.3	1.6	1.7	1.7
Italy	0.2	1.6	3.9	2.4	1.9	2.2	1.9	0.5	1.0	0.6	1.0	0.9
Spain	3.2	4.4	3.9	4.5	4.8	6.3	5.5	4.6	4.9	5.3	4.4	0.5
Japan	3.1	1.8	3.0	2.4	2.3	1.9	1.6	0.4	2.0	0.9	2.3	1.3
United Kingdom	1.3	2.5	2.4	3.4	3.5	3.4	1.7	1.6	1.5	3.4	2.7	1.6
Canada	0.8	2.9	3.9	2.5	3.1	2.0	1.5	3.8	3.7	3.4	2.1	2.6
Other advanced economies	2.9	2.9	3.2	3.5	2.5	1.7	2.3	2.9	2.6	2.8	4.4	2.8
Memorandum												
Major advanced economies	1.5	1.8	2.7	3.2	2.3	1.6	0.9	1.3	1.9	2.3	2.3	−0.2
Newly industrialized Asian economies	4.4	3.6	3.8	4.0	2.7	1.9	2.7	3.8	3.5	3.4	6.7	4.1
Gross fixed capital formation												
Advanced economies	**3.6**	**−0.3**	**−0.7**	**−1.5**	**2.1**	**4.5**	**4.5**	**3.8**	**2.0**	**−1.8**	**−12.5**	**−2.6**
United States	5.7	−1.3	−1.7	−3.5	3.2	6.1	5.8	2.0	−2.0	−3.5	−14.5	−3.1
Euro area	. . .	0.1	0.6	−1.4	1.3	2.3	3.3	5.5	4.3	0.7	−11.2	−3.7
Germany	2.2	−1.3	−3.7	−6.1	−0.3	−0.3	1.1	7.7	4.3	4.4	−12.6	−6.3
France	1.7	1.4	2.3	−1.6	2.2	3.3	4.4	5.1	5.0	0.5	−5.1	−1.4
Italy	1.3	−0.7	2.7	3.7	−1.2	2.3	0.8	2.9	2.0	−3.0	−14.9	−0.9
Spain	3.3	0.6	4.8	3.4	5.9	5.1	7.0	7.1	5.3	−3.0	−19.1	−7.3
Japan	−0.7	−1.6	−0.9	−4.9	−0.5	1.4	3.1	0.5	1.1	−4.6	−10.7	0.6
United Kingdom	2.8	0.5	2.6	3.6	1.1	4.9	2.2	6.0	6.8	−3.1	−11.4	−6.2
Canada	2.8	3.3	4.0	1.6	6.2	7.8	9.2	7.1	3.9	0.8	−8.0	1.3
Other advanced economies	4.8	1.2	−3.8	4.0	2.8	7.2	4.3	5.7	6.4	0.3	−12.3	−0.9
Memorandum												
Major advanced economies	3.4	−0.8	−0.6	−2.6	1.9	4.3	4.4	3.1	0.8	−2.3	−12.6	−2.7
Newly industrialized Asian economies	6.5	−0.7	−5.7	2.4	2.5	7.8	1.8	4.0	4.9	−2.7	−17.9	−1.1

Table A3 *(concluded)*

	Ten-Year Averages		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	1991–2000	2001–10										
Final domestic demand												
Advanced economies	**2.8**	**1.3**	**1.7**	**1.7**	**2.0**	**2.9**	**2.7**	**2.7**	**2.3**	**0.4**	**–2.9**	**–0.2**
United States	3.5	1.5	1.8	1.8	2.8	3.8	3.1	2.6	1.8	0.0	–2.7	–0.2
Euro area	. . .	1.0	1.7	0.7	1.3	1.7	2.1	2.7	2.3	0.8	–2.8	–0.6
Germany	2.1	0.0	0.4	–1.4	0.1	–0.1	0.4	2.2	1.1	1.4	–2.8	–1.5
France	1.7	1.7	2.2	1.4	2.0	2.6	2.6	2.7	2.7	1.2	–0.9	0.4
Italy	1.3	0.4	1.7	1.3	0.7	1.4	1.2	1.4	1.3	–1.0	–4.0	0.0
Spain	2.9	2.2	3.9	3.2	4.0	4.8	5.2	4.9	4.2	0.1	–6.2	–1.7
Japan	1.2	0.4	1.2	–0.2	0.5	1.6	1.9	1.1	1.1	–0.6	–2.6	0.5
United Kingdom	2.5	1.6	2.9	3.5	2.8	3.3	1.9	2.6	3.4	1.0	–3.8	–1.6
Canada	2.2	2.8	2.9	3.0	3.7	3.9	4.4	4.8	4.2	2.5	–2.8	1.2
Other advanced economies	4.1	2.0	1.0	4.2	2.0	4.0	3.5	3.8	4.5	1.2	–4.0	0.4
Memorandum												
Major advanced economies	2.6	1.2	1.7	1.3	2.0	2.8	2.5	2.4	1.9	0.2	–2.7	–0.2
Newly industrialized Asian economies	5.9	1.6	1.0	5.2	1.4	3.6	3.2	3.8	4.4	0.3	–6.3	0.5
Stock building[1]												
Advanced economies	**0.0**	**–0.1**	**–0.6**	**0.0**	**0.1**	**0.3**	**–0.1**	**0.0**	**–0.1**	**0.0**	**–0.4**	**0.2**
United States	0.1	–0.1	–0.9	0.4	0.0	0.4	–0.1	0.0	–0.4	–0.2	–0.6	0.4
Euro area	. . .	–0.1	–0.4	–0.3	0.1	0.2	–0.1	0.0	0.1	0.0	–0.1	0.0
Germany	–0.1	–0.1	–0.9	–0.6	0.5	0.0	–0.4	0.0	0.1	0.1	–0.1	0.0
France	0.1	–0.1	–0.5	–0.3	–0.3	0.6	0.1	–0.1	0.3	–0.2	–1.1	0.3
Italy	0.0	0.1	0.1	0.0	0.1	–0.1	–0.3	0.5	0.0	–0.2	0.7	0.0
Spain	–0.1	0.0	–0.1	0.0	–0.1	0.0	–0.1	0.2	–0.1	0.0	–0.2	0.0
Japan	0.0	0.0	–0.2	–0.3	0.2	0.3	–0.1	0.2	0.3	–0.1	–0.3	0.0
United Kingdom	0.1	–0.1	0.1	–0.3	0.2	0.0	0.0	0.0	0.2	–0.4	–1.0	0.6
Canada	0.2	–0.1	–1.7	0.2	0.8	0.1	0.3	–0.1	0.1	–0.1	–0.4	0.0
Other advanced economies	0.0	0.0	–0.5	0.1	–0.1	0.6	0.0	0.0	–0.1	0.3	–0.1	0.0
Memorandum												
Major advanced economies	0.0	–0.1	–0.6	0.1	0.1	0.3	–0.1	0.1	–0.1	–0.2	–0.5	0.3
Newly industrialized Asian economies	0.0	0.1	–0.9	0.4	–0.4	1.0	–0.1	0.2	–0.3	1.1	0.0	0.0
Foreign balance[1]												
Advanced economies	**0.0**	**0.0**	**0.1**	**–0.1**	**–0.3**	**–0.2**	**–0.1**	**0.2**	**0.4**	**0.4**	**–0.3**	**0.0**
United States	–0.4	0.0	–0.2	–0.7	–0.4	–0.7	–0.2	0.0	0.6	1.3	0.7	–0.2
Euro area	. . .	0.0	0.6	0.5	–0.6	0.3	–0.1	0.2	0.3	0.0	–0.9	0.1
Germany	0.0	0.5	1.7	2.0	–0.8	1.4	0.7	1.0	1.4	–0.3	–2.9	0.5
France	0.2	–0.5	0.1	–0.1	–0.6	–0.9	–0.7	–0.3	–0.9	–0.3	–0.9	–0.2
Italy	0.2	–0.2	0.2	–0.8	–0.8	0.2	–0.3	0.0	0.2	0.3	–0.7	–0.4
Spain	–0.1	–0.2	–0.2	–0.6	–0.8	–1.7	–1.7	–1.5	–0.8	1.0	3.7	1.0
Japan	0.1	0.0	–0.8	0.7	0.7	0.8	0.3	0.8	1.1	0.1	–3.6	0.0
United Kingdom	0.0	–0.1	–0.5	–1.1	–0.1	–0.7	0.1	0.1	–0.7	0.2	0.9	0.6
Canada	0.6	–0.9	0.7	–0.1	–2.5	–0.9	–1.7	–1.3	–1.5	–1.9	0.4	–0.1
Other advanced economies	0.5	0.3	0.8	–0.2	0.6	0.2	0.6	0.8	0.7	–0.2	–0.3	0.2
Memorandum												
Major advanced economies	–0.1	0.0	0.0	–0.2	–0.4	–0.2	–0.1	0.1	0.4	0.6	–0.5	–0.1
Newly industrialized Asian economies	0.4	1.1	1.3	0.6	2.2	1.2	1.6	1.6	2.0	–0.3	0.1	0.4

[1]Changes expressed as percent of GDP in the preceding period.

Table A4. Emerging and Developing Economies, by Country: Real GDP[1]

(Annual percent change)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Africa	**2.4**	**4.9**	**6.5**	**5.5**	**6.7**	**5.8**	**6.1**	**6.2**	**5.2**	**2.0**	**3.9**	**5.4**
Algeria	1.6	2.7	4.7	6.9	5.2	5.1	2.0	3.0	3.0	2.1	3.9	4.3
Angola	1.3	3.1	14.5	3.3	11.2	20.6	18.6	20.3	14.8	−3.6	9.3	6.1
Benin	4.5	6.2	4.4	4.0	3.0	2.9	3.8	4.6	5.0	3.8	3.0	6.0
Botswana	6.4	3.5	9.0	6.3	6.0	1.6	5.1	4.4	2.9	−10.4	14.3	3.5
Burkina Faso	5.3	6.6	4.7	7.3	4.6	7.1	5.5	3.6	5.0	3.5	4.1	6.0
Burundi	−1.7	2.1	4.4	−1.2	4.8	0.9	5.1	3.6	4.5	3.5	3.8	5.0
Cameroon[2]	1.4	4.5	4.0	4.0	3.7	2.3	3.2	3.5	3.4	2.4	2.6	4.7
Cape Verde	6.8	6.1	5.3	4.7	4.3	6.5	10.8	7.8	5.9	2.5	3.0	6.4
Central African Republic	1.0	0.6	−0.6	−7.1	1.0	2.4	3.8	3.7	2.2	2.4	3.1	5.1
Chad	2.8	11.7	8.5	14.7	33.6	7.9	0.2	0.2	−0.4	2.8	2.5	1.8
Comoros	1.1	3.3	4.1	2.5	−0.2	4.2	1.2	0.5	1.0	0.8	1.5	4.0
Congo, Dem. Rep. of	−5.6	−2.1	3.5	5.8	6.6	7.9	5.6	6.3	6.2	2.7	5.5	7.5
Congo, Rep. of	1.4	3.8	4.6	0.8	3.5	7.8	6.2	−1.6	5.6	9.5	11.9	2.8
Côte d'Ivoire	3.1	0.0	−1.6	−1.7	1.6	1.9	0.7	1.6	2.3	3.7	4.2	6.0
Djibouti	−1.7	2.0	2.6	3.2	3.0	3.2	4.8	5.1	5.8	5.1	5.4	7.1
Equatorial Guinea	31.6	63.4	19.5	14.0	38.0	9.7	1.3	21.4	11.3	−5.4	−2.8	−1.9
Eritrea	. . .	8.8	3.0	−2.7	1.5	2.6	−1.0	1.3	1.0	1.1	4.7	3.1
Ethiopia	2.9	7.7	1.2	−3.5	9.8	12.6	11.5	11.5	11.6	6.5	6.5	7.7
Gabon	1.7	2.1	−0.3	2.4	1.1	3.0	1.2	5.6	2.0	0.7	2.7	2.8
Gambia, The	4.2	5.8	−3.2	6.9	7.0	5.1	6.5	6.3	5.9	4.0	4.4	5.5
Ghana	4.5	4.2	4.5	5.2	5.6	5.9	6.4	6.1	7.2	4.5	4.7	5.8
Guinea	4.1	3.8	4.2	1.2	2.3	3.0	2.5	1.8	4.0	2.6	4.1	5.0
Guinea-Bissau	0.9	−0.6	−4.2	−0.6	2.2	3.5	0.6	2.7	3.3	1.9	3.1	4.4
Kenya	1.7	4.7	0.3	2.8	4.6	5.9	6.4	7.0	2.0	3.0	4.0	6.5
Lesotho	3.8	3.0	1.6	3.9	4.6	0.7	8.1	5.1	3.5	0.6	3.0	4.4
Liberia	. . .	2.9	3.7	−31.3	2.6	5.3	7.8	9.5	7.1	4.9	7.5	12.9
Madagascar	1.7	6.0	−12.4	9.8	5.3	4.6	5.0	6.2	5.0	−0.2	2.0	5.7
Malawi	3.4	−4.1	1.7	5.7	5.4	3.3	6.7	8.6	9.7	6.9	6.0	5.3
Mali	3.6	12.1	4.3	7.2	1.2	6.1	5.3	4.3	5.0	3.9	4.1	5.3
Mauritania	2.9	2.9	1.1	5.6	5.2	5.4	11.4	1.0	2.2	2.3	4.7	5.9
Mauritius	6.0	4.2	1.5	3.8	4.8	3.4	3.5	4.2	6.6	2.1	2.3	4.2
Morocco	2.4	7.6	3.3	6.3	4.8	3.0	7.8	2.7	5.4	4.4	4.4	6.0
Mozambique	6.5	12.3	9.2	6.5	7.9	8.4	8.7	7.0	6.2	4.3	4.0	6.5
Namibia	3.9	1.2	4.8	4.3	12.3	2.5	7.2	4.1	2.9	−0.7	1.8	3.1
Niger	1.0	8.0	5.3	7.1	−0.8	8.4	5.8	3.3	9.5	3.0	4.5	5.6
Nigeria	1.9	8.2	21.2	10.3	10.6	5.4	6.2	6.4	5.3	2.9	2.6	6.3
Rwanda	0.7	8.5	11.0	0.3	5.3	7.2	7.3	7.9	11.2	5.6	5.8	6.1
São Tomé and Príncipe	1.5	3.1	11.6	5.4	6.6	5.7	6.7	6.0	5.8	5.0	6.0	8.0
Senegal	3.1	4.6	0.7	6.7	5.9	5.6	2.4	4.7	2.5	3.1	3.4	4.9
Seychelles	4.5	−2.3	1.2	−5.9	−2.9	7.5	8.3	7.3	0.1	−9.6	2.6	5.0
Sierra Leone	−7.6	18.2	27.4	9.5	7.4	7.3	7.4	6.4	5.5	4.5	5.3	5.6
South Africa	1.8	2.7	3.7	3.1	4.9	5.0	5.3	5.1	3.1	−0.3	1.9	4.4
Sudan	3.5	6.2	5.4	7.1	5.1	6.3	11.3	10.2	6.8	4.0	5.0	5.0
Swaziland	2.9	1.0	1.8	3.9	2.5	2.2	2.9	3.5	2.5	0.5	2.6	2.5
Tanzania	2.9	6.0	7.2	6.9	7.8	7.4	6.7	7.1	7.5	5.0	5.7	7.5
Togo	0.9	−2.3	−0.3	5.2	2.4	1.2	3.9	1.9	1.1	1.7	2.1	4.0
Tunisia	4.7	5.0	1.7	5.6	6.0	4.0	5.5	6.3	4.5	3.3	3.8	6.0
Uganda	6.2	5.2	8.7	6.5	6.8	6.3	10.8	8.6	9.5	6.2	5.5	7.0
Zambia	−0.2	4.9	3.3	5.1	5.4	5.3	6.2	6.3	6.0	4.0	4.5	5.9
Zimbabwe[3]	0.6	−2.7	−4.4	−10.4	−3.6	−4.0	−5.4	−6.1	. . .	. . .	. . .	. . .

Table A4 *(continued)*

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Central and eastern Europe[4]	**2.0**	**0.0**	**4.4**	**4.9**	**7.3**	**6.0**	**6.6**	**5.4**	**2.9**	**–3.7**	**0.8**	**4.0**
Albania	1.3	7.0	4.2	5.8	5.7	5.8	5.5	6.3	6.8	0.4	2.0	6.0
Bosnia and Herzegovina	. . .	3.6	5.0	3.5	6.3	3.9	6.9	6.8	5.5	–3.0	0.5	4.5
Bulgaria	–4.0	4.1	4.5	5.0	6.6	6.2	6.3	6.2	6.0	–2.0	–1.0	5.0
Croatia	. . .	3.8	5.4	5.0	4.2	4.2	4.7	5.5	2.4	–3.5	0.3	4.0
Estonia	. . .	7.7	7.8	7.1	7.5	9.2	10.4	6.3	–3.6	–10.0	–1.0	4.5
Hungary	1.0	4.1	4.1	4.2	4.8	4.0	4.0	1.1	0.6	–3.3	–0.4	4.5
Latvia	. . .	8.0	6.5	7.2	8.7	10.6	12.2	10.0	–4.6	–12.0	–2.0	4.0
Lithuania	. . .	6.7	6.9	10.2	7.4	7.8	7.8	8.9	3.0	–10.0	–3.0	5.5
Macedonia, FYR	. . .	–4.5	0.9	2.8	4.1	4.1	4.0	5.9	5.0	–2.0	1.0	2.0
Montenegro	. . .	1.1	1.9	2.5	4.4	4.2	8.6	10.7	7.5	–2.7	–2.0	4.0
Poland	3.8	1.2	1.4	3.9	5.3	3.6	6.2	6.7	4.8	–0.7	1.3	4.3
Romania	–1.6	5.6	5.0	5.3	8.5	4.1	7.9	6.2	7.1	–4.1	–0.0	4.1
Serbia	. . .	5.6	3.9	2.4	8.3	5.6	5.2	6.9	5.4	–2.0	0.0	5.5
Turkey	3.7	–5.7	6.2	5.3	9.4	8.4	6.9	4.7	1.1	–5.1	1.5	3.5
Commonwealth of Independent States[4,5]	. . .	**6.1**	**5.2**	**7.8**	**8.2**	**6.7**	**8.4**	**8.6**	**5.5**	**–5.1**	**1.2**	**5.3**
Russia	. . .	5.1	4.7	7.3	7.2	6.4	7.7	8.1	5.6	–6.0	0.5	5.0
Excluding Russia	. . .	8.9	6.6	9.1	10.8	7.4	10.2	9.9	5.3	–2.9	3.1	5.9
Armenia	. . .	9.6	13.2	14.0	10.5	14.0	13.2	13.8	6.8	–5.0	0.0	5.0
Azerbaijan	. . .	6.5	8.1	10.5	10.4	24.3	30.5	23.4	11.6	2.5	12.3	–0.8
Belarus	. . .	4.7	5.0	7.0	11.4	9.4	10.0	8.6	10.0	–4.3	1.6	5.7
Georgia	. . .	4.7	5.5	11.1	5.9	9.6	9.4	12.4	2.0	1.0	3.0	5.0
Kazakhstan	. . .	13.5	9.8	9.3	9.6	9.7	10.7	8.9	3.2	–2.0	1.5	8.0
Kyrgyz Republic	. . .	5.3	–0.0	7.0	7.0	–0.2	3.1	8.5	7.6	0.9	2.9	5.6
Moldova	. . .	6.1	7.8	6.6	7.4	7.5	4.8	4.0	7.2	–3.4	0.0	5.0
Mongolia	0.3	0.2	4.7	7.0	10.6	7.3	8.6	10.2	8.9	2.7	4.3	6.0
Tajikistan	. . .	10.2	9.1	10.2	10.6	6.7	7.0	7.8	7.9	2.0	3.0	7.0
Turkmenistan	. . .	20.4	15.8	17.1	14.7	13.0	11.4	11.6	9.8	6.9	7.0	8.4
Ukraine	. . .	9.2	5.2	9.6	12.1	2.7	7.3	7.9	2.1	–8.0	1.0	6.0
Uzbekistan	. . .	4.2	4.0	4.2	7.7	7.0	7.3	9.5	9.0	7.0	7.0	6.0

