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World Economic Outlook

Adjusting to Lower Commodity Prices

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Editor's note:

(October 1, 2015)
Note 44 on page 122 has been amended to correct the start date of the period covered from January 2012 to January 2013.

ASSUMPTIONS AND CONVENTIONS

A number of assumptions have been adopted for the projections presented in the *World Economic Outlook* (WEO). It has been assumed that real effective exchange rates remained constant at their average levels during July 27–August 24, 2015, except for those for the currencies participating in the European exchange rate mechanism II (ERM II), which are assumed to have remained 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 in the Statistical Appendix); that the average price of oil will be $51.62 a barrel in 2015 and $50.36 a barrel in 2016 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 0.4 percent in 2015 and 1.2 percent in 2016; that the three-month euro deposit rate will average 0.0 percent in 2015 and 2016; and that the six-month Japanese yen deposit rate will yield on average 0.1 percent in 2015 and 2016. These are, of course, working hypotheses rather than forecasts, and the uncertainties surrounding them add to the margin of error that would in any event be involved in the projections. The estimates and projections are based on statistical information available through September 16, 2015.

The following conventions are used throughout the WEO:

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

– between years or months (for example, 2014–15 or January–June) to indicate the years or months covered, including the beginning and ending years or months;

/ between years or months (for example, 2014/15) to indicate a fiscal or financial year.

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

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

Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F in the Statistical Appendix, which lists the economies with exceptional reporting periods for national accounts and government finance data for each country.

For some countries, the figures for 2014 and earlier are based on estimates rather than actual outturns. Please refer to Table G in the Statistical Appendix, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments indicators for each country.

- Data for Lithuania are now included in the euro area aggregates, but they were excluded in the April 2015 WEO.
- Projections for Greece are based on data available as of August 12, 2015.
- As in the April 2015 WEO, data for Syria are excluded from 2011 onward because of the ongoing conflict and the related lack of data.

In the tables and figures, the following conventions apply:

- If no source is listed on tables and figures, data are drawn from the 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 terms "country" and "economy" do 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.

Composite data are provided for various groups of countries organized according to economic characteristics or region. Unless noted otherwise, country group composites represent calculations based on 90 percent or more of the weighted group data.

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The data appearing in the *World Economic Outlook* are compiled by the IMF staff at the time of the WEO exercises. The historical data and projections are based on the information gathered by the IMF country desk officers in the context of their missions to IMF member countries and through their ongoing analysis of the evolving situation in each country. Historical data are updated on a continual basis as more information becomes available, and structural breaks in data are often adjusted to produce smooth series with the use of splicing and other techniques. IMF staff estimates continue to serve as proxies for historical series when complete information is unavailable. As a result, WEO data can differ from those in other sources with official data, including the IMF's *International Financial Statistics*.

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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—namely, the African Department, Asia and Pacific Department, European Department, Middle East and Central Asia Department, and Western Hemisphere Department—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 Gian Maria Milesi-Ferretti, Deputy Director, Research Department, and Thomas Helbling, Division Chief, Research Department.

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The analysis has benefited from comments and suggestions by staff members from other IMF departments, as well as by Executive Directors following their discussion of the report on September 21, 2015. 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.

FOREWORD

Six years after the world economy emerged from its broadest and deepest postwar recession, a return to robust and synchronized global expansion remains elusive. The revised forecasts in this latest *World Economic Outlook* report underscore the challenges all countries face. Despite considerable differences in country-specific outlooks, the new forecasts mark down expected near-term growth rates marginally, but nearly across the board. Moreover, downside risks to the world economy appear more pronounced than they did just a few months ago.

Near-term economic growth still looks stronger in advanced economies, compared with the recent past, but weaker in the emerging market and developing economies that account for a growing share of world output and will still account for the lion's share of world growth. Within advanced economies, receding legacies of recent crises, coupled with protracted monetary policy support and a return to fiscal neutrality, have underpinned generally accelerating output and falling unemployment, although deflationary pressures remain. Recovery is most advanced in the United States and the United Kingdom, where monetary policy looks likely to tighten soon, but is more tentative in the euro area and Japan. In countries outside of the advanced economies, the sources of slower growth are diverse, ranging from commodity price declines (which are also affecting a few advanced economies adversely), to overhangs from past rapid credit growth, to political turmoil. Of course, countries with multiple diagnoses are faring worst, in some cases also facing higher inflation. For emerging market and developing economies as a whole, our forecast is that 2015 will mark the fifth consecutive year of declining growth.

What underpins forecasts of moderating growth? First, the ongoing experience of slow productivity growth suggests that long-run potential output growth may have fallen broadly across economies. Persistently low investment helps explain limited labor productivity and wage gains, although the joint productivity of all factors of production, not just labor, has also been slow. Low aggregate demand is one factor that discourages investment, as the last *World Economic Outlook* report showed. Slow expected potential growth itself dampens aggregate demand, further limiting investment, in a vicious circle. Aging populations further restrain investment in a number of countries; in some others, institutional shortcomings or political instability are deterrents. In its more extreme forms, political conflict has created a large global stock of displaced persons, both within and across borders. The economic and social costs are immense.

Chapter 1 suggests that recessions may have a permanent negative effect not only on trend productivity levels, but on trend productivity growth. This mechanism would make current low productivity forecasts look in part like products of the post-2007 turbulence. Some economic historians advance the idea that the postwar global growth experience largely reflects diminishing returns along the extensive margin of technological innovation, punctuated temporarily by the entry of China and the former nations of the Soviet Union into the global market economy and by the information and communications technology revolution. Others counter that transformative innovation continues in many areas, from robotics to bioengineering. But like electrification over a century ago, these advances may take decades to embody in commercial production processes whose outputs are measured in national income. Only time can resolve these debates.

For countries that export oil and other commodities, changes in prices affect both the output gap and potential output itself, so recent movements in commodity prices also inform the near-term and longer-term output forecasts. Those movements have been dramatic, in part because of changes in China's economy, and affect low-income commodity exporters with particular force. Now the world's most important importer of metals, China maintained very rapid growth rates during the 2000s through 2011; as commodity prices rose, exporters invested heavily in capacity, fueling domestic growth. China's leadership has recently targeted lower growth rates, however, as it

seeks to rebalance its formerly export- and investment-driven economy in favor of consumption, including of services. As Chapters 1 and 2 document, many real commodity prices, notably those of metals, have fallen from peaks reached in 2011, and fell particularly sharply in the recent weeks of financial volatility starting in mid-August. It remains unclear, at the time of publication, if the recent declines represent a downward overshooting, but the effects of earlier reductions are already reflected in commodity exporter growth. Chapter 2 estimates that on average about a third of the resulting growth reductions are attributable to the structural component of growth, mostly via reduced investment.

Commodity exporters in particular have seen sharp depreciations of their currencies, but a general trend of reduced financial inflows to emerging markets has resulted in more generalized depreciation against the U.S. dollar, euro, and yen. Chapter 3 suggests that these exchange rate changes should be associated with growing net exports for the depreciating countries, a development that is part of the natural adjustment process to differential growth rates that flexible exchange rates promote. Although one result may be an increase in the current account deficits of some advanced economies with relatively good growth performance, it is important that these exchange rate adjustments be seen as the natural shock absorbers they typically are rather than as intentional acts of "currency war." Indeed, past attempts by emerging markets to fix their exchange rates in the face of large financial outflows had quite negative consequences for global financial stability.

Large exchange rate depreciations carry the risk of negative balance sheet effects. A notable potential pressure point is offshore foreign-currency borrowing by emerging market corporations. Counteracting such risks are substantial reserve buffers, greater external equity finance, and a growing trend of domestic-currency denomination of onshore loans. Of course, other risks abide—renewed concerns about China's growth potential, Greece's future in the euro area, the impact of sharply lower oil prices, and contagion effects could be sparks for market volatility. In the advanced economies and in China, deflationary pressures, which continue to slow balance sheet adjustment, have not been entirely banished.

No single set of policy prescriptions is suitable for every country seeking to improve growth performance or build resilience. But some familiar general principles still apply in light of the shared challenges that countries face. Emerging market and developing economies need to be ready for monetary policy normalization by the United States. Advanced economies must continue to deal with crisis legacies where they persist. At the same time, monetary accommodation should continue where output gaps are negative, supplemented by fiscal measures where fiscal space permits. In particular, the case for infrastructure investment seems compelling at a time of very low long-term real interest rates. Investment is one way to enhance potential output growth, but targeted structural reforms can also play an important positive role. Such reforms help not only to enhance future growth, but to increase the resilience of growth. They can help low-income countries to diversify their export bases. In all countries, continued strengthening of micro- and macro-prudential policy frameworks will also support resilience to economic shocks, whether originating domestically or from abroad.

Maurice Obstfeld
Economic Counsellor

EXECUTIVE SUMMARY

Global growth for 2015 is projected at 3.1 percent, 0.3 percentage point lower than in 2014, and 0.2 percentage point below the forecasts in the July 2015 World Economic Outlook (WEO) Update. *Prospects across the main countries and regions remain uneven. Relative to last year, the recovery in advanced economies is expected to pick up slightly, while activity in emerging market and developing economies is projected to slow for the fifth year in a row, primarily reflecting weaker prospects for some large emerging market economies and oil-exporting countries. In an environment of declining commodity prices, reduced capital flows to emerging markets and pressure on their currencies, and increasing financial market volatility, downside risks to the outlook have risen, particularly for emerging market and developing economies.*

Global growth remains moderate—and once again more so than predicted a few months earlier. Although country-specific shocks and developments play a role, the persistently modest pace of recovery in advanced economies and the fifth consecutive year of growth declines in emerging markets suggest that medium-term and long-term common forces are also importantly at play. These include low productivity growth since the crisis, crisis legacies in some advanced economies (high public and private debt, financial sector weakness, low investment), demographic transitions, ongoing adjustment in many emerging markets following the post-crisis credit and investment boom, a growth realignment in China—with important cross-border repercussions—and a downturn in commodity prices triggered by weaker demand as well as higher production capacity. Chapter 2 of this WEO report and the Commodities Special Feature in Chapter 1 examine in detail causes and implications of the commodity price downturn, while the October 2015 *Fiscal Monitor* examines the role of fiscal policy and fiscal policy frameworks in managing commodity price volatility.

Financial market volatility spiked in August, following the depreciation of the renminbi, with an increase in global risk aversion, weakening currencies for many emerging markets, and a sharp correction in equity prices worldwide. Temporary surges in volatility had earlier been associated with events surrounding Greek debt negotiations and the sharp stock market decline in China and subsequent policy measures by the Chinese authorities in June–July. With the first increase in U.S. policy rates approaching and a worsening of the global outlook, financial conditions for emerging markets have tightened since the spring, especially in recent weeks: dollar bond spreads and long-term local-currency bond yields have increased by 50 to 60 basis points on average, and stock prices are weaker, while exchange rates have depreciated or come under pressure. Financial conditions in advanced economies continue in contrast to be easy, and real interest rates remain low even as the policy rate liftoff approaches in the United States and the United Kingdom.

Commodity prices have weakened, particularly in recent weeks. After increasing in the spring from their January trough, oil prices have declined sharply, reflecting resilient supply, the prospects of higher future output following the nuclear deal with the Islamic Republic of Iran, and weaker global demand. Metal prices have also fallen on concerns about global demand, especially the slowdown in commodity-intensive investment and manufacturing activity in China, but also owing to increases in supply following the past mining investment boom.

For many commodity exporters with flexible exchange rate regimes, weakening commodity prices have triggered sizable currency depreciation. But emerging market currencies more generally have seen sharp depreciations since the spring, particularly in August, while exchange rate movements across major advanced economy currencies have been relatively modest in recent months compared to the August 2014–March 2015 period. These realignments across floating-rate currencies have reflected to an important extent the evolution of underlying fundamentals—countries with weakening growth prospects and worsening terms of trade are facing currency depreciation pressures as part of global adjustment. As discussed in Chapter 3, countries experiencing sharp and persistent exchange rate movements will likely see notable changes in their net external demand.

These global factors—and country-specific developments—point to a somewhat weaker recovery in 2015 and 2016 than previously envisaged, and to higher downside risks.

Growth in advanced economies is projected to increase modestly this year and next year. This year's developments reflect primarily a strengthening of the modest recovery in the euro area and a return to positive growth in Japan, supported by declining oil prices, accommodative monetary policy, and in some cases, currency depreciation. The pickup in advanced economies is tempered by lower growth in commodity exporters—particularly Canada and Norway—and in Asia outside of Japan (in particular, Korea and Taiwan Province of China). Unemployment is declining, but underlying productivity growth remains weak, including in the United States, where the recovery is more entrenched. This heightens concern about the medium-term outlook. Some pickup in growth is expected in 2016 (especially in North America), but medium-term prospects remain subdued, reflecting a combination of lower investment, unfavorable demographics, and weak productivity growth. The recent further decline in oil prices, as well as in prices of other commodities, should support demand in the majority of advanced economies that are net commodity importers, but the slowdown in emerging markets will imply weaker exports.

The renewed declines in commodity prices will again put downward pressure on headline inflation in advanced economies in the coming months and could delay the expected pickup in core inflation as the recovery progresses. While core inflation has remained more stable, it generally is still much below central bank objectives. The outlook is for inflation to remain subdued, notwithstanding declining unemployment and weaker medium-term growth potential.

Growth prospects in emerging markets are very different across countries and regions, but the outlook is generally weakening, with growth projected to decline for the fifth year in a row. This reflects a combination of factors: weaker growth in oil exporters; a slowdown in China with less reliance on import-intensive investment; adjustment in the aftermath of credit and investment booms; and a weaker outlook for exporters of other commodities, including in Latin America, following declines in other commodity prices, as well as geopolitical tensions and domestic strife in a number of countries.

For most emerging market economies, external conditions are becoming more difficult. While currency depreciation will help net exports, the "pull" from advanced economies will be somewhat more modest than previously forecast, given their weak recovery and moderate prospects for medium-term growth. Capital flows to emerging markets have slowed in recent quarters, and the liftoff of U.S. policy rates from the zero lower bound is likely to be associated with some tightening of external financial conditions. And while the growth slowdown in China is so far in line with forecasts, its cross-border repercussions appear greater than previously envisaged. This is reflected in weakening commodity prices (especially those for metals) and reduced exports to China (particularly in some east Asian economies).

Growth in emerging market and developing economies is projected to rebound in 2016. This reflects mostly a less deep recession or a partial normalization of conditions in countries in economic distress in 2015 (including Brazil, Russia, and some countries in Latin America and in the Middle East), spillovers from the stronger pickup in activity in advanced economies, and the easing of sanctions on the Islamic Republic of Iran. China's growth is projected to slow further, albeit gradually.

The weakness in commodity prices, slower-than-expected global growth, and the prospect of tighter global financial conditions weigh on the outlook for low-income countries. Some have been running large current account deficits, benefiting from easy access to foreign savings and abundant foreign direct investment, especially in resource-rich countries, and they are hence particularly vulnerable to external financial shocks.

The balance of risks is still tilted to the downside. Lower oil and other commodity prices could provide some upside to demand in commodity importers, but complicate the outlook for commodity exporters, some of which already face strained initial conditions. The Chinese authorities face difficult trade-offs in their objectives of achieving a transition to more consumption-driven growth without activity slowing too much, while also reducing financial vulnerabilities and implementing reforms to strengthen the role of market forces in the economy. Emerging markets remain vulnerable in the short term to further declines in commodity prices and sharp appreciation of the U.S. dollar, which could further strain corporate

balance sheets in some countries. Increased financial market volatility can pose financial stability challenges in advanced economies (for instance, if accompanied by a sudden decompression of risk premiums), with substantial spillovers onto emerging markets, including through tighter financial conditions and a reversal of capital flows.

The main medium-term risk for advanced economies is a further decline of already-low growth into near stagnation, particularly if global demand falters further as prospects weaken for emerging market and developing economies. In this context, persistently below-target inflation could become more entrenched. In emerging markets, medium-term risks come from spillovers from a "hard landing" or much slower potential growth in China, or lower potential growth more generally.

Raising both actual and potential output through a combination of demand support and structural reforms continues to be the economic policy priority. In advanced economies, accommodative monetary policy remains essential, alongside macroprudential policies to contain financial sector risks as needed. Countries with fiscal space and sizable output gaps or significant reliance on net external demand should ease their fiscal stance in the near term, especially through increased infrastructure investment. Indeed, to the extent that demand support is able to boost confidence and investment, which has been lagging in many advanced economies, this would also contribute to higher potential output. The structural reform agenda is country specific, but its main planks are measures to strengthen labor force participation and trend employment, facilitate labor market adjustment, tackle legacy debt overhang, and lower barriers to entry in product markets, especially in services.

Emerging market and developing economies face a difficult trade-off between supporting demand amid slowing growth—actual and potential—and reducing vulnerabilities in a more difficult external environment. Many economies have eased macroeconomic policies in response. The scope for further easing varies considerably across countries, however, given differences in growth performance, macroeconomic conditions, and sensitivity to commodity price shocks, as well as external, financial, and fiscal vulnerabilities.

- In oil importers, lower oil prices have reduced price pressures and external vulnerabilities, which will ease the burden on monetary policy. These positive effects are, however, offset in oil importers that export other commodities by weaker export prices and the ensuing exchange rate depreciation.
- In oil exporters without fiscal space, lower oil revenues require a reduction in public spending. For those with space, it is appropriate to adjust the fiscal position gradually, but medium-term adjustment plans should be formulated and initiated to maintain policy credibility.
- In commodity-exporting countries with flexible exchange rate regimes, currency depreciation can help offset the demand impact of terms-of-trade losses, but sharp exchange rate changes can in some countries exacerbate vulnerabilities associated with high corporate leverage and foreign-currency exposure.
- Structural reforms to raise productivity and remove bottlenecks to production are urgently needed in many economies.

CHAPTER 1

RECENT DEVELOPMENTS AND PROSPECTS

Global growth declined in the first half of 2015, reflecting a further slowdown in emerging markets and a weaker recovery in advanced economies. It is now projected at 3.1 percent for 2015 as a whole, slightly lower than in 2014, and 0.2 percentage point below the forecasts in the July 2015 World Economic Outlook (WEO) Update. *Prospects across the main countries and regions remain uneven. Relative to last year, growth in advanced economies is expected to pick up slightly, while it is projected to decline in emerging market and developing economies. With declining commodity prices, depreciating emerging market currencies, and increasing financial market volatility, downside risks to the outlook have risen, particularly for emerging market and developing economies.*

Global activity is projected to gather some pace in 2016. In advanced economies, the modest recovery that started in 2014 is projected to strengthen further. In emerging market and developing economies, the outlook is projected to improve: in particular, growth in countries in economic distress in 2015 (including Brazil, Russia, and some countries in Latin America and in the Middle East), while remaining weak or negative, is projected to be higher next year, more than offsetting the expected gradual slowdown in China.

Recent Developments and Prospects

The evolution of the global outlook in recent months reflects a combination of short-term factors and longer-term forces.

The World Economy in Recent Months

Growth in advanced economies in the first half of 2015 remained modest. For most emerging market economies, external conditions are becoming more difficult. Financial market volatility rose sharply during the summer, with declining commodity prices and downward pressure on many emerging market currencies. Capital inflows have slowed, and the liftoff of U.S. policy rates from the zero lower bound is likely to herald some further tightening of external financial conditions. And while the growth slowdown in China is so far broadly in line with forecasts, its cross-border repercussions appear larger than previously envisaged. This is reflected in weakening commodity prices (especially those for metals) and weak exports to China.

Slowing Global Activity, Tame Inflation

Preliminary data suggest that global growth in the first half of 2015 was 2.9 percent, about 0.3 percentage point weaker than predicted in April of this year (Figure 1.1). Growth was below forecast for both advanced economies and emerging markets. Specifically:

- Growth in the United States was weaker than expected, despite a strong second quarter. This reflected setbacks to activity in the first quarter, caused by one-off factors, notably harsh winter weather and port closures, as well as much lower capital spending in the oil sector. Despite weaker growth, the unemployment rate declined to 5.1 percent at the end of August, 0.4 percentage point below its February level (and 1 percentage point below the level a year ago). Lower capital expenditures in the oil sector were also a major contributor to the slowdown in Canada, where economic activity contracted modestly during the first two quarters of 2015.
- The recovery was broadly in line with the April forecast in the euro area, with stronger-than-expected growth in Italy and especially in Ireland and Spain (sustained by recovering domestic demand) offsetting weaker-than-expected growth in Germany.
- In the United Kingdom, GDP expanded at an annualized rate of 2¼ percent in the first half of 2015, with the unemployment rate now back near its precrisis average of about 5½ percent.
- In Japan, a strong rebound in the first quarter was followed by a drop in activity in the second quarter. Over the first half of the year, consumption fell short of expectations and so did net exports. Exports declined substantially in the second quarter.
- Growth in China was broadly in line with previous forecasts. Investment growth slowed compared with

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

(Percent change, unless noted otherwise)

		Projections		Difference from July 2015 *WEO Update*[1]		Difference from April 2015 *WEO*[1]	
	2014	2015	2016	2015	2016	2015	2016
World Output	**3.4**	**3.1**	**3.6**	**–0.2**	**–0.2**	**–0.4**	**–0.2**
Advanced Economies	**1.8**	**2.0**	**2.2**	**–0.1**	**–0.2**	**–0.4**	**–0.2**
United States	2.4	2.6	2.8	0.1	–0.2	–0.5	–0.3
Euro Area	0.9	1.5	1.6	0.0	–0.1	0.0	0.0
Germany	1.6	1.5	1.6	–0.1	–0.1	–0.1	–0.1
France	0.2	1.2	1.5	0.0	0.0	0.0	0.0
Italy	–0.4	0.8	1.3	0.1	0.1	0.3	0.2
Spain	1.4	3.1	2.5	0.0	0.0	0.6	0.5
Japan	–0.1	0.6	1.0	–0.2	–0.2	–0.4	–0.2
United Kingdom	3.0	2.5	2.2	0.1	0.0	–0.2	–0.1
Canada	2.4	1.0	1.7	–0.5	–0.4	–1.2	–0.3
Other Advanced Economies[2]	2.8	2.3	2.7	–0.4	–0.4	–0.5	–0.4
Emerging Market and Developing Economies	**4.6**	**4.0**	**4.5**	**–0.2**	**–0.2**	**–0.3**	**–0.2**
Commonwealth of Independent States	1.0	–2.7	0.5	–0.5	–0.7	–0.1	0.2
Russia	0.6	–3.8	–0.6	–0.4	–0.8	0.0	0.5
Excluding Russia	1.9	–0.1	2.8	–0.8	–0.5	–0.5	–0.4
Emerging and Developing Asia	6.8	6.5	6.4	–0.1	0.0	–0.1	0.0
China	7.3	6.8	6.3	0.0	0.0	0.0	0.0
India[3]	7.3	7.3	7.5	–0.2	0.0	–0.2	0.0
ASEAN-5[4]	4.6	4.6	4.9	–0.1	–0.2	–0.6	–0.4
Emerging and Developing Europe	2.8	3.0	3.0	0.1	0.1	0.1	–0.2
Latin America and the Caribbean	1.3	–0.3	0.8	–0.8	–0.9	–1.2	–1.2
Brazil	0.1	–3.0	–1.0	–1.5	–1.7	–2.0	–2.0
Mexico	2.1	2.3	2.8	–0.1	–0.2	–0.7	–0.5
Middle East, North Africa, Afghanistan, and Pakistan	2.7	2.5	3.9	–0.1	0.1	–0.4	0.1
Saudi Arabia	3.5	3.4	2.2	0.6	–0.2	0.4	–0.5
Sub-Saharan Africa	5.0	3.8	4.3	–0.6	–0.8	–0.7	–0.8
Nigeria	6.3	4.0	4.3	–0.5	–0.7	–0.8	–0.7
South Africa	1.5	1.4	1.3	–0.6	–0.8	–0.6	–0.8
Memorandum							
European Union	1.5	1.9	1.9	0.0	–0.1	0.1	0.0
Low-Income Developing Countries	6.0	4.8	5.8	–0.3	–0.4	–0.7	–0.2
Middle East and North Africa	2.6	2.3	3.8	–0.1	0.1	–0.4	0.1
World Growth Based on Market Exchange Rates	2.7	2.5	3.0	–0.1	–0.2	–0.4	–0.2
World Trade Volume (goods and services)	**3.3**	**3.2**	**4.1**	**–0.9**	**–0.3**	**–0.5**	**–0.6**
Imports							
Advanced Economies	3.4	4.0	4.2	–0.5	–0.3	0.7	–0.1
Emerging Market and Developing Economies	3.6	1.3	4.4	–2.3	–0.3	–2.2	–1.1
Exports							
Advanced Economies	3.4	3.1	3.4	–0.5	–0.6	–0.1	–0.7
Emerging Market and Developing Economies	2.9	3.9	4.8	–1.1	0.1	–1.4	–0.9
Commodity Prices (U.S. dollars)							
Oil[5]	–7.5	–46.4	–2.4	–7.6	–11.5	–6.8	–15.3
Nonfuel (average based on world commodity export weights)	–4.0	–16.9	–5.1	–1.3	–3.4	–2.8	–4.1
Consumer Prices							
Advanced Economies	1.4	0.3	1.2	0.3	0.0	–0.1	–0.2
Emerging Market and Developing Economies	5.1	5.6	5.1	0.1	0.3	0.2	0.3
London Interbank Offered Rate (percent)							
On U.S. Dollar Deposits (six month)	0.3	0.4	1.2	0.0	0.0	–0.3	–0.7
On Euro Deposits (three month)	0.2	0.0	0.0	0.0	0.0	0.0	0.0
On Japanese Yen Deposits (six month)	0.2	0.1	0.1	0.0	0.0	0.0	–0.1

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during July 27–August 24, 2015. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook* (WEO).

[1]Difference based on rounded figures for both the current, July 2015 *WEO Update,* and April 2015 *World Economic Outlook* forecasts.

[2]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[3]For India, data and forecasts are presented on a fiscal year basis and GDP from 2011 onward is based on GDP at market prices with FY2011/12 as a base year.

	Year over Year				Q4 over Q4[6]			
			Projections				Projections	
	2013	2014	2015	2016	2013	2014	2015	2016
World Output	**3.3**	**3.4**	**3.1**	**3.6**	**3.6**	**3.3**	**3.0**	**3.6**
Advanced Economies	**1.1**	**1.8**	**2.0**	**2.2**	**2.0**	**1.8**	**2.0**	**2.3**
United States	1.5	2.4	2.6	2.8	2.5	2.5	2.5	2.8
Euro Area	–0.3	0.9	1.5	1.6	0.6	0.9	1.5	1.7
Germany	0.4	1.6	1.5	1.6	1.3	1.5	1.6	1.6
France	0.7	0.2	1.2	1.5	1.0	0.1	1.5	1.5
Italy	–1.7	–0.4	0.8	1.3	–0.9	–0.4	1.2	1.5
Spain	–1.2	1.4	3.1	2.5	0.0	2.0	3.2	2.2
Japan	1.6	–0.1	0.6	1.0	2.3	–0.8	1.3	1.3
United Kingdom	1.7	3.0	2.5	2.2	2.4	3.4	2.2	2.2
Canada	2.0	2.4	1.0	1.7	2.7	2.5	0.5	2.0
Other Advanced Economies[2]	2.2	2.8	2.3	2.7	2.7	2.6	2.5	2.6
Emerging Market and Developing Economies	**5.0**	**4.6**	**4.0**	**4.5**	**5.2**	**4.7**	**4.0**	**4.8**
Commonwealth of Independent States	2.2	1.0	–2.7	0.5	2.3	–0.6	–3.3	0.3
Russia	1.3	0.6	–3.8	–0.6	1.9	0.3	–4.6	0.0
Excluding Russia	4.2	1.9	–0.1	2.8	. . .	. . .	. . .	. . .
Emerging and Developing Asia	7.0	6.8	6.5	6.4	6.8	6.8	6.4	6.4
China	7.7	7.3	6.8	6.3	7.5	7.1	6.7	6.3
India[3]	6.9	7.3	7.3	7.5	6.9	7.6	7.3	7.5
ASEAN-5[4]	5.1	4.6	4.6	4.9	4.6	4.8	4.4	5.2
Emerging and Developing Europe	2.9	2.8	3.0	3.0	3.9	2.6	3.2	4.2
Latin America and the Caribbean	2.9	1.3	–0.3	0.8	1.7	1.1	–1.5	1.7
Brazil	2.7	0.1	–3.0	–1.0	2.1	–0.2	–4.4	1.3
Mexico	1.4	2.1	2.3	2.8	1.0	2.6	2.3	2.9
Middle East, North Africa, Afghanistan, and Pakistan	2.3	2.7	2.5	3.9	. . .	. . .	. . .	. . .
Saudi Arabia	2.7	3.5	3.4	2.2	4.9	1.6	3.9	1.6
Sub-Saharan Africa	5.2	5.0	3.8	4.3	. . .	. . .	. . .	. . .
Nigeria	5.4	6.3	4.0	4.3	. . .	. . .	. . .	. . .
South Africa	2.2	1.5	1.4	1.3	2.8	1.3	0.7	1.7
Memorandum								
European Union	0.2	1.5	1.9	1.9	1.1	1.5	1.8	2.1
Low-Income Developing Countries	6.1	6.0	4.8	5.8	. . .	. . .	. . .	. . .
Middle East and North Africa	2.1	2.6	2.3	3.8	. . .	. . .	. . .	. . .
World Growth Based on Market Exchange Rates	2.4	2.7	2.5	3.0	2.8	2.5	2.4	3.0
World Trade Volume (goods and services)	**3.3**	**3.3**	**3.2**	**4.1**	**. . .**	**. . .**	**. . .**	**. . .**
Imports								
Advanced Economies	2.0	3.4	4.0	4.2	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	5.2	3.6	1.3	4.4	. . .	. . .	. . .	. . .
Exports								
Advanced Economies	2.9	3.4	3.1	3.4	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	4.4	2.9	3.9	4.8	. . .	. . .	. . .	. . .
Commodity Prices (U.S. dollars)								
Oil[5]	–0.9	–7.5	–46.4	–2.4	2.6	–28.7	–38.0	13.6
Nonfuel (average based on world commodity export weights)	–1.2	–4.0	–16.9	–5.1	–2.9	–7.5	–16.1	–0.3
Consumer Prices								
Advanced Economies	1.4	1.4	0.3	1.2	1.2	1.0	0.5	1.4
Emerging Market and Developing Economies	5.8	5.1	5.6	5.1	5.6	5.1	6.7	5.7
London Interbank Offered Rate (percent)								
On U.S. Dollar Deposits (six month)	0.4	0.3	0.4	1.2	. . .	. . .	. . .	. . .
On Euro Deposits (three month)	0.2	0.2	0.0	0.0	. . .	. . .	. . .	. . .
On Japanese Yen Deposits (six month)	0.2	0.2	0.1	0.1	. . .	. . .	. . .	. . .

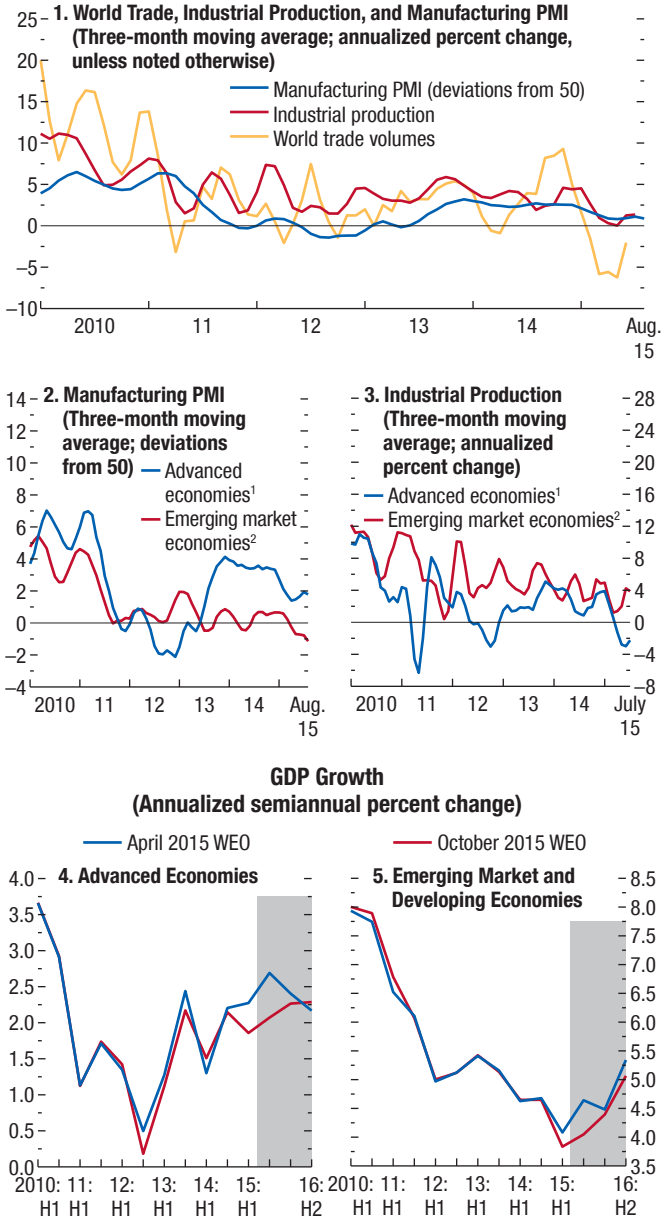
[4]Indonesia, Malaysia, Philippines, Thailand, Vietnam.

[5]Simple average of prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was $96.25 in 2014; the assumed price based on futures markets is $51.62 in 2015 and $50.36 in 2016.

[6]For World Output, the quarterly estimates and projections account for approximately 90 percent of annual world output at purchasing-power-parity weights. For Emerging Market and Developing Economies, the quarterly estimates and projections account for approximately 80 percent of annual emerging market and developing economies' output at purchasing-power-parity weights.

Figure 1.1. Global Activity Indicators

Global growth moderated in the first half of 2015, and global industrial production and world trade volumes slowed markedly. Global activity is projected to gather pace in 2016. In advanced economies, the projections suggest a broad-based further strengthening of growth in the second half of 2015 and in early 2016. In emerging market and developing economies, the pickup in 2016 mainly reflects a gradual improvement in countries in economic distress in 2015.



Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff estimates.
Note: IP = industrial production; PMI = purchasing managers' index.
[1]Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR (IP only), Israel, Japan, Korea, New Zealand, Norway (IP only), Singapore, Sweden (IP only), Switzerland, Taiwan Province of China, United Kingdom, United States.
[2]Argentina (IP only), Brazil, Bulgaria (IP only), Chile (IP only), China, Colombia (IP only), Hungary, India, Indonesia, Latvia (IP only), Lithuania (IP only), Malaysia (IP only), Mexico, Pakistan (IP only), Peru (IP only), Philippines (IP only), Poland, Romania (IP only), Russia, South Africa, Thailand (IP only), Turkey, Ukraine (IP only), Venezuela (IP only).

last year and imports contracted, but consumption growth remained steady. While exports were also weaker than expected, they declined less than imports, and net exports contributed positively to growth. Equity prices have dropped sharply since July after a one-year bull run. While the authorities intervened to restore orderly market conditions, market volatility remained elevated through August.

- Economic activity in some advanced and emerging market economies in east Asia—such as Korea, Taiwan Province of China, and economies of Association of Southeast Asian Nations (ASEAN) members—was also a bit weaker than expected, reflecting lower exports but also a slowdown in domestic demand.
- In Latin America, the downturn in Brazil was deeper than expected, and with declining commodity prices, momentum continues to weaken in other countries in the region. Growth was also lower than expected in Mexico, reflecting slower U.S. growth but also lackluster domestic demand.
- The decline in GDP in Russia over the first half of 2015 was somewhat larger than forecast, and the recession in Ukraine was deeper than previously forecast, reflecting the ongoing conflict in the region.
- Macroeconomic indicators suggest that economic activity in sub-Saharan Africa and the Middle East—for which quarterly GDP series are not broadly available—also fell short of expectations, affected by the drop in oil prices, declines in other commodity prices, and geopolitical and domestic strife in a few countries.

Global industrial production remained weak through 2014, consistent with the uneven strength in demand across major economies and groups of countries, and slowed markedly over the course of the first half of 2015, reflecting some building of inventories in late 2014 and early 2015 but also lower investment growth. World trade volumes also slowed in the first half of 2015. Weak investment worldwide, particularly in mining, as well as the trade spillovers of China's growth transition, has likely contributed to this slowing. Measuring the extent of the trade slowdown in the current context of large commodity price and exchange rate changes is challenging, however, and depends on the underlying measure. National-accounts-based estimates suggest a moderation in the growth of world trade volumes, while measures based on international merchandise trade statistics, depicted in the first panel of Figure 1.1, imply an outright contraction.

Headline inflation declined in advanced economies (Figure 1.2), mostly reflecting the decline in oil prices and softer prices for other commodities, while core inflation remained stable. With regard to emerging markets, lower prices for oil and other commodities (including food, which has a larger weight in the consumer price index of emerging market and developing economies) have generally contributed to reductions in inflation, except in countries suffering sizable currency depreciations, such as Russia.

Declining Commodity Prices

After remaining broadly stable during the second quarter of 2015, oil prices declined through much of the third quarter (Figure 1.3). Weaker-than-expected global activity played a role, but supply was also higher than expected, reflecting strong production in members of the Organization of the Petroleum Exporting Countries as well as in the United States and Russia. Furthermore, a future boost to supply is expected, coming from the Islamic Republic of Iran after the recent nuclear agreement with the P5+1 nations.[1]

Recent developments suggest that oil markets will take longer to adjust to current conditions of excess flow supply, and oil prices through 2020 are now forecast to remain below the levels projected a few months ago. Supply has remained more resilient than expected, and global activity has been weaker. While lower oil prices have supported demand in importers, other shocks have partly offset the effects and so far prevented a broad-based pickup in activity, which in turn would have supported oil market rebalancing. The income windfall gains from lower oil prices have supported a pickup in private consumption in advanced economies, broadly as expected, except in the United States, where harsh winter weather and other temporary factors weakened the consumption response somewhat, and Japan, where the consumption response has been dampened by delayed pass-through and wage moderation. But investment has not responded, partly reflecting a greater contraction in oil sector investment, but also lackluster investment more broadly. And in emerging markets, economic activity has been weaker than expected, particularly in oil exporters, as discussed earlier.

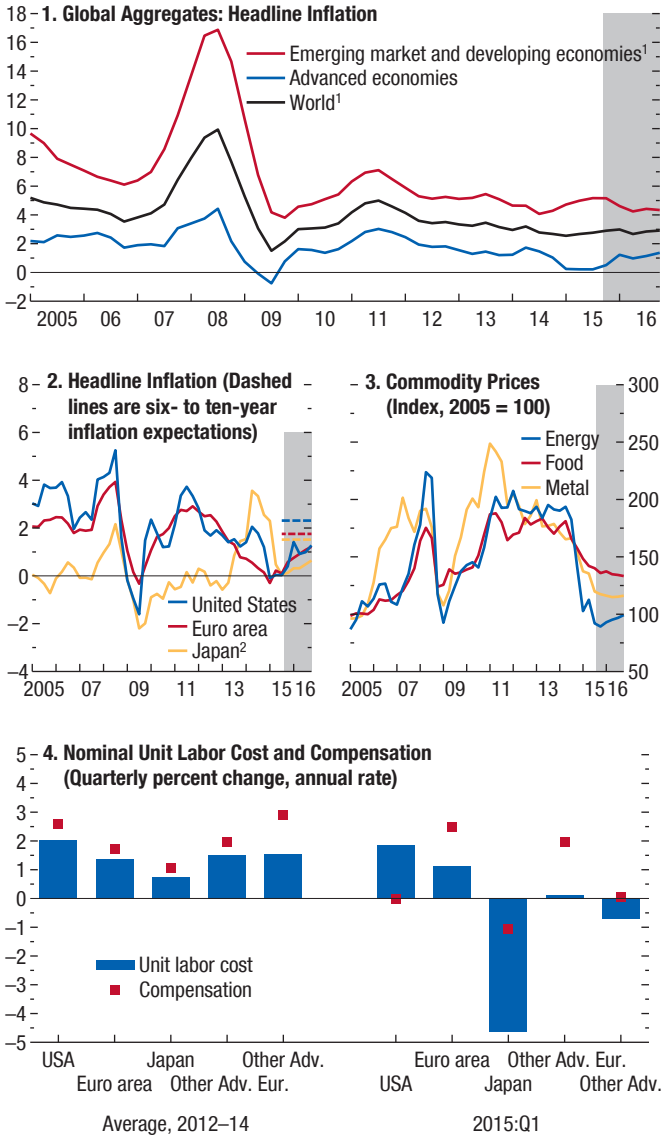
As examined in more detail in the Special Feature, the prices of nonfuel commodities—especially base metals—have fallen sharply in recent weeks. The

[1]The P5+1 are the five permanent members of the UN Security Council and Germany.

Figure 1.2. Global Inflation

(Year-over-year percent change, unless noted otherwise)

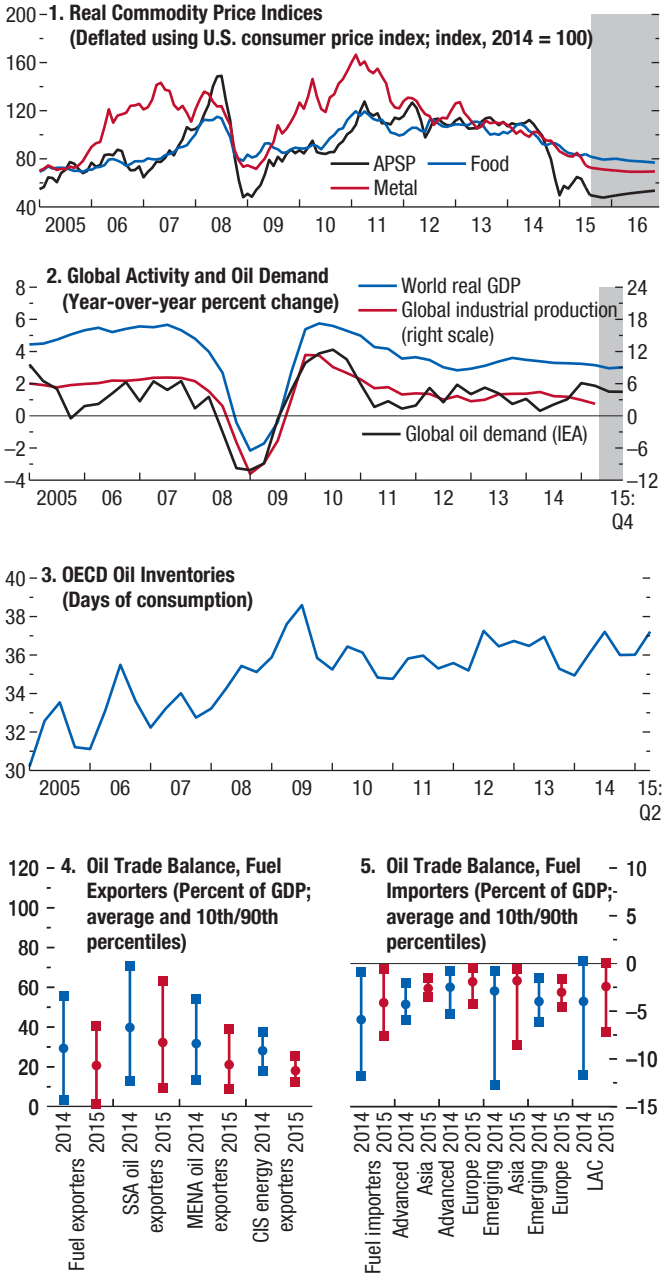
Headline inflation has declined in advanced economies, mostly reflecting the decline in the prices of oil and other commodities. Core inflation has remained more stable, but generally is below central banks' inflation objectives, as are nominal unit labor costs. In emerging market economies, lower commodity prices have also contributed to lowering headline inflation, but sizable currency depreciation has led to offsets on the upside in some economies.



Sources: Consensus Economics; IMF, Primary Commodity Price System; and IMF staff estimates.
Note: Other Adv. = other advanced economies; other Adv. Eur. = other advanced Europe; USA = United States.
[1]Excludes Venezuela.
[2]In Japan, the increase in inflation in 2014 reflects, to a large extent, the increase in the consumption tax.

Figure 1.3. Commodity and Oil Markets

In global oil markets, spot prices have declined again after rising from the lows reached in January 2015. More resilient supply, including in North America, and weaker global activity likely have been the main factors behind the renewed downward pressure on prices. The adjustment to excess flow supply conditions is now expected to take longer, and prices are projected to remain below the levels assumed a few months ago.



Sources: International Energy Agency (IEA); IMF, Primary Commodity Price System; Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: APSP = average petroleum spot price; CIS = Commonwealth of Independent States; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; OECD = Organisation for Economic Co-operation and Development; SSA = sub-Saharan Africa.

dynamics are similar to those of the recent adjustment in the oil market. High prices have generally led to a buildup in supply capacity that came onstream as demand began to slow. However, developments in China play a much more important role in base metal markets than they do in the oil market. China's share in the global consumption of these metals has increased from some 10 to 20 percent in the early 2000s to more than 50 percent currently. Some of this increase relates to the country's role as a manufacturing hub, but it also reflects the infrastructure investment and construction boom in 2009–13 after the global financial crisis. China's growth transition and slower metal-intensive investment growth have been instrumental in weakening base metal prices, and the trend is expected to continue during the transition. With demand growth expected to stay relatively weak under the baseline projections, prices are assumed to move broadly sideways in the near term.

The global macroeconomic implications of lower oil prices were discussed in detail in the April 2015 WEO. In commodity exporters, the near-term outlook has deteriorated with lower oil prices and commodity prices more broadly. Chapter 2 analyzes in more detail the implications of commodity terms-of-trade fluctuations for real GDP in commodity exporters. All else equal, current WEO assumptions for commodity prices imply average commodity exporter growth rates almost 1 percentage point lower in 2015–17 than in 2012–14—with a stronger drag for exporters of fuel and metals (about 2¼ percentage points). The impact will, of course, also depend on other factors, including macroeconomic policy responses—as discussed in the October 2015 *Fiscal Monitor*.

Exchange Rate Movements

Weakening commodity prices have been reflected in sizable exchange rate depreciation for many commodity exporters with flexible exchange rate regimes. But emerging market currencies more generally have seen sharp depreciations since the spring, and particularly since July. Exchange rate movements across major advanced economy currencies have instead been relatively modest in recent months, after the large changes during the August 2014–March 2015 period. In real effective terms, the euro appreciated by 3.7 percent and the U.S. dollar by 2.3 percent between March and August 2015, while the yen weakened slightly. Exchange rate volatility increased in August, particu-

larly after the depreciation of the renminbi associated with the announced increase in exchange rate flexibility. Despite its 4 percent adjustment with respect to the U.S. dollar, the renminbi remains some 10 percent stronger than its 2014 average in real effective terms. More generally, exchange rate movements across floating-rate currencies over the past year have reflected to an important extent large variations in underlying fundamentals, such as expected demand growth at home and in trading partners, declines in commodity prices, and country-specific shocks. For instance, countries with weakening growth prospects and worsening terms of trade are facing currency depreciation pressures as part of global adjustment. And as discussed in Chapter 3, countries experiencing sharp and persistent exchange rate movements will likely see notable changes in net external demand.

Long-Term Interest Rates and Financial Conditions

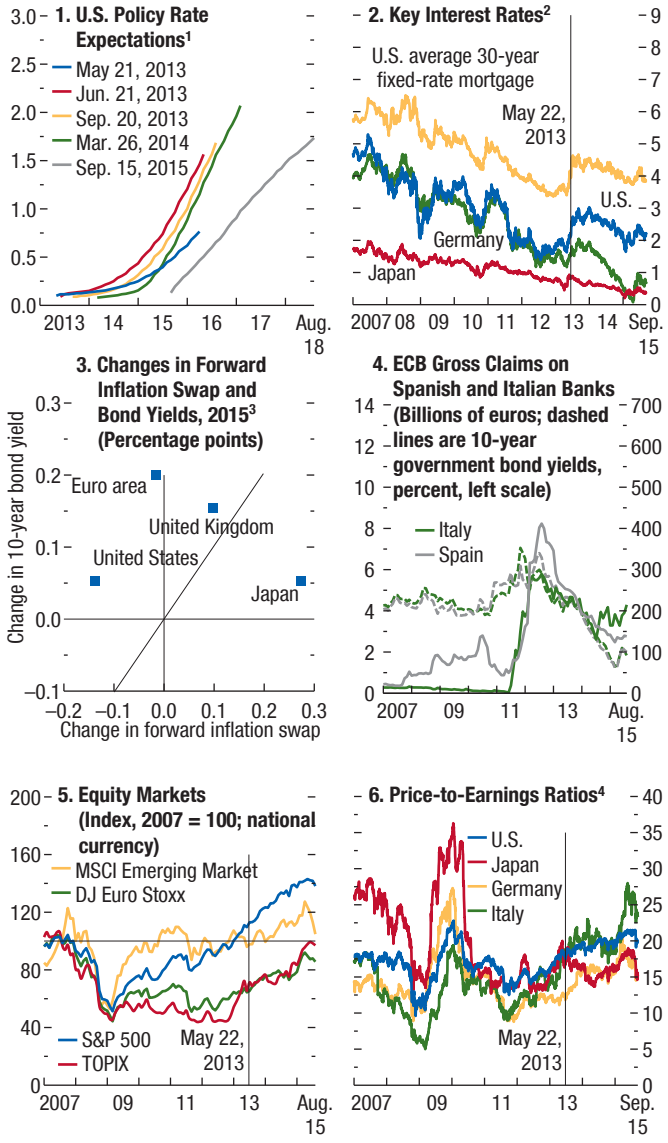
Financial market volatility spiked in August, with an increase in global risk aversion triggered by concerns about China's outlook, uncertainty about the implementation of its new exchange rate regime, and emerging market prospects more generally. This episode was associated with lower equity prices, higher interest rate spreads, declining yields on safe assets, and—as discussed earlier—sharp declines in commodity prices and currency depreciation for most emerging markets. Longer-term sovereign bond yields are currently some 30 basis points higher than the level prevailing in April in the United States and are up by 45–80 basis points in the euro area (excluding Greece) over the same period (Figure 1.4). Despite some increases in corporate bond spreads (modest for investment-grade firms and larger for high-yield bonds), financial conditions for corporate and household borrowers have remained broadly favorable, with solid growth in household credit in the United States and gradually improving lending conditions in the euro area (Figure 1.5).

Higher yields partly reflect improving economic activity and the bottoming out of headline inflation; in the euro area, they also reflect a correction after earlier declines to extremely compressed levels in response to increased bond purchases by the European Central Bank. On the policy rate front, the United States and the United Kingdom are approaching liftoff, but a number of other countries are easing monetary policy. Namely, policy rates have been reduced in commodity exporters (Australia, Canada, New Zealand) and

Figure 1.4. Financial Conditions in Advanced Economies

(Percent, unless noted otherwise)

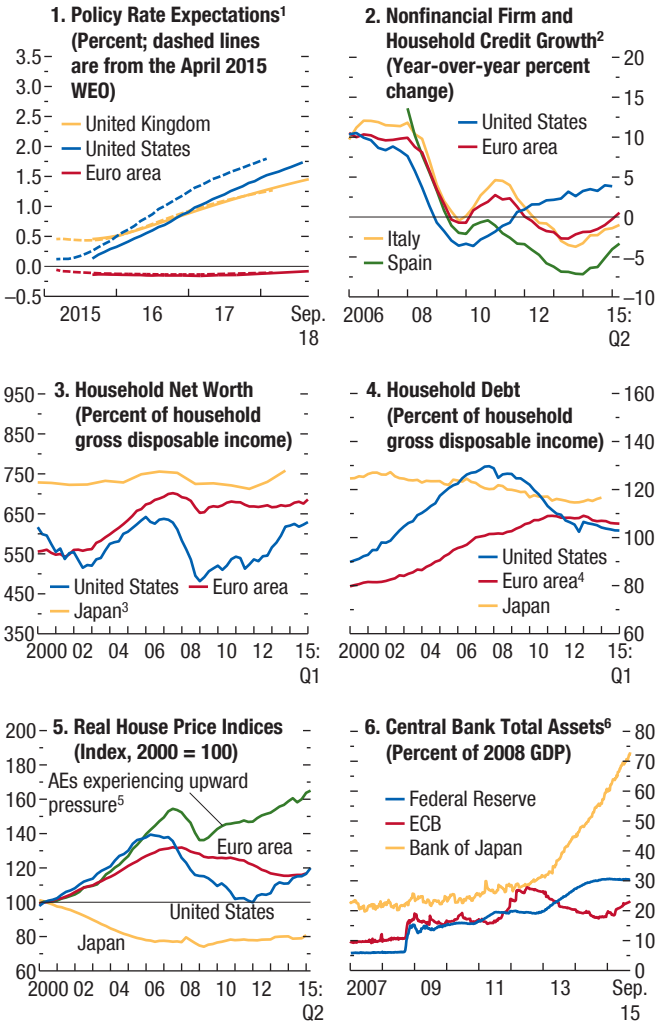
Financial market volatility spiked in August following an increase in global risk aversion triggered by concerns about China's growth outlook and emerging market prospects more broadly. But financial conditions have remained favorable in advanced economies. Slightly higher yields on longer-term bonds primarily reflect improving activity and the bottoming out of headline inflation.



Sources: Bank of Spain; Bloomberg, L.P.; Haver Analytics; Thomson Reuters Datastream; and IMF staff calculations.
Note: DJ = Dow Jones; ECB = European Central Bank; MSCI = Morgan Stanley Capital International; S&P = Standard & Poor's; TOPIX = Tokyo Stock Price Index.
[1]Expectations are based on the federal funds rate futures for the United States.
[2]Interest rates are 10-year government bond yields, unless noted otherwise. Data are through September 11, 2015.
[3]Changes are calculated from the beginning of 2015 to September 15, 2015. Interest rates are measured by 10-year government bond yields. Expected medium-term inflation is measured by the implied rate from five-year five-year-forward inflation swaps.
[4]Data are through September 14, 2015.

Figure 1.5. Advanced Economies: Monetary Conditions

Markets still expect a policy rate liftoff in late 2015 in the United States, but subsequent rate increases are expected to be more gradual. With more accommodative monetary conditions in the euro area, the contraction in private credit has started to bottom out. In the United States, household net worth has stabilized at a higher level, and household debt continues to decrease.



Sources: Bank of England; Bank of Spain; Bloomberg, L.P.; European Central Bank (ECB); Haver Analytics; Organisation for Economic Co-operation and Development; and IMF staff calculations.
[1]Expectations are based on the federal funds rate futures for the United States, the sterling overnight index swap forward for the United Kingdom, and the euro interbank offered forward rate for the euro area; updated September 15, 2015.
[2]Flow-of-funds data are used for the euro area, Spain, and the United States. Italian bank loans to Italian residents are corrected for securitizations.
[3]Interpolated from annual net worth as a percentage of disposable income.
[4]Includes subsector employers (including self-employed workers).
[5]Upward-pressure countries are those with a residential real estate vulnerability index above the median for advanced economies (AEs): Australia, Austria, Belgium, Canada, France, Hong Kong SAR, Israel, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, and the United Kingdom.
[6]Data are through September 11, 2015. ECB calculations are based on the Eurosystem's weekly financial statement.

in Korea, and Sweden has adopted and subsequently expanded quantitative-easing measures.

Low long-term interest rates, easy monetary policy conditions, and still-compressed spreads in advanced economies support the recovery and have favorable impacts on debt dynamics. But they also raise some concern, as discussed in the October 2015 *Global Financial Stability Report* (GFSR) and in the "Risks" section of this chapter. Inflation expectations, particularly in the euro area and Japan, remain low, and there is a risk they may drift downward if inflation remains persistently weak. Financial stability concerns associated with a protracted period of low interest rates remain salient—particularly in advanced economies with modest slack. Insurance companies and pension funds face difficult challenges in this respect. And compressed term premiums imply a potential risk of a sharp increase in long-term rates, with significant spillovers to emerging markets.

Financial conditions have in contrast tightened in most emerging market and developing economies, albeit very differently across countries and regions (Figure 1.6). Corporate and sovereign dollar bond spreads have risen by 40 to 50 basis points on average since the spring, and long-term local-currency bond yields by close to 60 basis points on average. Stock prices have weakened, and exchange rates have depreciated or come under pressure, particularly in commodity exporters. The evolution of policy rates in recent months has also differed across regions, reflecting differences in inflation pressure, other domestic macroeconomic conditions, and the external environment (Figure 1.7). Nominal policy rates have been reduced in China and other countries in emerging Asia (notably India) and in Russia, after the very sharp increase in December 2014. In contrast, because of increasing inflation, policy rates have risen further in Brazil, while in the rest of the region they have been stable or declining, reflecting the weakness in domestic demand.

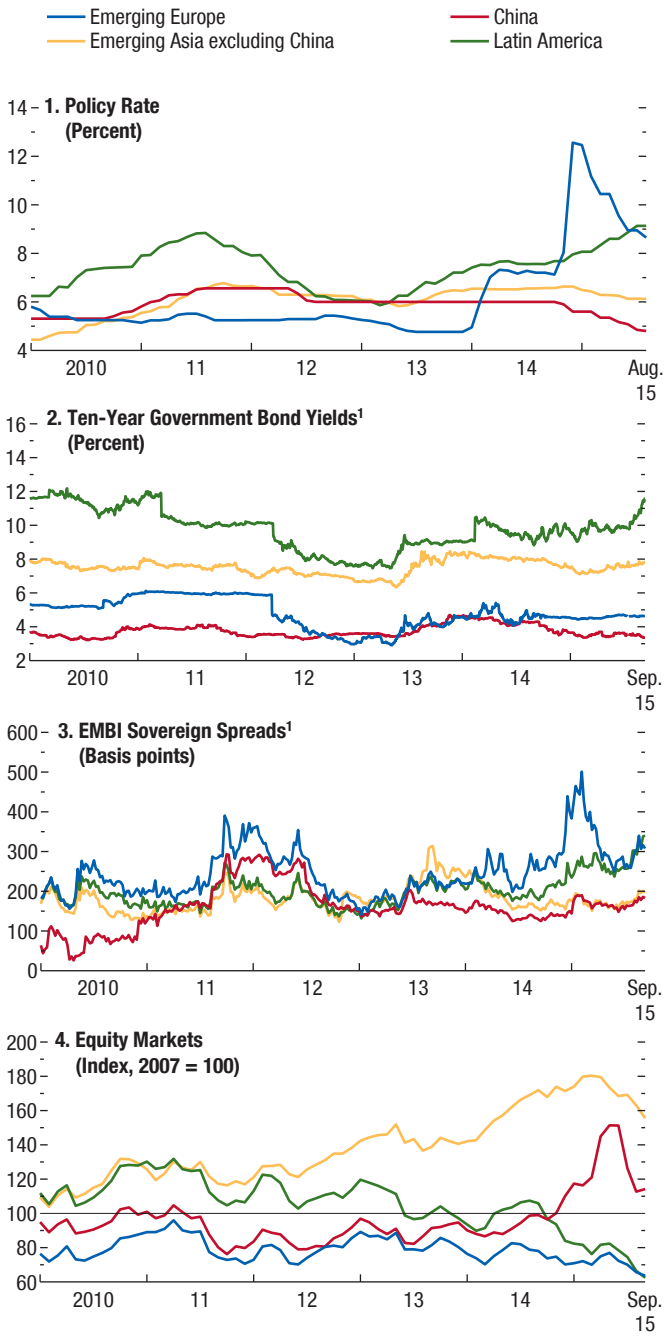
Longer-Term Factors

Productivity Growth in Advanced Economies

As highlighted in previous WEO reports, growth has fallen short of forecasts over the past four years. A comparison of output growth for advanced economies for 2011–14 with the forecast in the April 2011 WEO shows an aggregate overprediction over the horizon of

Figure 1.6. Financial Conditions in Emerging Market Economies

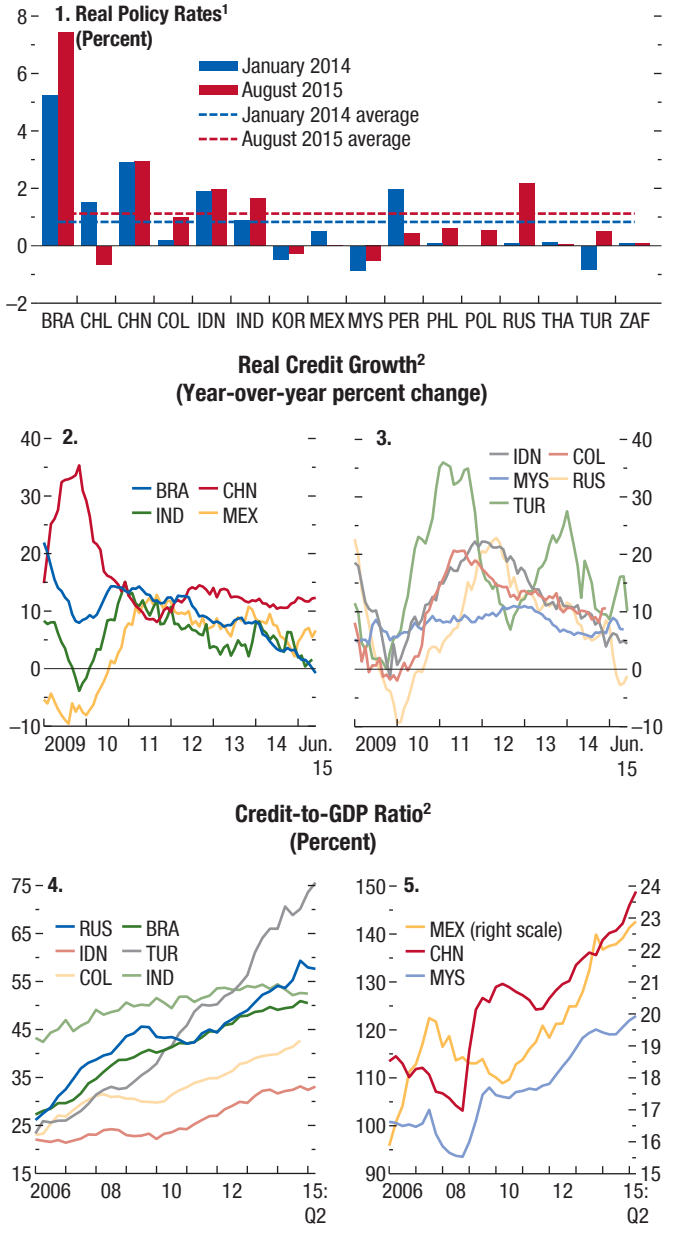
Financial conditions in emerging market economies have tightened since the April 2015 *World Economic Outlook* in a more challenging external environment.



Sources: Bloomberg, L.P.; EPFR Global; Haver Analytics; IMF, *International Financial Statistics;* and IMF staff calculations.
Note: Emerging Asia excluding China comprises India, Indonesia, Malaysia, the Philippines, and Thailand; emerging Europe comprises Poland, Romania (capital inflows only), Russia, and Turkey; Latin America comprises Brazil, Chile, Colombia, Mexico, and Peru. EMBI = J.P. Morgan Emerging Market Bond Index.
[1]Data are through September 11, 2015.

Figure 1.7. Monetary Policies and Credit in Emerging Market Economies

Monetary conditions generally remain accommodative in many emerging market economies. Real policy rates are low, while currencies have depreciated in real effective terms. However, in a number of emerging market economies with inflationary pressures or external vulnerabilities, central banks have raised policy rates. Real credit growth has slowed in many emerging market economies after credit booms and rapid increases in credit-to-GDP ratios.

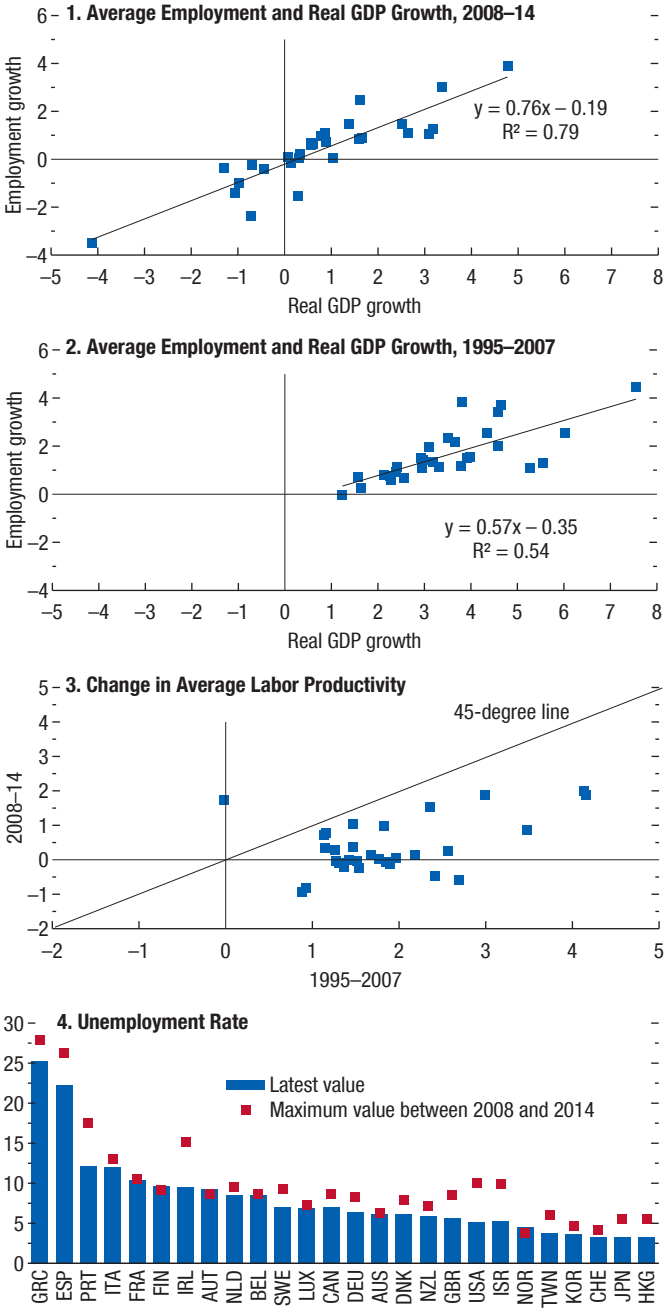


Sources: Haver Analytics; IMF, International Financial Statistics (IFS) database; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Deflated by two-year-ahead *World Economic Outlook* inflation projections.
[2]Credit is other depository corporations' claims on the private sector (from IFS), except in the case of Brazil, for which private sector credit is from the Monetary Policy and Financial System Credit Operations published by Banco Central do Brasil.

Figure 1.8. Growth, Employment, and Labor Productivity in Advanced Economies

(Percent)

Labor productivity growth in advanced economies has been much lower since the global financial crisis. The flip side is that, since the crisis, the same rate of output growth has, on average, been associated with higher employment growth (as reflected in a higher slope coefficient in the trend line). With relatively more employment-intensive growth, unemployment has decreased noticeably in economies that have experienced a sustained growth recovery.



Sources: IMF, Global Data Source database; and IMF staff calculations.
Note: Scatter plots exclude the Czech Republic, Estonia, Latvia, Lithuania, Malta, the Slovak Republic, and Slovenia. Data labels in the figure use International Organization for Standardization (ISO) country codes.

about 1 percentage point. However, the overprediction of employment growth (0.3 percentage point) is much lower. And for a range of economies—including Germany, Japan, Korea, and the United Kingdom—the overprediction of output growth has instead been associated with an underprediction of employment growth. In other words, labor productivity has fallen well short of predictions.

Figure 1.8 looks at this issue in more detail. The first two panels show the average relationship between output growth and employment growth across countries, before and after the crisis. A comparison of these panels highlights that both output growth and employment growth were much weaker in the period 2008–14 relative to the precrisis period 1995–2007. The panels also show that, on average, the same rate of output growth has been associated since the crisis with higher employment growth—but with much lower output growth rates, employment growth since the crisis has nevertheless been weaker than before the crisis. Adjusting employment growth for changes in hours worked yields the same results.

The figure's third panel compares labor productivity growth in advanced economies—proxied by the difference between output growth and employment growth—across the periods 1995–2007 and 2008–14. It shows that while labor productivity growth still varies substantially across countries, there has been a common slowdown across virtually all countries—the only exception being Spain (the only point above the 45-degree line in the panel), reflecting large changes especially in temporary, lower-productivity jobs over the cycle. Again, adjusting employment growth for changes in hours worked leads to a virtually identical picture.

The fourth panel of the figure compares the 2014 level of unemployment with the maximum level during the period 2008–14. Although the recently elevated "employment intensity" of growth has helped reduce unemployment in a number of countries, the low rate of output growth implies that unemployment is still high and that output gaps are sizable in a number of advanced economies.

What is behind the decline in labor productivity? Clearly weak investment after the crisis is playing a role, but as Chapter 3 of the April 2015 WEO shows, slowing total factor productivity growth across large advanced economies looks so far to be the most important part of the explanation in most cases. In turn, the reasons for slowing total factor productiv-

ity growth across advanced economies are still poorly understood (see for instance OECD 2015), but likely include slower human capital accumulation, a compositional shift of GDP toward services, and—at least for the United States—gradually declining positive effects on productivity from the information and communications technology revolution (Fernald 2014; Gordon 2014).[2]

A key question is whether the protracted slowdown in growth and weak productivity growth could also reflect the nature of the recent crisis, given the literature on weak recoveries in the aftermath of severe financial distress. Box 1.1 addresses this question by focusing on more than 100 recessions in 23 advanced economies since the 1960s. It finds that two-thirds of recessions are followed by lower output relative to the prerecession trend. Even more surprising, almost half of those are followed not only by lower output, but also by lower output growth relative to the prerecession trend. The results discussed in the box raise important policy questions—for instance, the extent to which these effects reflect supply shocks or the erosion of potential output coming from protracted downturns in domestic demand. In the IMF staff's view, both factors are at play in accounting for lower potential growth, and—despite lower potential growth—demand shortfalls are still sizable in a number of advanced economies (as shown, for instance, in the fourth panel of Figure 1.8).

A Protracted Slowdown in Emerging Markets

After a strong rebound to almost 7½ percent after the global financial crisis, real GDP growth in emerging market and developing economies decreased from about 6.3 percent in 2011 to 4.6 percent in 2014. In 2015, it is projected to decline further to 4 percent. With this decline, growth for the entire group in 2014 was about 1 percentage point below the average growth recorded during 1995–2007.

Larger deviations from the average in the major emerging market economies heavily influenced these outcomes for the group, which are calculated using GDP weights. And among emerging market and developing economies, the slowdown has not been universal—for almost 40 percent of them, growth in 2011–14 was above the 1995–2007 average.[3] Against the backdrop of such variation, it should not come as a surprise that slightly more than half of the variation in the 2011–14 change in growth in emerging market and developing economies appears to have resulted from country-specific factors. Such factors—including, for example, supply bottlenecks and changes in structural policies—have been discussed extensively in previous WEO reports. The flip side is that slightly less than half of the variation can be related to a set of initial conditions and external factors.

An interesting feature of the decline in growth is that in the first two years of the decline (2011–12), external factors, notably lower partner country growth, appear to have played a more important role than they did subsequently in 2013–14.[4] Changes in growth in all partner countries seem to have been a more relevant factor than changes in partner advanced economies only, perhaps a reflection of increased trade within the group of emerging market and developing economies. While the extent of direct trade exposure to China does not seem to have been a significant factor in explaining differences in growth declines across economies, being a net commodity exporter appears to have been a relevant factor: these economies experienced relatively larger growth declines, all else equal. Still, as discussed in Chapter 2, the impact of commodity terms-of-trade fluctuations on both actual and potential (medium-term) growth depends on a number of factors, such as initial levels of financial development, how much fiscal policy smooths or exacerbates the cycle, and exchange rate regimes. Typically, exporters with greater exchange rate flexibility experienced smaller reductions in growth in 2011–14, which was also true for other emerging market economies.

The growth slowdown also appears to reflect a correction after years of exceptionally rapid growth in the 2000s. Countries that recorded growth much above longer-term averages around the time of the global financial crisis slowed down more during 2011–14 ("mean reversion"). This suggests that the protracted slowdowns could in part also reflect adjustment to various possible boom legacies, including an investment overhang and higher corporate sector leverage after credit booms, as discussed in Chapter 3 of the October 2015 GFSR.