Table A4 *(continued)*

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Developing Asia	**7.4**	**5.8**	**6.9**	**8.2**	**8.6**	**9.0**	**9.8**	**10.6**	**7.7**	**4.8**	**6.1**	**8.8**
Afghanistan, I.R. of	. . .	. . .	. . .	15.1	8.8	16.1	8.2	12.1	3.4	9.0	7.0	9.4
Bangladesh	4.9	4.8	4.8	5.8	6.1	6.3	6.5	6.3	5.6	5.0	5.4	7.0
Bhutan	5.0	6.8	10.9	7.2	6.8	7.0	8.8	17.9	6.6	5.7	6.6	6.7
Brunei Darussalam	. . .	2.7	3.9	2.9	0.5	0.4	4.4	0.6	−1.5	0.2	0.6	1.7
Cambodia	. . .	8.1	6.6	8.5	10.3	13.3	10.8	10.2	6.0	−0.5	3.0	7.5
China	10.4	8.3	9.1	10.0	10.1	10.4	11.6	13.0	9.0	6.5	7.5	10.0
Fiji	5.0	2.0	3.2	1.0	5.5	0.7	3.3	−6.6	0.2	−1.8	1.2	2.8
India	5.6	3.9	4.6	6.9	7.9	9.2	9.8	9.3	7.3	4.5	5.6	8.0
Indonesia	4.0	3.6	4.5	4.8	5.0	5.7	5.5	6.3	6.1	2.5	3.5	6.0
Kiribati	5.2	−5.1	6.1	2.3	2.2	0.0	3.2	−0.5	3.4	1.5	1.1	1.1
Lao PDR	6.3	5.7	5.9	6.1	6.4	7.1	8.4	7.5	7.2	4.4	4.7	7.1
Malaysia	7.1	0.5	5.4	5.8	6.8	5.3	5.8	6.3	4.6	−3.5	1.3	6.0
Maldives	7.5	3.5	6.5	8.5	9.5	−4.6	18.0	7.2	5.7	−1.3	2.9	5.5
Myanmar	7.1	11.3	12.0	13.8	13.6	13.6	13.1	11.9	4.5	5.0	4.0	4.0
Nepal	5.0	5.6	0.1	3.9	4.7	3.1	3.7	3.2	4.7	3.6	3.3	5.5
Pakistan	3.9	2.0	3.2	4.8	7.4	7.7	6.2	6.0	6.0	2.5	3.5	7.0
Papua New Guinea	4.6	−0.1	−0.2	2.2	2.7	3.6	2.6	6.5	7.0	3.9	3.7	2.4
Philippines	3.0	1.8	4.4	4.9	6.4	5.0	5.4	7.2	4.6	0.0	1.0	5.0
Samoa	3.2	8.1	5.5	2.1	2.4	6.0	1.8	6.0	4.5	4.0	3.5	3.5
Solomon Islands	2.5	−8.0	−2.8	6.5	8.0	5.0	6.1	10.2	7.3	4.0	3.4	7.3
Sri Lanka	5.2	−1.5	4.0	5.9	5.4	6.2	7.7	6.8	6.0	2.2	3.6	5.5
Thailand	4.4	2.2	5.3	7.1	6.3	4.6	5.2	4.9	2.6	−3.0	1.0	6.0
Timor-Leste	. . .	18.9	2.4	0.1	4.2	6.2	−5.8	8.4	12.8	7.2	7.9	7.8
Tonga	1.6	2.6	3.0	3.2	1.4	5.4	0.6	−3.2	1.2	2.6	1.9	1.6
Vanuatu	2.8	−2.5	−7.4	3.2	5.5	6.5	7.4	6.8	6.6	3.0	3.5	4.5
Vietnam	7.6	6.9	7.1	7.3	7.8	8.4	8.2	8.5	6.2	3.3	4.0	7.0
Middle East	**4.0**	**2.6**	**3.8**	**7.0**	**6.0**	**5.8**	**5.7**	**6.3**	**5.9**	**2.5**	**3.5**	**4.5**
Bahrain	4.6	4.6	5.2	7.2	5.6	7.9	6.7	8.1	6.1	2.6	3.5	4.9
Egypt	4.4	3.5	3.2	3.2	4.1	4.5	6.8	7.1	7.2	3.6	3.0	6.0
Iran, I.R. of	3.7	3.7	7.5	7.2	5.1	4.7	5.8	7.8	4.5	3.2	3.0	2.2
Iraq	. . .	. . .	. . .	. . .	. . .	−0.7	6.2	1.5	9.8	6.9	6.7	4.7
Jordan	4.7	5.3	5.8	4.2	8.6	8.1	8.0	6.6	6.0	3.0	4.0	5.5
Kuwait	3.7	0.2	3.0	17.3	10.2	10.6	5.1	2.5	6.3	−1.1	2.4	4.6
Lebanon	7.1	4.5	3.3	4.1	7.5	2.6	0.6	7.5	8.5	3.0	4.0	4.5
Libya	0.2	−4.3	−1.3	13.0	4.4	10.3	6.7	6.8	6.7	1.1	2.8	8.4
Oman	4.6	7.5	2.6	2.0	5.3	6.0	6.8	6.4	6.2	3.0	3.8	6.5
Qatar	6.9	6.3	3.2	6.3	17.7	9.2	15.0	15.3	16.4	18.0	16.4	3.3
Saudi Arabia	2.7	0.5	0.1	7.7	5.3	5.6	3.0	3.5	4.6	−0.9	2.9	5.1
Syrian Arab Republic	4.8	3.7	5.9	−2.1	6.7	4.5	5.1	4.2	5.2	3.0	2.8	5.2
United Arab Emirates	4.4	1.7	2.6	11.9	9.7	8.2	9.4	6.3	7.4	−0.6	1.6	5.1
Yemen, Rep. of	5.7	3.8	3.9	3.7	4.0	5.6	3.2	3.3	3.9	7.7	4.7	4.5

Table A4 *(concluded)*

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Western Hemisphere	**3.3**	**0.7**	**0.6**	**2.2**	**6.0**	**4.7**	**5.7**	**5.7**	**4.2**	**−1.5**	**1.6**	**4.3**
Antigua and Barbuda	3.4	1.5	2.0	4.3	5.2	5.5	12.4	6.9	4.2	−2.0	0.0	4.9
Argentina	4.2	−4.4	−10.9	8.8	9.0	9.2	8.5	8.7	7.0	−1.5	0.7	3.0
Bahamas, The	2.1	0.8	2.3	1.0	−0.2	3.3	4.6	2.8	−1.3	−4.5	−0.5	1.8
Barbados	1.0	−2.6	0.7	2.0	4.8	3.9	3.2	3.4	0.6	−3.5	0.5	3.0
Belize	6.0	5.0	5.1	9.3	4.6	3.0	4.7	1.2	3.0	1.0	2.0	2.5
Bolivia	3.8	1.7	2.5	2.7	4.2	4.4	4.8	4.6	5.9	2.2	2.9	3.6
Brazil	2.5	1.3	2.7	1.1	5.7	3.2	4.0	5.7	5.1	−1.3	2.2	4.5
Chile	6.5	3.5	2.2	4.0	6.0	5.6	4.6	4.7	3.2	0.1	3.0	5.0
Colombia	2.7	2.2	2.5	4.6	4.7	5.7	6.9	7.5	2.5	0.0	1.3	4.5
Costa Rica	5.2	1.1	2.9	6.4	4.3	5.9	8.8	7.8	2.9	0.5	1.5	5.2
Dominica	2.1	−4.2	−5.1	0.1	3.0	3.3	4.0	1.5	2.6	1.1	2.0	3.0
Dominican Republic	6.1	1.8	5.8	−0.3	1.3	9.3	10.7	8.5	4.8	0.5	2.0	7.0
Ecuador	2.2	5.3	4.2	3.6	8.0	6.0	3.9	2.5	5.3	−2.0	1.0	3.0
El Salvador	4.6	1.7	2.3	2.3	1.9	3.1	4.2	4.7	2.5	0.0	0.5	4.5
Grenada	4.5	−3.0	1.6	7.1	−5.7	11.0	−2.3	4.5	0.3	−0.7	1.0	3.9
Guatemala	3.7	2.4	3.9	2.5	3.2	3.3	5.4	6.3	4.0	1.0	1.8	4.0
Guyana	4.9	2.3	1.1	−0.7	1.6	−1.9	5.1	5.4	3.2	2.6	3.4	3.8
Haiti	0.3	−1.0	−0.3	0.4	−3.5	1.8	2.3	3.4	1.3	1.0	2.0	3.7
Honduras	3.3	2.7	3.8	4.5	6.2	6.1	6.6	6.3	4.0	1.5	1.9	3.0
Jamaica	0.5	1.3	1.0	3.5	1.4	1.0	2.7	1.4	−1.2	−2.6	−0.3	2.1
Mexico	3.5	−0.2	0.8	1.7	4.0	3.2	5.1	3.3	1.3	−3.7	1.0	4.9
Nicaragua	3.6	3.0	0.8	2.5	5.3	4.4	3.9	3.2	3.0	0.5	1.0	4.0
Panama	5.5	0.6	2.2	4.2	7.5	7.2	8.5	11.5	9.2	3.0	4.0	6.5
Paraguay	1.8	2.1	0.0	3.8	4.1	2.9	4.3	6.8	5.8	0.5	1.5	5.0
Peru	4.0	0.2	5.0	4.0	5.0	6.8	7.7	8.9	9.8	3.5	4.5	5.5
St. Kitts and Nevis	4.1	2.0	1.0	0.5	7.6	5.6	5.3	2.9	3.0	−1.2	0.0	2.0
St. Lucia	2.2	−4.1	0.6	3.5	4.5	3.8	5.0	1.7	1.7	−1.4	0.0	4.2
St. Vincent and the Grenadines	3.1	−0.1	3.2	2.8	6.8	2.6	7.6	7.0	0.9	0.1	1.2	4.1
Suriname	0.7	6.8	2.6	6.0	8.2	4.5	4.8	5.5	6.5	2.8	2.5	4.7
Trinidad and Tobago	4.5	3.8	7.9	14.4	7.8	5.4	13.3	5.5	3.4	0.5	2.0	3.3
Uruguay	3.0	−3.8	−7.7	0.8	5.0	7.5	4.6	7.6	8.9	1.3	2.0	3.8
Venezuela	2.1	3.4	−8.9	−7.8	18.3	10.3	10.3	8.4	4.8	−2.2	−0.5	0.5

[1]For many countries, figures for recent years are IMF staff estimates. Data for some countries are for fiscal years.

[2]The percent changes in 2002 are calculated over a period of 18 months, reflecting a change in the fiscal year cycle (from July–June to January–December).

[3]Given recent trends, it is not possible to forecast GDP with any precision and consequently no data are shown for 2008 and beyond.

[4]Data for some countries refer to real net material product (NMP) or are estimates based on NMP. For many countries, figures for recent years are IMF staff estimates. The figures should be interpreted only as indicative of broad orders of magnitude because reliable, comparable data are not generally available. In particular, the growth of output of new private enterprises of the informal economy is not fully reflected in the recent figures.

[5]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A5. Summary of Inflation

(Percent)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
GDP deflators												
Advanced economies	**2.4**	**2.0**	**1.6**	**1.7**	**2.0**	**2.1**	**2.1**	**2.2**	**2.0**	**0.8**	**0.6**	**1.6**
United States	2.1	2.4	1.7	2.1	2.9	3.3	3.2	2.7	2.2	0.9	0.4	2.0
Euro area	. . .	2.5	2.6	2.2	1.9	2.0	2.0	2.3	2.3	1.0	1.0	1.7
Japan	0.2	–1.2	–1.5	–1.6	–1.1	–1.2	–0.9	–0.7	–1.0	0.9	–0.7	0.5
Other advanced economies[1]	3.2	2.1	1.8	2.2	2.3	2.0	2.0	2.6	2.9	1.0	1.8	1.9
Consumer prices												
Advanced economies	**2.7**	**2.2**	**1.5**	**1.8**	**2.0**	**2.3**	**2.4**	**2.2**	**3.4**	**–0.2**	**0.3**	**1.9**
United States	2.8	2.8	1.6	2.3	2.7	3.4	3.2	2.9	3.8	–0.9	–0.1	2.2
Euro area[2]	. . .	2.4	2.3	2.1	2.2	2.2	2.2	2.1	3.3	0.4	0.6	1.5
Japan	0.8	–0.7	–0.9	–0.3	0.0	–0.3	0.3	0.0	1.4	–1.0	–0.6	1.0
Other advanced economies[1]	3.3	2.2	1.7	1.8	1.8	2.1	2.1	2.1	3.8	0.8	1.1	2.2
Emerging and developing economies	**44.5**	**7.7**	**6.8**	**6.7**	**5.9**	**5.7**	**5.4**	**6.4**	**9.3**	**5.7**	**4.7**	**4.2**
Regional groups												
Africa	24.6	10.9	9.1	8.7	6.6	7.1	6.3	6.3	10.1	9.0	6.3	4.8
Central and eastern Europe	59.4	24.4	18.9	11.3	6.6	5.6	5.7	6.1	8.0	4.6	4.2	3.3
Commonwealth of Independent States[3]	. . .	20.3	14.0	12.3	10.4	12.1	9.4	9.7	15.6	12.6	9.5	6.9
Developing Asia	8.2	2.8	2.1	2.6	4.1	3.8	4.2	5.4	7.4	2.8	2.4	2.8
Middle East	10.3	3.8	5.3	6.1	7.1	6.2	6.8	10.5	15.6	11.0	8.5	5.8
Western Hemisphere	64.8	6.5	8.6	10.4	6.6	6.3	5.3	5.4	7.9	6.6	6.2	6.3
Memorandum												
European Union	7.6	3.0	2.5	2.2	2.3	2.3	2.3	2.4	3.7	0.8	0.8	1.7
Analytical groups												
By source of export earnings												
Fuel	78.0	13.6	12.0	11.5	9.9	9.6	8.4	9.8	15.3	12.3	10.6	8.4
Nonfuel	35.8	6.3	5.6	5.5	5.0	4.8	4.7	5.6	7.9	4.2	3.4	3.3
of which, primary products	51.3	15.1	8.5	6.1	3.7	6.6	6.7	7.0	10.9	7.1	5.8	4.6
By external financing source												
Net debtor countries	42.6	8.3	8.1	7.4	5.4	5.7	5.7	5.9	8.6	6.3	4.7	4.2
of which, official financing	22.1	6.3	3.7	5.9	6.7	7.8	8.0	8.4	14.8	9.6	6.2	4.9
Net debtor countries by debt-servicing experience												
Countries with arrears and/or rescheduling during 2003–07	32.1	9.3	12.8	9.5	6.8	8.2	8.7	8.1	11.1	10.4	6.6	6.0
Memorandum												
Median inflation rate												
Advanced economies	2.6	2.6	2.3	2.1	2.0	2.1	2.2	2.1	3.8	0.5	1.0	2.0
Emerging and developing economies	9.7	4.7	3.6	4.2	4.5	5.7	6.1	6.3	10.4	5.5	5.0	4.0

[1]In this table, "other advanced economies" means advanced economies excluding the United States, euro area countries, and Japan.

[2]Based on Eurostat's harmonized index of consumer prices.

[3]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A6. Advanced Economies: Consumer Prices

(Annual percent change)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	End of Period 2008	2009	2010
Consumer Prices															
Advanced economies	**2.7**	**2.2**	**1.5**	**1.8**	**2.0**	**2.3**	**2.4**	**2.2**	**3.4**	**–0.2**	**0.3**	**1.9**	**1.6**	**0.0**	**0.4**
United States	2.8	2.8	1.6	2.3	2.7	3.4	3.2	2.9	3.8	–0.9	–0.1	2.2	0.8	–0.1	0.1
Euro area[1]	. . .	2.4	2.3	2.1	2.2	2.2	2.2	2.1	3.3	0.4	0.6	1.5	1.6	0.9	0.6
Germany	2.3	1.9	1.4	1.0	1.8	1.9	1.8	2.3	2.8	0.1	–0.4	0.7	1.1	–1.0	–0.4
France	1.8	1.8	1.9	2.2	2.3	1.9	1.9	1.6	3.2	0.5	1.0	1.8	1.2	0.5	1.0
Italy	3.7	2.3	2.6	2.8	2.3	2.2	2.2	2.0	3.5	0.7	0.6	1.8	3.4	0.7	0.6
Spain	4.0	2.8	3.6	3.1	3.1	3.4	3.6	2.8	4.1	0.0	0.9	1.7	1.5	0.4	0.8
Netherlands	2.3	5.1	3.8	2.2	1.4	1.5	1.7	1.6	2.2	0.3	1.1	1.5	2.2	0.3	1.1
Belgium	2.0	2.4	1.6	1.5	1.9	2.5	2.3	1.8	4.5	0.5	1.0	1.5	2.7	0.0	1.4
Greece	9.1	3.7	3.9	3.4	3.0	3.5	3.3	3.0	4.2	1.6	2.1	2.5	3.2	1.9	2.1
Austria	2.0	2.3	1.7	1.3	2.0	2.1	1.7	2.2	3.2	0.5	1.3	1.9	1.5	1.4	1.2
Portugal	4.7	4.4	3.7	3.3	2.5	2.1	3.0	2.4	2.6	0.3	1.0	1.8	2.6	0.3	1.0
Finland	1.9	2.7	2.0	1.3	0.1	0.8	1.3	1.6	3.9	1.0	1.1	1.3	3.4	1.9	1.1
Ireland	2.6	4.0	4.7	4.0	2.3	2.2	2.7	2.9	3.1	–0.6	1.0	1.9	1.3	0.3	1.3
Slovak Republic	. . .	7.2	3.5	8.4	7.5	2.8	4.3	1.9	3.9	1.7	2.3	2.3	3.5	2.0	2.3
Slovenia	. . .	8.4	7.5	5.6	3.6	2.5	2.5	3.6	5.7	0.5	1.5	3.0	2.1	0.5	2.1
Luxembourg	2.2	2.7	2.1	2.0	2.2	2.5	2.7	2.3	3.4	0.2	1.8	1.6	0.9	2.1	1.5
Cyprus	3.8	2.0	2.8	4.0	1.9	2.0	2.2	2.2	4.4	0.9	2.4	2.8	1.8	1.2	2.4
Malta	3.1	2.5	2.6	1.9	2.7	2.5	2.6	0.7	4.7	1.8	1.7	2.5	5.0	1.3	2.0
Japan	0.8	–0.7	–0.9	–0.3	0.0	–0.3	0.3	0.0	1.4	–1.0	–0.6	1.0	0.4	–1.3	–0.4
United Kingdom[1]	2.7	1.2	1.3	1.4	1.3	2.0	2.3	2.3	3.6	1.5	0.8	1.8	3.9	0.8	1.0
Canada	2.0	2.5	2.3	2.7	1.8	2.2	2.0	2.1	2.4	0.0	0.5	2.1	1.9	–0.2	0.9
Korea	5.1	4.1	2.8	3.5	3.6	2.8	2.2	2.5	4.7	1.7	3.0	3.0	4.1	1.5	3.0
Australia	2.2	4.4	3.0	2.8	2.3	2.7	3.5	2.3	4.4	1.6	1.3	2.5	3.7	1.9	1.1
Taiwan Province of China	2.6	0.0	–0.2	–0.3	1.6	2.3	0.6	1.8	3.5	–2.0	1.0	2.0	3.7	–1.0	0.0
Sweden	2.7	2.7	1.9	2.3	1.0	0.8	1.5	1.7	3.3	–0.2	0.0	2.0	2.1	–0.5	0.5
Switzerland	1.9	1.0	0.6	0.6	0.8	1.2	1.0	0.7	2.4	–0.6	–0.3	1.0	1.2	–0.6	–0.3
Hong Kong SAR	5.3	–1.6	–3.0	–2.6	–0.4	0.9	2.0	2.0	4.3	1.0	1.0	2.6	2.0	1.3	1.0
Czech Republic	13.3	4.7	1.9	0.1	2.8	1.8	2.5	2.9	6.3	1.0	1.6	2.0	3.6	1.0	1.6
Norway	2.3	3.0	1.3	2.5	0.5	1.5	2.3	0.7	3.8	1.5	1.9	2.5	2.1	1.0	2.3
Singapore	1.7	1.0	–0.4	0.5	1.7	0.5	1.0	2.1	6.5	0.0	1.1	1.8	5.4	–1.5	2.0
Denmark	2.1	2.4	2.4	2.1	1.2	1.8	1.9	1.7	3.4	–0.3	0.0	2.0	2.9	–0.6	0.3
Israel	9.5	1.1	5.7	0.7	–0.4	1.3	2.1	0.5	4.7	1.4	0.8	2.0	4.8	–0.1	1.1
New Zealand	1.8	2.6	2.6	1.7	2.3	3.0	3.4	2.4	4.0	1.3	1.1	2.1	3.4	0.8	1.3
Iceland	3.2	6.7	4.8	2.1	3.2	4.0	6.8	5.0	12.4	10.6	2.4	2.5	18.1	3.0	2.3
Memorandum															
Major advanced economies	2.4	1.9	1.3	1.7	2.0	2.3	2.3	2.1	3.2	–0.4	0.0	1.8	1.2	–0.2	0.2
Newly industrialized Asian economies	4.1	1.9	1.0	1.4	2.4	2.2	1.6	2.2	4.5	0.4	2.0	2.6	3.9	0.5	1.8

[1]Based on Eurostat's harmonized index of consumer prices.