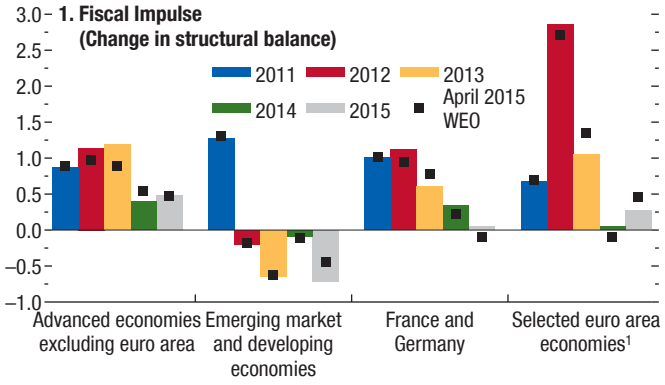
[2]Some have argued that owing to rapid technological change, especially in the information and communications technology sector, conventional national income statistics increasingly understate the true income level, but that view is not widely accepted.

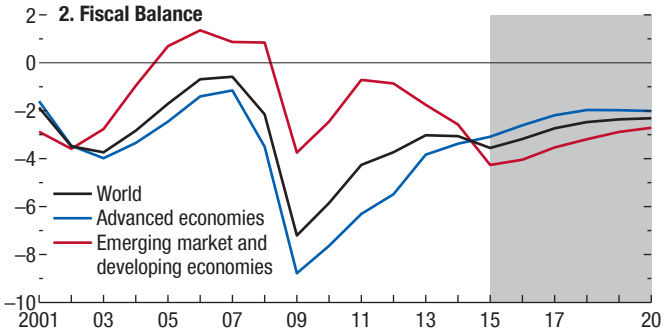
[3]The analysis of forecast errors shows a similar picture, as discussed in Box 1.3 of the October 2014 WEO.

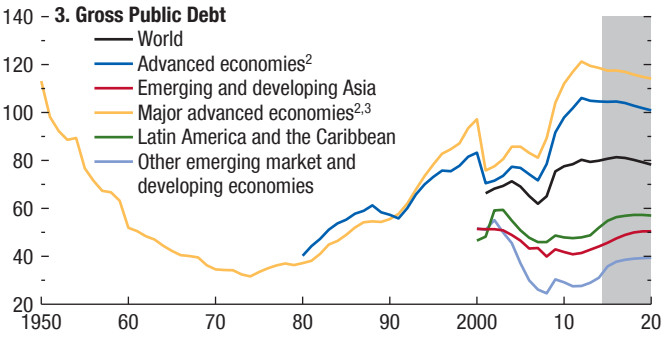
[4]Chapter 4 of the April 2014 WEO also finds an important role for external shocks in the initial stages of the slowdown.

Figure 1.9. Fiscal Policies
(Percent of GDP, unless noted otherwise)

Fiscal consolidation is expected to moderate in most advanced economies over the forecast horizon. However, in core euro area economies, the fiscal stance will be slightly tighter relative to projections in the April 2015 *World Economic Outlook* (WEO), while in some other euro area economies, it has eased relative to earlier projections. In emerging market and developing economies, the fiscal policy stance is projected to ease in 2015, but with considerable differences across countries.







Source: IMF staff estimates.
[1]Euro area countries (Greece, Ireland, Italy, Portugal, Spain) with high borrowing spreads during the 2010–11 sovereign debt crisis.
[2]Data through 2000 exclude the United States.
[3]Canada, France, Germany, Italy, Japan, United Kingdom, United States.

The Forecast

Policy Assumptions

Fiscal consolidation is projected to moderate in advanced economies over the forecast horizon (Figure 1.9). In emerging markets, the fiscal policy stance is projected to turn more expansionary to offset the slowdown—albeit with marked differences across countries and regions. On the monetary policy front, U.S. policy rates are expected to increase beginning in late 2015 (Figure 1.5). Monetary policy normalization in the United Kingdom is projected to begin in 2016 (consistent with market expectations). Very accommodative policy stances are expected to remain in place for longer in Japan and also in the euro area, where monthly purchases of government bonds started March 9. Policy rates are generally expected to be on hold in a number of emerging market economies until rate increases start in the United States.

Other Assumptions

Global financial conditions are assumed to remain accommodative, with some gradual tightening reflected in, among other things, rising 10-year yields on U.S. Treasury bonds as the expected date for liftoff from the zero bound in the United States approaches. The process of normalizing monetary policy in the United States and the United Kingdom is assumed to proceed smoothly, without large and protracted increases in financial market volatility or sharp movements in long-term interest rates. Nevertheless, financial conditions in emerging markets are assumed to be tighter than over the past few months, reflecting the recent rise in spreads and decline in equity prices, with some further increases in long-term rates reflecting rising 10-year yields in advanced economies. Oil prices are projected to increase gradually over the forecast horizon, from an average of $52 a barrel in 2015 to about $55 a barrel in 2017. In contrast, nonfuel commodity prices are expected to stabilize at lower levels after recent declines in both food and metal prices. Geopolitical tensions are assumed to stay elevated, with the situation around Ukraine remaining difficult and strife continuing in some countries in the Middle East. These tensions are generally assumed to ease, allowing for a gradual recovery in the most severely affected economies in 2016–17.

Global Outlook for 2015–16

Global growth is projected to decline from 3.4 percent in 2014 to 3.1 percent in 2015, before picking

up to 3.6 percent in 2016 (see Table 1.1). The decline in growth this year reflects a further slowdown in emerging markets, partially offset by a modest pickup in activity in advanced economies—particularly in the euro area. This pickup, supported by the decline in oil prices (Figure 1.3) and accommodative monetary policy, will modestly narrow output gaps.

The decline in growth in emerging markets—for the fifth year in a row—reflects a combination of factors: weaker growth in oil exporters; a slowdown in China, as the pattern of growth becomes less reliant on investment; and a weaker outlook for exporters of other commodities, including in Latin America, following price declines. In emerging market oil importers, a more limited pass-through to consumers of the windfall gains from lower oil prices, together with in some cases substantial exchange rate depreciation, has muted the attendant boost to growth, with lower prices accruing in part to governments (for example, in the form of savings from lower energy subsidies—as discussed in the April 2015 *Fiscal Monitor*).

The sizable pickup in projected 2016 growth reflects stronger performance in both emerging market and advanced economies. Among emerging market and developing economies, growth in countries in economic distress in 2015 (including Brazil, Russia, and some countries in Latin America and in the Middle East), while remaining weak or negative, is projected to be higher than in 2015, and domestic demand in India is projected to remain strong. These developments more than offset the projected continuation of the slowdown in China. Among advanced economies, higher growth reflects a strengthening recovery in Japan, the United States, and the euro area, as output gaps gradually close.

The outlook is weaker than the one in the July 2015 *WEO Update* for both advanced economies and emerging markets. Relative to the April 2015 WEO, global growth has been revised downward by 0.4 percentage point in 2015 and 0.2 percentage point in 2016.

Global Outlook for the Medium Term

Global growth is forecast to increase beyond 2016, entirely reflecting a further pickup in growth in emerging market and developing economies. This pickup reflects two factors. The first is the assumption of a gradual return to trend rates of growth in countries and regions under stress or growing well below potential in 2015–16 (for example, Brazil and the rest of Latin America, Russia, and parts of the Middle East).

The second factor is the gradual increase in the global weight of fast-growing countries such as China and India, which further increases their importance as drivers of global growth.

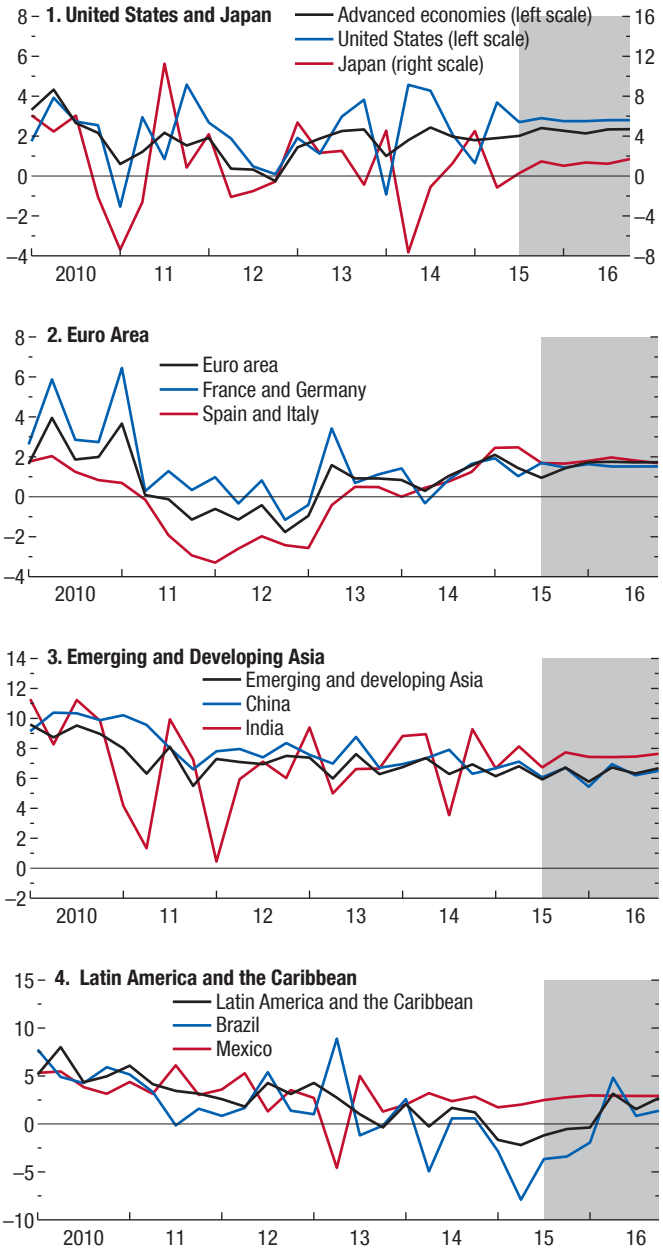
On the other hand, growth in advanced economies is projected to remain at about 2¼ percent as output gaps gradually close, and then to decline below 2 percent, reflecting the gradual effects of demographics on labor supply and hence on potential output, which were discussed in Chapter 3 of the April 2015 WEO.

Economic Outlook for Individual Countries and Regions

- The recovery is expected to continue in the *United States*, supported by lower energy prices, reduced fiscal drag, strengthened balance sheets, and an improving housing market (Figure 1.10, panel 1). These forces are expected to more than offset the drag on net exports coming from the strengthening of the dollar. As a result, growth is projected to reach 2.6 percent in 2015 and 2.8 percent in 2016. However, longer-term growth prospects are weaker, with potential growth estimated to be only about 2 percent, weighed down by an aging population and low total factor productivity growth (which recent revisions to national accounts suggest was lower than previously thought during 2012–14).
- The moderate *euro area* recovery is projected to continue in 2015–16, sustained by lower oil prices, monetary easing, and the euro depreciation (Figure 1.10, panel 2). At the same time, potential growth remains weak—a result of crisis legacies, but also of demographics and a slowdown in total factor productivity that predates the crisis (see Chapter 3). Hence the outlook is for moderate growth and subdued inflation. Growth is expected to increase from 0.9 percent in 2014 to 1.5 percent this year and 1.6 percent in 2016, in line with the forecast of last April. Growth is forecast to pick up for 2015 and 2016 in France (1.2 percent in 2015 and 1.5 percent in 2016), Italy (0.8 percent in 2015 and 1.3 percent in 2016), and especially Spain (3.1 percent in 2015 and 2.5 percent in 2016). In Germany, growth is expected to remain at about 1½ percent (1.5 percent in 2015 and 1.6 percent in 2016). The outlook for Greece is markedly more difficult following the protracted period of uncertainty earlier in the year.
- In *Japan* GDP growth is projected to rise from –0.1 percent in 2014 to 0.6 percent in 2015 and

Figure 1.10. GDP Growth Forecasts
(Annualized quarterly percent change)

In advanced economies, growth is expected to remain robust and above trend through 2016 and contribute to narrowing the output gap. The growth recovery in the euro area is projected to be broad based. Growth in India is expected to rise above the rates in other major emerging market economies. In Latin America and the Caribbean, activity is expected to rebound in 2016 after a recession in 2015.



Source: IMF staff estimates.

1.0 percent in 2016 (Figure 1.10, panel 1). The gradual pickup reflects support from higher real compensation and higher equity prices due to the Bank of Japan's additional quantitative and qualitative easing, as well as lower oil and commodity prices.

- In other advanced economies, growth is generally expected to be solid, but weaker than in 2014. In the *United Kingdom*, continued steady growth is expected (2.5 percent in 2015 and 2.2 percent in 2016), supported by lower oil prices and continued recovery in wage growth. The recovery in *Sweden* (2.8 percent growth projected in 2015) is supported by consumption and double-digit housing investment. In *Switzerland*, the sharp exchange rate appreciation earlier in the year is projected to depress growth in the near term (1.0 percent in 2015). In commodity exporters, lower commodity prices weigh on the outlook through reduced disposable income and a decline in resource-related investment. The latter mechanism has been particularly sharply felt in *Canada*, where growth is now projected to be about 1 percent in 2015, 1.2 percentage points lower than forecast in April. *Australia*'s projected growth of 2.4 percent in 2015, a bit weaker than predicted in April, also reflects the impact of lower commodity prices and resource-related investment—partly offset by supportive monetary policy and a weaker exchange rate. In *Norway* GDP is projected to grow by 0.9 percent this year as the fall in oil prices is reflected in stalling investment and weakening consumption. Among Asian advanced economies, growth is generally weaker than in 2014, reflecting domestic shocks and slower exports. The decline in growth relative to last year is particularly noticeable for *Taiwan Province of China* (from 3.8 percent to 2.2 percent), where exports have been slowing especially sharply.
- Growth in *China* is expected to decline to 6.8 percent this year and 6.3 percent in 2016—unchanged projections relative to April (Figure 1.10, panel 3). Previous excesses in real estate, credit, and investment continue to unwind, with a further moderation in the growth rates of investment, especially that in residential real estate. The forecast assumes that policy action will be consistent with reducing vulnerabilities from recent rapid credit and investment growth and hence not aim at fully offsetting the underlying moderation in activity. Ongoing

implementation of structural reforms and lower oil and other commodity prices are expected to expand consumer-oriented activities, partly buffering the slowdown. The decline in stock market valuations is assumed to have only a modest effect on consumption (reflecting modest household holdings), and the current episode of financial market volatility is assumed to unwind without sizable macroeconomic disruptions.

- Elsewhere in emerging and developing Asia, *India*'s growth is expected to strengthen from 7.3 percent this year and last year to 7.5 percent next year. Growth will benefit from recent policy reforms, a consequent pickup in investment, and lower commodity prices. Among the ASEAN-5 economies (*Indonesia*, *Malaysia*, *Philippines*, *Thailand*, *Vietnam*), Malaysia and to a lesser extent Indonesia are expected to slow this year, affected by weaker terms of trade. Growth is on the other hand projected to pick up in Thailand, as a result of reduced policy uncertainty, to remain broadly stable at around 6 percent in the Philippines, and to strengthen to 6.5 percent in Vietnam, which is benefiting from the oil price windfall.
- Economic activity in *Latin America and the Caribbean* continues to slow sharply, with a small contraction in activity in 2015 (Figure 1.10, panel 4). A modest recovery is projected for 2016, but with growth at 0.8 percent, still well below trend. Growth projections have been revised downward by more than 1 percentage point in both 2015 and 2016 relative to the April 2015 WEO. The bleaker outlook for commodity prices interacts in some countries with strained initial conditions. In *Brazil*, business and consumer confidence continue to retreat in large part because of deteriorating political conditions, investment is declining rapidly, and the needed tightening in the macroeconomic policy stance is putting downward pressure on domestic demand. Output is now projected to contract by 3 percent in 2015 and by 1 percent in 2016 (for both years, a forecast 2 percentage points lower than in April), with significant negative spillovers onto growth in large parts of the region given the size and interconnectedness of the Brazilian economy. *Venezuela* is projected to experience a deep recession in 2015 and 2016 (–10 percent and –6 percent, respectively), because the oil price decline since mid-June 2014 has exacerbated domestic macroeconomic imbalances and balance of payments pressures. Venezuelan inflation is projected to be well above 100 percent in 2015. A modest decline in activity is now projected for *Ecuador*, where 2015 growth has been revised downward by more than 2 percentage points, reflecting the impact of lower oil prices coupled with sizable real appreciation driven by the stronger U.S. dollar. Additional weakness in metal prices is projected to dampen the growth recovery in *Chile* and *Peru*, while the projected deceleration in *Colombia* reflects the drop in oil prices.
- Projections for economies in the *Commonwealth of Independent States* remain very weak, reflecting the recession in *Russia* with its attendant regional spillovers, as well as a very sharp further contraction in *Ukraine.* Overall, activity is projected to contract by 2.7 percent, after growing by 1 percent in 2014. The outlook is projected to improve in 2016, with a return to positive growth (0.5 percent). In Russia the economy is expected to contract by 3.8 percent this year, reflecting the interaction of falling oil prices and international sanctions with preexisting structural weaknesses. Output is projected to decline further in 2016. The projected 0.1 percent contraction in the remainder of the region this year reflects to an important extent the deep recession in Ukraine (–9 percent), where positive growth is expected to return in 2016, supported by the beginning of reconstruction. Elsewhere in the region, especially in the Caucasus and Central Asia, activity will be held back by lower commodity prices and spillovers from Russia (through trade, foreign direct investment, and especially remittances), which will interact with existing structural vulnerabilities.
- Growth in *emerging and developing Europe* is projected to rise modestly to 3.0 percent in 2015–16. The region has benefited from lower oil prices and the gradual recovery in the euro area, but is also affected by the contraction in Russia and the impact of still-elevated corporate debt on investment. The latter, together with political uncertainty, is expected to weigh on domestic demand in *Turkey*, where the growth of activity is projected to remain at about 3 percent in 2015–16. Growth remains relatively robust in central and eastern Europe, with *Hungary* and *Poland* growing at rates of 3 percent or higher in 2015, but weaker in southeastern Europe (with the exception of *Romania*), with growth in *Bulgaria*, *Croatia*, and *Serbia* below 2 percent.

- Growth across the *Middle East, North Africa, Afghanistan, and Pakistan* is forecast to remain modest in 2015 at 2.5 percent, slightly below last year. Spillovers from regional conflicts and intensified security and social tensions are weighing on confidence and holding back higher growth. Low oil prices are also taking a toll on the outlook for oil exporters. In oil importers, the recovery is strengthening. Headwinds from weak confidence are being offset by gains from lower oil prices, economic reforms, and improved euro area growth. Regional growth is projected to pick up substantially in 2016, supported by accelerated activity in the *Islamic Republic of Iran*, where the lifting of sanctions—once the Joint Comprehensive Plan of Action becomes binding and is implemented—should allow for a recovery in oil production and exports, as well as by a gradual improvement in the outlook for countries severely affected by conflicts, such as Iraq, Libya, and Yemen. Compared with the April 2015 projections, the outlook for 2015 is weaker, reflecting the collapse in activity in Yemen and a further decline in GDP in Libya, but looks stronger for 2016, primarily on account of the improved prospects for the Islamic Republic of Iran.
- Growth in *sub-Saharan Africa* is expected to slow this year to 3.8 percent (from 5.0 percent in 2014, a 0.7 percentage point downward revision relative to April). The slowdown in 2015 is primarily driven by the repercussions of declining commodity prices, particularly those for oil, as well as lower demand from China—the largest single trade partner of sub-Saharan Africa—and the tightening of global financial conditions for the region's frontier market economies. Among the region's oil exporters, *Nigeria*'s growth is now projected at 4 percent in 2015, some 2¼ percentage points lower than last year, and growth in *Angola* is also expected to decline to 3.5 percent from close to 5 percent in 2014. Among the region's oil importers—projected to grow at 4 percent on average—a majority will continue to experience solid growth, especially low-income countries, where investment in infrastructure continues and private consumption remains strong. Countries such as *Côte d'Ivoire, the Democratic Republic of the Congo, Ethiopia, Mozambique,* and *Tanzania* are still expected to register growth of about 7 percent or above this year and next. But others, such as *Sierra Leone* and *Zambia*, are feeling the pinch from lower prices for their main export commodity, even as lower oil prices relieve their energy import bill. *South Africa*'s growth is projected to be below 1½ percent both this year and next, reflecting electricity-load shedding and other supply bottlenecks. In *Ghana*, power shortages and fiscal consolidation are also weighing on activity, which is projected to slow further in 2015 to 3.5 percent. Growth for the region is projected to pick up in 2016 to 4.3 percent, with the global recovery supporting a moderate pickup in external demand, the modest recovery in oil prices benefiting oil exporters, and an improvement in the outlook for Ebola-affected countries.
- Growth in low-income developing countries is projected to slow to 4.8 percent in 2015, more than 1 percentage point weaker than in 2014, before picking up to 5.8 percent in 2016. These projections are shaped by the outlook for sub-Saharan economies, in particular Nigeria; the resilient growth in low-income developing countries in Asia, particularly *Bangladesh* and *Vietnam*; and for 2015, the domestic-conflict-driven collapse in activity in *Yemen*.

Global Inflation

Inflation is projected to decline in 2015 in advanced economies, reflecting primarily the impact of lower oil prices. The pass-through of lower oil prices into core inflation is expected to remain moderate, in line with recent episodes of large changes in commodity prices. In emerging market and developing economies, the inflation rate is projected to increase in 2015, but this reflects the sharp increase in the inflation forecast for Venezuela (more than 100 percent in 2015) and Ukraine (about 50 percent). Excluding these countries, inflation in emerging market and developing economies in 2015 is projected to decline from 4.5 percent in 2014 to 4.2 percent in 2015.

In advanced economies, inflation is projected to rise in 2016 and thereafter, but to remain generally below central bank targets. In emerging market and developing economies, inflation is projected to decline in 2016, with markedly lower inflation in countries that experienced sizable depreciation in recent months, such as Russia and to a lesser extent Brazil.

- In the euro area, headline inflation is projected to be 0.2 percent in 2015, slightly lower than in 2014. After dipping below zero in December 2014 and remaining negative through the first quarter of 2015, inflation picked up in the second quarter

of 2015, reflecting a modest recovery in economic activity, the partial reversal in oil prices, and the impact of the euro depreciation. Inflation expectations, while higher than in the first quarter, remain low, although core measures point to tentative signs of an upturn in underlying inflation. Headline inflation is projected to increase to 1 percent in 2016, but is expected to remain subdued through the medium term.

- In Japan, several factors will put upward pressure on the price level, including the lagged impact of the recent yen weakening and the closing of the output gap. Continued tightening of the labor market could accelerate favorable wage-price dynamics. As a result, under current policies, inflation is expected to rise gradually to 1½ percent over the medium term.
- In the United States, annual inflation in 2015 is projected to decline to 0.1 percent. After a sharp decline in late 2014 and early 2015 that reflected lower energy prices, it has started to increase gradually, even though the effects of dollar appreciation, muted wage dynamics, and the renewed bout of declines in oil prices act as a headwind. Inflation is then projected to rise gradually toward the Federal Reserve's longer-term objective of 2 percent.
- Inflation is projected to remain well below target in a number of other smaller advanced economies—especially in Europe and east Asia. In particular, consumer prices are projected to decline in both 2015 and 2016 in Switzerland, following the sharp appreciation of the currency in January. Inflation remains subdued in the Czech Republic, New Zealand, and Sweden, but is projected to gradually rise toward the target over 2016–17.

In emerging market economies, the decline in oil prices and a slowdown in activity are contributing to lower inflation in 2015, even though not all of the decline in the price of oil will be passed on to end-user prices. At the same time, however, large nominal exchange rate depreciations are putting upward pressure on prices in several countries, particularly commodity exporters. In subsequent years the effect of lower oil prices is expected to phase out, but this effect is projected to be offset by a phasing out of the effect of large depreciations as well as by a gradual decline in underlying inflation toward medium-term inflation targets.

- In China, consumer price index inflation is forecast to be 1.5 percent in 2015—reflecting the decline in commodity prices, the sharp real appreciation of the renminbi, and some weakening in domestic demand—but to increase gradually thereafter.
- In India, inflation is expected to decline further in 2015, reflecting the fall in global oil and agricultural commodity prices. In Brazil, average inflation is expected to rise to 8.9 percent this year, above the ceiling of the tolerance band, reflecting an adjustment of regulated prices and exchange rate depreciation, and to converge toward the 4.5 percent target over the following two years. In contrast, inflation is projected to rise to about 16 percent in 2015 in Russia, reflecting the large depreciation of the ruble, and to decline below 9 percent next year. In Turkey, inflation for 2015 is projected at about 7½ percent, some 2½ percentage points above target.
- A few emerging markets are projected to experience headline inflation well below target in 2015, with modest increases in 2016. These include in particular a number of small European countries whose currencies are tightly linked to the euro.

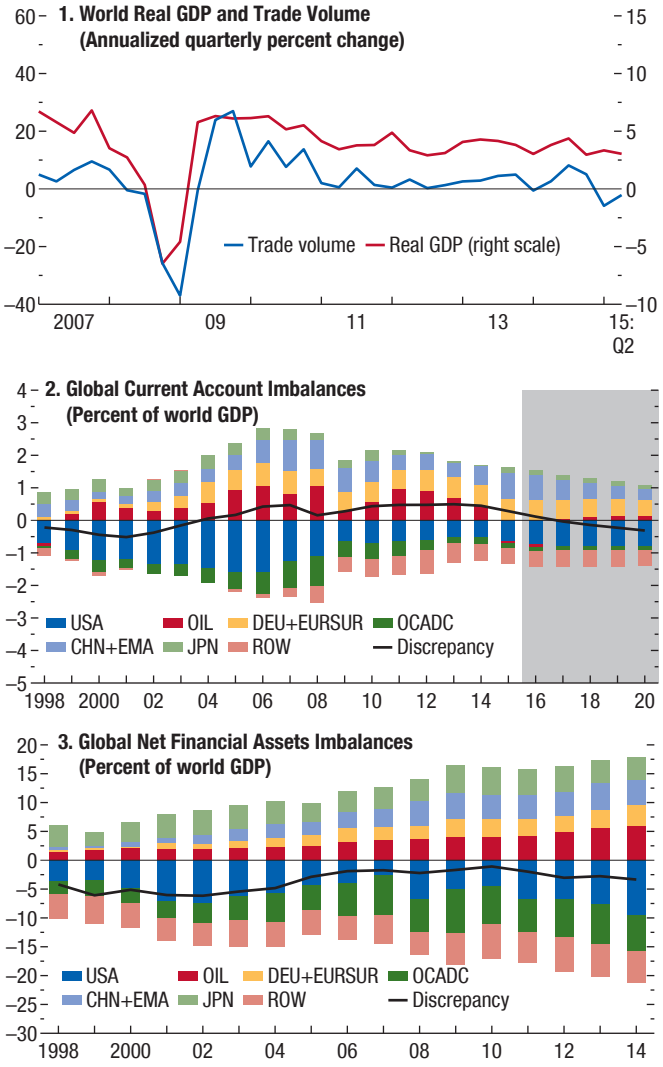
External Sector Developments

World trade growth is projected to remain modest, as in the past two years (Figure 1.11, panel 1). A pickup in trade is forecast for advanced economies. For emerging markets import growth is projected to decline further, reflecting weakening domestic demand and depreciating exchange rates, but export growth is projected to increase, sustained by higher oil exports from the Middle East and the pickup of domestic demand in advanced economies.

Capital flows to and from advanced economies remained modest relative to their precrisis trends during 2014, but showed signs of a pickup in early 2015. After a sustained period of strength, capital flows to emerging markets have been declining since the end of 2013 (Figure 1.12, panels 1 and 2). This has reflected to an important extent reductions in capital inflows to China and Russia, but also declining flows to other countries and regions, including Latin America. With no large change in the aggregate current account balance for emerging market and developing economies, the decline in inflows has been offset by a corresponding decline in these economies' net purchases of foreign assets (Figure 1.12, panel 4). Large emerging market economies as a group sold about $100 billion in foreign exchange reserves during both the last quarter of 2014 and the first quarter of 2015,

Figure 1.11. External Sector

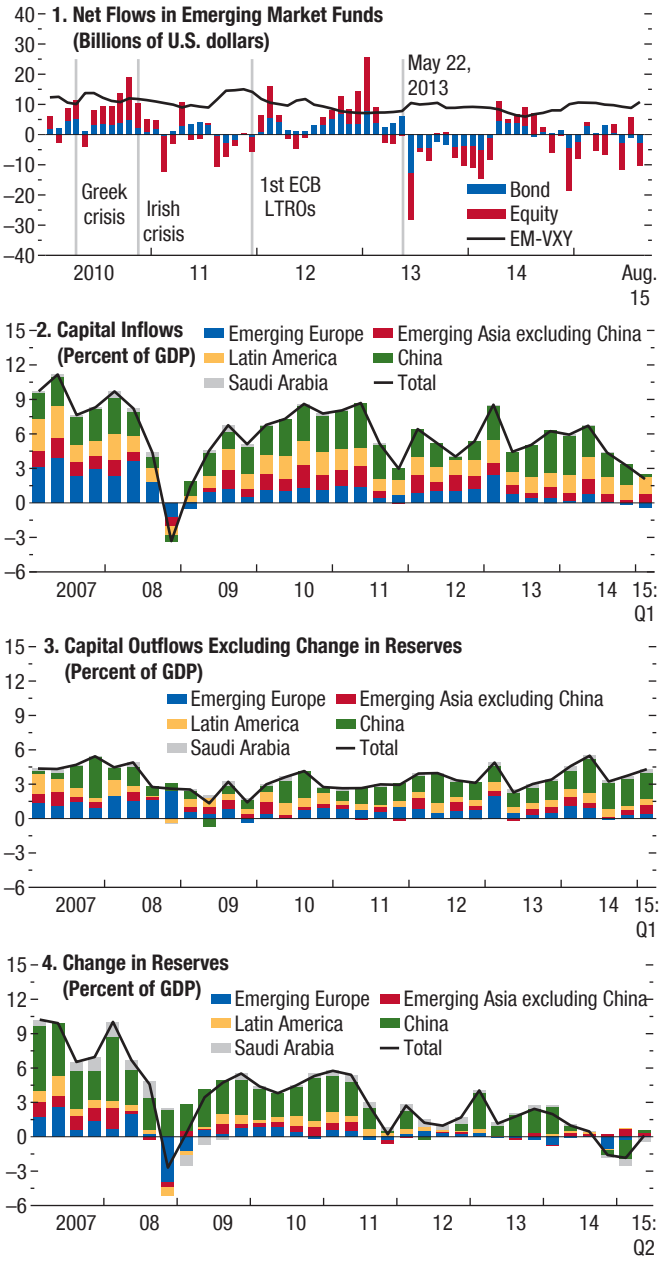
Global trade volumes weakened more than GDP in the first half of 2015, highlighting that economic growth in the services and other nontradables sectors has been relatively stronger than in the tradables sectors. Global current account imbalances are expected to narrow further over the forecast horizon, with most of the contribution coming from smaller surpluses in oil exporters. In contrast, global creditor and debtor positions have increased further as a share of world GDP.



Sources: CPB Netherlands Bureau for Economic Policy Analysis; and IMF staff estimates.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. CHN+EMA = China and emerging Asia (Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand); DEU+EURSUR = Germany and other European advanced surplus economies (Austria, Denmark, Luxembourg, Netherlands, Sweden, Switzerland); OCADC = other European countries with precrisis current account deficits (Greece, Ireland, Italy, Portugal, Spain, United Kingdom, WEO group of emerging and developing Europe); OIL = Norway and WEO group of emerging market and developing economy fuel exporters; ROW = rest of the world.

Figure 1.12. Capital Flows in Emerging Market Economies

Gross capital inflows to emerging market economies began slowing markedly in 2014 and, as a percent of GDP, reached their lowest level since the recovery from the global financial crisis in the first quarter of 2015. As gross capital outflows have held up, and with little change in the aggregate current account balance, these economies as a group started selling foreign exchange reserves in 2014.



Sources: Bloomberg, L.P.; EPFR Global; Haver Analytics; IMF, *International Financial Statistics;* and IMF staff calculations.
Note: Capital inflows are net purchases of domestic assets by nonresidents. Capital outflows are net purchases of foreign assets by domestic residents. Emerging Asia excluding China comprises India, Indonesia, Malaysia, the Philippines, and Thailand; emerging Europe comprises Poland, Romania, Russia, and Turkey; Latin America comprises Brazil, Chile, Colombia,Mexico, and Peru. ECB = European Central Bank; EM-VXY = J.P. Morgan Emerging Market Volatility Index; LTROs = longer-term refinancing operations.

with net sales of foreign reserves by China, Russia, and Saudi Arabia representing the lion's share.[5]

Current account deficits and surpluses across the main creditor and debtor regions declined further in 2014, albeit relatively modestly (Figure 1.12, panel 2). Nevertheless, global creditor and debtor positions, as measured by net international investment positions, continued to grow in 2014 as a share of world GDP (Figure 1.12, panel 3). Valuation effects play an important role in explaining such widening. Specifically, the appreciation of the U.S. dollar and the increase in the value of U.S. assets related to interest rate and equity price movements have increased the net external liabilities of the United States and symmetrically boosted asset values in holders of U.S. financial instruments.

Projections for 2015 suggest changes in the composition of global current account deficits and surpluses, reflecting the impact of declining prices of oil and other commodities, as well as the large exchange rate movements that have taken place since last year. As discussed in Chapter 3, the evidence suggests that exchange rate movements continue to have an economically significant impact on external balances. However, the aggregate size of global current account deficits and surpluses will remain broadly stable. Specifically, the contraction in the surpluses of oil-exporting countries will continue to be broadly offset by increasing surpluses in oil importers such as European surplus countries as well as in China, while the reduction in deficits for some oil importers is and will remain offset by a deteriorating current account balance in the United States.

From a normative perspective, there is of course no presumption that current account deficits and surpluses should necessarily decline. But as discussed in the *2015 External Sector Report* (IMF 2015a), a number of countries' 2014 current account imbalances appear too large relative to a country-specific norm consistent with external stability. These countries have made limited progress in reducing the excess imbalances remaining after the large narrowing of imbalances in the aftermath of the global financial crisis. As discussed earlier, external balances in 2015 are affected by substantial shocks, including changes in commodity prices and large fluctuations in exchange rates. Panel 3 of Figure 1.13 depicts projected changes in current account balances relative to GDP in 2015 in relation to the current account gaps for 2014 discussed in the *2015 External Sector Report*.[6] The figure shows a modest general tendency for current account balances to move in the direction of narrowing 2014 current account gaps, but with large economies such as China, Germany, and the United States being notable exceptions, such gaps would not narrow on a global scale. Panel 2 of Figure 1.13 undertakes the same exercise for real effective exchange rates, and it shows that exchange rate changes in 2015 relative to their 2014 average are not systematically consistent with a reduction in the exchange rate gaps identified for 2014 by the *2015 External Sector Report*. Of course a normative assessment of external balances and exchange rates must also take into account changes in the underlying current account and real exchange rate "norms" as well, and such an assessment will be undertaken in next year's *External Sector Report*.

More generally, a desirable pattern of global rebalancing would depend not just on exchange rate changes and their attendant current account implications, but on policies underpinning desirable shifts to relative demand and consistent with sustaining world growth.

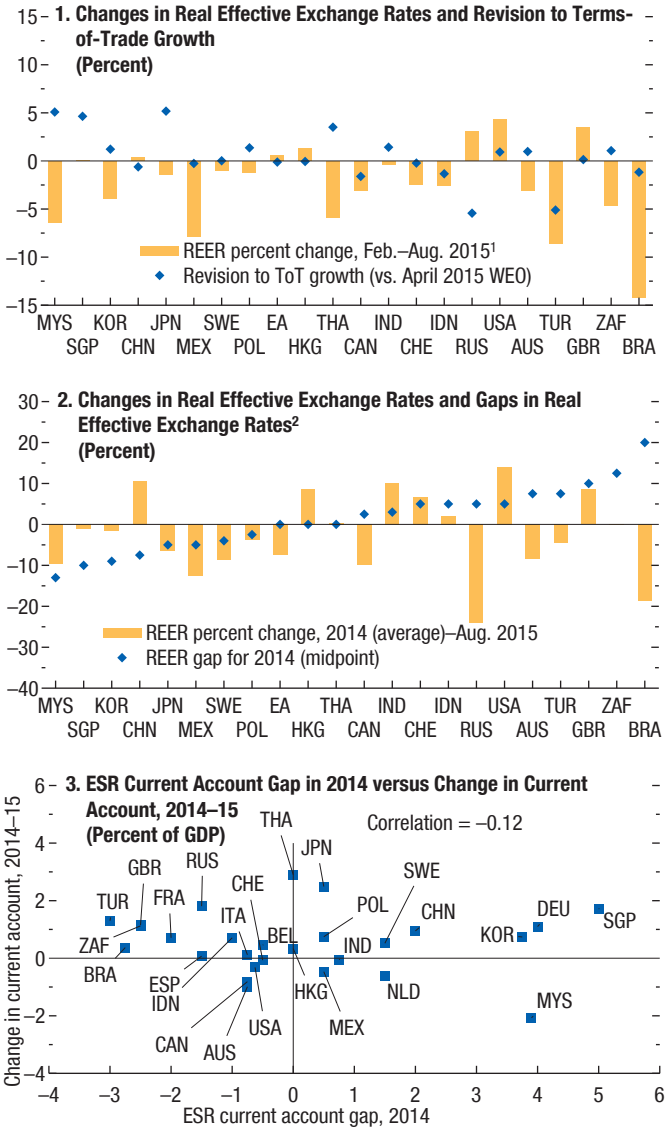
Although the compression of global current account imbalances following the global financial crisis has been discussed extensively (see, for instance, Chapter 4 of the October 2014 WEO), large current account surpluses and deficits in smaller countries have received less attention. Their number—especially the number of deficits—remains elevated. During 2012–14, more than 80 countries ran current account deficits that exceeded 5 percent of GDP but altogether accounted for only 3½ percent of world GDP. For comparison, during 2005–08 the number of countries with current account deficits above 5 percent of GDP was only slightly larger (90), but they accounted for a share of world GDP that was larger by a factor of 10. And the number of countries running large surpluses is much smaller than in the previous period. Box 1.2 discusses the characteristics of countries that have run large current account deficits in recent years in more detail, highlighting a variety of different drivers (ranging from domestic shocks to commodity price booms to increased access to external finance after debt forgive-

[5]The decline in the stock of reserves for emerging market and developing economies overstates the amount of actual sales because of valuation effects. Namely, the appreciation of the U.S. dollar with respect to most other reserve currencies in recent quarters implies a decline in the stock of reserves measured in U.S. dollars.

[6]These gaps measure deviations of current account balances from a level consistent with underlying fundamentals and desirable policies. Real exchange rate gaps are defined analogously.

Figure 1.13. Real Exchange Rates and Current Account Gaps

Currencies of many major emerging market economies have depreciated further in real effective terms since the projections for the April 2015 *World Economic Outlook* (WEO) were prepared, reflecting to an important extent weaker fundamentals, notably weakening growth prospects and worsening terms of trade. As for external imbalances, the assessment in the *2015 External Sector Report* is that these remained too large in 2014 relative to underlying norms. WEO projections suggest some general tendency for the expected current account balances in 2015 to move in the direction of narrowing the implied 2014 current account gaps. However, in some large economies, including China, Germany, and the United States, no narrowing is expected.



Sources: Global Insight; IMF, *2015 Pilot External Sector Report* (ESR); IMF, *International Financial Statistics;* and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area; REER = real effective exchange rate; ToT = terms of trade.
[1]The data for the euro area are calculated by taking the average of the data for France, Germany, Italy, and Spain.
[2]REER gaps and classifications are based on the IMF's *2015 Pilot External Sector Report*.

ness) within the general tendency for poor countries, as well as for small countries (in terms of population), to run current account deficits. Box 1.3 addresses a related question—namely, the impact of capital flows to low-income developing countries on those countries' credit growth. Its findings suggest an important influence of external financial conditions on domestic credit expansion in those countries. Clearly, reliance on external finance among countries with pressing development needs and high rates of return on investment is to be expected. However, given declining commodity prices and worsening external conditions, these two boxes suggest that some countries that relied heavily on private external financing may face significant external adjustment pressures in the future.

Risks

The distribution of risks to global growth remains tilted to the downside. Compared to the risk assessment in the April 2015 WEO, downside risks to growth for emerging market and developing economies have increased, given the combination of risks from China's growth transition, more protracted commodity market rebalancing, increased foreign-currency exposure of corporate balance sheets, and capital flow reversals associated with disruptive asset price shifts. In advanced economies, contagion risks from Greece-related events to other euro area economies, while lower than earlier in the year, remain a concern, as do risks from protracted weak demand and low inflation. Oil price declines since June (and lagged effects from previous declines) could imply some upside risk to domestic demand and growth in oil importers.

The Fan Chart: Risks around the Global GDP Forecast

The fan chart for the global GDP forecast suggests that the confidence interval around the projected path for global growth in 2016 has narrowed, especially on the upside (Figure 1.14, panel 1). Hence, high growth outcomes much above the baseline forecast are now less likely compared to what they were in the April 2015 WEO.[7]

The smaller probability of growth outcomes much above the baseline is consistent with the view that an

[7]The indicators used in the construction of the fan chart are based either on prices of derivatives or on the distribution of forecasts for the underlying variables.

even stronger growth rebound above trend than is already incorporated in current forecasts is unlikely in advanced economies. Productivity growth has turned out weaker than expected, and potential output growth is projected to remain substantially below precrisis rates (see the discussion earlier and in Box 1.1). In addition, downside risks to growth in many major emerging market economies have increased.

While upside risks from large positive growth surprises have decreased, the probability of global growth falling below 2 percent remains small and broadly unchanged relative to that in the April 2015 WEO. Simulations using the IMF's Global Projection Model, which draw on past shocks over a longer horizon, suggest a small decrease in the probability of a recession in the major advanced economies over a four-quarter horizon relative to April 2015 (Figure 1.15, panel 1). However, the risk of a recession is now higher in the Latin America 5 and the "rest of the world" group. This increase, which highlights the higher emerging market economy risks noted earlier in the chapter, reflects lower starting values for growth, given weaker growth in the second quarter of 2015 for these economies as a group and weaker near-term forecasts.

Risks to the Global Outlook

Downside risks differ between advanced and emerging market economies to some extent. However, there would be spillovers if any of the risks discussed in this subsection materialized, and these spillovers, as illustrated in Scenario Box 1 and in the October 2015 GFSR, could be substantial. In regard to upside risks, lower oil and commodity prices could have a stronger impact on demand than currently expected (including through lagged effects of earlier price declines).

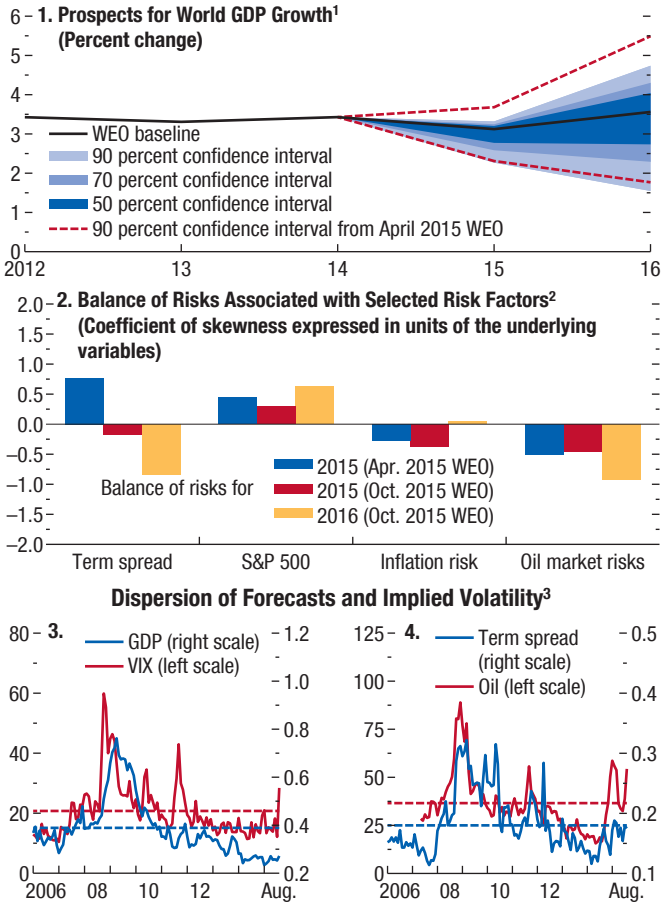
Disruptive Asset Price Shifts and Financial Market Turmoil

As elaborated in the October 2015 GFSR, disruptive asset price shifts and financial turmoil could take a toll on global activity. Emerging market economies are particularly exposed, as these risks, if they materialized, could involve capital flow reversals. Four factors underpin these risks.

- Term premiums and risk premiums in bond markets are still very low by historical standards. Estimates of the term premium on longer-term U.S. Treasury bonds suggest that it turned negative in late 2014, and estimates of term premiums for other advanced

Figure 1.14. Risks to the Global Outlook

The fan chart, which indicates the degree of uncertainty about the global growth outlook, suggests that upside risks to the forecast have narrowed compared to the April 2015 *World Economic Outlook* (WEO), while the distribution of downside risks is broadly unchanged. The distribution of the risks to the forecast for global growth is thus tilted more to the downside. Measures of forecast dispersion and implied volatility for equity and oil prices as well as the term spread in major advanced economies suggest an increase in perceived uncertainty about key variables for the global outlook.



Sources: Bloomberg, L.P.; Chicago Board Options Exchange (CBOE); Consensus Economics; Haver Analytics; and IMF staff estimates.

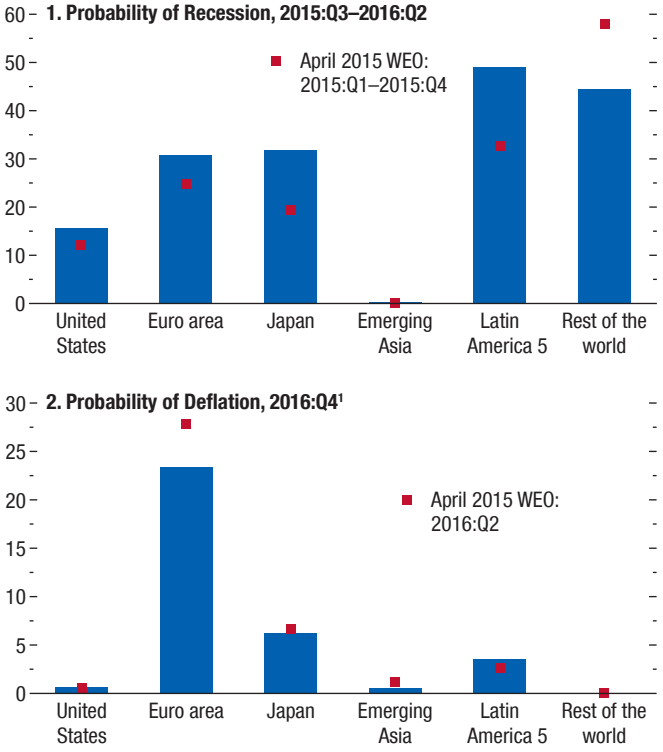
[1]The fan chart shows the uncertainty around the WEO central forecast with 50, 70, and 90 percent confidence intervals. As shown, the 70 percent confidence interval includes the 50 percent interval, and the 90 percent confidence interval includes the 50 and 70 percent intervals. See Appendix 1.2 of the April 2009 WEO for details. The 90 percent intervals for the current-year and one-year-ahead forecasts from the April 2015 WEO are shown relative to the current baseline.

[2]The bars depict the coefficient of skewness expressed in units of the underlying variables. The values for inflation risks and oil price risks enter with the opposite sign since they represent downside risks to growth.

[3]GDP measures the purchasing-power-parity-weighted average dispersion of GDP growth forecasts for the G7 economies (Canada, France, Germany, Italy, Japan, United Kingdom, United States), Brazil, China, India, and Mexico. VIX is the CBOE Standard & Poor's 500 (S&P 500) Implied Volatility Index. Term spread measures the average dispersion of term spreads implicit in interest rate forecasts for Germany, Japan, the United Kingdom, and the United States. Oil is the CBOE crude oil volatility index. Forecasts are from Consensus Economics surveys. Dashed lines represent the average values from 2000 to the present.

Figure 1.15. Recession and Deflation Risks
(Percent)

The IMF staff's Global Projection Model suggests that recession risks have increased for most advanced economies and the Latin America 5 group, mostly reflecting relatively weaker baseline projections. The risk of deflation, while decreasing, remains elevated in the euro area.



Source: IMF staff estimates.
Note: Emerging Asia comprises China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, and Thailand; Latin America 5 comprises Brazil, Chile, Colombia, Mexico, and Peru; Rest of the world comprises Argentina, Australia, Bulgaria, Canada, Czech Republic, Denmark, Estonia, Israel, New Zealand, Norway, Russia, South Africa, Sweden, Switzerland, Turkey, United Kingdom, and Venezuela.
[1]Deflation is defined as a fall in the price level on a year-over-year basis in the quarter indicated in the figure.

economies are also low if not negative. A correction to higher term premiums in the United States could lead to sharply higher yields abroad, given the strong linkages among longer-term bond yields.[8]

- The context underlying this asset price configuration—in particular, very accommodative monetary policies in the major advanced economies, as well as crisis legacies and deflation risks—is expected to start changing with improved recovery prospects in those economies. Deflation risks, for example, which appear to have partly underpinned very low bond term premiums, should decrease as output gaps close. Under the baseline, the change in term premiums is assumed to be gradual, but news that changes expectations about these fault lines and unexpected portfolio shifts could trigger disruptive asset price adjustments. These adjustments might be related to the start and especially the pace of monetary policy normalization in the United States, also in light of the remaining divergence between market expectations and estimates by members of the Federal Open Market Committee about the path of U.S. policy rates over the next few years.
- Vulnerabilities and financial stability risks in emerging market economies have likely increased amid lower growth, recent commodity price declines, and increased leverage after years of rapid credit growth. Hence, unfavorable news in these areas could trigger higher risk premiums and disruptive declines in emerging market asset prices and currency values.
- Financial market reaction to the protracted uncertainties surrounding the negotiations for a new financing program with Greece was limited, reflecting the strength of euro area firewalls and European Central Bank policies, as well as declining systemic linkages with Greece. Risks have diminished since the agreement on a new European Stability Mechanism program for Greece, but should policy and political uncertainty reemerge in Greece, sovereign and financial sector stress in the euro area could also reemerge, with potentially broader spillovers.

Lower Potential Output

Potential output is projected to grow at a rate lower than it did before the crisis, in both advanced and emerging market economies.[9] Risks are that the growth rate of potential output could be even lower than expected. Indeed, recent revisions in U.S. national accounts data suggest that productivity growth in recent years was weaker than estimated previously. That said, the growth rate of potential output will likely continue to differ between advanced and emerging market economies even if this risk materializes. In the latter, potential output growth will remain substantially

[8]See, example, Chapter 3 of the April 2014 WEO.

[9]Chapter 3 of the April 2015 WEO discusses prospects for potential output in major advanced and emerging market economies in more detail.

higher than in the former, given demographic trends and the forces of convergence in per capita income.

Some of the forces underlying the risks of lower potential output growth are the same in the two groups of economies, while others differ.

- In terms of common forces, lower capital stock growth is a concern in both groups. In advanced economies, the protracted crisis legacies—notably financial sector weakness, still-high public debt ratios, and private debt overhang—are the main concern. In emerging market economies, the concerns are structural constraints, less favorable external conditions for investment, notably tighter financial conditions and lower commodity prices, and a possible greater credit overhang after the recent credit booms. As a result, capital stock growth could be lower for longer, which, in turn, might also lower productivity growth at least temporarily because of capital-embodied technological progress.
- In terms of differences, risks of negative productivity effects from longer-lasting high unemployment (skill losses, lower labor force participation) apply primarily to advanced economies. Conversely, lower total factor productivity growth than expected under current convergence assumptions is primarily a concern for emerging market economies.

Risks to Growth in China

Growth has slowed in China in recent years, and a further moderate slowdown has been factored into the baseline projections. There are risks of a stronger growth slowdown if the macroeconomic management of the end of the investment and credit boom of 2009–12 proves more challenging than expected. Risks span a broad spectrum, with real and financial spillovers, including through commodity market channels:

- *A moderate growth shortfall:* Given risks of a further growth slowdown in the future and expectations of policy reforms that may increase input and capital costs, firms may lower investment more than expected. But unlike in 2013–14, the Chinese authorities could put greater weight on reducing vulnerabilities from recent rapid credit and investment growth, rather than on supporting growth.
- *Hard landing in China:* In this case, the authorities would use their policy space to prevent growth from slowing by shoring up investment through credit and public resources. Vulnerability from booming credit and investment would thus continue to increase, and policy space would shrink. This could mean a sharper growth slowdown in the medium term when the vulnerabilities would be more difficult to manage.

Lower Commodity Prices

Prices of commodities have fallen sharply in recent months. They could fall further if market rebalancing in response to recent excess supply conditions were to take longer than expected.[10] Growth in commodity exporters would be negatively affected, and their vulnerabilities would increase further in light of lower revenue and foreign exchange earnings. In commodity importers, however, the windfall gains from lower commodity prices from more persistent supply improvements would lower costs and increase real incomes, which should boost spending and activity, as discussed in the April 2015 WEO for the case of oil. In that case, the spending increases by importers should more than offset lower spending in exporters, as the latter tend to smooth spending more in the aggregate, and global demand would increase (see Husain and others 2015). The case is less clear-cut for other commodities: exporters of metals may not smooth spending to the same extent as oil exporters, given that exhaustibility considerations generally play a smaller role for the former.

However, possible nonlinear effects of lower commodity prices are a concern. Specifically, if lower prices also led to significant financial stress, defaults, and broad contagion among commodity exporters, the negative impact on activity in these economies would be larger, as exporters might not be able to smooth spending to the extent they would otherwise. This would also lead to larger adverse spillovers to commodity importers.

A Further Sizable Strengthening of the U.S. Dollar

The constellation underpinning dollar appreciation over the past year or so is expected to remain in place for some time in the baseline forecast. It includes domestic demand strength relative to most other advanced economies, monetary policy divergence among major advanced economies, and an improved external position with lower oil prices. U.S. dollar appreciation

[10]Specifically, the demand increases in response to lower prices or capacity adjustment through lower investment might be very gradual. In the meantime, spot prices might have to fall more relative to expected future prices, so as to create incentives for further inventory buildup to absorb excess flow supply in the meantime.

against most currencies could thus continue, causing a lasting upswing in the dollar, as has happened previously. If this risk were to materialize, balance sheet and funding strains for dollar debtors could potentially more than offset trade benefits from real depreciation in some economies. In addition, if dollar appreciation were driven by increases in longer-term bond yields, the latter would likely be transmitted rapidly to other economies, which might negatively affect the interest-sensitive components of domestic demand. Balance sheet and funding constraints are a particular concern for emerging market economies with considerable international financial integration, in which—as discussed in the *2015 Spillover Report* (IMF 2015b) and the October 2015 GFSR—foreign-currency corporate debt has increased substantially over the past few years. Much of the increase has been in the energy sector, in which a high share of revenue in U.S. dollars provides a natural hedge, although increased leverage in the sector remains a concern, especially if energy prices were to fall while the dollar appreciated. In addition, foreign-currency debt is also higher in firms operating in sectors without natural revenue hedges, especially the nontradables sector.

Geopolitical Risks

Ongoing events around Ukraine, the Middle East, and parts of Africa could lead to escalation in tensions and increased disruptions in global trade and financial transactions. Disruptions in energy and other commodity markets remain a particular concern, given the possibility of sharp price spikes, which, depending on their duration, could substantially lower real incomes and demand in importers. More generally, an escalation of such tensions could take a toll on confidence.

Secular Stagnation and Hysteresis

The risk of a protracted shortfall of domestic demand associated with excess saving (discussed in more detail in a scenario analysis in the October 2014 WEO) will remain a concern. In some advanced economies, especially in the euro area, demand continues to be relatively weak, and output gaps are still large. Inflation is expected to stay below target beyond the usual monetary policy horizons, and deflation risks—while lower than in April—remain elevated amid crisis legacies and constraints on monetary policy at the zero lower bound (Figure 1.15, panel 2). Furthermore, after six years of demand weakness, the likelihood of damage to potential output is increasingly a concern, and the considerations previously presented under risks from lower potential output apply.

A Combined Risk Scenario

The possible global repercussions of a generalized slowdown in emerging market and developing economies are presented in Scenario Box 1. The scenario includes the materialization of a number of risks highlighted earlier—a slowdown in investment and growth across emerging market economies, more severe in faster-growing economies such as China and India; lower commodity prices, arising from this slowdown; and higher risk premiums and exchange rate depreciation across emerging market economies. The implications for growth in emerging market economies and developing countries would be sizable, with growth rates 1.5 to 2 percentage points lower after five years—even though the model assumes no "sudden stop" in capital flows or crisis outcomes with contagion effects. Spillovers onto advanced economies would also be material, with growth about 0.2 to 0.3 percentage point lower after five years, depending on whether risk aversion toward emerging market assets increases, and a sizable deterioration in current account balances, despite the partial offset from lower commodity prices.

Policies

Raising actual and potential output continues to be a general policy priority. Specific policy requirements vary from country group to country group and among individual countries, although there is a broad need for structural reforms in many economies, advanced and emerging market alike. In this regard, more countries should capitalize on the opportunities that lower energy prices offer to reform energy subsidies and taxes. Addressing external vulnerabilities is also of the essence in a number of emerging market and developing economies facing a more difficult external environment.

Policies for Full Employment and Stable Inflation in Advanced Economies

With nominal policy rates still at or close to the zero lower bound in many countries, reducing risks to activity from low inflation and prolonged demand deficiency remains a priority for macroeconomic policy. In particular, to prevent real interest rates from rising prematurely, monetary policy must stay accommodative, including through unconventional measures (such

Scenario Box 1. A Structural Slowing in Emerging Market Economies

Two simulations employing the IMF's G20 Model are used to examine the global impact of a stronger-than-expected slowing in potential output growth in emerging market economies. In both simulations, investors expect lower growth in the future, because of slower catching up and lower productivity growth, as well as because of lower capital inflows and tighter financial conditions. Hence, they reduce investment expenditure relative to the *World Economic Outlook* (WEO) baseline projections, resulting in weaker domestic demand in emerging market economies. In particular, the sizable decline in investment and growth in China—together with the generalized slowdown across emerging market economies—implies a sizable weakening of commodity prices, particularly those for metals, resulting in a weakening of the terms of trade for commodity exporters.

Investment growth in emerging market economies is assumed to decline annually by about 4 percentage points on average relative to the baseline in both simulations. The decline varies within regions: countries with weaker baseline medium-term growth projections see a smaller decline. This reflects the assumption of a broader slowing in economic convergence in the current global environment.

The lower investment growth and the resulting weaker domestic demand conditions reduce potential output in emerging market economies. The negative impact operates not only through the relatively lower growth in the capital stock, but also through a reduction in total factor productivity growth. The latter reflects the assumption of new technology being embodied in new capital. Lower investment growth therefore results in a lower rate of technological progress, with the decline assumed to be proportional to the slowing in investment growth. In addition, weaker domestic demand leads to higher unemployment, which, in turn, results in a reduction in labor supply. Skill depreciation among the unemployed leads to a higher natural rate of unemployment, and discouraged workers withdraw from the labor force.

The first simulation focuses on the real side of the shock, while in the second simulation, the stronger slowing in potential output also leads to increased risk aversion toward emerging market assets. The reason is that investors worry about return prospects on assets and default risks on loans made before expected growth fell. As a result, risk premiums on assets issued by entities in these economies increase at the outset by 100 basis points, and their currencies depreciate by 10 percent relative to the dollar. The increase in risk aversion and premiums is akin to the decompression of risk premiums in the global asset market disruption scenario in the October 2015 *Global Financial Stability Report,* except that in the risk scenario examined in this box, it is confined to emerging market economies where the shock originates.

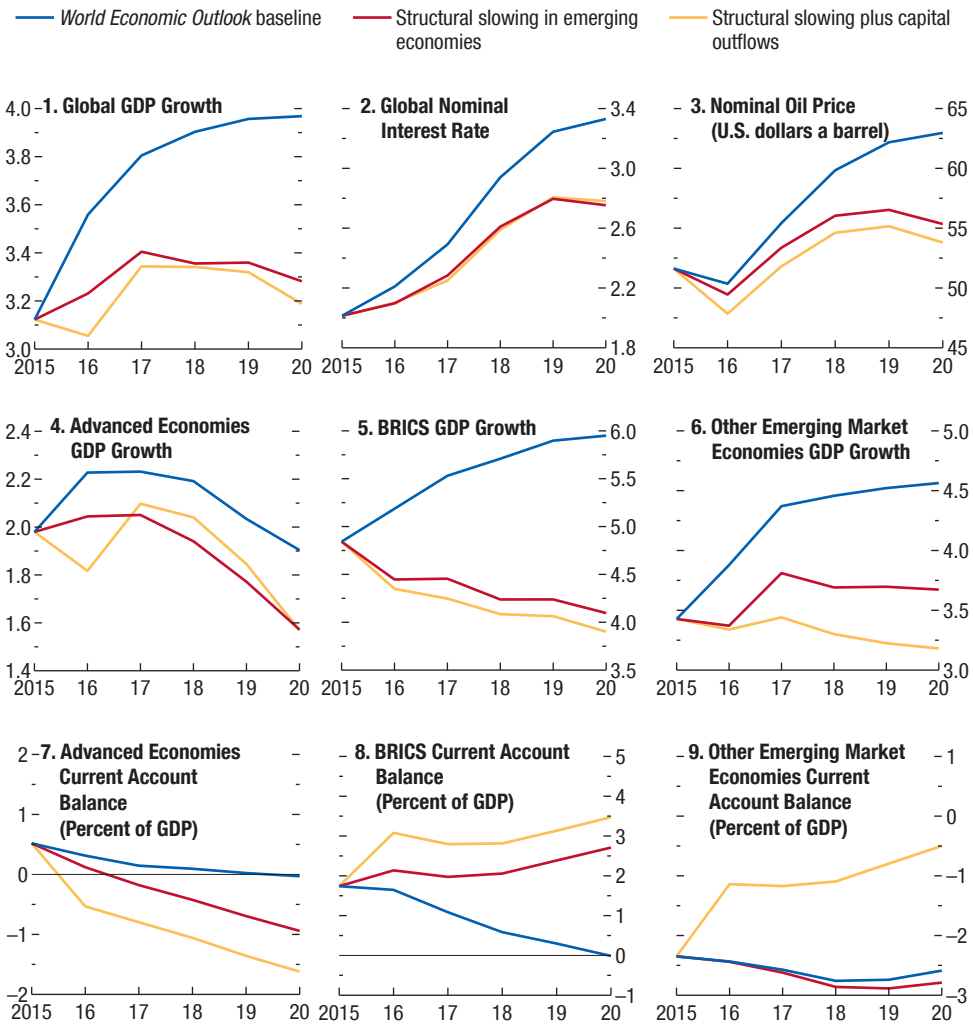
In the first simulation (red lines in Scenario Figure 1), growth in 2016 would be about 0.4 percentage point below the WEO baseline (blue lines in the figure). Economic growth in the major emerging market economies (Brazil, Russia, India, China, South Africa) would gradually decline by 1 percentage point relative to 2015. Compared with the baseline, this would amount to a sizable growth differential of 2 percentage points after five years. In other emerging market economies, growth would remain broadly unchanged relative to 2015, rather than increasing by about 1 percentage point under the baseline.

The growth rebound in advanced economies in 2016 would be smaller. Lower global interest rates and a more modest recovery in oil prices would boost domestic demand in these economies relative to the baseline. Lower interest rates would reflect both weaker global activity and the monetary policy response across the globe. But the positive domestic demand impact from lower interest rates and oil prices in advanced economies would be more than offset by the effects of weaker external demand. In fact, the scenario suggests substantial demand rebalancing. Currencies of emerging market economies would depreciate in real effective terms, and these economies' current accounts would improve with the positive impact on net exports. Conversely, advanced economies would see real appreciation and a deterioration in current accounts. Overall, the spillovers to advanced economies from the structural slowdown in emerging market economies would be negative.

In a second simulation, in which lower growth prospects in emerging market economies also heighten risk aversion, growth in emerging market economies would decline by more (yellow lines in the figure). While the depreciations and initial tightening in financial conditions would gradually dissipate, there would be some persistent tightening in financial conditions broadly proportional to emerging market economies' growth slowdowns, highlighting the amplifying role of financial channels in the transmission of the shock. There would be no pickup in global growth in 2016, and average growth would be lower across all country groups over

Scenario Box 1 *(continued)*

Scenario Figure 1. *World Economic Outlook* Stagnation Scenario
(Percent, unless noted otherwise)



Sources: IMF, G20MOD simulations; and IMF staff estimates.
Note: BRICS = Brazil, Russia, India, China, South Africa. Other emerging market economies = Albania, Antigua and Barbuda, Argentina, Armenia, The Bahamas, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Chile, Colombia, Comoros, Democratic Republic of the Congo, Costa Rica, Côte d'Ivoire, Djibouti, Dominica, Dominican Republic, El Salvador, Eritrea, Ethiopia, The Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, Indonesia, Jamaica, Kenya, Kiribati, Kosovo, Kyrgyz Republic, Lao P.D.R., Latvia, Lesotho, Liberia, Lithuania, FYR Macedonia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Niger, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Rwanda, Samoa, São Tomé and Príncipe, Senegal, Serbia, Sierra Leone, Solomon Islands, South Sudan, Sri Lanka, St. Kitts and Nevis, St. Lucia, Sudan, Suriname, Swaziland, Tajikistan, Tanzania, Thailand, Tonga, Tunisia, Turkey, Tuvalu, Uganda, Ukraine, Vanuatu, Vietnam, Zambia, Zimbabwe.

the next five years. The decline in growth in emerging market economies would be partly cushioned by stronger net exports, and their current account balances would improve substantially, reflecting the weakness in domestic demand as well as the real depreciation. On the other hand, advanced economies would see a sizable deterioration in current account balances, given weaker external demand and stronger currencies.

as large-scale asset purchases, but also negative policy rates where effective). It is important, however, that the overall policy mix be supportive. Monetary policy efforts should be accompanied by efforts to strengthen balance sheets and the credit supply channel, and by the active use of macroprudential policies to address financial stability risks. Complementary fiscal policy action in countries with fiscal space is also important, supporting global rebalancing, and demand-supporting structural reforms are necessary, in particular to improve productivity and stimulate investment. Managing high public debt in a low-growth and low-inflation environment also remains a key challenge in many advanced economies. Nominal income growth contributes little to reducing debt ratios in this environment, and fiscal consolidation would be the main means for achieving more sustainable public debt levels. But if the pace of consolidation is not attuned to the strength of the economic conditions, it risks lowering growth and putting downward pressure on prices, thereby offsetting the direct positive effect of consolidation on debt ratios.

Within these broad contours, challenges differ considerably across countries.

In the *euro area*, the pickup in activity is welcome, but the recovery remains modest and uneven. Output gaps are still sizable, and projections suggest that euro-area-wide inflation will remain below target into the medium term. Hence, ensuring a stronger euro-area-wide recovery must remain a priority, helping global rebalancing and with positive spillovers through trade and financial channels.

- On the monetary policy front, the European Central Bank's expanded asset purchase program has boosted confidence and eased financial conditions. These monetary policy efforts must continue and should be supported by measures to strengthen bank balance sheets, which would help improve monetary policy transmission and credit market conditions. Stricter supervision of nonperforming loans and measures to improve insolvency and foreclosure procedures are a priority in this regard.
- On the fiscal policy front, countries should adhere to their commitments under the Stability and Growth Pact. Nevertheless, countries with fiscal space, notably Germany and the Netherlands, could do more to encourage growth, especially by undertaking much-needed infrastructure investment and supporting structural reforms. Countries without fiscal space should continue to reduce debt and meet their fiscal targets. In general, all countries should pursue growth-friendly fiscal rebalancing that lowers marginal taxes on labor and capital, financed by cuts to unproductive spending or measures to broaden the tax base. Swift implementation of investments related to the European Fund for Strategic Investments could help support the recovery, particularly in countries with limited fiscal space.

In *Japan*, near-term prospects for economic activity have weakened, while medium-term inflation expectations are stuck substantially below the 2 percent inflation target. At the same time, potential output growth remains low.

- On the monetary policy front, the Bank of Japan should stand ready for further easing, preferably by extending purchases under its quantitative and qualitative monetary easing program to longer-maturity assets. It should also consider providing stronger guidance to markets by moving to more forecast-oriented monetary policy communication. This would increase the transparency of its assessment of inflation prospects and signal its commitment to the country's inflation target, mainly through the discussion of envisaged policy changes if inflation is not on track.
- On the fiscal front, the announced medium-term fiscal consolidation plan provides a useful anchor to guide fiscal policy. Japan should aim to put debt on a downward path, based on realistic economic assumptions, and specific structural revenue and expenditure measures should be identified up front.

In the *United States*, conditions for further job creation and improvement in labor market conditions remain in place, notwithstanding lower productivity growth and the less favorable prospects for exports in light of the sharp dollar appreciation.

- On the monetary policy front, the main near-term policy issue is the appropriate timing and pace of monetary policy normalization. The Federal Open Market Committee's decisions should remain data dependent, with the first increase in the federal funds rate waiting until there are firmer signs of inflation rising steadily toward the Federal Reserve's 2 percent medium-term inflation objective, with continued strength in the labor market. At present a broad range of indicators suggest a notable improvement in the labor market, but there is little evidence of accelerating wage and price pressures. Regardless of the timing of the initial policy move, the data would suggest that the pace of subsequent rate

increases should be gradual. An effective monetary policy communication strategy will remain essential, particularly in an environment of higher financial market volatility in which spillovers through financial channels could be material.
- On the fiscal policy front, the priority remains to agree on a medium-term fiscal consolidation plan to prepare for rising aging-related fiscal costs, while avoiding disruptive changes to the fiscal stance in the short term because of political gridlock. A credible medium-term fiscal plan will need to include higher tax revenue.

Structural Reforms

Potential output growth in advanced economies is expected to remain weak compared with precrisis standards. The main reasons for the subdued forecast are population aging, which underlies the projected low growth and possible decline in trend employment under current policies affecting labor force participation, and weak productivity growth. A first priority for structural policies therefore is to strengthen both labor force participation and trend employment.

- In Japan, removing tax disincentives and raising the availability of child care facilities through deregulation would help to boost female labor force participation further. Increasing reliance on foreign labor and providing incentives for older workers to remain in the workforce should also help in avoiding declines in trend employment.
- In the euro area, where structural, long-term, and youth unemployment are high in many economies, an important concern is skill erosion and its effect on trend employment. In addition to macroeconomic policies to boost demand, priorities include lower disincentives to employment—among them lowering the labor tax wedge—as well as better-targeted training programs and active labor market policies.
- In the United States, expanding the earned income tax credit, better family benefits (including child care assistance), and immigration reform would help boost labor supply.

Increasing productivity growth through structural policies is challenging. But a number of high-priority structural measures would likely boost productivity through their direct or indirect effects on investment (as new technology is embodied in new capital) and through the effects of labor market reforms on incentives for learning and human capital development.

- In a number of advanced economies (including several countries in the euro area as well as the United States), there is a strong case for greater infrastructure investment. In addition to boosting medium-term potential output, partly by making private investment more efficient, such investment would also provide much-needed short-term support to domestic demand in some of these economies.
- In euro area economies, lowering barriers to entry in product markets and reforming labor market regulations that hamper adjustment are critical. In debtor economies, these changes would strengthen external competitiveness and help sustain gains in external adjustment while economies recover, whereas in creditor economies, they would primarily strengthen investment and employment. Further progress should also be made in implementing the European Union Services Directive, advancing free-trade agreements, and integrating capital and energy markets, which could raise productivity. And as mentioned earlier, reforms tackling legacy debt overhang (for instance, through resolving nonperforming loans, facilitating out-of-court settlement, and improving insolvency frameworks) would help credit demand and supply recover.
- In Japan, more forceful structural reforms (the third arrow of Abenomics) should be the priority. Measures to increase labor force participation are essential, as previously discussed, but there is also scope for raising productivity in the services sector through deregulation, invigorating labor productivity by reducing labor market duality, and supporting investment through corporate governance reform as well as improvements to the provision of risk capital by the financial system.