Table A7. Emerging and Developing Economies, by Country: Consumer Prices[1]
(Annual percent change)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	End of Period 2008	2009	2010
Africa	**24.6**	**10.9**	**9.1**	**8.7**	**6.6**	**7.1**	**6.3**	**6.3**	**10.1**	**9.0**	**6.3**	**4.8**	**11.6**	**7.0**	**5.6**
Algeria	16.3	4.2	1.4	2.6	3.6	1.6	2.5	3.6	4.5	4.6	3.4	3.0	5.8	3.5	3.3
Angola	549.4	152.6	108.9	98.3	43.6	23.0	13.3	12.2	12.5	12.1	8.9	0.0	13.2	10.0	8.0
Benin	7.6	4.0	2.4	1.5	0.9	5.4	3.8	1.3	8.0	4.0	2.8	2.8	9.9	3.5	3.3
Botswana	10.6	6.6	8.0	9.2	7.0	8.6	11.6	7.1	12.6	8.1	5.2	4.0	13.7	5.7	4.8
Burkina Faso	4.4	4.7	2.3	2.0	–0.4	6.4	2.4	–0.2	10.7	4.7	2.3	2.0	11.6	3.3	2.0
Burundi	15.2	9.3	–1.3	10.7	8.0	13.4	2.8	8.3	24.4	10.9	7.5	5.0	25.7	7.8	7.3
Cameroon[2]	4.9	2.8	6.3	0.6	0.3	2.0	4.9	1.1	5.3	2.3	2.0	2.0	5.3	–0.1	2.0
Cape Verde	5.9	3.7	1.9	1.2	–1.9	0.4	4.8	4.4	6.8	3.5	2.7	2.0	6.7	3.3	2.7
Central African Republic	3.9	3.8	2.3	4.4	–2.2	2.9	6.7	0.9	9.3	5.2	2.6	2.5	13.0	3.8	1.5
Chad	4.5	12.4	5.2	–1.8	–4.8	3.7	7.7	–7.4	8.3	3.0	3.0	3.0	9.7	3.0	3.0
Comoros	3.9	5.6	3.6	3.7	4.5	3.0	3.4	4.5	4.8	4.9	2.4	3.0	7.4	2.3	2.5
Congo, Dem. Rep. of	977.6	357.3	25.3	12.8	4.0	21.4	13.2	16.7	18.0	33.9	19.9	8.7	27.6	24.8	15.0
Congo, Rep. of	7.3	0.8	3.0	1.7	3.7	2.5	4.7	2.6	6.0	9.5	5.1	3.0	11.4	6.4	3.8
Côte d'Ivoire	6.0	4.4	3.1	3.3	1.5	3.9	2.5	1.9	6.3	5.9	3.2	2.5	9.0	3.4	3.0
Djibouti	3.6	1.8	0.6	2.0	3.1	3.1	3.5	5.0	12.0	5.5	5.0	3.0	12.0	5.5	5.0
Equatorial Guinea	6.5	8.8	7.6	7.3	4.2	5.7	4.5	2.8	5.9	4.1	6.1	4.1	6.0	5.7	4.9
Eritrea	. . .	14.6	16.9	22.7	25.1	12.5	15.1	9.3	11.0	10.5	9.7	8.5	11.0	10.0	9.5
Ethiopia	7.2	–5.2	–7.2	15.1	8.6	6.8	12.3	15.8	25.3	42.2	13.3	9.1	55.3	15.7	12.1
Gabon	4.0	2.1	0.2	2.1	0.4	1.2	–1.4	5.0	5.3	2.6	3.0	2.5	5.6	0.5	3.0
Gambia, The	4.2	4.5	8.6	17.0	14.3	5.0	2.1	5.4	4.5	6.4	5.7	5.0	6.8	6.0	5.5
Ghana	25.6	32.9	14.8	26.7	12.6	15.1	10.2	10.7	16.5	14.6	7.6	5.0	18.1	11.0	8.0
Guinea	7.3	6.8	5.4	3.0	11.0	17.5	31.4	34.7	22.9	18.4	5.9	5.0	12.8	13.5	10.3
Guinea-Bissau	32.8	3.3	–2.2	–3.5	0.8	5.6	–0.1	4.6	10.4	3.6	3.6	2.6	8.7	2.1	2.9
Kenya	15.9	5.8	2.0	9.8	11.6	10.3	14.5	9.8	13.1	8.3	5.0	5.0	13.8	6.0	5.0
Lesotho	10.5	6.9	12.5	7.3	5.0	3.4	6.1	8.0	10.7	6.6	6.1	5.6	10.6	6.4	5.2
Liberia	. . .	12.1	14.2	10.3	3.6	6.9	7.2	11.4	17.5	2.0	4.5	5.0	9.4	4.0	5.0
Madagascar	16.2	6.9	16.2	–1.1	14.0	18.4	10.8	10.4	9.2	9.4	8.1	5.0	10.1	8.7	7.4
Malawi	30.9	27.2	17.4	9.6	11.4	15.5	13.9	7.9	8.7	10.1	8.0	6.2	9.9	9.2	7.8
Mali	3.6	5.2	4.9	–1.2	–3.1	6.4	1.5	1.5	9.1	2.5	2.8	2.8	7.4	2.9	2.9
Mauritania	5.1	7.7	5.4	5.3	10.4	12.1	6.2	7.3	7.3	4.9	5.8	5.0	3.9	6.0	5.5
Mauritius	7.5	5.4	6.5	3.9	4.7	4.9	8.9	9.1	8.8	7.3	5.1	6.0	9.7	5.0	5.2
Morocco	4.0	0.6	2.8	1.2	1.5	1.0	3.3	2.0	3.9	3.0	2.8	2.6	4.2	3.0	2.8
Mozambique	28.7	9.1	16.8	13.5	12.6	6.4	13.2	8.2	10.3	5.4	5.2	5.3	6.2	5.4	5.3
Namibia	9.9	9.3	11.3	7.2	4.1	2.3	5.1	6.7	10.3	9.1	6.3	5.0	10.9	7.3	5.3
Niger	5.0	4.0	2.7	–1.8	0.4	7.8	0.1	0.1	11.3	5.0	2.3	2.0	13.6	2.0	2.0
Nigeria	28.5	18.0	13.7	14.0	15.0	17.8	8.3	5.5	11.2	14.2	10.1	8.5	15.1	11.9	8.5
Rwanda	16.3	3.4	2.0	7.4	12.0	9.0	8.9	9.1	15.4	11.5	6.3	5.0	22.3	6.0	5.0
São Tomé and Príncipe	35.8	9.5	9.2	9.6	12.8	17.2	23.1	18.5	26.0	17.5	12.8	5.0	24.8	16.0	10.0
Senegal	4.1	3.0	2.3	0.0	0.5	1.7	2.1	5.9	5.8	1.1	2.2	2.2	4.3	2.2	2.2
Seychelles	2.3	6.0	0.2	3.3	3.9	0.6	–1.9	5.3	37.0	39.2	17.9	3.0	63.3	16.3	11.5
Sierra Leone	32.2	2.6	–3.7	7.5	14.2	12.1	9.5	11.7	14.8	10.6	8.9	7.4	12.2	9.0	8.7
South Africa	9.0	5.7	9.2	5.8	1.4	3.4	4.7	7.1	11.5	6.1	5.6	5.1	9.5	5.9	4.7
Sudan	67.9	4.9	8.3	7.7	8.4	8.5	7.2	8.0	14.3	9.0	8.0	5.5	14.9	8.5	7.5
Swaziland	8.9	7.5	11.7	7.4	3.4	4.8	5.3	8.2	13.1	7.9	6.7	5.5	12.9	7.3	6.2
Tanzania	19.6	5.1	4.6	4.4	4.1	4.4	7.3	7.0	10.3	10.9	5.7	5.0	13.5	6.7	5.0
Togo	6.1	3.9	3.1	–0.9	0.4	6.8	2.2	1.0	8.4	2.8	2.1	2.5	7.2	2.0	2.5
Tunisia	4.4	2.0	2.7	2.7	3.6	2.0	4.5	3.1	5.0	3.2	3.4	3.0	4.1	3.2	3.4
Uganda	12.6	4.5	–2.0	5.7	5.0	8.0	6.6	6.8	7.3	13.7	7.4	5.8	12.5	10.3	6.2
Zambia	60.0	21.7	22.2	21.4	18.0	18.3	9.0	10.7	12.4	12.2	8.3	5.0	16.6	10.0	7.0
Zimbabwe[3]	31.7	73.4	133.2	365.0	350.0	237.8	1,016.7	10,452.6	. . .	. . .	. . .	. . .	. . .	. . .	. . .

Table A7 *(continued)*

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	End of Period 2008	2009	2010
Central and eastern Europe[4]	**59.4**	**24.4**	**18.9**	**11.3**	**6.6**	**5.6**	**5.7**	**6.1**	**8.0**	**4.6**	**4.2**	**3.3**	**6.8**	**4.1**	**4.0**
Albania	34.7	3.1	5.2	2.3	2.9	2.4	2.4	2.9	3.4	1.5	2.2	3.0	2.2	1.5	2.4
Bosnia and Herzegovina	. . .	4.5	0.3	0.5	0.3	3.6	6.1	1.5	7.4	2.1	2.3	2.5	3.8	2.0	2.5
Bulgaria	107.9	7.4	5.8	2.3	6.1	6.0	7.4	7.6	12.0	3.7	1.3	3.4	7.2	2.0	0.7
Croatia	. . .	3.8	1.7	1.8	2.0	3.3	3.2	2.9	6.1	2.5	2.8	3.0	5.8	3.0	2.8
Estonia	. . .	5.8	3.6	1.3	3.0	4.1	4.4	6.6	10.4	0.8	–1.3	2.5	7.0	–0.5	–1.0
Hungary	20.0	9.2	5.3	4.6	6.8	3.6	3.9	7.9	6.1	3.8	2.8	3.0	3.5	4.2	2.8
Latvia	. . .	2.5	1.6	3.3	6.2	6.9	6.6	10.1	15.3	3.3	–3.5	2.9	10.4	–1.0	–2.6
Lithuania	. . .	1.6	0.3	–1.1	1.2	2.7	3.8	5.8	11.1	5.1	0.6	1.1	8.5	1.5	–0.3
Macedonia, FYR	. . .	5.5	2.2	1.2	–0.4	0.5	3.2	2.3	8.3	1.0	3.0	3.0	4.1	1.0	3.0
Montenegro	. . .	23.7	19.7	7.5	3.1	3.4	2.1	3.5	9.0	1.7	–0.2	2.1	. . .	. . .	. . .
Poland	26.1	5.5	1.9	0.8	3.5	2.1	1.0	2.5	4.2	2.1	2.6	2.5	3.3	1.8	2.8
Romania	101.1	34.5	22.5	15.3	11.9	9.0	6.6	4.8	7.8	5.9	3.9	3.5	6.3	4.5	3.5
Serbia	. . .	91.8	19.5	11.7	10.1	17.3	12.7	6.5	11.7	10.0	8.2	4.7	2.2	1.5	2.4
Turkey	75.9	54.2	45.1	25.3	8.6	8.2	9.6	8.8	10.4	6.9	6.8	4.0	10.1	6.5	6.5
Commonwealth of Independent States[4,5]	. . .	**20.3**	**14.0**	**12.3**	**10.4**	**12.1**	**9.4**	**9.7**	**15.6**	**12.6**	**9.5**	**6.9**	**14.0**	**11.1**	**8.5**
Russia	. . .	21.5	15.8	13.7	10.9	12.7	9.7	9.0	14.1	12.9	9.9	7.4	13.3	11.0	9.0
Excluding Russia	. . .	17.1	9.2	8.6	9.1	10.6	8.8	11.5	19.6	11.9	8.5	5.8	15.8	11.4	7.3
Armenia	. . .	3.1	1.1	4.7	7.0	0.6	2.9	4.4	9.0	3.6	7.2	4.0	5.2	8.0	4.0
Azerbaijan	. . .	1.5	2.8	2.2	6.7	9.7	8.4	16.6	20.8	4.0	7.0	6.0	15.4	7.0	7.0
Belarus	. . .	61.1	42.6	28.4	18.1	10.3	7.0	8.4	14.8	12.6	6.0	6.8	13.3	9.5	6.8
Georgia	. . .	4.7	5.6	4.8	5.7	8.3	9.2	9.2	10.0	5.0	6.5	6.0	5.5	7.0	6.0
Kazakhstan	. . .	8.4	5.9	6.4	6.9	7.6	8.6	10.8	17.2	9.5	8.7	6.0	9.5	11.0	6.5
Kyrgyz Republic	. . .	6.9	2.1	3.1	4.1	4.3	5.6	10.2	24.5	12.4	8.6	4.7	20.1	10.0	8.2
Moldova	. . .	9.8	5.3	11.7	12.5	11.9	12.7	12.4	12.7	2.6	4.7	4.0	7.3	4.0	5.0
Mongolia	. . .	6.2	0.9	5.1	7.9	12.5	4.5	8.2	26.8	10.1	7.9	5.0	23.2	9.6	7.0
Tajikistan	. . .	38.6	12.2	16.4	7.2	7.3	10.0	13.2	20.4	11.9	11.5	6.5	11.8	13.0	10.0
Turkmenistan	. . .	11.6	8.8	5.6	5.9	10.7	8.2	6.3	15.0	10.0	8.0	6.0	12.0	9.0	7.0
Ukraine	. . .	12.0	0.8	5.2	9.0	13.4	9.0	12.8	25.2	16.8	10.0	5.0	22.3	15.0	8.0
Uzbekistan	. . .	27.3	27.3	11.6	6.6	10.0	14.2	12.3	12.7	12.5	9.5	8.0	14.4	10.2	9.0

Table A7 *(continued)*

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	End of Period 2008	2009	2010
Developing Asia	**8.2**	**2.8**	**2.1**	**2.6**	**4.1**	**3.8**	**4.2**	**5.4**	**7.4**	**2.8**	**2.4**	**2.8**	**5.8**	**2.7**	**2.3**
Afghanistan, I.R. of	. . .	. . .	5.1	24.1	13.2	12.3	5.1	13.0	27.2	5.5	5.4	5.0	8.5	6.0	5.0
Bangladesh	5.6	1.9	3.7	5.4	6.1	7.0	7.1	9.1	8.4	6.4	6.1	4.2	7.2	5.7	6.5
Bhutan	9.2	3.4	2.5	2.1	4.6	5.3	5.0	5.2	7.7	5.0	4.0	3.9	6.4	4.5	4.0
Brunei Darussalam	. . .	0.6	–2.3	0.3	0.9	1.1	0.2	0.3	2.7	1.2	1.2	1.2	. . .	. . .	. . .
Cambodia	. . .	0.2	3.3	1.2	3.9	5.8	4.7	5.9	19.7	5.2	1.4	3.5	13.5	3.5	3.5
China	7.2	0.7	–0.8	1.2	3.9	1.8	1.5	4.8	5.9	0.1	0.7	1.9	2.5	0.8	0.7
Fiji	3.5	4.3	0.8	4.2	2.8	2.4	2.5	4.8	8.0	4.0	4.0	4.0	6.6	4.0	4.0
India	9.0	3.8	4.3	3.8	3.8	4.2	6.2	6.4	8.3	6.3	4.0	4.0	9.7	4.3	4.1
Indonesia	13.2	11.5	11.8	6.8	6.1	10.5	13.1	6.0	9.8	6.1	5.9	3.1	11.1	5.5	4.7
Kiribati	3.0	6.0	3.2	1.6	–0.7	–0.4	–1.5	4.2	11.0	9.1	2.8	2.8	18.6	2.8	2.8
Lao PDR	29.1	7.8	10.6	15.5	10.5	7.2	6.8	4.5	7.6	0.2	2.6	4.0	3.2	3.0	2.5
Malaysia	3.5	1.4	1.8	1.1	1.4	3.0	3.6	2.0	5.4	0.9	2.5	2.5	4.3	1.2	2.5
Maldives	6.7	0.7	0.9	–2.8	6.3	3.3	3.5	7.4	12.3	3.7	5.5	5.5	9.1	4.6	6.2
Myanmar	24.1	34.5	58.1	24.9	3.8	10.7	26.3	32.9	26.4	22.0	20.0	20.0	24.0	20.0	20.0
Nepal	9.2	2.4	2.9	4.7	4.0	4.5	8.0	6.4	7.7	11.1	2.3	4.0	12.1	4.6	4.5
Pakistan	9.1	4.4	2.5	3.1	4.6	9.3	7.9	7.8	12.0	20.0	6.0	6.0	21.5	10.0	6.5
Papua New Guinea	9.5	9.3	11.8	14.7	2.1	1.8	2.4	0.9	10.7	8.2	5.0	3.7	11.2	5.3	4.8
Philippines	8.7	6.8	2.9	3.5	6.0	7.7	6.2	2.8	9.3	3.4	4.5	4.5	8.0	3.0	4.5
Samoa	3.5	1.9	7.4	4.3	7.9	1.9	3.8	6.0	7.1	5.1	4.3	3.0	6.0	4.7	4.3
Solomon Islands	10.4	7.4	9.5	10.5	6.9	7.1	11.1	7.7	18.2	10.5	3.3	7.2	23.0	0.9	7.3
Sri Lanka	9.7	14.2	9.6	9.0	9.0	11.0	10.0	15.8	22.6	6.1	12.6	7.0	14.4	8.4	12.0
Thailand	4.5	1.7	0.6	1.8	2.8	4.5	4.6	2.2	5.5	0.5	3.4	1.8	0.4	6.5	1.4
Timor-Leste	. . .	3.6	4.7	7.2	3.2	1.8	4.1	8.9	7.6	4.0	4.0	4.0	5.7	4.0	4.0
Tonga	4.4	6.9	10.4	11.1	11.7	9.7	7.0	5.1	14.5	12.3	6.1	4.2	6.0	6.0	6.0
Vanuatu	3.0	3.7	2.0	3.0	1.4	1.2	2.0	3.9	4.8	4.3	3.0	3.0	5.8	3.5	3.0
Vietnam	15.4	–0.3	4.1	3.3	7.9	8.4	7.5	8.3	23.1	6.0	5.0	5.0	19.9	5.0	5.0
Middle East	**10.3**	**3.8**	**5.3**	**6.1**	**7.1**	**6.2**	**6.8**	**10.5**	**15.6**	**11.0**	**8.5**	**5.8**	**15.5**	**9.5**	**8.7**
Bahrain	0.9	–1.2	–0.5	1.7	2.2	2.6	2.0	3.3	3.5	3.0	2.5	2.0	5.1	3.0	2.5
Egypt	8.9	2.4	2.4	3.2	8.1	8.8	4.2	11.0	11.7	16.5	8.6	6.5	20.2	10.0	8.0
Iran, I.R. of	23.9	11.3	15.7	15.6	15.3	10.4	11.9	18.4	26.0	18.0	15.0	10.0	23.0	15.0	15.0
Iraq	. . .	. . .	. . .	. . .	. . .	37.0	53.2	30.8	3.5	13.8	8.0	4.0	6.8	9.0	8.0
Jordan	3.5	1.8	1.8	1.6	3.4	3.5	6.3	5.4	14.9	4.0	3.6	1.8	9.6	5.0	2.7
Kuwait	2.2	1.4	0.8	1.0	1.3	4.1	3.1	5.5	10.5	6.0	4.8	3.4	10.5	6.0	4.8
Lebanon	18.5	–0.4	1.8	1.3	1.7	–0.7	5.6	4.1	10.8	3.6	2.1	2.2	6.4	3.9	2.9
Libya	5.8	–8.8	–9.9	–2.1	1.0	2.9	1.4	6.2	10.4	6.5	4.5	2.5	10.4	6.5	4.5
Oman	0.5	–0.8	–0.3	0.2	0.7	1.9	3.4	5.9	12.6	6.2	6.0	4.5	9.2	6.1	5.7
Qatar	2.7	1.4	0.2	2.3	6.8	8.8	11.8	13.8	15.0	9.0	8.4	3.0	15.0	9.0	8.4
Saudi Arabia	0.8	–1.1	0.2	0.6	0.4	0.6	2.3	4.1	9.9	5.5	4.5	3.0	7.8	4.8	4.0
Syrian Arab Republic	5.6	3.4	–0.5	5.8	4.4	7.2	10.4	4.7	14.5	7.5	6.0	5.0	12.0	7.5	6.0
United Arab Emirates	3.6	2.7	2.9	3.2	5.0	6.2	9.3	11.1	11.5	2.0	3.1	4.1	. . .	. . .	. . .
Yemen, Rep. of	34.4	11.9	12.2	10.8	12.5	9.9	10.8	7.9	19.0	12.0	13.3	8.3	10.8	13.2	13.4