Policies to Foster Growth and Manage Vulnerabilities in Emerging Market and Developing Economies

Policymakers in emerging market economies face the challenge of dealing with slowing growth, more difficult external conditions, and increased vulnerabilities after a decade or so of buoyant growth. While the resilience to external shocks has increased in many emerging market economies because of increased exchange rate flexibility, higher foreign exchange reserves, more robust external financing patterns, and generally stronger policy frameworks, there are a number of important policy challenges and trade-offs to consider.

- *The extent of economic slack might be small despite the growth slowdown*. An important consideration for the calibration of macroeconomic policies is the degree of economic slack. The latter might be smaller than the sizable growth slowdown since 2011 in many emerging market economies might suggest. The reason is that the growth slowdown partly reflects a cyclical return to potential output after overheating in broad credit and investment booms, driven by factors such as increasing commodity prices and easing financial conditions for emerging market economies.[11] In addition, as discussed in Chapter 2, in countries where the growth slowdown has been partly driven by lower commodity prices, potential output growth is likely to have declined as well and might decrease further, given the weaker commodity price outlook. The evidence of slowing productivity growth in major emerging market economies in recent years adds to these concerns.[12]
- *Monetary conditions have eased with exchange rate depreciation, but vulnerabilities might limit the scope for monetary easing.* Amid greater exchange rate flexibility, substantial currency depreciation in real effective terms in many emerging market economies has contributed to easier monetary conditions. Whether economic conditions also call for monetary policy easing raises difficult trade-offs. Real policy rates are already below natural rates in many economies, and lowering rates could trigger sizable further depreciation. This could increase financial stability risks, given higher corporate leverage and balance sheet exposure to foreign-currency risks in many emerging market economies (as analyzed in Chapter 3 of the October 2015 GFSR). Moreover, if monetary policy frameworks lack credibility or policy credibility is strained, the concern is that depreciation could also lead to persistently higher prices and pressure for further exchange rate depreciation, a particular worry when inflation is already above target.
- *The likelihood of further currency depreciation in emerging market economies may require stronger regulatory and macroprudential frameworks.* Emerging market and developing economies not relying on exchange rate pegs have to be ready to allow the exchange rate to respond to adverse external shocks. In some countries, this may require strengthening the credibility of monetary and fiscal policy frameworks, while balance sheet exposures to foreign exchange risks need to remain manageable. The latter calls for enforcing or (if needed) strengthening prudential regulation and supervision as well as adequate macroprudential frameworks.
- *Increased vulnerabilities might also introduce fiscal policy trade-offs.* Public debt ratios are relatively low in a number of emerging market economies, although budget deficits generally remain above precrisis ratios despite the strong recovery after the global financial crisis. Fiscal easing could support demand when output gaps are large and monetary policy is constrained, but it would also increase vulnerabilities in the current context, mostly because of risks of higher country risk premiums in the broader context of capital flow reversal risks. In economies with preexisting fiscal vulnerabilities, the fiscal space is thus likely to be limited. In addition, in economies with downward revisions to medium-term growth prospects, fiscal policy might have to adjust to lower fiscal revenue at full employment, a first-order issue notably in commodity exporters, given commodity price declines.

Beyond the common context, policy considerations for net commodity exporters generally differ from those for net commodity importers.

- In many net commodity importers, lower commodity prices have alleviated inflation pressure and reduced external vulnerabilities with the terms-of-trade windfall gains. The trade-off between supporting demand if there is economic slack and reducing macroeconomic vulnerabilities has become less pronounced as a result. In some importers with commodity-related subsidies, the windfall gains from lower oil prices have been used to increase public sector savings and strengthen fiscal positions. Whether the improved fiscal policy space should be used depends on the extent of economic slack, the strength of the economy's fiscal position, and the need for structural reforms or growth-enhancing spending (on, for example, infrastructure).
- In commodity exporters, fiscal positions have deteriorated and external and fiscal vulnerabilities have increased. The urgency to adjust policies varies considerably, depending on fiscal buffers. Exporters with buffers can afford to adjust government spending gradually to avoid exacerbating the slowdown. Nev-

[11]See Box 1.2 of the October 2013 WEO.
[12]See Chapter 3 of the April 2015 WEO.

ertheless, with some of the commodity price decline expected to be permanent, it will be important to assess the revenue implications and plan for fiscal adjustment. In exporters with limited policy space, allowing substantial exchange rate depreciation will be the main avenue available to cushion the impact of the commodity price shock on their economies. As discussed in the October 2015 *Fiscal Monitor*, the weaker commodity price outlook also highlights that in some commodity exporters, fiscal policy frameworks might need to be upgraded to factor in commodity-market-related uncertainty and to provide a longer-term anchor to guide policy decisions.

Turning to policy requirements in large emerging market economies, policymakers in *China* face the challenge of simultaneously achieving three objectives: avoiding a sharp growth slowdown in the transition to more sustainable patterns of growth, reducing vulnerabilities from excess leverage after a credit and investment boom, and strengthening the role of market forces in the economy. Modest further policy support to ensure that growth does not fall sharply is likely to be needed, but further progress in implementing the authorities' structural reforms will be critical for private consumption to pick up some of the slack from slowing investment growth. The core of the reforms is to give market mechanisms a more decisive role in the economy, eliminate distortions, and strengthen institutions. Examples include financial sector reforms to strengthen regulation and supervision, liberalize deposit rates, increase the reliance on interest rates as an instrument of monetary policy, and eliminate widespread implicit guarantees; fiscal and social security reforms; and reforms of state-owned enterprises, including leveling the playing field between the public and private sectors. The recent change in China's exchange rate system provides the basis for a more market-determined exchange rate, but much depends on implementation. A floating exchange rate will enhance monetary policy autonomy and help the economy adjust to external shocks, as China continues to become more integrated into both the global economy and global financial markets.

In *India*, near-term growth prospects remain favorable, and the decrease in the current account deficit has lowered external vulnerabilities. The faster-than-expected decline in inflation has created space for considering modest cuts in the nominal policy rate, but the real policy rate needs to remain tight for inflation to decline to the inflation target in the medium term, given upside risks to inflation. Continued fiscal consolidation is also essential, but it should be more growth friendly (tax reform, reduction in subsidies). With balance sheet strains in the corporate and banking sectors, financial sector regulation should be enhanced, provisioning increased, and debt recovery strengthened. Structural reforms should focus on relaxing long-standing supply constraints in the energy, mining, and power sectors. Priorities include market-based pricing of natural resources to boost investment, addressing delays in the implementation of infrastructure projects, and improving policy frameworks in the power and mining sectors.

Several years of downgraded medium-term growth prospects suggest that it is also time for major emerging market economies to turn to important structural reforms to raise productivity and growth in a lasting way. Although the slowing in estimated total factor productivity growth in major emerging market economies is partly a natural implication of recent progress in convergence, as discussed in Chapter 3 of the April 2015 WEO, the concern is that potential output growth has become too dependent on factor accumulation in some economies. The structural reform agenda naturally differs across countries, but it includes removing infrastructure bottlenecks in the power sector (India, Indonesia, South Africa); easing limits on trade and investment and improving business conditions (Brazil, Indonesia, Russia); and implementing reforms to education, labor, and product markets to raise competitiveness and productivity (Brazil, China, India, South Africa) and government services delivery (South Africa).

Policies in Low-Income Countries

Growth in low-income countries as a group has stayed high while growth in emerging market economies has weakened. But with weak activity in advanced economies, a slowdown in emerging market economies, and lower commodity prices, low-income countries' growth prospects for 2015 and beyond have been revised downward. In addition, greater access to foreign-market financing has increased some low-income countries' exposure to a possible tightening in global financial conditions.

Policies must respond to the increased challenges and vulnerabilities. In some countries, fiscal positions must be improved against the backdrop of lower

commodity and other export-related revenue and the possibility of some future growth moderation. Specific requirements vary from country to country, but general priorities include broadening the revenue base and adjusting nonessential expenditure while maintaining essential capital expenditure to address infrastructure gaps and social spending.

In many low-income countries, allowing for exchange rate flexibility will help the adjustment to less favorable external demand and financial conditions. But such flexibility may require steps to tighten the macroeconomic policy stance and to strengthen the monetary policy framework to limit damaging second-round effects on domestic prices. And for commodity exporters, especially those with limited buffers, fiscal consolidation will be needed to adjust to lower commodity revenue. Commodity exporters also need a longer-term anchor for fiscal policy, given commodity-price-related uncertainty. The anchor should provide for sufficient longer-term fiscal buffers to deal with large and persistent shocks, and, where relevant, resource depletion. It will also be critical for commodity exporters to manage foreign-currency exposures in balance sheets carefully.

Low-income countries also need to make progress in meeting the Sustainable Development Goals, which replaced the Millennium Development Goals in September. Progress in attaining the Millennium Development Goals was uneven, and the global financial crisis set back the hard-won gains in many cases. The poorest states, fragile states, and conflict-affected states continue to face severe challenges in meeting their development priorities.

Measures to address the growth challenges and vulnerabilities discussed earlier will be important for progress on these development goals. Policies to foster sustainable resource mobilization to boost growth and promote economic diversification will also be important. Priorities vary across countries, but broadly include measures to strengthen fiscal revenue, promote financial deepening, and attract foreign capital flows. The international community, including advanced and systemically important emerging market economies, will also need to play an important supportive role in maintaining an enabling external environment. Priorities include further trade liberalization, providing development aid and technical assistance, completing the global regulatory reform agenda, and cooperating on international taxation and climate change issues.

Annex 1.1. Regional Projections

The tables in this annex formerly appeared in Chapter 2, "Country and Regional Perspectives," which has now been integrated into Chapter 1. Beginning with this *World Economic Outlook* report, these tables will appear instead in this annex to Chapter 1. For reader convenience, the following shows the old and new numbering of the tables:

Annex Table (New) Number	Title	Old Number
1.1.1	European Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.2
1.1.2	Asian and Pacific Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.3
1.1.3	Western Hemisphere Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.4
1.1.4	Commonwealth of Independent States Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.5
1.1.5	Middle East and North African Economies, Afghanistan, and Pakistan: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.6
1.1.6	Sub-Saharan African Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment	2.7

Annex Table 1.1.1. European Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Europe	**1.6**	**1.9**	**2.0**	**1.2**	**0.7**	**1.5**	**1.7**	**2.2**	**2.0**	. . .	. . .	. . .
Advanced Europe	**1.3**	**1.7**	**1.8**	**0.6**	**0.2**	**1.1**	**2.2**	**2.6**	**2.5**	**10.2**	**9.6**	**9.2**
Euro Area[4,5]	0.9	1.5	1.6	0.4	0.2	1.0	2.0	3.2	3.0	11.6	11.0	10.5
Germany	1.6	1.5	1.6	0.8	0.2	1.2	7.4	8.5	8.0	5.0	4.7	4.7
France	0.2	1.2	1.5	0.6	0.1	1.0	–0.9	–0.2	–0.4	10.3	10.2	9.9
Italy	–0.4	0.8	1.3	0.2	0.2	0.7	1.9	2.0	2.3	12.7	12.2	11.9
Spain	1.4	3.1	2.5	–0.2	–0.3	0.9	0.8	0.9	1.1	24.5	21.8	19.9
Netherlands	1.0	1.8	1.9	0.3	1.0	1.3	10.2	9.6	9.2	7.4	7.2	7.0
Belgium	1.1	1.3	1.5	0.5	0.7	1.1	1.6	2.1	2.1	8.5	8.5	8.3
Austria	0.4	0.8	1.6	1.5	1.0	1.7	0.7	1.6	1.7	5.6	5.8	5.6
Greece	0.8	–2.3	–1.3	–1.5	–0.4	0.0	0.9	0.7	1.5	26.5	26.8	27.1
Portugal	0.9	1.6	1.5	–0.2	0.6	1.3	0.6	0.7	1.6	13.9	12.3	11.3
Ireland	5.2	4.8	3.8	0.3	0.2	1.5	3.6	3.2	3.0	11.3	9.6	8.5
Finland	–0.4	0.4	0.9	1.2	0.0	1.3	–1.9	–1.1	–0.7	8.7	9.5	9.5
Slovak Republic	2.4	3.2	3.6	–0.1	–0.1	1.4	0.1	0.1	0.1	13.2	11.9	11.1
Lithuania	2.9	1.8	2.6	0.2	–0.4	1.6	0.1	–2.2	–2.4	10.7	10.6	10.0
Slovenia	3.0	2.3	1.8	0.2	–0.4	0.7	7.0	6.7	6.2	9.7	8.7	8.1
Luxembourg	5.6	4.4	3.4	0.7	0.3	1.6	5.1	5.6	5.6	7.2	6.9	6.8
Latvia	2.4	2.2	3.3	0.7	0.4	1.8	–3.1	–1.7	–2.7	10.8	10.4	10.2
Estonia	2.9	2.0	2.9	0.5	0.2	1.6	0.1	0.6	0.3	7.4	6.8	6.5
Cyprus	–2.3	0.5	1.4	–0.3	–1.0	0.9	–4.5	–4.2	–3.8	16.1	16.0	15.0
Malta	3.5	3.4	3.5	0.8	1.0	1.4	3.3	1.5	1.3	5.9	5.7	5.5
United Kingdom[5]	3.0	2.5	2.2	1.5	0.1	1.5	–5.9	–4.7	–4.3	6.2	5.6	5.5
Switzerland	1.9	1.0	1.3	0.0	–1.1	–0.2	7.3	7.2	7.0	3.2	3.4	3.6
Sweden	2.3	2.8	3.0	0.2	0.5	1.1	6.2	6.7	6.7	7.9	7.7	7.6
Norway	2.2	0.9	1.3	2.0	2.3	2.2	9.4	7.0	5.4	3.5	4.2	4.3
Czech Republic	2.0	3.9	2.6	0.4	0.4	1.5	0.6	1.7	1.2	6.1	5.2	4.9
Denmark	1.1	1.6	2.0	0.6	0.5	1.8	6.3	7.0	7.2	6.5	6.2	6.0
Iceland	1.8	4.8	3.7	2.0	2.1	4.5	3.4	4.6	3.4	5.0	4.3	4.1
San Marino	–1.0	1.0	1.1	1.1	0.4	0.9	. . .	. . .	. . .	8.7	8.4	7.9
Emerging and Developing Europe[6]	**2.8**	**3.0**	**3.0**	**3.8**	**2.9**	**3.5**	**–2.9**	**–2.1**	**–2.4**	. . .	. . .	. . .
Turkey	2.9	3.0	2.9	8.9	7.4	7.0	–5.8	–4.5	–4.7	9.9	10.8	11.2
Poland	3.4	3.5	3.5	0.0	–0.8	1.0	–1.3	–0.5	–1.0	9.0	7.5	7.2
Romania	2.8	3.4	3.9	1.1	–0.4	–0.2	–0.4	–0.7	–1.5	6.8	6.9	6.8
Hungary	3.6	3.0	2.5	–0.2	0.3	2.3	4.0	5.0	4.3	7.8	7.3	7.0
Bulgaria[5]	1.7	1.7	1.9	–1.6	–0.8	0.6	0.0	1.0	0.2	11.5	10.3	9.7
Serbia	–1.8	0.5	1.5	2.1	1.6	3.4	–6.0	–4.0	–3.8	19.7	20.6	21.8
Croatia	–0.4	0.8	1.0	–0.2	–0.4	1.1	0.7	1.7	1.5	17.1	16.6	16.1

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*. Current account position corrected for reporting discrepancies in intra-area transactions.

[5]Based on Eurostat's harmonized index of consumer prices.

[6]Includes Albania, Bosnia and Herzegovina, Kosovo, FYR Macedonia, and Montenegro.

Annex Table 1.1.2. Asian and Pacific Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Asia	**5.6**	**5.4**	**5.4**	**3.2**	**2.5**	**2.8**	**1.7**	**2.6**	**2.4**	. . .	. . .	. . .
Advanced Asia	**1.6**	**1.5**	**2.0**	**2.2**	**0.8**	**1.2**	**2.2**	**3.7**	**3.5**	**3.8**	**3.9**	**3.8**
Japan	–0.1	0.6	1.0	2.7	0.7	0.4	0.5	3.0	3.0	3.6	3.5	3.5
Korea	3.3	2.7	3.2	1.3	0.7	1.8	6.3	7.1	6.7	3.5	3.7	3.5
Australia	2.7	2.4	2.9	2.5	1.8	2.6	–3.0	–4.0	–4.1	6.1	6.3	6.2
Taiwan Province of China	3.8	2.2	2.6	1.2	–0.1	1.0	12.4	12.4	11.8	4.0	4.0	4.0
Singapore	2.9	2.2	2.9	1.0	0.0	1.8	19.1	20.8	18.0	2.0	2.0	2.0
Hong Kong SAR	2.5	2.5	2.7	4.4	2.9	3.0	1.9	2.2	2.5	3.2	3.2	3.1
New Zealand	3.3	2.2	2.4	1.2	0.2	1.5	–3.3	–4.7	–5.6	5.7	5.8	5.8
Emerging and Developing Asia	**6.8**	**6.5**	**6.4**	**3.5**	**3.0**	**3.2**	**1.4**	**2.0**	**1.8**	. . .	. . .	. . .
China	7.3	6.8	6.3	2.0	1.5	1.8	2.1	3.1	2.8	4.1	4.1	4.1
India	7.3	7.3	7.5	5.9	5.4	5.5	–1.3	–1.4	–1.6	. . .	. . .	. . .
ASEAN-5	**4.6**	**4.6**	**4.9**	**4.6**	**3.7**	**4.0**	**1.1**	**1.3**	**1.1**	. . .	. . .	. . .
Indonesia	5.0	4.7	5.1	6.4	6.8	5.4	–3.0	–2.2	–2.1	6.1	5.8	5.6
Thailand	0.9	2.5	3.2	1.9	–0.9	1.5	3.3	6.2	5.4	0.8	0.8	0.8
Malaysia	6.0	4.7	4.5	3.1	2.4	3.8	4.3	2.2	2.1	2.9	3.0	3.0
Philippines	6.1	6.0	6.3	4.2	1.9	3.4	4.4	5.0	4.5	6.8	6.3	6.0
Vietnam	6.0	6.5	6.4	4.1	2.2	3.0	4.9	0.7	–0.9	2.5	2.5	2.5
Other Emerging and Developing Asia[4]	**6.6**	**6.6**	**6.7**	**5.9**	**6.3**	**6.6**	**–1.7**	**–3.2**	**–3.7**	. . .	. . .	. . .
Memorandum												
Emerging Asia[5]	6.8	6.5	6.3	3.4	2.8	3.1	1.5	2.2	2.0	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Other Emerging and Developing Asia comprises Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, Kiribati, Lao P.D.R., Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, Palau, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

[5]Emerging Asia comprises the ASEAN-5 (Indonesia, Malaysia, Philippines, Thailand, Vietnam) economies, China, and India.

Annex Table 1.1.3. Western Hemisphere Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
North America	**2.4**	**2.4**	**2.7**	**1.9**	**0.4**	**1.4**	**–2.2**	**–2.6**	**–2.8**	. . .	. . .	. . .
United States	2.4	2.6	2.8	1.6	0.1	1.1	–2.2	–2.6	–2.9	6.2	5.3	4.9
Canada	2.4	1.0	1.7	1.9	1.0	1.6	–2.1	–2.9	–2.3	6.9	6.8	6.8
Mexico	2.1	2.3	2.8	4.0	2.8	3.0	–1.9	–2.4	–2.0	4.8	4.3	4.0
South America[4]	**0.7**	**–1.5**	**–0.3**	**9.9**	**15.8**	**15.0**	**–3.2**	**–3.5**	**–3.3**	. . .	. . .	. . .
Brazil	0.1	–3.0	–1.0	6.3	8.9	6.3	–4.4	–4.0	–3.8	4.8	6.6	8.6
Argentina[5,6]	0.5	0.4	–0.7	. . .	16.8	25.6	–1.0	–1.8	–1.6	7.3	6.9	8.4
Colombia	4.6	2.5	2.8	2.9	4.4	3.5	–5.2	–6.2	–5.3	9.1	9.0	8.9
Venezuela	–4.0	–10.0	–6.0	62.2	159.1	204.1	5.3	–3.0	–1.9	8.0	14.0	18.1
Chile	1.9	2.3	2.5	4.4	4.4	3.7	–1.2	–0.7	–1.6	6.4	6.6	7.0
Peru	2.4	2.4	3.3	3.2	3.2	2.8	–4.0	–3.7	–3.8	6.0	6.0	6.0
Ecuador	3.8	–0.6	0.1	3.6	4.1	2.9	–0.6	–2.6	–2.8	3.8	4.7	5.0
Bolivia	5.5	4.1	3.5	5.8	4.3	4.9	0.0	–4.5	–5.0	4.0	4.0	4.0
Uruguay	3.5	2.5	2.2	8.9	8.4	8.1	–4.4	–3.7	–3.7	6.6	6.6	7.0
Paraguay	4.4	3.0	3.8	5.0	3.3	4.2	0.1	–2.0	–1.9	5.5	5.5	5.5
Central America[7]	**4.1**	**3.9**	**4.2**	**3.6**	**2.1**	**3.0**	**–6.0**	**–4.8**	**–4.9**	. . .	. . .	. . .
Caribbean[8]	**4.7**	**3.8**	**3.4**	**4.0**	**3.1**	**4.5**	**–3.7**	**–3.3**	**–3.3**	. . .	. . .	. . .
Memorandum												
Latin America and the Caribbean[9]	1.3	–0.3	0.8	7.9	11.2	10.7	–3.0	–3.3	–3.0	. . .	. . .	. . .
Excluding Argentina	1.4	–0.3	0.9	7.9	11.2	10.7	–3.2	–3.5	–3.2	. . .	. . .	. . .
Eastern Caribbean Currency Union[10]	2.7	2.5	2.2	1.1	–0.1	1.5	–14.3	–12.9	–12.9	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Data for Argentina's consumer prices are excluded from Latin America and the Caribbean and South America aggregates. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Includes Guyana and Suriname. See note 6 regarding consumer prices.

[5]The data for Argentina are officially reported data as revised in May 2014. On February 1, 2013, the IMF issued a declaration of censure, and in December 2013 called on Argentina to implement specified actions to address the quality of its official GDP data according to a specified timetable. On June 3, 2015, the Executive Board recognized the ongoing discussions with the Argentine authorities and their material progress in remedying the inaccurate provision of data since 2013, but found that some specified actions called for by the end of February 2015 had not yet been completely implemented. The Executive Board will review this issue again by July 15, 2016, and in line with the procedures set forth in the IMF legal framework.

[6]Consumer price data from December 2013 onward reflect the new national CPI (IPCNu), which differs substantively from the preceding CPI (the CPI for the Greater Buenos Aires Area, CPI-GBA). Because of the differences in geographical coverage, weights, sampling, and methodology, the IPCNu data cannot be directly compared to the earlier CPI-GBA data. Because of this structural break in the data, the average CPI inflation for 2014 is not reported in the October 2015 *World Economic Outlook*. Following a declaration of censure by the IMF on February 1, 2013, the public release of a new national CPI by the end of March 2014 was one of the specified actions in the IMF Executive Board's December 2013 decision calling on Argentina to address the quality of its official CPI data. On June 3, 2015, the Executive Board recognized the ongoing discussions with the Argentine authorities and their material progress in remedying the inaccurate provision of data since 2013, but found that some specified actions called for by the end of February 2015 had not yet been completely implemented. The Executive Board will review this issue again by July 15, 2016, and in line with the procedures set forth in the IMF legal framework.

[7]Central America comprises Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[8]The Caribbean comprises Antigua and Barbuda, The Bahamas, Barbados, Dominica, the Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago.

[9]Latin America and the Caribbean comprises Mexico and economies from the Caribbean, Central America, and South America. See note 6 regarding consumer prices.

[10]Eastern Caribbean Currency Union comprises Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines as well as Anguilla and Montserrat, which are not IMF members.

Annex Table 1.1.4. Commonwealth of Independent States Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Commonwealth of Independent States[4]	**1.0**	**–2.7**	**0.5**	**8.1**	**15.9**	**8.9**	**2.2**	**2.4**	**2.5**	. . .	. . .	. . .
Net Energy Exporters	**1.5**	**–2.3**	**0.4**	**7.5**	**13.9**	**8.4**	**3.2**	**3.2**	**3.4**	. . .	. . .	. . .
Russia	0.6	–3.8	–0.6	7.8	15.8	8.6	3.2	5.0	5.4	5.2	6.0	6.5
Kazakhstan	4.3	1.5	2.4	6.7	6.3	8.6	2.1	–3.0	–4.1	5.0	5.0	5.0
Uzbekistan	8.1	6.8	7.0	8.4	9.7	9.2	1.7	0.2	0.3	. . .	. . .	. . .
Azerbaijan	2.8	4.0	2.5	1.4	5.0	4.2	14.1	3.0	2.7	6.0	6.0	6.0
Turkmenistan	10.3	8.5	8.9	6.0	7.0	6.0	–5.8	–13.6	–12.1	. . .	. . .	. . .
Net Energy Importers	**–2.6**	**–5.5**	**1.1**	**12.2**	**30.9**	**12.6**	**–6.2**	**–4.5**	**–4.1**	. . .	. . .	. . .
Ukraine[5]	–6.8	–9.0	2.0	12.1	50.0	14.2	–4.7	–1.7	–1.6	9.3	11.5	11.0
Belarus	1.6	–3.6	–2.2	18.1	15.1	14.2	–6.7	–4.9	–4.3	0.5	0.5	0.5
Georgia	4.8	2.0	3.0	3.1	3.7	5.0	–9.7	–10.7	–9.6	. . .	. . .	. . .
Armenia	3.4	2.5	2.2	3.0	4.3	3.4	–7.3	–5.9	–6.4	18.0	17.9	17.7
Tajikistan	6.7	3.0	3.4	6.1	10.8	8.2	–9.2	–7.5	–6.1	. . .	. . .	. . .
Kyrgyz Republic	3.6	2.0	3.6	7.5	8.3	9.0	–16.8	–17.7	–15.7	7.6	7.5	7.4
Moldova	4.6	–1.0	1.5	5.1	8.4	7.4	–3.7	–6.2	–6.4	3.9	7.0	6.0
Memorandum												
Caucasus and Central Asia[6]	5.3	3.7	4.0	5.8	6.8	7.4	2.0	–3.4	–3.8	. . .	. . .	. . .
Low-Income CIS Countries[7]	6.7	4.8	5.4	6.9	8.5	8.1	–3.3	–3.8	–3.4	. . .	. . .	. . .
Net Energy Exporters Excluding Russia	5.4	3.8	4.1	5.9	6.8	7.6	3.3	–2.7	–3.2	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Table A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States (CIS), are included in this group for reasons of geography and similarity in economic structure.

[5]Starting in 2014 data exclude Crimea and Sevastopol.

[6]Caucasus and Central Asia comprises Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

[7]Low-Income CIS Countries comprise Armenia, Georgia, the Kyrgyz Republic, Moldova, Tajikistan, and Uzbekistan.

Annex Table 1.1.5. Middle East and North African Economies, Afghanistan, and Pakistan: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Middle East, North Africa, Afghanistan, and Pakistan	**2.7**	**2.5**	**3.9**	**6.7**	**6.2**	**5.4**	**5.6**	**–3.6**	**–4.3**	. . .	. . .	. . .
Oil Exporters[4]	**2.6**	**1.8**	**3.8**	**5.6**	**5.8**	**5.1**	**8.9**	**–3.4**	**–4.3**	. . .	. . .	. . .
Saudi Arabia	3.5	3.4	2.2	2.7	2.1	2.3	10.3	–3.5	–4.7	5.5	. . .	. . .
Iran[5]	4.3	0.8	4.4	15.5	15.1	11.5	3.8	0.4	1.3	10.6	11.7	12.3
United Arab Emirates	4.6	3.0	3.1	2.3	3.7	3.0	13.7	2.9	3.1	. . .	. . .	. . .
Algeria	3.8	3.0	3.9	2.9	4.2	4.1	–4.5	–17.7	–16.2	10.6	11.6	11.7
Iraq	–2.1	0.0	7.1	2.2	1.9	3.0	–2.8	–12.7	–11.0	. . .	. . .	. . .
Qatar	4.0	4.7	4.9	3.0	1.6	2.3	26.1	5.0	–4.5	. . .	. . .	. . .
Kuwait	0.1	1.2	2.5	2.9	3.3	3.3	31.0	9.3	7.0	2.1	2.1	2.1
Oil Importers[6]	**2.9**	**3.9**	**4.1**	**9.1**	**7.0**	**6.1**	**–4.2**	**–4.2**	**–4.2**	. . .	. . .	. . .
Egypt	2.2	4.2	4.3	10.1	11.0	8.8	–0.8	–3.7	–4.5	13.4	12.9	12.4
Pakistan	4.0	4.2	4.5	8.6	4.5	4.7	–1.3	–0.8	–0.5	6.7	6.5	6.0
Morocco	2.4	4.9	3.7	0.4	1.5	2.0	–5.5	–2.3	–1.6	9.9	9.8	9.7
Sudan	3.6	3.5	4.0	36.9	19.8	12.7	–7.7	–5.8	–5.6	13.6	13.3	13.0
Tunisia	2.3	1.0	3.0	4.9	5.0	4.0	–8.8	–8.5	–7.0	15.3	15.0	14.0
Lebanon	2.0	2.0	2.5	1.9	0.1	1.5	–24.9	–21.0	–19.3	. . .	. . .	. . .
Jordan	3.1	2.9	3.7	2.9	0.2	3.1	–6.8	–7.4	–6.5		. . .	. . .
Memorandum												
Middle East and North Africa	2.6	2.3	3.8	6.5	6.5	5.5	6.1	–4.0	–4.7	. . .	. . .	. . .
Israel[7]	2.6	2.5	3.3	0.5	–0.1	2.0	4.3	4.6	4.7	5.9	5.3	5.2
Maghreb[8]	0.7	2.5	3.6	2.5	3.9	4.0	–8.1	–15.8	–13.8	. . .	. . .	. . .
Mashreq[9]	2.2	3.9	4.1	8.9	9.4	7.8	–4.6	–6.3	–6.6	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Includes Bahrain, Libya, Oman, and Yemen.

[5]For Iran, data and forecasts are based on GDP at market prices. Corresponding data used by the IMF staff for GDP growth at factor prices are 3.0 percent, –1.9 percent, and –6.8 percent for 2014/15, 2013/14, and 2012/13, respectively.

[6]Includes Afghanistan, Djibouti, and Mauritania. Excludes Syria because of the ongoing conflict and related lack of data.

[7]Israel, which is not a member of the economic region, is included for reasons of geography. Note that Israel is not included in the regional aggregates.

[8]The Maghreb comprises Algeria, Libya, Mauritania, Morocco, and Tunisia.

[9]The Mashreq comprises Egypt, Jordan, and Lebanon. Syria is excluded because of the ongoing conflict and related lack of data.

Annex Table 1.1.6. Sub-Saharan African Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Sub-Saharan Africa	**5.0**	**3.8**	**4.3**	**6.4**	**6.9**	**7.3**	**–4.1**	**–5.7**	**–5.5**	**. . .**	**. . .**	**. . .**
Oil Exporters[4]	**5.9**	**3.5**	**4.1**	**7.4**	**9.1**	**9.7**	**–0.4**	**–3.3**	**–2.4**	**. . .**	**. . .**	**. . .**
Nigeria	6.3	4.0	4.3	8.1	9.1	9.7	0.2	–1.8	–1.2	7.8	8.2	. . .
Angola	4.8	3.5	3.5	7.3	10.3	14.2	–1.5	–7.6	–5.6	. . .	. . .	. . .
Gabon	4.3	3.5	4.9	4.5	0.6	2.5	8.3	–7.0	–4.2	. . .	. . .	. . .
Chad	6.9	6.9	4.2	1.7	4.3	3.1	–8.9	–10.4	–9.3	. . .	. . .	. . .
Republic of Congo	6.8	1.0	6.5	0.9	0.9	1.7	–9.4	–15.2	–14.6	. . .	. . .	. . .
Middle-Income Countries[5]	**2.9**	**2.7**	**2.9**	**6.0**	**5.3**	**5.6**	**–4.8**	**–4.4**	**–4.8**	**. . .**	**. . .**	**. . .**
South Africa	1.5	1.4	1.3	6.1	4.8	5.9	–5.4	–4.3	–4.5	25.1	25.8	25.7
Ghana	4.0	3.5	5.7	15.5	15.3	10.1	–9.6	–8.3	–7.2	. . .	. . .	. . .
Côte d'Ivoire	7.9	8.2	7.6	0.4	1.6	1.5	–0.7	–1.0	–1.9	. . .	. . .	. . .
Cameroon	5.7	5.3	5.4	1.9	2.0	2.1	–4.6	–5.0	–5.2	. . .	. . .	. . .
Zambia	5.6	4.3	4.0	7.8	7.3	7.5	–1.4	–1.4	–2.6	. . .	. . .	. . .
Senegal	4.7	5.1	5.9	–1.1	0.6	2.1	–8.8	–6.1	–5.2	. . .	. . .	. . .
Low-Income Countries[6]	**6.5**	**5.8**	**6.4**	**5.2**	**5.8**	**5.9**	**–11.0**	**–11.7**	**–11.8**	**. . .**	**. . .**	**. . .**
Ethiopia	10.3	8.7	8.1	7.4	10.0	9.0	–8.0	–12.5	–9.3	. . .	. . .	. . .
Kenya	5.3	6.5	6.8	6.9	6.3	5.9	–10.4	–9.6	–9.2	. . .	. . .	. . .
Tanzania	7.0	6.9	7.0	6.1	5.6	5.9	–9.3	–8.2	–7.1	. . .	. . .	. . .
Uganda	4.8	5.2	5.5	4.6	5.7	6.5	–9.7	–10.5	–11.3	. . .	. . .	. . .
Madagascar	3.3	3.4	4.6	6.1	7.6	7.4	–0.2	–1.3	–2.2	. . .	. . .	. . .
Democratic Republic of the Congo	9.2	8.4	7.3	1.0	1.0	1.7	–9.2	–7.6	–8.0	. . .	. . .	. . .
Memorandum												
Sub-Saharan Africa Excluding South Sudan	5.0	3.9	4.3	6.4	6.8	7.3	–4.1	–5.7	–5.5	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Table A7 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Includes Equatorial Guinea and South Sudan.

[5]Includes Botswana, Cabo Verde, Lesotho, Mauritius, Namibia, Seychelles, and Swaziland.

[6]Includes Benin, Burkina Faso, Burundi, the Central African Republic, Comoros, Eritrea, The Gambia, Guinea, Guinea-Bissau, Liberia, Malawi, Mali, Mozambique, Niger, Rwanda, São Tomé and Príncipe, Sierra Leone, Togo, and Zimbabwe.

Special Feature: Commodity Market Developments and Forecasts, with a Focus on Metals in the World Economy

After experiencing large swings, commodity prices have declined significantly since the release of the April 2015 World Economic Outlook *(WEO). Following an initial recovery, oil prices have since declined on account of strong supply and concerns about future demand. Metal prices have fallen owing to slowing demand growth from China and substantial increases in the supply of most metals. Food prices have also declined owing to abundant harvests this year. With concerns over China's growth, risks to oil and metal prices are on the downside. Weather-related risks to food supplies have heightened. This special feature includes an in-depth analysis of metal markets in the world economy. It puts recent developments into perspective by documenting the dramatic demand and supply shifts over past decades and argues that the balance between demand and supply forces points to a "low-for-long" scenario in metal prices.*

Commodity prices have declined 14 percent since February 2015, the reference period for the April WEO (Figure 1.SF.1, panel 1). Oil prices had initially recovered in response to a sharp drop in investment in the sector, but have since declined again on account of strong supply from members of the Organization of the Petroleum Exporting Countries (OPEC) and the Islamic Republic of Iran nuclear deal. Natural gas and coal prices, which are mainly indexed to oil prices, albeit with a lag, have also declined. Nonfuel commodity prices have also weakened, with metal prices and those of agricultural commodities declining by 13 and 8 percent, respectively.

Global excess flow supply in oil (the difference between global production and global consumption) has continued to increase in 2015 on account of strong supply, in spite of the dramatic fall in investment in the oil sector. In the United States, the number of oil rigs—apparatuses for on-land oil drilling—is half what it was at its peak in October 2014 (Figure 1.SF.1, panel 2). In OPEC countries, production has been increasing despite low oil prices, exceeding OPEC's target of 30 million barrels a day (mbd) by more than 1.5 mbd in August. Russia has also been producing at record levels. In addition, the United Nations Security Council has adopted a resolution establishing a monitoring mechanism for the Iranian nuclear program, paving the way for eventual removal of all nuclear-related sanctions against the country. Iranian crude oil exports are thus expected to increase, and the country is believed to have 30 million barrels of oil inventory. Without sanctions, the Islamic Republic of Iran is also expected to increase its capacity to 500,000 to 800,000 barrels a day within two years. Most of the future increase in Iranian oil supply has been priced in spot markets, contributing to a flattening of futures curves.

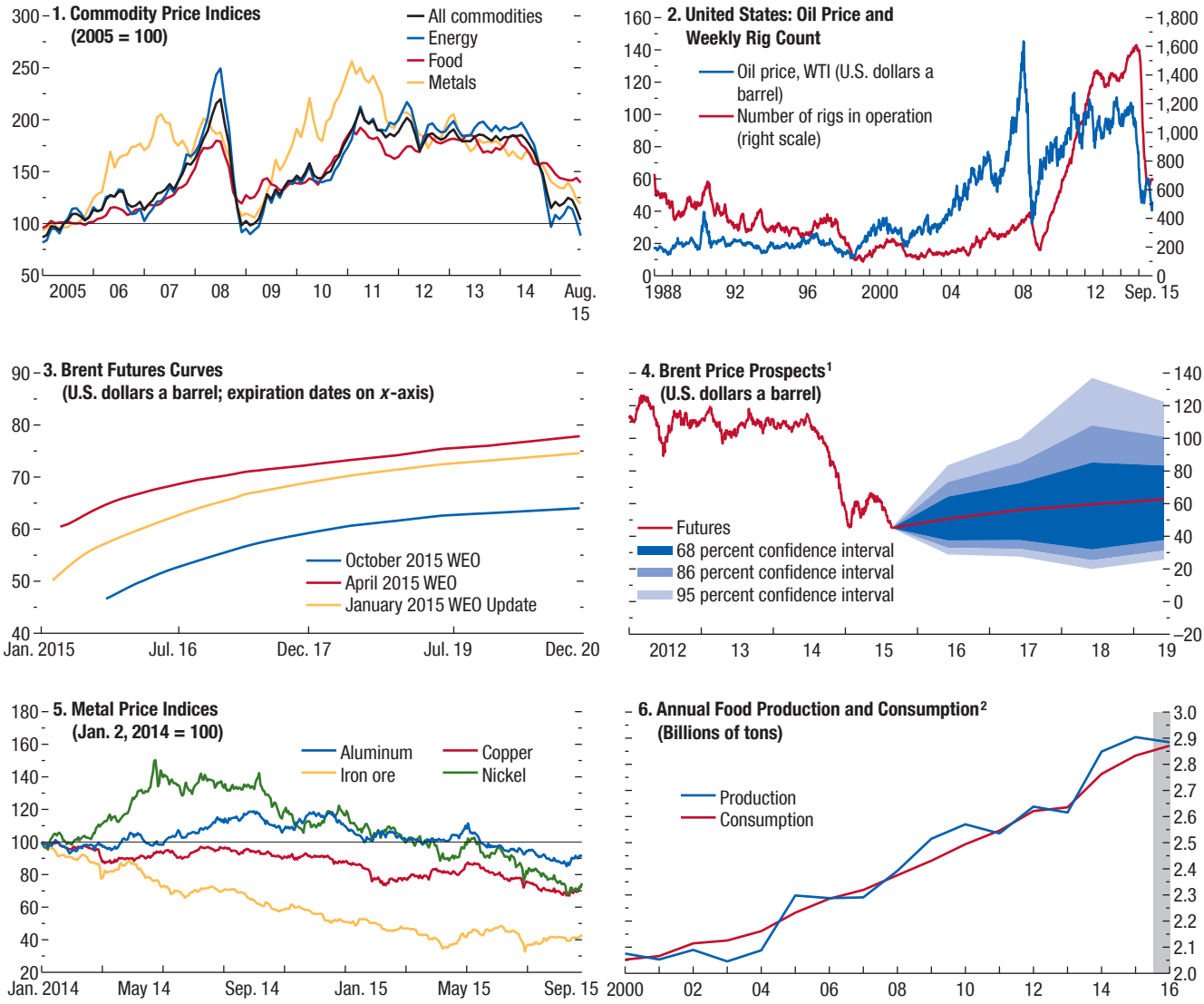
While actual global oil demand is strong, there are concerns about what the future will bring. Global oil demand in 2015 is expected to grow at 1.7 mbd above trend growth, the fastest rate in five years, according to the International Energy Agency. It has been revised upward by 0.9 mbd relative to the March projection. However, the recent volatility in stock markets worldwide has triggered concerns about future global economic growth that may eventually affect demand for oil. The loss in confidence in global financial markets added downward pressure on oil prices in August.

Oil futures contracts point to rising prices (Figure 1.SF.1, panel 3). The baseline assumptions for the IMF's average petroleum spot price, which is based on futures prices, suggest average annual prices of $51.62 a barrel in 2015, $50.36 in 2016, and $55.42 in 2017 (Figure 1.SF.1, panel 4). There is still substantial uncertainty around the baseline assumptions for oil prices, but it is slightly less than at the time of the April 2015 WEO.

Metal prices have declined 13 percent since February 2015 (Figure 1.SF.1, panel 5). Prices had initially rebounded as a result of supply concerns but have faced downward pressure since mid-May. China's currency decline and stock market correction have raised concern over the strength of metal demand. China represents roughly half of global demand for major base metals and has been the main engine of global growth since 2002 (see "Metals in the World Economy"). Metal prices are projected to decline by 22 percent in 2015 and 9 percent in 2016. Futures prices point to continued low prices but with rising uncertainty on account of both demand (especially from China) and stronger supply.

The authors of this feature are Rabah Arezki (team leader), Akito Matsumoto, and Hongyan Zhao, with contributions from Frederik Toscani and research assistance from Rachel Yuting Fan and Vanessa Diaz Montelongo.

Figure 1.SF.1. Commodity Market Developments



Sources: Baker Hughes Inc.; Bloomberg, L.P.; IMF, Primary Commodity Price System; Thomson Reuters Datastream; U. S. Department of Agriculture; and IMF staff calculations.
Note: WTI = West Texas Intermediate.
[1]Derived from prices of futures options on August 20, 2015.
[2]Sum of data for major grains and oilseeds: barley, corn, millet, rice, rye, sorghum, wheat, palm kernel, rapeseed, soybean, and sunflower seed.

Prices of agricultural commodities have declined by 8 percent overall relative to February 2015. Food prices have decreased 6 percent, with declines in all main indices except that for meat, which has increased slightly. Prices of cereals have fallen despite unfavorable weather in North America and Europe. Prices of agricultural raw materials are also down relative to February 2015 and their highs in 2011. Cotton prices, which have climbed on weaker supply, are a notable exception. Prices of beverages have shown divergent trends: coffee prices have declined in response to a modest recovery in Brazil's arabica production, while tea prices have risen after recent drought in Kenya. Cocoa prices rose in the second quarter of 2015 as a result of weather-related supply shortfalls in Ghana, but demand remains strong.

Annual food prices are projected to decline by 17 percent in 2015 as supply growth, together with high levels of stocks, outpaces slower demand increases. Large declines are expected in prices for cereals and vegetable oil, particularly those for wheat and soybeans. For 2016 the expected drop is relatively smaller (5 percent), following marginal declines in projected production for major crops (Figure 1.SF.1, panel 6). Food price risks are associated with the usual weather variability, particularly concerns over El Niño conditions, which are expected to strengthen through the Northern Hemisphere and persist into the first quarter of 2016.

Metals in the World Economy

Although the recent fall has captured the public's attention, metal prices have been declining since 2011. Some analysts have argued that we are at a critical juncture, pointing to the end of the so-called commodities supercycle. While that is hard to assert with confidence, the prolonged fall in metal prices is consistent with a typical commodity boom-and-bust cycle. Indeed, after a period of high metal prices during the 2000s, investment and in turn capacity in the sector have increased substantially. At the same time, high prices have led to downward adjustments on the demand side. Those adjustments have contributed to a gradual decline in metal prices since 2011, which has led to less investment in the sector, especially in high-cost mines, considering the lower expected profits. The lower investment will eventually reduce capacity, and lower production should eventually lead to a rebound in metal prices. The more prolonged the slump in metal prices, the sharper the likely eventual reversal.

Understanding the evolution of metal markets is important for at least two reasons. First, at the global level, metals are at the heart of the world economy because they are key intermediate inputs in industrial production and construction. Metal markets are thus shaped by shifts in the volume and composition of global demand and supply. As such, transformations in metal markets also signal important changes in the world economy. Second, for some countries, metal exports are a large portion of their total exports, and fluctuations in metal prices can have important macroeconomic consequences.[1] The remaining subsections of this Special Feature address the following questions:

- What are metals?
- Where are the main centers of metal production and consumption?
- How have metal markets evolved?
- What lies ahead?

What Are Metals?

Metals are mineral bodies that come in a variety of forms, from base metals to precious metals. Base metals are those that oxidize or corrode relatively easily. Within base metals, a distinction is made between ferrous and nonferrous metals. Ferrous metals, typically iron, tend to be heavy and relatively abundant. Nonferrous metals do not contain iron in significant amounts. Generally more expensive than ferrous metals, nonferrous metals have desirable properties such as low weight (for example, aluminum), higher conductivity (for example, copper), nonmagnetic properties, or resistance to corrosion (for example, zinc and nickel). The term "base metals" is commonly used in contrast with "noble metals," which unlike most base metals are resistant to corrosion or oxidation. Noble metals tend to be precious metals, often because of their perceived scarcity. Examples include gold, platinum, silver, rhodium, iridium, and palladium. Chemically, precious metals are less reactive than most elements and have high luster and high electrical conductivity.

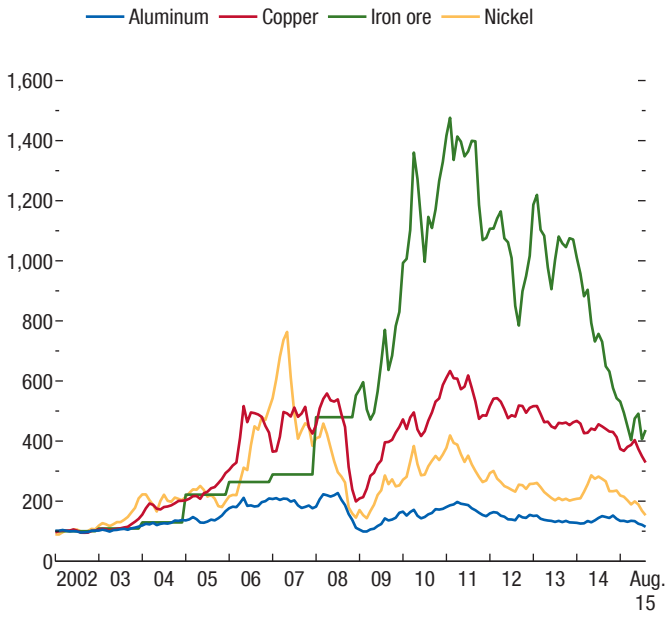
Unless otherwise indicated, this Special Feature focuses on four main base metals: iron ore, copper, aluminum, and nickel. All have experienced price declines, although to a varying extent (Figure 1.SF.2). The end use of these metals covers a wide spectrum, but construction and machinery are two key sectors for their use, given their ductile and malleable properties.

Where Are the Main Centers of Metal Production and Consumption?

Production and consumption centers for metals are concentrated in a few countries, but the location of production centers varies considerably with the metal under consideration. The main production and consumption centers, however, often overlap: iron ore, for example, given its bulk, must be close to markets. China is front and center for both metal consumption and metal production, also reflecting its importance in world industrial production. Selected multinational or state-owned corporations have large market shares in the production and refining of some of the main

[1]Chapter 2 discusses the macroeconomic consequences resulting from commodity price fluctuations in depth.

Figure 1.SF.2. Metal Price Indices
(2002 = 100)



Sources: IMF, Primary Commodity Price System; and IMF staff calculations.

Table 1.SF.1. World Crude Steel Production, 2014
(Millions of metric tons)

World	1,643.51	Share (Percent)
China	822.70	50
Japan	110.67	7
United States	88.17	5
India	86.53	5
Russia	71.46	4
Korea	71.04	4
Germany	42.94	3
Turkey	34.04	2
Brazil	33.90	2
Ukraine	27.17	2
Italy	23.71	1
Taiwan Province of China	23.12	1

Source: World Steel Association.

metals. Those high degrees of concentration have at times led to concerns over market manipulation and collusion either through output restrictions, export bans, stock accumulations, or some combination of these (see Rausser and Stuermer 2014 for an analysis of collusion in the copper market).

From an economic point of view, iron ore is by far the most important base metal, with a $225 billion annual industry in terms of global sales.[2] Steel, which is produced from iron ore, is mostly used for construction, transportation equipment, and machinery. In the past, iron ore prices were mostly determined by negotiations between Japanese steel makers and producers. More recently, the market has become more transparent, with the price on delivery at Chinese ports used as the benchmark price. The top iron-ore-producing country is China, whose share is about half of the world's production, followed by Australia and Brazil.[3] Considering that mining iron ore is capital intensive, iron ore production is concentrated among top producers (Table 1.SF.1, Figure 1.SF.3). The production of iron ore depends crucially on the level of investment activity in the sector, which has been on the decline in the past few years. The demand for iron ore comes primarily from large steel-producing countries such as China, which consumes more than half of the world production of iron ore.

Copper is the second-most-important base metal by value—accounting for roughly a $130 billion industry annually.[4] Copper is used for construction and electrical wire. Chile is the largest producer, followed by China and Peru. A few companies are involved in copper production—Chile's Codelco is the largest. Copper prices have been more transparent than those for iron ore because copper futures markets and London Metal Exchange settlements are used as benchmarks. China consumes about half of the world's refined copper.

The third-most-important base metal is aluminum (with an annual $90 billion industry).[5] Aluminum is used in the aerospace industry as well as other industries requiring light metal. Large producers of aluminum are located where electricity is cheap and abundant. The largest producer is China, followed by Russia, Canada, and the United Arab Emirates. Aluminum prices are the most stable among those for metals because of the reliance on electricity in its production—electricity prices are heavily regulated in most countries.

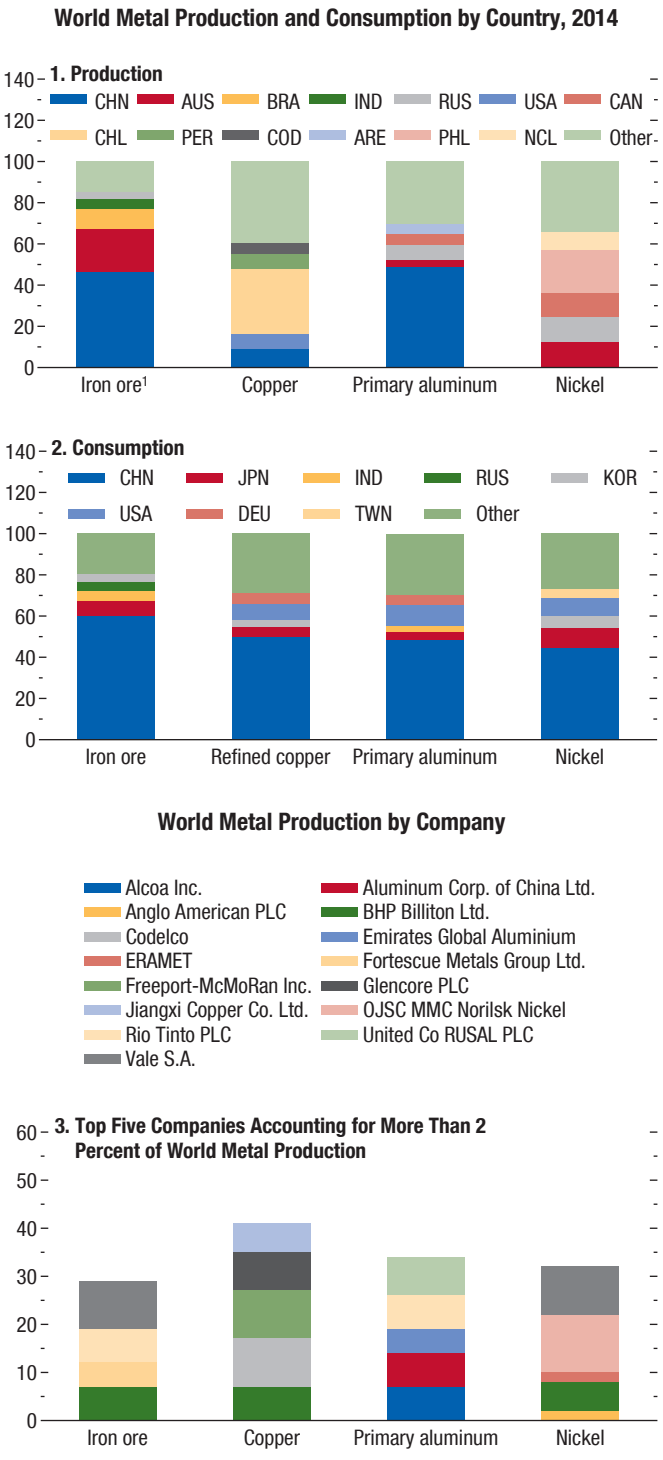
[2]World production of iron ore is currently 3 billion metric tons; its metal content weighs about 1.4 billion tons, according to the U.S. Geological Survey. The price of iron ore with 62 percent iron content has been roughly $100 a metric ton in the past year.

[3]China's share, however, is much smaller when the ore's metal content is taken into consideration. Iron ore is also important for individual countries, such as Ukraine, which relies on coal and iron ore to produce steel.

[4]World mine production was 18.7 million metric tons in 2014. It is evaluated at $7,000 a metric ton, close to the average price in 2014.

[5]World primary aluminum production last year was 49.3 million metric tons, and the associated price was $1,900 a metric ton.

Figure 1.SF.3. Production and Consumption of Metals
(Percent of world production or consumption)



Sources: Bloomberg, L.P.; World Bureau of Metal Statistics; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Mine production for China is based on crude ore, rather than usable ore, which is reported for the other countries.

Recycling has become an important part of aluminum production because the recycling process is much less energy intensive than the production of primary aluminum. China consumes about half of the world's production of primary aluminum. In contrast, advanced economies rely more on recycling and in turn have less influence over primary aluminum prices.

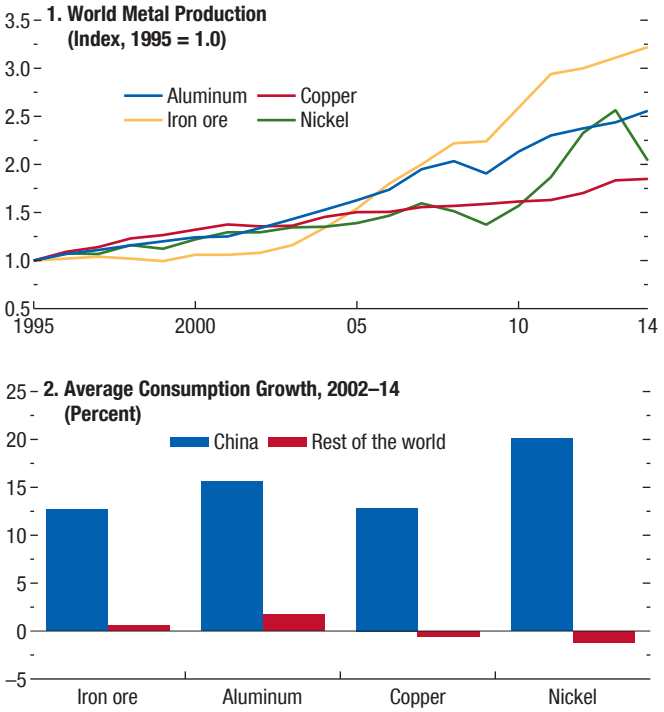
The fourth-most-important base metal is nickel (accounting for a $40 billion market),[6] which is used for alloys such as stainless steel. Nickel ore is mined in several countries, including the Philippines. The Brazilian Vale groups and Russia-based Norilsk are the two top producers, and their combined share is 23 percent of global production. Nickel is typically extracted from its ores by conventional roasting and reduction processes that yield a metal of greater than 75 percent purity. China consumes about half of the world's smelted and refined nickel, followed by Japan. Indonesia, whose production share was 27 percent in 2012, imposed an export ban on nickel ore in January 2014 to increase incentives for domestic processing. The Philippines and New Caledonia have used the opportunity created by the ban to increase their market shares, but may not be in a position to meet the portion of Chinese demand that relied on Indonesian production. On the other hand, global inventory of refined nickel has been increasing, suggesting a supply glut.

How Have Metal Markets Evolved?

Over the past decades, metal markets have undergone dramatic shifts in the volume and structure of both demand and supply. Global production has increased across the board for most metals owing to the rapid investment in capacity in the 2000s (Figure 1.SF.4, panel 1). On the demand side, demand has shifted from West to East; that is, from consumption concentrated in advanced economies toward that concentrated in emerging markets—especially China on account of its rapid growth (Figure 1.SF.4, panel 2). On the supply side, the so-called frontier of extraction of nonferrous metals, including precious metals such as gold, has shifted from North to South—that is, from advanced to developing economies—because of the rapid improvement in the investment climate, first in Latin America and then in sub-Saharan Africa (see Box 1.SF.1). While high-income member coun-

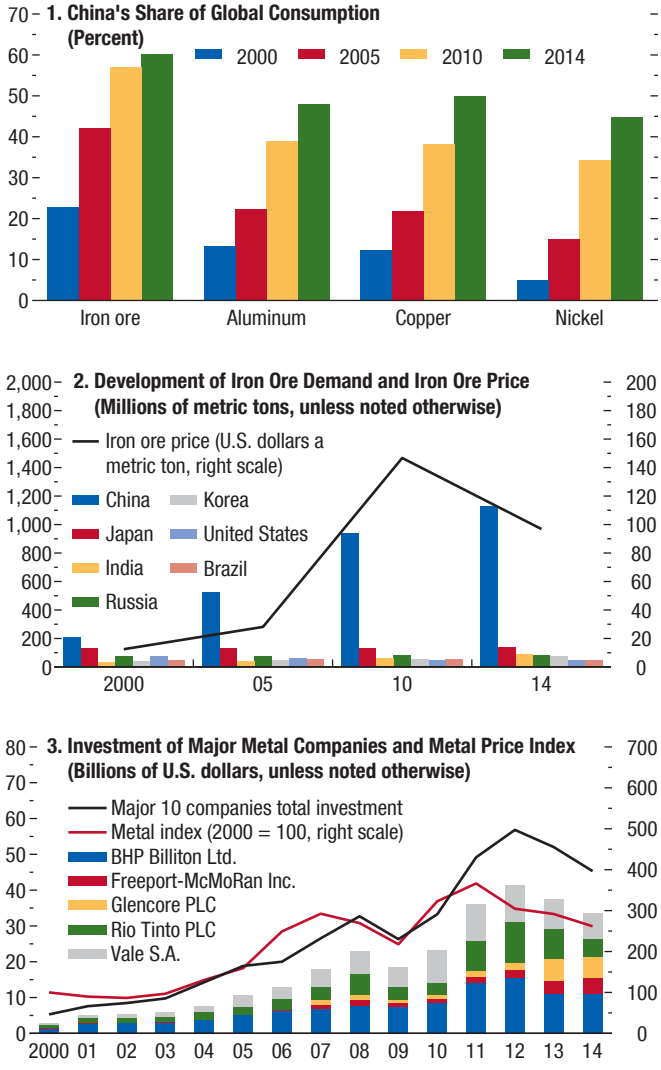
[6]Nickel mine production was 2.4 million tons in 2014, and the price of refined nickel was roughly $17,000 a metric ton.

Figure 1.SF.4. Evolution of Metal Market



Sources: Bloomberg, L.P.; World Bureau of Metal Statistics; and IMF staff calculations.
Note: The figures reported for iron ore production in China are in crude terms, contrary to what other countries report. Iron ore production data should thus be interpreted with caution. The production figures for iron ore are thus not consistent with those for consumption, because the latter are based on effectively usable iron ore.

Figure 1.SF.5. Development of Metal Market



Sources: Bloomberg, L.P.; IMF, Primary Commodity Price System; World Bureau of Metal Statistics; and IMF staff estimates.
Note: Investments are deflated by the price index for mining and oil field machinery. Total investment is the sum of capital expenditures for Anglo American PLC, BHP Billiton Ltd, Codeleo, Freeport McMoRan Inc., Glencore PLC, Grupo Mexico S.A.B. de C.V., Mitsubishi Corp., Mitsui & Co. Ltd., Rio Tinto PLC, and Vale S.A.

tries of the Organisation for Economic Co-operation and Development accounted for close to half of global discoveries of major mines between 1950 and 1990, sub-Saharan Africa and Latin America and the Caribbean have doubled their shares in total discoveries since 1990, which are about half what they were in the preceding period. The pattern of global trade in metals has radically changed as a result of those shifts in the loci of major discoveries. It should be noted that for steel and aluminum, production tends to be located in countries with combined deposits of iron ore or bauxite—which are abundant worldwide—and port facilities, easy access to energy, and proximity to markets.

On the demand side, the most dramatic development explaining the shift from West to East is the formidable growth performance of China. China's growth in consumption of metals has been the main driving force behind global metal consumption since the early 2000s (Figure 1.SF.5, panels 1 and 2). As a result China is now the main consumption locus for most metals. Far behind, India, Russia, and Korea have also increased their metal consumption, while consumption in Japan has stagnated somewhat. The rapid rise in demand from emerging markets has been a key driver of metal and other commodity prices (see Gauvin and Rebillard 2015 and Aastveit, Bjørnland, and Thorsrud, forthcoming, for systematic evidence on the importance of China and emerging markets in driving metal and oil prices).

On the supply side, investment in the sector has been on the decline. Indeed, available data on investment by

Table 1.SF.2. Metal Trade Evolution
(Millions of U.S. dollars)

1. Bilateral Metal Trade, 2002

Country	China	Germany	Japan	Korea	United States
Australia	1,043	63	2,309	1,067	181
Brazil	605	360	700	179	754
Canada	90	270	353	212	4,232
Chile	784	197	768	541	687
Russia	196	161	716	93	1,061

2. Bilateral Metal Trade, 2014

Country	China	Germany	Japan	Korea	United States
Australia	52,153	53	10,985	6,283	268
Brazil	12,851	1,194	3,004	1,368	1,207
Canada	2,496	311	1,522	1,074	8,815
Chile	15,249	415	4,875	3,252	2,349
Peru	5,621	593	1,030	856	351

Sources: UN Comtrade; and IMF staff calculations.
Note: Data show exports of metals from the countries listed at the left of the rows to the countries listed at the tops of the columns. The gradient of color from green to red refers to the absolute size of trade volume in each panel.

major metal companies producing iron ore suggest that the rapid increase in investment during the period of high metal prices in the early 2000s has been followed by a gradual decline since 2011, closely following the trajectory of metal prices (Figure 1.SF.5, panel 3). As mentioned earlier, for ferrous metals, investment is a good indicator of future supply capacity. For nonferrous metals, the actual quantity available from mineral deposits is much more relevant for predicting supply. A unique data set of discoveries is used here to allow an assessment of the emergence of new frontiers of metal extraction. That assessment offers evidence that prices have played little role in driving discoveries of mineral deposits (see Box 1.SF.1). Instead, rapid improvements in institutions, including those related to property rights in Latin America and Africa, have led to a gradual increase in the number of major discoveries of metals in those regions since the 1990s. The results have important implications both for the welfare of individual countries and for our global understanding of the balance of forces shaping metal markets and the pattern of global trade in metals.

The pattern of global metal trade has evolved dramatically over the past decades,[7] with the major destination countries shifting from West to East and the source countries from North to South. In 2002, metals were exported mainly from Canada and Russia to the United States or from Australia to Japan, Korea, and China. In contrast, by 2014 almost half of metal exports were going from Australia, Brazil, and Chile to China. China has become the largest importer of metals, with its share increasing from less than 10 percent to 46 percent from 2002 to 2014 (Table 1.SF.2).

Many developing economies depend heavily on metal exports. These exports have risen sharply as a percentage of GDP, and the group of largest metal exporters (as a percentage of GDP) has changed substantially as a result (Table 1.SF.3). Metal exports from Chile, Mauritania, and Niger now account for more than half of these countries' total exports of goods. These countries are thus vulnerable to fluctuations in metal prices such as those that have recently occurred as a result of shifts in demand from large importers such as China. Discoveries of new metal deposits have expanded the list of resource-dependent countries that face new challenges in terms of macroeconomic management.

China's recent attempts to rebalance its economy away from investment toward domestic consumption are leading not only to lower Chinese demand for metals, but also to a compositional shift in that demand, which may have different implications for different metals. Metals are heavily used in machinery, construction, transportation equipment, and manufacturing industries, while oil is used mainly in transportation. Thus the decline in growth of manufacturing, machinery, and construction has led to slowing demand for metal since 2010 (Figure 1.SF.6). The metal price index has decreased correspondingly. The potential future rise in the share of the service sector should lead to lower

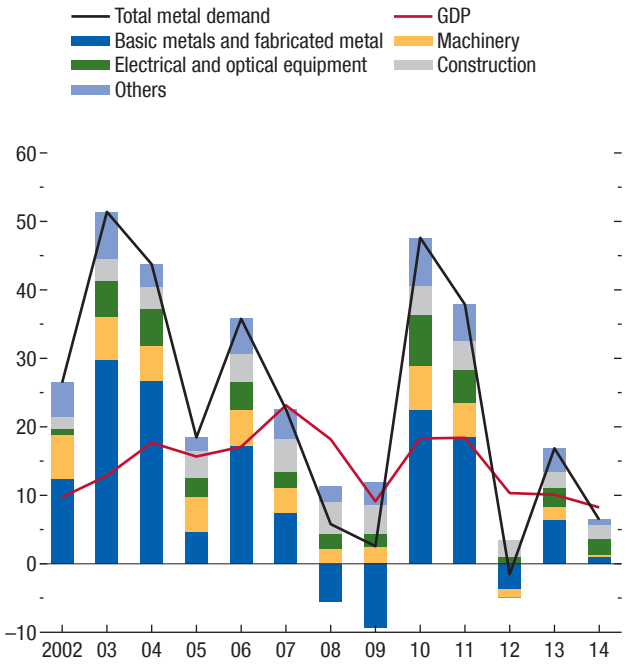
[7]Here, metals include aluminum, copper, iron ore, lead, nickel, tin, uranium, and zinc.

Table 1.SF.3. Net Metal Exports
(Percent of GDP)

2002	Zambia	11.27
	Chile	8.82
	Guinea	8.02
	Mozambique	7.27
	Papua New Guinea	7.07
	Niger	4.31
	Iceland	4.21
	Peru	3.62
	Namibia	2.88
	Bolivia	2.16
2014	Mongolia	26.52
	Mauritania	21.06
	Chile	15.00
	Zambia	14.76
	Iceland	8.67
	Peru	6.23
	Niger	5.94
	Australia	5.23
	Bolivia	4.75
	Guyana	4.64

Sources: UN Comtrade; and IMF staff calculations.

Figure 1.SF.6. China: Composition of Metal Use and Growth Rates by Sector
(Percent)



Sources: Bureau of National Statistics, China; World Input-Output Database; and IMF staff calculations.
Note: The growth rates of total demand for metals are calculated as the sum of output growth rates for each sector, weighted by the shares of metal input in the individual sector in the total economy. The share of metal input for each sector is calculated based on the World Input-Output Database. For the calculation, the value of the share of metal input in the most recent year is chosen, that is, 2011, considering that the share of metal input has been quite stable over the years. Given that the output data for China are not available at the sector level, profit data by sector are used as a proxy for most of the industries, and for nonindustry sectors, GDP data by industrial classification are used.

consumption of metals. Notwithstanding the dramatic increase in Chinese imports of metals, these represent less than 2 percent of China's GDP (Figure 1.SF.7).

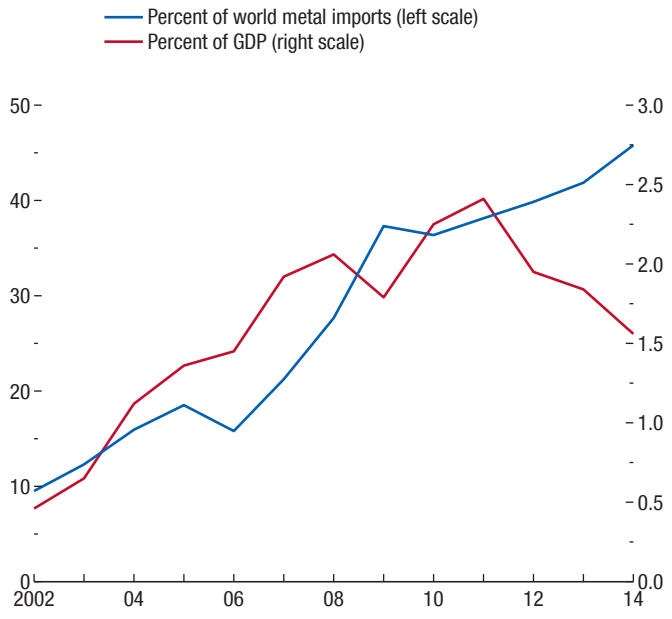
What Lies Ahead?

The slower pace of investment in China, that country's sharp stock market decline since June, and the ample supply of metals have been exerting downward pressure on metal prices. Considering that the decline in metal prices started much earlier, it makes sense to ask what should be expected. As mentioned earlier, futures markets point to lower prices, though the decline is projected to bottom out. But it is helpful in this regard to go beyond futures and review the forces underpinning demand and supply of metals.

On the demand side, the Chinese economy is projected to slow further, albeit gradually, but with considerable uncertainty as to both the time frame for the slowdown and the full extent of the slowing. A basic econometric exercise using historical data and relating the IMF's metal price index to China's industrial production (with both variables expressed as logarithms) shows that the fall in prices can be explained quite well by the decline in industrial production (Figure 1.SF.8), with 60 percent of the variance in metal prices explained by fluctuations in China's industrial production. In addition, this simple regression suggests that the fall in China's industrial production in recent months could produce further metal price declines, as evidenced by the decoupling between the fitted and actual growth rates in the metal price index.

On the supply side, the drop in investment is unlikely to lead to a substantial price rebound in the near future. Low energy prices have in fact helped reduce mining and refining costs, including those for copper, steel, and aluminum. High-cost mines will certainly close down first, considering that current metal prices may be close to these mines' break-even point. However, a recent analysis of the cost-price relationship released by consulting firm SNL Metals & Mining concludes that during cyclical low points in metal prices, the copper price has fallen to at least the ninth decile of high-cost producers, which indicates that prices would need to fall further before substantial

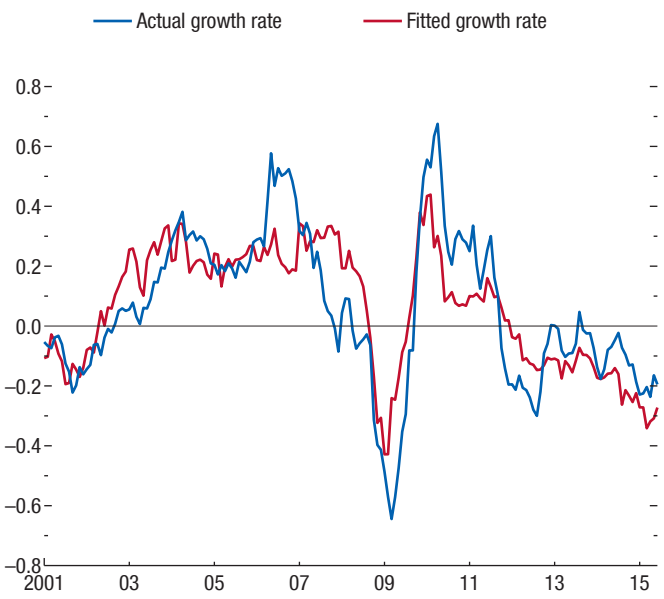
Figure 1.SF.7. China: Metal Imports



Sources: UN Comtrade; and IMF staff calculations.

Figure 1.SF.8. Growth Rates of Metal Price Index

(Percent)



Sources: IMF, Primary Commodity Price System; and IMF staff calculations.
Note: The figure shows the actual and fitted annual growth rate of the metal price index. The fitted growth rate is based on the regression of the annual growth rate of the metal price index on the annual growth rate of China's industrial production.

capacity becomes vulnerable to closure.[8] Moreover, the secular expansion of the frontier of metal extraction to Latin America and Africa as a result of improvements in the investment climate is unlikely to revert to any great extent. Instead, those improvements should continue steadily. Thus ample supply is likely to continue pushing metal prices farther down.

[8]See http://www.snl.com/Sectors/MetalsMining/Default.aspx.

The balance between weaker demand and a steady increase in supply suggests that given the existing cost structure, metal markets are likely to experience a continued glut, leading to a low-for-long price scenario. In turn, the risks associated with such a scenario are that investment will continue to falter and lead to a sharp increase in prices down the road.

Box 1.SF.1. The New Frontiers of Metal Extraction: The North-to-South Shift

Fundamental factors underpinning the demand for primary commodities, including metals, have received much attention, but supply-side factors have not. As noted in the Special Feature text, the center of gravity of global demand has shifted from West to East as a result of the high growth in emerging markets—especially China—in the past two decades. This box argues that developments in the supply of metals have been perhaps just as dramatic. The box focuses on discoveries of major metal deposits that signal previously unknown possibilities to expand global supply.[1] The main finding is that the new frontiers of metal exploitation have shifted from North to South, that is, from advanced to emerging market and developing economies.

Metal Discoveries through Space and Time

A critical look at the data on known reserves of subsoil assets suggests that emerging market and developing economies have substantial deposits of metals that have yet to be discovered. There is an estimated $130,000 in known subsoil assets beneath the average square kilometer of Organisation for Economic Co-operation and Development (OECD) countries, which contrasts with only about $25,000 in Africa (see Collier 2010 and McKinsey Global Institute 2013). It is unlikely that those differences represent differences in geological formations between advanced and developing economies. Rather, differences in the quality of property rights and political stability can help explain why relatively less exploration effort has been devoted to emerging market and developing economies. Improvements in the institutional environments of these economies accelerated rapidly in the 1990s, however, and a cursory look at the data on political risk seems to indicate that the timing of the improvements coincides with the increase in the share of discoveries in Latin America and Africa (Figure 1.SF.1.1).

Data on discoveries of a wide range of metal deposits obtained from the consulting firm MinEx suggest that the frontier of metal exploitation has gradually moved from advanced to emerging market and developing economies (Figure 1.SF.1.2). The total number of discoveries has remained broadly constant, but the distribution has changed. Although high-income OECD countries accounted for 37 to 50 percent of all discoveries during 1950–89, this share fell to 26 percent in the first decade of this century, with sub-Saharan Africa and Latin America and the Caribbean doubling their shares. Latin America has experienced the most discoveries of metal deposits in the past two decades.

Figure 1.SF.1.1. Metal Deposit Discoveries in Latin America and the Caribbean and Sub-Saharan Africa

Sources: MinEx Consulting; PRS Group, *International Country Risk Guide;* and IMF staff calculations.

What Do the Data Show about the Drivers of Discoveries?

Investments in exploration and extraction activities involve sunk costs and are thus subject to the holdup problem.[2] For an investment to be expected to be profitable, a stable political environment, a low risk of expropriation,

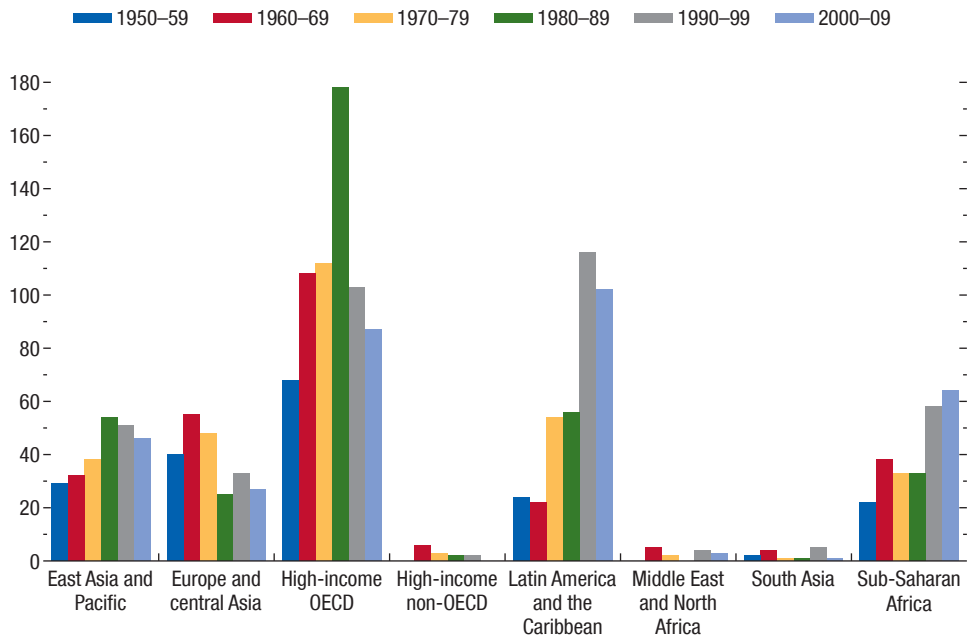
The authors of this box are Rabah Arezki and Frederik Toscani.

[1]The data used in this box are from MinEx Consulting. The list of metals used in the analysis is comprehensive and includes precious metals and rare earth. The data set excludes iron ore and bauxite, which tend to be relatively more abundant than other metals and require for their exploitation proximity to port facilities in the case of the former and substantial energy availability for the latter.

[2]The results presented in this section are also robust to an array of checks, including additional controls and estimators.

Box 1.SF.1 *(continued)*

Figure 1.SF.1.2. Number of Metal Deposit Discoveries by Region and Decade



Source: MinEx Consulting.
Note: OECD = Organisation for Economic Co-operation and Development.

and a favorable investment climate are crucial (Acemoglu, Johnson, and Robinson 2001; Bohn and Deacon 2000). Cust and Harding (2014) provide evidence that institutions substantially affect oil and gas exploration.[3] Mining could be seen as more expropriable than oil extraction because mining output does not move through pipelines and takes place exclusively on land.

The approach in this box is to estimate, using a panel data set, a zero-inflated Poisson model with the number of mine discoveries by country, year, and metal as the dependent variable.[4] N_{itm} denotes the number of mines discovered in country i at time t and for a specific metal m. N_{itm} is assumed to follow a Poisson distribution.

The main explanatory variable of interest is a country's political risk rating, obtained from the *International Country Risk Guide*'s (ICRG's) Political Risk Index. The regressions include metal fixed effects because metals differ in their abundance and location. They also include country fixed effects to capture time-invariant country characteristics that are hard to observe, such as actual geology, and year fixed effects to control for technology and other global shocks. In addition, price changes for the corresponding metals over the past five years are controlled for. The baseline specification uses the standard log-linear approach to model the expected number of mine discoveries for metal m in country i at time t in the three-way Poisson regression model:

$$\ln E(N_{itm}) = \alpha + \beta \Delta p_{t-1,m} + \gamma ICRG_{it-1} + \delta X_{itm},$$

Arezki, van der Ploeg, and Toscani (forthcoming) present extensive technical details and an in-depth discussion of endogeneity.

[3]These authors' identification strategy relies on exploiting variations in institutions and oil deposits sitting on both sides of a border.

[4]Large numbers of zeros and the heteroscedasticity of errors may imply that ordinary least-squares results will be biased and inconsistent. Silva and Tenreyro (2006) suggest the Poisson pseudo–maximum likelihood estimator to address this issue. This box follows this suggestion and uses zero-inflated Poisson models. The count data are modeled as a Poisson count model, and a logit model is used to predict zeros.

Box 1.SF.1 *(continued)*

Table 1.SF.1.1. Impact of Political Institutions on Mineral Discoveries

Variables	(1)	(2)	(3)	(4)
Political Risk Rating, Lagged	0.0216***	0.0171**	0.0192**	0.0195**
	(0.00729)	(0.00782)	(0.00783)	(0.00787)
Polity2 Score, Lagged		0.0128	0.0179	0.0173
		(0.0155)	(0.0156)	(0.0155)
Stock of Discoveries, Lagged			0.0161***	0.0162***
			(0.00343)	(0.00344)
Political Risk Rating x Change in Metals Price				–0.00635
				(0.0165)
Log Change in Metals Price	–0.449	–0.464	–0.466	–0.0207
	(0.316)	(0.320)	(0.320)	(1.159)
Log Change in Metals Price, Lagged	–0.334	–0.341	–0.345	–0.345
	(0.315)	(0.314)	(0.322)	(0.322)
Number of Observations	37,252	35,480	31,812	31,812

Source: IMF staff estimates.
Note: Robust standard errors are in parentheses. Country, year, and metal fixed effects are included in all regressions.
*$p < .1$; **$p < .05$; ***$p < .01$.

in which the vector α includes country, time, and metal fixed effects. The key controls of interest are the natural logarithm of the world market price for metal m and the measure of political risk *ICRG*. The vector X includes other controls. It should be noted that the quality of institutions may be endogenous to metal discoveries in that these discoveries may, for instance, trigger conflicts over resources and erode institutions (Ross 2001, 2012). Any such endogeneity will, however, tend to bias the coefficient associated with institutions toward zero, and as such, that coefficient should be interpreted as presenting a lower bound. To alleviate issues of reverse causality somewhat, the political risk rating is included with a one-year lag. In addition, lagged discoveries are controlled for, to account for the clustering of discoveries. The interactions between *ICRG* and metal price and between price and fixed effects are also explored. Other robustness checks consist of adding controls such as GDP per capita and the initial capital stock and using price levels instead of changes. The main results remain unchanged.

The political risk rating, reflecting property rights and political stability, is found to be statistically and economically significant (Table 1.SF.1.1). The results indicate that a one standard deviation improvement in the political risk rating (which corresponds to a move from, for example, Mali to South Africa, South Africa to Chile, or Chile to Canada) would lead to 1.2 times as many metal discoveries in those countries. To provide a further sense of the relevant magnitude, a thought experiment is conducted in which Latin America's and sub-Saharan Africa's median property rights suddenly jump to the levels of the most advanced economies in each of these regions, which are, respectively, Chile and Botswana. This experiment yields a 15 percent increase in the number of mines discovered worldwide, all else equal. The figure increases to 25 percent if instead Latin America and sub-Saharan Africa were to suddenly adopt the same level of property rights as in the United States, again all else equal. Notwithstanding the dramatic increase in institutions forced by the thought experiment, the magnitudes suggest that institutions play an important role in driving exploration for and ultimately discoveries of metals. Institutions affect discoveries through a variety of channels besides the perception of risk on the part of the potential foreign investors. For instance, better institutions could affect the adoption of better technology or improve the quality of the labor force and in turn affect the number of discoveries. The analysis here does not attempt to separate those channels.

Results also suggest that movements in metal prices over the past five years are not statistically significant in explaining the number of discoveries. The likelihood of additional discoveries appears to increase with

Box 1.SF.1 *(continued)*

previous discoveries, as would be expected given the reduced risk of exploring close to a known deposit.

What Are the Implications?

The North-South shift in the frontier of metal exploitation is likely to have important consequences for individual economies with newly found metal deposits, especially in Latin America and Africa. Indeed, these discoveries expand the list of resource-rich countries. New mines mean more investment and jobs, especially in the resource sector, and increased government revenues. New trade routes have been inaugurated from Latin America and Africa to emerging Asia. However, these newly found resources pose challenges for the conduct of macroeconomic policy in developing economies in both the short and the long term.

While demand for metals emanating from emerging markets has been a key driver of recent global metal market developments, progress in the quality of institutions has helped increase the supply of metals and shifted its composition. A future steady increase in institutions along with slowing demand could lead to excess supply and exercise further downward pressure on prices.

Box 1.1. What Is the Effect of Recessions?

The global financial crisis put the spotlight on the issue of hysteresis, the hypothesis that recessions may have permanent effects and lead to lower output later. Figure 1.1.1 shows why. The figure shows the evolution of U.S. and euro area output since 2000. Its visually striking implication is that, since the global financial crisis, output appears to be evolving on a lower path, perhaps even a lower growth path, especially in the euro area.

To get a sense of how unusual such evolution is, Blanchard, Cerutti, and Summers (2015) look at 122 recessions in 23 advanced economies since the 1960s. Their analysis of the relative evolution of output after each recession takes a nonparametric approach that estimates and extrapolates prerecession trends—taking into account, among other factors, that an economy may have been in a boom, and thus above trend, before the recession started. Figure 1.1.2 shows the case of Portugal, which is representative of other countries. All but one of the recessions in Portugal since 1960 appear to be associated not only with lower output relative to trend, but with a subsequent decrease in trend growth, and thus increasing gaps between actual and past trend output.

More generally, these authors' analysis of the average output gaps between the prerecession trend and actual log GDP (covering from three to seven years after the recession) concludes that a surprisingly high two-thirds of recessions are followed by lower output relative to the prerecession trend. Even more surprisingly, almost half of those are followed not only by lower output, but also by lower output growth relative to the prerecession trend.

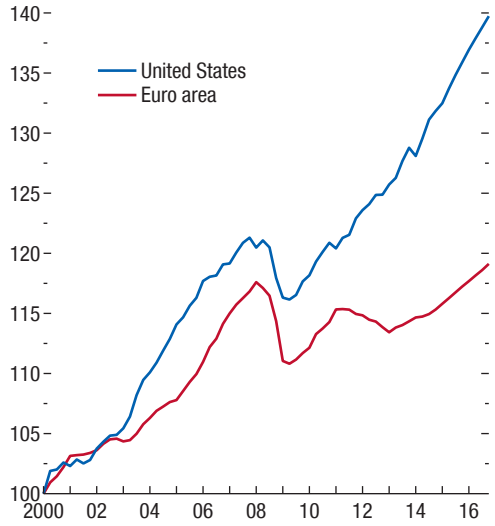
But correlation does not necessarily imply causality. One can think of three different explanations:

- *Hysteresis:* A number of mechanisms have been suggested that could generate lower output paths after recessions. Financial crises, like the recent global meltdown, often trigger institutional changes, such as tougher capital requirements or changes in bank business models, which could affect the long-term level of output. In the labor market, a recession and the associated high unemployment may lead some workers either to drop out permanently or to become unemployable.[1] Firms may cut back on research and development during a recession,

The authors of this box are Olivier Blanchard and Eugenio Cerutti, drawing on Blanchard, Cerutti, and Summers 2015.

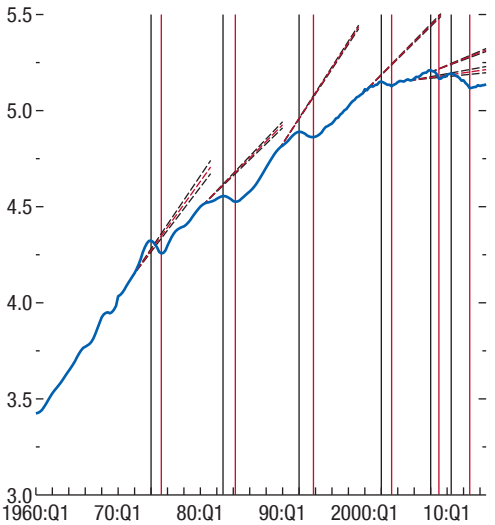
[1]Blanchard and Summers (1986) also relate the increase in unemployment in Europe during the 1980s to hysteresis in the form of prolonged unemployment episodes leading to a change in labor market institutions.

Figure 1.1.1. Advanced Economies: Real GDP
(Index, 2000:Q1 = 100)



Source: IMF staff calculations.

Figure 1.1.2. Portugal: Evolution of Log Real GDP and Extrapolated Trends



Source: IMF staff calculations.
Note: Peaks in log GDP are indicated by black vertical lines, troughs by red vertical lines. Recession dates are 1974:Q1–75:Q2; 1982:Q4–84:Q2; 1992:Q1–93:Q4; 2002:Q1–03:Q2; 2008:Q1–09:Q1; 2010:Q1–12:Q4.

Box 1.1 *(continued)*

leading to a lower productivity level than had there not been a recession. It is more difficult, but not impossible, to think of mechanisms through which a recession leads to lower output *growth* later.[2] A recession may trigger changes in behavior or to institutions' permanently cutting back on research and development or lowering reallocation forever. Changes may range from increased legal or self-imposed restrictions on risk taking by financial institutions to changes in taxation discouraging entrepreneurship.

- *Dynamic effects of supply shocks:* Supply shocks (for example, oil shocks and financial crises) may be behind both the recession and the lower output later. For example, it is plausible to argue that the sharp decline in output at the start of the global crisis and the subsequent lower growth path stem from the same underlying cause—namely, the crisis in the financial system, manifesting itself through an acute effect at the start and a more chronic effect thereafter.
- *Reverse causality:* A recession could be partly due to the anticipation of lower growth to come. For example, an exogenous decrease in underlying potential growth might lead households to reduce consumption and firms to reduce investment, leading to an initial recession.

To distinguish between these three explanations, Blanchard, Cerutti, and Summers (2015) focus on decompositions based on the recessions' proximate cause. They home in on recessions induced by intentional disinflation—demand shock recessions characterized by a large increase in nominal interest rates followed by subsequent disinflation—in which the correlation is more likely to reflect hysteresis than the other two hypotheses. They find that, even for those recessions, the proportion followed by lower output relative to the prerecession trend is substantial (in about 17 of the 28 intentional-disinflation recessions).

The policy implications of these findings are important, but potentially conflicting. When hysteresis is present, in general, macroeconomic policies must be more aggressive. Deviations of output from its optimal level are much longer lasting and thus more costly than usually assumed. Nevertheless, to the extent that the other two explanations are also relevant, there is the risk of overestimating potential output during and after a recession, and by implication of overestimating the output gap. Macroeconomic policies based on an overestimated output gap may turn out to be too aggressive. Hence, the macroeconomic policy mix must be not only country specific, but also recession specific.

[2]In order to differentiate the impact of a recession on the growth rate from its impact on the level of output, Ball (2014) calls the former "super-hysteresis."

Box 1.2. Small Economies, Large Current Account Deficits

Despite the narrowing of global current account imbalances, the number of countries with large current account deficits remains high. Over the period 2012–14, 62 countries had an average current account deficit exceeding 7 percent of GDP—only 4 fewer than over 2005–08.[1] This box presents stylized facts on the characteristics of these countries and tries to shed light on the potential drivers of their external borrowing and their external vulnerabilities.

The first striking fact about these countries is their small size. Despite representing about one-third of the IMF membership and half of the countries with current account deficits, their aggregate GDP is below 1½ percent of world GDP at market prices, and their aggregate current account deficit is about one-tenth of global current account deficits (somewhat smaller than the deficit in the United Kingdom). Their geographic distribution is heterogeneous, with 22 economies in sub-Saharan Africa, 12 in the Caribbean, 3 in Central America, 5 in the Pacific islands, 4 in Asia, 7 in the Middle East and North Africa, 5 in emerging Europe, and 4 in the Commonwealth of Independent States. Roughly half are low-income countries, and the other half are emerging markets. Table 1.2.1 provides a comparison of country characteristics for the median country in this group compared to the rest of the world, highlighting that these countries have both small populations and low GDP per capita as well. They are also highly dependent on oil imports.

Table 1.2.2 examines more formally whether the variables in Table 1.2.1 are systematically related to current account balances, estimating a simple cross-sectional regression in which the dependent variable is the average current-account-to-GDP ratio over the period 2012–14 and the parsimonious set of explanatory variables includes GDP per capita, population, and a proxy for net oil exports and imports over the same time period. There is of course a vast literature estimating current account regressions (see, for instance, Chinn and Prasad 2003, Lee and others 2008, and Prati and others 2011). In contrast to

Table 1.2.1. Median Country Characteristics
(2012–14 average)

	Population (millions)	GDP per Capita (thousands of U.S. dollars)	Oil Net Exports (percent of GDP)
Large Current Account Deficits	3.8	2.4	–7.3
Others	10.5	9.3	–2.9

Sources: World Bank, *World Development Indicators;* and IMF staff estimates.

Table 1.2.2. Cross-Sectional Current Account Models
(Variables expressed as 2012–14 averages, unless noted otherwise

	(1)	(2)[1]	(3)	(4)
Log GDP Per Capita	3.40***	2.22***	3.49***	3.34***
	(0.44)	(0.31)	(0.43)	(0.43)
Log Population	1.43***	1.40***	0.97**	1.13***
	(0.29)	(0.28)	(0.31)	(0.32)
Hydrocarbon-Rich Dummy	9.18***	8.65***	9.02***	
	(1.82)	(2.04)	(1.77)	
Caribbean Dummy			–7.36**	–3.55
			(2.42)	(2.41)
Oil Net Exports (percent of GDP)				0.24***
				(0.06)
Number of Observations	188	172	188	171
R^2	0.40	0.46	0.42	0.49
Adjusted R^2	0.39	0.45	0.41	0.48

Note: Standard errors are in parentheses.
[1]The dependent and explanatory variables are expressed as 1995–2014 averages.
**$p < .01$; ***$p < .001$.

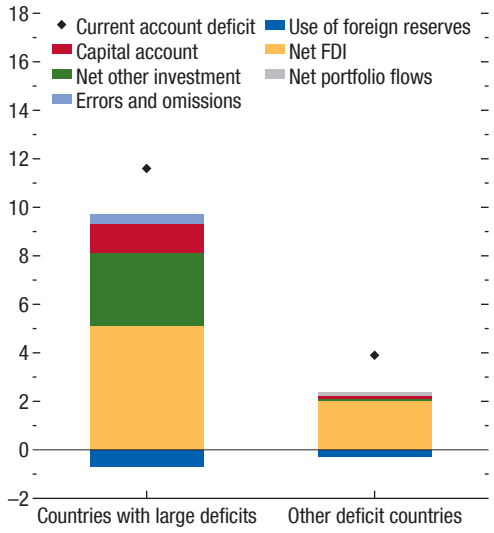
The authors of this box are Carolina Osorio-Buitrón and Gian Maria Milesi-Ferretti.

[1]The number of countries with current account surpluses exceeding 7 percent of GDP in 2012–14 was much smaller (15), but their aggregate size was four times larger. The majority are oil exporters.

Box 1.2 *(continued)*

Figure 1.2.1. Sources of External Financing, Current Account Deficit Countries

(Percent of GDP; median values, 2012–14)



Sources: IMF, *Balance of Payments Statistics;* and IMF staff calculations.
Note: The figure presents the median values of the 2012–14 averages in each country group for each financing source. FDI = foreign direct investment.

that in most of the literature, the focus here is purely on the cross-section, and the very limited number of control variables permits a truly global sample (wider than commonly used samples).

Results show a very strong cross-sectional relationship between current account balances and GDP per capita: for instance, a country with GDP per capita of $5,000 will have on average a current account balance 6 percentage points of GDP stronger than a country with GDP per capita of $1,000. The regression also yields a positive relationship between current account balances and population, which is statistically and economically significant, after GDP per capita is controlled for. For instance, a country with a population of 10 million has on average a current account balance that is about 2.8 percentage points of GDP stronger than a country with the same GDP per capita but a population of 1 million. These results are not specific to the 2012–14 period, as shown in column (2) of Table 1.2.2. Possible reasons why countries with smaller populations have on average larger deficits are discussed later in this box.[2] A dummy for oil exporters is also highly significant, and even more so the oil trade balance. Column (3) shows that the significance of population is not solely driven by Caribbean islands, which have large deficits and very small populations—but it suggests that these countries do run larger deficits than others, after their size and level of development are controlled for. The intensity of their oil dependence is clearly a factor explaining their deficits—as shown in column (4), substituting the oil balance for the oil exporter dummy reduces the economic and statistical significance of the Caribbean dummy.

External Financing

Figure 1.2.1 provides information on the structure of external financing for the countries in the large-deficit sample. These countries have relied to an important extent on net foreign direct investment (FDI) flows—the median is about 5 percentage points of GDP—as well as net flows of other investments (a broad category including private and official loans). This variable understates net inflows in the presence of debt relief, since the latter is recorded as a capital account transfer accompanied by a repayment of other investment liabilities. Indeed, capital account transfers account for close to 1 percent of GDP of median current account financing. Median portfolio flows are negligible, even though a few countries have relied heavily on them. Neither median changes in foreign exchange reserves nor errors and omissions play an important role.

Given the balance of payments identity, net sources of current account financing are also correlated with both GDP per capita and population. The correlation is especially strong for capital account transfers, foreign official flows, and foreign direct investment—all of which are proportionately higher, as a share of domestic GDP, in poor countries as well as in countries with small populations.

[2]Since the current-account-to-GDP ratio in small economies tends to be more volatile than that in larger ones, countries with small populations could be overrepresented in the sample of large-deficit countries. But volatility is unlikely to be the main driver of the relationship between population and the current account, as the negative correlation between these variables is systematic across all countries. Moreover, small economies are not overrepresented in the sample of countries with large surpluses.

Box 1.2 (continued)

Drivers of Large External Financing

Large current account deficits can in principle be associated with a variety of factors:

- *Sizable reliance on development assistance, particularly in small economies:* Countries with smaller populations tend to receive more aid as a share of GDP than larger nations (see Alesina and Dollar 2005).[3] With greater reliance on aid flows, the current account balance can overstate the access to external borrowing (through grants classified under the capital account), and borrowing costs may be lower than for other countries, given concessional loans. Indeed, if the financial account is used as the dependent variable in the regressions of Table 1.2.2 (thereby netting out the part of current account financing accounted for by capital transfers), the link with population size weakens, both economically and statistically.
- *Legacy effects from large past external borrowing, which imply a strongly negative income balance:* Such legacy effects are intensified by low economic growth.
- *Negative growth shocks, such as natural disasters or conflicts, which (temporarily) curtail a country's production possibilities, as well as the induced increase in spending associated with reconstruction needs:* In small states, the macroeconomic consequences of natural disasters are particularly large, as these shocks tend to affect a larger share of the population and of the economy.[4] While existing estimates of the GDP cost of natural disasters are not a significant determinant of current account balances when added to the regression specifications of Table 1.2.2, these estimates' incomplete coverage poses a challenge to testing their empirical relevance in a reliable fashion.
- *Measurement issues:* The sample of large-deficit countries includes 18 with tourism-based economies, for which there is anecdotal evidence that tourist spending may be underestimated and hence the current account deficit overestimated (see, for instance, IMF 2015d). When added to the regressions presented in Table 1.2.2, tourism revenues as a share of total exports are negatively correlated with the current account balance (and reduce the size and significance of the coefficient on population), consistent with the hypothesis that such revenues may be underestimated. Analogously, large-deficit countries rely more on remittances than other deficit countries.[5] However, these flows are notoriously difficult to distinguish from capital inflows and to measure accurately, for instance, because individual remittances often fall below financial institutions' reporting thresholds (see UNECE 2011).

Different countries in the diverse high current account deficit sample fall into each of these categories. Chronic current account deficits with low GDP per capita and sizable reliance on development assistance is the most common profile among countries in the sample. Indeed, while some 50 countries in the group experienced a worsening in current account deficits relative to their average current account values during 1995–2011, only 11 of them had deficits averaging less than 5 percent of GDP during the earlier period. In a number of these countries, legacy effects from past external borrowing were alleviated through debt forgiveness or debt reduction agreements, either during the 2012–14 period or in the preceding decade (for instance, Liberia, Mozambique, and St. Kitts and Nevis). However, the number of countries with very high net external liabilities remains elevated, as discussed next.

Turning to reasons for sizable changes in current account balances, Mauritania, Mongolia, Mozambique, and Papua New Guinea have had booms in FDI related to natural resources, and The Bahamas, Grenada, and Guyana have had natural disasters with estimated macroeconomic costs exceeding 2 percentage points of GDP a year.

External Risks for High-Deficit Countries

Many countries in the large-deficit sample have structural vulnerabilities. For instance, small developing states, which constitute a third of the sample, face vulnerabilities and policy challenges due to their size, which adds to production and distribution costs, hampers the delivery of public goods, poses other administrative capacity constraints, and leaves them

[3]Hence, a country's size, measured by its population, has been used as a measure of donor interest (Bräutigam and Knack 2004) and as an instrument for aid flows (see, for instance, Rajan and Subramanian 2008).

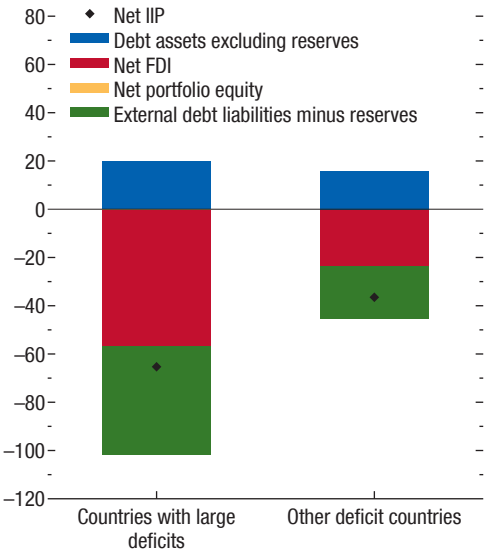
[4]It is estimated that natural disasters cost microstates (countries with populations of 200,000 or less) between 3 and 5 percent of GDP annually (Jahan and Wang 2013).

[5]The median remittances-to-GDP ratio is roughly 3 percent in large-deficit countries and close to zero for other deficit countries.

Box 1.2 *(continued)*

Figure 1.2.2. Composition of Net International Investment Position, Current Account Deficit Countries

(Percent of GDP; median values, 2013)



Sources: IMF, *Balance of Payments Statistics;* and Lane and Milesi-Ferretti 2007.
Note: The figure presents the median values for 2013 in each country group for each investment type. FDI = foreign direct investment; IIP = international investment position.

with minimal diversification against external shocks, including natural disasters (IMF 2013, 2015e).

More generally, with sizable reliance on external financing, countries in this sample are generally sensitive to changes in the global macroeconomic environment, given their generally small size, openness, and reliance on external financing. These changes include, for example, a tightening of external financing conditions and a growth slowdown in emerging market economies. Declines in commodity prices hurt natural resource exporters, but as Table 1.1.1 highlights, lower oil prices are actually beneficial for a large majority of countries in this group. Of course an assessment of external sector risks has to take into account sizable differences in the macroeconomic environment, as well as the level and structure of external financing—and risks arising from external factors are exacerbated by domestic macroeconomic shocks and weak economic growth.

A heavy reliance on portfolio flows to finance large current account deficits can imply a higher risk of capital flow reversals should global attitudes toward risk change. For the period 2012–14, 10 countries in the large-deficit group (excluding financial centers, which by their nature have large portfolio flows) had average net portfolio inflows exceeding 2 percent of GDP (for instance, Ghana, Kenya, Mongolia, and Serbia).

Furthermore, 5 countries in the sample, including countries with conflicts such as Ukraine, as well as others such as Papua New Guinea, had substantial drawdowns in foreign exchange reserves during 2012–14 (averaging more than 2 percent of GDP a year).

In addition, with large and persistent current account deficits, a sizable number of countries in the sample have high net external liabilities, despite the external transfers and debt reduction agreements discussed earlier (Figure 1.2.2). In many countries, net FDI represents the lion's share of net foreign liabilities. The value of FDI liabilities is generally tied to a country's economic prospects, which implies better risk sharing in comparison to foreign-currency debt.[6] This notwithstanding, large FDI liabilities also imply sizable income outflows, and a country with large FDI liabilities is still vulnerable to a sharp decline in FDI flows, should its prospects or those for the sector in which its FDI is primarily located (for example, resource extraction or tourism) deteriorate.

Figure 1.2.2 also shows that external debt liabilities net of reserves exceed 40 percent of GDP in more than half of the sample of countries, and empirical evidence suggests that a country's net external debt position is correlated with the probability of an external crisis (Catão and Milesi-Ferretti 2014). In a number of countries in the sample, the sizable share of concessional loans is a mitigating factor (for more than 20 of them, that share was above 50 percent in 2013). However, the share of concessional loans is generally declining and is below one-third for about half of the sample.

In sum, this box documents that a sizable number of countries still run large current account deficits. These countries are overwhelmingly small—in terms of GDP per capita, population, or both. Factors that can

[6]In a number of cases a large share of FDI inflows is associated with matching imports of machinery and equipment. Therefore, a decline in FDI could reduce FDI-related imports and strengthen the current account balance, as was the case in many countries in the Caribbean during the global financial crisis.

Box 1.2 *(continued)*

Table 1.2.3. Profile of Countries with Large Current Account Deficits

	Large Debt Relief[1]	Fragile[2]	Natural Resource Rich[3]	Tourism Based[4]	Financial Center
Albania				Yes	
Anguilla					
Antigua and Barbuda				Yes	Yes
Armenia					
Bahamas, The				Yes	Yes
Barbados					Yes
Benin	Yes				
Bhutan					
Bosnia and Herzegovina		Yes			
Burundi	Yes	Yes			
Cabo Verde				Yes	
Cambodia				Yes	
Chad		Yes	Yes		
Comoros	Yes	Yes			
Congo, Dem. Rep. of the	Yes	Yes	Yes		
Djibouti					
Dominica				Yes	
Fiji				Yes	
Gambia, The					
Georgia					
Ghana			Yes		
Grenada				Yes	
Guinea		Yes	Yes		
Guyana	Yes				
Honduras					
Jamaica				Yes	
Jordan				Yes	
Kenya					
Kiribati		Yes			
Kosovo		Yes			
Kyrgyz Republic			Yes		
Lao P.D.R.					
Lebanon				Yes	Yes
Lesotho					
Liberia	Yes	Yes	Yes		
Marshall Islands		Yes			
Mauritania			Yes		
Mongolia			Yes		
Montenegro				Yes	
Montserrat					
Morocco					
Mozambique	Yes				
Nicaragua	Yes				
Niger					
Palau				Yes	
Panama					Yes
Papua New Guinea			Yes		
Rwanda	Yes				
São Tomé & Príncipe	Yes	Yes	Yes		
Senegal	Yes				
Serbia					
Seychelles	Yes			Yes	Yes
Sierra Leone	Yes	Yes	Yes		

Box 1.2 *(continued)*

Table 1.2.3. Profile of Countries with Large Current Account Deficits *(continued)*

	Large Debt Relief[1]	Fragile[2]	Natural Resource Rich[3]	Tourism Based[4]	Financial Center
St. Kitts and Nevis				Yes	
St. Lucia				Yes	
St. Vincent and the Grenadines				Yes	
Sudan		Yes			
Tanzania	Yes				
Togo	Yes	Yes			
Tunisia					
Tuvalu		Yes			
Uganda	Yes				
Ukraine					
Zimbabwe		Yes			

[1]Countries with cumulative debt relief since 2000 greater than 10 percent of GDP.
[2]Countries classified as fragile in IMF 2015c.
[3]Countries that are hydrocarbon rich, potentially hydrocarbon rich, or mineral rich according to the IMF's *Guide to Resource Transparency*.
[4]Tourism-based economies have a ratio of international tourism receipts to total exports that exceeds 25 percent and international tourism receipts in excess of 10 percent of GDP.

help explain the incidence of large deficits in countries with small populations include higher grants and external assistance relative to the size of the economy and vulnerabilities of particular relevance to small countries (such as the effects of recurrent natural disasters), as well as measurement problems (for instance, in regard to revenues from tourism or remittances). In recent years, these countries have benefited from a very benign external financing environment, with several of them issuing international securities for the first time. The environment is likely to change, and this will pose policy challenges, particularly to those countries with large net external liabilities and sizable recourse to nonconcessional debt.

Box 1.3. Capital Flows and Financial Deepening in Developing Economies

Low-income developing countries have integrated significantly with global financial markets over the past few decades—with annual gross private capital inflows increasing from $4 billion in the early 1980s to more than $60 billion in recent years, representing almost 6.4 percent of GDP in 2013.[1] This acceleration, which occurred together with the commodity price boom, has been driven by foreign direct investment, which has increased from about 2 percent of GDP in the early 2000s to more than 4 percent since 2011. Other inflows to the nonofficial sector have also increased in recent years, but they still account for less than 1.5 percent of GDP. Portfolio flows have been a negligible source of external financing for low-income developing countries, although they have been increasing recently in some frontier economies (Araujo and others 2015).

Low-income developing countries are typically more credit constrained than advanced economies, and capital inflows can be an important source of financial deepening for these economies to stimulate investment and efficient allocation of resources. Capital inflows can raise private credit directly—through increased bank deposits and collateral valuation effects (thanks to increased asset prices)—and indirectly, through their effect on macroeconomic and financial variables that influence the demand for and the supply of credit.[2] Foreign direct investment could, for example, have positive spillovers on local firms, easing financing constraints (Harrison, Love, and McMillan 2004), and increase their demand for credit.[3]

Against this backdrop, this box examines the role of global capital flows in driving credit to the private sector in low-income developing countries. Figure 1.3.1 suggests strong comovement between domestic bank lending and international capital flows in these countries, although the acceleration in credit from the mid-2000s surpassed that in capital inflows. The specific contribution of the latter in driving private credit (as a percentage of GDP) is identified here by estimating the following specification:

$$CRED_{i,t} = \alpha CRED_{i,t-1} + \beta CF_{i,t} + \gamma X_{i,t} + \delta_i + \varepsilon_{i,t}.$$

The vector $X_{i,t}$ includes a set of standard control variables (real per capita GDP, interest rate, GDP growth, and a banking crisis dummy), while α measures the persistence of private credit. The model is estimated with annual data for a sample of 36 low-income developing countries over the period 1980–2012, with country fixed effects δ_i and robust clustered standard errors.[4]

Given the obvious challenges in establishing a causal relationship between capital flows and domestic credit, the analysis relies on an instrument for capital inflows, which are uncorrelated with domestic economic conditions in recipient economies (see Gori, Li, and Presbitero, forthcoming). Gross capital inflows to emerging markets are taken as an instrument for capital inflows to low-income developing countries on the basis of the following three conditions. First, aggregate capital inflows to emerging markets are strongly and positively correlated with capital inflows to low-income developing countries, as shown in Figure 1.3.1, especially in the period before the global financial crisis, and this is confirmed by the first-stage coefficients (Table 1.3.1).[5]

The authors of this box are Filippo Gori, Bin Grace Li, and Andrea F. Presbitero.

[1]Weighted average; the unweighted average is 9.6 percent of GDP. The definition of private capital inflows used here follows Bluedorn and others 2013 and excludes from total capital inflows changes in recorded reserves, IMF lending, and other flows that record the official sector as a counterparty (for example, other flows to the central bank or monetary authority and general government, which are typically official lending or aid).

[2]Recent studies have explored the relationship between financial integration and domestic financial deepening for advanced and emerging market economies but not for low-income developing countries. The size of the domestic banking system and the scale of financial globalization have been shown to be strongly correlated (Lane and Milesi-Ferretti 2008), and episodes of capital inflows, mainly debt driven, have been associated with an increase in domestic credit growth (Furceri, Guichard, and Rusticelli 2012; Lane and McQuade 2014; Igan and Tan 2015).

[3]While foreign direct investment is often concentrated in enclave sectors, it is becoming more important in manufacturing and service sectors, with significant spillovers to domestic firms (Amendolagine and others 2013).

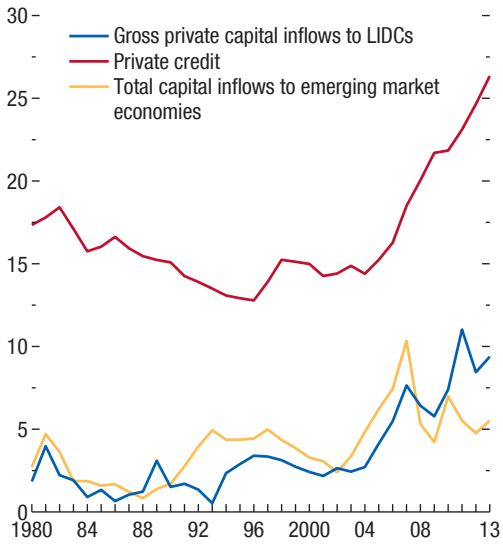
[4]To deal with the volatility of capital flows during the global financial crisis (see Figure 1.3.1), a dummy for 2008–12 is added. The sample includes Bangladesh, Benin, Bolivia, Burkina Faso, Cambodia, Cameroon, Republic of Congo, Djibouti, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Haiti, Honduras, Kenya, Lao P.D.R., Lesotho, Madagascar, Malawi, Mali, Mongolia, Mozambique, Nepal, Nicaragua, Niger, Nigeria, Papua New Guinea, Rwanda, Senegal, Sierra Leone, Solomon Islands, Tanzania, Togo, Uganda, and Zambia. The analysis focuses on the overall relationship between domestic credit and capital flows, and although it controls for the incidence of banking crises, financial stability risks related to the cyclicality of capital flows are not tackled here.

[5]Moreover, the first-stage *F*-statistics are generally close to or above the critical value of 10, which signals (for values below) a weak instrument. Results are robust to the exclusion of the crisis

Box 1.3 *(continued)*

Figure 1.3.1. Gross Capital Inflows and Private Credit in Selected Low-Income Developing Countries

(Percent of GDP)



Source: IMF staff calculations.
Note: Unweighted averages. Gross private capital inflows (calculated with cross-border flows to the official sector within other capital inflows stripped out) to the sample of 36 low-income developing countries (those used in the regressions with at least 10 observations in each variable) and total gross capital inflows to emerging markets are based on IMF staff calculations; private credit refers to the same sample of 36 low-income developing countries (LIDCs) and is from the World Bank's Global Financial Development Database, integrated with the World Bank's World Development Indicators.

Second, they are unlikely to be affected by the countries' economic performance. Third, for the uniqueness condition, the instrument is valid only if it affects private credit through its effect on capital inflows. It is not restrictive to imagine that capital inflows to emerging markets could affect low-income developing countries through international capital flows, but there may be other channels at work, particularly trade. To control for the trade channel, the set of controls includes the trade balance of emerging markets.

A number of global factors affecting advanced and developing economies at the same time could also weaken the identification strategy, to the extent that changes in such factors simultaneously affect capital inflows to emerging markets and to low-income developing countries. A proxy for these factors is constructed by extracting the first principal component of real GDP in a large sample of 135 advanced, emerging market, and developing economies. This variable explains more than 82 percent of the cross-country comovement in real GDP and is included as a measure of the global business cycle. Given that a large share of the countries in the sample are commodity exporters, commodity prices and terms-of-trade shocks can boost both private credit and capital inflows. To show that results are not driven by commodity prices, the model is also estimated on the sample of noncommodity exporters.

The main results suggest that global capital inflows contribute to private credit creation in low-income developing countries, and this is true also for noncommodity exporters (columns (4)–(6) of the table).[6] Quantitatively, a 1 percentage point increase in total private capital inflows (as a share of GDP) increases the private-credit-to-GDP ratio by 0.32 percentage point (column 1). The results are largely driven by foreign direct investment and other private inflows (flows to the nonofficial sector, including bank loans and trade credit).[7] The response of domestic credit to foreign investment may reflect direct local funding of foreign firms and potential positive spillovers from foreign direct investment increasing the demand for credit by local firms. The statistically significant bearing between private credit and other private flows, by contrast, reflects a supply channel working through cross-border bank flows (although the magnitude of other private flows is still relatively small in low-income developing countries). These results contrast with those of studies on advanced and emerging market

years and the use of alternative instruments, such as the first principal components of capital outflows from advanced economies and capital outflows from the United States.

[6]Results are robust to the inclusion of country-specific net commodity terms of trade (defined as in Gruss 2014; see Chapter 2 for details).

[7]When capital flows are measured by portfolio flows, the model is weakly identified, and the coefficients on capital flows are imprecisely estimated. For that reason, results are not shown in Table 1.3.1. Results are similar when net flows are used.

Box 1.3 *(continued)*

Table 1.3.1. Gross Capital Inflows and Private Credit: Two-State Least-Squares Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Private credit (% of GDP)$_t$						
Total Private Capital Inflows (% of GDP)$_t$	0.320***			0.283**		
	(0.006)			(0.028)		
Foreign Direct Investment Inflows (% of GDP)$_t$		0.611***			0.492**	
		(0.007)			(0.031)	
Other Inflows to Nonofficial Sector (% of GDP)$_t$			0.693**			0.731*
			(0.022)			(0.082)
Private Credit (% of GDP)$_{t-1}$	0.827***	0.802***	0.856***	0.849***	0.847***	0.836***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Real Per Capita GDP$_{t-1}$	3.208***	3.624**	3.100***	3.418	3.500	3.638*
	(0.004)	(0.014)	(0.003)	(0.144)	(0.178)	(0.088)
Real GDP Growth$_{t-1}$	0.016	0.013	0.019	–0.002	0.006	–0.023
	(0.442)	(0.594)	(0.437)	(0.924)	(0.813)	(0.468)
Interest Rate$_t$	–0.700**	–1.176***	–0.228	–0.458	–0.804	–0.004
	(0.023)	(0.004)	(0.443)	(0.335)	(0.217)	(0.990)
Banking Crisis$_{t-1}$ (0/1)	–1.772**	–1.869**	–1.371	–1.190	–1.443*	–0.744
	(0.015)	(0.023)	(0.108)	(0.138)	(0.051)	(0.474)
Emerging Market and Developing Economies Trade Balance$_t$	–0.133	–0.217*	–0.028	–0.101	–0.111	–0.058
	(0.139)	(0.073)	(0.735)	(0.312)	(0.348)	(0.546)
Global Business Cycle$_t$	–0.065	–0.528	0.400	–0.158	–0.518	0.271
	(0.823)	(0.205)	(0.241)	(0.653)	(0.319)	(0.429)
First-Stage Coefficient (Total Capital Inflows to Emerging Market and Developing Economies)	0.628***	0.324***	0.290**	0.537***	0.302***	0.208**
	(0.200)	(0.113)	(0.111)	(0.119)	(0.094)	(0.073)
Number of Observations	939	927	939	540	532	540
R^2	0.796	0.742	0.765	0.813	0.782	0.802
Sample	Low-income developing countries			Noncommodity-exporting low-income developing countries		
Number of Countries	36	36	36	21	21	21
Underidentification Test (Kleibergen-Paap rk LM)	0.005	0.008	0.015	0.001	0.005	0.016
Weak Identification Test (Kleibergen-Paap rk Wald)	9.817	8.183	6.864	20.440	10.346	8.025

Source: Authors' calculations.

Note: The table reports the regression results of a two-stage least-squares model in which the dependent variable is the ratio of private credit to GDP in country *i* at time *t*. Capital inflows are instrumented with total capital inflows to emerging markets. Standard errors, clustered at the country level, are in parentheses. The Kleibergen-Paap rk LM statistic tests the null hypothesis that the excluded instruments are not correlated with the endogenous regressor; the Kleibergen-Paap rk Wald *F*-statistic tests for weak identification. Each regression includes country fixed effects and a dummy for the crisis period 2008–12.

*$p < .10$; **$p < .05$; ***$p < .01$.

economies that find portfolio debt flows to be more important drivers of private credit (Furceri, Guichard, and Rusticelli 2012; Lane and McQuade 2014). For low-income developing countries, portfolio debt and equity flows represent only a tiny fraction of total flows, and there is no robust correlation with domestic credit.

This analysis identifies a causal relationship between capital flows and domestic private credit in low-income developing countries—confirming the potentially enabling role of global financial integration for financial deepening in these countries, conditional on financial depth itself being a robust driver of economic growth and development.

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CHAPTER 2

WHERE ARE COMMODITY EXPORTERS HEADED? OUTPUT GROWTH IN THE AFTERMATH OF THE COMMODITY BOOM

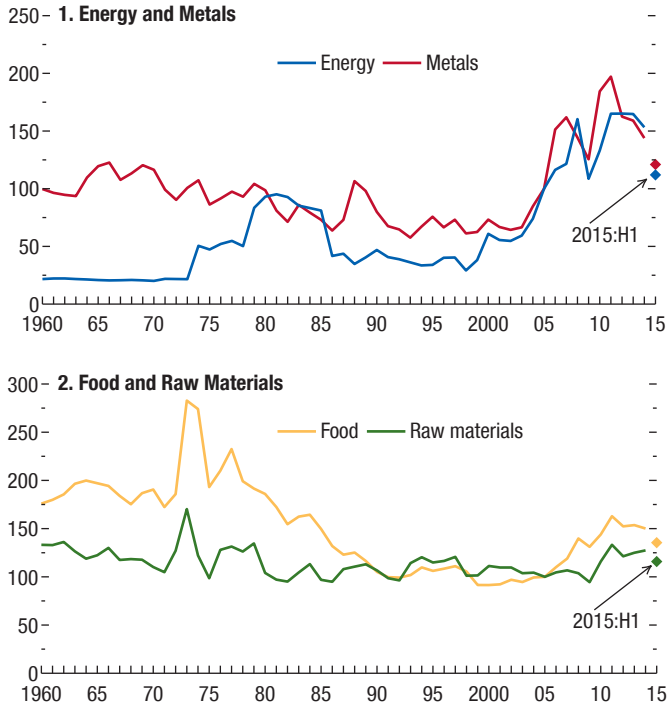
Commodity prices have declined sharply over the past three years, and output growth has slowed considerably among those emerging market and developing economies that are net exporters of commodities. A critical question for policymakers in these countries is whether commodity windfall gains and losses influence potential output or merely trigger transient fluctuations of actual output around an unchanged trend for potential output. The analysis in this chapter suggests that both actual and potential output move together with the commodity terms of trade but that actual output comoves twice as strongly as potential output. The weak commodity price outlook is estimated to subtract almost 1 percentage point annually from the average rate of economic growth in commodity exporters over 2015–17 as compared with 2012–14. In exporters of energy commodities, the drag is estimated to be larger—about 2¼ percentage points on average over the same period. The projected drag on the growth of potential output is about one-third of that for actual output.

Introduction

After rising dramatically for almost a decade, the prices of many commodities, especially those of energy and metals, have dropped sharply since 2011 (Figure 2.1). Many analysts have attributed the upswing in commodity prices to sustained strong growth in emerging market economies, in particular those in east Asia, and the downswing to softening growth in these economies and a greater supply of commodities.[1] Commodity prices are notoriously difficult to predict, but there is general agreement among analysts that they will likely remain low, given ample supplies and weak prospects for global economic growth. Commodity futures prices also suggest that, depending on

Figure 2.1. World Commodity Prices, 1960–2015
(In real terms; index, 2005 = 100)

After a dramatic rise in the 2000–10 period, the prices of many commodities have been dropping sharply. The cycle has been especially pronounced for energy and metals.



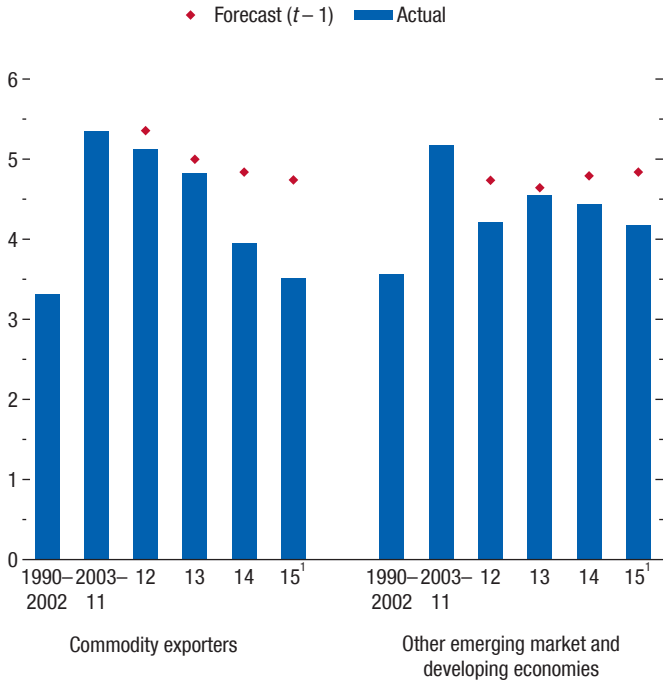
Sources: Gruss 2014; IMF, Primary Commodity Price System; U.S. Energy Information Administration; World Bank, Global Economic Monitor database; and IMF staff calculations.
Note: The real price index for a commodity group is the trade-weighted average of the global U.S. prices of the commodities in the group deflated by the advanced economy manufacturing price index and normalized to 100 in 2005. The commodities within each group are listed in Annex 2.1. The values for the first half of 2015 are the average of the price indices for the first six months of the year.

The authors of this chapter are Aqib Aslam, Samya Beidas-Strom, Rudolfs Bems, Oya Celasun (team leader), Sinem Kılıç Çelik, and Zsóka Kóczán, with support from Hao Jiang and Yun Liu and contributions from the IMF Research Department's Economic Modeling Division and Bertrand Gruss. José De Gregorio was the external consultant for the chapter.

[1]The role of global and emerging market demand in driving the surge in commodity prices in the first decade of the 2000s is discussed in Erten and Ocampo 2012, Kilian 2009, and Chapter 3 of the October 2008 *World Economic Outlook*. On the impact of slowing emerging market growth on commodity prices, see "Special Feature: Commodity Market Review" in Chapter 1 of the October 2013 *World Economic Outlook*. Roache 2012 documents the increase in China's share in global commodity imports in the 2000s.

Figure 2.2. Average Growth in Commodity-Exporting versus Other Emerging Market and Developing Economies, 1990–2015
(Percent)

The recent drop in commodity prices has been accompanied by pronounced declines in real GDP growth rates, much more so in commodity-exporting countries than in other emerging market and developing economies.



Source: IMF staff estimates.
Note: "Commodity exporters" are emerging market and developing economies for which gross exports of commodities constitute at least 35 percent of total exports and net exports of commodities constitute at least 5 percent of exports-plus-imports on average, based on the available data for 1960–2014. "Other emerging market and developing economies" are defined as the emerging market and developing economies that are not included in the commodity exporters group. Countries are selected for each group so as to have a balanced sample from 1990 to 2015. Outliers, defined as economies in which any annual growth rate during the period exceeds 30 percent (in absolute value terms), are excluded.
[1]Average growth projected for 2015 in the July 2015 *World Economic Outlook Update*.

the commodity, future spot prices will remain low or rebound only moderately over the next five years.

The decline in commodity prices has been accompanied by stark slowdowns in economic growth among commodity-exporting emerging market and developing economies, most of which had experienced high growth during the commodity price boom (Figure 2.2). Besides the decline in growth, commodity exporters have also seen downgrades in their medium-term growth prospects: almost 1 percentage point has been shaved off the average of their five-year-ahead growth forecasts since 2012, while the medium-term growth forecasts of other emerging market and developing economies have remained broadly unchanged.

Weaker commodity prices raise key questions for the outlook in commodity-exporting economies. One that looms large is whether commodity-price-related fluctuations in growth are mostly cyclical or structural. The flip side of this question is whether the faster rate of output growth during the commodity boom reflected a cyclical overheating as opposed to a higher rate of growth in potential output.[2] Distinguishing between the cyclical and structural components of growth is not straightforward in any business cycle; it is particularly challenging during prolonged commodity booms, when a persistent pickup in incomes and demand makes it harder to estimate the underlying trend in output.[3]

The diagnosis of how actual and potential growth is influenced by commodity price fluctuations is crucial for the setting of macroeconomic policies in commodity exporters. Price declines that lead to a mostly cyclical slowdown in growth could call for expansionary macroeconomic policies (if policy space is available) to pick up the slack in aggregate demand. In contrast, lower growth in potential output would tend to imply a smaller amount of slack and, therefore, less scope for stimulating the economy using macroeconomic policies. In countries where the decline in commodity prices leads to a loss in fiscal revenues, weaker potential output growth would also require fiscal adjustments to ensure public debt sustainability.

This chapter contributes to the literature on the macroeconomic effects of booms and downturns in the commodity terms of trade (the commodity price cycle) in net commodity exporters.[4] Using a variety of empirical approaches, it makes a novel contribution

[2]Potential output is defined in this chapter as the amount of output in an economy consistent with stable inflation. Actual output may deviate from potential output because of the slow adjustment of prices and wages to changes in supply and demand. In most of the empirical analysis, potential output is proxied by trend output—based on an aggregate production function approach and using the growth rates of the capital stock as well as smoothed employment and total factor productivity series. Chapter 3 of the April 2015 *World Economic Outlook* includes a primer on potential output (pp. 71–73).

[3]See the discussion in De Gregorio 2015.

[4]A country's "terms of trade" refers to the price of its exports in terms of its imports. The concept of "commodity terms of trade" as used in this chapter refers to the price of a country's commodity exports in terms of its commodity imports. It is calculated as a country-specific weighted average of international commodity prices, for which the weights used are the ratios of the net exports of the

by analyzing changes in the cyclical versus structural components of output growth in small open net commodity-exporting economies during the commodity price cycle.[5] The empirical analysis focuses on emerging market and developing economies that are net exporters of commodities, with the exception of case studies that examine the sectoral reallocation resulting from commodity booms in Australia, Canada, and Chile. The chapter also uses model-based simulations to analyze the impact of the commodity price cycle on income, domestic demand, and output; that investigation draws on the IMF's Global Economy Model (GEM), which has a full-fledged commodities sector and is hence uniquely suited to this analysis.[6]

Specifically, the chapter seeks to answer the following questions about the effects of the commodity price cycle:

- *Macroeconomic effects:* How do swings in the commodity terms of trade affect key macroeconomic variables—including output, spending, employment, capital accumulation, and total factor productivity (TFP)? How different are the responses of actual and potential output? Do the economies of commodity exporters overheat during commodity booms?
- *Policy influences:* Do policy frameworks influence the variation in growth over the cycle?
- *Sectoral effects:* How do swings in the commodity terms of trade affect the main sectors of the economy—commodity producing, manufacturing, and nontradables (that is, goods and services not traded internationally)?
- *Growth outlook:* What do the empirical findings imply for the growth prospects of commodity-exporting economies over the next few years?

The main findings of the chapter are as follows:

Macroeconomic effects

- Swings in the commodity terms of trade lead to fluctuations in both the cyclical and structural components of output growth, with the former tending to be about twice the size of the latter. In previous prolonged terms-of-trade booms, annual actual output growth tended to be 1.0 to 1.5 percentage points higher on average during upswings than in downswings, whereas potential output growth tended to be only 0.3 to 0.5 percentage point higher. These averages mask considerable diversity across episodes, including in regard to the underlying changes in the terms of trade.
- The strong response of investment to swings in the commodity terms of trade is the main driver of changes in potential output growth over the cycle. In contrast, employment growth and TFP growth contribute little to the variations in potential output growth.

Policy influences, sectoral effects, and growth outlook

- Certain country characteristics and policy frameworks can influence how strongly output growth responds to the swings in the commodity terms of trade. Growth responds more strongly in countries specialized in energy commodities and metals and in countries with a low level of financial development. Less flexible exchange rates and more procyclical fiscal spending patterns (that is, stronger increases in fiscal spending when the commodity terms of trade are improving) also tend to exacerbate the cycle.
- Case studies of Australia, Canada, and Chile suggest that investment booms in commodity exporters are mostly booms in the commodity sector itself. Evidence of large-scale movements of labor and capital to nontradables activities is mixed.
- All else equal, the weak commodity price outlook is projected to subtract about 1 percentage point annually from the average rate of economic growth in commodity-exporting economies over 2015–17 as compared with 2012–14. In energy exporters the drag is estimated to be larger, about 2¼ percentage points on average.

relevant commodity to the country's total commodity trade. Details of the calculation are provided in Annex 2.1.

[5]The literature has mostly focused on the comparative longer-term growth record of commodity exporters. Surveys can be found in van der Ploeg 2011 and Frankel 2012. Other major topics in the literature include the contribution of terms-of-trade shocks to macroeconomic volatility (for example, Mendoza 1995 and Schmitt-Grohé and Uribe 2015), the comovement between the commodity terms of trade and real exchange rate (for example, Chen and Rogoff 2003 and Cashin, Céspedes, and Sahay 2004), the impact of natural resource discoveries on activity in the nonresource sector (Corden and Neary 1982; van Wijnbergen 1984a, 1984b), and the relationship between terms-of-trade movements and the cyclical component of output (Céspedes and Velasco 2012). Chapter 1 of the October 2015 *Fiscal Monitor* discusses the optimal management of resource revenues, a topic that has also been the subject of a large literature (for example, IMF 2012).

[6]This chapter is a sequel to Chapter 3 of the April 2015 *World Economic Outlook*, which provides estimates of potential output for 16 major economies for the past two decades, and to Chapter 4 of the April 2012 *World Economic Outlook*, which examines the growth implications of commodity price movements driven by global production versus global demand and the optimal fiscal management of commodity windfalls.

The findings of the chapter suggest that, on average, some two-thirds of the decline in output growth in commodity exporters during a commodity price downswing should be cyclical. Whether the decline in growth has opened up significant economic slack (that is, has increased the quantity of labor and capital that could be employed productively but is instead idle) and the degree to which it has done so are likely to vary considerably across commodity exporters. The variation depends on the cyclical position of the economy at the start of the commodity boom, the extent to which macroeconomic policies have smoothed or amplified the commodity price cycle, the extent to which structural reforms have bolstered potential growth, and other shocks to economic activity. Nevertheless, a key takeaway for commodity exporters is that attaining growth rates as high as those experienced during the commodity boom will be challenging under the current outlook for commodity prices unless critical supply-side bottlenecks that constrain growth are alleviated rapidly.

The rest of the chapter is structured as follows. First it discusses the macroeconomic implications of a terms-of-trade windfall in a commodity-exporting economy and presents illustrative model simulations. It then presents two sets of empirical tests of whether the evidence conforms to the model-based predictions, namely, event studies and regression-based estimates. The event studies cover a large sample of prolonged upswings and subsequent downswings in the commodity terms of trade to document the key regularities in the data; by design, they do not control for contextual factors. To isolate the effects of the terms-of-trade movements, regression-based estimates of the responses of key macroeconomic variables to terms-of-trade shocks are also presented. In addition, case studies examine the sectoral implications of terms-of-trade booms. The chapter concludes with a summary of the findings and a discussion of their policy implications.

Commodity Terms-of-Trade Windfalls: A Model-Based Illustration

How would commodity price cycles be expected to affect small open economies that are net exporters of commodities (hereafter, commodity-exporting economies)? This section first reviews the concept of potential output and then turns to simulations of a calibrated model that illustrate the response of a typical commodity-exporting economy to a terms-of-trade boom.

Preliminaries

The model-based analysis focuses on a commodity cycle in which a surge in prices—driven by stronger global demand—is followed by a partial, supply-driven correction. This assumption is consistent with how most analysts view the commodity price boom of the 2000s. The correction is partial given the exhaustible nature of commodities and because income levels in emerging markets are considered to have increased permanently (with higher demand for commodities), even if the increase in income may have been smaller than what had been expected.[7]

Potential Output

The following discussion of the macroeconomic implications of a terms-of-trade windfall distinguishes between temporary effects on potential output (those over a commodity cycle) and permanent effects (beyond a commodity cycle). Over a commodity cycle, potential output is defined as the level of output consistent with stable inflation—in the model, this is captured by the path of output under flexible prices. The short-term divergence of actual output from potential output—resulting from the slow adjustment in prices—is referred to as the output gap. These two components of output fluctuations can also be called the "structural" and "cyclical" components. Beyond the commodity cycle, potential output in a commodity-exporting economy is driven by changes in global income, the implied change in the relative price of commodities, and any durable effects of the commodity price boom on domestic productive capacity (as discussed next). All else equal, a permanent increase in the commodity terms of trade would lead to an increase in potential output.

With a growth-accounting framework (which measures the contribution to growth from various factors), potential output can be decomposed into capital, labor, and the remainder unexplained by those two—TFP. Terms-of-trade booms can affect the path of potential

[7]The empirical analysis in the next section shows that this pattern of commodity cycles also characterizes the average commodity cycle during the past five decades, in which an initial price boom is followed by a partial correction. The model captures the exhaustibility of commodities with land as a unique and important production input for commodities but not for other goods.

output through each of these three components. More durable changes in potential growth are possible to the extent that productivity growth is affected.

Capital. A commodity terms-of-trade boom that is expected to persist for some time will increase investment in the commodity sector and in supportive industries.[8] A broader pickup in investment could be facilitated by a lower country risk premium and an easing of borrowing constraints that coincide with better commodity terms of trade. Higher investment rates in the commodity and noncommodity sectors, in turn, will raise the economy's level of productive capital and hence raise the level (but not the permanent growth rate) of its potential output.

Labor supply. Large and persistent terms-of-trade booms may also affect potential employment. Structural unemployment may decline following a period of low unemployment through positive hysteresis effects. Lower unemployment rates may also encourage entry into the labor force as well as job search, raising the trend participation rate. As with investment, the labor supply channels have an effect on the level of potential output, but not on its permanent growth rate.

Total factor productivity. Terms-of-trade booms can raise TFP by inducing faster adoption of technology and higher spending on research and development. The sectoral reallocation of labor and capital during a terms-of-trade boom could also influence economy-wide TFP, but the sign of the effect is uncertain beforehand (because factors of production may be reallocated from high- to low-productivity sectors and vice versa).

Although the increases in productive capital and the labor force during a commodity price boom translate into increased potential output, this increase may not be sustainable. For example, investment may no longer be viable at lower commodity prices (once the boom has abated); thus the growth rate of aggregate investment may fall along with the terms of trade.

Transmission Channels for Commodity Cycles

Upswings in the commodity terms of trade affect the macroeconomy through two main channels, income and investment.

Income. The commodity price boom generates an income windfall, as existing levels of production yield greater revenues. Higher income boosts domestic demand and thereby stimulates domestic production. Because the income windfall is generated by more favorable terms of trade, the response of real domestic output is more subdued than that of income and domestic demand.[9] This was indeed the case during the most recent commodity boom (2000–10) (Figure 2.3). Consistent with the Dutch disease effect, the domestic supply response to higher domestic income occurs disproportionately in the nontradables sector because demand for tradables can be met in part by a rise in imports.[10] In the process, the prices of the relatively scarce nontradable goods and services increase relative to the prices of tradables, and the real exchange rate appreciates.

Investment. In addition, commodity price booms heighten incentives to invest in the commodity sector and supporting industries—such as construction, transportation, and logistics. The resulting increase in economic activity ultimately generates spillovers to the rest of the economy and raises incomes further. Moreover, in the medium term, the increase in the supply of commodities can reverse the commodity price boom, contributing to the commodity cycle itself.[11]

The income and investment channels are interrelated. The income gain in the domestic economy will be higher and more broadly based if investment and activity in the commodity sector respond more strongly to the increase in the terms of trade. Likewise, a greater income windfall will make higher investment more likely.

[8]See also the discussion in Gruss 2014.

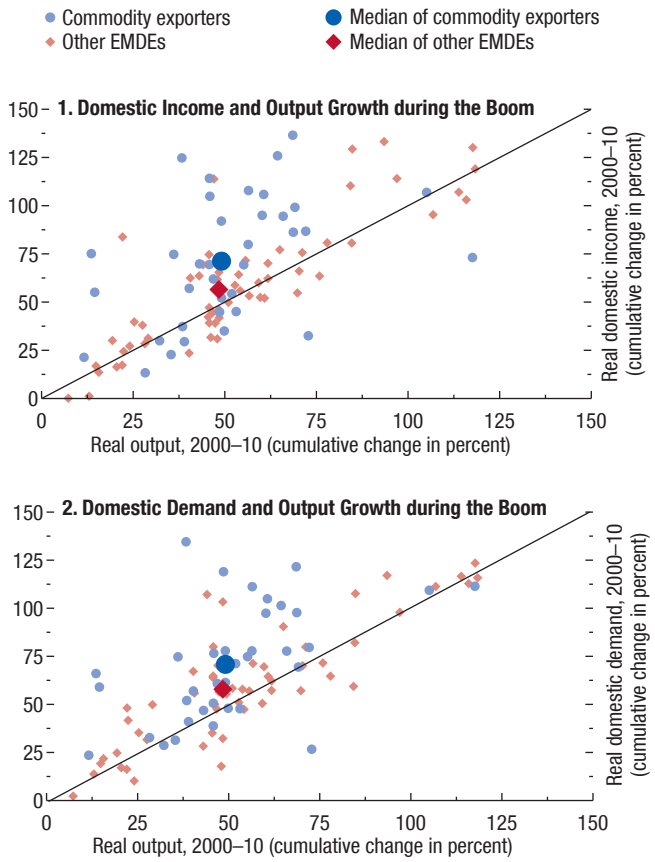
[9]Kohli (2004) and Adler and Magud (2015) show that real GDP tends to underestimate the increase in real domestic income when the terms of trade improve. In addition, Adler and Magud (2015) provide estimates of the income windfall during commodity terms-of-trade booms during 1970–2012.

[10]An extensive theoretical and empirical literature studies the Dutch disease effect (see Box 2.1 for an overview).

[11]The strength of the supply response in the commodity sector depends on the sector's maturity. That is, output in the sector will respond more to a boom the more potential there is for new resource discoveries and the less costly it is to ramp up production volumes. Anecdotal evidence from some countries in the 2000s boom illustrates the case of a relatively more mature sector: boosting or even just maintaining production required extractive companies to dig deeper, use more sophisticated technology, and incur higher costs than in the past; thus, the boom in commodity sector investment was associated with only a relatively modest rise in commodity output.

Figure 2.3. Real Income, Output, and Domestic Demand, 2000–10

The 2000–10 commodity price boom sharply improved the terms of trade for commodity exporters and induced an income windfall. Real domestic income and demand in the median commodity-exporting economy increased considerably more than real output.



Source: IMF staff calculations.
Note: Real income is calculated by deflating nominal GDP using the domestic consumer price index. Countries with a decline in real GDP, income, or domestic demand over 2000–10 or those with greater than 150 percent growth over the same period are excluded. EMDEs = emerging market and developing economies.

Model-Based Illustrations

The effects of a commodity price cycle on a commodity-exporting economy are illustrated here using GEM.[12]

[12]GEM is a micro-founded multicountry and multisector dynamic general equilibrium model of the global economy. Its key features are a commodities sector with land as a major nonreproducible production factor; conventional real and nominal frictions, such as sticky prices and wages; adjustment costs for capital and labor; habit formation in consumption; a fraction of liquidity-constrained consumers; and a financial accelerator mechanism. For a detailed description of GEM, see Lalonde and Muir 2007 and Pesenti 2008.

In the simulations, the commodity boom is induced by a temporary pickup in growth in east Asia.[13] The discussion in this section focuses on model responses to the boom in a typical Latin American economy, as the region exemplifies net commodity exporters.[14]

The Upswing

The growth pickup in east Asia is calibrated so that the commodity price index in the commodity-exporting country gradually increases by 20 percent over a 10-year period (Figure 2.4).[15] The more favorable terms of trade boost income and consumption in the exporter's economy. Meeting the surge in demand from domestic supply requires front-loading an increase in investment, which is followed by an increase in output. In response to higher demand, to capital deepening (that is, an increase in capital per worker), and to the resulting increase in real wages, the other factor of production—labor—also increases during the boom.

An important question that the model can help clarify relates to the relative contributions of cyclical and structural factors in the supply boom. In the model, increases in output during the commodity cycle are decomposed into the structural and cyclical contributing factors. First, under flexible prices the income windfall gives rise to an increase in demand and output (the structural component). Second, a slow adjustment in prices (in the presence of "sticky prices" given nominal rigidities) exacerbates the response of economic activity in the short term (the cyclical component—the deviation of actual output from potential output). The flexible- and sticky-price versions of the model are used to decompose the response in actual output and labor into contributions from these two factors (Figure 2.4, panels 2 and 4).

[13]This choice is motivated by the broad agreement among market analysts that fast growth in east Asia was a major force behind the surge in commodity prices between the late 1990s and 2008 (for a list of references on this topic, see note 1). The assumed duration of the pickup in east Asian growth in the model is selected to match this episode.

[14]Latin America, one of the six regions included in the model, accounts for about 6¼ percent of world output. The region is parameterized as a net exporter of commodities, with the commodities sector accounting for 11 percent of output. The commodities sector in the model is further divided into oil and non-oil commodities of approximately equal size, with a lower price elasticity of demand in the oil sector. All results reported in this section refer to the aggregate commodities sector.

[15]Figure 2.4 reports the responses of the model to the boom in the relative price of commodities (baseline scenario), presented as percentage deviations from the no-boom case.