Table A7 (concluded)

	Average 1991–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014	End of Period 2008	End of Period 2009	End of Period 2010
Western Hemisphere	**64.8**	**6.5**	**8.6**	**10.4**	**6.6**	**6.3**	**5.3**	**5.4**	**7.9**	**6.6**	**6.2**	**6.3**	**8.1**	**6.2**	**6.1**
Antigua and Barbuda	2.7	1.7	2.4	2.0	2.0	2.1	1.8	1.4	5.6	2.1	2.0	2.0	2.3	1.8	2.0
Argentina	15.7	−1.1	25.9	13.4	4.4	9.6	10.9	8.8	8.6	6.7	7.3	7.2	7.2	7.2	7.2
Bahamas, The	2.5	2.0	2.2	3.0	1.0	2.2	1.8	2.5	4.5	1.8	0.6	1.5	4.5	1.0	0.2
Barbados	2.9	2.6	−1.2	1.6	1.4	6.1	7.3	4.0	8.3	1.4	1.9	2.8	8.9	−3.6	7.6
Belize	1.8	1.2	2.2	2.6	3.1	3.7	4.2	2.3	6.4	3.5	2.5	2.5	4.4	2.5	2.5
Bolivia	9.1	1.6	0.9	3.3	4.4	5.4	4.3	8.7	14.0	6.5	6.1	4.0	11.8	6.0	5.5
Brazil	204.4	6.8	8.4	14.8	6.6	6.9	4.2	3.6	5.7	4.8	4.0	4.5	5.9	4.2	4.0
Chile	9.4	3.6	2.5	2.8	1.1	3.1	3.4	4.4	8.7	2.9	3.5	3.0	6.9	2.2	3.0
Colombia	20.0	8.0	6.3	7.1	5.9	5.0	4.3	5.5	7.0	5.4	4.0	3.2	7.7	4.6	3.6
Costa Rica	15.9	11.3	9.2	9.4	12.3	13.8	11.5	9.4	13.4	10.0	7.5	4.0	13.9	8.0	7.0
Dominica	2.1	1.6	0.1	1.6	2.4	1.6	2.6	3.2	6.9	4.8	1.5	1.5	6.7	3.5	1.5
Dominican Republic	10.4	8.9	5.2	27.4	51.5	4.2	7.6	6.1	10.6	1.7	5.8	5.1	4.5	6.0	5.0
Ecuador	42.5	37.7	12.6	7.9	2.7	2.1	3.3	2.3	8.4	4.0	3.0	2.5	8.8	2.0	2.5
El Salvador	7.9	3.8	1.9	2.1	4.5	4.7	4.0	4.6	7.3	1.8	2.4	2.8	5.5	2.5	2.3
Grenada	2.4	1.7	1.1	2.2	2.3	3.5	4.2	3.9	8.0	2.3	2.9	2.0	5.2	2.1	2.2
Guatemala	11.5	7.3	8.1	5.6	7.6	9.1	6.6	6.8	11.4	4.8	5.7	4.1	9.4	5.5	4.7
Guyana	16.6	2.7	5.4	6.0	4.7	6.9	6.7	12.2	8.1	3.6	5.0	5.0	6.4	5.0	5.0
Haiti	19.7	16.5	9.3	26.7	28.3	16.8	14.2	9.0	14.4	7.1	8.3	5.0	20.8	3.0	5.0
Honduras	18.2	9.7	7.7	7.7	8.1	8.8	5.6	6.9	11.4	9.5	8.6	5.8	10.8	9.4	8.1
Jamaica	24.9	6.9	7.0	10.1	13.5	15.1	8.5	9.3	22.0	9.1	9.5	6.2	16.8	8.9	8.9
Mexico	18.3	6.4	5.0	4.5	4.7	4.0	3.6	4.0	5.1	4.8	3.4	3.0	6.5	3.5	3.1
Nicaragua	19.2	4.7	4.0	6.5	8.5	9.6	9.1	11.1	19.9	7.5	7.2	7.4	13.8	7.0	7.4
Panama	1.2	0.3	1.0	0.6	0.5	2.9	2.5	4.2	8.8	3.7	2.9	2.5	6.8	3.2	2.5
Paraguay	13.4	7.3	10.5	14.2	4.3	6.8	9.6	8.1	10.2	4.7	5.6	3.0	7.5	5.5	5.0
Peru	38.1	2.0	0.2	2.3	3.3	1.6	2.0	1.8	5.8	4.1	2.5	2.0	6.7	2.5	2.0
St. Kitts and Nevis	3.3	2.1	2.1	2.3	2.2	3.4	8.5	4.5	5.4	4.2	2.8	2.2	7.6	3.5	2.2
St. Lucia	3.2	5.4	−0.3	1.0	1.5	3.9	2.4	2.2	7.2	2.2	2.8	2.2	3.8	3.1	2.2
St. Vincent and the Grenadines	2.5	0.8	0.8	0.2	3.0	3.7	3.0	6.9	10.1	4.2	2.9	2.9	8.7	2.9	2.9
Suriname	75.5	39.8	15.5	23.0	9.1	9.9	11.3	6.4	14.6	4.8	8.7	5.5	9.3	9.5	8.0
Trinidad and Tobago	5.2	5.5	4.2	3.8	3.7	6.9	8.3	7.9	12.1	7.3	5.0	5.0	14.5	5.0	5.0
Uruguay	35.2	4.4	14.0	19.4	9.2	4.7	6.4	8.1	7.9	7.0	6.7	5.0	9.2	6.4	6.5
Venezuela	43.3	12.5	22.4	31.1	21.7	16.0	13.7	18.7	30.4	36.4	43.5	55.5	30.9	42.0	45.0

[1]In accordance with standard practice in the *World Economic Outlook*, movements in consumer prices are indicated as annual averages rather than as December–December changes during the year, as is the practice in some countries. For many countries, figures for recent years are IMF staff estimates. Data for some countries are for fiscal years.

[2]The percent changes in 2002 are calculated over a period of 18 months, reflecting a change in the fiscal year cycle (from July-June to January-December).

[3]2007 represents an estimate. No data are shown for 2008 and beyond because Zimbabwe is in hyperinflation, and inflation can no longer be forecast in a meaningful way. Unless policies change, inflation has the potential increase without limit.

[4]For many countries, inflation for the earlier years is measured on the basis of a retail price index. Consumer price index (CPI) inflation data with broader and more up-to-date coverage are typically used for more recent years.

[5]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A8. Major Advanced Economies: General Government Fiscal Balances and Debt[1]
(Percent of GDP)

	Average 1993–2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Major advanced economies										
Actual balance	–2.7	–4.8	–4.2	–3.4	–2.4	–2.3	–4.6	–10.4	–8.7	–4.6
Output gap[2]	0.2	–0.4	0.3	0.3	0.8	0.9	–0.2	–5.1	–6.1	–1.0
Structural balance[2]	–2.5	–3.5	–3.1	–2.6	–2.1	–1.8	–3.4	–5.1	–5.3	–3.2
United States										
Actual balance	–1.6	–4.8	–4.4	–3.3	–2.2	–2.9	–6.1	–13.6	–9.7	–4.7
Output gap[2]	0.7	0.3	1.2	1.4	1.6	1.2	0.2	–4.1	–5.5	0.0
Structural balance[2]	–1.3	–2.9	–2.5	–1.9	–1.6	–1.6	–3.7	–6.0	–6.5	–3.4
Net debt	46.2	41.5	43.0	43.4	42.5	43.2	49.9	61.7	70.4	83.4
Gross debt	64.9	61.2	62.2	62.5	61.9	63.1	70.5	87.0	97.5	106.7
Euro area										
Actual balance	–2.9	–3.0	–2.9	–2.5	–1.3	–0.7	–1.8	–5.4	–6.1	–3.3
Output gap[2]	–0.1	–0.7	–0.5	–0.6	0.6	1.4	0.7	–4.3	–5.4	–2.2
Structural balance[2]	–2.8	–3.0	–2.8	–2.6	–1.9	–1.6	–2.1	–3.0	–2.9	–1.9
Net debt	59.2	59.5	60.0	60.3	58.3	52.2	54.1	62.2	68.0	74.9
Gross debt	68.6	68.7	69.0	69.6	67.9	65.8	69.1	78.9	85.0	91.4
Germany[3]										
Actual balance	–2.4	–4.0	–3.8	–3.3	–1.5	–0.5	–0.1	–4.7	–6.1	–1.4
Output gap[2]	0.0	–1.7	–1.9	–2.3	–0.8	0.3	0.3	–5.8	–7.2	–2.7
Structural balance[2,4]	–2.0	–3.2	–2.8	–2.3	–1.2	–0.5	–0.3	–2.0	–2.5	0.0
Net debt	48.9	57.7	60.0	61.8	60.2	57.0	60.6	70.9	78.0	83.2
Gross debt	56.1	62.8	64.7	66.4	66.0	63.6	67.2	79.4	86.6	91.0
France										
Actual balance	–3.5	–4.1	–3.6	–3.0	–2.4	–2.7	–3.4	–6.2	–6.5	–4.6
Output gap[2]	–0.2	0.0	0.3	0.2	0.6	0.6	–0.3	–4.5	–5.2	–2.5
Structural balance[2,4]	–3.3	–4.0	–3.5	–3.3	–2.5	–2.9	–3.1	–3.3	–3.0	–3.0
Net debt	46.6	53.2	55.3	56.7	53.9	54.2	57.6	65.2	70.6	80.0
Gross debt	56.0	62.9	65.0	66.4	63.6	63.9	67.3	74.9	80.3	89.7
Italy										
Actual balance	–4.7	–3.5	–3.5	–4.3	–3.3	–1.5	–2.7	–5.4	–5.9	–4.5
Output gap[2]	–0.3	–0.4	–0.0	–0.5	0.6	1.3	–0.3	–5.1	–5.7	–2.4
Structural balance[2,4]	–4.8	–3.5	–3.8	–4.2	–3.7	–2.3	–2.7	–2.7	–2.9	–3.3
Net debt	109.8	101.5	100.8	102.6	102.4	100.5	102.7	111.9	117.5	125.6
Gross debt	114.9	104.4	103.8	105.8	106.5	103.5	105.8	115.3	121.1	129.4
Japan										
Actual balance	–5.5	–8.0	–6.2	–5.0	–4.0	–2.5	–5.6	–9.9	–9.8	–7.1
Excluding social security	–6.8	–8.1	–6.6	–5.4	–4.1	–2.4	–4.6	–8.5	–8.2	–5.8
Output gap[2]	–0.8	–2.2	–1.1	–0.8	–0.4	0.3	–1.6	–8.0	–7.9	–1.2
Structural balance[2]	–5.2	–7.1	–5.7	–4.7	–3.8	–2.6	–5.0	–6.5	–6.5	–6.7
Excluding social security	–6.8	–7.6	–6.4	–5.2	–4.0	–2.4	–4.3	–6.6	–6.4	–5.6
Net debt	42.8	76.5	82.7	84.6	84.3	80.4	87.8	103.6	114.8	136.3
Gross debt	117.3	167.2	178.1	191.6	191.3	187.7	196.3	217.2	227.4	234.2
United Kingdom										
Actual balance	–2.5	–3.3	–3.3	–3.3	–2.6	–2.6	–5.4	–9.8	–10.9	–6.4
Output gap[2]	–0.1	–0.1	0.1	–0.4	–0.1	0.4	–0.6	–5.5	–6.6	–2.8
Structural balance[2]	–2.2	–2.9	–3.4	–3.0	–2.6	–2.8	–5.0	–6.7	–6.1	–0.9
Net debt	37.6	33.7	35.6	37.4	38.2	38.3	45.5	56.8	66.9	83.0
Gross debt	43.1	38.5	40.3	42.1	43.3	44.1	51.9	62.7	72.7	87.8
Canada										
Actual balance	–1.8	–0.1	0.9	1.5	1.3	1.4	0.4	–3.4	–3.6	0.4
Output gap[2]	0.0	–0.7	–0.1	0.4	1.1	1.5	–0.2	–4.3	–4.7	0.0
Structural balance[2]	–1.6	0.3	0.9	1.4	0.8	0.7	0.5	–0.9	–0.8	0.4
Net debt	58.7	38.7	34.5	30.0	26.4	23.2	21.9	26.2	29.1	26.8
Gross debt	92.6	76.6	72.4	70.5	67.9	64.2	63.6	75.4	77.2	66.2

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

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

[2]Percent of potential GDP.

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

[4]Excludes 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.

Table A9. Summary of World Trade Volumes and Prices
(Annual percent change)

	Ten-Year Averages		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	1991–2000	2001–10										
Trade in goods and services												
World trade[1]												
Volume	7.1	3.5	0.3	3.5	5.4	10.7	7.7	9.2	7.2	3.3	−11.0	0.6
Price deflator												
In U.S. dollars	−0.9	3.3	−3.6	1.2	10.4	9.7	5.5	5.2	8.0	11.5	−14.6	2.6
In SDRs	−0.6	2.2	−0.1	−0.6	2.1	3.8	5.7	5.6	3.8	8.0	−9.0	3.6
Volume of trade												
Exports												
Advanced economies	6.9	2.2	−0.4	2.4	3.4	9.1	6.2	8.5	6.1	1.8	−13.5	0.5
Emerging and developing economies	8.4	6.5	2.4	7.0	10.5	14.2	10.8	10.9	9.5	6.0	−6.4	1.2
Imports												
Advanced economies	7.0	2.2	−0.4	2.7	4.2	9.3	6.4	7.6	4.7	0.4	−12.1	0.4
Emerging and developing economies	7.3	7.5	3.1	6.2	10.2	16.0	12.2	13.2	14.0	10.9	−8.8	0.6
Terms of trade												
Advanced economies	−0.1	−0.1	0.4	0.9	1.0	−0.1	−1.5	−1.1	0.4	−2.0	1.5	−0.2
Emerging and developing economies	−0.2	1.2	−2.3	0.4	1.2	3.1	5.9	4.1	1.2	4.4	−8.0	2.3
Trade in goods												
World trade[1]												
Volume	7.5	3.5	−0.4	3.7	6.3	11.0	7.5	9.3	6.6	3.2	−11.5	0.7
Price deflator												
In U.S. dollars	−1.1	3.3	−3.8	0.6	9.9	9.8	6.2	5.7	8.2	12.3	−15.4	2.8
In SDRs	−0.8	2.2	−0.4	−1.1	1.6	3.8	6.4	6.2	4.0	8.7	−9.9	3.8
World trade prices in U.S. dollars[2]												
Manufactures	−1.3	3.8	−3.4	2.1	14.4	8.8	3.6	3.7	8.8	9.6	−8.9	1.7
Oil	2.1	8.3	−13.8	2.5	15.8	30.7	41.3	20.5	10.7	36.4	−46.4	20.2
Nonfuel primary commodities	−1.7	3.6	−4.8	1.9	5.9	15.2	6.1	23.2	14.1	7.5	−27.9	4.4
Food	−2.3	4.5	−2.0	3.5	6.3	14.0	−0.9	10.5	15.2	23.4	−19.4	0.8
Beverages	−1.3	4.4	−13.3	24.3	4.8	−0.9	18.1	8.4	13.8	23.3	−13.6	−11.4
Agricultural raw materials	−0.4	−0.6	−3.4	−0.2	0.6	4.1	0.5	8.8	5.0	−0.8	−21.7	4.4
Metals	−1.7	5.5	−10.3	−3.5	11.8	34.6	22.4	56.2	17.4	−8.0	−45.4	15.9
World trade prices in SDRs[2]												
Manufactures	−1.0	2.7	0.1	0.4	5.7	2.9	3.8	4.2	4.6	6.1	−3.0	2.7
Oil	2.4	7.1	−10.7	0.8	7.1	23.6	41.6	21.0	6.4	32.1	−42.9	21.4
Nonfuel primary commodities	−1.4	2.5	−1.3	0.2	−2.1	9.0	6.3	23.8	9.6	4.1	−23.2	5.4
Food	−2.0	3.4	1.5	1.8	−1.7	7.8	−0.7	11.0	10.7	19.5	−14.2	1.8
Beverages	−1.0	3.3	−10.2	22.2	−3.1	−6.3	18.3	8.8	9.4	19.4	−7.9	−10.5
Agricultural raw materials	−0.1	−1.7	0.1	−1.9	−7.0	−1.6	0.8	9.3	0.9	−3.9	−16.6	5.4
Metals	−1.4	4.3	−7.0	−5.1	3.3	27.3	22.7	56.9	12.8	−10.9	−41.8	17.1
World trade prices in euros[2]												
Manufactures	1.9	0.3	−0.3	−3.1	−4.5	−1.1	3.4	2.9	−0.3	2.1	2.3	2.1
Oil	5.4	4.6	−11.1	−2.8	−3.3	18.9	41.0	19.5	1.4	27.1	−39.8	20.6
Nonfuel primary commodities	1.6	0.1	−1.8	−3.3	−11.6	4.8	5.9	22.3	4.5	0.1	−19.0	4.7
Food	0.9	1.0	1.1	−1.8	−11.2	3.7	−1.1	9.6	5.6	14.9	−9.5	1.2
Beverages	1.9	0.9	−10.5	17.9	−12.5	−9.9	17.8	7.5	4.2	14.8	−2.9	−11.1
Agricultural raw materials	2.9	−4.0	−0.4	−5.4	−16.0	−5.3	0.3	8.0	−3.8	−7.6	−12.0	4.7
Metals	1.5	1.9	−7.4	−8.4	−6.7	22.4	22.2	55.0	7.5	−14.3	−38.7	16.3