The results show that both structural and cyclical components contribute to the supply response following the commodity price boom; that is, the slow adjustment in prices and wages leads actual output to increase more than potential output. The cyclical component—reflected in a positive output gap—drives a pickup in inflation during the boom. A key takeaway from this exercise is that an important component of the boom is structural—in the sense that a commodity boom generates a gradual and significant increase in capital, output, and employment even in the absence of sticky prices.[16]

The income windfall increases demand in all sectors. However, domestic supply increases more in the nontradables sector than in the tradables sector because domestic tradable goods can more readily be substituted with imported tradable goods than nontradables can be substituted with tradables.[17] Whether supply in the tradables sector increases or decreases depends on the degree of substitutability between domestic tradables and imports and whether the commodity exporter is also a net exporter of tradables to east Asia, where the global demand boom originates.

Partitioning the economy into three sectors—commodities, nontradables, and tradables—yields a distinct pattern of resource reallocation (Figure 2.4, panels 5–8). Investment rises relative to the no-boom case in all three sectors but more so in the commodities and nontradables sectors. Employment is correspondingly reallocated away from tradables and into commodities and nontradables. Consistent with these sectoral shifts, the relative price of nontradables to tradables increases, and the real effective exchange rate appreciates. The reproducible production factor—the capital stock—grows in all sectors, including in tradables, because the boom unambiguously increases demand in all sectors (even if in relative terms, the increase is larger for nontradables). Notably, in the model simulations, the sectoral shares in real value added are little changed because the fastest-growing commodities sector is small (about 10 percent of GDP in the model), and the

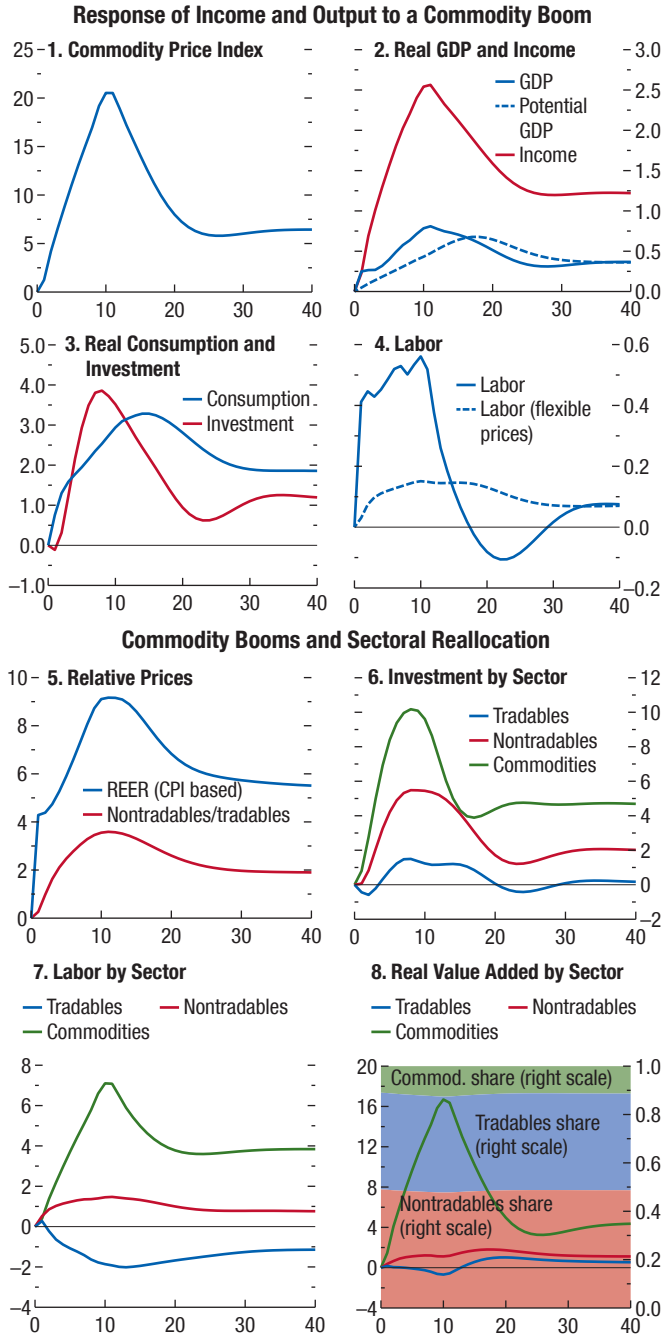
[16]The gradual nature of the increase in potential output and consumption is driven by real frictions, such as adjustment costs in production factors, liquidity-constrained consumers, and habit formation in consumption.

[17]That is, the elasticity of substitution is parameterized to be larger within sectors than across sectors. The cross-sectoral shifts will be largest if, within the tradables sector, domestic goods and imports are perfect substitutes.

Figure 2.4. Model Simulations: Macroeconomic Effects of a Commodity Boom

(Percent deviation, unless noted otherwise; years on x-axis)

The IMF's Global Economy Model predicts that a commodity price boom should induce higher investment, consumption, output, and labor effort in commodity-exporting economies. The gains in output and labor effort have cyclical and structural components. The model also predicts that these economies' factors of production will shift toward the nontradables and commodities sectors and that the currency will appreciate in real terms.



Source: IMF staff estimates.
Note: Potential output is given by the path of output under flexible prices. All variables except shares in real value added are shown in percentage deviations from their paths in the absence of a commodity boom. Commod. = commodities; CPI = consumer price index; REER = real effective exchange rate.

noncommodity parts of the economy get a boost from the income windfall.

The Downswing

In the medium term (after year 10 in the model simulations) the boom in commodity prices is partially reversed by the dissipation of the growth pickup in east Asia and the rise in the global supply of commodities in response to higher prices. The price reversal sets in motion a downswing phase for the economy. As income falls, all the forces outlined previously for the upswing phase occur in reverse. The drop in demand lowers supply. Actual output temporarily falls below potential output. Labor is reallocated from the commodities and nontradables sectors back into the tradables sector. Value added drops most in the commodities sector and grows more in the tradables sector than it does in the nontradables sector.

In the absence of permanent changes in the terms of trade, the boom produces no lasting gains in potential output. Put differently, potential output rises temporarily above a no-boom path and then returns to it. In contrast, if the terms of trade remain higher than their preboom level, as in the model simulations, the boom leads to a permanent gain in potential output.

Additional Factors Affecting the Commodity Cycle

The baseline scenario suppresses numerous factors that could influence the commodity cycle and its effect on the commodity-exporting economy. Four such factors are expectations about the price of the commodity, the reaction of fiscal policy to higher revenues, the easing of financial frictions due to the commodity boom, and sectoral reallocation of capital and labor.

Commodity price expectations. Expectations are central to the commodity cycle. Consumption and investment in the commodity-exporting economy increase only if the boom is expected to be long lasting. Overly optimistic expectations regarding the persistence of the boom can therefore aggravate the boom-bust cycle by generating a greater boom in domestic demand during the upswing, which in turn requires a greater correction in spending during the downswing. Overoptimism is more likely in the case of persistent upswings in commodity prices, like those experienced in the early 2000s. It can be global, rather than country specific; for example, the prices embedded in commodity futures may not materialize.

To illustrate how overly optimistic expectations can aggravate the cycle, the simulation compares the baseline scenario with a case in which the commodity price is initially expected to increase gradually for more than 10 years. Up to year 10, these expectations are validated; then, expectations are corrected downward, and the increase in the commodity price comes to a halt (Figure 2.5). As a result, income is less than initially expected. This scenario implies a more pronounced initial boom in the commodity-exporting economy because the expected wealth gain from the commodity price boom is larger than in the baseline case. In the aftermath of the boom, demand and supply dip below the responses in the baseline to correct for the excessive initial boom.

Fiscal policy. Much of the commodity price windfall accrues to the government in commodity-producing economies—especially in energy exporters. Thus, the terms-of-trade boom may loosen the government budget constraint and allow the government to finance a higher level of spending. Moreover, the government's use of the income windfall can substantially affect the economy's response to the commodity price cycle.[18] For example, if the government pursues a procyclical fiscal policy during the boom, using the additional revenues to reduce taxes on households or increase consumption spending, it can aggravate the boom-bust cycle in economic activity. Such a scenario is examined in detail in Chapter 4 of the April 2012 *World Economic Outlook*. In contrast, if the government invests in productivity-enhancing capital (whether infrastructure or human capital), productive capacity and income can benefit over the longer term. The implications of such a scenario—using a model calibrated to a low-income developing country—are examined in Box 2.2.

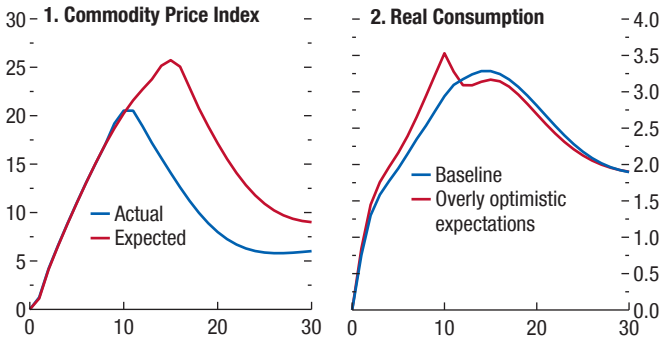
Financial frictions. The commodity boom increases returns, thereby improving companies' net worth and reducing their leverage. Reduced leverage, in turn, decreases both the premium firms pay to obtain financing and their cost of capital. The result is to reduce the economy's financial frictions, broadly defined. Increased global risk appetite during the boom can further magnify this channel. The effect can be illustrated with one summary measure of the cost of external financing—sovereign bond yield spreads—for a sample of commodity-exporting economies

[18]See the discussion in Chapter 1 of the October 2015 *Fiscal Monitor*.

Figure 2.5. Consumption Dynamics with Overly Optimistic Commodity Price Expectations

(Percent deviation; years on x-axis)

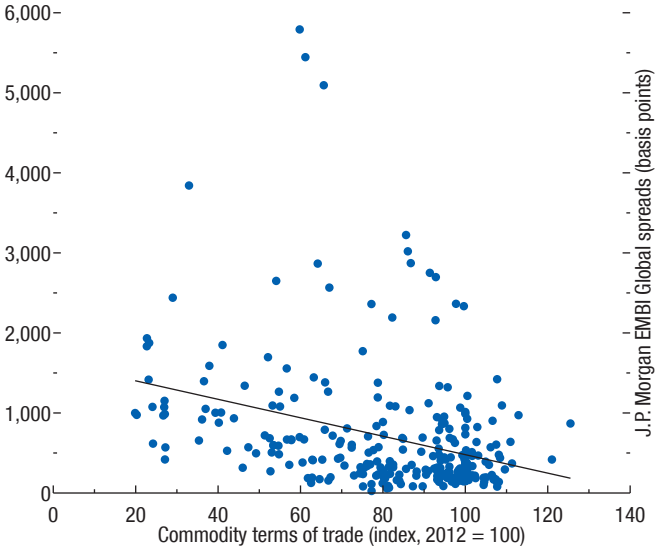
The IMF's Global Economy Model predicts that overestimating the ultimate size and persistence of a commodity price boom will yield a more pronounced initial increase in consumption that is followed by a dip in growth rates to levels below those in the baseline scenario.



Source: IMF staff estimates.
Note: All variables are shown in percentage deviations from their paths in the absence of a commodity boom.

Figure 2.6. Sovereign Bond Yield Spreads and the Commodity Terms of Trade

During 1997–2014, commodity-exporting economies had lower spreads on sovereign bond yields when their commodity terms of trade were higher, which meant lower financing costs during the boom phase of the commodity cycle.



Sources: Thomson Reuters Datastream; and IMF staff calculations.
Note: Data are for commodity-exporting emerging market and developing economies for which J.P. Morgan Emerging Markets Bond Index Global (EMBI Global) spreads are available. See Annex 2.1 for the definition of the commodity terms-of-trade index.

from 1997 to 2014 (Figure 2.6). The negative relationship between the country-specific terms of trade and spreads implies that the cost of financing decreases for exporters during commodity booms and increases during downswings.

The reduction in the cost of financing and the easing of financial frictions further boosts income and potential output during the upswing; its effects reverse during the downswing. The effect of the commodity price cycle on financial frictions is therefore another channel that aggravates the boom-bust dynamics in a commodity-exporting economy. Such effects are unlikely to affect the economy beyond the horizon of the commodity cycle unless they lead to a sustained improvement in financial sector development.

Sectoral reallocation. The responses in the baseline scenario feature a shift of labor and capital away from the noncommodity tradables sector toward the commodity and nontradables sectors as part of the equilibrium adjustment to the windfall. The sectoral reallocation of factors raises additional issues. If manufacturing is associated with positive externalities for the broader economy (such as learning-by-doing externalities), the shrinking of the relative size of the manufacturing sector can raise concerns.[19] In addition, the reallocation could change the weights of the different sectors in the overall economy and thus affect measured aggregate TFP growth. Most applied macroeconomic models, including GEM, assume balanced growth across sectors and thus abstract from such considerations. The case studies in the following section investigate this issue by examining whether sectoral shifts in activity during commodity booms have altered aggregate TFP growth.

Five Decades of Evidence: Commodity Terms-of-Trade Cycles and Output

How do actual and potential output respond to commodity windfall gains and losses? This section analyzes the question in two steps with data for a sample of 52 commodity-exporting emerging market and developing economies.[20] In the first step, event

[19]Box 2.1 provides a discussion of this issue.

[20]A country is classified as a commodity exporter (using data available for 1962–2014) if (1) commodities constitute at least 35 percent of its total exports and (2) net exports of commodities are

studies are carried out to shed light on how actual and potential output growth have behaved during and after prolonged upswings in the commodity terms of trade. The event study findings provide an overview of the main regularities in the data. However, event studies do not control for contextual factors (such as the broader effects of global demand booms that often accompany prolonged upswings in international commodity prices). Therefore, in the second step, the analysis uses a regression approach to isolate the impact of changes in the terms of trade by controlling for relevant contextual factors, such as output growth in trading partners.

To capture the country-specific impact of global commodity price movements, the analysis focuses on the commodity terms of trade by weighting the global prices of individual commodities according to country-specific net export volumes.[21] This approach has two advantages compared with a focus on the changes in the global price of a country's most important export commodity. First, few of the non-oil commodity exporters are so specialized that focusing on the price of a single commodity would be representative of the changes in their terms of trade. Second, the approach recognizes that fluctuations in commodity prices affect countries differently depending on the composition of both their exports and their imports. For instance, despite the upswing in food and raw materials prices in the 2000s, many agricultural commodity exporters did not experience terms-of-trade windfalls given the even stronger surge in their oil import bills.

Event Studies of Commodity Cycles with Pre-2000 Peaks

Since the recent declines in commodity prices have occurred after an unusually prolonged boom phase, the event studies focus on past episodes of *persistent* upswings in the commodity terms of trade (Figure 2.7).[22] Event studies are carried out for the cycles with peaks before 2000 because the end of the downswing phase cannot yet be identified for the post-2000 upswings. In this sample, the commodity terms of trade increased by 63 percent on average during upswings and declined by 24 percent on average over the subsequent downswings. On average, upswings are eight years long for extractive commodities and five years long otherwise.

The event studies confirm that output and domestic spending tend to grow faster during upswings in commodity terms of trade than in downswings. The variation in investment growth—both private and public—is particularly pronounced (Figure 2.8, panel 1).[23] Investment and consumption contribute about equally to the difference in the growth of real GDP, as the stronger response of investment makes up for its smaller share in overall spending.

Factors supporting domestic demand, such as credit to the private sector and overall government spending, tend to expand more strongly in upswings than in downswings (Figure 2.8, panel 2).[24] Somewhat surprisingly, the real effective exchange rate in the identified episodes did not appreciate during the average pre-2000 upswing.[25] However, breaking the sample into episodes involving countries with fixed versus flexible

at least 5 percent of its gross trade (exports plus imports) on average. A list of the countries and their shares of commodity exports is provided in Annex Table 2.1.2. Exporters of energy commodities and metals represent slightly more than 70 percent of the countries in the sample.

[21]See Annex 2.1 for details. This approach follows Gruss 2014 and builds on earlier work on gross country-specific commodity export price indices in Deaton and Miller 1996, IMF 2006, and Spatafora and Tytell 2009. Previous studies have used either price indices of individual commodities or standard terms-of-trade measures (exceptions include Deaton and Miller 1996, Dehn 2000, Cashin, Céspedes, and Sahay 2004, Céspedes and Velasco 2012, and Gruss 2014). Most of the previous studies have focused on price changes of at least a given magnitude, rather than a given duration, and on samples of disjointed price increases or decreases.

[22]Commodity price cycles are identified using an asymmetric Bry-Boschan Quarterly algorithm, following Harding and Pagan 2002 (Figure 2.7 presents three examples). Details of the algorithm are in Annex 2.2. Annex 2.3 provides further details of the event study analysis.

[23]During upswings, real GDP has grown about 1.5 percentage points more a year than in downswings, real consumption about 2.0 to 2.5 percentage points more, and investment about 8.0 to 8.5 percentage points more. Differences are statistically significant at the 5 percent level for all of these variables.

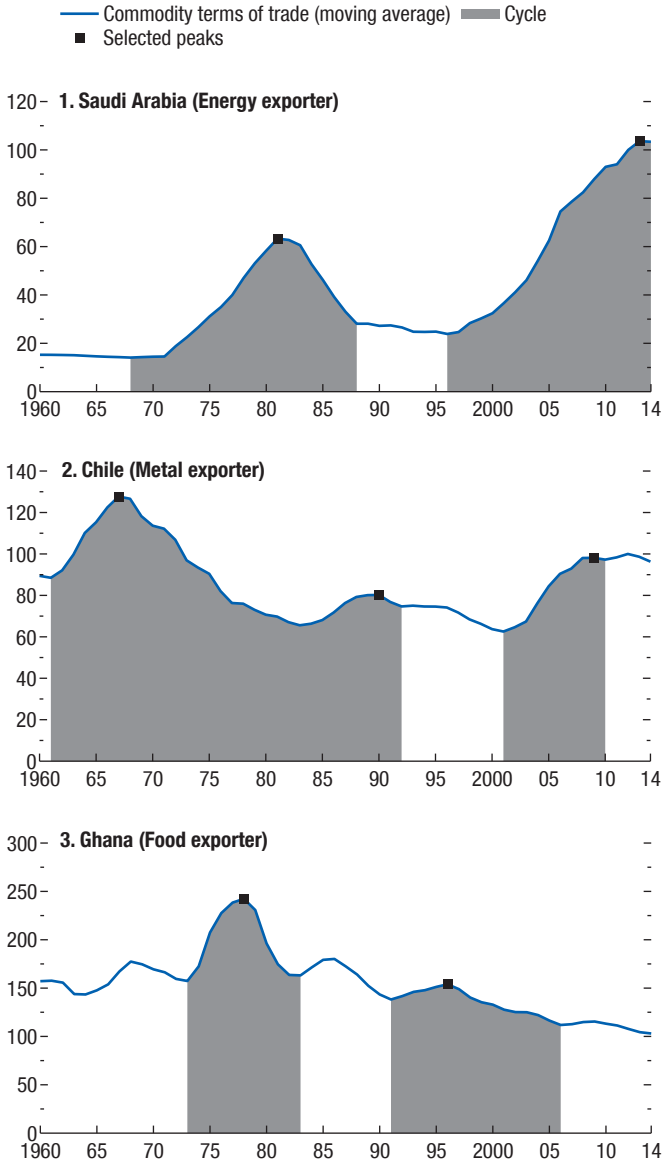
[24]Husain, Tazhibayeva, and Ter-Martirosyan (2008) examine a sample of 10 oil exporters and find that oil price changes affect the economic cycle only through their impact on fiscal policy. Their results are particularly stark for Gulf Cooperation Council countries, in which all oil income accrues to the state. An interesting question is whether governments use the windfall gains to invest in human as well as physical capital. In the absence of consistently measured cross-country data on education and health spending, Box 2.3 examines whether terms-of-trade booms are associated with improved education and health outcomes.

[25]This pattern, however, holds only for the cycles with peaks before 2000. During the pre-2000 upswings, factors other than the commodity terms of trade appear to have dominated the movements in the real exchange rate. By contrast, the most recent upswing is more in line with priors, showing about 2.0 to 2.5 percent average real appreciation a year. Regression analysis presented in Box 2.1 using data for 1970–2007 finds that the real exchange rate appreciates following increases in the commodity terms of trade.

Figure 2.7. Identification of Cycles in the Commodity Terms of Trade: Three Country Examples

(Index, 2012 = 100)

The event studies focus on the behavior of variables during commodity terms-of-trade cycles with prolonged upswings that peaked before 2000. On average, those upswings were eight years long for exporters of extractive commodities and five years long otherwise, and the commodity terms of trade improved by 63 percent.

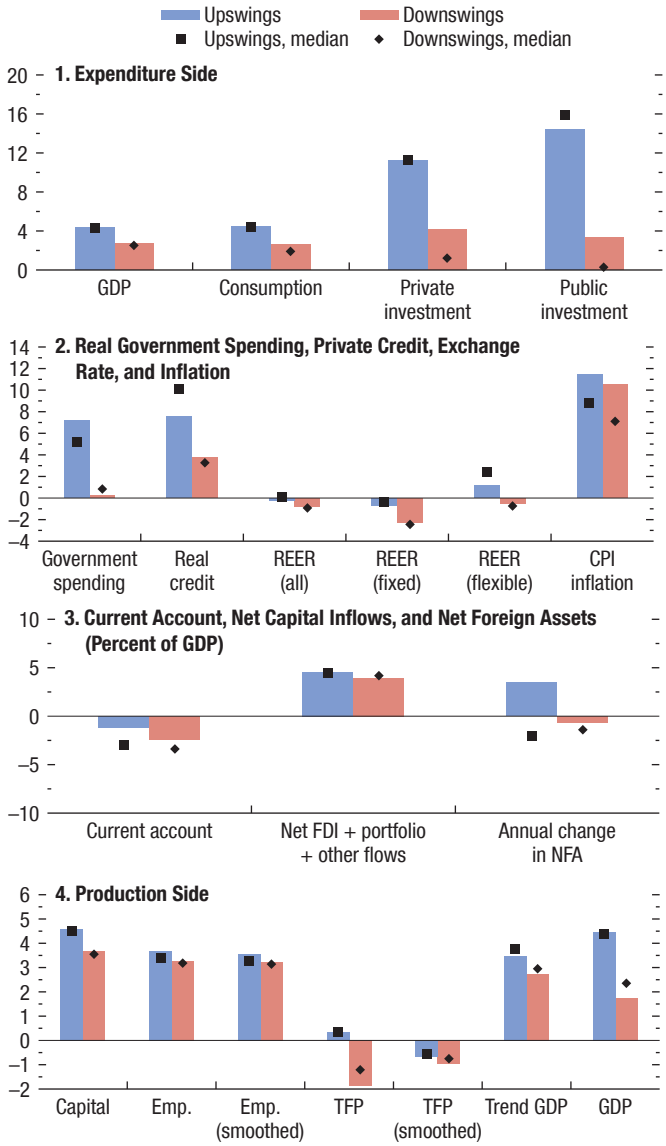


Sources: Gruss 2014; IMF, Primary Commodity Price System; U.S. Energy Information Administration; World Bank, Global Economic Monitor database; and IMF staff calculations.
Note: The definition of the commodity terms of trade is given in Annex 2.1. The algorithm for selecting the cycles is described in Annex 2.2. The portion of a cycle before (after) the peak is referred to as an upswing (downswing).

Figure 2.8. Event Studies: Average Annual Growth Rates of Key Macroeconomic Variables during Commodity Terms-of-Trade Upswings and Downswings

(Percent, unless noted otherwise)

Output and domestic spending tend to grow faster during upswings in the commodity terms of trade than in downswings. The growth of trend output tends to vary as well, as capital accumulation comoves with the terms of trade. Credit to the private sector and government spending expand faster during upswings, and net capital inflows tend to be higher.



Sources: External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007 and updates thereafter); IMF, Balance of Payments Statistics database; IMF, Fiscal Monitor database; IMF, International Financial Statistics database; Penn World Table 8.1; and IMF staff calculations.
Note: Samples consist of cycles with peaks before 2000. They are balanced across upswings and downswings, but differ across panels depending on data availability. See Annex 2.2 for the cycle identification methodology. The exchange rate classification is based on Reinhart and Rogoff 2004. See Annex 2.3 for details. CPI = consumer price index; Emp. = employment; FDI = foreign direct investment; NFA = net foreign assets; REER = real effective exchange rate; TFP = total factor productivity.

exchange rate regimes reveals that flexible regimes have been associated with currency appreciations during upswings (and depreciations during downswings), as would be expected, whereas depreciations have occurred in fixed regimes during both upswings and downswings.

The behavior of external accounts provides some additional evidence that financing constraints loosen during upswings. Even though outflows in the form of official reserves and foreign direct investment rise when commodity prices are high, net commodity exporters have received, on average, slightly higher net capital inflows during upswings than during downswings (Figure 2.8, panel 3). Given the higher net inflows, no general tendency toward improved net foreign asset positions has been observed for upswings, even though, as expected, current account balances have been stronger in those episodes. Specifically, the average ratio of net foreign assets to GDP has tended to rise during upswings, a result driven by a few oil exporters, while the median ratio has tended to decline more in upswings than in downswings.

A growth-accounting perspective highlights the key supply-side factors behind the cycle in output growth. Aggregate production factors (capital and labor) and TFP have tended to move in tandem with the changes in the commodity terms of trade (Figure 2.8, panel 4). The comovement is particularly strong for the rate of change in the capital stock, which is consistent with the substantially faster growth in investment spending during upswings. The variation in employment growth is driven by Latin America, where employment has grown 1.5 percentage points more during upswings than in downswings.

The growth rate of trend output—calculated using estimates of the actual capital stock and smoothed employment and TFP series—is considerably smoother than that of actual output.[26] In line with the model-based predictions, trend output growth weakens during downswings relative to upswings, but it does so with less vigor than actual output growth. Annual actual output growth has tended to be 1.0 to 1.5 percentage points higher on average during upswings than in downswings, whereas potential output growth has tended to be only 0.3 to 0.5 percentage point higher. The fact that inflation tends to be higher during upswings than in downswings (Figure 2.8, panel 2) corroborates the notion of a smaller amount of slack in the economy during upswings. As discussed in Box 2.4, the experience of six commodity exporters provides evidence of increasing output gaps during the uninterrupted phase of the commodity boom in the first decade of the 2000s.

The exchange rate regime, cyclicality of fiscal policy, and depth of financial markets have a bearing on the difference in growth between upswings and downswings (Figure 2.9). Countries with fixed exchange rates tend to experience stronger variation in growth relative to countries with flexible exchange rates. This is consistent with the notion that a more flexible exchange rate tends to act as a shock absorber and cushion the domestic effects of terms-of-trade shocks. Likewise, the difference in the growth rate of output between upswings and downswings is larger in countries with more procyclical fiscal spending.[27] Countries with a lower level of credit to the private sector (relative to GDP) also exhibit stronger variation in growth. The growth slowdown in these countries is sharper during downswings, probably because they experience a greater tightening of borrowing constraints when commodity prices decline than do countries with greater financial depth.[28]

Commodity exporters differ across many other dimensions—in terms of the weight of commodities in their aggregate production, the nature of the commodities they export (for example, exhaustible versus renewable resource bases), and their levels of economic and institutional development. As could be expected, the growth patterns described previously are more marked for economies that are less diversified, that is, those in which commodity exports account for a larger share of GDP. They are also clearer for exporters of extractive commodities, whose economies tend to be less diversified and face more persistent commodity terms-of-trade cycles. Low-income countries have less procyclical fiscal spending and a slightly lower degree of commodity intensity in production but also less flexible exchange rates and lower levels of financial development. They exhibit greater variability in their

[26]Employment and TFP are smoothed using a standard Hodrick-Prescott filter on annual data; the capital and labor shares are from Penn World Table 8.1.

[27]Some correlation between fiscal spending and commodity prices may be optimal. Cycles are classified here as having more procyclical fiscal policy if the correlation between the growth of real spending and the change in the commodity terms of trade is greater than the sample median.

[28]This result is not driven by the variation in the level of economic development, which tends to be correlated with financial depth.

growth rates for investment, employment, and TFP compared with emerging market economies, but the differences between the two groups are not statistically significant (Annex 2.3).

The Boom of the 2000s

The event studies of commodity price cycles with pre-2000 peaks provide evidence that is highly relevant for the current downswing in commodity exporters. Nevertheless, the most recent commodity price boom was different in a number of dimensions from the earlier booms. In particular, this boom entailed a larger upswing in the terms of trade, especially for commodity exporters specializing in energy and metals.[29] The main reason for the difference is the greater number of oil exporters in the recent upswing, for reasons of data availability or more recent oil discovery and development.

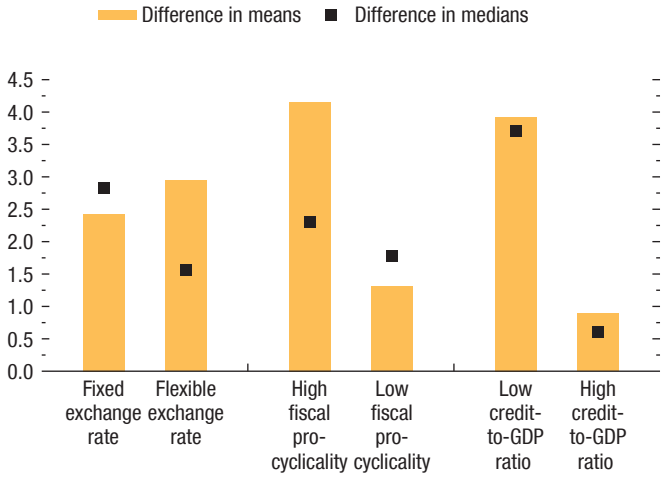
Nonetheless, the average annual growth rates of key macroeconomic variables during the most recent upswing were very similar to those in the pre-2000 upswings (Figure 2.10). However, investment and, accordingly, capital accumulation and trend growth were somewhat lower in the most recent upswing than in previous upswings. Increases in real credit and government spending were also slightly lower.

Improvements in their macroeconomic policy frameworks and financial depth since the earlier episodes have put commodity exporters in a better position to deal with a downswing. Fiscal policy was considerably less procyclical during the most recent upswing: the correlation of government spending growth with changes in the commodity terms of trade fell to half of what it was in the pre-2000 episodes. Reduced procyclicality is consistent with the finding of greater fiscal savings out of commodity-based revenues in the 2000s, as reported in Chapter 1 of the October 2015 *Fiscal Monitor*. Financial depth and the extent of exchange rate flexibility, which in past downswings were associated with a smaller drop in output growth, have also increased in most commodity exporters.

[29]For the sample of net exporters that experienced at least two upswings in our data sample—one in the 2000s and at least one in the 1960–99 period—the cumulative net terms-of-trade increase averaged slightly more than 70 percent in the 2000s, compared with 50 percent in past episodes. When all net exporters—not only those that recorded a pre-2000s upswing—are included, the average cumulative increase in the commodity terms of trade in the 2000s was even sharper, about 140 percent.

Figure 2.9. Variation in Average Output Growth between Upswings and Downswings: The Role of Policy Frameworks and Financial Depth
(Percentage points)

Commodity-exporting countries with more flexible exchange rates, less procyclical fiscal policy, and a higher level of credit to the private sector exhibit less growth variation over commodity price cycles.



Sources: IMF, Fiscal Monitor database; IMF, International Financial Statistics database; Penn World Table 8.1; and IMF staff calculations.
Note: The bars (blocks) show the difference between the average (median) growth rates during upswings and subsequent downswings. The exchange rate regime classification is based on Reinhart and Rogoff 2004. See Annex 2.3 for details. An episode is classified as having high fiscal policy procyclicality if the correlation between real government spending growth and the change in the smoothed net commodity terms of trade during the cycle is higher than the overall sample median (and having low fiscal policy procyclicality otherwise). A country is classified as having a high credit-to-GDP ratio if credit to the private sector (as a share of GDP) during the upswing is higher than the sample median (and having a low credit-to-GDP ratio otherwise).

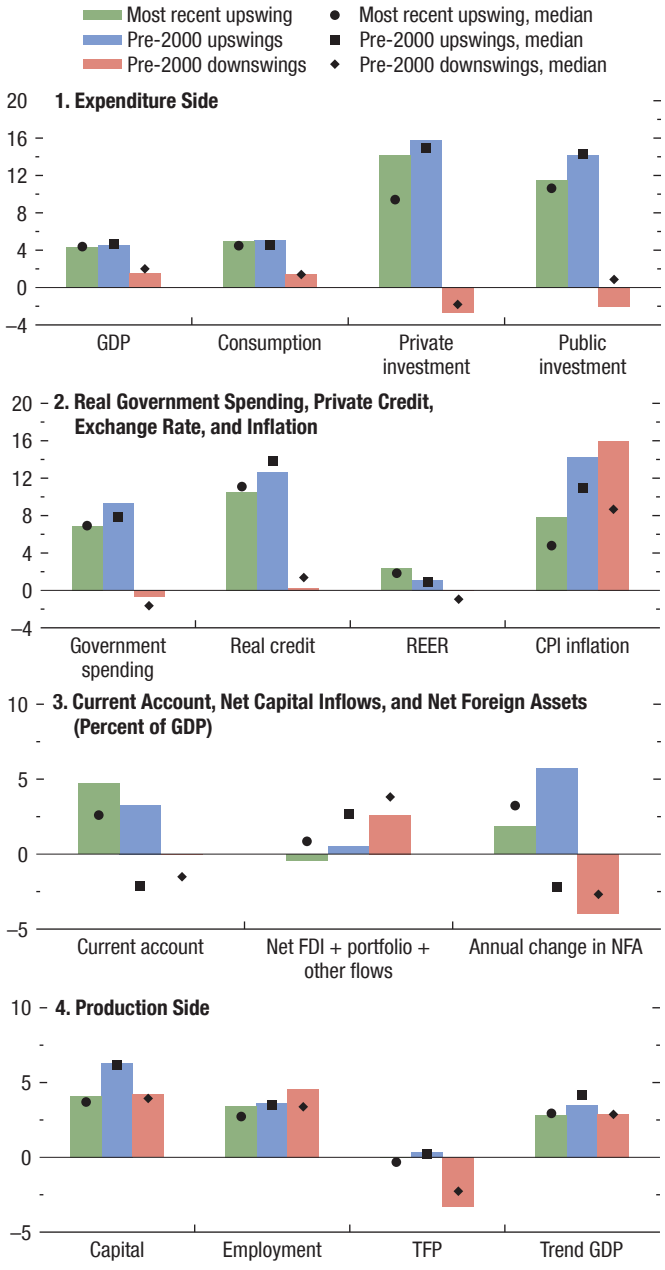
Commodity exporters are entering the current downswing with stronger external positions as well. The median annual current account balance and the average annual change in the net foreign asset position were 5 percentage points of GDP stronger in the 2000s upswings than earlier.

In sum, the larger increase in commodity prices in the 2000s could potentially presage sharper terms-of-trade downswings for some commodity exporters (beyond the decline already experienced) and therefore lead to sharper reductions in actual and potential growth. At the same time, stronger external positions, more robust policy frameworks, and more developed financial markets could help mitigate some of the growth impacts.

Figure 2.10. Most Recent Upswing: Average Real Growth Rates during Upswings and Downswings

(Percent, unless noted otherwise)

The most recent upswing in the commodity terms of trade was longer and larger than the upswings with pre-2000 peaks, notably for energy exporters, but it coincided with average annual growth rates in key macroeconomic variables that were similar to those in the earlier booms.



Sources: External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007 and updates thereafter); IMF, Balance of Payments Statistics database; IMF, Fiscal Monitor database; IMF, International Financial Statistics database; Penn World Table 8.1; and IMF staff calculations.

Note: Restricted samples of 17 (panel 1), 21 (panels 2 and 3), or 20 (panel 4) countries, each with one pre-2000 and one post-2000 cycle peak. See Annex 2.2 for the cycle identification methodology. CPI = consumer price index; FDI = foreign direct investment; NFA = net foreign assets; REER = real effective exchange rate; TFP = total factor productivity.

Regression Analysis

This subsection examines the responses of key macroeconomic variables to changes in the terms of trade.[30] The estimations control for global time effects and partner country GDP growth, as well as political regime change and conflict.

The estimation results suggest that terms-of-trade shocks have positive, statistically significant, and fairly long-lasting effects on output (Figure 2.11). A 10 percentage point increase in a country's commodity terms of trade is found to lead to a slightly more than 1 percentage point increase in GDP after three years. The effect gradually subsides, but remains statistically significant, over a horizon of up to five years. The estimates suggest that the effects of negative shocks are somewhat larger and more persistent than those of positive shocks. Nonetheless, the analysis cannot statistically reject the possibility that output responds symmetrically to positive and negative changes in the commodity terms of trade.

Turning to the spending side, both consumption and investment respond positively and with statistical significance to commodity terms-of-trade shocks over a seven-year period. The average response of total fixed investment is almost double that of consumption. The positive response of public investment is more immediate and long lasting than that of private investment.

On the production side, shocks to the commodity terms of trade raise capital accumulation over the medium term in line with the estimated persistent response of investment. The capital stock increases (or decreases) steadily for seven years after the shock by a cumulative 1 percentage point. In contrast, the impacts on labor supply and TFP are muted. The response of employment is not statistically significant. The impact on TFP is only weakly significant in the first two years after the shock, which could reflect a cyclical deterioration in the Solow residual relative to its underlying trend, as seen in the event studies. Overall, these results are consistent with the event study findings, which suggest that commodity terms-of-trade shocks affect potential output mainly by raising capital accumulation.[31]

[30]The analysis uses the local projection estimation method proposed in Jordà 2005. This method does not impose the dynamic restrictions embedded in vector autoregression specifications and is therefore suited to estimating nonlinearities in the dynamic response. Annex 2.4 provides details of the estimation methodology.

[31]The estimation does not distinguish between supply-driven and demand-driven changes in the commodity terms of trade. Chapter 3

The response of output to terms-of-trade shocks is stronger among low-income developing countries than in emerging market economies (Figure 2.12). Terms-of-trade shocks are estimated to have a more rapid effect on growth in countries specializing in extractive commodities. In contrast, they take longer to build but appear more persistent for countries specializing in nonextractive commodities. Given the smaller sample and more varied responses, the estimates for the latter group are not statistically significant.

What do the estimated responses of output growth to the commodity terms of trade imply for the growth outlook for commodity exporters? To answer this question, projections for the country-specific commodity terms-of-trade indices through 2020 were constructed using the forecasts for international commodity prices.[32]

On average, the weaker outlook for commodity prices implies that the annual growth of output for net commodity exporters will decline further, by almost 1 percentage point in 2015–17 compared with 2012–14. The results differ sizably among the different types of commodity exporters. Most notably, reflecting a relatively larger decline for energy prices, the reduction in growth for energy exporters is projected to be about 2¼ percentage points over the same period.[33] The effect of commodity prices on capital accumulation implies a reduction in the growth of potential output as well. Based on the estimated response of capital accumulation to the commodity terms of trade, the projected decline in the growth of potential output in 2015–17 compared with 2012–14 is about ⅓ percentage point on average and ⅔ percentage point for energy exporters.

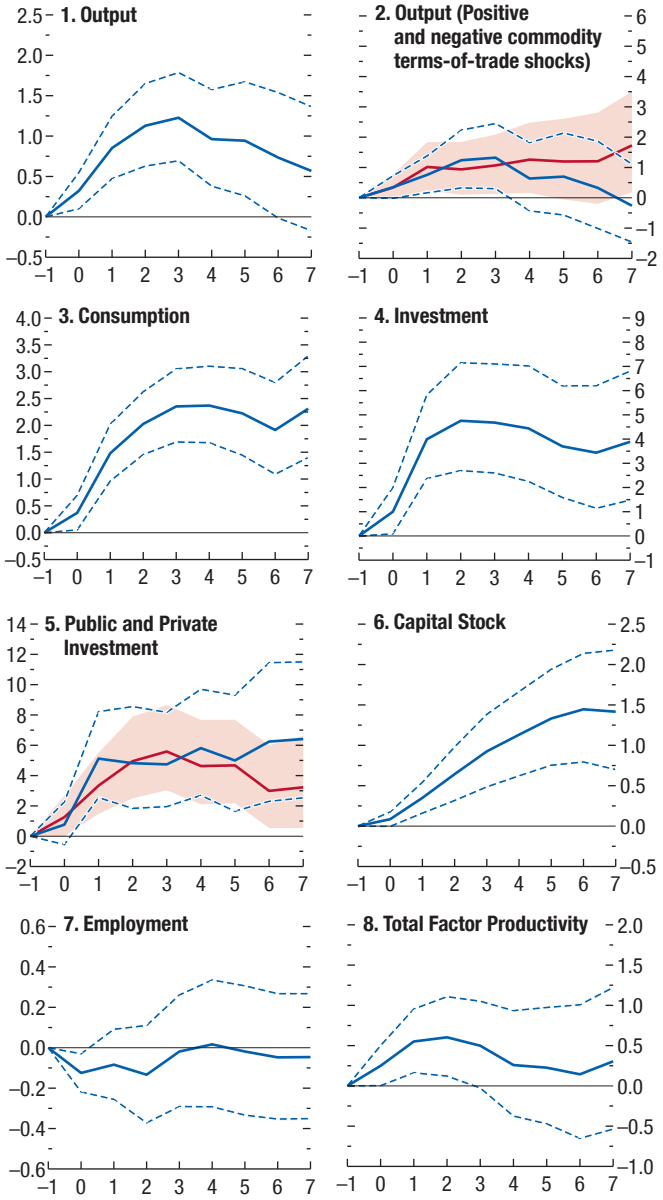
Sectoral Reallocation during Commodity Booms: Case Studies

Theoretical studies predict that the composition of economic activity will change following a boom

Figure 2.11. Macroeconomic Variables in the Aftermath of Commodity Terms-of-Trade Shocks

(Percentage points; years on x-axis)

Terms-of-trade shocks have positive, fairly long-lasting, and symmetric effects on output. Consumption and investment respond positively to an increase in the terms of trade. On the production side, capital accumulation rises, whereas the responses of labor supply and total factor productivity are muted.



Source: IMF staff estimates.
Note: $t = 0$ is year of the shock; dashed lines and shaded areas denote 90 percent confidence bands. In panels 1 and 3–8, solid lines represent the response of the variable to an exogenous 10 percentage point increase in the commodity terms of trade. In panel 2, the blue (red) solid line denotes the response to an exogenous positive (negative) 10 percentage point change in the commodity terms of trade. In panel 5, the blue (red) solid line denotes the response of public (private) investment. See Annex 2.4 for the estimation methodology.

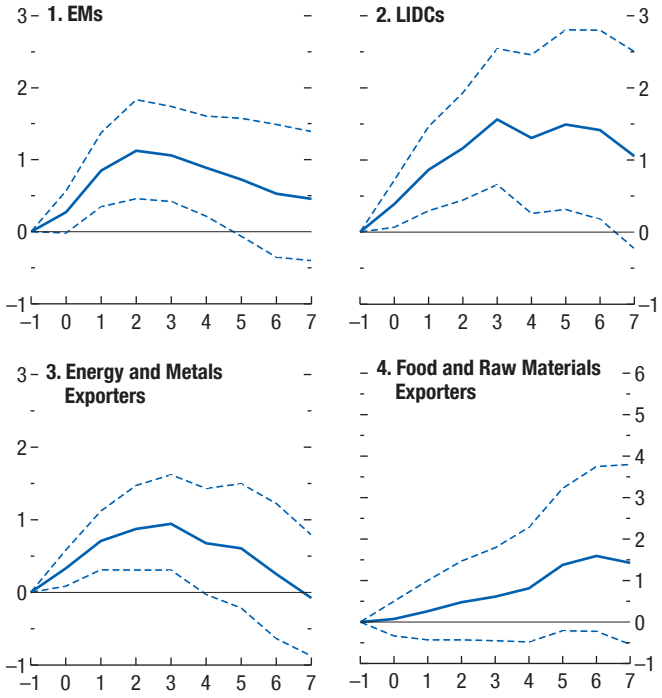
of the April 2012 *World Economic Outlook* finds the output responses to demand-driven commodity price shocks to be somewhat larger than the responses to supply-driven shocks, but with no statistically significant difference.

[32]Output projections for all the countries in the sample were then generated, feeding the relevant historical data and the forecasts for the terms of trade into the impulse response functions for output under the main specification.

[33]These projections assume that all other factors are unchanged and therefore are not equivalent to regular *World Economic Outlook* forecasts, which take other factors into account.

Figure 2.12. Output in the Aftermath of Commodity Terms-of-Trade Shocks: Role of Income Level and Type of Commodity
(Percentage points; years on x-axis)

Terms-of-trade shocks have stronger effects on output in low-income developing countries than in emerging market economies. The shocks are estimated to have a more rapid effect on output in countries specializing in the export of extractive commodities.



Source: IMF staff estimates.
Note: $t = 0$ is year of the shock; dashed lines denote 90 percent confidence bands; solid lines represent the response of the variable to an exogenous 10 percentage point increase in the commodity terms of trade. EM = emerging market; LIDC = low-income developing country.

in the commodity terms of trade, with a reallocation of output and factors from the manufacturing sector toward the commodity and nontradables sectors.[34] These predictions of the Dutch disease effect are also borne out in the model simulations presented earlier in this chapter. The sectoral reallocation could shift the share of sectors in overall output; to the extent that TFP levels and growth rates differ across sectors, the change in sectoral shares could affect the economy's overall TFP growth rate. The sectoral reallocation patterns are thus relevant to country growth prospects in the aftermath of the boom, but data constraints make them challenging to examine for a large set of countries.

This section uses data from the Latin America KLEMS and World KLEMS data sets to examine patterns of sectoral reallocation and their implications for aggregate TFP growth in three commodity exporters with well-established macroeconomic policy frameworks—Australia, Canada, and Chile—during the commodity boom of the 2000s.[35] The analysis seeks to answer the following questions:

- How did the growth rates of sectoral capital and labor stocks change during the boom period (2000–10) relative to the preboom period (1990–99)? Which sectors contributed the most to changes in the growth rates of aggregate investment and employment?
- Were the shifts in the relative shares of nontradables and manufacturing in economy-wide output and factor stocks different from those in commodity importers over the same period?
- Did the reallocation of output across sectors during the boom have an effect on the growth rate of TFP?

Background

The surge in global commodity prices in the first decade of the 2000s led to commodity terms-of-trade gains for Australia, Canada, and Chile given their relatively large extractive industries: coal and iron ore in Australia, oil and natural gas in Canada, and copper in Chile. Among these three countries, the relative share of the commodity sector is largest in Chile, closely followed by Australia, and is the smallest in Canada (Table 2.1). Australia and Chile enjoyed larger terms-of-trade gains over the decade than Canada (Figure 2.13). Chile experienced the smallest real appreciation of its currency over the boom period, while Canada's real appreciation was the largest relative to its terms-of-trade gain.

In line with the model-based predictions, the rate of income growth exceeded the rate of output growth in all three countries during the boom. Domestic demand grew in line with incomes, if not more than incomes. Invest-

[34]Recent case studies of sectoral change among commodity exporters include Francis 2008; Steenkamp 2014; Bjørnland and Thorsrud, forthcoming; and Fornero, Kirchner, and Yany 2014.

[35]The analysis uses case studies and focuses on the most recent boom because comparable data on sectoral output, capital, and labor stocks are available for only a very small subset of commodity-exporting emerging market and developing economies for limited periods. KLEMS databases have been set up to promote and facilitate the analysis of growth and productivity patterns around the world, based on a growth-accounting framework at a detailed industry level.

Table 2.1. Commodity Exports

	Period	Australia	Canada	Chile
Share of Total	1990–2000	44.3	24.3	52.1
	2000–10	47.1	27.8	56.6
Share of GDP	1990–2000	7.3	7.9	13.3
	2000–10	8.8	9.5	21.1

Source: IMF staff calculations.

ment as a share of GDP rose strongly in all three cases, surpassing the change in savings as a share of GDP.

Did Capital and Labor Reallocate toward the Commodity and Nontradables Sectors?

In all three countries, there was a clear pickup in the growth rates of both capital and labor in the extractive sector during the boom period.[36] Higher investment in the sector accounted for the bulk of the increase in economy-wide investment in Australia and Chile. But the broader changes in investment and employment growth across the commodity, manufacturing, and nontradables sectors did not always conform to the model-based predictions. Contrary to those predictions, in Australia the pace of capital accumulation in manufacturing picked up during the boom period, reflecting in part strong demand from export markets (mainly east Asia), while it declined in the nontradables sector.[37] In Chile, manufacturing employment growth increased during the boom, while capital accumulation slowed in nontradables. Canada is the only case among the three countries in which the sectoral factor accumulation patterns consistently favored the extractive and nontradables sectors: both the pace of capital accumulation and employment levels fell in the Canadian manufacturing sector during the boom, while those in the extractive and nontradables sectors increased (Figure 2.14).

Were the Shifts between Manufacturing and Nontradables Different from Those in Commodity Importers?

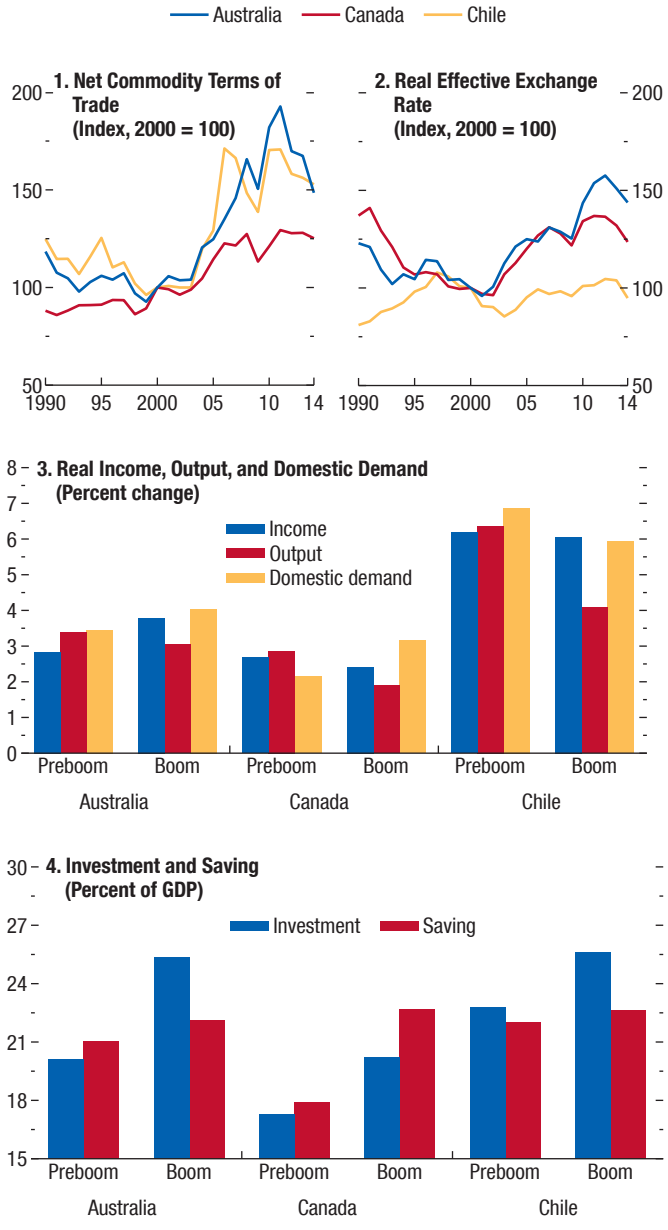
The reallocation of activity from manufacturing toward nontradables in the 2000s was not unique to

[36]To analyze sectoral shifts arising from the commodity boom, the economy is disaggregated into three sectors: extractive industries (fuels and mining), manufacturing, and nontradables. Agriculture is omitted for simplicity—it accounts for 2 to 4 percent of aggregate value added in the three countries studied.

[37]In the 2000s, manufacturing exports to east Asia accounted for more than one-third of total manufacturing exports in Australia, about 15 percent in Chile, and about 5 percent in Canada.

Figure 2.13. Commodity Booms and Macroeconomic Indicators in Australia, Canada, and Chile

Australia, Canada, and Chile experienced commodity terms-of-trade booms in the first decade of the 2000s. In that period, the three countries differed in the extent of their real currency appreciation, but in all three, real incomes grew faster than real output, and investment picked up strongly.

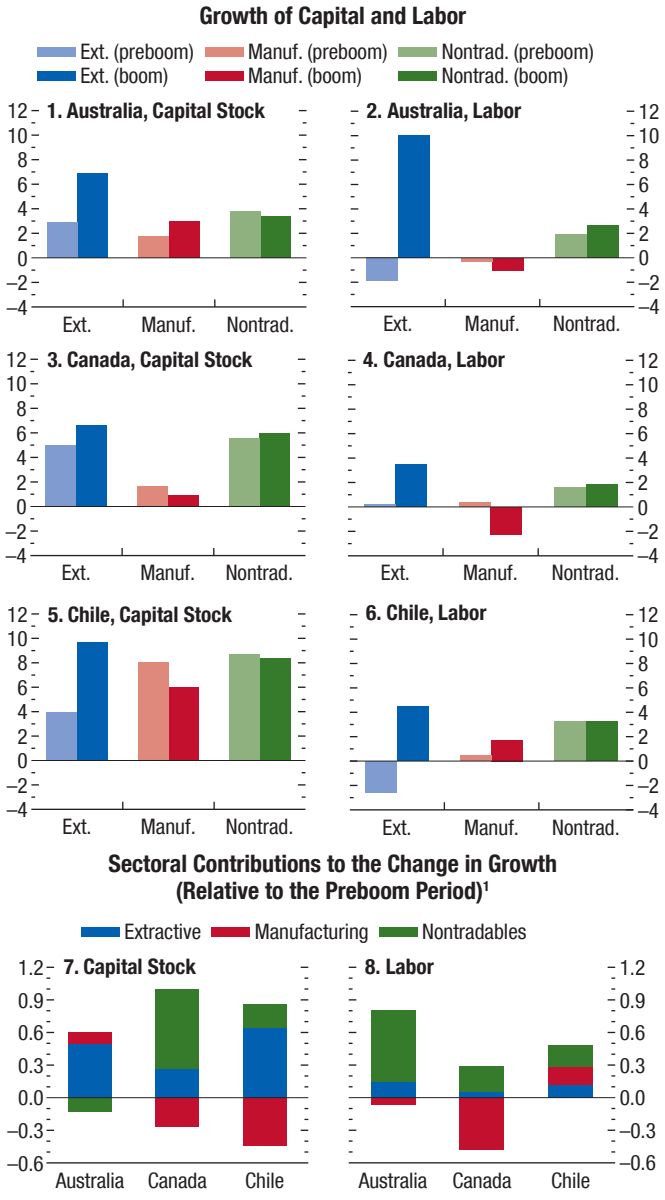


Source: IMF staff calculations.
Note: Preboom is 1990–2000; boom is 2000–10. In panel 3, bars show annualized average growth rates during the specified periods. In panel 4, bars are annual averages over the specified periods.

Figure 2.14. Growth of Capital and Labor by Sector: Boom versus Preboom Periods

(Average annual percent change)

In Australia, Canada, and Chile, the 2000–10 commodity boom period coincided with a clear increase in both capital and labor in the extractive sector; in Australia and Chile, that sector accounted for the bulk of economy-wide capital accumulation in the period. Labor and capital in the three countries did not shift notably into the nontradables sector.



Sources: Hofman and others 2015; Latin America KLEMS; World KLEMS; and IMF staff calculations.

Note: Preboom is 1990–2000; boom is 2000–10. The contributions of the agriculture sector are small and not shown. Ext. = extractive; Manuf. = manufacturing; Nontrad. = nontradables.

[1]The change in the growth of capital and labor relative to the preboom period is decomposed into sectoral contributions. A sector's contribution to the change in growth is calculated as the annual growth of capital or labor multiplied by the weight of that sector in the total capital and labor stock and averaged across the 10-year period.

the commodity-exporting economies; many advanced economies have experienced a similar shift during the past three decades. Thus, to draw definitive conclusions on whether the boom of the 2000s accelerated the reallocation of activity toward nontradables in commodity exporters, it is useful to examine whether the shift was stronger than in commodity importers. The data indeed suggest that the three commodity exporters considered here saw a faster reallocation of output shares toward nontradables during the boom relative to importers (Figure 2.15, panel 1). But only in Canada did this represent a change relative to the preboom years; in Australia and Chile, the faster reallocation toward nontradables represented a continuation of a preexisting trend. Data on factors of production paint an even more mixed picture: only in the case of labor in Canada is there a steepening in the trend relative to importers during the boom period (Figure 2.15, panels 2 and 3). In sum, benchmarking against the experience of commodity importers suggests little evidence of a faster shift from manufacturing toward nontradables activities during the boom among the three countries studied, except in Canada. The evolution of house prices offers a slightly different view: in all three countries, especially Canada, real house prices rose faster than the average real house price in commodity importers, providing some evidence of relative strength in nontradables activities during the boom period (Figure 2.15, panel 4).

The different patterns of sectoral reallocation across the three countries can be attributed in part to the destination of their export manufacturing products. Among the countries, Australia—which saw a pickup in manufacturing investment during the boom period—sent a relatively larger share of its manufacturing exports to east Asia, particularly China, on the eve of the boom. In contrast, the majority of Canada's manufacturing exports went to the United States, where manufacturing output growth slowed in the 2000s. As highlighted in Box 2.1, to the extent that booms in commodity prices coincide with strong global activity, Dutch disease effects in commodity exporters could be offset, especially if the manufacturing sector has trade linkages with the faster-growing regions.

Did the Reallocation of Activity Hamper Aggregate TFP Growth?

The evidence on sectoral growth rates of output, capital, and labor points to unambiguous shifts toward

the commodity sector as well as shifts—though not as consistent—toward nontradables activities. To examine whether these changes had an impact on economy-wide TFP growth, the latter is decomposed into within-sector and between-sector effects, applying the decomposition in Dabla-Norris and others 2015.[38]

Data from Latin America KLEMS and World KLEMS indicate that aggregate TFP growth declined in all three case study countries during the commodity boom relative to the previous decade and even turned negative in Australia and Chile. The decomposition indicates that this decline was entirely due to the within-sector effect (Figure 2.16, panels 1, 3, and 5). The between-sector effect in fact attenuated the decline in TFP. This finding of a negative contribution from the within-sector effect holds more broadly for Latin American economies (Aravena and others 2014; Hofman and others 2015).

Declining TFP growth in extractive industries and manufacturing appears to be a common factor behind the weak within-sector TFP performance in all three cases (Figure 2.16, panels 2, 4, and 6). A marked decline in TFP growth in nontradables was also a key driver in Australia and Chile. The weak TFP growth in the extractive sectors during the boom is likely to have resulted from the time-to-build associated with large-scale mining investments and the tapping of less efficient mines (Figure 2.17) (see Francis 2008). The remoteness of extractive production sites may have contributed to higher marginal costs in the supporting nontradables service industries.

In summary, the case studies point to substantial heterogeneity across countries in terms of sectoral reallocation patterns during commodity booms. While all three countries under study experienced a flow of factors of production into the commodity sector, they experienced varying degrees of reallocation between the manufacturing and nontradables sectors. The fact that the countries were exposed to different manufacturing export destinations (that were experiencing different

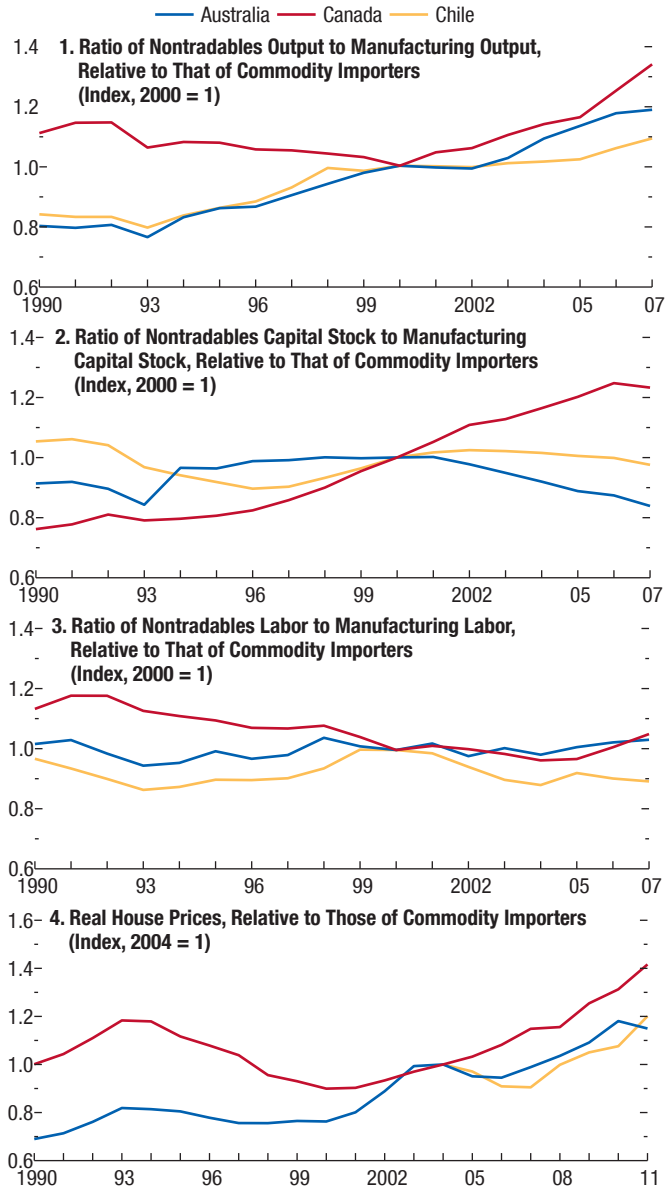
[38]The decomposition is based on the following specification:

$$tfp_t - tfp_{t-1} = \sum_i \omega_{i,t-1}(tfp_{i,t} - tfp_{i,t-1}) + \sum_i tfp_{i,t}(\omega_{i,t} - \omega_{i,t-1}),$$

in which i refers to the sectors of the economy (here, extractive commodities, manufacturing, and nontradables); tfp_t and $tfp_{i,t}$ refer to economy-wide and sectoral TFP, respectively; and $\omega_{i,t}$ is the share of real value added of sector i. The first term on the right side is the within-sector effect given by the weighted sum of TFP growth in each sector. The second term is the between-sector effect, which captures the effect of the sectoral reallocation of real value added on aggregate TFP growth.

Figure 2.15. Evolution of Activity in Nontradables Relative to Manufacturing, Commodity Exporters Relative to Commodity Importers

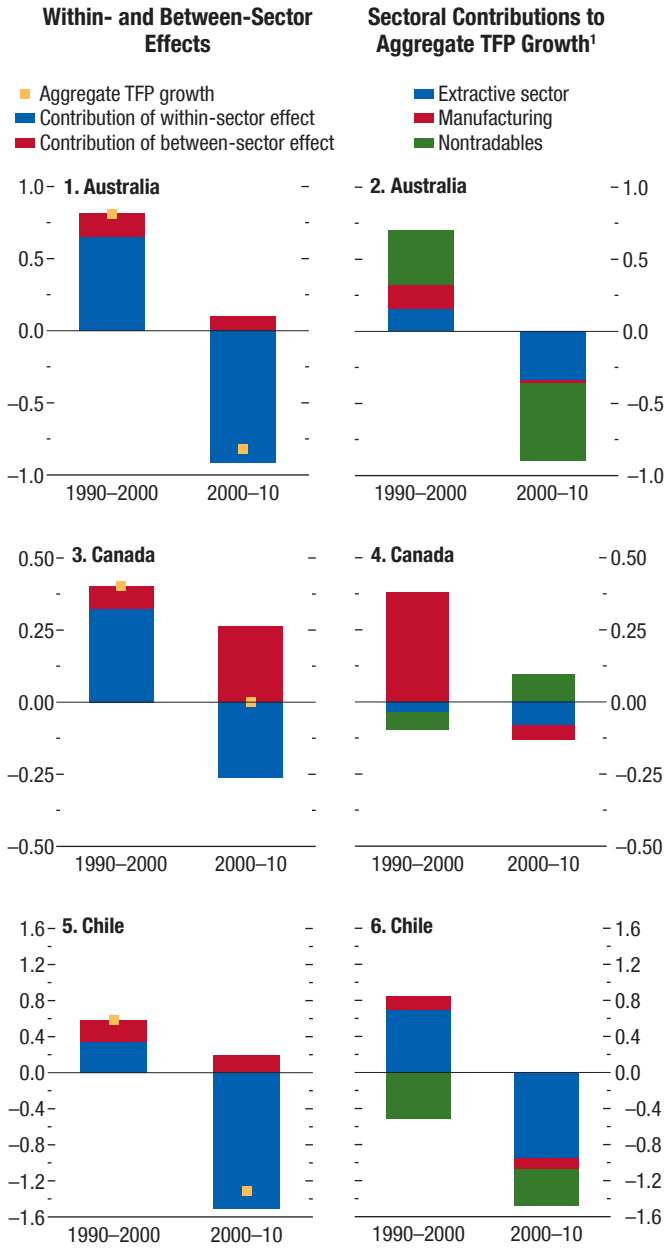
In Australia and Chile, the 2000–10 commodity boom did not accelerate the shift of output, capital, and labor shares from manufacturing into nontradables. House prices, however, grew more strongly in Australia, Canada, and Chile than in their commodity-importing peers.



Sources: Haver Analytics; Hofman and others 2015; Latin America KLEMS; national authorities; World KLEMS; and IMF staff calculations.
Note: Panels 1–3 show the evolution in commodity exporters of the ratios of output, capital, and labor in nontradables to those in manufacturing, scaled by the average ratio across a sample of commodity importers in the same year. An increase in the trend of a ratio beginning in 2000 relative to the pre-2000 trend indicates that the reallocation from manufacturing to nontradables in commodity exporters intensified relative to that in importers during the commodity boom. Panel 4 shows the evolution of real house prices in commodity exporters scaled by the average real house prices across commodity importers. The sample of commodity importers comprises Denmark, Finland, Germany, Japan, Sweden, the United Kingdom, and the United States.

Figure 2.16. Total Factor Productivity Growth Decompositions
(Percent)

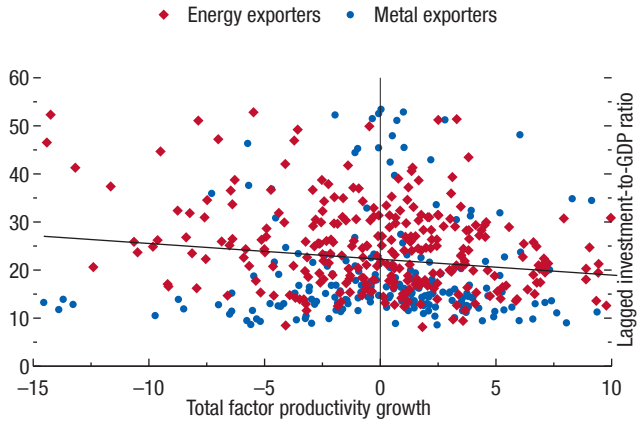
Economy-wide total factor productivity (TFP) growth slowed in Australia, Canada, and Chile during the 2000–10 commodity boom, with weak TFP growth in the extractive sector a common contributor to the economy-wide decline.



Sources: Hofman and others 2015; Latin America KLEMS; World KLEMS; and IMF staff calculations.
Note: The within-sector effect captures the contribution of TFP growth within the subsectors (extractive, manufacturing, and nontradables). The between-sector effect captures the contribution of sectoral reallocation.
[1]The contributions of the agriculture sector are small and not shown.

Figure 2.17. Investment and Total Factor Productivity Growth
(Percent)

In exporters of energy and metals, large increases in the investment-to-GDP ratio tend to be followed by weaker total factor productivity growth. This correlation is likely to partly reflect underutilized capital during the gradual buildup of large-scale projects in extractive industries.



Sources: Penn World Table 8.1; and IMF staff calculations.
Note: Sample of 18 commodity-exporting emerging market and developing economies. The data are Winsorized at the 1 percent level to reduce the influence of outliers. The correlation between the lagged investment-to-GDP ratio and total factor productivity growth is statistically significant at the 5 percent level.

rates of expansion) seems to have been a factor behind the varying intensity of sectoral reallocation; countries with trading linkages to faster-growing countries had more limited Dutch disease symptoms. Decompositions of economy-wide TFP growth do not suggest that sectoral reallocation hindered TFP growth during the commodity boom of the 2000s but instead point to a marked decline in productivity growth within sectors. Understanding the mechanisms behind the drop in TFP growth in these economies is an important area for future research.[39]

Conclusions

The evidence presented in this chapter suggests that fluctuations in international commodity prices, through their impact on domestic spending, can lead to sizable output fluctuations in commodity exporters. In exporters of energy and metals, the comovement between output and the commodity terms of trade tends to be particularly strong. It is also stronger in countries with lower levels of financial develop-

[39]Studies of this issue include Parham 2012 for Australia and Baldwin and others 2014 for Canada.

ment, more procyclical fiscal policies, and less flexible exchange rates.

The strong investment response to changes in the commodity terms of trade means that the latter affect not only actual output, but also potential output. As a result, the growth of potential output can be expected to decline during downswings in commodity prices. The change in the cyclical component of output is, however, about twice the size of the change in potential output, the structural component.

Against the backdrop of the recent declines in the commodity prices, the findings of this chapter suggest that the growth slowdown in commodity exporters mirrors experiences during earlier downswings. The slowdown could even be larger than those experienced in past episodes, since the terms-of-trade upswings that many exporters experienced in the first decade of the 2000s were much larger than earlier ones. As a result, they may have led to much larger increases in actual and potential output growth than in the past upswings analyzed in the chapter. If the terms-of-trade downswings are now also larger, the declines in growth would likely be correspondingly larger as well.

The chapter's regression-based analysis indeed suggests that the recent commodity price declines, together with the weak commodity price outlook, could subtract about 1 percentage point on average from the growth rate of commodity exporters in 2015–17 relative to 2012–14. For energy exporters, the reduction in growth could be even larger—about 2¼ percentage points on average. The projected drag on the growth of potential output is about ⅓ percentage point on average for commodity exporters and ⅔ percentage point on average for energy exporters.

At the same time, many commodity exporters have moved toward policy frameworks and structural characteristics that are more conducive to smoothing the macroeconomic effects of terms-of-trade fluctuations—less procyclical fiscal policies, more flexible exchange rates, and deeper financial systems. These changes could mitigate some of the growth impact of commodity price downswings.

The analysis in the chapter suggests that policymakers must avoid overestimating output gaps and the scope for expansionary macroeconomic policies to support demand. As commodity-exporting economies are likely to overheat toward the end of a prolonged surge in commodity prices, the growth slowdown in the immediate aftermath of the boom most likely reflects a cooling of output toward potential, which may itself be growing at a reduced pace, given a slowdown in investment. If indicators of slack show few signs of output having fallen below potential, expansionary monetary and fiscal policies are more likely to raise inflation than to sustainably raise investment and employment.

In countries where output has fallen below potential, supportive domestic demand policies could help avoid a costly underutilization of resources. But two considerations suggest that the drop in the commodity terms of trade may itself limit the scope to ease macroeconomic policies. First, in economies with some exchange rate flexibility, currency depreciation may have led to an easing of monetary conditions without a change in the stance of monetary policy; thus, any easing in the stance could risk further depreciation and unwelcome increases in inflation. In other economies, declining resource-based fiscal revenues may call for fiscal adjustment to secure debt sustainability. As also emphasized in Chapter 1 of the October 2015 *Fiscal Monitor*, these trade-offs highlight the need, during upswings, to build fiscal buffers that will help support the economy during downswings.

Although the comovement of potential output with the commodity terms of trade tends to be less pronounced than that of actual output, the analysis in this chapter suggests that declining growth of potential output exacerbates the postboom slowdowns. The challenge for policymakers in commodity exporters, therefore, is to implement targeted structural reforms to alleviate the most binding supply-side bottlenecks and restore stronger growth potential.

Annex 2.1. Data Sources, Index Construction, and Country Groupings

Variables and Sources

The primary data sources for this chapter are the IMF's World Economic Outlook database, Haver Analytics, Penn World Table 8.1, UN Comtrade International Trade Statistics, the United Nations Industrial Development Organization, the World Bank's *World Development Indicators*, the IMF's *International Financial Statistics*, Latin America KLEMS, and World KLEMS. Sources for specific data series are listed in Annex Table 2.1.1.

Construction of Commodity Terms-of-Trade Indices

For each country, commodity terms-of-trade indices are constructed, following Gruss 2014, as a

Annex Table 2.1.1. Data Sources

Variable	Source
Cross-Country Variables	
Capital Stock	Penn World Table 8.1
Commodity Export Prices	Gruss 2014; IMF, Primary Commodity Price System; U.S. Energy Information Administration; World Bank, Global Economic Monitor database
Commodity Export Weights	UN Comtrade; IMF, World Economic Outlook database
Conflict	Correlates of War Project, New Correlates of War Data, 1816–2007, v4.0 (2011)
Consumer Price Index	IMF, International Financial Statistics database; IMF, World Economic Outlook database
Consumption	Penn World Table 8.1; IMF, World Economic Outlook database
Credit to the Private Sector	IMF, International Financial Statistics database; IMF, World Economic Outlook database
Current Account	Penn World Table 8.1; IMF, World Economic Outlook database
EMBI Global Spread	Thomson Reuters Datastream
Employment	Penn World Table 8.1; IMF, World Economic Outlook database
Exchange Rate Classifications	Reinhart and Rogoff 2004
Government Expenditure	IMF, Fiscal Monitor database; IMF, World Economic Outlook database
House Price Index	Haver Analytics
Human Development Indicators	Barro and Lee 2010, April 2013 update; United Nations Development Programme; United Nations Department of Economic and Social Affairs, Statistics Division
Infant Mortality (0–1 Year) per 1,000 Live Births	United Nations Department of Economic and Social Affairs, Statistics Division, UNdata
Investment (Private and Public)	Haver Analytics; IMF, Fiscal Monitor database; Organisation for Economic Co-operation and Development; IMF, World Economic Outlook database
Life Expectancy	World Bank, World Development Indicators database
Manufacturing Exports	UN Comtrade
National Saving	Penn World Table 8.1; IMF, World Economic Outlook database
Net Financial Assets	External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007 and updates thereafter)
Net Financial Flows	IMF, Balance of Payments Statistics database (sum of net foreign direct investment, portfolio equity, and other investment flows)
Real and Nominal GDP	Penn World Table 8.1; IMF, World Economic Outlook database
Real Domestic Demand	Penn World Table 8.1; IMF, World Economic Outlook database
Real Domestic Income	Nominal gross domestic output deflated by the consumer price index, both from the IMF's World Economic Outlook database
Real Effective Exchange Rate (CPI Based)	IMF, International Financial Statistics; IMF staff calculations based on the April 2010 *World Economic Outlook,* Chapter 4
Regime Transition	Polity IV Project, Political Regime Characteristics and Transitions, 1800–2013
Secondary School Attainment	Barro and Lee 2010, April 2013 update
Total Factor Productivity	Penn World Table 8.1; IMF, World Economic Outlook database; IMF staff calculations (Solow residual)
Trading-Partner Country Output Growth	IMF, World Economic Outlook database
Case Studies	
Capital Stock	Haver Analytics; Hofman and others 2015; Latin America KLEMS; national authorities; World KLEMS
Employment	Haver Analytics; Hofman and others 2015; Latin America KLEMS; national authorities; World KLEMS
Total Factor Productivity	Haver Analytics; Hofman and others 2015; Latin America KLEMS; national authorities; World KLEMS; IMF staff calculations (Solow residual)
Value Added	Haver Analytics; Hofman and others 2015; Latin America KLEMS; national authorities; World KLEMS

Source: IMF staff compilation.
Note: CPI = consumer price index; EMBI = J.P. Morgan Emerging Markets Bond Index.

trade-weighted average of the prices of imported and exported commodities. The annual change in country i's terms-of-trade index ($CTOT$) in year t is given by

$$\Delta \log CTOT_{i,t} = \sum_{j=1}^{J} \Delta \log P_{j,t}\, \tau_{i,j,t},$$

in which $P_{j,t}$ is the relative price of commodity j at time t (in U.S. dollars and divided by the IMF's unit value index for manufactured exports) and Δ denotes the first difference. Country i's weights for each commodity price, $\tau_{i,j,t}$, are given by

$$\tau_{i,j,t} = \frac{x_{i,j,t-1} - m_{i,j,t-1}}{\sum_{j=1}^{J} x_{i,j,t-1} + \sum_{j=1}^{J} m_{i,j,t-1}},$$

in which $x_{i,j,t-1}$ ($m_{i,j,t-1}$) denote the average export (import) value of commodity j by country i between $t-1$ and $t-5$ (in U.S. dollars). This average value of net exports is divided by total commodity trade (exports plus imports of all commodities).

The commodity price series start in 1960. Prices of 41 commodities are used, sorted into four broad categories:

1. *Energy:* coal, crude oil, and natural gas
2. *Metals:* aluminum, copper, iron ore, lead, nickel, tin, and zinc
3. *Food:* bananas, barley, beef, cocoa, coconut oil, coffee, corn, fish, fish meal, groundnuts, lamb, oranges, palm oil, poultry, rice, shrimp, soybean meal, soybean oil, soybeans, sugar, sunflower oil, tea, and wheat
4. *Raw materials:* cotton, hardwood logs and sawn wood, hides, rubber, softwood logs and sawn wood, soybean meal, and wool

The price of crude oil is the simple average of three spot prices: Dated Brent, West Texas Intermediate, and Dubai Fateh. The World Bank's Global Economic Monitor database has been used to extend the price series of barley, iron ore, and natural gas from the IMF's Primary Commodity Price System back to 1960. The price of coal is the Australian coal price, extended back to 1960 using the World Bank's Global Economic Monitor database and U.S. coal price data from the U.S. Energy Information Administration.

Forecasts of the country-specific commodity terms of trade are constructed in the same manner, using the prices of commodities futures for the 41 commodities, where available, through 2020.

Commodity-Exporting Country Groupings

A country is classified as a commodity exporter if it meets the following two conditions:

- Commodities constituted at least 35 percent of the country's total exports, on average, between 1962 and 2014.
- Net commodity exports accounted for at least 5 percent of its gross trade (exports plus imports), on average, between 1962 and 2014.

Among emerging market and developing economies, 52 satisfy these criteria, 20 of which are low-income developing countries (according to the classification in the *World Economic Outlook*'s Statistical Appendix). For a list of the 52 economies and their shares of commodity exports, see Annex Table 2.1.2.

Annex Table 2.1.2. Commodity-Exporting Emerging Market and Developing Economies

	Commodity Exports (percent of total exports)					Net Commodity Exports (percent of total exports-plus-imports)
	Total Commodities	Extractive		Nonextractive		
		Energy	Metals	Food	Raw Materials	
Emerging Markets						
Algeria	89.2	87.9	0.7	0.5	0.2	37.6
Angola	81.1	47.8	5.5	26.2	3.2	34.6
Argentina	49.8	5.7	1.5	30.0	12.7	20.1
Azerbaijan	76.7	73.2	0.7	0.8	1.9	35.9
Bahrain	60.4	35.5	24.1	0.7	0.1	12.4
Brazil	45.3	3.3	9.5	23.5	8.9	8.3
Brunei Darussalam	90.0	89.9	0.0	0.1	0.0	55.5
Chile	61.2	0.8	48.0	7.0	5.5	20.9
Colombia	58.5	21.7	0.3	34.7	1.9	20.8
Costa Rica	36.2	0.4	0.4	34.9	0.5	8.4
Ecuador	79.0	40.1	0.2	38.8	0.7	32.6
Gabon	78.4	66.3	1.2	0.5	10.8	44.4
Guatemala	45.4	2.4	0.3	36.6	6.1	8.1
Guyana	66.3	0.0	21.5	41.9	2.9	14.4
Indonesia	64.4	40.8	5.0	8.5	10.1	24.9
Iran	81.5	78.9	0.6	0.4	1.6	41.4
Kazakhstan	70.5	53.3	11.7	4.3	1.3	35.5
Kuwait	72.2	71.7	0.1	0.4	0.1	42.4
Libya	96.8	96.7	0.0	0.1	0.0	58.2
Malaysia	45.0	12.7	6.3	8.2	17.8	15.3
Oman	79.8	77.8	1.4	1.0	0.0	42.3
Paraguay	65.4	0.2	0.4	36.6	28.5	12.4
Peru	60.6	7.4	32.8	18.0	2.3	17.5
Qatar	82.5	82.4	0.0	0.1	0.0	49.2
Russia	60.5	50.3	6.6	1.0	2.5	34.0
Saudi Arabia	85.8	85.5	0.1	0.1	0.1	47.3
Syria	54.3	45.8	0.1	2.7	6.2	8.2
Trinidad and Tobago	64.2	60.9	1.2	2.0	0.2	19.8
Turkmenistan	58.9	45.5	0.4	0.2	12.8	19.7
United Arab Emirates	49.6	36.8	13.4	2.4	0.1	12.6
Uruguay	37.0	0.6	0.2	22.5	13.7	5.5
Venezuela	87.1	82.1	4.1	0.8	0.1	46.6

Annex 2.2. Methodology for Dating Commodity Price Cycles

Cycles in country-specific commodity terms-of-trade indices are identified using the Bry-Boschan Quarterly algorithm, which is standard in the business cycle literature (Harding and Pagan 2002). The algorithm as used here differs from the standard version in two ways: (1) it is applied to a smoothed (five-year centered moving-average) version of the price index because the underlying series are choppy, making it difficult for standard algorithms to identify meaningful cycles, and (2) it allows for asymmetry between upswings and downswings, as the focus here is on cycles in which the upswing was at least five years long, even if the subsequent downswing was sudden.

The algorithm identifies 115 cycles since 1960 (78 with peaks before 2000 and 37 with peaks after 2000). There are approximately two cycles a country. Upswings are slightly longer than downswings, with a mean (median) of seven (six) years for upswings and six (five) years for downswings (Annex Figure 2.2.1, panel 1). The duration of phases and the amplitude of price movements are correlated (Annex Figure 2.2.1, panels 3 and 4). Most peaks were in the 1980s and the most recent years, particularly for extractive commodities (Annex Figure 2.2.1, panel 2).

Upswings are defined trough to peak (excluding the trough year, but including the peak year); downswings are defined peak to trough (excluding the peak year, but including the trough year).

Annex 2.3. Stylized Facts and Event Studies

The event studies presented in the chapter use the following definitions:

Annex Table 2.1.2. Commodity-Exporting Emerging Market and Developing Economies *(continued)*

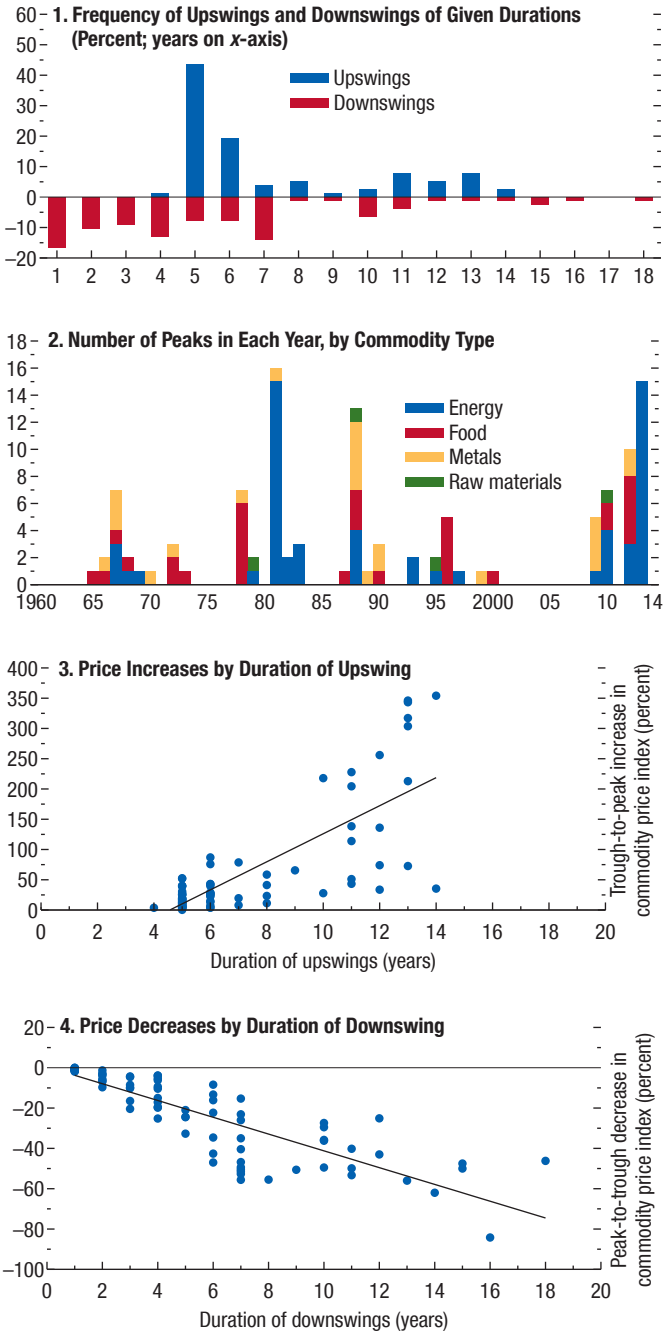
	Commodity Exports (percent of total exports)					Net Commodity Exports (percent of total exports-plus-imports)
	Total Commodities	Extractive		Nonextractive		
		Energy	Metals	Food	Raw Materials	
Low-Income Developing Countries						
Bolivia	65.9	25.3	27.7	6.0	6.8	28.4
Cameroon	71.3	16.1	6.6	34.7	13.9	22.6
Chad	91.6	4.5	0.0	15.6	71.5	8.6
Republic of Congo	61.3	52.6	0.2	1.8	6.7	30.6
Côte d'Ivoire	70.9	11.9	0.2	44.7	14.0	26.7
Ghana	66.0	5.4	7.0	50.2	3.3	12.3
Guinea	67.3	0.5	61.4	3.9	1.5	9.3
Honduras	66.6	1.3	2.8	60.0	2.5	14.1
Mauritania	75.9	9.2	47.2	23.8	0.0	12.2
Mongolia	59.2	4.6	35.6	1.9	17.2	12.4
Mozambique	46.1	4.7	26.7	10.9	3.9	5.1
Myanmar	52.8	36.1	0.7	6.1	9.8	24.4
Nicaragua	55.9	0.6	0.5	42.7	12.2	7.2
Niger	65.8	2.1	38.0	23.2	2.5	10.2
Nigeria	88.4	79.5	0.7	6.2	2.0	46.8
Papua New Guinea	58.0	6.7	24.5	20.7	6.1	15.7
Sudan	69.4	56.5	0.3	11.8	9.8	11.3
Tajikistan	63.4	0.0	51.6	0.2	11.6	21.5
Yemen	82.5	79.6	0.2	2.4	0.4	20.8
Zambia	77.0	0.4	72.4	2.7	1.6	30.4
Memorandum						
Number of Economies	52	52	52	52	52	52
Maximum	96.8	96.7	72.4	60.0	71.5	58.2
Mean	67.1	34.6	11.6	14.5	6.7	24.2
Median	65.9	30.4	1.3	6.2	2.7	20.8
Standard Deviation	14.5	32.6	18.2	16.5	11.0	14.5

Sources: UN Comtrade; and IMF staff calculations.

Note: Countries listed are those for which gross commodity exports as a share of total exports were greater than 35 percent and net commodity exports as a share of total trade (exports plus imports) were greater than 5 percent, on average, between 1962 and 2014. Commodity intensities are determined using a breakdown of the first criterion into the four main commodity categories: energy, food, metals, and raw materials.

- *Growth rates:* Average growth rates over upswings (downswings) are computed by first averaging for a given country over all upswing (downswing) years, then taking simple averages of these across countries. Samples are fully balanced, that is, they include the same country cycles for upswings and downswings.
- *Exchange rate regimes:* Exchange rate regimes are categorized as fixed or flexible according to the classification set out by Reinhart and Rogoff (2004). Regimes of countries in their coarse categories 1 and 2 are classified as fixed, and those in their coarse categories 3 and 4 are categorized as flexible. Countries in categories 1 and 2 have no separate legal tender or variously use currency boards, pegs, horizontal bands, crawling pegs, and narrow crawling bands. Countries in categories 3 and 4 variously have wider crawling bands, moving bands, and managed floating or freely floating arrangements. As very few countries maintain the same regime over an entire cycle, the exchange rate regime in the peak year is used to classify the cycle. The sample includes 34 cycles with fixed exchange rates but only 8 cycles with flexible exchange rates. Regimes classified as free-falling are dropped.
- *Type of fiscal policy:* Cycles are classified as being subject to either a high or low degree of fiscal policy procyclicality. The classification depends on whether the correlation between real spending growth and the change in the smoothed commodity terms-of-trade series is above or below the median for the overall sample during the cycle.
- *Cycles and credit ratio:* Cycles are classified as having a high (low) ratio of credit to GDP depending on whether average domestic credit to the private sector as a share of GDP during the upswing is above (below) the sample median.

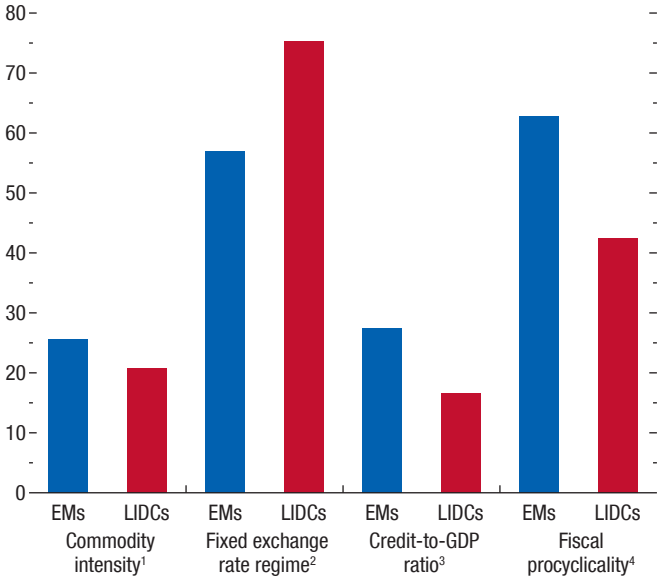
Annex Figure 2.2.1. Characteristics, Amplitudes, and Durations of Cycles



Sources: Gruss 2014; IMF, Primary Commodity Price System; U.S. Energy Information Administration; World Bank, Global Economic Monitor database; and IMF staff calculations.
Note: The cycles shown are for the country-specific commodity terms-of-trade indices. See Annexes 2.1 and 2.2 for the data definitions and cycle-dating methodology.

Annex Figure 2.3.1. Commodity Intensity, Policy Frameworks, and Financial Depth: Commodity-Exporting Emerging Markets versus Low-Income Developing Countries

(Percent)



Sources: IMF, Fiscal Monitor database; IMF, International Financial Statistics database; World Bank, *World Development Indicators*; and IMF staff calculations.
Note: Figures are the averages of data for all available years across all commodity exporters within each group. EM = emerging market; LIDC = low-income developing country.
[1]Average of commodity exports as a share of GDP.
[2]Share of commodity-exporting emerging markets and low-income developing countries with a fixed exchange rate regime as defined in Annex 2.3.
[3]Average of bank credit to the private sector as a share of GDP.
[4]Determined by whether the correlation between real spending growth and the change in the smoothed commodity terms of trade is greater or less than the sample median.

Among the commodity-exporting countries, emerging market economies can be differentiated from low-income developing countries along four key dimensions: commodity intensity, exchange rate regime, credit ratio, and fiscal procyclicality (Annex Figure 2.3.1). Emerging markets tend to have a greater degree of commodity intensity (GDP share of gross commodity exports). A greater share of low-income developing countries operate fixed exchange rates. Emerging markets tend to have greater financial depth, as captured by higher credit-to-GDP ratios. And emerging markets tend to have a more procyclical fiscal stance.

The comovement between the commodity terms-of-trade cycle and investment (and hence capital) is particularly marked in extractive commodity exporters (Annex Figure 2.3.2, panels 1 and 2), in line with the longer, more pronounced cycles in their terms of trade.

As extractive commodity exporters represent almost three-fourths of the emerging market economies in the sample, but less than half of low-income developing countries, differences across commodity types thus also translate into distinctions across country groups (Annex Figure 2.3.2, panels 3 and 4). GDP, spending, and production factors as well as trend GDP are less procyclical (or even countercyclical) in low-income developing countries.

Annex 2.4. Local Projection Method

Methodology and Data

The estimations of baseline impulse responses presented in the chapter follow the local projection method proposed by Jordà (2005) and developed further by Teulings and Zubanov (2014). This method provides a flexible alternative to traditional vector autoregression techniques and is robust to misspecification of the data-generating process. Local projections use separate horizon-specific regressions of the variable of interest (for example, output, investment, capital) on the shock variable and a series of control variables. The sequence of coefficient estimates for the various horizons provides a nonparametric estimate of the impulse response function.

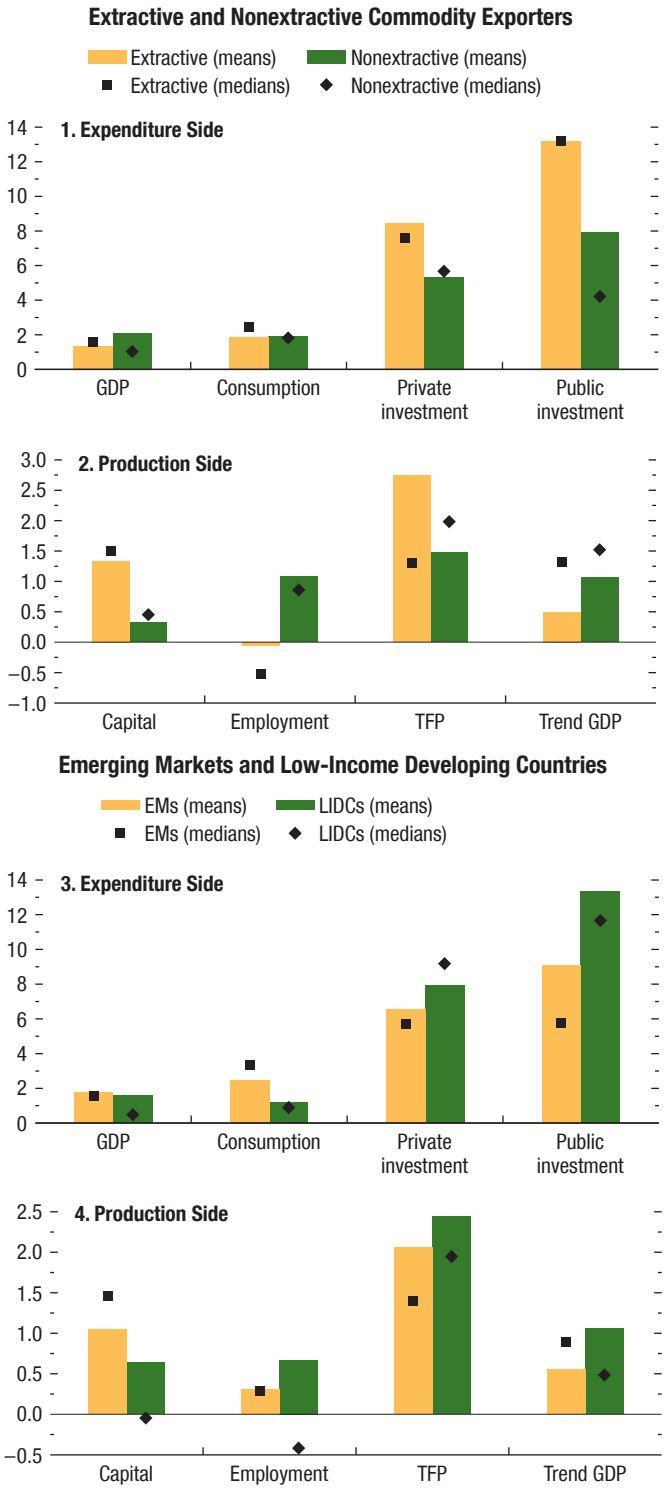
The estimated baseline specification is as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta_1^h \Delta s_{i,t} + \sum_{j=1}^{p} \beta_2^h \Delta s_{i,t-j} + \sum_{j=1}^{h-1} \beta_3^h \Delta s_{i,t+h-j} + \sum_{j=1}^{p} \theta_1^h \Delta y_{i,t-j} + \sum_{j=0}^{p} \theta_2^h x_{i,t-j} + \sum_{j=1}^{h-1} \theta_3^h x_{i,t+h-j} + \varepsilon_{i,t}^h,$$

in which the i subscripts index countries; the t subscripts index years; the h superscripts index the horizon of the projection after time t; p is the number of lags for each variable; $y_{i,t}$ is the natural logarithm of the variable of interest (for example, output); and $s_{i,t}$ is the natural logarithm of the commodity terms of trade, the shock variable of interest. The equation also includes controls for additional factors, $x_{i,t}$, such as the trade-weighted output growth of trading partners, political regime transition, and conflict in the domestic economy. Regressions include country fixed effects, α_i^h, and time fixed effects, γ_t^h.

A balanced panel for the period 1960–2007 is used for the baseline regression (Annex Table 2.4.1). The period of the global financial crisis and its aftermath is thus omitted. However, because of differences in data availability, the number of economies included differs

Annex Figure 2.3.2. Average Differences in Real Growth Rates between Upswings and Downswings
(Percentage points)



Sources: IMF, Fiscal Monitor database; Penn World Table 8.1; and IMF staff calculations.
Note: The bars show the average differences between growth rates during upswings and downswings. EM = emerging market; LIDC = low-income developing country; TFP = total factor productivity.

Annex Table 2.4.1. Sample of Commodity Exporters Used in the Local Projection Method Estimations, 1960–2007

Emerging Markets		Low-Income Developing Countries	
Argentina	Iran	Bolivia	Mongolia
Brazil	Libya	Cameroon	Mozambique
Chile	Malaysia	Chad	Niger
Colombia	Paraguay	Republic of Congo	Nigeria
Costa Rica	Peru	Côte d'Ivoire	Zambia
Ecuador	Syria	Ghana	
Gabon	Trinidad and Tobago	Guinea	
Guatemala	Uruguay	Honduras	
Indonesia	Venezuela	Mauritania	

Sources: IMF, Fiscal Monitor database; Penn World Table 8.1; and IMF staff calculations.

Annex Table 2.4.2. Country Coverage for Key Macroeconomic Variables in the Local Projection Method Estimations

	Commodity Exporters		
Variable	Emerging Markets	Low-Income Developing Countries	Total
Real GDP	18	14	32
Real Consumption	16	14	30
Real Total Fixed Investment	17	16	33
Real Capital Stock	16	14	30
Employment	14	9	23
Real Total Factor Productivity	14	5	19

Sources: IMF, Fiscal Monitor database; Penn World Table 8.1; and IMF staff calculations.
Note: The sample length for all variables is 1960–2007.

by variable. For example, for real GDP, the sample spans 32 commodity-exporting emerging market and developing economies (Annex Table 2.4.2). However, the results are robust to the minimum sample of economies available for total factor productivity.

Robustness Tests

The chapter's baseline regression analysis focuses on the macroeconomic impact of terms-of-trade shocks and thus excludes economies for which data are not available until the 1970s. Repeating the analysis using data starting a decade later, in 1970, brings in 13 additional commodity exporters, including the oil exporters of the Gulf region (Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates). The findings are broadly robust to the addition of these economies. Furthermore, starting the estimation from 1980 (thereby omitting the 1970s oil shocks) marginally boosts the GDP response in the outer years.

In addition, investment and consumption respond more strongly and with greater persistence to shocks that occur during a persistent commodity terms-of-trade cycle than to other shocks. This is consistent with the idea that successive commodity terms-of-trade gains can generate perceptions of a more persistent income windfall and therefore boost the incentive to invest (and consume), which in turn supports aggregate activity.

Box 2.1. The Not-So-Sick Patient: Commodity Booms and the Dutch Disease Phenomenon

In the "Dutch disease" phenomenon, a boom in the commodity-producing sector of an economy puts downward pressure on the output of the (noncommodity) tradable goods sector—essentially manufacturing. An extensive theoretical literature, starting with Corden 1981 and Corden and Neary 1982, examines the patterns and optimality of factor reallocation between sectors following booms in commodity production (linked to the discovery of natural resources). The models presented in these studies predict that an improvement in the commodity terms of trade and the subsequent spending of the income windfall in the domestic economy will drive up the real exchange rate and divert capital and labor from manufacturing toward the commodity and nontradables sectors.[1]

Despite some evidence of a positive association between the terms of trade and the real exchange rate of commodity exporters, empirical research on whether commodity booms hinder manufacturing performance has been mixed, even among studies that focus on the same countries or similar episodes:[2]

- *No Dutch disease effects found:* Studies of the 1970s oil price boom, such as Gelb and Associates 1988 and Spatafora and Warner 1995, estimate that higher oil prices led to real exchange rate appreciations but had no adverse effect on manufacturing output in oil-exporting economies. Sala-i-Martin and Subramanian (2003) find both the real exchange rate and manufacturing activity to be insensitive to oil price movements in Nigeria, an oil exporter. Bjørnland (1998) argues that evidence of Dutch disease following the United Kingdom's oil boom is weak and that manufacturing output in Norway actually benefited from oil discoveries and higher oil prices.
- *Support for Dutch disease effects:* Studies that have found support for Dutch disease effects are more recent. Ismail (2010) uses disaggregated data for manufacturing subsectors for a sample of oil exporters for the 1977–2004 period and shows that manufacturing output was negatively associated with the oil price, especially in subsectors with a relatively higher degree of labor intensity in production. Harding and Venables (2013) use balance of payments data for a broad sample of commodity exporters for 1970–2006 and find that an increase of $1 in commodity exports tends to be accompanied by a fall of about 75 cents in noncommodity exports and an increase of almost 25 cents in noncommodity imports.

Some indirect evidence of the Dutch disease effect can be gleaned by looking at the evolution of country shares in global manufacturing exports, which tend to be lower on average for commodity exporters than for other emerging market and developing economies. Although both groups have increased their market shares over time (relative to advanced economies), commodity exporters have seen a smaller increase in their global manufacturing export shares than the others, and the gap between the average market shares of the two groups has widened since the early 1990s (Figure 2.1.1, panel 1).

Formal tests of whether terms-of-trade booms hurt manufacturing export performance yield varied results, however. The real exchange rate appreciates gradually following an increase in the commodity terms of trade (with the increase becoming statistically significant only after the fifth year), but the impact on manufacturing exports is not significant, which points to a wide range of experiences across episodes (Figure 2.1.1, panels 2 and 3).

Numerous explanations have been offered for the absence of major Dutch disease symptoms following commodity terms-of-trade booms. These include policy-induced production restraints in the oil sector (especially in the 1970s), the "enclave nature" of the commodity sector (that is, its limited participation in domestic factor markets), limited spending of the windfall on nontradables (with a ramping up of imports instead), and government protection of the manufacturing sector.[3]

A further explanation could be linked to the pickup in global economic activity that, in some episodes,

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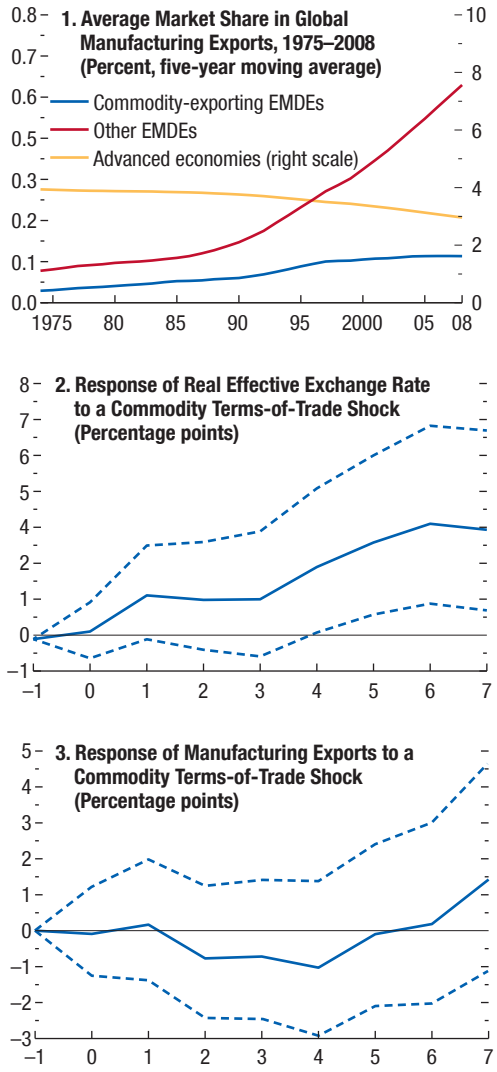
[1]There are two effects at work: a "resource movement" effect, in which the favorable price shock in the commodity sector draws factors of production out of other activities, and a "spending effect," which draws factors of production out of tradables (to be substituted with imports) into the nontradables sector.

[2]For instance, Chen and Rogoff (2003) show that the currencies of three advanced economy commodity exporters—Australia, Canada, and New Zealand—have comoved strongly with their terms of trade. Cashin, Céspedes, and Sahay (2004) find a long-run relationship between the real exchange rates and commodity terms-of-trade indices in about one-third of a sample of 58 commodity exporters. Arezki and Ismail (2013) argue that delays in the response of nontradables-intensive government spending to declines in commodity prices could weaken the empirical correlation between the latter and the real exchange rate.

[3]See Ismail 2010, Sala-i-Martin and Subramanian 2003, and Spatafora and Warner 1995.

Box 2.1 *(continued)*

Figure 2.1.1. Manufacturing Export Performance



Sources: UN Comtrade; United Nations Industrial Development Organization; and IMF staff estimates.
Note: Impulse responses are estimated using the local projection method; $t = 0$ is year of the shock; solid lines denote response of variables to a 10 percentage point increase in the shock variable; dashed lines denote 90 percent confidence bands. For panel 2, sample of 27 commodity-exporting emerging market and developing economies (EMDEs) from 1970 through 2007. For panel 3, sample of 45 commodity-exporting EMDEs from 1970 through 2007. See Annexes 2.1 and 2.4 for data definitions and estimation methodology.

could be contributing to the booms in world commodity prices. Stronger global activity could lead to stronger foreign demand for manufactured goods in all countries, commodity exporters included, and provide some offset to the loss of competitiveness associated with an appreciating real exchange rate. This explanation seems consistent with the varying findings in the empirical literature. Dutch disease symptoms appear to be stronger in studies that examine the performance of the manufacturing sector over longer time periods, which would include episodes of resource discoveries and consequent increases in commodity production volumes. Such country-specific episodes would not necessarily be expected to coincide with episodes of strong growth in global demand.

A question that has received much attention among policymakers is whether commodity boom effects on the manufacturing sector weigh on longer-term growth. In principle, commodity booms could compromise the longer-term outlook for the economy if they weaken features of the manufacturing sector that support longer-term growth—such as increasing returns to scale, learning by doing, and positive technological externalities.[4] However, the evidence is inconclusive.[5] One explanation for the lack of an apparent correlation between Dutch disease symptoms and longer-term growth could be that learning-by-doing externalities are not necessarily exclusive to manufacturing; the commodity sectors could also benefit from that effect (Frankel 2012). Another explanation proposes that a manufacturing sector that contracts and shifts toward greater capital intensity as a result of a commodity boom—and that, in turn, uses higher-skilled labor—may generate more positive externalities for the economy than a larger manufacturing sector using low-skilled labor (Ismail 2010).

[4]Theoretical models that incorporate learning-by-doing externalities in the manufacturing sector include Matsuyama 1992, van Wijnbergen 1984a, Krugman 1987, and Benigno and Fornaro 2014. Rodrik (2015) also argues that premature deindustrialization can reduce the economic growth potential of developing economies by stifling the formal manufacturing sector, which tends to be the most technologically dynamic sector.

[5]A comprehensive survey of the literature on this topic is in Magud and Sosa 2013. Rodrik (2008) analyzes the effect of the real exchange rate on economic growth and the channels through which this link operates; he concludes that episodes of undervaluation are associated with more rapid economic growth. Eichengreen (2008), however, notes that the evidence of a positive growth effect from a competitive real exchange rate is not overwhelming.

Box 2.2. Commodity Booms and Public Investment

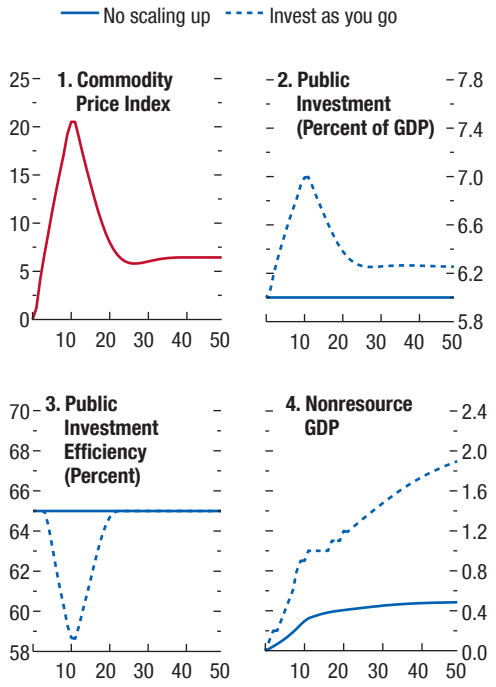
A commodity resource windfall can support economic development in low-income developing countries where potential returns to public investment are high and access to international and domestic credit markets is limited. When managed well, investments in productivity-enhancing public capital, such as infrastructure, can help raise output and living standards over the long term (Collier and others 2010; IMF 2012, 2015).[1]

A model calibrated to a low-income developing country is presented here to illustrate how a commodity windfall can raise public investment and boost income levels over the long term if capital is scarce and credit is constrained.[2] The model captures the key trade-offs in public investment decisions.[3] In particular, public investment in low-income developing countries has the potential for high returns but exhibits low levels of efficiency.[4] The long-term effects of the boom on the growth of output depend on the rate of return of public capital (relative to the cost of funding), the efficiency of public investment, and the response of private investment to the increase in public capital.

The analysis examines the behavior of nonresource GDP in two scenarios—"no scaling up" (the baseline) and "invest as you go"—both of which feature a 20 percent increase in commodity prices followed by a 15 percent drop after year 10 (consistent with the scenario discussed in the chapter) (Figure 2.2.1):

- *No scaling up:* In the baseline case, the public investment ratio stays constant at 6 percent of GDP.
- *Invest as you go:* In the alternative scenario, all royalties from the commodity boom are spent on public investment, whose share of GDP increases 1 percentage point, to 7 percent, during the boom (the initial 10 years) and subsequently falls in tandem with the commodity price. Nevertheless, it stays elevated in the long term in line with the permanent gain in the commodity price.

Figure 2.2.1. Long-Term Effects of Heightened Public Investment during Commodity Booms
(Percent deviation, unless noted otherwise; years on x-axis)



Source: IMF staff calculations.
Note: "Public investment efficiency" refers to the share of investment that ends up embedded in the capital stock.

The authors of this box are Rudolfs Bems and Bin Grace Li.

[1]For example, public investment can help close infrastructure gaps, which are an important impediment to trade integration and total factor productivity catch-up (see Chapter 3 of the April 2015 *Regional Economic Outlook: Sub-Saharan Africa*).

[2]Berg and others (forthcoming) find that low levels of efficiency may be correlated with high rates of return because the low efficiency implies very scarce public capital. In this situation, the rate of return to investment spending may not depend on the level of efficiency. *Increasing* efficiency would nonetheless increase the return to public investment spending.

[3]The model extends the work of Berg and others (2013) and Melina, Yang, and Zanna (2014). A detailed presentation of the model calibration is provided by Gupta, Li, and Yu (2015). The modeled economy features the same structure as the commodity exporter in the IMF's Global Economy Model (GEM) used in the chapter, including three sectors: tradables, nontradables, and commodities. However, it excludes some of the real and nominal frictions featured in the GEM, which makes it more suitable for studying long-term effects rather than fluctuations over the commodity cycle. The calibration of the model pays particular attention to the lower levels of public investment efficiency and limited absorptive capacity in low-income countries.

[4]Albino-War and others 2014 and IMF 2015 discuss the definition and measurement of public investment efficiency. These papers also highlight possible reforms that could help make public investments more efficient, such as steps to strengthen project appraisal, selection, and budget planning.

Box 2.2 *(continued)*

As in the model simulation shown in the chapter's second section, nonresource GDP increases by 0.5 percent over the long term if the government maintains an unchanged investment ratio. Under invest as you go, the additional public investment increases long-term nonresource output by about 2 percent because of the direct impact of a higher stock of public capital and the crowding-in of private investment.[5] The magnitude of this positive impact on output is broadly consistent with the empirical findings for developing economies in Chapter 3 of the October 2014 *World Economic Outlook*.

The gains from higher public investment in low-income developing countries depend crucially on efficiency levels, which vary across the two scenarios (Figure 2.2.1). In the baseline case, 35 percent of public investment is lost. In the alternative scenario, the ramping up of public investment reduces the efficiency level by about 6 percentage points—about 41 percent is lost. The decline in efficiency in the scenario highlights the trade-off between the need for public investment and investment efficiency, with the latter calibrated to match levels reported in empirical studies.[6]

In sum, a ramping up of public investment in response to a commodity boom can bring long-term benefits to commodity exporters. But considering the limited absorptive capacity of many developing economies, a more gradual investment profile can yield higher efficiency levels and lead to more favorable long-term outcomes. The more gradual pace can also curb the demand pressures during the boom phase of the commodity cycle.

[5]While the increase in the long-term output under this alternative scenario might appear small, it should be considered against the relatively small size of the increase in public investment (1 percent of GDP at the peak). In comparison, Chapter 3 of the October 2014 *World Economic Outlook* finds that in a typical public investment boom, the increase is about 7 percentage points of GDP. However, a large scaling up of public investment may also result in the implementation of inframarginal projects, lowering its impact (see Warner 2014).

[6]These levels are consistent with the cost overruns in low-income developing countries in Africa, as reported by development agencies (see Foster and Briceño-Garmendia 2010). Gupta and others (2014) document the decrease in public investment efficiency during the 2000–08 boom.

Box 2.3. Getting By with a Little Help from a Boom: Do Commodity Windfalls Speed Up Human Development?

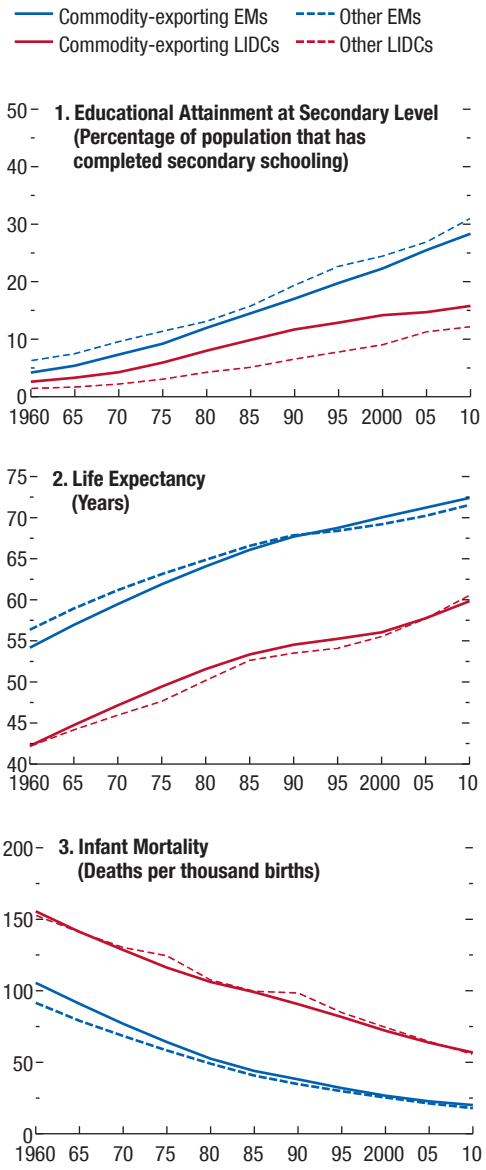
Improvements in education and health help a country increase its economic potential over time by building larger and more-skilled pools of human capital. Increasing their investments in human development is therefore one way in which commodity-exporting emerging market and developing economies can use commodity windfall gains to boost their longer-term living standards. The following discussion considers whether commodity exporters have had an advantage in boosting human development.[1]

Does Being a Commodity Exporter Matter for Human Development?

To set the stage, it is useful to investigate whether being a commodity exporter matters for the level and pace of improvement in human development. Examination of the average levels of key human development indicators over the past five decades reveals no clear pattern across exporters and others (Figure 2.3.1).[2] For instance, in terms of educational attainment at the secondary school level, commodity-exporting low-income developing countries have on average had better outcomes than noncommodity exporters, while commodity-exporting emerging market economies on average have had poorer outcomes than their noncommodity-exporting peers. For life expectancy and infant mortality, levels of indicators have been similar across the two different types of economies, but the relative pace of improvement has varied between the groups over time.

Controlling for basic country characteristics—including initial conditions, population size, GDP, and political variables—does not reveal statistically significant differences between commodity exporters and other similar emerging market and developing economies in terms of educational attainment, life expectancy, or infant mortality (Figure 2.3.2).[3]

Figure 2.3.1. Human Development Indicators



Sources: Barro and Lee 2010, April 2013 update; United Nations Department of Economic and Social Affairs, UNdata; United Nations Development Programme; World Bank, *World Development Indicators*; and IMF staff calculations.
Note: Simple averages are taken over balanced samples for each group. EM = emerging market; LIDC = low-income developing country.

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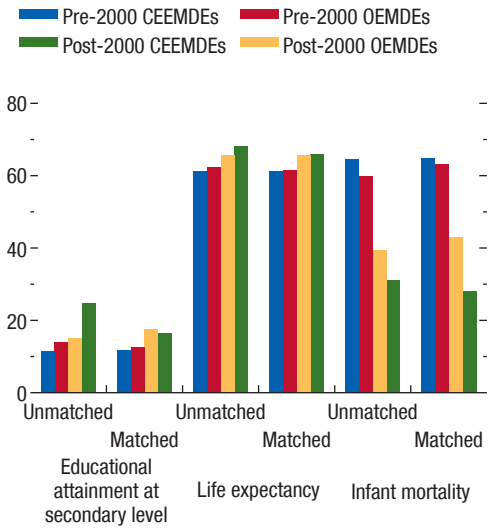
[1]McMahon and Moreira (2014) find that in the 2000s, human development improved more rapidly in extractive commodity exporters than in countries that are not dependent on extractive industries. Gylfason (2001) suggests that education levels were inversely related to resource abundance in the 1980–97 period.

[2]These particular indicators of human development have been shown to have an impact on the quality of human capital (for example, Kalemli-Özcan, Ryder, and Weil 2000 and Oster, Shoulson, and Dorsey 2013).

[3]These results are obtained using propensity score matching (Rosenbaum and Rubin 1983). This estimation technique tests for statistically significant differences between commodity exporters and noncommodity exporters while ensuring that they

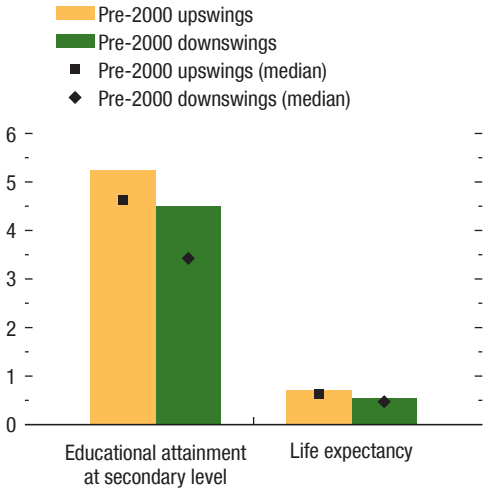
Box 2.3 *(continued)*

Figure 2.3.2. Comparing the Performance of Commodity and Noncommodity Exporters
(Percent)



Sources: Barro and Lee 2010, April 2013 update; United Nations Department of Economic and Social Affairs, UNdata; United Nations Development Programme; World Bank, *World Development Indicators*; and IMF staff calculations.
Note: CEEMDEs = commodity-exporting emerging market and developing economies; OEMDEs = other emerging market and developing economies. None of the differences between matched samples are statistically significant at the 10 percent level.

Figure 2.3.3. Event Studies: Average Changes in Human Development Indicators during Upswings and Downswings
(Percent)



Sources: Barro and Lee 2010, April 2013 update; United Nations Department of Economic and Social Affairs, UNdata; United Nations Development Programme; World Bank, *World Development Indicators*; and IMF staff calculations.
Note: Sample includes only cycles with peaks before 2000. See Annex 2.2 for the cycle dating methodology. Infant mortality is omitted from the event studies because data are available only in five-year intervals and interpolation would confound the effects.

Do Changes in the Commodity Terms of Trade Predict Changes in the Pace of Human Development?

Like the macroeconomic variables examined in the chapter, key human development indicators tend to move in tandem with the commodity terms of trade. Educational attainment and life expectancy rise faster during commodity terms-of-trade upswings than during downswings (Figure 2.3.3). This comovement is not surprising, since education and health outcomes are likely to benefit from higher social spending by the public sector and a faster-growing economy during a commodity boom. However, the differences between average changes in educational attainment and life expectancy during upswings and downswings are not statistically significant, which is probably attributable to other contextual factors affecting these variables during these episodes.

Using the local projection method allows some contextual factors such as the output growth of trading partners, domestic conflict, and political

are otherwise comparable in terms of key characteristics such as population, level of GDP, political factors (regime change, conflict), and lagged measures of human development. Figure 2.3.2 illustrates how commodity exporters compare with noncommodity exporters in both an unmatched and a matched sample. The former provides a simple comparison across groups without controlling for any differences between them, whereas in the latter, commodity exporters are compared with (hypothetical) noncommodity exporters similar to them in regard to a number of key characteristics.

Box 2.3 *(continued)*

regime change to be controlled for. Estimates from that method show that the responses of educational attainment are barely statistically significant following changes in the net commodity terms of trade; those of life expectancy are not statistically significant.

Infant mortality has a statistically significant negative response, but this result appears sensitive to the inclusion of data from the 1970s and early 1980s, when commodity windfalls allowed commodity exporters to catch up with their noncommodity-exporting peers—infant mortality among commodity exporters fell by 30 to 50 percent over that period. The result weakened during later decades, when the pace of improvement slowed for both commodity exporters and noncommodity exporters. During those years upswings no longer brought statistically significant reductions, as marginal improvements appear to have become progressively more difficult to achieve.

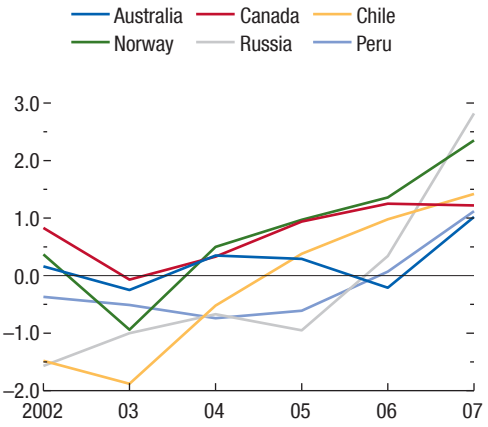
Box 2.4. Do Commodity Exporters' Economies Overheat during Commodity Booms?

The model simulations presented in this chapter predict that commodity booms will tend to be accompanied by overheating: if prices and wages adjust only slowly to higher demand, the volume of output will overreact and rise above its potential level (defined as the level of output consistent with stable inflation). The event studies presented in the chapter provide indirect evidence of overheating during booms, documenting that actual output tends to grow faster than trend output during prolonged upswings in the commodity terms of trade (Figure 2.8, panel 4). Such a growth differential would be likely to push actual output above potential output over the duration of the boom.

The discussion here presents direct evidence of overheating in six net commodity exporters during the global commodity boom of the 2000s. Multivariate filtering is used to estimate potential output and the output gap, both of which are unobserved. The technique combines information on the relationship between unemployment and inflation (Phillips curve) on the one hand, and between unemployment and the output gap (Okun's law) on the other.[1] It is based on the notion that a positive (negative) output gap will be correlated with excess demand (slack) in the labor market and lead to increases (decreases) in inflation.

The six net exporters of commodities are Australia, Canada, Chile, Norway, Peru, and Russia.[2] The inflation process in these countries largely conforms to that predicted by economic theory, with a broadly stable relationship between inflation and unemployment.

Figure 2.4.1. Output Gaps in Six Commodity Exporters
(Percent)



Source: IMF staff calculations.
Note: Output gaps are estimated using the multivariate-filter technique.

The discussion focuses on the period 2002–07: the uninterrupted phase of the boom in world commodity prices ahead of the volatility associated with the 2008–09 global financial crisis.

The analysis finds that the six economies moved into excess demand as the commodity boom progressed (Figure 2.4.1). The results are striking in that all six economies show positive output gaps toward the end of the prolonged commodity price boom. Moreover, the changes in the output gap exhibit a positive correlation with the commodity terms of trade, even if the estimation does not incorporate information on the latter variable (Figure 2.4.2). That result underscores the important role of the commodity terms of trade in driving cyclical fluctuations in net commodity exporters.

However, estimates of output gaps based on multivariate filtering benefit from hindsight, in the

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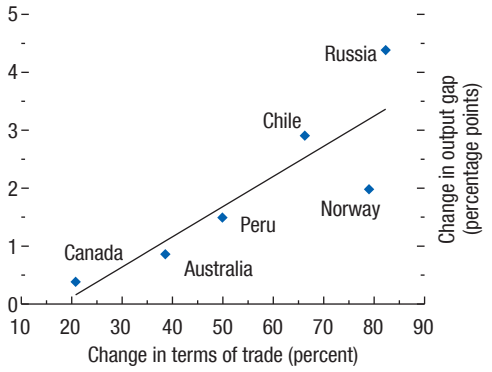
[1]Chapter 3 of the April 2015 *World Economic Outlook* uses the multivariate-filter methodology to estimate potential output for 16 countries. A detailed description of the methodology can be found in Annex 3.2 of that report and in Blagrave and others 2015.

[2]The countries and time period chosen for the analysis reflect the data requirements. Reliable unemployment series are not available for a large number of commodity exporters, nor do many countries show a broadly stable relationship between inflation and unemployment. To ensure a focus on the link between the terms of trade and the output gap, estimates are shown for the uninterrupted phase of the commodity boom prior to the 2008–09 global financial crisis.

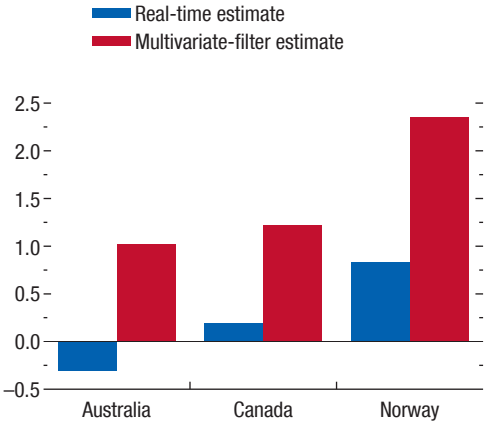
Box 2.4 *(continued)*

Figure 2.4.2. Changes in the Output Gap and Terms of Trade



Source: IMF staff calculations.
Note: The definition of the commodity terms of trade is given in Annex 2.1. The trend line is estimated by regressing the change in the output gap during 2002–07 on the change in the terms of trade over the same period.

Figure 2.4.3. Real-Time and Multivariate-Filter Estimates of 2007 Output Gaps
(Percent)



Source: IMF staff calculations.
Note: Real-time estimates of output gaps are from the September 2007 World Economic Outlook database.

sense that the estimation of output gaps for 2002–07 incorporates information on the actual behavior of output, inflation, and unemployment in the aftermath of the period. Disentangling the cyclical versus structural components of output is more challenging in real time.[3] Available real-time estimates of output gaps in the September 2007 World Economic Outlook database are lower than the multivariate-filter-based estimates obtained with data through 2014, suggesting that the structural component of output was overestimated in real time (Figure 2.4.3).[4]

[3]Grigoli and others (2015) document the wide range of uncertainty surrounding real-time estimates of the output gap. They find that initial assessments of an economy's cyclical position tend to overestimate the amount of slack in the economy, especially during recessions.

[4]For advanced economies, the World Economic Outlook database contains estimates and projections of output gaps from 1991 onward. For emerging market and developing economies, estimates start in 2008.

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CHAPTER 3

EXCHANGE RATES AND TRADE FLOWS: DISCONNECTED?

Recent exchange rate movements have been unusually large, triggering a debate regarding their likely effects on trade. Historical experience in advanced and emerging market and developing economies suggests that exchange rate movements typically have sizable effects on export and import volumes. A 10 percent real effective depreciation in an economy's currency is associated with a rise in real net exports of, on average, 1.5 percent of GDP, with substantial cross-country variation around this average. Although these effects fully materialize over a number of years, much of the adjustment occurs in the first year. The boost to exports associated with currency depreciation is found to be largest in countries with initial economic slack and with domestic financial systems that are operating normally. Some evidence suggests that the rise of global value chains has weakened the relationship between exchange rates and trade in intermediate products used as inputs into other economies' exports. However, the bulk of global trade still consists of conventional trade, and there is little evidence of a general trend toward disconnect between exchange rates and total exports and imports.

Introduction

Recent exchange rate movements have been unusually large. The U.S. dollar has appreciated by more than 10 percent in real effective terms since mid-2014. The euro has depreciated by more than 10 percent since early 2014 and the yen by more than 30 percent since mid-2012 (Figure 3.1).[1] Such movements, although not unprecedented, are well outside these currencies' normal fluctuation ranges. Even for emerging market and developing economies, whose currencies typically fluctuate more than those of advanced economies, the recent movements have been unusually large.

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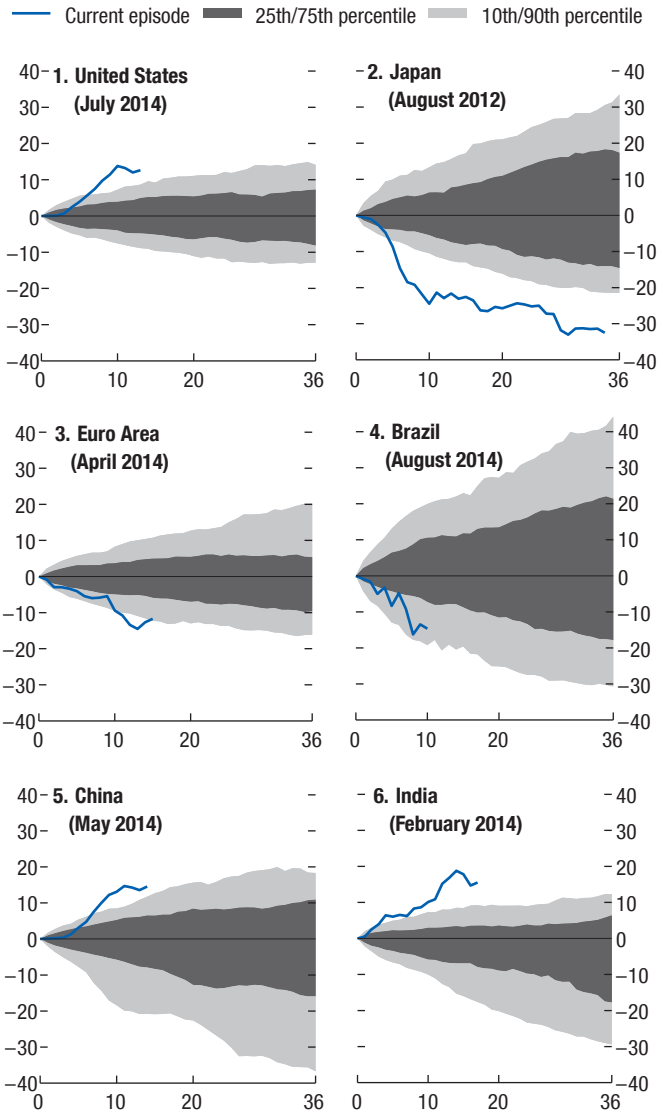
[1]Based on consumer price index–based real effective exchange rate data ending in June 2015.

Figure 3.1. Recent Exchange Rate Movements in Historical Perspective
(Percent; months on x-axis)

Major currencies have seen large movements in recent years in real effective terms that are unusual compared with historical experience.



Source: IMF, Information Notice System.
Note: Figure reports historical fluctuation bands for level of consumer price index–based real effective exchange rate based on all 36-month-long evolutions since January 1980. Confidence band at month *t* is based on all historical evolutions up to month *t*. Blue lines indicate most recent exchange rate paths of appreciation or depreciation that have no interruptions of more than three months. Dates in parentheses mark the starting point for the current episode in each panel. Last observation reported is June 2015.

There is little consensus, however, on the likely effects of these large exchange rate movements on trade—exports and imports—and, therefore, on economic activity. Some have predicted strong effects, based on conventional economic models (Krugman 2015, for example). Others have pointed to the limited changes in trade balances in some economies following recent exchange rate movements—in Japan, in particular—implying an apparent disconnect between exchange rates and trade. It has also been suggested that the increasing participation of firms in global value chains has reduced the relevance of exchange rate movements for trade flows, as in recent studies conducted at the Organisation for Economic Co-operation and Development (Ollivaud, Rusticelli, and Schwellnus 2015) and the World Bank (Ahmed, Appendino, and Ruta 2015).[2]

This is not the first time that the conventional wisdom regarding the link between exchange rates and trade has been questioned. In the late 1980s, for example, the U.S. dollar depreciated, and the yen appreciated sharply after the 1985 Plaza Accord, but trade volumes were slow to adjust, leading some commentators to suggest a disconnect between exchange rates and trade. By the early 1990s, however, U.S. and Japanese trade balances had adjusted, after some lags, largely in line with the predictions of conventional models.[3] A key question is whether this time is different, reflecting the changing structure of world trade since the 1990s, or whether, once lags have played out, the apparent disconnect between exchange rates and trade will once again dissipate.

A disconnect between exchange rates and trade would have profound policy implications. It could, in particular, weaken a key channel for the transmission of monetary policy by reducing the boost to exports that comes with exchange rate depreciation when monetary policy eases. It could also complicate the resolution of trade imbalances (that is, when exports exceed imports, or vice versa) via the adjustment of relative trade prices.

To contribute to the debate on the likely effects of recent currency movements and to assess whether trade flows are becoming disconnected from exchange rates, this chapter focuses on the following questions:

- Based on historical experience, how does trade typically evolve following real exchange rate movements? In particular, to what extent do exchange rate changes pass through to the relative prices of exports and imports, and how strongly do trade flows respond following these trade price changes? How quickly do the adjustments occur?
- Is there evidence of a disconnect between exchange rates and trade over time? In particular, has the changing structure of global trade, with increasing participation in global value chains, weakened the relationship between exchange rates and trade? Have either the long-term effects or the speed of transmission of exchange rate movements declined over time, making them less relevant for overall trade?

To address these questions, the chapter starts by investigating the relationship between exchange rate changes and trade in advanced and emerging market and developing economies over the past three decades. The growing importance of emerging market and developing economies in world trade warrants this broad coverage, which goes beyond the group of economies typically examined in related studies.[4] The approach employs both standard trade equations and an analysis of historical cases of large exchange rate movements. The chapter then assesses whether the rise of global value chains, also referred to as the international fragmentation of production, has weakened the link between exchange rates and trade. Finally, it investigates more generally whether there is evidence of disconnect over time by estimating the relationship between exchange rates and trade in different historical periods.

The analysis focuses narrowly on the direct effect of exchange rate changes on trade. Although the trade channel is a critical channel for the transmission of exchange rate changes to an economy, this partial equilibrium focus on direct effects has limitations. By definition, it ignores the general equilibrium effects of exchange rate changes on overall economic activity, which involve not just the effects on trade, but also those operating through other variables, including inflation expectations, interest rates, and domes-

[2]As explained in the discussion that follows, during the past several decades, international trade has increasingly been organized within so-called global value chains, with different stages of production located across different economies.

[3]See Krugman 1991 for a discussion of this episode.

[4]Much of the related literature focuses on advanced economies, with a number of exceptions, including Bussière, Delle Chiaie, and Peltonen 2014, which estimates trade price equations for 40 economies, and Morin and Schwellnus 2014.

tic demand.[5] Through the effects on these variables, trade is also affected indirectly. The narrow focus also abstracts from the fact that the underlying drivers of an exchange rate change also matter for trade and economic activity outcomes. The main reason that these outcomes can differ is that the indirect effects of exchange rate changes can differ, depending on the driver. Consider, for example, the exchange rate changes during the past year or so. As discussed in the April 2015 *World Economic Outlook* (WEO), these changes have been partly driven by surprises in the relative strength of domestic demand, with countries with stronger domestic demand experiencing appreciation. Compare this with another example, in which the exchange rate change is not driven by domestic demand, but reflects an unexpected shift in investor preferences for U.S.-dollar-denominated assets. The behavior of domestic demand in the two examples would clearly be different, with implications for the overall outcome for trade.

The chapter's main findings are as follows:

- Trade tends to respond strongly to exchange rate movements. A depreciation in an economy's currency is typically associated with lower export prices paid by foreigners and higher domestic import prices, and these price changes, in turn, lead to a rise in exports and a decline in imports.[6] Reflecting these channels, a 10 percent real effective exchange rate depreciation implies, on average, a 1.5 percent of GDP increase in real net exports. The figures around this average response vary widely across economies (from 0.5 percent to 3.1 percent). It takes a number of years for the effects to fully materialize, but much of the adjustment occurs in the first year. The export increase associated with currency depreciation is typically stronger when the domestic economy is experiencing more slack, but weaker when a country's financial system is weak, as in the context of a banking crisis.
- The rise of global value chains has weakened the relationship between exchange rates and trade for some economies and products, but little evidence shows that it has led to a disconnect between exchange rates and trade in general. In particular, for economies that have become more deeply involved in global value chains, trade in intermediate products used as inputs into other economies' exports has become less responsive to exchange rate changes. However, the relative pace of expansion of global-value-chain-related trade has decelerated in recent years, and the bulk of global trade still consists of conventional trade.
- More generally, the notion of a disconnect between exchange rates, trade prices, and gross export and import volumes finds little support in the data. The estimated links have not generally weakened over time. A key exception to this pattern is Japan, which displays some evidence of disconnect, with weaker-than-expected export growth despite substantial exchange rate depreciation, although this weak export growth reflects a number of Japan-specific factors.[7]

From Exchange Rates to Trade: Historical Evidence

A natural benchmark for assessing the implications of recent exchange rate movements is the historical relationship between exchange rates and trade. Standard theoretical models predict that currency depreciation will reduce the prices of exports in foreign currency and increase the prices of imports in domestic currency, which will lead to more exports and less imports.[8] These theoretical predictions guide the statistical analysis in this chapter.

This section starts by examining the historical evidence on the connection between exchange rates, trade prices, and trade volumes for a large group of economies. It estimates export and import price and volume equations for 60 individual economies—23 advanced and 37 emerging market and developing economies—for the past three decades. This is a broader sample of economies than is typically covered in related studies.[9]

[5]For an example of a general equilibrium assessment of the effects of exchange rate movements, see Scenario Box 2 in the April 2015 *World Economic Outlook*, which uses the IMF's G20 Model to explore the potential macroeconomic impact of real exchange rate changes from August 2014 to February 2015 based on shocks that represent changes in investor preferences for U.S.-dollar-denominated assets.

[6]There is little evidence of asymmetry—exchange rate appreciations and depreciations tend to have opposite effects, but of a similar absolute size.

[7]These factors include, in particular, the acceleration in production offshoring since the global financial crisis and the 2011 earthquake.

[8]The response of trade volumes to relative trade prices relates to the expenditure-switching effect discussed, for example, in Obstfeld and Rogoff 2007.

[9]Related studies also tend to focus on either the effect of exchange rates on relative trade prices or the effect of relative trade prices on volumes. In contrast, the analysis here focuses on both parts of the

To contribute more directly to the debate on the recent large exchange rate changes, the section also presents evidence on trade dynamics following unusually large exchange rate movements. The focus is on the evolution of export prices and volumes following large and sudden currency depreciations in both advanced and emerging market and developing economies.

Revisiting Trade Elasticities

To inform the assessment of the likely impact of the recent large exchange rate movements on trade, this subsection estimates standard trade elasticities (that is, how responsive trade variables are to changes in other variables) for both advanced and emerging market and developing economies. In particular, it focuses on estimating four elasticities: the relationship between exchange rate movements and export and import prices, respectively (exchange rate pass-through), and the relationship between these export and import prices and trade volumes (price elasticity), based on standard trade equations. The emphasis is on long-term effects of exchange rate movements, although the discussion also touches on how much of these long-term effects materialize in the near term.

The theoretical framework underlying the analysis comes from the pricing-to-market literature, as described in Krugman 1986, Feenstra, Gagnon, and Knetter 1996, Campa and Goldberg 2005, Burstein and Gopinath 2014, and others. In this framework, exporting firms maximize profits by choosing export prices subject to the demand for their products in foreign markets, taking into account their competitors' prices.[10] Product demand depends on the prices of exports relative to the prices of competing products as well as on overall demand conditions in destination markets. Based on these assumptions, export prices relative to foreign prices depend on the real exchange rate and real production costs, while export quantities depend on these relative export prices as well as on foreign aggregate demand. The determinants of import prices and quantities can be derived analogously based on the observation that the price of each economy's imports is the price of its trading partners' exports multiplied by the bilateral exchange rate.[11]

The analysis estimates the four trade elasticities at the individual-economy level using annual data for 60 economies. Depending on data availability and the economy in question, the sample starts between 1980 and 1989 and ends in 2014. To permit the long-term relationship between exchange rate changes and trade to be estimated, the sample is restricted to economies for which at least 25 years of annual data are available.[12] The analysis focuses on gross exports and imports, which include both goods and services (Annex 3.1 reports the sources of the data used). The econometric specifications employed are standard and yield estimates of the relationship between exchange rates and trade prices and between trade prices and trade volumes.[13]

exchange rate transmission process, thus providing a more comprehensive assessment.

[10]This literature assumes market segmentation between domestic and foreign purchasers.

[11]In this framework, the export price equation reflects optimal pricing decisions of suppliers and can be written as $eP^X/P^* = S(ULC/P, eP/P^*)$, in which e is the nominal exchange rate, P^X is the price of exports in domestic currency, P^* is the foreign price level, P is the domestic price level, ULC/P denotes the real unit labor cost, and eP/P^* denotes the real effective exchange rate. The export volume equation represents the demand side of the market and can be written as $X = D(eP^X/P^*, Y^*)$, in which eP^X/P^* is the relative export price in foreign currency already mentioned and Y^* denotes foreign aggregate demand. On the import side, the relative prices of imports are a function of the real exchange rate and domestic aggregate demand, $P^M/P = S(eP^*/P, Y)$, in which Y denotes domestic aggregate demand, and import volumes are a function of this relative price and domestic aggregate demand, $M = D(P^M/P, Y)$.

[12]The sample excludes a number of advanced economies with special circumstances, including Hong Kong SAR and Singapore, given these economies' significant entrepôt activity, and Ireland, given its special treatment of export sales (April 2015 WEO). To avoid unduly influencing the estimation results with developments in small or very low-income economies, it also excludes economies with fewer than 1 million inhabitants as of 2010 or with an average per capita income (at purchasing-power parity) of less than $3,000 in 2014 prices.