Table A9 *(concluded)*

	Ten-Year Averages		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	1991–2000	2001–10										
Trade in goods												
Volume of trade												
Exports												
Advanced economies	7.2	1.9	−1.2	2.4	4.0	9.0	5.7	8.7	5.2	1.5	−14.4	0.4
Emerging and developing economies	8.4	6.3	1.8	6.9	11.4	14.3	10.7	10.8	8.9	6.1	−7.2	1.1
Fuel exporters	3.3	3.8	0.4	2.3	11.8	9.3	5.1	4.1	3.5	4.4	−4.9	3.1
Nonfuel exporters	10.6	7.2	2.3	8.5	11.3	16.0	12.8	13.6	11.3	6.8	−8.3	0.3
Imports												
Advanced economies	7.6	2.1	−1.2	3.1	5.0	9.7	6.3	7.9	4.1	0.0	−12.7	0.9
Emerging and developing economies	7.4	7.7	2.8	6.3	11.5	16.9	12.6	12.6	13.7	10.9	−8.7	0.7
Fuel exporters	−0.4	12.0	16.0	9.0	9.2	15.5	17.4	15.0	20.4	18.5	−2.9	4.0
Nonfuel exporters	9.8	6.8	0.6	5.7	12.0	17.2	11.6	12.1	12.3	9.2	−10.0	−0.1
Price deflators in SDRs												
Exports												
Advanced economies	−1.3	1.6	−0.2	−0.9	2.6	3.0	3.7	4.2	3.9	6.1	−7.8	2.5
Emerging and developing economies	1.3	3.9	−1.1	−0.1	1.2	7.3	14.3	11.0	5.0	13.6	−16.0	7.3
Fuel exporters	3.1	6.6	−7.4	0.9	4.7	17.4	33.5	18.6	7.9	26.0	−34.6	16.8
Nonfuel exporters	0.9	2.7	1.3	−0.4	0.0	3.8	7.2	7.7	3.7	8.3	−7.0	3.6
Imports												
Advanced economies	−1.4	1.8	−0.7	−1.9	1.4	3.2	5.6	5.6	3.5	8.6	−9.2	2.7
Emerging and developing economies	1.5	2.6	1.0	−0.8	−0.1	4.0	6.9	6.6	4.0	9.1	−8.3	4.5
Fuel exporters	1.5	3.1	0.6	0.6	0.8	4.3	7.2	7.5	4.5	7.1	−4.7	3.5
Nonfuel exporters	1.3	2.5	1.0	−1.0	−0.2	4.0	6.9	6.5	3.9	9.6	−9.1	4.8
Terms of trade												
Advanced economies	0.1	−0.1	0.5	1.0	1.2	−0.2	−1.8	−1.4	0.4	−2.4	1.5	−0.2
Emerging and developing economies	−0.2	1.2	−2.1	0.7	1.2	3.2	6.9	4.1	0.9	4.0	−8.4	2.7
Regional groups												
Africa	0.1	1.9	−3.6	−0.2	2.9	3.7	15.0	10.2	0.7	12.6	−24.6	8.2
Central and eastern Europe	0.1	1.0	4.2	0.6	0.0	1.6	−0.8	−1.8	1.5	−1.1	7.6	−0.9
Commonwealth of Independent States[3]	−0.1	3.9	−2.6	−2.0	9.0	12.1	14.7	8.9	2.3	17.7	−24.6	10.6
Developing Asia	−0.6	−0.2	1.0	0.7	−0.6	−2.0	−0.8	−0.3	−0.5	−3.0	5.4	−1.9
Middle East	2.1	2.3	−8.5	1.8	0.2	9.6	25.1	5.9	1.3	13.4	−27.7	11.1
Western Hemisphere	−0.2	1.4	−4.0	1.3	2.9	5.7	5.6	8.6	2.1	3.7	−11.5	1.6
Analytical groups												
By source of export earnings												
Fuel exporters	1.6	3.4	−8.0	0.3	3.8	12.6	24.5	10.3	3.2	17.7	−31.4	12.9
Nonfuel exporters	−0.4	0.2	0.2	0.6	0.3	−0.1	0.4	1.2	−0.2	−1.2	2.3	−1.2
Memorandum												
World exports in billions of U.S. dollars												
Goods and services	6,108	13,073	7,615	7,995	9,312	11,304	12,840	14,774	17,149	19,694	14,768	15,280
Goods	4,870	10,446	6,078	6,356	7,428	9,023	10,294	11,907	13,738	15,875	11,661	12,101
Average oil price[4]	2.1	8.3	−13.8	2.5	15.8	30.7	41.3	20.5	10.7	36.4	−46.4	20.2
In U.S. dollars a barrel	18.73	51.62	24.3	25.0	28.9	37.8	53.4	64.3	71.1	97.0	52.0	62.5
Export unit value of manufactures[5]	−1.3	3.8	−3.4	2.1	14.4	8.8	3.6	3.7	8.8	9.6	−8.9	1.7

[1]Average of annual percent change for world exports and imports.

[2]As represented, respectively, by the export unit value index for manufactures of the advanced economies; the average of U.K. Brent, Dubai, and West Texas Intermediate crude oil prices; and the average of world market prices for nonfuel primary commodities weighted by their 2002–04 shares in world commodity exports.

[3]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

[4]Average of U.K. Brent, Dubai, and West Texas Intermediate crude oil prices.

[5]For manufactures exported by the advanced economies.

Table A10. Summary of Balances on Current Account

(Billions of U.S. dollars)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Advanced economies	**−207.7**	**−219.0**	**−220.1**	**−213.8**	**−394.0**	**−454.5**	**−389.6**	**−465.0**	**−371.3**	**−371.6**	**−193.2**
United States	−384.7	−461.3	−523.4	−625.0	−729.0	−788.1	−731.2	−673.3	−393.2	−396.8	−476.8
Euro area[1]	6.6	47.8	43.0	117.0	40.9	31.5	20.4	−95.5	−133.8	−134.9	−10.8
Japan	87.8	112.6	136.2	172.1	165.7	170.4	211.0	157.1	76.4	56.0	75.3
Other advanced economies[2]	82.6	81.9	124.1	122.2	128.3	131.6	110.2	146.7	79.3	104.1	219.2
Memorandum											
Newly industrialized Asian economies	48.0	55.7	81.0	83.5	80.2	90.0	103.6	76.2	91.0	88.9	129.9
Emerging and developing economies	**46.6**	**83.2**	**151.3**	**226.1**	**447.8**	**630.6**	**633.4**	**714.4**	**262.4**	**384.2**	**798.8**
Regional groups											
Africa	0.9	−8.6	−4.5	2.8	15.9	34.0	10.7	12.2	−72.7	−57.9	−49.8
Central and eastern Europe	−10.4	−16.9	−29.0	−48.6	−54.7	−82.5	−122.1	−142.2	−59.4	−50.5	−63.6
Commonwealth of Independent States[3]	33.0	30.3	35.7	63.5	87.5	96.2	70.9	108.7	0.6	27.0	−20.7
Developing Asia	36.6	64.8	82.4	89.3	162.3	282.4	406.5	422.4	481.3	469.0	761.5
Middle East	40.4	29.9	57.5	97.1	201.3	252.9	254.1	341.6	−10.2	56.2	205.1
Western Hemisphere	−53.9	−16.2	9.3	22.1	35.5	47.7	13.4	−28.3	−77.3	−59.7	−33.6
Memorandum											
European Union	−25.3	18.7	17.8	65.1	−12.8	−60.2	−102.9	−196.5	−204.2	−184.6	−41.0
Analytical groups											
By source of export earnings											
Fuel	81.6	58.3	104.4	186.2	351.0	446.8	409.2	587.2	−22.8	107.3	238.9
Nonfuel	−35.0	24.9	46.8	39.9	96.8	183.8	224.2	127.2	285.3	276.9	560.0
of which, primary products	−4.1	−2.8	−2.4	0.3	−1.6	7.9	6.2	−7.2	−12.8	−13.8	−9.1
By external financing source											
Net debtor countries	−73.1	−35.2	−29.8	−57.0	−94.0	−115.6	−202.5	−341.9	−256.4	−246.8	−267.0
of which, official financing	−1.8	−3.6	−7.7	−5.6	−6.6	−6.6	−17.2	−28.2	−23.7	−26.6	−26.3
Net debtor countries by debt-servicing experience											
Countries with arrears and/or rescheduling during 2003–07	−13.4	4.4	5.5	−2.7	−10.5	−13.3	−27.9	−45.8	−46.3	−42.9	−47.0
World[1]	**−161.1**	**−135.8**	**−68.8**	**12.3**	**53.7**	**176.1**	**243.8**	**249.5**	**−108.9**	**12.6**	**605.6**
Memorandum											
In percent of total world current account transactions	−1.0	−0.8	−0.4	0.1	0.2	0.6	0.7	0.6	−0.4	0.0	1.4
In percent of world GDP	−0.5	−0.4	−0.2	0.0	0.1	0.4	0.4	0.4	−0.2	0.0	0.9

[1]Reflects errors, omissions, and asymmetries in balance of payments statistics on current account, as well as the exclusion of data for international organizations and a limited number of countries. Calculated as the sum of the balance of individual euro area countries. See "Classification of Countries" in the introduction to this Statistical Appendix.

[2]In this table, "other advanced economies" means advanced economies excluding the United States, euro area countries, and Japan.

[3]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A11. Advanced Economies: Balance on Current Account
(Percent of GDP)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Advanced economies	**−0.8**	**−0.8**	**−0.7**	**−0.7**	**−1.1**	**−1.3**	**−1.0**	**−1.1**	**−1.0**	**−1.0**	**−0.4**
United States	−3.8	−4.4	−4.8	−5.3	−5.9	−6.0	−5.3	−4.7	−2.8	−2.8	−2.8
Euro area[1]	0.1	0.7	0.5	1.2	0.4	0.3	0.2	−0.7	−1.1	−1.2	−0.1
Germany	0.0	2.0	1.9	4.7	5.1	6.1	7.5	6.4	2.3	2.4	5.2
France	1.9	1.4	0.8	0.6	−0.6	−0.6	−1.0	−1.6	−0.4	−0.9	−0.6
Italy	−0.1	−0.8	−1.3	−0.9	−1.7	−2.6	−2.4	−3.2	−3.0	−3.1	−3.0
Spain	−3.9	−3.3	−3.5	−5.3	−7.4	−8.9	−10.1	−9.6	−5.4	−4.4	−3.7
Netherlands	2.4	2.5	5.5	7.5	7.1	8.2	6.1	4.4	2.4	2.1	2.3
Belgium	3.4	4.6	4.1	3.5	2.6	2.6	1.7	−2.5	−2.4	−3.0	−1.1
Greece	−7.2	−6.5	−6.6	−5.8	−7.5	−11.1	−14.1	−14.4	−13.5	−12.6	−9.3
Austria	−0.8	2.7	1.7	2.1	2.0	2.4	3.2	2.9	1.3	1.3	0.6
Portugal	−9.9	−8.1	−6.1	−7.6	−9.5	−10.1	−9.5	−12.0	−9.1	−8.8	−7.1
Finland	8.6	8.8	5.2	6.6	3.6	4.5	4.1	2.5	1.0	0.6	2.2
Ireland	−0.6	−1.0	0.0	−0.6	−3.5	−3.6	−5.4	−4.5	−2.7	−1.8	−1.4
Slovak Republic	−8.3	−8.0	−5.9	−7.8	−8.5	−7.1	−5.4	−6.3	−5.7	−5.0	−2.8
Slovenia	0.2	1.1	−0.8	−2.7	−1.7	−2.5	−4.2	−5.9	−4.0	−5.0	−5.2
Luxembourg	8.8	10.5	8.1	11.8	11.0	10.4	9.8	9.1	7.6	7.0	6.3
Cyprus	−3.3	−3.7	−2.2	−5.0	−5.6	−7.5	−11.6	−18.3	−10.3	−10.1	−9.8
Malta	−3.8	2.5	−3.1	−6.0	−8.7	−9.2	−6.1	−6.3	−5.1	−5.2	−3.8
Japan	2.1	2.9	3.2	3.7	3.6	3.9	4.8	3.2	1.5	1.2	1.4
United Kingdom	−2.1	−1.7	−1.6	−2.1	−2.6	−3.4	−2.9	−1.7	−2.0	−1.5	−0.7
Canada	2.3	1.7	1.2	2.3	1.9	1.4	0.9	0.6	−0.9	−0.7	0.9
Korea	1.6	0.9	1.9	3.9	1.8	0.6	0.6	−0.7	2.9	3.0	3.0
Australia	−2.0	−3.7	−5.3	−6.1	−5.8	−5.3	−6.3	−4.2	−5.8	−5.3	−4.0
Taiwan Province of China	6.5	8.9	10.0	6.0	4.9	7.2	8.6	6.4	9.7	10.7	12.3
Sweden	4.3	5.0	7.2	6.7	7.0	8.6	8.6	8.3	6.9	7.4	8.7
Switzerland	7.8	8.3	12.8	12.9	13.6	14.5	10.1	9.1	7.6	8.1	12.0
Hong Kong SAR	5.9	7.6	10.4	9.5	11.4	12.1	12.3	14.2	7.2	5.2	6.7
Czech Republic	−5.3	−5.7	−6.3	−5.3	−1.3	−2.6	−3.2	−3.1	−2.7	−3.0	−2.5
Norway	16.1	12.6	12.3	12.7	16.3	17.2	15.9	18.4	11.0	12.6	11.6
Singapore	13.1	13.1	23.7	18.1	22.7	25.4	23.5	14.8	13.1	11.2	13.3
Denmark	3.1	2.5	3.4	3.1	4.3	2.9	0.7	0.5	−1.2	−1.1	−1.7
Israel	−1.1	−0.8	1.1	2.1	3.0	5.6	2.8	1.2	1.1	0.3	0.2
New Zealand	−2.8	−3.9	−4.3	−6.4	−8.5	−8.7	−8.2	−8.9	−7.8	−7.0	−4.3
Iceland	−4.3	1.6	−4.8	−9.8	−16.1	−25.3	−15.4	−34.7	0.6	−2.1	3.1
Memorandum											
Major advanced economies	−1.4	−1.5	−1.5	−1.4	−1.8	−2.0	−1.4	−1.4	−1.2	−1.3	−0.9
Euro area[2]	−0.4	0.7	0.3	0.8	0.2	0.1	0.4	−0.7	−1.1	−1.1	−0.1
Newly industrialized Asian economies	4.6	4.9	6.7	6.3	5.3	5.5	5.7	4.4	6.3	6.1	7.0

[1]Calculated as the sum of the balances of individual euro area countries.

[2]Corrected for reporting discrepancies in intra-area transactions.

Table A12. Emerging and Developing Economies, by Country: Balance on Current Account
(Percent of GDP)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Africa	**0.2**	**−1.9**	**−0.8**	**0.4**	**1.9**	**3.6**	**1.0**	**1.0**	**−6.5**	**−4.7**	**−3.0**
Algeria	12.9	7.7	13.0	13.1	20.6	24.8	22.6	23.2	−1.7	1.4	4.2
Angola	−16.0	−1.3	−5.2	3.5	16.8	25.2	15.9	21.2	−8.1	0.1	2.8
Benin	−6.4	−8.4	−8.3	−7.2	−5.5	−5.7	−9.9	−8.3	−9.6	−9.0	−6.5
Botswana	9.9	3.2	5.7	3.5	15.2	17.2	14.3	7.0	−6.5	−4.8	3.6
Burkina Faso	−11.2	−10.0	−8.7	−10.6	−11.7	−9.6	−8.3	−11.0	−10.1	−10.7	−8.6
Burundi	−4.6	−3.5	−4.6	−8.4	−1.2	−14.5	−15.7	−11.1	−7.4	−5.6	−12.2
Cameroon	−3.6	−5.1	−1.8	−3.4	−3.4	0.6	0.8	0.4	−5.8	−5.1	−3.0
Cape Verde	−10.7	−11.2	−11.2	−14.4	−3.4	−5.0	−9.1	−12.3	−13.3	−14.3	−12.3
Central African Republic	−1.8	−1.6	−2.2	−1.7	−6.5	−3.0	−6.1	−8.6	−8.0	−8.6	−8.2
Chad	−31.8	−94.7	−48.8	−17.4	2.4	−9.0	−10.5	−11.4	−14.9	−5.5	−11.4
Comoros	3.0	−1.7	−3.2	−4.6	−7.2	−6.1	−6.7	−9.2	−8.5	−9.3	−8.4
Congo, Dem. Rep. of	−4.0	−1.6	1.0	−2.4	−10.4	−2.1	−1.5	−15.4	−26.1	−28.7	−16.5
Congo, Rep. of	−7.0	−2.4	−23.5	8.8	4.2	−4.7	−25.9	−6.8	−12.7	1.2	−11.8
Côte d'Ivoire	−0.6	6.7	2.1	1.6	0.2	2.8	−0.7	2.4	1.6	−1.6	−3.4
Djibouti	−2.9	−1.6	3.4	−1.3	−3.2	−14.7	−25.6	−39.2	−16.1	−16.6	−18.8
Equatorial Guinea	−41.2	0.9	−33.3	−21.6	−6.2	7.1	4.3	9.8	−7.7	−2.9	4.1
Eritrea	−4.6	6.8	9.7	−0.7	0.3	−3.6	−3.7	−2.7	1.0	2.0	4.1
Ethiopia	−3.0	−4.7	−1.4	−4.0	−6.0	−9.1	−4.5	−5.8	−5.8	−5.8	−3.3
Gabon	11.0	6.8	9.5	11.2	22.9	12.7	15.6	17.3	1.5	3.6	1.5
Gambia, The	−2.6	−2.8	−4.9	−13.4	−20.1	−14.6	−13.4	−17.1	−19.4	−18.2	−17.4
Ghana	−5.3	−0.5	0.6	−4.0	−8.1	−9.7	−11.7	−18.2	−10.9	−14.0	−6.3
Guinea	−2.7	−2.5	−0.4	−2.2	0.2	−1.4	−7.4	−10.3	−1.2	−3.2	−4.2
Guinea-Bissau	−13.2	−5.3	−5.6	6.2	−0.5	−11.3	10.1	−2.0	−3.6	−5.6	−9.4
Kenya	−3.1	2.2	−0.2	0.1	−0.8	−2.5	−4.1	−6.7	−3.6	−4.6	−4.0
Lesotho	−13.2	−20.7	−12.8	−5.7	−7.5	4.3	12.7	−3.2	−11.0	−22.2	−15.1
Liberia	−16.6	−5.9	−26.4	−21.1	−38.4	−13.8	−31.7	−26.3	−43.2	−62.7	−14.2
Madagascar	−1.3	−6.0	−4.9	−9.1	−10.9	−8.8	−14.5	−24.4	−16.8	−15.6	−7.0
Malawi	−6.8	−8.6	−5.8	−7.3	−11.7	−7.2	−1.7	−6.3	−3.7	−4.4	−1.5
Mali	−10.4	−3.1	−6.3	−8.5	−8.6	−4.2	−7.9	−8.2	−6.7	−7.0	−7.1
Mauritania	−11.7	3.0	−13.6	−34.6	−47.2	−1.3	−11.4	−15.7	−9.0	−16.4	6.8
Mauritius	3.2	5.7	2.4	0.8	−3.5	−5.3	−8.0	−8.7	−11.2	−12.1	−4.9
Morocco	4.3	3.7	3.2	1.7	1.8	2.2	0.2	−5.6	−2.5	−3.0	−0.8
Mozambique	−17.6	−18.8	−15.5	−8.9	−11.4	−9.2	−9.5	−12.6	−11.7	−10.9	−9.3
Namibia	1.7	3.4	6.1	7.0	4.7	13.8	9.2	2.3	−0.7	−0.8	1.5
Niger	−5.1	−9.7	−7.5	−7.3	−8.9	−9.7	−9.0	−12.6	−22.0	−30.9	−7.7
Nigeria	4.7	−12.6	−5.7	6.0	6.9	13.5	5.8	4.5	−9.0	−3.5	−1.3
Rwanda	−6.0	−10.7	−12.4	1.9	2.3	−3.9	−1.7	−7.2	−6.6	−6.4	−6.3
São Tomé and Príncipe	−22.7	−17.0	−14.5	−16.8	−10.3	−28.8	−29.9	−32.8	−44.3	−39.1	−35.3
Senegal	−4.3	−5.6	−6.1	−6.1	−7.7	−9.5	−11.8	−12.3	−11.9	−10.0	−9.9
Seychelles	−19.5	−13.6	0.2	−6.0	−19.7	−13.9	−23.4	−32.1	−26.7	−24.6	−21.7
Sierra Leone	−6.3	−2.0	−4.8	−5.8	−7.1	−3.5	−3.8	−8.4	−4.8	−4.6	−3.5
South Africa	0.3	0.8	−1.1	−3.2	−4.0	−6.3	−7.3	−7.4	−5.8	−6.0	−6.8
Sudan	−12.7	−10.3	−7.9	−6.5	−11.1	−15.2	−12.5	−9.3	−11.6	−10.0	−9.1
Swaziland	−4.3	4.8	6.8	3.1	−4.1	−7.4	−1.4	−6.4	−5.5	−7.7	−2.9
Tanzania	−4.5	−6.2	−4.2	−3.6	−4.1	−7.7	−9.0	−9.7	−8.7	−8.8	−6.5
Togo	−9.3	−5.5	−4.2	−3.0	7.8	−2.9	−3.9	−6.6	−6.1	−5.9	−5.7
Tunisia	−5.1	−3.6	−2.9	−2.7	−1.0	−2.0	−2.6	−4.5	−2.9	−4.3	−4.1
Uganda	−3.7	−4.6	−4.7	0.1	−1.4	−3.4	−3.1	−3.2	−6.2	−6.5	−2.7
Zambia	−19.9	−13.8	−14.7	−11.7	−8.3	1.2	−6.6	−7.4	−8.5	−7.2	−3.0
Zimbabwe[1]	−0.3	−0.6	−2.9	−8.3	−11.0	−6.1	−1.4	. . .	. . .	. . .	. . .

Table A12 *(continued)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Central and eastern Europe	**−1.9**	**−2.7**	**−3.8**	**−5.1**	**−4.8**	**−6.5**	**−7.7**	**−7.6**	**−4.1**	**−3.5**	**−3.4**
Albania	−3.1	−7.2	−5.0	−4.0	−6.1	−5.6	−9.1	−13.5	−11.3	−7.4	−8.9
Bosnia and Herzegovina	−12.5	−17.8	−19.4	−16.3	−18.0	−8.4	−12.7	−15.0	−9.3	−9.2	−8.2
Bulgaria	−5.6	−2.4	−5.5	−6.6	−12.4	−18.4	−25.1	−24.4	−12.3	−3.6	−3.0
Croatia	−3.2	−7.3	−5.4	−4.6	−5.8	−6.7	−7.6	−9.4	−6.5	−4.1	−4.5
Estonia	−5.2	−10.6	−11.3	−11.7	−10.0	−16.7	−18.1	−9.2	−6.5	−5.4	−7.8
Hungary	−6.0	−7.0	−7.9	−8.4	−7.5	−7.5	−6.4	−7.8	−3.9	−3.4	−1.1
Latvia	−7.5	−6.7	−8.2	−12.8	−12.5	−22.5	−22.6	−13.2	−6.7	−5.5	−3.2
Lithuania	−4.7	−5.2	−6.9	−7.6	−7.1	−10.7	−14.6	−11.6	−4.0	−5.3	−5.7
Macedonia, FYR	−7.2	−9.4	−4.1	−8.4	−2.6	−0.9	−7.2	−13.1	−14.1	−12.6	−8.9
Montenegro	. . .	. . .	−6.8	−7.2	−8.5	−24.1	−29.3	−31.3	−23.2	−16.7	−11.7
Poland	−2.8	−2.5	−2.1	−4.0	−1.2	−2.7	−4.7	−5.5	−4.5	−3.9	−2.9
Romania	−5.5	−3.3	−5.8	−8.4	−8.9	−10.4	−13.9	−12.6	−7.5	−6.5	−6.3
Serbia	−2.5	−8.3	−7.2	−12.1	−8.7	−10.1	−15.3	−17.3	−12.2	−11.3	−5.4
Turkey	1.9	−0.3	−2.5	−3.7	−4.6	−6.0	−5.8	−5.7	−1.2	−1.6	−2.5
Commonwealth of Independent States[2]	**8.0**	**6.5**	**6.2**	**8.2**	**8.7**	**7.4**	**4.2**	**5.0**	**0.0**	**1.5**	**−0.7**
Russia	11.1	8.4	8.2	10.1	11.0	9.5	5.9	6.1	0.5	1.4	−1.5
Excluding Russia	−0.8	1.0	0.2	2.2	1.3	0.6	−1.3	1.2	−1.4	1.8	1.9
Armenia	−9.5	−6.2	−6.8	−0.5	−1.0	−1.8	−6.4	−12.6	−11.5	−11.0	−7.7
Azerbaijan	−0.9	−12.3	−27.8	−29.8	1.3	17.6	28.8	35.5	10.8	18.4	11.9
Belarus	−3.3	−2.2	−2.4	−5.3	1.4	−3.9	−6.8	−8.4	−8.1	−5.6	−5.7
Georgia	−6.4	−6.1	−9.4	−6.7	−10.9	−15.1	−19.6	−22.6	−16.4	−16.7	−12.5
Kazakhstan	−5.4	−4.2	−0.9	0.8	−1.8	−2.5	−7.8	5.3	−6.4	1.1	4.4
Kyrgyz Republic	−1.5	−4.0	1.7	4.9	2.8	−3.1	−0.2	−6.5	−6.3	−8.4	−3.6
Moldova	−1.8	−1.2	−6.6	−2.3	−10.3	−11.8	−17.0	−19.4	−19.4	−16.6	−13.7
Mongolia	−12.0	−8.6	−7.1	1.3	1.3	7.0	6.7	−9.6	−6.5	−6.2	17.0
Tajikistan	−4.9	−3.5	−1.3	−3.9	−2.7	−2.8	−11.2	−8.8	−9.7	−8.3	−3.4
Turkmenistan	1.7	6.7	2.7	0.6	5.1	15.7	15.4	19.6	15.7	9.2	17.8
Ukraine	3.7	7.5	5.8	10.6	2.9	−1.5	−3.7	−7.2	0.6	1.4	−2.3
Uzbekistan	−1.0	1.2	5.8	7.2	7.7	9.1	7.3	13.6	7.7	6.8	5.6

Table A12 *(continued)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Developing Asia	**1.5**	**2.4**	**2.7**	**2.6**	**4.0**	**6.0**	**6.9**	**5.8**	**6.4**	**5.7**	**6.1**
Afghanistan, I.R. of	. . .	−3.7	−15.7	−4.9	−2.8	−4.9	0.9	−1.5	−3.7	−4.7	−5.8
Bangladesh	−0.9	0.3	0.3	−0.3	0.0	1.2	1.1	0.9	0.9	−0.1	−0.5
Bhutan	−8.5	−15.8	−23.6	−17.9	−30.4	−4.3	11.0	11.7	2.8	−8.7	−32.2
Brunei Darussalam	48.4	41.2	47.7	48.6	52.8	56.3	50.7	50.6	35.2	36.8	38.6
Cambodia	−1.1	−2.4	−3.6	−2.2	−3.8	−0.6	−2.7	−10.9	−7.5	−7.2	−4.9
China	1.3	2.4	2.8	3.6	7.2	9.5	11.0	10.0	10.3	9.3	9.4
Fiji	−6.7	2.5	−6.6	−12.9	−12.1	−24.7	−17.3	−26.1	−21.2	−16.1	−8.2
India	0.3	1.4	1.5	0.1	−1.3	−1.1	−1.0	−2.8	−2.5	−2.6	−2.5
Indonesia	4.3	4.0	3.5	0.6	0.1	3.0	2.4	0.1	−0.4	−0.7	−1.0
Kiribati	16.1	7.6	−19.5	−11.1	−19.1	−2.6	−1.0	−0.9	−3.1	−6.3	−11.4
Lao PDR	−10.7	−9.4	−12.4	−16.9	−17.2	−10.5	−18.0	−15.6	−11.7	−6.5	−13.8
Malaysia	7.9	8.0	12.0	12.1	15.0	16.7	15.4	17.4	12.9	10.7	9.8
Maldives	−9.4	−5.6	−4.6	−16.2	−35.9	−33.0	−40.3	−55.6	−17.8	−17.2	−11.8
Myanmar	−2.4	0.2	−1.0	2.4	3.7	7.1	9.2	3.3	1.3	0.2	−2.8
Nepal	4.5	4.2	2.4	2.7	2.0	2.2	0.4	2.5	2.3	0.1	−2.2
Pakistan	0.4	3.9	4.9	1.8	−1.4	−3.9	−4.8	−8.4	−5.9	−4.9	−3.9
Papua New Guinea	6.5	−1.0	4.5	2.2	4.2	2.3	1.8	2.8	−6.7	−4.7	−3.1
Philippines	−2.4	−0.4	0.4	1.9	2.0	4.5	4.9	2.5	2.3	1.6	−0.1
Samoa	0.1	−1.1	−95.3	−6.8	−1.6	−4.6	−6.1	−9.4	−8.4	−5.3	0.0
Solomon Islands	−9.4	−6.5	9.1	23.5	−9.8	−5.6	−2.8	−6.8	−9.6	−0.3	−22.7
Sri Lanka	−1.1	−1.4	−0.4	−3.1	−2.5	−5.3	−4.3	−9.4	−2.7	−0.8	1.4
Thailand	4.4	3.7	3.4	1.7	−4.3	1.1	5.7	−0.1	0.6	0.2	−0.4
Timor-Leste	−12.6	−15.9	−15.4	20.7	78.4	165.2	296.1	408.3	66.2	49.4	−50.8
Tonga	−9.5	5.1	−3.1	4.2	−2.6	−9.7	−10.4	−10.4	−8.8	−8.7	−7.6
Vanuatu	2.0	−5.4	−6.6	−5.0	−7.4	−4.1	−5.9	−6.2	−5.3	−4.8	−6.5
Vietnam	2.1	−1.7	−4.9	−3.5	−1.1	−0.3	−9.8	−9.4	−4.8	−4.2	−3.2
Middle East	**6.4**	**4.7**	**8.1**	**11.7**	**19.7**	**21.0**	**18.2**	**18.8**	**−0.6**	**3.2**	**8.2**
Bahrain	2.8	−0.7	2.0	4.2	11.0	13.8	15.8	10.6	1.6	3.6	9.6
Egypt	0.0	0.7	2.4	4.3	3.2	0.8	1.4	0.5	−3.0	−4.1	−2.3
Iran, I.R. of	5.2	3.1	0.6	0.9	8.8	9.2	11.9	5.2	−5.2	−3.6	0.4
Iraq	. . .	. . .	. . .	−39.6	6.1	15.4	15.5	19.1	−6.1	3.2	11.5
Jordan	0.1	5.7	12.2	0.8	−17.4	−10.8	−16.8	−12.7	−11.2	−10.6	−9.4
Kuwait	23.9	11.2	19.7	30.6	42.5	49.8	44.7	44.7	25.8	29.3	44.6
Lebanon	−19.3	−14.1	−13.2	−15.5	−13.4	−5.6	−7.1	−11.4	−10.5	−10.0	−7.9
Libya	12.3	3.0	19.9	22.3	38.4	45.8	33.8	39.2	8.3	11.7	24.7
Oman	9.8	6.7	3.8	2.4	15.2	12.1	5.9	6.1	−0.2	2.1	0.1
Qatar	27.3	21.9	25.3	22.4	33.2	28.3	30.9	35.3	7.5	18.1	11.2
Saudi Arabia	5.1	6.3	13.1	20.8	28.7	27.9	25.1	28.9	−1.8	4.5	11.5
Syrian Arab Republic	8.3	5.4	−6.6	−1.6	−2.2	−2.8	−3.3	−4.0	−3.1	−4.4	−4.0
United Arab Emirates	9.5	4.9	8.5	9.1	18.0	22.6	16.1	15.8	−5.6	−1.0	6.9
Yemen, Rep. of	6.8	4.1	1.5	1.6	3.8	1.1	−7.0	−2.0	−2.3	−1.3	−1.1

Table A12 *(concluded)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2014
Western Hemisphere	**−2.7**	**−0.9**	**0.5**	**1.0**	**1.3**	**1.5**	**0.4**	**−0.7**	**−2.2**	**−1.6**	**−0.7**
Antigua and Barbuda	−8.0	−11.5	−12.9	−8.3	−12.3	−31.4	−33.4	−19.5	−18.6	−20.5	−20.3
Argentina	−1.4	8.9	6.3	2.1	1.7	2.3	1.6	1.4	1.0	1.8	2.0
Bahamas, The	−11.6	−7.8	−8.6	−5.4	−10.0	−20.4	−18.2	−13.4	−9.5	−10.4	−9.9
Barbados	−4.4	−6.8	−6.3	−12.4	−12.8	−8.4	−5.2	−8.4	−7.2	−6.9	−7.2
Belize	−21.9	−17.7	−18.2	−14.7	−13.6	−2.1	−4.0	−11.4	−6.7	−6.2	−6.0
Bolivia	−3.4	−4.1	1.0	3.8	6.5	11.3	13.2	11.5	−2.1	−1.1	−1.3
Brazil	−4.2	−1.5	0.8	1.8	1.6	1.3	0.1	−1.8	−1.8	−1.8	−1.1
Chile	−1.6	−0.9	−1.1	2.2	1.2	4.9	4.4	−2.0	−4.8	−5.0	−3.2
Colombia	−1.2	−1.5	−1.1	−0.8	−1.3	−1.8	−2.8	−2.8	−3.9	−3.3	−1.5
Costa Rica	−3.7	−4.9	−4.8	−4.3	−4.9	−4.5	−6.3	−8.9	−5.3	−5.3	−5.2
Dominica	−18.4	−13.6	−12.8	−16.5	−28.0	−17.8	−29.2	−31.9	−25.2	−24.9	−20.7
Dominican Republic	−3.0	−3.6	4.9	4.8	−1.4	−3.6	−5.0	−9.7	−6.8	−6.9	−5.6
Ecuador	−3.2	−4.8	−1.5	−1.7	0.8	3.9	2.3	2.4	−3.5	−2.3	−2.0
El Salvador	−1.1	−2.8	−4.7	−4.0	−3.3	−3.6	−5.5	−7.2	−2.3	−3.9	−3.0
Grenada	−19.7	−26.6	−25.3	−9.0	−31.3	−33.4	−41.9	−42.2	−32.9	−30.4	−26.0
Guatemala	−6.5	−6.1	−4.6	−4.9	−4.5	−5.0	−5.2	−4.8	−4.0	−4.9	−4.0
Guyana	−15.0	−11.9	−8.6	−9.3	−14.8	−20.9	−18.0	−20.8	−18.1	−15.6	−11.4
Haiti	−2.0	−0.9	−1.6	−1.6	2.6	−1.4	−0.3	−3.1	−3.3	−2.8	0.7
Honduras	−6.3	−3.6	−6.8	−7.7	−3.0	−3.7	−10.3	−14.0	−8.0	−9.2	−8.0
Jamaica	−8.3	−11.2	−7.5	−6.4	−9.4	−10.2	−14.9	−15.3	−12.5	−10.9	−8.2
Mexico	−2.6	−2.0	−1.0	−0.7	−0.5	−0.5	−0.8	−1.4	−2.5	−2.2	−1.8
Nicaragua	−19.4	−17.7	−16.2	−14.5	−14.6	−13.6	−18.3	−23.2	−15.5	−14.5	−7.7
Panama	−1.5	−0.8	−4.5	−7.5	−4.9	−3.1	−7.3	−12.4	−10.1	−11.6	−7.0
Paraguay	−4.2	1.8	2.3	2.1	0.3	0.5	0.7	−1.4	−1.0	−0.9	0.6
Peru	−2.1	−1.9	−1.5	0.0	1.4	3.0	1.4	−3.3	−3.3	−3.2	−1.6
St. Kitts and Nevis	−32.0	−39.1	−34.8	−20.1	−18.2	−20.4	−23.8	−24.2	−19.4	−19.4	5.8
St. Lucia	−15.6	−15.0	−14.7	−10.9	−17.1	−30.2	−31.3	−29.5	−24.2	−22.5	−22.1
St. Vincent and the Grenadines	−10.4	−11.5	−20.8	−24.8	−22.3	−24.1	−35.1	−33.7	−29.3	−29.8	−20.8
Suriname	−15.2	−5.6	−10.8	−2.1	−4.3	1.8	2.9	0.2	−7.8	−1.9	1.3
Trinidad and Tobago	5.0	0.9	8.7	12.5	22.4	37.5	24.8	26.8	7.4	10.2	8.2
Uruguay	−2.9	2.9	−0.5	0.3	0.0	−2.3	−0.8	−3.6	−1.7	−2.4	−1.2
Venezuela	1.6	8.2	14.1	13.8	17.7	14.7	8.8	12.3	−0.4	4.1	8.4

[1]Given recent trends, it is not possible to forecast nominal GDP with any precision, and consequently no data are shown for 2008 and beyond.

[2]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A13. Emerging and Developing Economies: Net Capital Flows[1]
(Billions of U.S. dollars)