[13]The analysis is based on log-linear specifications for the four trade equations. For each equation, the analysis checks whether the variables included are cointegrated based on a Dickey-Fuller test, in which case the equations are estimated in levels. For example, for export prices, the specification estimated in levels for each economy is

$$\ln\left(\frac{eP^X}{P^*}\right)_t = \alpha + \beta \ln\left(\frac{eP}{P^*}\right)_t + \gamma \ln\left(\frac{ULC}{P}\right)_t + \varepsilon_t,$$

in which the subscript t denotes the tth year; $\left(\frac{eP^X}{P^*}\right)$ denotes the relative price of exports in foreign currency (e is the nominal effective exchange rate; P^X is the price of exports in domestic currency; and P^* is the foreign, trade-weighted producer price index [PPI]); and $\left(\frac{eP}{P^*}\right)$ is the PPI-based real effective exchange rate. The PPI represents the relative price of goods and services produced at home and abroad more precisely than does the consumer price index (CPI). Nevertheless, as reported later, the results are similar when all the

A number of issues complicate the estimation of trade elasticities and can bias the analysis against finding any effect of exchange rate movements on trade. Different economic developments can lead to different joint evolutions of trade prices and quantities, complicating the estimation of the causal effects of trade prices on quantities. The main potential source of this simultaneity problem is the movement in either domestic or foreign demand. For example, a contraction in foreign demand can cause a simultaneous decline in both the quantity and the price of exports, obscuring the conventional positive effect of a drop in export prices on export demand. And when domestic demand growth is weak, reducing imports, the price of imports may also fall, obscuring the positive effect of lower import prices on imports. The analysis addresses this source of endogeneity by controlling for foreign and domestic output.[14] This leaves shifts in the composition of demand or in the propensity to import for a given composition of demand. The analysis attempts to control for shifts in composition by including nonexports and exports together in the import equation, but controlling for shifts in import propensities is challenging. Overall, because of these remaining sources of bias, weak or perversely signed estimation results could still arise, although they do not necessarily imply that trade is unresponsive to changes in trade prices.[15]

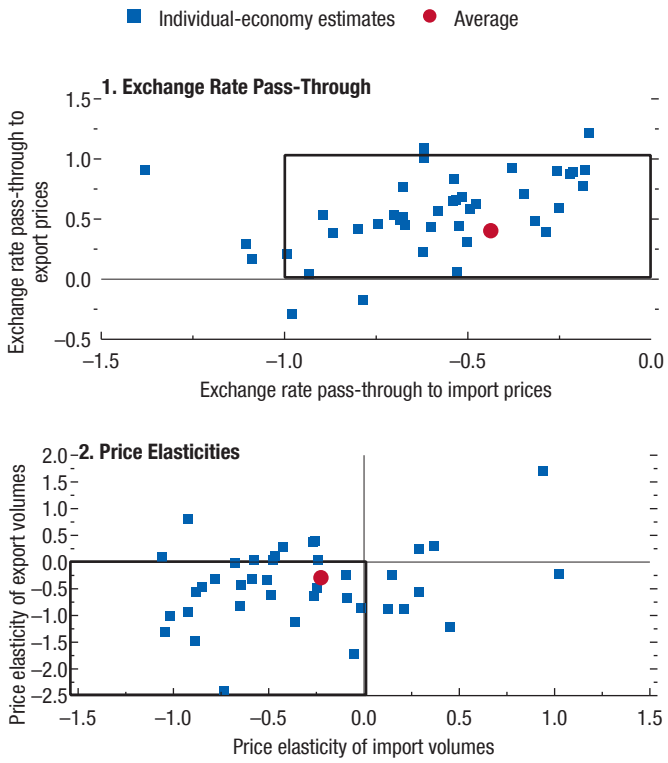
P and *P** terms in the equation are replaced with the domestic and foreign CPI. The estimate for β provides the long-term effect of the exchange rate on export prices. Short-term effects are obtained by estimating, in a second step, the equation in error correction form, as explained in Annex 3.2. The equations for estimating the other elasticities are set up analogously, as also explained in Annex 3.2.

[14]Moreover, all equations also include a time trend to account for secular trends in the variables and a dummy variable (which equals 1 during 2008–09) to account for the global financial crisis and the interaction of this crisis dummy with the measure of foreign output in the export volume equation and with the measure of domestic output in the import volume equation, respectively. These interaction terms address the notion that trade responded unusually strongly to demand during the crisis (see, for example, Bussière and others 2013). In addition, to control for shifts in global commodity prices, which can affect exporting firms' costs, the equations for export and import prices control for the (log) indices of international fuel and nonfuel commodity prices. To ensure the results are not driven by periods of high inflation (such episodes can be caused by factors that have an independent effect on trade), the sample excludes years in which CPI inflation exceeds 30 percent. As a further precaution against outliers, observations with Cook's distance greater than 4/*N*, where *N* is the sample size, are discarded.

[15]A large literature that goes back to Orcutt (1950) explains how simultaneity and omitted-variable issues can lead to considerable underestimation of trade price elasticities. Another issue that biases the analysis against finding a strong effect of trade price changes on trade is that of heterogeneous elasticities across different goods. Different goods have different price elasticities, but movements in aggregate trade prices may be dominated by movements in the relative prices of price-inelastic goods. This dominance would dampen estimated price effects on trade flows. In fact, micro-level estimates of trade elasticities tend to be somewhat larger than those based on aggregate data, as discussed by Feenstra and others (2014) and Imbs and Mejean (2015).

Figure 3.2. Long-Term Exchange Rate Pass-Through and Price Elasticities

The estimated effects of exchange rate movements on trade prices and volumes have the expected sign for most of the economies considered.



Source: IMF staff estimates.
Note: Estimates based on annual data for 60 advanced and emerging market and developing economies from 1980 to 2014. Boxes indicate the expected sign and, in the case of exchange rate pass-through, the expected size of the estimates.

Results: From Exchange Rates to Trade Prices

The analysis suggests that exchange rate movements typically have substantial effects on trade prices, with the estimates of long-term pass-through elasticities having the expected sign for virtually all the economies considered (Figure 3.2). The estimates of exchange rate pass-through typically lie, as would be expected, in the 0–1 interval. The results imply that, on average, a 10 percent real effective currency depreciation increases import prices by 6.1 percent and reduces export prices

Table 3.1. Exchange Rate Pass-Through and Price Elasticities

	Exchange Rate Pass-Through		Price Elasticity of Volumes		Marshall-Lerner Condition Satisfied?[1]
	Export Prices	Import Prices	Exports	Imports	
Based on Producer Price Index[2]					
Long-Term	0.552	–0.605	–0.321	–0.298	Yes
One-Year Effect	0.625	–0.580	–0.260	–0.258	Yes
Based on Consumer Price Index[3]					
Long-Term	0.457	–0.608	–0.328	–0.333	Yes
One-Year Effect	0.599	–0.546	–0.200	–0.200	Yes
Memorandum					
Noncommodity Exporters[4]					
Long-Term Elasticity[2]	0.571	–0.582	–0.461	–0.272	Yes

Source: IMF staff estimates.

Note: Table reports simple average of individual-economy estimates for 60 economies during 1980–2014.

[1]The formula for the Marshall-Lerner condition adjusted for imperfect pass-through is (–*ERPT* of P^X)(1 + price elasticity of *X*) + (*ERPT* of P^M)(1 + price elasticity of *M*) + 1 > 0, in which *X* denotes exports, *M* denotes imports, and P^X and P^M denote the prices of exports and imports, respectively (Annex 3.3).

[2]Estimates based on producer price index–based real effective exchange rate and export and import prices relative to foreign and domestic producer prices, respectively.

[3]Estimates based on consumer price index–based real effective exchange rate and export and import prices relative to foreign and domestic consumer prices, respectively.

[4]Excludes economies for which primary products constitute the main source of export earnings, exceeding 50 percent of total exports, on average, between 2009 and 2013.

in foreign currency by 5.5 percent (Table 3.1).[16] The estimation results are broadly in line with existing studies for major economies.[17] It is interesting to note that economies with stronger exchange rate pass-through to export prices in foreign currency tend to have weaker pass-through to domestic import prices, a pattern that also emerges from the findings of Bussière, Delle Chiaie, and Peltonen (2014). The results also indicate that most of the long-term effects on trade prices materialize within one year.[18]

[16]The corresponding response of export prices in *domestic* currency to a real effective currency depreciation of 10 percent would be a rise of 4.5 percent (–10 × (0.552 – 1)).

[17]For example, the results are strongly correlated with those reported in a recent study by Bussière, Delle Chiaie, and Peltonen (2014), who report pass-through elasticities for 40 economies (Annex Figure 3.2.1).

[18]The estimates of pass-through to trade prices also have implications for the estimated effect of a change in the exchange rate on the terms of trade (the price of exports relative to imports), which have implications for domestic demand. The baseline long-term pass-through estimates reported in Table 3.1 are 0.55 for export prices in foreign currency and –0.61 for import prices in domestic currency. So a 1 percent appreciation in a country's currency lowers the domestic prices of its imports by 0.61 percent and raises the foreign-currency price of exports by 0.55 percent. This means that the domestic-currency price of exports falls by 0.45 percent (0.55 – 1) and the terms of trade improve by 0.16 percent (–0.45 – (–0.61)) following a 1 percent appreciation. This is well below the full pass-through case in which a 1 percent appreciation translates into a 1 percent improvement in the terms of trade.

Results: From Trade Prices to Trade Volumes

The analysis suggests that trade price movements typically have the expected effects on export and import volumes, with most individual-economy estimates having the conventional (negative) sign (Figure 3.2, panel 2). On average, the estimated price elasticities of volumes suggest that a 10 percent rise in export and import prices reduces the level of both export and import volumes by about 3 percent in the long term (Table 3.1). The results also indicate that most of the long-term effects on trade volumes materialize within one year.

At the same time, numerous individual-economy estimates have counterintuitive (positive) signs. Given the challenges already mentioned of identifying the effects of trade prices on volumes, these exceptions are not surprising, and the true effects are likely to be stronger than suggested by the cross-country averages reported in Table 3.1. Also, the sample includes a range of economies, including some for whom fuel and nonfuel primary products constitute the main source of export earnings (exceeding 50 percent of total exports). To investigate whether these primary-product exporters have a strong influence on the estimation results, the analysis is repeated while excluding them from the sample. The results are similar to the baseline, suggesting that these economies are not driving the results (Table 3.1).

Meanwhile, the effects of shifts in foreign and domestic aggregate demand on export and import volumes have the expected positive sign for all economies

in the sample (Annex Figure 3.2.2). On average, a 1 percent increase in trading-partner aggregate demand is associated with a 2.3 percent increase in exports. A 1 percent increase in domestic aggregate demand is associated with a 1.4 percent increase in imports.[19] These results confirm that shifts in relative demand have a strong bearing on trade, a link that has featured prominently in the policy debate on the postcrisis decline in global trade.[20]

Overall Effect on Net Exports

What do the estimates for price and volume elasticities imply for the overall effect of exchange rate movements on net exports? To answer this question, the analysis combines the average estimates for the four elasticities reported in Table 3.1, which are more reliable than the individual-economy estimates, with economy-specific shares of imports and exports in real GDP.[21] The results suggest that a 10 percent real effective depreciation in an economy's currency is associated with a rise in real net exports of, on average, 1.5 percent of GDP, with substantial cross-country variation around this average (Figure 3.3). Given the wide range of GDP shares of exports and imports across economies, this implied effect of a real effective depreciation of 10 percent ranges from 0.5 percent of GDP to 3.1 percent of GDP. Although it takes a number of years for these effects to fully materialize, much of the adjustment occurs in the first year, as mentioned.[22]

[19]As mentioned, the equation estimated for import volumes decomposes the effects of aggregate demand into exports and domestic demand for domestic goods. The estimated elasticities for these two components of aggregate demand are both 0.7, consistent with a combined aggregate demand elasticity of 1.4.

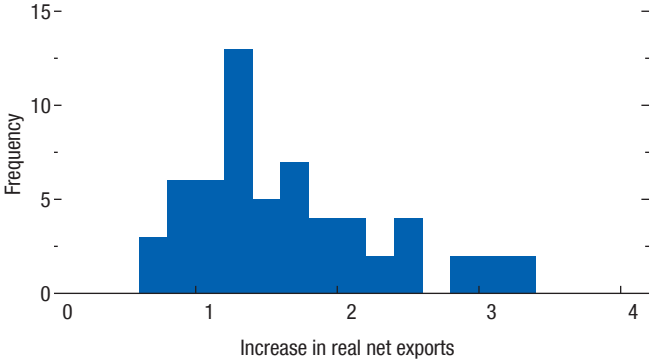
[20]For a broader discussion of the role of foreign and domestic output in driving trade, including during the postcrisis decline in global trade, see Chapter 4 of the October 2010 WEO and Hoekman 2015.

[21]The effect of a real exchange rate movement on real net exports as a percentage of GDP is defined as $\eta P^X \eta^X (X/Y) - \eta P^M \eta^M (M/Y)$, in which ηP^X and η^X denote the exchange rate pass-through to export prices and the price elasticity of exports, respectively, and ηP^M and η^M denote the exchange rate pass-through to import prices and the price elasticity of imports, respectively. Given the focus on the effects of exchange rate movements since 2012, the shares of exports and imports in GDP (X/Y and M/Y, respectively) as of 2012 are used in the calculation. Combining the estimates in the first row of Table 3.1 with the sample averages for exports and imports in percent of GDP as of 2012 (42 and 41 percent of GDP, respectively) yields an estimated rise in net exports of 1.47 percent of GDP following a real effective depreciation of 10 percent.

[22]Similarly, the estimates indicate that the Marshall-Lerner condition holds, so that a currency depreciation improves the nominal trade balance. Note that, in the presence of imperfect pass-through, the Marshall-Lerner condition is (–*ERPT* of P^X) (1 + price elasticity of X) + (*ERPT* of P^M) (1 + price elasticity of M) + 1 > 0, in which *ERPT* denotes exchange rate pass-through, as explained in Annex 3.3. The Marshall-Lerner condition computed here is based on the cross-country average of estimates reported in Table 3.1. The condition also holds for much—though not all—of the sample, when individual-economy elasticity estimates, rather than the sample averages, are used in the calculation.

Figure 3.3. Effect of a 10 Percent Real Effective Depreciation on Real Net Exports
(Percent of GDP)

A 10 percent real effective depreciation in an economy's currency is associated with a rise in real net exports of, on average, 1.5 percent of GDP, with substantial cross-country variation around this average.



Source: IMF staff calculations.
Note: Figure shows long-term effect on level of real net exports in percent of GDP based on country-specific import- and export-to-GDP ratios and the average producer price index–based trade elasticities reported in Table 3.1 for the 60 economies in the sample.

Insights from Large Exchange Rate Depreciation Episodes

To contribute more directly to the debate about the effects of the recent large exchange rate changes, this subsection presents evidence of the effects of large and sudden depreciations. In a number of cases, these episodes coincide with currency crisis episodes identified in the literature. A study of trade dynamics following such relatively extreme events allows the analysis to provide better estimates of export elasticities. (The exercise is less able to identify import elasticities because various domestic developments that affect imports coincide with large exchange rate depreciations.) The analysis focuses on large exchange rate depreciation episodes not associated with banking crises, given that such crises can have additional confounding effects on trade. Overall, large exchange rate depreciation episodes are likely to include a larger exogenous component than more normal exchange rate

fluctuations and are more appropriate for estimating the relationship between exchange rates and trade.[23]

Identifying Large Exchange Rate Depreciation Episodes

The analysis identifies large exchange rate depreciation episodes using a statistical approach similar to those employed in the literature. The approach is based on two criteria. The first criterion identifies a large depreciation as an unusually sharp nominal depreciation of the currency against the U.S. dollar. This identification approach is based on a numerical threshold set at the 90th percentile of all annual depreciations in the sample.[24] The second criterion prevents the same large exchange rate depreciation episode from being captured more than once. It requires the change in the depreciation rate compared with the previous year to be unusually large (greater than the 90th percentile of all changes). Because exchange rates tend to be more volatile in emerging market and developing economies than in advanced economies, both thresholds are defined separately for the two groups of economies. For the first criterion, the threshold for advanced economies is a depreciation of 13 percent against the dollar, whereas for emerging market and developing economies, the threshold is 20 percent. For the second criterion, both thresholds are about 13 percentage points.

To ensure that the results are not unduly influenced by high-inflation episodes, the analysis considers only large exchange rate depreciations that occur when the inflation rate is less than 30 percent. In addition, the analysis focuses on episodes not associated with banking crises to avoid confounding factors associated with credit supply disruptions. In particular, large exchange rate depreciation episodes occurring within three years of a banking crisis based on Laeven and Valencia's (2013) data set are discarded. The effects of large depreciations associated with banking crises are considered separately later in the chapter.

Applying this strategy to all economies that have data on export volumes and prices during 1980–2014 yields 66 large exchange rate depreciation episodes.[25] As reported in Annex Table 3.4.1, about one-quarter (17) of these large exchange rate depreciations occurred in advanced economies. They include, for example, European economies affected by the 1992 European Exchange Rate Mechanism crisis. The remaining episodes occurred in emerging market and developing economies and include, for example, the devaluation of the Chinese yuan in 1994 and the large depreciation of the Venezuelan bolívar in 2002.[26]

What Happens to Exports after a Large Exchange Rate Depreciation?

Now that large exchange rate depreciation episodes have been identified, this subsection uses statistical techniques to assess the relationship between exchange rates and export prices and export volumes. The methodology is standard and follows Cerra and Saxena 2008 and Romer and Romer 2010, among others. In particular, the average responses of export prices and export volumes to a large depreciation are estimated separately using panel data analysis.[27]

[23]Although this episode-based approach addresses some of the problems associated with the conventional approach of estimating the effects of exchange rates on trade, it is subject to the criticism that large depreciation episodes could be triggered by a policy response to unusually weak export performance in the context of an unsustainable balance of payments deficit. In that case, the episodes would tend to be associated with unusually weak export growth, biasing the analysis against finding that currency depreciation causes a rise in exports.

[24]This approach of identifying large exchange rate depreciation episodes based on statistical thresholds is similar to that of Laeven and Valencia (2013), who in turn build on the approach of Frankel and Rose (1996).

[25]For the purpose of the panel estimation conducted in this subsection, the sample includes all economies that have data on export volumes and prices during 1980–2014. Thus, 158 economies are included in the sample. For a number of the 158 economies, no large exchange rate depreciation episodes are identified, and the data for these economies serve to estimate the dynamic structure of the equations. Note that, in contrast, for the individual-economy estimates reported earlier in the chapter, the sample includes only the 60 economies with at least 25 years of data on relative trade prices and volumes.

[26]A number of well-known large exchange rate depreciation episodes were associated with banking crises and are therefore not included in the baseline sample for analysis, for example, Mexico in 1994, Russia in 1998, Argentina in 2002, and Finland and Sweden in the early 1990s.

[27]The estimated equation makes use of an autoregressive distributed lags model in first differences. The estimated lagged impacts of an episode of large exchange rate depreciation are then cumulated to obtain the dynamic impact on the level of export prices and export volumes. For export prices, the estimated equation has the change in the log of export prices in foreign currency as the dependent variable on the left-hand side. On the right-hand side, the explanatory variables are the current and lagged values of the dummy variable indicating an episode of large exchange rate depreciation. Including lags allows for a delayed impact of a large depreciation. In addition, the approach controls for lags of the change in the log of export prices in foreign currency, to distinguish the effect of a large depreciation from that of normal dynamics. The equation estimated for export prices is

$$y_{it} = \alpha + \sum_{j=1}^{2} \beta_j y_{i,t-j} + \sum_{s=0}^{2} \beta_s S_{i,t-s} + \mu_i + \lambda_t + \upsilon_{it},$$

in which the subscript i denotes the ith country and the subscript t denotes the tth year; y is the log change in export prices in foreign

The results suggest that large depreciations substantially boost exports. By definition, the episodes studied are associated with large depreciations, and the results indicate that these depreciations average 25 percent in real effective terms over five years (Figure 3.4). Export prices in foreign currency fall by about 10 percent, with much of the adjustment occurring in the first year. The implied pass-through elasticity of export prices relative to the real exchange rate is thus about 0.4, similar to the estimate based on trade equations already noted.

Export volumes rise more gradually, by about 10 percent over five years.[28] This response indicates an average price elasticity of exports of about –0.7, which is stronger than the elasticity of –0.3 estimated using the traditional trade equations discussed earlier. This stronger estimated price elasticity could reflect the clearer identification strategy based on large exchange rate depreciation episodes. All the results are statistically significant at conventional levels.[29]

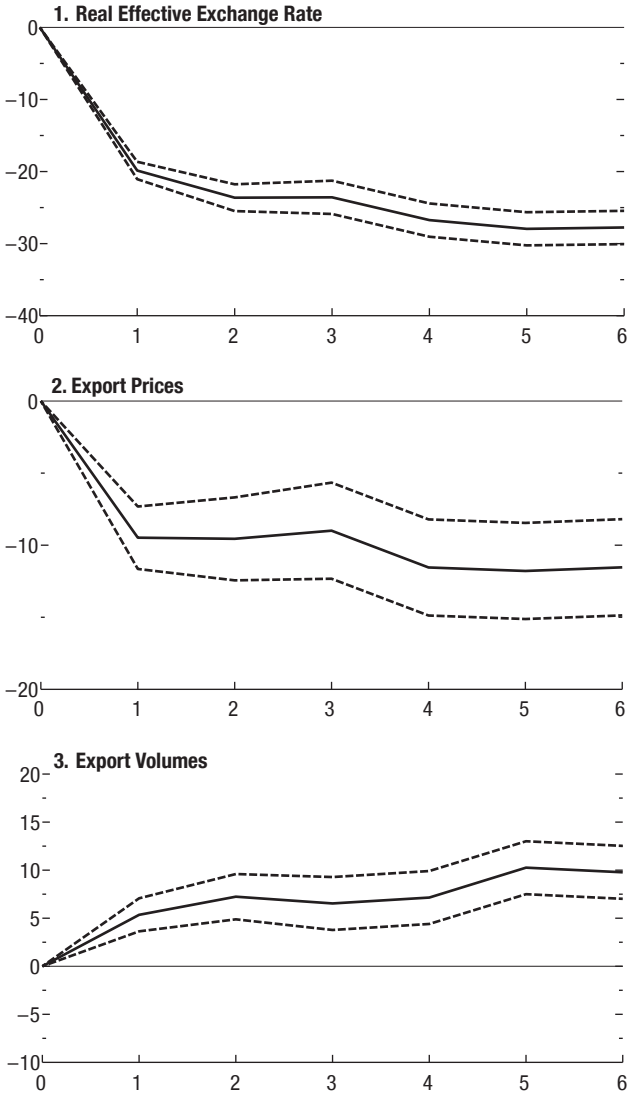
Do Initial Economic Conditions Matter?

Do export dynamics following large depreciations differ depending on initial economic conditions? When there is more economic slack and a greater degree of spare capacity in the economy, there could be more scope for production and exports to expand following a rise in foreign demand associated with exchange rate depreciation. Intuitively, this is because the volume of exports sold depends not only on the strength of demand, but also on an economy's ability to adjust production in response to stronger demand. After all, while an individual firm can readily expand its export production by purchasing more inputs, a national economy has to either utilize unemployed resources or move resources from nontraded into traded goods production. Economies may vary in the speed of their ability to reallocate resources in this way, although this issue would be less salient in the presence of economic slack.

To investigate this possibility, the analysis divides the 66 identified episodes of depreciation in half according to the degree of economic slack in the year preceding

Figure 3.4. Export Dynamics Following Large Exchange Rate Depreciations
(Percent; years on x-axis)

Large exchange rate depreciations are associated with a substantial decline in export prices in foreign currency and a rise in export volumes.



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

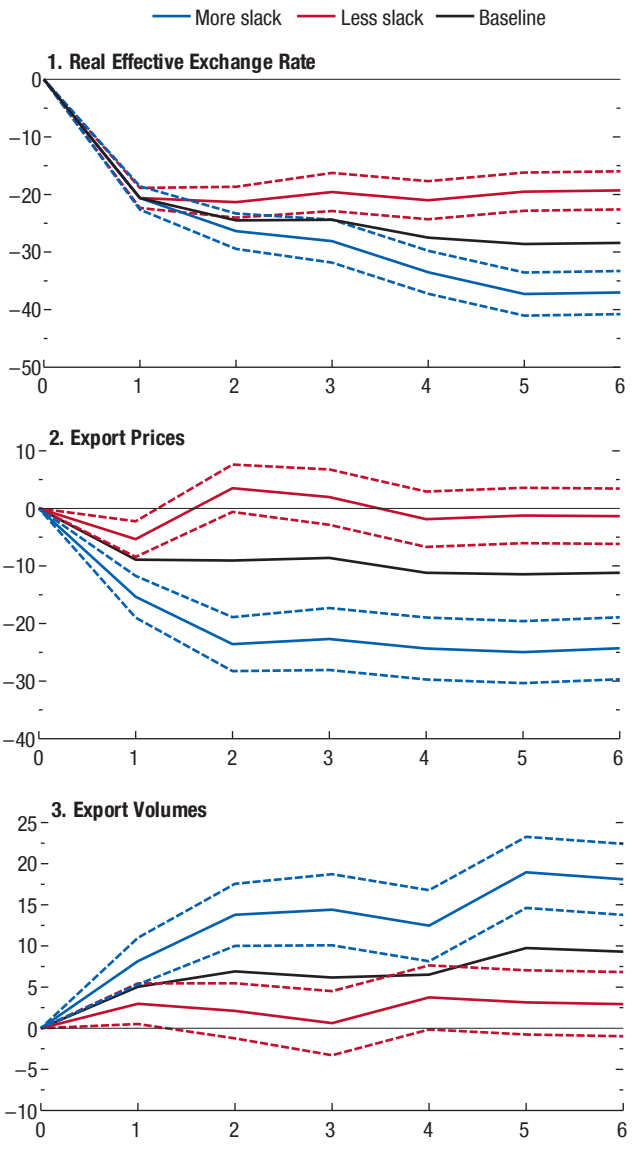
currency, $y = \Delta \ln\left(\frac{eP^X}{P^*}\right)$, in which P^* is the foreign (trade-weighted) consumer price index; and S is the dummy variable indicating the occurrence of a large depreciation. The approach includes a full set of country dummies (μ_i) to take into account differences in countries' normal growth rates. The estimated equation also includes a full set of time dummies (λ_t) to take into account global shocks such as shifts in oil prices or global business cycles. For the real effective exchange rate (*REER*) and for export volumes, the dependent variable is replaced with $y = \Delta \ln(REER)$ and $y = \Delta \ln(X)$, respectively. For the study of export volumes, the analysis also controls for changes in foreign demand, proxied by trading-partner GDP growth.

[28]Consistent with this result, Alessandria, Pratap, and Yue (2013) find that exports rise gradually following a large depreciation, based on data for 11 emerging market economies.

[29]These results are robust to the use of a number of alternative specifications and methodologies to estimate the impulse responses or to identify the large exchange rate movements, as explained in Annex 3.4.

Figure 3.5. Export Dynamics Following Large Exchange Rate Depreciations: The Role of Initial Economic Slack
(Percent; years on x-axis)

The export increase associated with large currency depreciations is typically stronger when there is more economic slack in the domestic economy.



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

the exchange rate depreciation.[30] The results suggest that, for the subsample of episodes with less economic slack, the impact of the depreciation on exports is still positive but close to zero (Figure 3.5).[31] By contrast, for the subsample with more initial slack in the economy, the export gain is larger than in the full-sample baseline (by an additional 7 percentage points after five years). While this result is not surprising from an analytical viewpoint, it has not been highlighted in related studies. The exchange rate also tends to depreciate by more and in a more persistent manner than in the baseline, arguably providing exporters with stronger incentives to cut export prices than in the baseline.

Is the Behavior of Exports Different after Large Depreciations Associated with Banking Crises?

Does the boost to exports associated with a large exchange rate depreciation depend on the health of the exporting economy's financial sector? In principle, banking crises can depress exports by reducing the availability of credit needed to expand export production.[32] This drop in credit availability could offset the export gains due to the currency depreciation.

To shed light on this question, the analysis in this subsection focuses on large exchange rate depreciation episodes associated with banking crises. In particular, it applies the same criteria used in the previous subsections, identifying 57 episodes in which a

[30]The degree of economic slack is defined here based on real GDP growth in the year preceding the episode of large exchange rate depreciation, as explained in Annex 3.4. The results are broadly similar when the definition of economic slack is based on the output gap in the year preceding the large exchange rate depreciation.

[31]To ease comparability of the estimation results for the two groups, the estimated impulse responses are scaled to ensure that the first-year impact on the real exchange rate is exactly the same. Such rescaling is performed in all later comparisons of large exchange rate depreciation episodes.

[32]Ronci (2004) analyzes the effect of constrained trade finance on trade flows in countries undergoing financial and balance of payments crises and concludes that constrained trade finance depresses both export and import volumes in the short term. Dell'Ariccia, Detragiache, and Rajan (2005) and Iacovone and Zavacka (2009) find that banking crises have a detrimental effect on real activity in sectors more dependent on external finance, which includes export-oriented sectors. Kiendrebeogo (2013) investigates whether banking crises are associated with declines in bilateral exports, by estimating a gravity model using a sample of advanced economies and developing countries for the period 1988–2010. The results suggest that banking-crisis-hit countries experience lower levels of bilateral exports, with exports of manufactured goods falling particularly strongly. More generally, for an analysis of the evolution of trade following large depreciations associated with financial crises, see Chapter 4 of the October 2010 WEO.

banking crisis (again, based on the data set of Laeven and Valencia 2013) occurred in the three-year period before or after the large exchange rate depreciation (see Annex Table 3.4.2). By definition, these 57 episodes are not the same set as those included in the baseline analysis. They include, for example, the large exchange rate depreciations in Finland and Sweden in 1993; Thailand and Korea in 1997 and 1998, respectively; Russia in 1998; Brazil in 1999; and Argentina in 2002.

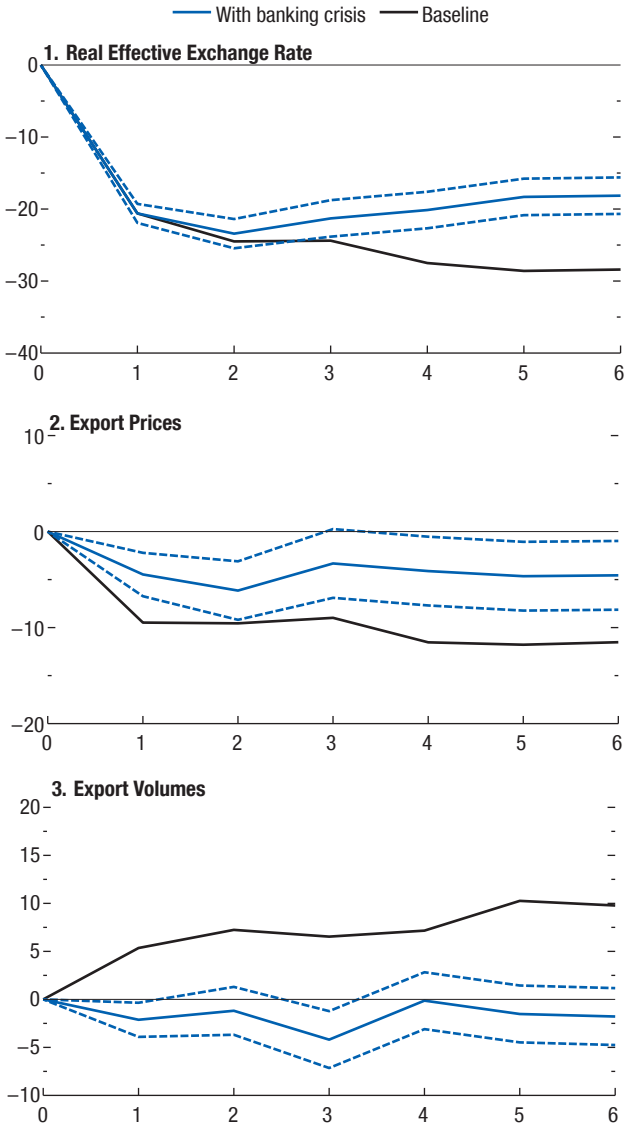
The results suggest that the boost to exports is indeed weaker when an exchange rate depreciation is associated with a banking crisis (Figure 3.6). In particular, export prices decline by less, suggesting an average elasticity of export prices to the real effective exchange rate of 0.25, about half that observed in the baseline case. The response of real exports is near zero. These results are consistent with the view that the credit constraint exporting firms face when a country's financial sector is weak limits their ability to borrow and increases their exporting capacity when the currency depreciates.[33]

At the same time, banking crises result in a wide range of outcomes, as discussed in the literature (see Chapter 4 of the October 2009 WEO, for example). For a number of the episodes associated with banking crises analyzed here, exports outperformed the near-zero average effect—for example, for the large depreciations of Argentina (2002), Brazil (1999), Russia (1998), and Sweden (1993), for which the estimated effect on exports is positive.[34]

Overall, the results based on the analysis of traditional trade equations and large exchange rate depreciation episodes suggest that trade responds substantially to the exchange rate according to the historical evidence and that the conventional expenditure-switching effects apply. The rise in exports associated with exchange rate depreciation is likely to be largest when there is slack in the economy and when the financial sector is operating normally.

Figure 3.6. Export Dynamics Following Large Exchange Rate Depreciations Associated with Banking Crises
(Percent; years on x-axis)

The export increase associated with a large currency depreciation is typically smaller when a country's financial system is weak, as in the context of a banking crisis.



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

[33]These results are robust to controlling for the occurrence of banking crises in trading partners in the estimated equations.

[34]For additional analysis of the effects of the 2002 Argentina episode, see Calvo, Izquierdo, and Talvi 2006. For the 1998 Russia episode, see Chiodo and Owyang 2002. For the 1993 Sweden episode, see Jonung 2010.

Disconnect or Stability?

The analysis so far has assumed that the historical relationship between exchange rates and trade has been stable over time and thus provides an appropriate benchmark for assessing the implications of the recent exchange rate movements. This section investigates whether this assumption is warranted or whether trade and exchange rates have become disconnected. It starts by investigating the role of the rise of global value chains, with the associated international fragmentation of production, in reducing the links between exchange rates and trade—an issue that has featured prominently in the recent policy debate on disconnect. It then investigates more generally whether the relationship between exchange rates and trade flows—either measured using the traditional trade equations or based on large exchange rate depreciation episodes—has weakened.

Disconnect and the Rise of Global Value Chains

Gross trade flows can be decomposed into trade related to global value chains (trade in intermediate goods that serve as inputs into other economies' exports) and other trade. This section begins with a brief overview of the rise of global value chains during the past several decades. Then it explains why trade related to global value chains could respond more weakly than traditional trade to exchange rate changes and assesses the evidence.[35]

The Rise of Global Value Chains

During the past several decades, international trade has been increasingly organized within so-called global value chains, with different stages of production distributed across different economies. Production fragmentation has grown as economies increasingly specialize in adding value at some stage of production rather than producing entire final products. Exports of domestic value added have gradually declined as a fraction of gross exports, while the share of exports consisting of imported intermediate products, that is, foreign value added, has increased. At the same time, the share of intermediate goods in total exports is rising, while the share of final products is declining. As a result, export competitiveness is determined not only by the exchange rate and price level of the export destination economy, but also by the exchange rate and price level of the economy at the end of the production chain.

Participation in global value chains is measured along two dimensions: backward (import) links with previous production stages and forward (export) links with subsequent production stages.

- *Backward participation*. As global value chains have become more prevalent, the share of gross exports consisting of inputs imported from abroad has increased. Hence, the share of foreign value added in gross exports has gradually risen from a cross-country average of about 15 percent of gross exports in the 1970s to about 25 percent in 2013 (Figure 3.7). However, for some economies, such as Hungary, Romania, Mexico, Thailand, and Ireland, the increase has been greater than 20 percentage points, substantially larger than the cross-country average. Some evidence indicates that the rise of global value chains measured along this dimension has slowed in recent years. Indeed, Constantinescu, Mattoo, and Ruta (2015) find that the slower pace of global value chain expansion has contributed to the global trade slowdown observed since the global financial crisis.
- *Forward participation*. With the rise of global value chains, the share of exports consisting of intermediate inputs used by trading partners for production of their exports has increased. The share has increased gradually, to 24 percent from 20 percent of gross exports, on average, during the period 1995–2009 (Figure 3.7). Russia, Chile, Indonesia, Japan, and Korea have seen the largest rises.

These two measures could be used to assess a country's relative position in global value chains. Economies toward the end (downstream) of production chains are more likely to have strong backward but weak forward links. Those closer to the origin (upstream) of production chains are more likely to have strong forward but weak backward links.

Global Value Chain Participation and Trade Elasticities

What effect does increased participation in global value chains have on the responsiveness of trade to exchange rates?

- *Exchange rate pass-through*. If the share of foreign value added in exports is large, a currency

[35]The extent to which the rise of global value chains matters for the relationship between exchange rates and trade depends on the share of the related trade in gross trade flows and on the degree to which the related trade responds differently to exchange rate fluctuations.

depreciation can substantially increase the cost of an economy's imported inputs if the input composition remains unchanged.[36] This higher cost may then be passed on to the next production stage. Hence, foreign-currency export prices might not decline as much as in the conventional case of no foreign-value-added content, implying a weaker exchange rate pass-through to export prices.[37] The likely impact of the rise of global value chains on pass-through to import prices is less clear.

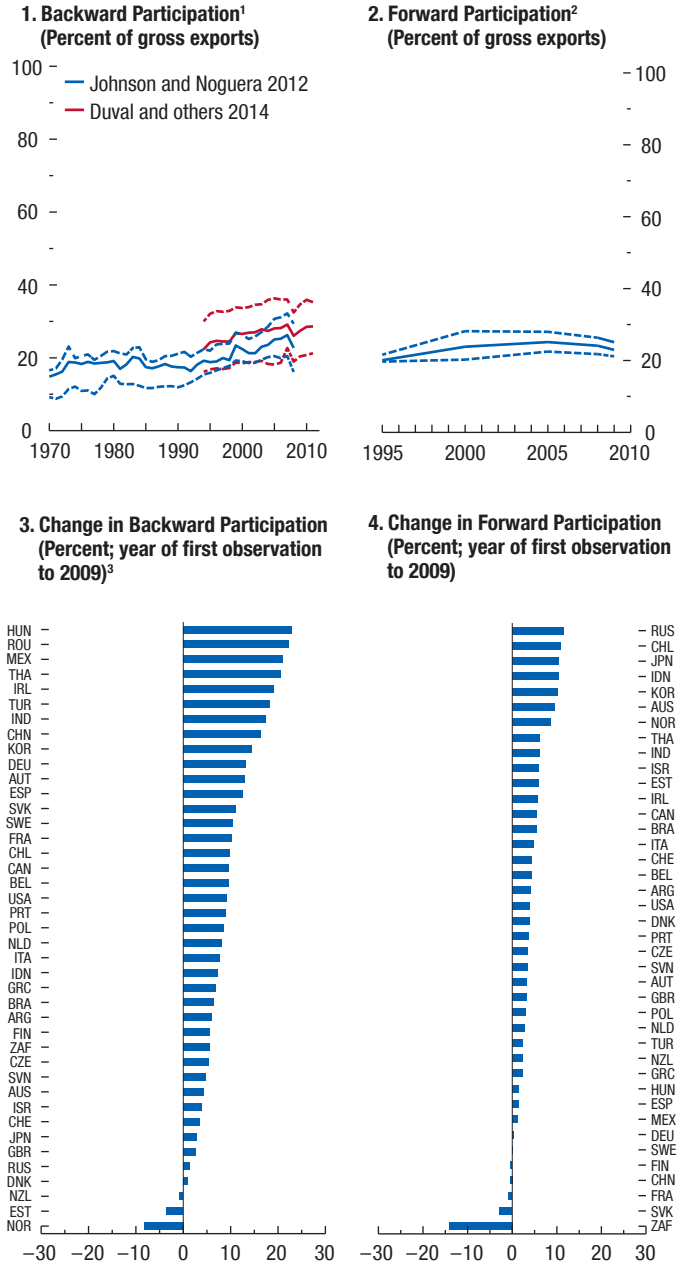
- *Price elasticities*. Demand for an economy's exports ultimately depends on the demand conditions and the price competitiveness of the finished product in the final destination market. With production increasingly fragmented across international borders, however, the final buyers at the end of an economy's production chain may not be among the economy's direct trading partners. This lack of direct connection complicates the estimation of the traditional trade relationship discussed earlier in the chapter. In particular, it could lead to "measurement error" in the sense that export prices become a weaker signal of true price competitiveness, and this measurement error could bias estimates of the effect of export prices on export demand toward zero. An analogous argument applies to the relationship between import prices and imports, since imports increasingly reflect developments in exports. An increase in import prices resulting from an exchange rate depreciation could coincide with lower export prices and stronger demand for exports and, therefore, a rise in import demand. The rise in the price of imports could then be associated with a perverse increase in imports despite higher import prices, counter to the traditional expenditure-switching logic. Overall, estimated export and import price elasticities could be smaller the more an economy participates in global value chains. The same reasoning also applies to the estimated effect of exchange rate movements on net exports.

[36]However, the composition of inputs might not remain unchanged, because foreign importers of intermediates can, at least in principle, substitute among a variety of suppliers to minimize production costs.

[37]At the same time a large fraction of trade in value added is within the same firm rather than between different firms. When a country's currency depreciates and export profits increase, firms may change export prices to shift some of their profits to foreign affiliates. Such transfer pricing behavior could alter pass-through to export prices, thus confounding the effect on pass-through attributable to global value chains.

Figure 3.7. Evolution of Global Value Chains

Participation in global value chains has generally risen gradually, with substantial changes in some countries.



Sources: Duval and others 2014; Johnson and Noguera 2012; and Organisation for Economic Co-operation and Development.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1] Share of foreign value added in gross exports. Solid lines denote the average. Dashed lines denote 25th and 75th percentiles.
[2] Intermediate goods used by trading partners for production of their exports as a share of gross exports.
[3] Based on Johnson and Noguera 2012.

In general, increased participation in global value chains could lower the effects of exchange movements on trade prices and of trade prices on trade volumes. At the same time, although trade related to global value chains has grown in recent decades, the bulk of global trade still consists of conventional trade. In addition, as already mentioned, the average increase in the share of foreign value added in exports has generally been gradual and has recently slowed. Thus, the rising share of foreign value added is unlikely to have dramatically reduced the responsiveness of gross exports and imports to exchange rates for most countries. The overall evidence regarding a rising disconnect between exchange rates and trade, which reflects not only the rise of global value chains but also other factors, is assessed later in the chapter. That analysis does not suggest a general weakening of the relationship between exchange rates, trade prices, and total trade volumes.

However, beyond the implications of global value chains for the relationship between overall gross trade flows and exchange rates, increased participation in value chains may have a bearing on the relationship between exchange rates and trade in global-value-chain-related goods. Box 3.1 assesses the evidence. In particular, it estimates the relationship between trade in global-value-chain-related goods and real effective exchange rates. It finds that a real appreciation of a country's currency not only reduces its exports of domestic value added, but also lowers its imports of foreign value added (in contrast to the traditional rise in imports following currency appreciation). This latter result is consistent with the notion that global-value-chain-related domestic and foreign value added are complements in production.[38] So producing and exporting less domestic value added would also reduce the derived demand for imported foreign value added. In addition, the analysis finds that the magnitudes of import and export elasticities depend on the size of a country's contribution to global value chains—smaller domestic contribution of value added tends to dampen the response to exchange rate changes (see Cheng and others, forthcoming; and IMF 2015a, 2015b, 2015c).[39]

Finally, the rise of global value chains has implications for competitiveness assessments. As already mentioned, in a value chain, the cost of producing an economy's goods as well the demand for them can depend on the exchange rates of economies that are not among the economy's direct trading partners. Thus, the real effective exchange rate relevant for competitiveness assessments not only needs to include the country's direct trading partners but must also take into account all participants in the value chain, including the final consumers. Such a measure, the so-called value-added real effective exchange rate, is described in Box 3.2. This measure depends on the final destinations of exported domestic value added, and it accounts for product substitutability in demand and production. As Box 3.2 reports, a number of economically important differences arise between value-added real effective exchange rates and conventional real effective exchange rates. However, overall, the two measures are strongly correlated, in part because the vast majority of trade does not consist of global-value-chain-related trade.[40]

Overall, the evidence suggests that, for economies that have become more deeply involved in global value chains, trade in global-value-chain-related products has become less strongly responsive to exchange rate changes. At the same time, although global-value-chain-related trade has gradually increased through the decades, the relative pace of its expansion appears to have decelerated in recent years, and the bulk of global trade still consists of conventional trade. The rise of global value chains is thus unlikely to have

[38]It is important to keep a macroeconomic perspective on this issue. Input substitution for product categories or some industries may rise. Generally, however, once a firm arranges production processes with a foreign supplier, it may well continue working with the supplier for some time to recoup sunk costs of moving production abroad. A generally low degree of substitutability between domestic and foreign input suppliers could thus be expected.

[39]Consistent with this result, Ahmed, Appendino, and Ruta (2015) find that the response of gross exports of manufactured goods to real exchange rate movements is weaker in economies with a higher share of foreign value added in gross exports, and Ollivaud, Rusticelli, and Schwellnus (2015) find that the elasticity of the terms of trade to the exchange rate is weaker in such economies. In related work based on firm-level data, Amiti, Itskhoki, and Konings (2014) find that import-intensive exporters have significantly lower exchange rate pass-through to their (foreign currency) export prices. Eichengreen and Tong (2015) find that renminbi appreciation has a positive effect on the stock market valuation of firms in sectors exporting final goods to China, with a negligible effect on those providing inputs for China's processing exports. The IMF (2015d) provides additional evidence, using data for Singapore, that products that have a higher foreign-value-added share respond more weakly to relative export prices.

[40]This observation also suggests that biases in estimated value-added trade relations due to incorrect use of standard real effective exchange rates could be small. The same implication applies to the estimation of gross trade relations based on value-added real effective exchange rates.

dramatically altered the responsiveness of gross exports and imports to exchange rates. This notion is further investigated in the next subsection.

Disconnect over Time?

This subsection investigates more generally whether the relationship between exchange rate movements and trade—either long-term effects or transmission lags—has weakened over time. Numerous developments beyond the rise of global value chains could, in principle, have altered the effects of exchange rate movements. Some, such as the liberalization of trade flows and increased international competition associated with globalization, may have increased the responsiveness of trade to exchange rates. Others, such as the rise of pricing to market among several emerging markets and the moderation and stabilization of inflation in some economies, may have reduced the effects of changes in exchange rates on trade prices.[41] The question is whether, taken together, these developments have led to a disconnect.

Stability Tests

To check whether the estimated links between exchange rates and trade have weakened, the analysis reestimates the four trade elasticities already discussed for successive 10-year rolling intervals. The first 10-year interval used for estimation is 1990–99 and the last is 2005–14. Since a period of 10 years provides insufficient data to estimate the elasticities for individual economies (based on annual data), the analysis is based on a panel estimation approach that combines data for multiple economies.[42]

[41]Frankel, Parsley, and Wei (2012) and Gust, Leduc, and Vigfusson (2010) provide evidence on the declining exchange rate pass-through to import prices over time. Shifts in the invoice currency chosen by economies are also likely to play a role (see Gopinath, Itskhoki, and Rigobon 2010).

[42]For each region, the analysis is based on the estimation of a multieconomy panel for the four trade equations already discussed. Given the lack of evidence of cointegration for the panel of economies considered (as assessed based on the panel cointegration tests in Pedroni 2004), the specification is estimated in first differences. For example, for export prices, the specification estimated is as follows (the other equations are set up analogously):

$$\Delta \ln\left(\frac{eP^X}{P^*}\right)_{it} = \alpha + \rho \Delta \ln\left(\frac{eP^X}{P^*}\right)_{i,t-1} + \Sigma_{j=0}^{2} \beta_j \Delta \ln\left(\frac{eP}{P^*}\right)_{i,t-j} + \Sigma_{j=0}^{2} \gamma_j \Delta \ln\left(\frac{ULC}{P}\right)_{i,t-j} + \mu_i + \lambda_t + \upsilon_{it},$$

in which the subscript i denotes the ith country and the subscript t denotes the tth year. As before, the estimated effects in years $t + j$, for $j = 0$, 1, and 2, are then based on the estimates of the β_j coefficients.

Given that some regions are likely to have experienced greater structural change than others, the analysis investigates the evolution of trade elasticities for a global sample and for separate regions. In particular, because the rise of global value chains has been particularly noticeable in a number of Asian and European economies, rolling regression results are provided separately for these two regions.

The results suggest that exchange rates have not generally become disconnected from trade (Figure 3.8). The elasticity of imports with respect to import prices shows some weakening toward the end of the sample in some of the regions, which is consistent with the view that imports are increasingly responsive to export developments, as in global value chains. However, because there is no sign of weakening in the responsiveness of exports to relative export prices (there is even a mild strengthening in some subsamples), or in the effects of exchange rates on trade prices, the evidence regarding the implications of the rise of global value chains remains inconclusive. Given that the rise of global value chains has generally been only gradual and appears to have decelerated recently, this inconclusive evidence is perhaps not surprising.[43]

Structural-break tests for a number of different samples confirm this finding of broad stability in total trade elasticities over time. When the sample used for the estimation of the panel regressions is divided into two halves—years through 2001 and years since 2002—a structural-break test fails to reject the null hypothesis of no change in the trade elasticities across the two time periods in most cases (Annex Table 3.5.1). The tests are conducted for the geographical groups included in Figure 3.8, as well as for a sample of economies that increased their participation in global value chains particularly strongly (those with a rise during 1995–2009 in the share of foreign value added in gross exports that is greater than the cross-country median), and for those economies that

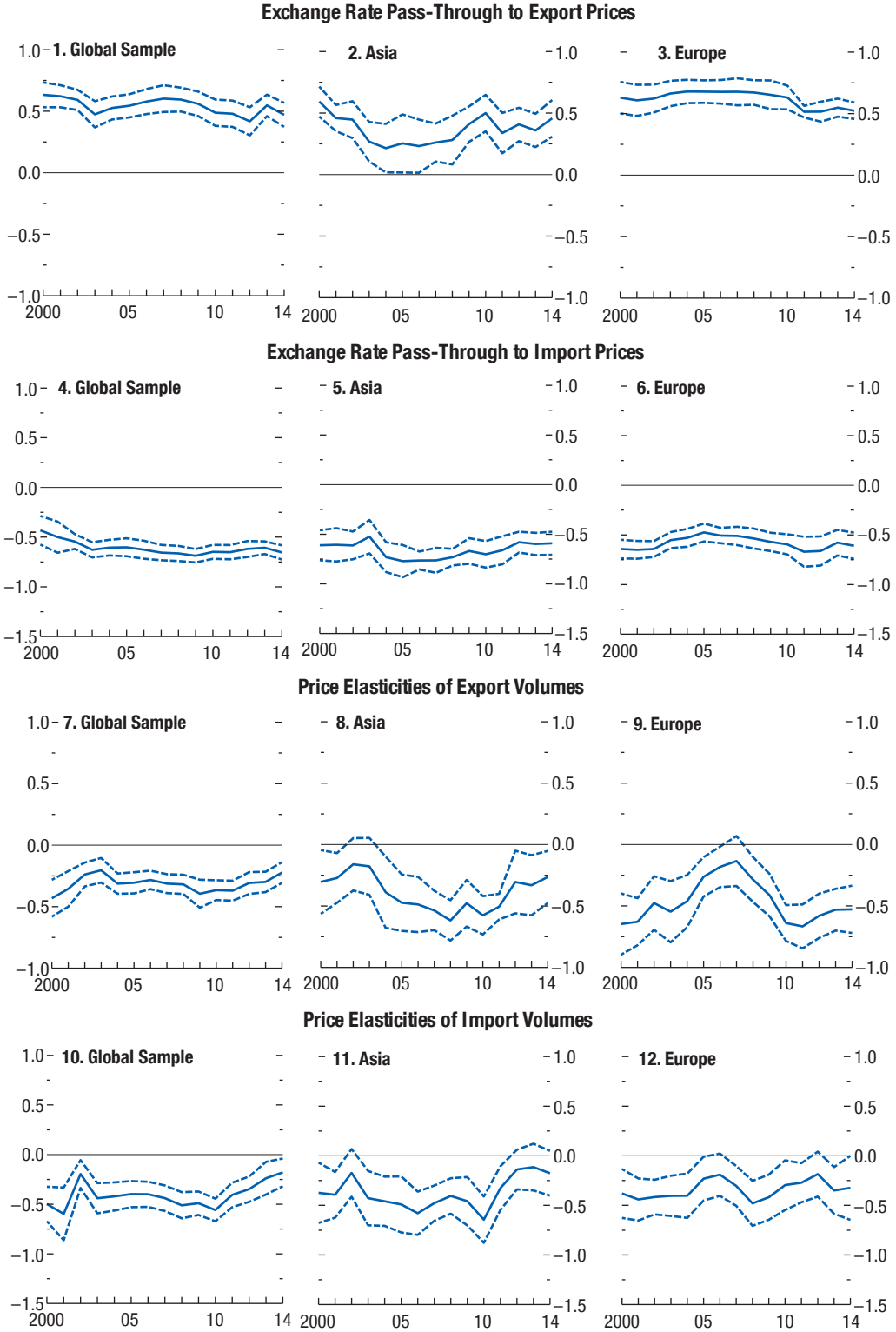
Long-term effects are estimated as $\Sigma_{j=0}^{2} \beta_j/(1 - \rho)$. The estimated equation also includes a full set of time dummies (λ_t) to take account of global shocks such as shifts in commodity prices. To avoid changes in its composition over time, the sample includes only economies for which at least 20 years of data are available. Based on data availability, the full sample includes 88 advanced and emerging market and developing economies. They are listed in Annex Table 3.1.4.

[43]The finding of broad stability in exchange rate pass-through over time is consistent with the findings of Bussière, Delle Chiaie, and Peltonen (2014), who test stability in exchange rate pass-through coefficients for the period 1990–2011 for 40 advanced and emerging market and developing economies.

Figure 3.8. Trade Elasticities over Time in Different Regions

(Ten-year rolling windows ending in year t)

There is little evidence of a general trend toward disconnect between exchange rates, trade prices, and total trade volumes.



Source: IMF staff estimates.

Note: Figure is based on panel estimates using producer price index–based real effective exchange rate and export and import prices relative to foreign and domestic producer prices, respectively. Full sample spans 88 advanced and emerging market and developing economies from 1990 to 2014. Dashed lines denote 90 percent confidence intervals.

increased their participation less strongly (those with a rise in the foreign-value-added share that is less than the cross-country median).

Similarly inconclusive results emerge when the tests are repeated for data samples used elsewhere, as in the 46 economies included in the analysis of Ahmed, Appendino, and Ruta 2015 (Annex 3.5). Additional analysis suggests that evidence regarding a lengthening of transmission lags is also limited. A lengthening in lags would imply a divergence between long-term effects and shorter-term effects, but there is little evidence of such a divergence.

In interpreting these results, it is also worth noting that the macroeconomic relevance of trade elasticities depends on the shares of exports and imports in GDP, both of which have risen in recent decades, reflecting the process of trade globalization (Figure 3.9). On their own, the increases in these trade ratios imply larger effects of exchange rate movement on total imports and exports in percentage points of GDP. Therefore, even a decline in trade elasticities could, in the context of rising import and export ratios, be consistent with exchange rate movements having equally important or even greater macroeconomic implications for trade than before.

Effects of Large Exchange Rate Depreciations over Time

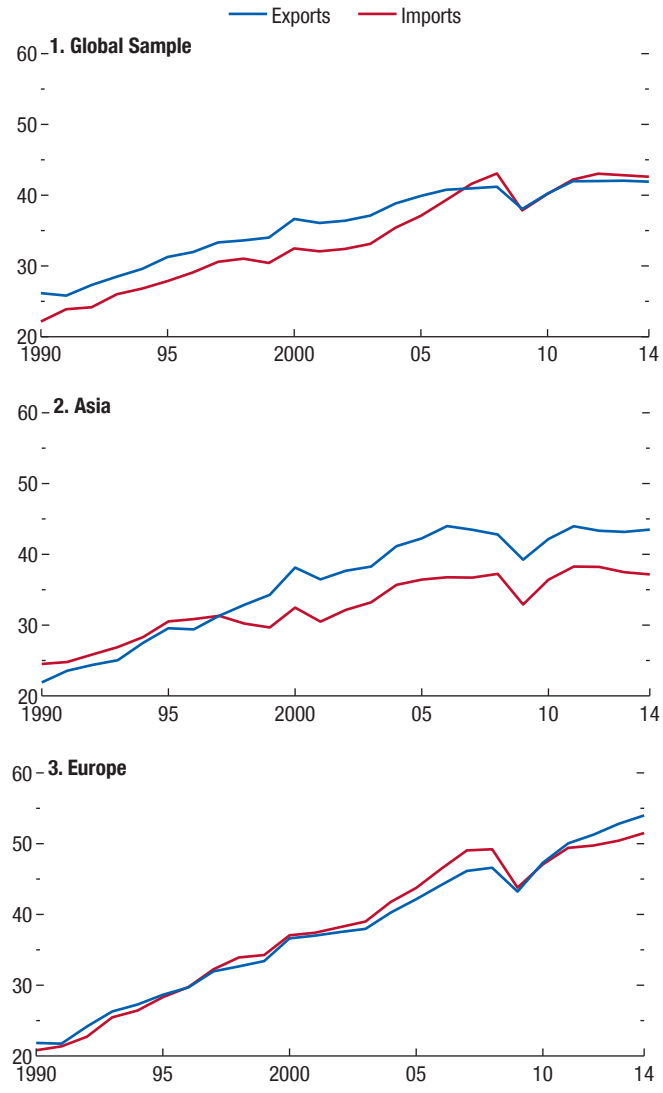
To shed more light on whether the links between exchange rates and trade have weakened, the analysis reconsiders the effects of large exchange rate depreciations on exports in the first and second halves of the sample. Of the 66 episodes of large currency depreciation in the sample, half (33) occurred in 1997 or earlier, and the other half occurred in more recent years.

Analysis of these two time samples indicates little evidence of a weakening in the effects of exchange rates over time (Figure 3.10). The analysis indicates that export prices and volumes responded similarly during the two time samples. Little evidence emerges of either weakened long-term responses or lengthened lags.

Overall, the results are consistent with the view that trade and exchange rates have remained connected. It is worth recalling that the view that exchange rates are becoming disconnected from trade has been partly motivated by Japan's recent experience; despite a sharp depreciation of the yen, export growth has failed to accelerate as expected. As discussed in Box 3.3, this experience reflects a number of Japan-specific factors that have partly offset the positive impact of yen depreciation on exports and that do not necessarily apply elsewhere.

Figure 3.9. Ratios of Exports and Imports to GDP, 1990–2014
(Percent)

Exports and imports have been rising as a share of GDP, increasing the macroeconomic relevance of exchange rate movements, for a given set of trade elasticities.



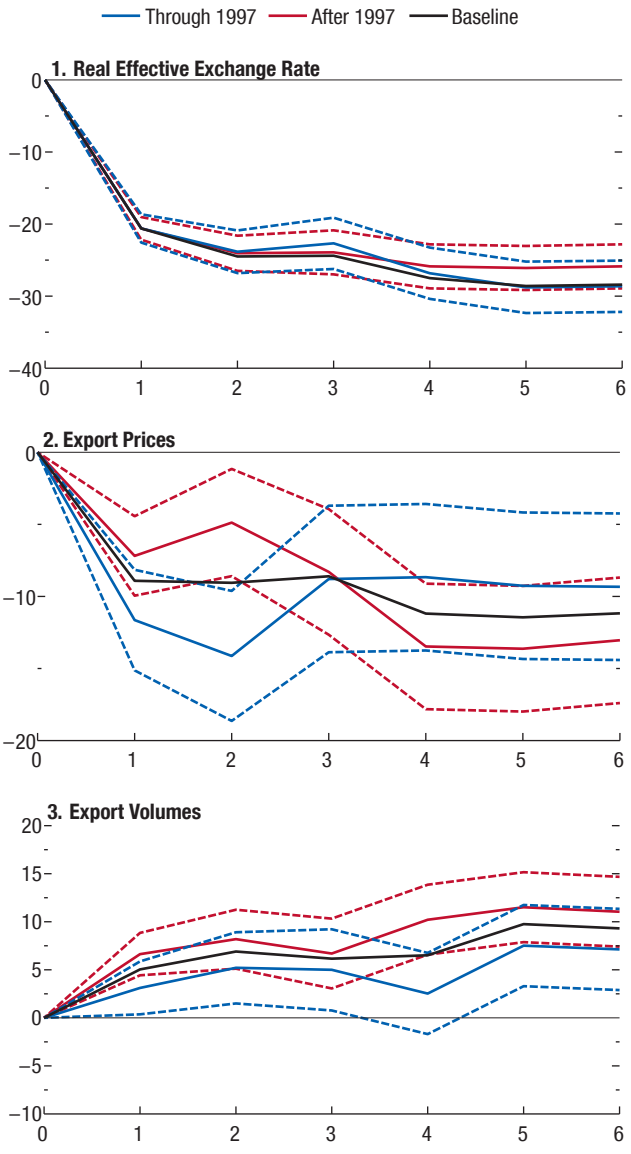
Source: IMF staff calculations.
Note: Figure presents simple averages of economies in the sample.

Implications for the Outlook

The analysis in this chapter suggests that exchange rate movements tend to have strong effects on exports and imports. Based on the chapter's estimates, a 10 percent real effective depreciation in an economy's currency is associated with, on average, a 1.5 percent of GDP rise in real net exports, with substantial cross-country variation around this average. It takes a number of years for the effects to fully materialize, but

Figure 3.10. Export Dynamics Following Large Exchange Rate Depreciations: Through and After 1997
(Percent; years on x-axis)

Export prices and volumes display similar dynamics during the period through 1997 and in the period thereafter.



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

much of the adjustment occurs in the first year. The analysis also indicates that foreign and domestic aggregate demand play robust roles in driving exports and imports, a link that has featured prominently in the policy debate on the postcrisis decline in global trade.

These results suggest that recent exchange rate movements, including the U.S. dollar's appreciation of more than 10 percent in real effective terms during the past year, would result in a substantial redistribution of real net exports across economies. As discussed in Chapter 1, recent exchange rate movements have reflected variations in underlying fundamentals, such as expected demand growth at home and in trading partners, declines in commodity prices, and a variety of country-specific shocks. Overall outcomes for trade will reflect not only the direct effect of exchange rates on trade, but also shifts in the underlying fundamentals driving exchange rates themselves. With regard to direct effects on trade, the real effective exchange rate movements since January 2013 point to a redistribution of real net exports, from the United States and economies whose currencies move with the dollar, to the euro area, to Japan, and to economies whose currencies move with the euro and the yen (Figure 3.11).[44] Among economies experiencing currency depreciation, the rise in exports is likely to be greatest for those with slack in the domestic economy and with financial systems operating normally.

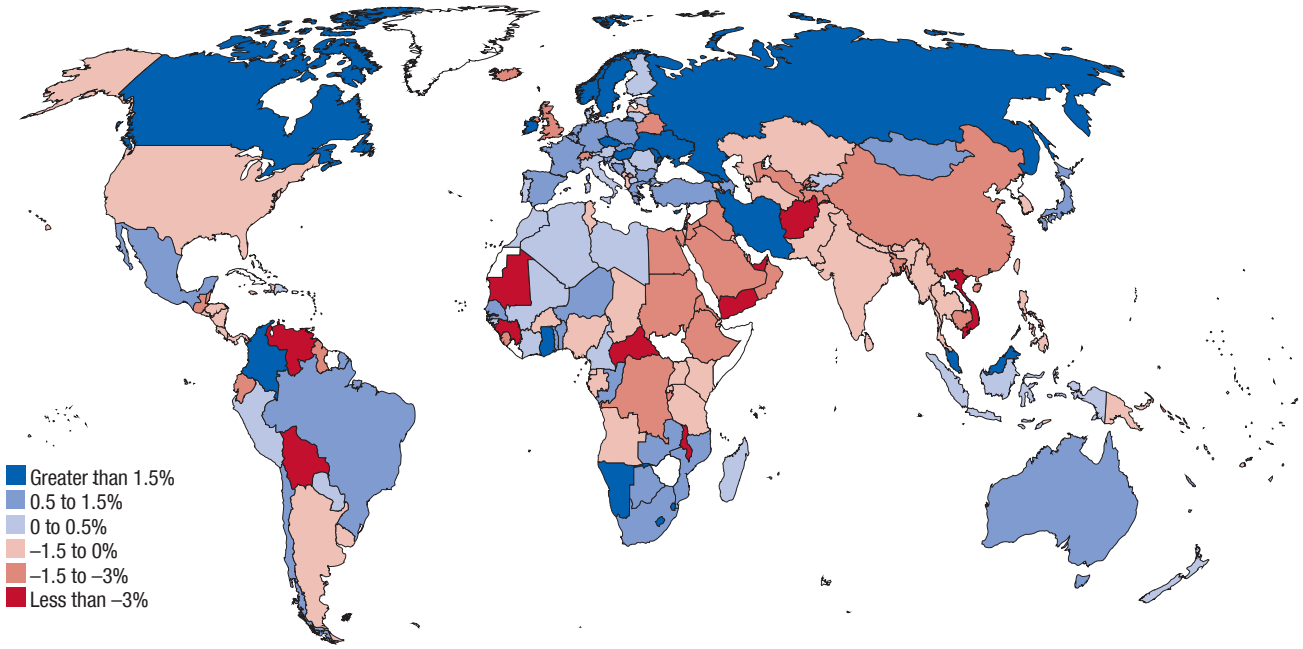
The chapter also finds that there is little evidence of a trend toward disconnect between exchange rates, trade prices, and trade volumes over time. Some evidence indicates that the rise of global value chains has weakened the relationship between exchange rates and trade in intermediate products used as inputs into other economies' exports. However, global-value-chain-related trade has increased only gradually through the decades, and the bulk of global trade still consists of conventional trade. There is also little sign of a general weakening in the responsiveness of exports to relative export prices or in the effects of exchange rates on trade prices. Overall, the evidence regarding a general disconnect between exchange rates and overall trade remains inconclusive.

Policy views based on the traditional relationship between exchange rates and trade are thus still tenable. The results confirm that exchange rate changes have strong effects on export and import prices, with implications for inflation dynamics and the transmission of monetary policy changes. Economies in which the rise of global value chains has weakened the effects

[44]The illustrative calculation reported in Figure 3.11 is based solely on changes in real effective exchange rates from January 2013 to June 2015. The calculation is based on CPI-based real effective exchange rates because they are available for more economies than are PPI-based ones. It applies the average estimates of CPI-based trade elasticities reported in Table 3.1 to all economies.

Figure 3.11. Illustrative Effect of Real Effective Exchange Rate Movements since January 2013 on Real Net Exports
(Percent of GDP)

Exchange rate movements since January 2013 imply a substantial redistribution of real net exports across economies.



Source: IMF staff calculations.
Note: The illustrative effects of consumer price index (CPI)–based real effective exchange rate movements from January 2013 to June 2015 on real net exports in percent of GDP are based on the average CPI-based estimates of the exchange rate pass-through into export and import prices and the price elasticity of exports and imports reported in Table 3.1. These average estimates are applied to all economies. Country-specific shares of exports and imports in GDP used in the calculation are from 2012.

of exchange rates on trade may have less scope for expenditure switching, and larger changes in exchange rates may be required for the resolution of trade imbalances. In general, however, the role of flexible exchange rates in facilitating the resolution of trade imbalances remains strong.

Annex 3.1. Data

Data Sources

The primary data sources for this chapter are the IMF's World Economic Outlook (WEO) database, Information Notice System (INS), and Global Assumption and Global Economic Environment databases; the Organisation for Economic Co-operation and Development's *OECD Economic Outlook*; and the U.S. Bureau of Labor Statistics. The analysis performed in "Disconnect and the Rise of Global Value Chains" also uses the Trade in Value Added database from the OECD–World Trade Organization.[45] Annex Table 3.1.1 describes all indicators used in the chapter as well as their sources. Annex Tables 3.1.2 and 3.1.3 list all countries used in the estimation of trade elasticities (individual economy and panel, respectively), and Annex Table 3.1.4 lists those used in the analysis of global value chains.

Data Definitions

The nominal exchange rate used throughout the chapter is the nominal effective exchange rate taken from the INS. It is a weighted average of trading-partner bilateral nominal exchange rates, with the weights based on gross exports. The consumer price

[45]The WEO list of 37 advanced economies is used as the basis for the analysis in this chapter. The maximum data range available spans 1960–2014, with data for 2014 preliminary. Data limitations constrain the sample size in a number of cases, as noted in the chapter text.

Annex Table 3.1.1. Data Sources

Indicator	Source
Export Prices	IMF staff calculations using export value divided by export volume
Export Volume	IMF, World Economic Outlook database
Export Value	IMF, World Economic Outlook database
Import Prices	IMF staff calculations using import value divided by import volume
Import Volume	IMF, World Economic Outlook database
Import Value	IMF, World Economic Outlook database
International Commodity Price Index	IMF, Global Assumptions database
International Energy Price Index	IMF, Global Assumptions database
Nominal Effective Exchange Rate	IMF, Information Notice System
Nominal GDP	IMF, World Economic Outlook database
Real Effective Exchange Rate	IMF, Information Notice System
Real GDP	IMF, World Economic Outlook database
Trade-Weighted Foreign CPI	IMF staff calculations
Trade-Weighted Foreign Demand	IMF, Global Economic Environment database
Trade-Weighted Foreign PPI	IMF staff calculations
Unit Labor Cost[1]	Organisation for Economic Co-operation and Development, *OECD Economic Outlook*; U.S. Bureau of Labor Statistics; and IMF staff calculations
Indicators Used for Global Value Chain Analysis	
Backward Participation	Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database
Forward Participation	Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database

Note: CPI = consumer price index; PPI = producer price index.

[1]IMF staff calculations use data from Haver Analytics; International Labour Organization; IMF, World Economic Outlook database; and IMF, International Financial Statistics.

Annex Table 3.1.2. Economies Included in Estimation of Trade Elasticities

Advanced Economies	Emerging Market Economies
Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States	Algeria*, Argentina, Bangladesh, Bolivia*, Bulgaria, Chile*, China, Colombia*, Republic of Congo*, Costa Rica, Côte d'Ivoire*, Egypt, El Salvador, Guatemala, Honduras, Hungary, India, Indonesia, Iran*, Jordan, Kenya, Kuwait*, Malaysia, Mexico, Morocco, Nigeria*, Pakistan, Paraguay*, Philippines, Saudi Arabia*, South Africa*, Sri Lanka, Thailand, Trinidad and Tobago*, Tunisia, United Arab Emirates, Venezuela*

*Denotes commodity exporters, that is, economies for which primary products constituted the main source of export earnings, exceeding 50 percent of total exports, on average, between 2009 and 2013.

Annex Table 3.1.3. Economies Covered in the Trade in Value Added Database

Argentina, Australia, Austria, Belgium, Bulgaria, Brazil, Brunei Darussalam, Cambodia, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Hungary, Iceland, Indonesia, India, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Russia, Saudi Arabia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan Province of China, Thailand, Tunisia, Turkey, United Kingdom, United States, Vietnam

Note: The Trade in Value Added database is from the Organisation for Economic Co-operation and Development and World Trade Organization.

Annex Table 3.1.4. Economies Included in the Rolling Regressions

Albania, Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Bulgaria, Cambodia, Canada, Chile, China, Colombia, Republic of Congo, Costa Rica, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Israel, Italy, Japan, Jordan, Kenya, Korea, Kuwait, Kyrgyz Republic, Latvia, Lebanon, Libya, FYR Macedonia, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syria, Taiwan Province of China, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Yemen, Zambia

index (CPI)–based real effective exchange rate also comes from the INS. The producer price index (PPI)–based real effective exchange rate, as well as the CPI-based and PPI-based trade-weighted foreign producer prices, are constructed as trade-weighted indices, with the weights from the INS. The unit labor cost data come from OECD Statistics and, in case of missing observations, are supplemented using IMF staff calculations. For non-OECD economies, the unit labor cost is constructed as the total wage bill divided by real GDP. The total wage bill and real GDP are taken from the IMF's WEO database, Haver Analytics, the International Labour Organization, the IMF's *International Financial Statistics*, and CEIC. When unavailable, total wage bill data are constructed using the average wage rate and total employment.

Annex 3.2. Estimation of Trade Elasticities

Trade Equations Estimated for Individual Economies

The analysis is based on log-linear specifications for the four trade equations. For each equation, the analysis checks whether the variables included are cointegrated based on a Dickey-Fuller test, in which case the equations are estimated using ordinary least squares in levels. Otherwise, they are estimated in first differences.

In level terms, the four trade equations estimated are as follows. For export prices, the specification is

$$\ln\left(\frac{eP^{X}}{P^{*}}\right)_t = \alpha + \beta \ln\left(\frac{eP}{P^{*}}\right)_t + \gamma \ln\left(\frac{ULC}{P}\right)_t + \varepsilon_t,$$

in which the subscript t denotes the tth year, $\left(\frac{eP^{X}}{P^{*}}\right)$ denotes the relative price of exports in foreign currency (e is the nominal effective exchange rate, P^{X} is the price of exports in domestic currency, and P^{*} is the foreign-trade-weighted producer price index [PPI]), and $\left(\frac{eP}{P^{*}}\right)$ is the PPI-based real effective exchange rate. *ULC* is unit labor costs.