	Average 1998–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Emerging and developing economies											
Private capital flows, net[2]	64.3	73.5	54.0	154.2	222.0	226.8	202.8	617.5	109.3	−190.3	−6.5
Private direct investment, net	164.2	180.5	144.4	161.3	183.9	243.7	241.4	359.0	459.3	312.8	303.1
Private portfolio flows, net	41.4	−76.9	−86.4	−3.8	10.0	−5.6	−100.7	39.5	−155.2	−234.5	−195.3
Other private capital flows, net	−141.2	−30.1	−4.1	−3.3	28.0	−11.3	62.2	219.2	−194.6	−268.5	−114.2
Official flows, net[3]	7.1	2.3	14.8	−43.3	−64.9	−98.5	−154.1	−100.5	−60.0	57.6	−28.1
Change in reserves[4]	−89.5	−132.7	−191.3	−360.6	−501.9	−585.7	−751.7	−1257.8	−865.7	−266.5	−512.2
Memorandum											
Current account[5]	41.7	93.3	138.0	233.6	312.3	532.0	728.7	741.5	793.0	355.7	473.8
Africa											
Private capital flows, net[2]	3.8	1.3	2.0	4.9	13.0	26.0	35.2	33.4	24.2	30.2	44.7
Private direct investment, net	7.4	23.1	14.3	17.1	15.8	23.3	23.4	32.1	32.4	27.6	31.7
Private portfolio flows, net	3.8	−7.9	−1.6	−0.4	5.6	4.2	17.6	9.9	−15.8	0.9	4.1
Other private capital flows, net	−7.3	−14.0	−10.7	−11.8	−8.4	−1.5	−5.7	−8.3	7.9	1.8	9.0
Official flows, net[3]	5.3	6.5	8.8	6.2	4.2	0.5	−10.0	5.0	11.1	15.1	12.8
Change in reserves[4]	−3.9	−10.2	−5.7	−11.5	−31.7	−43.3	−54.3	−61.6	−53.8	21.7	−3.6
Central and eastern Europe											
Private capital flows, net[2]	30.8	5.6	25.9	42.3	61.3	99.9	120.0	173.6	147.1	−38.3	13.4
Private direct investment, net	15.4	17.4	12.2	13.3	30.0	37.4	58.9	72.0	64.1	30.1	32.5
Private portfolio flows, net	4.1	0.2	3.1	9.7	25.3	25.9	9.4	−7.4	−13.2	−6.1	4.6
Other private capital flows, net	11.3	−12.0	10.6	19.2	6.1	36.6	51.7	108.9	96.2	−62.4	−23.6
Official flows, net[3]	−0.7	5.2	4.5	−2.4	−4.1	0.0	−7.9	−6.0	7.3	26.8	9.6
Change in reserves[4]	−8.4	−11.0	−14.2	−9.3	−8.1	−36.1	−20.3	−31.2	−9.7	36.6	6.1
Commonwealth of Independent States											
Private capital flows, net[2]	−16.3	6.9	15.7	19.0	2.6	30.4	55.1	127.2	−127.4	−119.0	−40.0
Private direct investment, net	4.2	4.9	5.2	5.4	13.1	11.6	20.7	26.6	44.4	17.3	22.9
Private portfolio flows, net	−3.5	−1.2	0.4	−0.4	4.3	−4.9	12.9	14.5	−36.8	1.6	3.4
Other private capital flows, net	−17.0	3.1	10.1	14.1	−14.8	23.7	21.5	86.1	−135.1	−137.9	−66.4
Official flows, net[3]	−2.2	−5.1	−10.8	−9.4	−7.6	−19.6	−29.8	−5.9	−0.7	25.1	6.2
Change in reserves[4]	−4.8	−14.4	−15.1	−32.7	−54.9	−77.1	−127.8	−168.1	33.1	94.3	8.0
Emerging Asia[6]											
Private capital flows, net[2]	−13.4	24.3	23.9	66.9	145.6	85.3	31.8	164.8	127.9	−46.9	−35.6
Private direct investment, net	64.0	53.5	52.4	70.6	64.7	100.5	94.3	138.5	222.6	161.6	138.8
Private portfolio flows, net	27.6	−50.7	−60.2	10.3	10.2	−5.3	−107.2	11.2	−65.9	−192.1	−204.5
Other private capital flows, net	−105.0	21.4	31.7	−13.9	70.7	−10.0	44.6	15.2	−28.7	−16.3	30.1
Official flows, net[3]	2.4	−13.1	2.6	−18.4	−13.4	−21.7	−21.7	−36.6	−13.1	−11.3	−40.0
Change in reserves[4]	−67.2	−87.7	−154.9	−236.7	−338.7	−288.3	−372.2	−673.1	−634.3	−514.5	−526.9
Middle East[7]											
Private capital flows, net[2]	0.5	−7.6	−19.2	1.4	−17.7	−53.7	−50.0	11.0	−120.9	−29.5	−24.1
Private direct investment, net	6.5	12.3	9.1	17.0	10.4	17.6	14.9	4.0	11.4	17.6	15.7
Private portfolio flows, net	−3.5	−11.8	−16.1	−18.0	−21.7	−36.2	−25.7	−31.0	−12.3	−14.4	−6.4
Other private capital flows, net	−2.6	−8.1	−12.3	2.3	−6.4	−35.1	−39.2	38.0	−120.1	−32.7	−33.4
Official flows, net[3]	−5.3	−12.8	−8.2	−24.4	−33.9	−27.3	−67.0	−58.9	−75.6	−9.4	−22.1
Change in reserves[4]	−7.8	−11.1	−2.9	−36.7	−46.3	−107.2	−126.2	−191.5	−151.3	46.6	−10.6
Western Hemisphere											
Private capital flows, net[2]	58.9	43.2	5.7	19.7	17.1	39.0	10.8	107.4	58.5	13.3	35.2
Private direct investment, net	66.6	69.2	51.2	38.0	50.0	53.3	29.1	85.8	84.3	58.7	61.6
Private portfolio flows, net	13.0	−5.6	−12.0	−5.0	−13.6	10.7	−7.7	42.3	−11.2	−24.4	3.6
Other private capital flows, net	−20.7	−20.4	−33.4	−13.3	−19.3	−25.0	−10.6	−20.6	−14.7	−21.0	−29.9
Official flows, net[3]	7.6	21.7	17.8	5.1	−10.1	−30.4	−17.7	1.8	11.0	11.3	5.4
Change in reserves[4]	2.5	1.7	1.4	−33.7	−22.1	−33.6	−51.0	−132.4	−49.8	48.9	14.8
Memorandum											
Fuel exporting countries											
Private capital flows, net[2]	−22.1	−6.0	−14.5	13.5	−18.4	−27.7	−9.0	93.8	−318.3	−148.4	−79.4
Other countries											
Private capital flows, net[2]	86.4	79.6	68.5	140.7	240.3	254.5	211.8	523.7	427.5	−41.9	72.9

[1]Net 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.

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

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

[4]A minus sign indicates an increase.

[5]The 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.

[6]Consists of developing Asia and the newly industrialized Asian economies.

[7]Includes Israel.

Table A14. Emerging and Developing Economies: Private Capital Flows[1]

(Billions of U.S. dollars)

	Average 1998–2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Emerging and developing economies											
Private capital flows, net	64.3	73.5	54.0	154.2	222.0	226.8	202.8	617.5	109.3	−190.3	−6.5
Inflow	221.6	170.1	167.1	418.5	666.6	841.9	1,314.4	2,129.8	753.9	524.5	957.1
Outflow	−113.4	−101.4	−113.2	−268.5	−446.8	−618.5	−1,111.9	−1,512.7	−645.0	−715.0	−963.6
Africa											
Private capital flows, net	3.8	1.3	2.0	4.9	13.0	26.0	35.2	33.4	24.2	30.2	44.7
Inflow	15.0	14.1	14.2	19.2	25.7	45.3	70.0	62.7	41.3	33.8	50.9
Outflow	−6.5	−12.9	−12.3	−14.2	−12.8	−19.3	−34.6	−29.1	−16.8	−3.6	−6.1
Central and eastern Europe											
Private capital flows, net	30.8	5.6	25.9	42.3	61.3	99.9	120.0	173.6	147.1	−38.3	13.4
Inflow	37.6	15.0	28.9	53.1	92.7	117.9	174.3	217.2	155.5	−51.6	17.0
Outflow	−2.4	−9.4	−3.0	−10.9	−31.3	−18.0	−54.4	−43.7	−8.5	13.2	−3.6
Commonwealth of Independent States											
Private capital flows, net	−16.3	6.9	15.7	19.0	2.6	30.4	55.1	127.2	−127.4	−119.0	−40.0
Inflow	1.8	11.1	22.8	45.9	62.6	112.4	160.5	283.7	154.4	−3.8	78.3
Outflow	−1.8	−4.3	−7.1	−26.9	−60.0	−82.0	−105.5	−156.5	−281.8	−115.2	−118.3
Emerging Asia[2]											
Private capital flows, net	−13.4	24.3	23.9	66.9	145.6	85.3	31.8	164.8	127.9	−46.9	−35.6
Inflow	56.5	57.7	80.7	215.4	355.1	391.6	558.1	931.4	326.9	464.9	662.4
Outflow	−71.3	−38.8	−56.6	−152.7	−211.6	−308.5	−526.5	−767.0	−199.3	−511.8	−697.9
Middle East[3]											
Private capital flows, net	0.5	−7.6	−19.2	1.4	−17.7	−53.7	−50.0	11.0	−120.9	−29.5	−24.1
Inflow	18.3	−3.3	−9.5	31.0	66.8	84.3	246.3	413.7	−67.0	6.8	54.5
Outflow	−17.1	−3.7	−9.8	−29.6	−84.5	−139.3	−296.5	−402.9	−54.1	−36.6	−78.8
Western Hemisphere											
Private capital flows, net	58.9	43.2	5.7	19.7	17.1	39.0	10.8	107.4	58.5	13.3	35.2
Inflow	92.4	75.5	30.1	53.9	63.8	90.4	105.2	221.0	142.9	74.3	94.1
Outflow	−14.3	−32.4	−24.3	−34.2	−46.7	−51.4	−94.4	−113.6	−84.5	−61.0	−58.9

[1]Private capital flows comprise direct investment, portfolio investment, and other long- and short-term investment flows. In this table, Hong Kong SAR, Israel, Korea, Singapore, and Taiwan Province of China are included.

[2]Consists of developing Asia and the newly industrialized Asian economies.

[3]Includes Israel.

Table A15. Emerging and Developing Economies: Reserves[1]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
					Billions of U.S. dollars					
Emerging and developing economies	**877.1**	**1,040.0**	**1,356.4**	**1,805.2**	**2,294.7**	**3,050.3**	**4,329.4**	**5,179.8**	**5,425.4**	**5,894.9**
Regional groups										
Africa	64.4	71.9	90.1	126.1	160.1	221.2	289.0	342.8	321.1	324.7
Sub-Sahara	35.5	35.9	39.8	62.2	82.9	115.8	146.3	163.5	144.0	144.6
Excluding Nigeria and South Africa	18.8	22.4	25.9	31.8	35.8	50.2	65.1	77.5	71.4	74.5
Central and eastern Europe	72.8	89.2	110.6	129.2	157.9	196.3	248.9	258.6	222.0	216.0
Commonwealth of Independent States[2]	43.9	58.1	92.3	148.8	214.4	356.1	547.9	514.8	420.5	412.4
Russia	33.1	44.6	73.8	121.5	176.5	296.2	466.7	421.3	333.2	320.1
Excluding Russia	10.8	13.5	18.5	27.3	37.9	59.8	81.2	93.4	87.2	92.3
Developing Asia	379.5	496.2	669.7	933.9	1,155.5	1,489.3	2,128.2	2,745.6	3,237.7	3,718.6
China	216.3	292.0	409.2	615.5	822.5	1,069.5	1,531.3	2,134.5	2,652.5	3,086.9
India	46.4	68.2	99.5	127.2	132.5	171.3	267.6	271.7	256.9	257.0
Excluding China and India	116.9	136.0	161.1	191.1	200.5	248.4	329.2	339.4	328.3	374.7
Middle East	157.9	163.9	198.3	246.7	351.6	477.2	670.4	823.1	778.2	792.0
Western Hemisphere	158.6	160.5	195.4	220.6	255.3	310.3	445.1	494.9	446.0	431.1
Brazil	35.6	37.5	48.9	52.5	53.3	85.2	179.5	192.9	168.8	157.3
Mexico	44.8	50.6	59.0	64.1	74.1	76.3	87.1	94.6	94.6	94.6
Analytical groups										
By source of export earnings										
Fuel	199.7	213.5	290.3	416.6	606.2	912.7	1,316.1	1,480.2	1,301.5	1,300.9
Nonfuel	677.5	826.4	1,066.1	1,388.6	1,688.6	2,137.6	3,013.4	3,699.6	4,124.0	4,594.0
of which, primary products	19.4	21.3	22.8	24.0	25.9	31.3	33.3	43.6	45.8	48.0
By external financing source										
Net debtor countries	400.3	466.6	574.6	671.5	752.5	943.3	1,310.9	1,410.0	1,307.6	1,317.6
of which, official financing	32.1	36.8	43.1	47.2	49.4	59.2	78.9	85.7	86.5	92.4
Net debtor countries by debt-servicing experience										
Countries with arrears and/or rescheduling during 2003–07	35.8	39.8	48.9	58.3	72.5	87.9	119.5	120.5	115.7	120.4
Other groups										
Heavily indebted poor countries	11.1	13.6	16.2	19.6	20.5	27.0	35.9	40.6	40.1	42.6
Middle East and north Africa	186.9	200.3	249.3	312.1	430.9	584.6	814.7	1,004.0	956.5	973.7

Table A15 *(concluded)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	Ratio of reserves to imports of goods and services[3]									
Emerging and developing economies	**50.3**	**55.7**	**61.1**	**63.8**	**67.8**	**75.5**	**87.5**	**84.5**	**110.6**	**115.3**
Regional groups										
Africa	46.1	46.9	47.9	54.3	57.8	68.9	71.8	69.5	75.5	71.1
Sub-Sahara	33.9	31.1	27.6	35.2	38.6	45.8	46.6	43.7	44.9	41.9
Excluding Nigeria and South Africa	32.2	36.6	35.0	34.7	31.7	39.3	39.5	37.8	41.8	38.9
Central and eastern Europe	36.9	39.9	38.1	34.0	35.5	36.3	36.4	31.6	37.1	34.6
Commonwealth of Independent States[2]	34.3	40.9	52.5	65.3	76.8	101.2	115.4	83.4	93.3	85.7
Russia	44.6	52.9	71.5	93.0	107.4	141.7	165.1	114.4	126.8	115.1
Excluding Russia	20.0	23.3	25.4	28.1	33.0	41.9	42.3	37.5	46.4	45.4
Developing Asia	58.3	68.1	74.5	79.5	81.8	89.4	107.7	112.6	174.2	195.7
China	79.7	89.0	91.1	101.5	115.5	125.4	148.0	163.6	302.1	356.6
India	65.0	90.0	107.1	97.0	72.8	75.5	95.1	79.3	80.2	77.4
Excluding China and India	37.9	41.8	45.1	43.7	38.6	42.4	49.9	42.9	49.7	53.4
Middle East	78.7	74.2	77.9	77.4	91.7	101.6	114.7	106.7	104.1	100.3
Western Hemisphere	37.1	40.3	47.3	44.5	43.5	44.8	53.9	49.8	54.1	50.1
Brazil	49.0	60.8	76.8	65.6	54.4	70.7	113.8	87.6	93.5	82.0
Mexico	24.2	27.3	31.4	29.8	30.5	27.4	28.5	28.3	34.8	33.8
Analytical groups										
By source of export earnings										
Fuel	62.0	59.4	68.8	78.6	92.7	113.3	126.1	110.2	110.8	104.0
Nonfuel	47.6	54.8	59.3	60.4	61.8	66.1	77.2	77.3	110.6	118.9
of which, primary products	49.6	54.6	50.8	43.1	37.1	39.4	32.8	34.2	43.3	42.0
By external financing source										
Net debtor countries	39.6	45.0	48.0	44.8	41.8	43.9	50.4	44.7	50.6	48.6
of which, official financing	48.2	50.7	49.9	45.0	39.7	39.8	41.7	36.5	44.0	44.2
Net debtor countries by debt-servicing experience										
Countries with arrears and/or rescheduling during 2003–07	30.3	37.2	38.5	36.2	36.2	36.6	40.7	32.5	37.5	36.9
Other groups										
Heavily indebted poor countries	28.1	31.6	33.2	33.0	28.9	32.8	34.4	31.7	35.2	35.0
Middle East and north Africa	78.2	76.3	82.3	82.0	94.7	106.5	118.6	110.8	110.7	106.5

[1]In this table, official holdings of gold are valued at SDR 35 an ounce. This convention results in a marked underestimation of reserves for countries that have substantial gold holdings.

[2]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

[3]Reserves at year-end in percent of imports of goods and services for the year indicated.

Table A16. Summary of Sources and Uses of World Savings
(Percent of GDP)

	Averages		2003	2004	2005	2006	2007	2008	2009	2010	Average 2011–14
	1987–94	1995–2002									
World											
Savings	22.6	22.0	20.9	22.0	22.8	23.9	24.4	24.2	22.4	22.6	24.4
Investment	22.4	22.2	21.1	22.0	22.5	23.2	23.7	24.0	22.6	22.6	23.8
Advanced economies											
Savings	22.2	21.3	19.1	19.8	20.1	20.6	20.5	19.4	17.4	17.1	18.3
Investment	22.7	21.6	19.9	20.5	21.0	21.4	21.3	20.8	18.3	18.0	19.1
Net lending	–0.5	–0.3	–0.8	–0.7	–0.9	–0.8	–0.7	–1.4	–0.9	–1.0	–0.8
Current transfers	–0.4	–0.5	–0.6	–0.6	–0.7	–0.7	–0.8	–0.7	–0.7	–0.7	–0.6
Factor income	–0.4	0.2	0.1	0.4	0.8	1.0	0.7	0.2	0.6	0.6	0.4
Resource balance	0.2	0.1	–0.3	–0.5	–0.9	–1.1	–0.6	–0.9	–0.8	–0.9	–0.6
United States											
Savings	16.1	16.9	13.3	13.8	14.8	15.5	14.2	11.9	11.9	11.8	14.0
Investment	18.6	19.6	18.4	19.4	20.0	20.1	18.8	17.5	14.7	14.6	17.1
Net lending	–2.5	–2.7	–5.1	–5.5	–5.1	–4.6	–4.6	–5.5	–2.8	–2.8	–3.1
Current transfers	–0.4	–0.6	–0.7	–0.7	–0.7	–0.7	–0.8	–0.8	–0.8	–0.7	–0.7
Factor income	–0.5	0.4	0.1	0.4	1.3	1.8	1.3	0.1	1.2	1.4	0.8
Resource balance	–1.5	–2.5	–4.5	–5.2	–5.7	–5.7	–5.1	–4.8	–3.3	–3.5	–3.3
Euro area											
Savings	. . .	21.4	20.7	21.6	21.2	22.0	22.4	21.6	18.8	18.1	18.8
Investment	. . .	20.8	20.1	20.4	20.8	21.6	22.1	22.2	19.7	19.1	19.4
Net lending	. . .	0.6	0.6	1.2	0.4	0.3	0.3	–0.6	–0.9	–1.0	–0.6
Current transfers[1]	–0.6	–0.7	–0.8	–0.8	–0.9	–1.0	–1.0	–0.9	–0.8	–0.8	–0.8
Factor income[1]	–0.8	–0.4	–0.7	–0.2	–0.2	0.1	–0.4	–0.5	–0.5	–0.6	–0.7
Resource balance[1]	0.9	1.7	2.1	2.2	1.6	1.2	1.6	0.7	0.4	0.4	0.9
Germany											
Savings	23.4	20.3	19.3	21.8	22.0	23.8	25.8	25.7	19.5	18.4	19.7
Investment	23.7	20.8	17.4	17.1	16.9	17.6	18.3	19.3	17.2	16.0	15.7
Net lending	–0.3	–0.5	1.9	4.7	5.1	6.1	7.5	6.4	2.3	2.4	4.0
Current transfers	–1.6	–1.4	–1.3	–1.3	–1.3	–1.2	–1.3	–1.3	–1.3	–1.3	–1.2
Factor income	–0.9	–0.4	–0.7	0.9	1.1	1.6	1.7	2.0	1.1	1.0	1.3
Resource balance	2.2	1.2	3.9	5.0	5.3	5.7	7.1	5.8	2.6	2.7	4.0
France											
Savings	20.3	20.9	20.0	20.2	19.7	20.5	21.0	20.8	20.4	19.6	20.0
Investment	20.5	18.9	18.9	19.6	20.3	21.1	22.1	22.3	19.9	20.3	21.5
Net lending	–0.3	2.0	1.2	0.6	–0.6	–0.6	–1.0	–1.6	0.4	–0.7	–1.5
Current transfers	–0.6	–0.9	–1.1	–1.1	–1.3	–1.2	–1.2	–0.5	–0.5	–0.5	–0.5
Factor income	–0.5	0.8	1.2	1.1	1.2	1.6	1.5	1.1	2.1	1.6	0.8
Resource balance	0.9	2.1	1.1	0.6	–0.5	–1.0	–1.4	–2.2	–1.2	–1.7	–1.7
Italy											
Savings	20.2	21.2	19.4	19.9	19.0	19.0	19.4	18.0	15.7	15.1	15.0
Investment	21.3	20.1	20.7	20.8	20.7	21.6	21.8	21.2	18.8	18.2	18.1
Net lending	–1.1	1.1	–1.3	–0.9	–1.7	–2.6	–2.4	–3.2	–3.0	–3.1	–3.2
Current transfers	–0.4	–0.5	–0.5	–0.6	–0.7	–0.9	–0.9	–0.8	–0.8	–0.8	–0.8
Factor income	–1.6	–1.1	–1.3	–1.1	–1.0	–0.9	–1.3	–1.9	–1.8	–1.7	–1.6
Resource balance	0.9	2.7	0.6	0.7	0.0	–0.8	–0.3	–0.5	–0.5	–0.6	–0.8
Japan											
Savings	33.5	28.6	26.1	26.8	27.2	27.7	28.9	26.7	23.5	23.2	23.8
Investment	30.9	26.3	22.8	23.0	23.6	23.8	24.1	23.5	22.0	22.0	22.1
Net lending	2.5	2.4	3.2	3.7	3.6	3.9	4.8	3.1	1.5	1.2	1.7
Current transfers	–0.2	–0.2	–0.2	–0.2	–0.2	–0.2	–0.3	–0.3	–0.2	–0.2	–0.2
Factor income	0.8	1.3	1.7	1.9	2.3	2.7	3.1	3.1	2.5	2.6	2.7
Resource balance	1.9	1.2	1.7	2.0	1.5	1.4	1.9	0.4	–0.8	–1.2	–0.9
United Kingdom											
Savings	16.0	16.1	15.1	15.0	14.7	14.2	15.3	15.1	12.1	12.4	13.7
Investment	18.6	17.5	16.7	17.1	17.3	17.6	18.2	16.8	14.1	13.9	14.6
Net lending	–2.7	–1.4	–1.6	–2.1	–2.6	–3.4	–2.9	–1.7	–2.0	–1.5	–0.9
Current transfers	–0.7	–0.8	–0.9	–0.9	–0.9	–0.9	–1.0	–1.0	–1.0	–1.1	–1.1
Factor income	–0.4	0.5	1.5	1.5	1.7	0.8	1.5	2.3	1.1	1.1	1.2
Resource balance	–1.6	–1.1	–2.3	–2.7	–3.4	–3.3	–3.4	–3.0	–2.1	–1.5	–1.1
Canada											
Savings	16.9	20.4	21.2	23.0	23.9	24.3	24.1	23.7	21.6	21.6	22.6
Investment	20.3	19.6	20.0	20.7	22.0	22.9	23.3	23.0	22.5	22.3	22.3
Net lending	–3.4	0.8	1.2	2.3	1.9	1.4	0.9	0.6	–0.9	–0.7	0.3
Current transfers	–0.2	0.1	0.0	–0.1	–0.1	–0.1	–0.1	0.0	0.0	0.0	0.1
Factor income	–3.5	–3.1	–2.5	–1.9	–1.6	–0.9	–0.9	–0.9	–0.5	–0.7	–0.8
Resource balance	0.2	3.8	3.7	4.2	3.7	2.4	1.9	1.5	–0.4	0.0	1.0

Table A16 *(continued)*

	Averages		2003	2004	2005	2006	2007	2008	2009	2010	Average
	1987–94	1995–2002									2011–14
Newly industrialized Asian economies											
Savings	34.9	31.9	31.5	32.6	31.4	31.6	31.8	31.9	29.1	28.6	29.9
Investment	27.4	30.0	24.8	26.4	25.9	26.1	26.0	27.4	22.8	22.6	23.3
Net lending	7.5	2.0	6.6	6.2	5.5	5.5	5.8	4.5	6.3	6.0	6.6
Current transfers	0.0	–0.4	–0.7	–0.7	–0.7	–0.7	–0.7	–0.6	–0.7	–0.7	–0.6
Factor income	4.1	–0.9	0.8	0.6	0.3	0.5	0.4	1.3	0.2	0.1	0.9
Resource balance	3.4	3.3	6.5	6.4	5.9	5.7	6.1	3.7	6.8	6.5	6.4
Emerging and developing economies											
Savings	24.2	24.5	28.0	29.8	31.6	33.3	34.2	35.1	33.7	34.2	35.6
Investment	25.1	24.9	25.9	27.2	27.3	28.3	30.1	31.3	32.2	32.1	32.5
Net lending	–1.9	–0.4	2.1	2.6	4.2	5.0	4.1	3.9	1.6	2.1	3.0
Current transfers	0.5	1.0	1.6	1.5	1.6	1.6	1.5	1.4	1.4	1.3	1.2
Factor income	–1.1	–1.7	–1.9	–2.0	–1.8	–1.6	–1.5	–1.5	–1.3	–1.3	–0.3
Resource balance	–0.8	0.4	2.4	3.0	4.4	5.1	4.1	4.0	1.5	2.1	2.1
Memorandum											
Acquisition of foreign assets	1.4	3.6	5.7	6.8	9.0	11.1	13.6	7.4	3.5	5.0	6.2
Change in reserves	0.5	1.2	3.8	4.7	5.0	5.6	7.9	4.6	1.5	2.6	3.3
Regional groups											
Africa											
Savings	18.2	18.8	21.1	22.7	24.1	26.7	25.7	26.0	20.0	21.6	23.2
Investment	19.6	20.3	21.6	22.6	22.2	23.2	24.8	24.9	26.5	26.3	26.6
Net lending	–1.4	–1.5	–0.5	0.1	1.8	3.5	1.0	1.2	–6.5	–4.7	–3.5
Current transfers	2.5	2.6	3.1	3.1	3.0	2.8	2.9	2.8	3.0	2.6	2.5
Factor income	–3.7	–4.1	–4.4	–5.1	–5.3	–4.3	–4.9	–4.9	–3.7	–3.2	–3.2
Resource balance	–0.3	0.0	0.8	2.1	4.1	5.0	3.0	3.3	–5.7	–4.2	–2.8
Memorandum											
Acquisition of foreign assets	0.1	2.8	3.4	4.5	5.8	7.7	6.9	4.6	–2.0	0.3	2.3
Change in reserves	0.4	1.4	2.0	4.4	5.2	5.7	5.6	4.2	–1.9	0.3	1.8
Central and eastern Europe											
Savings	23.0	18.7	16.3	16.6	16.7	17.2	17.4	17.8	18.9	19.6	21.8
Investment	25.0	21.6	20.1	21.6	21.5	23.5	25.0	25.1	22.5	22.6	24.7
Net lending	–2.0	–2.9	–3.8	–5.0	–4.8	–6.3	–7.6	–7.3	–3.6	–3.0	–2.8
Current transfers	1.7	1.8	1.7	1.5	1.4	1.6	1.5	1.3	1.4	1.6	1.7
Factor income	–2.6	–1.2	–2.1	–2.5	–2.1	–2.3	–2.9	–2.6	–3.3	–3.2	–3.0
Resource balance	–1.1	–3.4	–3.4	–4.0	–4.1	–5.6	–6.2	–6.0	–1.7	–1.4	–1.5
Memorandum											
Acquisition of foreign assets	0.9	2.0	2.5	4.1	5.1	5.7	5.2	1.3	–4.9	–0.7	2.1
Change in reserves	–0.6	1.9	1.2	0.9	3.2	1.6	2.0	0.5	–2.5	–0.4	1.1
Commonwealth of Independent States[2]											
Savings	. . .	24.9	27.4	29.7	29.8	29.7	29.1	30.8	24.7	24.9	24.2
Investment	. . .	20.4	21.2	21.4	21.1	22.5	25.1	25.8	24.8	23.6	24.1
Net lending	. . .	4.5	6.2	8.2	8.6	7.2	4.0	5.0	–0.1	1.3	0.1
Current transfers	. . .	0.5	0.6	0.5	0.5	0.4	0.3	0.5	0.8	0.7	0.5
Factor income	. . .	–2.0	–2.8	–2.2	–2.8	–3.6	–3.1	–3.5	–2.8	–3.5	–2.5
Resource balance	. . .	6.0	8.4	9.9	10.9	10.3	6.8	8.0	1.9	4.1	2.1
Memorandum											
Acquisition of foreign assets	. . .	5.4	11.5	13.9	15.3	16.1	17.3	9.6	–2.6	3.3	4.3
Change in reserves	. . .	1.6	5.7	7.1	7.7	9.8	9.9	–1.5	–6.0	–0.5	1.0

Table A16 *(continued)*

	Averages		2003	2004	2005	2006	2007	2008	2009	2010	Average
	1987–94	1995–2002									2011–14
Developing Asia											
Savings	29.8	32.7	36.5	38.4	41.3	44.0	46.8	47.8	48.3	47.9	48.4
Investment	32.1	31.9	33.7	35.8	37.2	38.0	39.9	42.0	42.0	42.1	42.1
Net lending	−2.3	0.8	2.8	2.6	4.1	6.0	7.0	5.9	6.4	5.7	6.3
Current transfers	0.9	1.4	2.1	2.0	2.1	2.1	2.1	2.0	1.8	1.7	1.5
Factor income	−1.7	−1.4	−1.1	−1.0	−0.6	−0.4	−0.2	0.0	−0.2	−0.3	1.1
Resource balance	−1.5	0.9	1.8	1.6	2.6	4.3	5.0	3.9	4.8	4.3	3.7
Memorandum											
Acquisition of foreign assets	3.5	5.3	6.1	7.2	9.5	11.3	14.2	11.1	10.1	9.3	9.5
Change in reserves	1.3	1.9	5.5	7.4	5.9	6.8	10.7	8.5	6.5	5.9	5.6
Middle East											
Savings	18.3	26.3	32.3	35.7	42.4	43.9	43.9	44.3	27.5	30.1	33.7
Investment	23.7	22.6	24.2	24.0	22.7	22.9	25.6	25.4	28.1	26.9	26.3
Net lending	−5.4	3.6	8.1	11.6	19.7	21.0	18.2	18.8	−0.6	3.2	7.4
Current transfers	−3.8	−2.7	−2.2	−2.0	−1.7	−1.8	−1.7	−1.4	−1.5	−1.5	−1.5
Factor income	2.2	2.2	0.2	0.3	1.2	2.5	2.6	1.4	1.0	1.0	3.1
Resource balance	−3.8	4.1	10.1	13.3	20.3	20.3	17.3	18.8	−0.1	3.7	5.8
Memorandum											
Acquisition of foreign assets	2.4	4.2	11.1	14.5	23.3	34.1	41.7	10.6	−2.6	3.7	8.8
Change in reserves	0.0	1.3	5.0	5.5	10.3	10.4	13.9	8.4	−2.8	0.8	3.8
Western Hemisphere											
Savings	18.6	17.9	19.8	22.0	22.0	23.2	22.5	22.0	19.6	20.0	21.2
Investment	19.3	20.7	19.1	20.8	20.6	21.7	22.2	22.8	21.9	21.8	22.3
Net lending	−0.7	−2.8	0.7	1.2	1.5	1.5	0.3	−0.8	−2.3	−1.8	−1.1
Current transfers	0.8	1.1	2.0	2.1	2.0	2.1	1.8	1.6	1.7	1.6	1.7
Factor income	−2.1	−2.8	−3.0	−3.0	−3.0	−3.2	−2.8	−2.8	−2.5	−2.4	−2.1
Resource balance	0.6	−1.0	1.6	2.1	2.4	2.6	1.3	0.4	−1.5	−1.0	−0.8
Memorandum											
Acquisition of foreign assets	0.1	1.8	3.3	2.7	3.0	3.0	5.8	2.1	−0.2	0.7	1.2
Change in reserves	0.6	0.2	1.8	1.0	1.3	1.6	3.6	1.2	−1.4	−0.4	0.4
Analytical groups											
By source of export earnings											
Fuel											
Savings	26.1	26.8	31.1	34.2	38.2	38.9	37.5	38.7	26.8	28.9	30.2
Investment	28.1	22.5	23.3	23.4	22.3	23.0	25.6	25.5	27.6	26.3	25.9
Net lending	−2.0	4.3	7.8	10.8	15.9	16.0	12.0	13.3	−0.7	2.6	4.3
Current transfers	−1.9	−1.9	−1.4	−1.2	−0.9	−1.0	−1.0	−0.9	−0.9	−0.9	−0.9
Factor income	0.0	−0.9	−2.3	−2.2	−2.2	−1.8	−1.7	−2.3	−1.7	−1.8	−0.3
Resource balance	−0.1	7.1	11.6	14.2	19.0	18.8	14.6	16.5	1.8	5.3	5.4
Memorandum											
Acquisition of foreign assets	1.3	4.8	11.1	13.6	18.9	23.7	26.3	10.6	−3.2	3.1	6.2
Change in reserves	−0.3	1.1	5.2	7.0	9.3	10.5	11.2	3.7	−5.2	0.0	2.4
Nonfuel											
Savings	23.3	24.1	27.3	28.7	29.8	31.7	33.3	34.0	35.5	35.6	37.1
Investment	25.1	25.4	26.5	28.2	28.6	29.8	31.4	33.1	33.3	33.6	34.4
Net lending	−1.8	−1.3	0.8	0.6	1.2	1.9	1.9	1.0	2.2	2.0	2.7
Current transfers	1.3	1.5	2.3	2.2	2.2	2.3	2.2	2.0	2.0	1.9	1.8
Factor income	−1.3	−1.9	−1.9	−1.9	−1.7	−1.6	−1.4	−1.2	−1.2	−1.2	−0.3
Resource balance	−1.0	−0.9	0.4	0.3	0.6	1.3	1.2	0.1	1.4	1.2	1.1
Memorandum											
Acquisition of foreign assets	1.5	3.3	4.5	5.2	6.4	7.5	10.0	6.4	5.2	5.5	6.3
Change in reserves	0.7	1.3	3.5	4.2	3.9	4.2	7.0	4.8	3.2	3.3	3.6

Table A16 *(concluded)*

	Averages		2003	2004	2005	2006	2007	2008	2009	2010	Average
	1987–94	1995–2002									2011–14
By external financing source											
Net debtor countries											
Savings	19.9	18.9	20.3	21.5	21.6	22.7	23.0	22.2	21.5	21.6	23.1
Investment	21.8	21.4	20.9	22.6	23.2	24.4	25.5	25.9	24.7	24.6	25.8
Net lending	–1.8	–2.5	–0.6	–1.2	–1.6	–1.6	–2.5	–3.6	–3.2	–3.0	–2.7
Current transfers	1.7	2.0	2.9	2.8	2.8	2.9	2.8	2.7	2.8	2.8	2.8
Factor income	–2.0	–2.0	–2.4	–2.6	–2.5	–2.6	–2.6	–2.6	–2.5	–2.5	–2.4
Resource balance	–1.5	–2.5	–1.1	–1.4	–1.9	–2.0	–2.6	–3.8	–3.5	–3.3	–3.1
Memorandum											
Acquisition of foreign assets	0.4	1.8	3.1	3.0	3.0	4.2	6.0	1.2	–1.6	–0.1	1.5
Change in reserves	0.5	0.8	2.0	1.5	1.8	2.3	4.1	1.1	–1.3	0.1	0.9
Official financing											
Savings	14.4	18.5	20.2	21.8	22.8	23.9	23.0	22.1	20.4	20.3	22.5
Investment	18.8	21.0	23.4	23.8	24.9	25.5	27.3	28.0	25.5	25.7	26.8
Net lending	–4.4	–2.4	–3.2	–2.0	–2.1	–1.6	–4.3	–5.9	–5.2	–5.4	–4.3
Current transfers	4.6	6.1	7.5	8.2	8.7	8.9	9.5	9.0	7.8	7.3	7.4
Factor income	–2.7	–1.4	–2.0	–2.0	–2.2	–1.7	–1.7	–1.8	–1.6	–1.9	–1.8
Resource balance	–6.3	–7.1	–8.6	–8.2	–8.6	–8.8	–12.0	–13.2	–11.4	–10.8	–9.9
Memorandum											
Acquisition of foreign assets	0.6	2.5	2.2	1.9	2.3	2.1	4.9	1.0	–0.2	0.9	1.9
Change in reserves	1.2	1.3	2.5	1.2	1.4	2.5	4.8	1.5	0.2	1.2	2.0
Net debtor countries by debt-servicing experience											
Countries with arrears and/or rescheduling during 2003–07											
Savings	16.0	14.9	19.2	19.3	20.0	21.4	20.9	19.4	18.0	18.4	19.5
Investment	19.3	18.4	17.3	19.5	21.1	22.7	23.8	23.8	23.0	22.7	23.4
Net lending	–3.2	–3.5	1.9	–0.2	–1.2	–1.3	–2.9	–4.4	–4.9	–4.3	–3.9
Current transfers	1.9	2.8	5.1	4.9	5.0	5.0	4.4	3.9	3.7	3.5	3.5
Factor income	–2.7	–3.7	–3.7	–4.2	–3.7	–3.4	–3.6	–3.6	–3.4	–3.3	–2.7
Resource balance	–2.4	–2.7	0.5	–1.0	–2.5	–2.8	–3.7	–4.7	–5.3	–4.6	–4.7
Memorandum											
Acquisition of foreign assets	1.1	2.3	4.4	3.0	2.3	2.9	4.9	0.8	–0.1	0.8	0.7
Change in reserves	0.2	0.2	2.3	2.0	2.6	1.9	3.5	0.1	–0.5	0.4	0.6

Note: The estimates in this table are based on individual countries' national accounts and balance of payments statistics. Country group composites are calculated as the sum of the U.S dollar values for the relevant individual countries. This differs from the calculations in the April 2005 and earlier issues of the *World Economic Outlook,* where the composites were weighted by GDP valued at purchasing power parities as a share of total world GDP. For many countries, the estimates of national savings are built up from national accounts data on gross domestic investment and from balance-of-payments-based data on net foreign investment. The latter, which is equivalent to the current account balance, comprises three components: current transfers, net factor income, and the resource balance. The mixing of data source, which is dictated by availability, implies that the estimates for national savings that are derived incorporate the statistical discrepancies. Furthermore, errors, omissions, and asymmetries in balance of payments statistics affect the estimates for net lending; at the global level, net lending, which in theory would be zero, equals the world current account discrepancy. Despite these statistical shortcomings, flow of funds estimates, such as those presented in these tables, provide a useful framework for analyzing development in savings and investment, both over time and across regions and countries.

[1]Calculated from the data of individual euro area countries.

[2]Mongolia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Table A17. Summary of World Medium-Term Baseline Scenario

	Eight-Year Averages		Four-Year Average 2007–10	2007	2008	2009	2010	Four-Year Average 2011–14
	1991–98	1999–2006						
	Annual percent change unless otherwise noted							
World real GDP	**2.8**	**3.9**	**2.2**	**5.2**	**3.2**	**–1.3**	**1.9**	**4.7**
Advanced economies	2.5	2.6	–0.1	2.7	0.9	–3.8	0.0	2.8
Emerging and developing economies	3.3	5.9	5.0	8.3	6.1	1.6	4.0	6.6
Memorandum								
Potential output								
Major advanced economies	2.5	2.3	1.5	2.1	1.7	1.2	1.1	1.4
World trade, volume[1]	**6.7**	**6.8**	**–0.2**	**7.2**	**3.3**	**–11.0**	**0.6**	**6.4**
Imports								
Advanced economies	6.2	6.2	–1.8	4.7	0.4	–12.1	0.4	4.9
Emerging and developing economies	7.3	9.3	3.8	14.0	10.9	–8.8	0.6	8.6
Exports								
Advanced economies	6.5	5.7	–1.6	6.1	1.8	–13.5	0.5	5.8
Emerging and developing economies	8.3	9.1	2.4	9.5	6.0	–6.4	1.2	7.8
Terms of trade								
Advanced economies	0.2	–0.4	–0.1	0.4	–2.0	1.5	–0.2	–0.2
Emerging and developing economies	–1.5	2.8	–0.1	1.2	4.4	–8.0	2.3	0.1
World prices in U.S. dollars								
Manufactures	–0.6	2.5	2.5	8.8	9.6	–8.9	1.7	2.3
Oil	–6.8	22.0	–0.7	10.7	36.4	–46.4	20.2	4.6
Nonfuel primary commodities	–1.5	5.0	–2.0	14.1	7.5	–27.9	4.4	2.7
Consumer prices								
Advanced economies	3.0	2.0	1.4	2.2	3.4	–0.2	0.3	1.5
Emerging and developing economies	54.5	7.4	6.5	6.4	9.3	5.7	4.7	4.3
Interest rates (in percent)								
Real six-month LIBOR[2]	3.1	1.3	1.3	2.6	0.9	0.5	1.0	3.1
World real long-term interest rate[3]	3.8	2.3	1.8	2.0	0.4	2.6	2.3	3.0
	Percent of GDP							
Balances on current account								
Advanced economies	0.1	–0.9	–1.0	–1.0	–1.1	–1.0	–1.0	–0.7
Emerging and developing economies	–1.8	2.1	2.9	4.1	3.8	1.6	2.1	3.0
Total external debt								
Emerging and developing economies	35.9	34.1	25.8	27.0	24.1	26.4	25.7	23.6
Debt service								
Emerging and developing economies	4.9	6.3	4.9	5.2	4.8	5.0	4.5	4.4

[1]Data refer to trade in goods and services.

[2]London interbank offered rate on U.S. dollar deposits minus percent change in U.S. GDP deflator.

[3]GDP-weighted average of 10-year (or nearest maturity) government bond rates for United States, Japan, Germany, France, Italy, United Kingdom, and Canada.

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