For export volumes, the specification is

$$\ln X_t = \alpha + \beta \ln\left(\frac{eP^{X}}{P^{*}}\right)_t + \gamma \ln Y^{*}_t + \varepsilon_t,$$

in which X denotes export volume and Y^{*} denotes foreign real GDP (in trade-weighted terms).[46]

[46]The estimates for the export price equation are also robust to the inclusion of a foreign demand control on its specification.

For import prices, the specification is

$$\ln\left(\frac{P^{M}}{P}\right)_t = \alpha + \beta \ln\left(\frac{eP}{P^{*}}\right)_t + \gamma \ln Y_t + \varepsilon_t,$$

in which Y denotes domestic real GDP.

For import volumes, the specification is

$$\ln M_t = \alpha + \beta \ln\left(\frac{P^{M}}{P}\right)_t + \gamma \ln(DD_t) + \delta \ln(X_t) + \varepsilon_t,$$

in which DD denotes domestic demand for domestic goods ($Y - X$).

All equations also include a time trend and a dummy variable (which equals 1 during 2008–09) to account for the global financial crisis, and the interaction of this crisis dummy with the measure of foreign output for the export equation and with the measure of domestic output for the import equation. These interaction terms address the notion that trade responded unusually strongly to demand during the crisis (see, for example, Bussière and others 2013). In addition, to control for shifts in global commodity prices, which can affect exporting firms' costs, the equations for export and import prices control for the (log) indices of international fuel and nonfuel commodity prices. The estimates for the export price equation are also similar when trading-partner real GDP growth is used as an additional control.

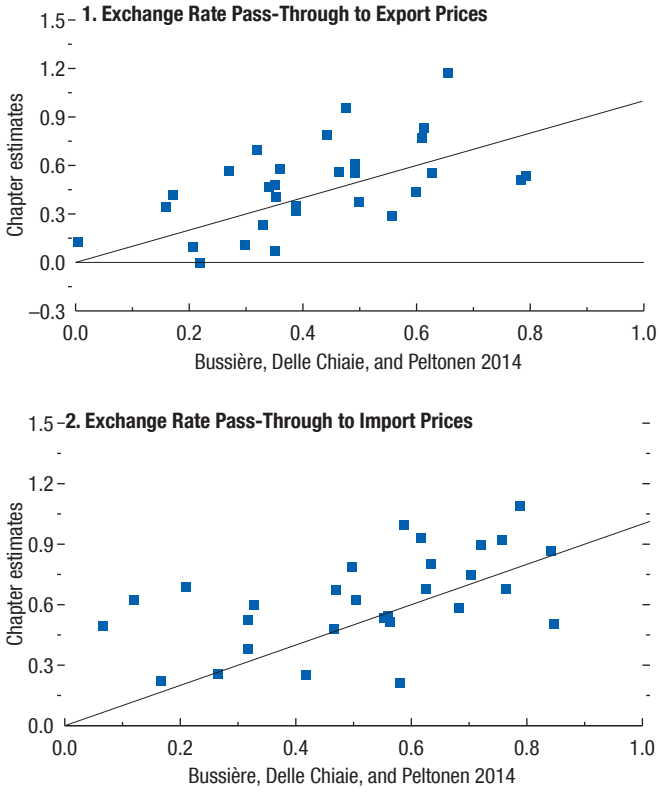
In each case, the estimate for β indicates the estimated long-term effect. Short-term effects are obtained by estimating, in a second step, the equation in error correction form. For example, for export prices, this equation is

$$\Delta\ln\left(\frac{eP^{X}}{P^{*}}\right)_t = \alpha + \rho\, \Delta\ln\left(\frac{eP^{X}}{P^{*}}\right)_{t-1} + \sum_{j=0}^{2} \beta_j\, \Delta\ln\left(\frac{eP}{P^{*}}\right)_{t-j} + \sum_{j=0}^{2} \gamma_j\, \Delta\ln\left(\frac{ULC}{P}\right)_{t-j} + \varphi EC_t + \varepsilon_t,$$

in which EC denotes the error correction term (residual from the levels equation). Here, the estimate of β_0 indicates the estimated adjustment in relative export prices after one year.

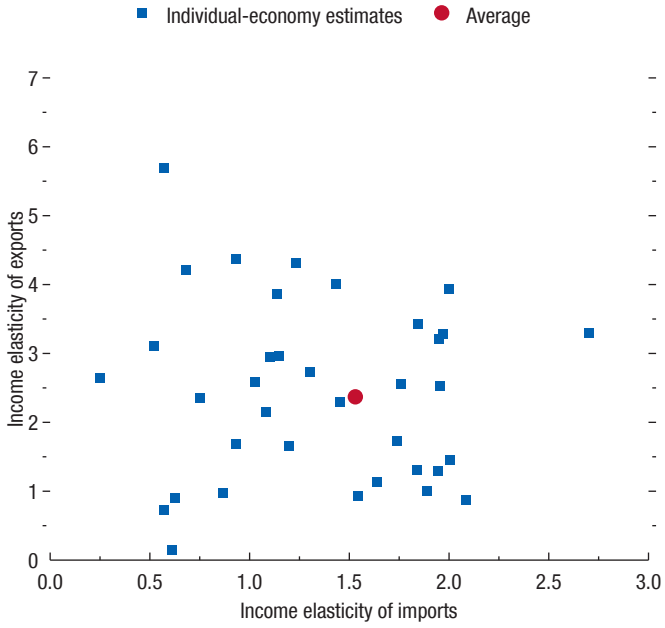
In the case in which there is no evidence of cointegration, the relevant equation is estimated in first differences, which is identical to the error correction case but without the EC term. In that case, long-term effects are estimated as $\sum_{j=0}^{2} \beta_j/(1 - \rho)$. The share of economies for which no evidence of cointegration is found is 57 percent for export prices, 50 percent for export volumes, 56 percent for import prices, and 54

Annex Figure 3.2.1. Exchange Rate Pass-Through Estimates: Comparison with Bussière, Delle Chiaie, and Peltonen 2014



Sources: Bussière, Delle Chiaie, and Peltonen 2014; and IMF staff estimates.
Note: For consistency with Bussière, Delle Chiaie, and Peltonen 2014, chapter estimates refer to pass-through of exchange rate depreciation to export and import prices in domestic currency.

Annex Figure 3.2.2. Income Elasticities of Imports and Exports



Source: IMF staff estimates.

percent for import volumes. The use of two lags in the analysis is a conventional choice.

Additional Country-by-Country Estimation Results

See Annex Figures 3.2.1 and 3.2.2 for additional country-by-country estimation results discussed in the text.

Annex 3.3. Derivation of the Marshall-Lerner Condition under Incomplete Pass-Through

The nominal trade balance TB is defined as

$$TB = \frac{\widetilde{P^{X}}X}{e} - P^{M}M,$$

in which $\widetilde{P^{X}}$ denotes export prices in foreign currency, X denotes export volumes, e denotes the nominal effective exchange rate, P^{M} denotes import prices in home currency, and M denotes import volumes.

The impact of the nominal effective exchange rate on the trade balance is

$$\frac{\partial TB}{\partial e} = -\frac{\widetilde{P^{X}}X}{e^{2}} + \frac{X}{e}\frac{\partial \widetilde{P^{X}}}{\partial e} + \frac{\widetilde{P^{X}}}{e}\frac{\partial X}{\partial \widetilde{P^{X}}}\frac{\partial \widetilde{P^{X}}}{\partial e} - M\frac{\partial P^{M}}{\partial e} - P^{M}\frac{\partial M}{\partial P^{M}}\frac{\partial P^{X}}{\partial e}. \quad \text{(A3.3.1)}$$

Exchange rate pass-through to trade prices ($ERPT^{X}$ and $ERPT^{M}$) and price elasticities of trade volumes (η^{X} and η^{M}) are defined as

$$ERPT^{X} = \frac{e}{\widetilde{P^{X}}}\frac{\partial \widetilde{P^{X}}}{\partial e},$$

$$\eta^{X} = \frac{\widetilde{P^{X}}}{X}\frac{\partial X}{\partial \widetilde{P^{X}}},$$

$$ERPT^{M} = \frac{e}{P^{M}}\frac{\partial P^{M}}{\partial e},$$

$$\eta^{M} = \frac{P^{M}}{M}\frac{\partial M}{\partial P^{M}}.$$

Substituting these in equation (A3.3.1) gives

$$\frac{\partial TB}{\partial e} = -\frac{\widetilde{P^{X}}X}{e^{2}}(-1 + ERPT^{X} + ERPT^{X} \times \eta^{X}) - \frac{P^{M}M}{e}(ERPT^{M} + ERPT^{M} \times \eta^{M}).$$

In equilibrium, $\frac{\widetilde{P^X}X}{e} = P^M M$.

The Marshall-Lerner condition under incomplete pass-through is thus

$$ERPT^X(1 - |\eta^X|) - ERPT^M(1 - |\eta^M|) < 1.$$

Note that when the pass-through is complete, $ERPT^X = 1$ and $ERPT^M = -1$. Then, the Marshall-Lerner condition is

$$|\eta^X| + |\eta^M| > 1.$$

Annex 3.4. Analysis of Large Exchange Rate Depreciation Episodes

List of Episodes

Annex Table 3.4.1 lists the 66 baseline large exchange rate depreciation episodes used in the subsection "Insights from Large Exchange Rate Depreciation Episodes." Annex Table 3.4.2 lists the additional 57 large exchange rate depreciation episodes that are associated with banking crises.

Robustness Analysis

The baseline results for the effects of large exchange rate depreciation episodes are compared with the results based on the following three alternative approaches. In each case, the results are similar to the baseline results.

- *Alternative 1: Local projections method*. In this exercise, the local projections method is used to estimate the relationship between a large exchange rate depreciation and trade. As in Chapter 2, the methodology used is the one first set out in Jordà 2005 and developed further in Teulings and Zubanov 2014. This method provides a flexible alternative to traditional vector autoregression (VAR) techniques. Unlike a VAR, local projections are robust to misspecification of the data-generating process. (If the VAR is misspecified, this specification error will be compounded at each horizon of the impulse response.) The method uses separate regressions for the variable of interest (the real effective exchange rate, export prices, or export volumes) at different horizons. The sequence of coefficient estimates for the various horizons provides a nonparametric estimate of the impulse response function. The estimated specification is as follows:

Annex Table 3.4.1. Large Exchange Rate Depreciations Not Associated with Banking Crises

Country	Year
Advanced Economies	
Australia	1985
Greece	1991, 1993, 2000
Iceland	1989, 1993, 2001
Ireland	1993
Israel	1989
Italy	1993
Korea	2008
New Zealand	1998, 2000
Portugal	1993
Spain	1993, 1997
United Kingdom	1993
Emerging Market and Developing Economies	
Belarus	2009
China	1994
Comoros	1994
Ethiopia	1993
The Gambia	1987
Ghana	2000, 2009, 2014
Guinea	2005
Haiti	2003
Honduras	1990
Iran	1985, 1989, 1993, 2000, 2002, 2012
Kazakhstan	1999
Kiribati	1985
Libya	1998, 2002
Madagascar	2004
Malawi	1992, 1994, 1998, 2003, 2012
Mozambique	2000
Nepal	1992
Nigeria	1999
Pakistan	2009
Papua New Guinea	1995, 1998
Paraguay	1987, 1989, 2002
Poland	2009
Rwanda	1991
Solomon Islands	1998, 2002
South Africa	1984
Syria	1988
Trinidad and Tobago	1986, 1993
Turkmenistan	2008
Venezuela	1987, 2002, 2009
Zambia	2009

Sources: Laeven and Valencia 2013; and IMF staff estimates.

$$y_{i,t+h} = \alpha_i^h + \gamma_t^h + \beta_{i,1}^h S_{i,t} + \sum_{j=1}^{p} \beta_{i,2}^h S_{i,t-j} + \sum_{j=0}^{h-1} \beta_{i,3}^h S_{i,t+h-j} + \sum_{j=1}^{p} \beta_{i,4}^h y_{i,t-j} + \varepsilon_{i,t}^h,$$

in which i subscripts denote countries; t and j subscripts denote years; h superscripts denote the horizon in years of the projection after time t; p denotes the number of lags included; y denotes the growth rate of the variable of interest; and S is the event indicator dummy, which in this chapter indicates the start of a large exchange rate depreciation. Regressions include country fixed effects, α_i^h,

Annex Table 3.4.2. Large Exchange Rate Depreciations Associated with Banking Crises

Country	Year
Advanced Economies	
Finland	1993
Iceland	2008
Japan	1996
Korea	1998, 2001
Norway	1993
Sweden	1993, 2009
Emerging Market and Developing Economies	
Albania	1997
Algeria	1988, 1991, 1994
Argentina	2002
Burkina Faso	1994
Brazil	1999, 2001
Cameroon	1994
Central African Republic	1994
Chile	1985
Colombia	1997
Costa Rica	1991
Côte d'Ivoire	1994
Dominican Republic	2003
Equatorial Guinea	1994
Ghana	1993
Guinea-Bissau	1994
Haiti	1992
India	1991
Indonesia	1997
Kazakhstan	2009
Madagascar	1987, 1991, 1997
Malaysia	1998
Mali	1994
Mongolia	2009
Nigeria	1991, 2009
Paraguay	1998
Philippines	1983, 1998
Russia	1998, 2009
São Tomé and Príncipe	2001
Senegal	1994
Sierra Leone	1995
Tanzania	1984, 1987, 1992
Thailand	1997
Uganda	1991, 1993
Ukraine	1998, 2009, 2014
Uruguay	2002
Zambia	1998

Sources: Laeven and Valencia 2013; and IMF staff estimates.

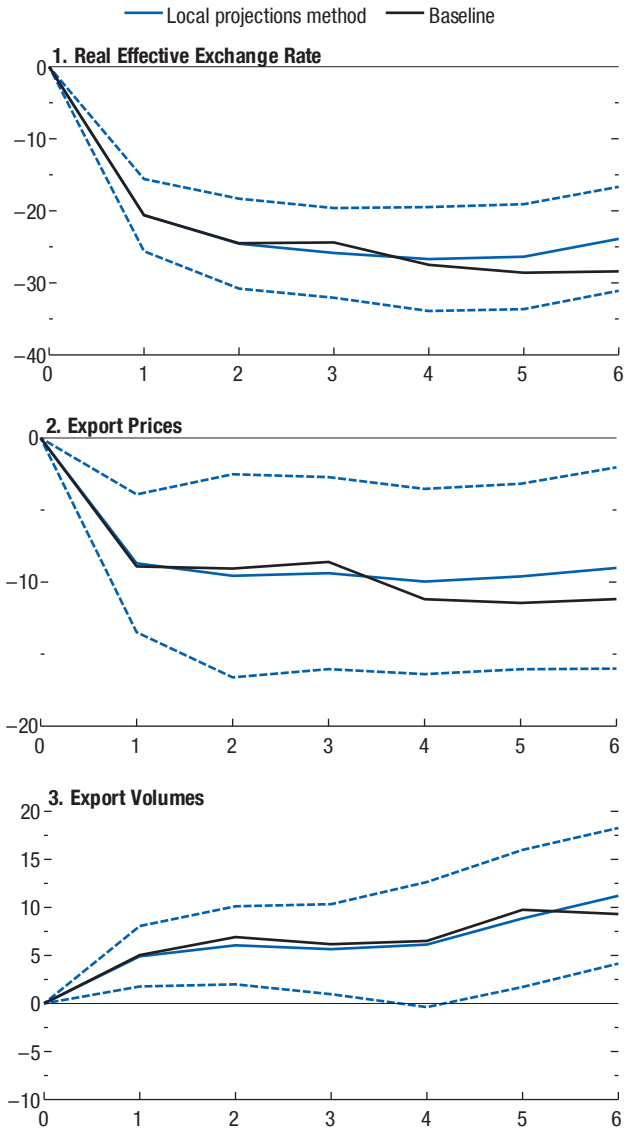
and time fixed effects, γ_t^b, to control for economic developments facing a particular country in a given year. Annex Figure 3.4.1 reports the estimation results based on this approach, which are similar to the baseline provided in Figure 3.4.

- *Alternative 2: Thresholds based on real effective exchange rate depreciations*. In this alternative, large exchange rate depreciation episodes are identified based on numeric thresholds taken from the statistical distribution of the depreciation rate of the real effective exchange rate, rather than of the currency vis-à-vis the U.S. dollar. Using this identification strategy, large exchange rate depreciation episodes for advanced economies require two criteria: (1) a real effective depreciation of at least 6 percent (the 90th percentile of all annual depreciation rates) and (2) a change in the real effective depreciation that is at least 7 percentage points greater than that in the previous year (the 90th percentile of all changes in annual depreciation rates). For emerging market and developing economies, the definition requires the same two criteria, but with different threshold values: (1) a real effective depreciation of at least 10 percent and (2) a change in the real effective depreciation that is at least 12 percentage points higher than that in the previous year. Annex Figure 3.4.2 reports the results of this robustness test.
- *Alternative 3: Using Laeven and Valencia currency crisis episodes.* The analysis is repeated based on the currency crisis episodes identified in Laeven and Valencia 2013. Annex Figure 3.4.3 reports the results of this robustness test.

The analysis in "Do Initial Economic Conditions Matter?" uses unusually low growth in the year before the episode to measure initial economic slack. Growth is defined as de-meaned real GDP growth (for each economy, growth minus the economy's mean growth rate). Low growth is then defined as de-meaned growth of less than the median for the 66 episodes (the median is near zero). As a robustness check, the analysis is repeated with economic slack defined based on the output gap one year before the episode. The source of the output gap data is the World Economic Outlook database. When this series is missing, it is replaced with an output gap computed based on the Hodrick-Prescott filter applied to real GDP with a smoothing parameter of 100. Episodes associated with economic slack are those having an output gap that is less than the median for the 66 episodes (the median is near zero). Annex Figure 3.4.4 reports the estimation results for this robustness test. The results for trade volumes continue to show that exports rise more strongly when there is more economic slack. The results for export prices, however, show no statistically distinguishable difference between the two sets of initial economic conditions.

Annex Figure 3.4.1. Export Dynamics Following Large Exchange Rate Depreciations

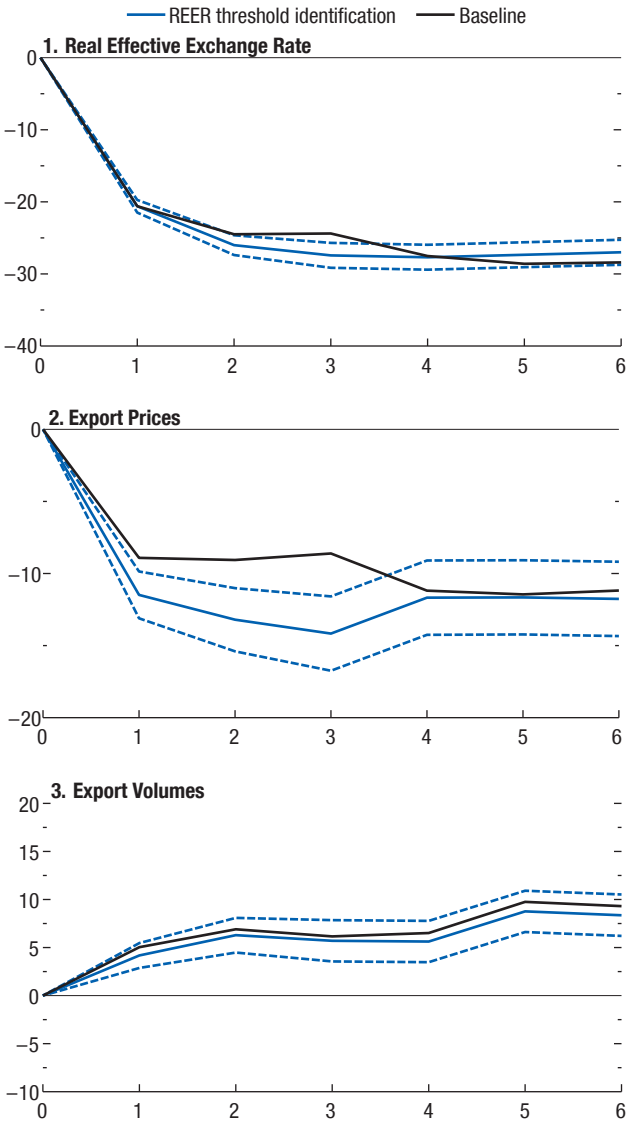
(Percent; years on x-axis)



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

Annex Figure 3.4.2. Export Dynamics Following Large Exchange Rate Depreciations Identified Based on the Real Effective Exchange Rate

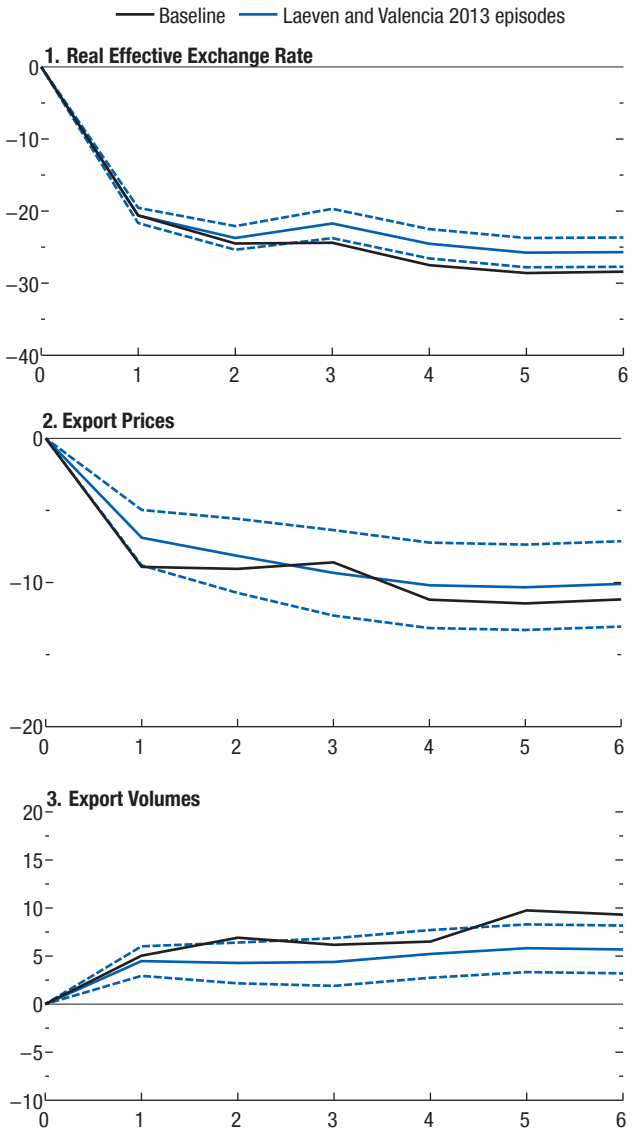
(Percent; years on x-axis)



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals. REER = real effective exchange rate.

Annex Figure 3.4.3. Export Dynamics Following Laeven and Valencia 2013 Currency Crises

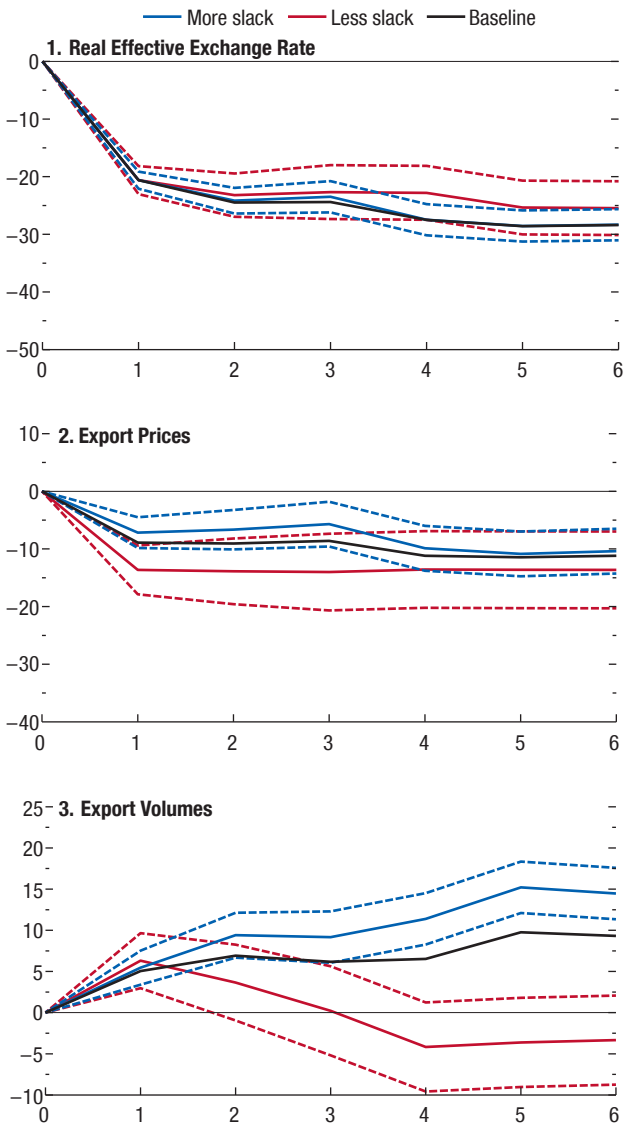
(Percent; years on x-axis)



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

Annex Figure 3.4.4. Export Dynamics Following Large Exchange Rate Depreciations: Role of Initial Output Gap

(Percent; years on x-axis)



Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

Annex 3.5. Trade Elasticities over Time: Stability Tests

The analysis in "Stability Tests" estimates the four long-term trade elasticities for successive 10-year rolling intervals (Figure 3.8) and finds limited evidence of a decline in trade elasticities over time.

Structural-break tests confirm this finding of broad stability (Annex Table 3.5.1). The tests divide the sample used for the estimation of the panel regressions into two halves—years through 2001 and years since 2002—and test the null hypothesis of no change in the trade elasticities across the two time periods. The tests are conducted for the geographical groups included in Figure 3.8, as well as for a sample of economies that increased their participation in global value chains particularly strongly (those with a rise during 1995–2009 in the share of foreign value added

in gross exports that is greater than the cross-country median), and for those economies that increased their participation less strongly (those with a rise in the foreign-value-added share that is less than the cross-country median).

As Annex Table 3.5.1 reports, the tests fail to reject the null of no change in most cases. Similarly inconclusive results emerge when the tests are repeated for data samples used elsewhere, as in the 46 economies included in the analysis of Ahmed, Appendino, and Ruta 2015. That study finds that the responsiveness of exports to the real effective exchange rate dropped substantially between 1996–2003 and 2004–12. When the analysis is repeated for this sample of 46 economies, but export volumes are constructed by deflating nominal exports using export prices rather than the consumer price index (CPI)—as in that study—there is little evidence of a decline in export elasticities. (The CPI reflects the prices of many nontraded goods and services and increases on average at a considerably higher rate than export prices.) The same applies if outlier observations, including those associated with spikes in CPI inflation, are removed from the sample.

Annex Table 3.5.1. Trade Elasticities over Time: Stability Tests

	Full	1990–2001	2002–14	Statistical Significance of the Difference between the Two Periods[1]
		1. Pass-Through to Export Prices		
By Region				
All Countries	0.569***	0.557***	0.457***	
Asia	0.429***	0.419***	0.346***	
Europe	0.658***	0.647***	0.687***	
By Integration into Global Value Chains				
Countries with Larger Increase	0.572***	0.560***	0.548***	
Countries with Smaller Increase	0.684***	0.608***	0.609***	
		2. Pass-Through to Import Prices		
By Region				
All Countries	–0.612***	–0.549***	–0.632***	
Asia	–0.671***	–0.684***	–0.668***	
Europe	–0.553***	–0.528***	–0.587***	
By Integration into Global Value Chains				
Countries with Larger Increase	–0.621***	–0.545***	–0.618***	
Countries with Smaller Increase	–0.650***	–0.511***	–0.720***	**
		3. Price Elasticities of Exports		
By Region				
All Countries	–0.207***	–0.147***	–0.255***	*
Asia	–0.329***	–0.265***	–0.489***	**
Europe	–0.281***	–0.303**	–0.375***	
By Integration into Global Value Chains				
Countries with Larger Increase	–0.305***	–0.343**	–0.373***	
Countries with Smaller Increase	–0.402***	–0.225	–0.566***	*
		4. Price Elasticities of Imports		
By Region				
All Countries	–0.433***	–0.452***	–0.335***	
Asia	–0.436***	–0.566***	–0.233	
Europe	–0.470***	–0.484***	–0.446***	
By Integration into Global Value Chains				
Countries with Larger Increase	–0.521***	–0.658***	–0.271**	**
Countries with Smaller Increase	–0.467***	–0.455***	–0.420***	

Source: IMF staff estimates.

[1]Blank space in this column indicates no statistically significant difference.

*$p < .1$; **$p < .05$; ***$p < .01$.

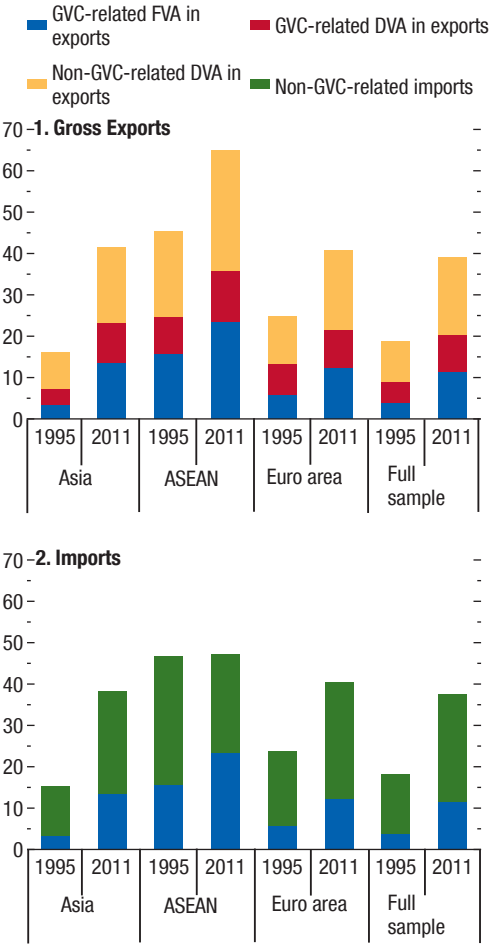
Box 3.1. The Relationship between Exchange Rates and Global-Value-Chain-Related Trade

Global value chains have increased in prominence in global production and trade. About one-third of world trade consists of intermediate products for subsequent reexport in a transformed state. This process contrasts with the traditional view of international trade, in which goods are produced in their entirety within a single country and shipped as final goods to export markets. Given that within a global value chain, imports are inputs into the production of exports, and imports (which represent foreign value added) are complements in production with domestic value added, global-value-chain-related trade may respond differently than trade in final goods to exchange rate changes. Using a recently released data set on trade in value added, this box assesses how global value chains affect the responses of different types of exports and imports and the overall trade balance to changes in exchange rates.[1] Moreover, this approach isolates the impact of exchange rate changes on domestic value added, the concept that determines GDP and competitiveness, and one that is of ultimate concern to policymakers.

Before turning to the main question at hand, exploring the trade data is useful. As shown in Figure 3.1.1, gross exports comprise exports produced within a global value chain as well as other, non–global value chain exports. Gross global value chain exports can, in turn, be divided into domestic-value-added and foreign-value-added components, both of which are subsequently exported as inputs into the next stage of the supply chain. In contrast, non–global value chain exports consist primarily of domestic value added. Therefore, gross exports consist of both domestic value added and foreign value added. Gross imports encompass global-value-chain-related imports—which is the foreign-value-added component of global-value-chain-related exports—and non-global-value-chain-related imports. Since foreign value added in global value chain exports appears in both gross imports and exports, it has no impact on the size of the trade balance. It is apparent that global-value-chain-related gross exports (the sum of domestic value added in global value chains and foreign value added) grew substantially as a share of GDP in all

Figure 3.1.1. Decomposition of Gross Exports and Imports, 1995 versus 2011

(Percent of GDP)



Sources: Organisation for Economic Co-operation and Development–World Trade Organization Trade in Value Added database; and IMF staff calculations.
Note: ASEAN = Association of Southeast Asian Nations; DVA = domestic value added; FVA = foreign value added; GVC = global value chain.

The authors of this box are Kevin Cheng and Rachel van Elkan, based on Cheng and others, forthcoming.

[1]The analysis is based on the Organisation for Economic Co-operation and Development–World Trade Organization Trade in Value Added database, which covers 57 countries, for the years 1995, 2000, 2005, and 2008–09. The periodic data are transformed to annual frequency, as discussed in Cheng and others, forthcoming.

Box 3.1 *(continued)*

regions during 1995–2011, and especially in member countries of the Association of Southeast Asian Nations. Nonetheless, non-global-value-chain-related exports remain, on average, about two-thirds of world total exported domestic value added.

The Exchange Rate Response of Global-Value-Chain-Related Trade

A panel framework with time and country fixed effects is used to estimate the responsiveness of global-value-chain-related export and import volumes to changes in real effective exchange rates (REERs).[2] A term for the interaction between the REER and the share of foreign value added in gross global-value-chain-related exports is also included to capture the dampening effect arising from a larger foreign-value-added share. The interpretation of this term and its corresponding coefficient is discussed later in this box.[3]

[2]The regressions are estimated using ordinary least squares. All variables are expressed in natural logarithm levels. Value-added trade weights are used to aggregate bilateral real exchange rates, and the consumer price index (CPI) is used to deflate nominal exchange rates. Real trade volumes are obtained by deflating nominal volumes by the CPI. Controls include own and partner country demand and others specified in the note to Table 3.1.1. Note that in the global value chain import equation, partner—rather than domestic—demand is used as a regressor to account for the fact that the imports are intended for reexport and hence depend on external demand conditions.

[3]Inclusion of this interaction term is grounded in a theoretical model, available in Cheng and others, forthcoming.

The main findings of the analysis reported in Table 3.1.1 are as follows:

- A real appreciation not only reduces exports of domestic value added (a conventional result), but also lowers imports of foreign value added (contrary to the traditional view). This latter result is consistent with the notion that global-value-chain-related domestic value added and foreign value added are complements in production, so producing and exporting less domestic value added also reduces the derived demand for imported foreign value added.
- A larger foreign-value-added share in gross global-value-chain-related exports tends to dampen the response of domestic value added and foreign value added to REER changes. This finding is shown by the positive coefficients on the interaction between REER and the foreign-value-added share in the second row of Table 3.1.1. Intuitively, this result is consistent with the notion that when a country's own domestic-value-added contribution in gross global value chain exports is relatively small, a change in its REER will have only a modest effect on the competitiveness of the entire supply chain, thereby muting the domestic-value-added and foreign-value-added responses to a change in the country's own REER.

The dampening effect on global value chain import and export elasticities from an increase in the foreign-value-added share is illustrated in Figure 3.1.2. When the foreign-value-added share is very small (corresponding to a large domestic-value-

Table 3.1.1. Responses of Global-Value-Chain-Related Trade to the Real Effective Exchange Rate

	(1)	(2)
Variables	Imports (FVA)	Exports (DVA)
Lagged Log (REER-Value-Added-Based)	–1.390***	–1.670***
	(–2.822)	(–3.527)
Lagged Log (REER) x Lagged (FVA/DVA + FVA)	0.027***	0.026***
	(3.166)	(3.330)
Lagged Log (Demand)	1.108***	0.758***
	(5.961)	(4.470)
Time Fixed Effects	Yes	Yes
Country Fixed Effects	Yes	Yes
Additional Controls	Yes	Yes
Clustering	Country level	Country level
Number of Observations	699	699
R^2	0.733	0.681

Source: IMF staff calculations.

Note: Specifications – log (*Exports [Imports] volume*)$_{c,t}$ = $\alpha t + \alpha c + \alpha_1 \log(REER)_{c,t-1} + \alpha_2$interaction term + $\alpha_3 \log(Demand)_{c[w],t-1} + \alpha \log(Controls)_{c,t} + \varepsilon_t$. Additional controls included in the specifications are log of real stock of foreign direct investment, foreign-value-added share, tariffs, and output gap. Demand is proxied by GDP. DVA = domestic value added; FVA = foreign value added; GVC = global value chain; REER = real effective exchange rate. Robust *t*-statistics in parentheses.

***$p < .01$.

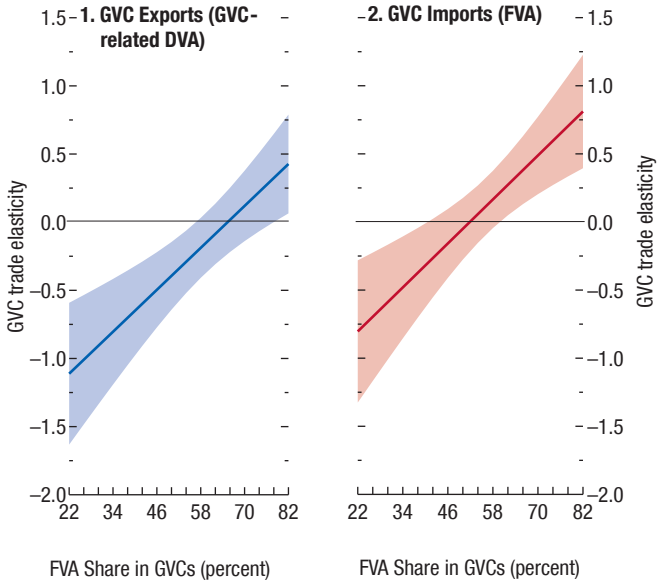
Box 3.1 *(continued)*

added contribution), the spillover from a country's exchange rate depreciation onto the competitiveness of the entire supply chain is correspondingly large. Therefore, the elasticities are negative and close to the "own effect" coefficients of row 1 of Table 3.1.1, causing both global-value-chain-related domestic value added and global-value-chain-related foreign value added to increase. As the foreign-value-added share rises—corresponding to a smaller own domestic-value-added contribution to the global value chain—the spillover benefit from an own depreciation on the competitiveness of the entire supply chain (second row in the table) declines, resulting in smaller (negative) global value chain trade elasticities. When the foreign-value-added share rises to 50–60 percent, the competitiveness benefit for the entire supply chain from an own depreciation is neutralized by the corresponding relative appreciation in global value chain partners' REERs, leading to zero import and export elasticities. With even larger foreign-value-added shares, import and export elasticities can become positive, although the relevance of the positive REER elasticity for global value chain trade appears to be limited in practice.[4]

Overall, it is worth recalling that although global value chain trade has grown considerably in recent decades, conventional trade remains important—if not dominant—at the global level. As additional analysis confirms, even for countries in the sample with the smallest domestic-value-added contributions and the largest global value chain trade shares, a depreciation is found to improve the real trade balance.

[4]The positive REER is irrelevant for two reasons. First, the estimated export elasticities corresponding to foreign-value-added shares of 50–80 percent lie within the 90 percent confidence interval spanning zero, suggesting that the elasticities are not statistically distinguishable from zero. For import elasticities, the corresponding foreign-value-added share range is 38–62 percent, but above this range, a positive elasticity cannot be rejected. Second, the maximum foreign-value-added contribution to global-value-chain-related gross exports for any country in the data set is less than 80 percent, with the average foreign-value-added share about 50–60 percent. Thus, most countries operate in the range in which global value chain elasticities are about zero.

Figure 3.1.2. Global Value Chain Trade Elasticities



Source: Cheng and others, forthcoming.
Note: Shaded areas denote 90 percent confidence intervals. DVA = domestic value added; FVA = foreign value added; GVC = global value chain.

Box 3.2. Measuring Real Effective Exchange Rates and Competitiveness: The Role of Global Value Chains

The real effective exchange rate (REER) is a widely used demand-based indicator of competitiveness.[1] Standard theory postulates that countries produce differentiated products and compete with one another to sell their products on world markets, and demand for products responds to relative prices. The rise of global value chains poses a challenge to this conventional view as countries increasingly specialize in adding value to a particular state of production rather than producing entire finished products. This practice means that countries compete to supply value added, rather than supply gross exports, to world markets.

This box, therefore, discusses two main questions related to the increased role of global value chains in international trade:

- How does the rise of global value chains affect the measurement of competitiveness and REERs?
- How do these new measures of competitiveness and REERs differ from the conventional measures?

The rise of global value chains requires a rethinking of the relationship between exchange rates and competitiveness. Consider, for example, the effect of a yuan depreciation on China's Asian trading partners. According to the conventional view, yuan depreciation unambiguously increases demand for Chinese goods and lowers demand for goods produced elsewhere in Asia. As a result, depreciations are beggar-thy-neighbor. When trade in inputs and specialization in stages of production are prevalent, this conventional view becomes incomplete. Because production in China is linked to its Asian supply chain partners, the yuan depreciation can make the supply chain's final product more competitive, stimulating demand for value added at each stage of production. This outcome counterbalances the conventional beggar-thy-neighbor channel. Which channel dominates is ultimately an empirical matter.

Bems and Johnson (2015) present a model framework that extends the conventional demand-side analysis to include supply-side linkages. The extended framework incorporates two key features pertaining to global value chains. First, by modeling intermediate production inputs, the framework distinguishes between gross and value-added concepts in trade (in terms of both quantities and prices). Second, there are two distinct margins of substitution (with potentially differing elasticities): substitution in final demand and substitution in production (between value added and intermediate inputs or across inputs). The latter captures substitution in supply chains.

The extended framework alters the conventional link between exchange rates and competitiveness in three important ways: different weights, different price indices, and country-specific trade elasticities.

Different Weights

The weights used in the construction of these new REER measures of Bems and Johnson (2015) depend on both input-output linkages and relative elasticities in production versus consumption. In contrast, conventional REER weights are constructed using gross trade flows. Accounting for input-output linkages and differences in elasticities can significantly alter REER weights. Bilateral weights can even become negative, if competitiveness gains for supply chain partners outweigh the beggar-thy-neighbor effects (as in the yuan depreciation example earlier).

Figure 3.2.1 illustrates this general result by comparing REER weights that trading partners assign to China and Germany. The figure includes three sets of weights for each country: conventional consumer price index (CPI)–based REER weights; input-output REER (IOREER) weights, which account for both input-output linkages and the variation in elasticities; and the intermediate case of value-added REER (VAREER) weights that impose equal elasticities in production and consumption.[2]

Consistent with standard intuition, neighboring countries that trade a great deal with China, such as Korea, Japan, and Malaysia, attach the largest weights to China in the conventional CPI-based REER indices.[3] Relative to this benchmark, countries that are integrated into the supply chains with China and "Factory Asia" put less weight on China in the newly proposed REER indices. VAREER weights are reduced for China's supply chain partners because value-added trade flows, on which the VAREER is based, eliminate

The authors of this box are Rudolfs Bems and Marcos Poplawski-Ribeiro.

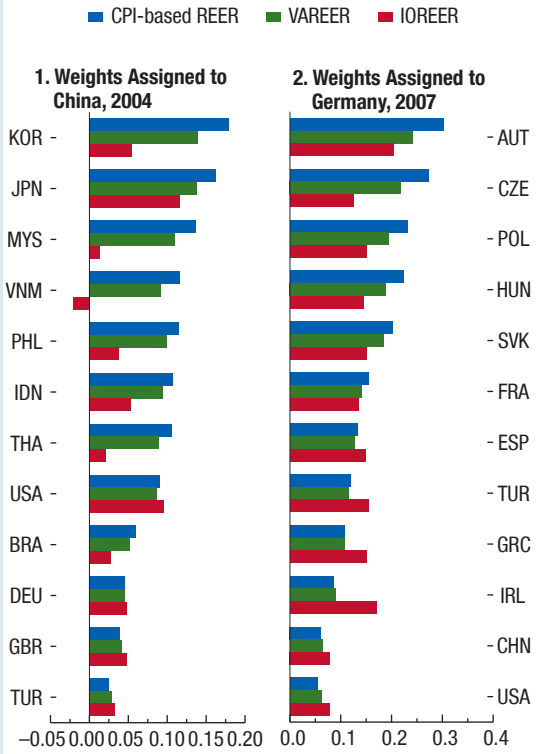
[1]Competitiveness for the purposes of this box is defined as a change in demand for a country's output induced by changes in international relative prices.

[2]For VAREER weights Bems and Johnson (2015) show that value-added trade flow data are sufficient for the weight construction.

[3]These large weights reflect the fact that in conventional macroeconomic analysis, large bilateral gross trade flows signify intense head-to-head competition.

Box 3.2 *(continued)*

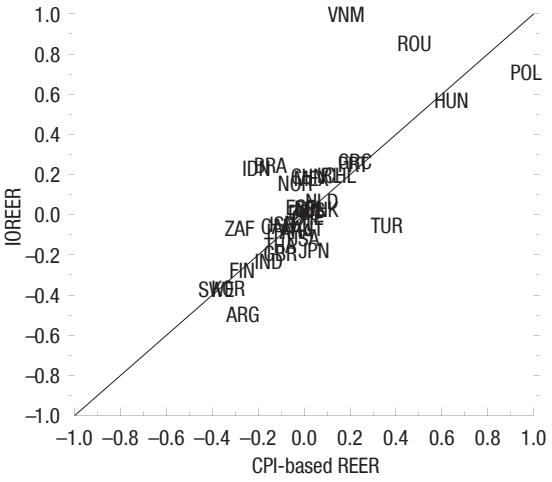
Figure 3.2.1. Real Effective Exchange Rate Weights Assigned to China and Germany



Sources: Bems and Johnson 2015; and IMF staff calculations.
Note: CPI = consumer price index; IO = input-output; REER = real effective exchange rate; VA = value added. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Figure 3.2.2. Comparison of Conventional and Input-Output Real Effective Exchange Rates

(Log changes, 1990–2009)



Sources: Bems and Johnson 2015; and IMF staff calculations.
Note: CPI = consumer price index; IO = input-output; and REER = real effective exchange rate. Data labels in the figure use International Organization for Standardization (ISO) country codes.

"round-tripping," which is more prevalent within the region. These weight shifts are further amplified when production elasticities are relatively low, as captured by the IOREER index. This is the case because low production elasticities emphasize the role of substitution in final demand, as opposed to the within-region substitution in supply chains. For some countries, weights attached to China fall dramatically, with an offsetting rise in weights elsewhere. For Vietnam, a decline in Chinese prices actually raises Vietnamese competitiveness in the IOREER case, as captured by Vietnam's negative IOREER weight.[4]

The basic insights from the Chinese example carry over to the case of Germany, reported in panel 2 of Figure 3.2.1. Conventional REER weights are largest for Germany's regional trading partners. The VAREER and IOREER weights, relative to the conventional ones, fall the most for the European Union accession countries (the Czech Republic and Poland, for example) because of supply chain linkages. The magnitudes of the weight changes can be substantial. For example, moving from the conventional REER to the IOREER roughly halves the weight that the Czech Republic attaches to Germany.

Different Price Indices

By distinguishing between gross flows and value added, the model framework provides clear guidance on how to combine REER weights and prices to measure competitiveness, where prices need to be measured using GDP deflators. Figure 3.2.2 reports REER changes during the 1990–2009 period, constructed

[4]Bems and Johnson (2015) find that the total weight attached by a typical Asian country to its Asian partners is 15 percentage points lower in the IOREER index than in a conventional CPI-based REER index.

Box 3.2 *(continued)*

using historical input-output data and observed price changes for the period. IOREER indices can differ substantially from conventional (CPI-based) REER indices, both because of differences in weights and because of different measures of price changes.[5] However, over this long horizon (19 years), the bulk of the divergence between the two REER indices reflects persistent differences in the two price measures (CPI and GDP deflators). At the same time, the two measures of the REER are strongly correlated, partly because the vast majority of trade does not consist of global-value-chain-related trade.[6] This observation also implies that biases in estimated value-added trade relations due to incorrectly using standard REERs are likely to be small.

Country-Specific Trade Elasticities

Conventional measures of competitiveness rely on a universal trade elasticity that translates effective price developments into changes in economic activity and hence competitiveness. In contrast, with two distinct margins of substitution—final demand and production—trade elasticities in the extended framework are country specific. If production is less responsive to price changes than is final demand,[7] countries that are more involved in global value chains (for example, China), and hence trade more in intermediate inputs, will in the aggregate exhibit lower trade elasticities than countries that trade more in final consumption goods (for example, the United States). In the latter case, the more price-sensitive final demand is weighted more heavily in the aggregate trade elasticity. One implication is that with country-specific aggregate trade elasticities, the REER index alone is an incomplete statistic for measuring competitiveness.[8]

Overall, global value chains change the measurement of competitiveness and REERs. Relative to the conventional benchmark, global value chains change both the weights and the prices that are used in the construction of REER indices. Global value chains can allow countries to benefit from improvements in the competitiveness of supply chain partners, which can counteract the standard beggar-thy-neighbor channel.

What do these findings mean for the relationship between trade and exchange rate movements? On the one hand, if production is less sensitive to relative price changes than is final demand, aggregate trade elasticities should be lower in countries that are more integrated in global value chains. On the other hand, if consumption is less price sensitive than is production, then countries that are more integrated into global value chains should exhibit higher aggregate trade elasticities.

[5]Bems and Johnson (2015) further show that value-added exchange rates capture competitiveness developments missed by conventional indices in important episodes.

[6]A regression of the IOREER measure on the CPI-based REER yields a slope coefficient of 0.89 that is statistically significant at the 1 percent level.

[7]For example, in the case of the so-called Leontief production function, in which there is no substitutability between production factors.

[8]Furthermore, with the worldwide rise of global value chains, value-added trade elasticities should decrease for the average country over time. For a more in-depth discussion of the role of value-added elasticities in the measurement of competitiveness, see Bems and Johnson 2015.

Box 3.3. Japanese Exports: What's the Holdup?

After rebounding from collapse during the global financial crisis, real goods exports from Japan have remained broadly flat during the past few years despite a sharp depreciation of the yen since late 2012. Following aggressive monetary easing by the Bank of Japan, the yen has depreciated by about 35 percent in real effective terms during that period. This depreciation has come after a sharp yen appreciation from 2008 to 2011. So what explains the subdued recovery of Japanese exports? This box focuses on three interconnected explanations: lower pass-through from exchange rates to export prices, offshoring of production, and deeper involvement in global value chains.

A Sluggish Export Recovery

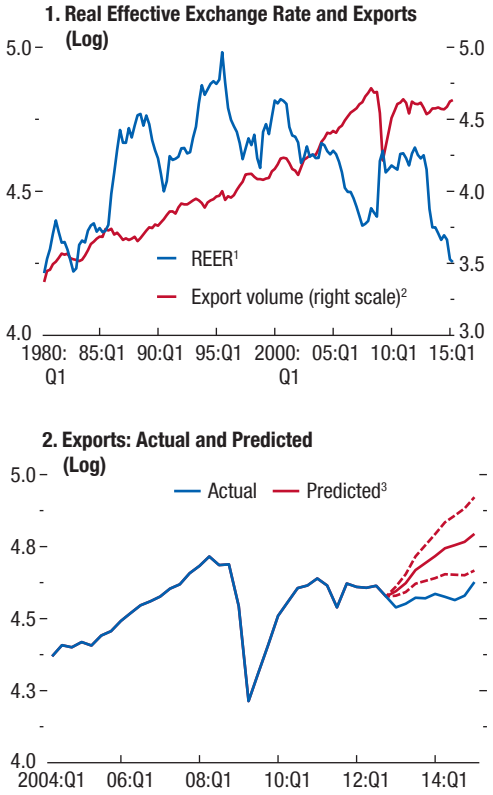
The recent pace of export recovery in Japan is much slower than could be expected based on the usual response of exports to external demand and the exchange rate. Exports are currently some 20 percent below the level predicted by a standard export demand equation estimated for the pre-Abenomics period (Figure 3.3.1).[1]

Lower Pass-Through to Export Prices

Japanese exporters have long demonstrated pricing-to-market behavior by maintaining the stability of their export prices in overseas markets and absorbing exchange rate fluctuations through profit margins. This practice results in limited exchange rate pass-through to export prices. Since the onset of yen depreciation in 2012, export prices in yen have risen sharply, and Japanese exporters' profit margins have surged by some 20 percent (Figure 3.3.2, panel 1).[2] (Exporters also experienced a sizable compression in profit margins during the sharp yen appreciation from 2008 to 2011 and have been rebuilding margins since.)

Incomplete exchange rate pass-through to export prices has been prevalent in Japan for some time, but evidence indicates that exchange rate pass-through has recently declined further (Figure 3.3.2, panel 2).

Figure 3.3.1. Japan: Exchange Rate and Exports



Sources: IMF, Information Notice System; and IMF staff calculations.
[1]REER denotes consumer price index–based real effective exchange rate.
[2]Goods exports.
[3]Out-of-sample prediction for third quarter of 2012 through first quarter of 2015 based on export demand equation estimated through third quarter of 2012. Dashed lines indicate 90 percent confidence intervals.

The authors of this box are Nan Li and Joong Shik Kang.

[1]The export demand equation is based on an error correction model specification and is estimated on data from the first quarter of 1980 through the third quarter of 2012:

$$\Delta \ln EX_t = c + \sum_{i=1}^{4} \beta_{1i} \Delta \ln EX_{t-i} + \sum_{i=1}^{4} \beta_{2i} \Delta \ln REER_{t-i} + \sum_{i=1}^{4} \beta_{3i} \Delta \ln D_{t-i} - \gamma(\ln EX_{t-1} - \alpha_1 \ln REER_{t-1} - \alpha_2 \ln D_{t-1}) + \varepsilon_t,$$

in which EX denotes the export volume, $REER$ denotes the real effective exchange rate, and D is foreign demand—measured by the weighted average of trading partners' real GDP. The specification also includes dummy variables for the crisis (taking a value of 1 from the third quarter of 2008 through the first quarter of 2009) and for the 2011 earthquake (taking a value of 1 in the first and second quarters of 2011).

[2]Exporters' profit margins are proxied by 1 minus the ratio of the input cost to the export price.

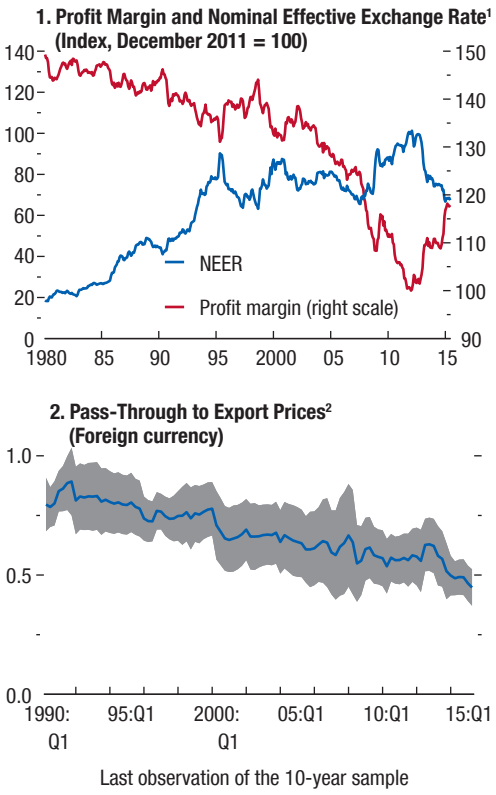
Box 3.3 *(continued)*

Analysis based on rolling regressions suggests that exchange rate pass-through has declined from near 85 percent during the 1980s to about 50 percent in recent years (Figure 3.3.2). In other words, a 10 percent yen depreciation reduced export prices by about 8.5 percent in the 1980s, but now reduces them by only 5 percent.[3] This observation suggests that if the pass-through had remained at the level of the 1980s, foreign export prices would have fallen by almost 30 percent since 2012, compared with the actual decline of 17 percent. Based on the estimated price elasticity of exports, this larger decline, in turn, could have boosted exports by an additional 6 percent.[4] Note, however, that in the medium term, exchange rate pass-through is likely to increase. Ree, Hong, and Choi (2015) find that exchange rate pass-through to export prices occurs over about five years in Japan, albeit not to a full extent, which would imply stronger export growth in the future.

Production Offshoring

During the past two decades, Japanese firms have expanded abroad to exploit labor cost differentials and rising demand in host countries. The pace of offshoring has accelerated since the global financial crisis, arguably as a reflection of the sharp appreciation of the yen in 2008–11 and uncertainty about the energy supply after the 2011 earthquake (Figure 3.3.3). Overseas investment by Japanese subsidiaries now accounts for about 25 percent of total manufacturing investment. Overseas sales—the sum of exports and sales by Japanese subsidiaries—have risen by more than 60 percent in value since 2011, which is much faster than the growth rate for domestic exports (14 percent), and now account for about 60 percent of total sales (Kang and Piao 2015). This trend increase in investment and sales overseas suggests that intrafirm trade has become much more important. This finding could help explain the decline in exchange rate pass-through, given that intrafirm transactions are less subject to the impact of exchange rate fluctuations.[5]

Figure 3.3.2. Exchange Rate, Profits, and Pass-Through



Sources: Haver Analytics; and IMF staff calculations.
Note: NEER = nominal effective exchange rate.
[1]Exporters' profit margins are proxied by 1 minus the ratio of the input cost to the export price normalized to 100 for December 2011.
[2]Estimated percent change in export prices in foreign currency resulting from a 1 percent nominal effective appreciation.

[3]The analysis is based on rolling regressions using the following specification and 10-year rolling windows with quarterly data, starting with the window beginning in the first quarter of 1980 and ending in the fourth quarter of 1989:

$$\Delta \ln P_t^X = \alpha + \sum_{i=0}^{4} \beta_i \Delta \ln NEER_{t-i} + \sum_{i=0}^{4} \gamma_i \Delta \ln C_{t-i} + \sum_{i=0}^{4} \delta_i \Delta \ln CP_{t-i}, \quad (3.3.1)$$

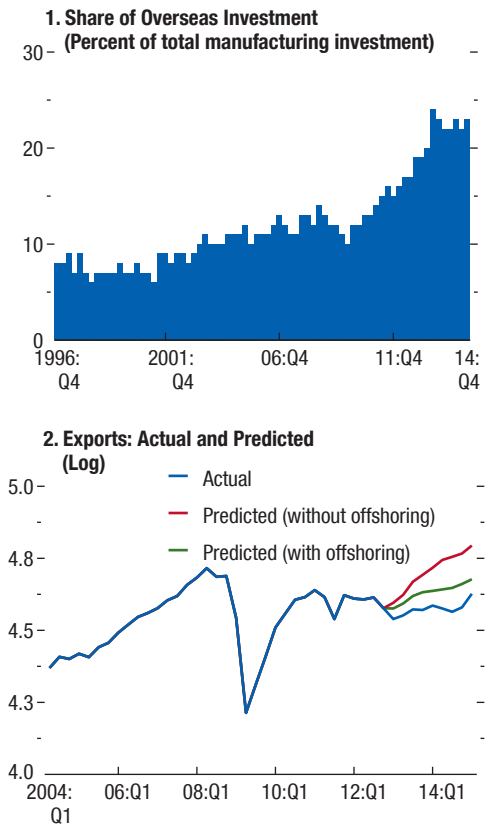
in which P_t^X stands for the export price index in foreign currency, C_t is the input cost index, and CP_t is the competitors' price index, which is proxied by trading partners' GDP deflator. The sum of the coefficients on the exchange rate, $\sum_{i=0}^{4} \beta_i$, corresponds to the pass-through rate of the nominal effective exchange rate (*NEER*) to export prices in the destination country after one year. Using the consumer price index and import price index as alternative proxies for CP_t and including more lags in the regression yield similar results.

[4]The estimated one-year elasticity of exports to foreign export prices used here is 0.5 and is obtained by reestimating the exports equation while substituting export prices for the *REER* terms.

[5]There is evidence that Japanese intrafirm trade is largely concentrated in the main exporting industries, such as trans-

Box 3.3 *(continued)*

Figure 3.3.3. Offshoring and Exports



Sources: Haver Analytics; and IMF staff calculations.

To what extent does Japan's lackluster export performance reflect this shift toward offshoring? To address this question, the export model estimated is augmented to control for the degree of offshoring, proxied by the share of overseas investment in total investment in Japan's manufacturing sector. The resulting out-of-sample forecasts come much closer to tracking the observed flat performance of Japan's exports since 2012 (Figure 3.3.3, panel 2). This result is consistent with the view that increases in production offshoring have decreased domestic exports, offsetting the positive impact of the yen depreciation on exports.

Deeper Involvement in Global Value Chains

Japanese exports are dominated by high-value-added products: electrical machinery, transportation equipment, and machinery, accounting for more than 60 percent of exports. These sectors are specialized, are not easily substitutable, and are tightly connected to global value chains.

During the past two decades, Japan has been increasingly involved in global value chains. According to the Organisation for Economic Co-operation and Development–World Trade Organization Trade in Value Added (TiVA) database, foreign value added as a percentage of Japan's gross exports (backward participation) increased between 1995 and 2009 from 6 percent to 11 percent (Figure 3.7). Meanwhile, Japan has also become a more important intermediate-input supplier for other countries' exports: domestically produced inputs used in third countries' exports (forward participation) rose from 22 percent to 33 percent during the same period. This places Japan among the countries experiencing the largest increase in the forward-participation rate. In addition, compared with other non-commodity-exporting countries, Japan is more specialized in sectors at the beginning of a value chain that are more intensive in research and design, as shown by the TiVA data. As Japan becomes more heavily involved in global value chains and as global value chains become ever more complex, exchange rate depreciation could be expected to play a less important role in boosting export growth of such global-value-chain-related goods.

Overall, the response of exports to the yen depreciation has been weaker than expected as a result of a number of Japan-specific factors. In particular, this weak response largely reflects the acceleration in production offshoring since the global financial crisis. It also reflects deeper involvement of Japanese production and trade in global value chains and a decline in the strength of the short-term exchange rate pass-through.

portation equipment and electrical machinery, which have been the most active in expanding overseas and accounted for almost three-quarters of total overseas investment as of 2014. This type of intrafirm trade involves exports of parts and components from Japanese parent firms to their foreign affiliates. The products produced or assembled by foreign affiliates in these industries are either sold in local markets or shipped to unrelated buyers in third-country markets. Therefore, the offshored production or sales by Japanese firms has increasingly become a "substitute" for domestic production or exports.

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STATISTICAL APPENDIX

The Statistical Appendix presents historical data as well as projections. It comprises six sections: Assumptions, What's New, Data and Conventions, Classification of Countries, Key Data Documentation, and Statistical Tables.

The assumptions underlying the estimates and projections for 2015–16 and the medium-term scenario for 2017–20 are summarized in the first section. The second section presents a brief description of the changes to the database and statistical tables since the April 2015 *World Economic Outlook* (WEO). The third section provides a general description of the data and the conventions used for calculating country group composites. The classification of countries in the various groups presented in the WEO is summarized in the fourth section. The fifth section provides information on methods and reporting standards for the member countries' national account and government finance indicators included in the report.

The last, and main, section comprises the statistical tables. (Statistical Appendix A is included here; Statistical Appendix B is available online.) Data in these tables have been compiled on the basis of information available through September 16, 2015. The figures for 2015 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 measured during the period July 27 to August 24, 2015. For 2015 and 2016, these assumptions imply average U.S. dollar/special drawing right (SDR) conversion rates of 1.402 and 1.408, U.S. dollar/euro conversion rates of 1.113 and 1.118, and yen/U.S. dollar conversion rates of 121.4 and 121.1, respectively.

It is assumed that the *price of oil* will average $51.62 a barrel in 2015 and $50.36 a barrel in 2016.

Established *policies* of national authorities are assumed to be maintained. The more specific policy assumptions underlying the projections for selected 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 0.4 percent in 2015 and 1.2 percent in 2016, that three-month euro deposits will average 0.0 percent in 2015 and 2016, and that six-month yen deposits will average 0.1 percent in 2015 and 2016.

As a reminder, 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 countries adopting the euro are as follows:

1 euro	=	13.7603	Austrian schillings
	=	40.3399	Belgian francs
	=	0.585274	Cyprus pound[1]
	=	1.95583	Deutsche marks
	=	15.6466	Estonian krooni[2]
	=	5.94573	Finnish markkaa
	=	6.55957	French francs
	=	340.750	Greek drachmas[3]
	=	0.787564	Irish pound
	=	1,936.27	Italian lire
	=	0.702804	Latvian lat[4]
	=	3.45280	Lithuanian litas[5]
	=	40.3399	Luxembourg francs
	=	0.42930	Maltese lira[1]
	=	2.20371	Netherlands guilders
	=	200.482	Portuguese escudos
	=	30.1260	Slovak koruna[6]
	=	239.640	Slovenian tolars[7]
	=	166.386	Spanish pesetas

[1]Established on January 1, 2008.
[2]Established on January 1, 2011.
[3]Established on January 1, 2001.
[4]Established on January 1, 2014.
[5]Established on January 1, 2015.
[6]Established on January 1, 2009.
[7]Established on January 1, 2007.

See Box 5.4 in the October 1998 WEO for details on how the conversion rates were established.

What's New

- Data for Lithuania are now included in the euro area aggregates, but they were excluded in the April 2015 WEO.
- Projections for Greece are based on data available as of August 12, 2015.
- As in the April 2015 WEO, data for Syria are excluded from 2011 onward because of the ongoing conflict and the related lack of data.

Data and Conventions

Data and projections for 189 economies form the statistical basis of the WEO database. The data are maintained jointly by the IMF's Research Department and regional 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 compilation of national statistics, including 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.

Most countries' macroeconomic data presented in the WEO conform broadly to the 1993 version of the *System of National Accounts* (SNA). The IMF's sector statistical standards—the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6), the *Monetary and Financial Statistics Manual* (MFSM 2000), and the *Government Finance Statistics Manual 2001* (GFSM 2001)—have been or are being aligned with the SNA 2008.[1] These standards reflect 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 standards begins in earnest when the manuals are released. However, full concordance with the manuals is ultimately dependent on the provision by national statistical compilers of revised country data; hence, the WEO estimates are only partially adapted to these manuals. Nonetheless, for many countries the impact, on major balances and aggregates, of conversion to the updated standards will be small. Many other countries have partially adopted the latest standards and will continue implementation over a period of years.

Composite data for country groups in the WEO are either sums or weighted averages of data for individual countries. Unless noted otherwise, multiyear averages of growth rates are expressed as compound annual rates of change.[2] Arithmetically weighted averages are used for all data for the emerging market and developing economies group except data on inflation and money growth, for which geometric averages are used. The following conventions apply:

- Country group composites for exchange rates, interest rates, and 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 ratios, are weighted by GDP valued at purchasing power parity as a share of total world or group GDP.[3]
- Unless noted otherwise, composites for all sectors for the euro area are corrected for reporting discrepancies in intra-area transactions. Annual data are not adjusted for calendar-day effects. For data prior to 1999, data aggregations apply 1995 European currency unit exchange rates.
- Composites for fiscal data are sums of individual country data after conversion to U.S. dollars at the average market exchange rates in the years indicated.
- Composite unemployment rates and employment growth are weighted by labor force as a share of group labor force.
- Composites relating to external sector statistics are sums of individual country data after conversion to U.S. dollars at the average market exchange rates

[1]Many countries are implementing the SNA 2008 or ESA 2010, and a few countries use versions of the SNA older than 1993. A similar adoption pattern is expected for the BPM6. Please refer to Table G, which lists the statistical standards adhered to by each country.

[2]Averages for real GDP and its components, employment, GDP per capita, inflation, factor productivity, trade, and commodity prices are calculated based on the compound annual rate of change, except in the case of the unemployment rate, which is based on the simple arithmetic average.

[3]See "Revised Purchasing Power Parity Weights" in the July 2014 *WEO Update* for a summary of the revised purchasing-power-parity-based weights, as well as Box A2 of the April 2004 WEO and Annex IV of the May 1993 WEO. 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.

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).
- Unless noted otherwise, group composites are computed if 90 percent or more of the share of group weights is represented.

Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F, which lists the economies with exceptional reporting periods for national accounts and government finance data for each country.

For some countries, the figures for 2014 and earlier are based on estimates rather than actual outturns. Please refer to Table G, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments indicators for each country.

Classification of Countries

Summary of the Country Classification

The country classification in the WEO divides the world into two major groups: advanced economies and emerging market and developing economies.[4] This classification is not based on strict criteria, economic or otherwise, and it has evolved over time. The objective is to facilitate analysis by providing a reasonably meaningful method of organizing data. Table A provides an overview of the country classification, showing the number of countries in each group by region and summarizing some key indicators of their relative size (GDP valued by purchasing power parity, total exports of goods and services, and population).

Some countries remain outside the country classification and therefore are not included in the analysis. Anguilla, Cuba, the Democratic People's Republic of Korea, and Montserrat are examples of countries that are not IMF members, and their economies therefore are not monitored by the IMF. Somalia is omitted from the emerging market and developing economies group composites because of data limitations.

[4]As used here, the terms "country" and "economy" do not always refer to a territorial entity that is a state as understood by international law and practice. Some territorial entities included here are not states, although their statistical data are maintained on a separate and independent basis.

General Features and Composition of Groups in the *World Economic Outlook* Classification

Advanced Economies

The 37 advanced economies are listed in Table B. The seven largest in terms of GDP based on market exchange rates—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 members of the *euro area* are also distinguished as a subgroup. 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 WEO.

Emerging Market and Developing Economies

The group of emerging market and developing economies (152) includes all those that are not classified as advanced economies.

The *regional breakdowns* of emerging market and developing economies are *Commonwealth of Independent States (CIS), emerging and developing Asia, emerging and developing Europe* (sometimes also referred to as "central and eastern Europe"), *Latin America and the Caribbean (LAC), Middle East, North Africa, Afghanistan, and Pakistan (MENAP),* and *sub-Saharan Africa (SSA).*

Emerging market and developing economies are also classified according to *analytical criteria.* The analytical criteria reflect the composition of export earnings and a distinction between net creditor and net debtor economies. The detailed composition of emerging market and developing economies in the regional and analytical groups is shown in Tables D and E.

The analytical criterion *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). Economies are categorized into one of these groups when their main source of export earnings

exceeded 50 percent of total exports on average between 2010 and 2014.

The financial criteria focus on *net creditor economies, net debtor economies, heavily indebted poor countries* (HIPCs), and *low-income developing countries* (LIDCs). Economies are categorized as net debtors when their latest net international investment position, where available, was less than zero or their current account balance accumulations from 1972 (or earliest available data) to 2014 were negative. Net debtor economies are further differentiated on the basis of *experience with debt servicing*.[5]

The HIPC group comprises the countries that are or have been considered by the IMF and the World Bank for participation in their debt initiative known as the HIPC Initiative, which aims to reduce the external debt burdens of all the eligible HIPCs to a "sustainable" level in a reasonably short period of time.[6] Many of these countries have already benefited from debt relief and have graduated from the initiative.

The LIDCs are countries that were designated as eligible to use the IMF's concessional financing resources under the Poverty Reduction and Growth Trust (PRGT) in the 2013 PRGT eligibility review and had a level of per capita gross national income less than the PRGT income graduation threshold for non–small states (that is, twice the World Bank International Development Association operational threshold, or US$2,390 in 2011 as measured by the World Bank's Atlas method) and Zimbabwe.

[5] During 2010–14, 19 economies incurred external payments arrears or entered into official or commercial bank debt-rescheduling agreements. This group is referred to as *economies with arrears and/or rescheduling during 2010–14.*

[6] 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 51 (Washington: International Monetary Fund, November 1999).

Table A. Classification by *World Economic Outlook* Groups and Their Shares in Aggregate GDP, Exports of Goods and Services, and Population, 2014[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	**37**	**100.0**	**42.9**	**100.0**	**62.2**	**100.0**	**14.7**
United States		37.2	15.9	16.0	10.0	30.5	4.5
Euro Area	19	28.4	12.2	41.2	25.7	32.2	4.7
Germany		8.0	3.4	12.1	7.5	7.8	1.1
France		5.6	2.4	5.9	3.7	6.1	0.9
Italy		4.6	2.0	4.3	2.7	5.8	0.9
Spain		3.4	1.4	3.1	1.9	4.4	0.7
Japan		10.2	4.4	5.9	3.7	12.2	1.8
United Kingdom		5.5	2.4	5.7	3.6	6.2	0.9
Canada		3.4	1.5	3.9	2.4	3.4	0.5
Other Advanced Economies	14	15.2	6.5	27.3	17.0	15.6	2.3
Memorandum							
Major Advanced Economies	7	74.6	32.0	53.8	33.5	72.0	10.6
		Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World
Emerging Market and Developing Economies	**152**	**100.0**	**57.1**	**100.0**	**37.8**	**100.0**	**85.3**
Regional Groups							
Commonwealth of Independent States[2]	12	8.2	4.7	9.5	3.6	4.7	4.0
Russia		5.8	3.3	6.3	2.4	2.4	2.1
Emerging and Developing Asia	29	52.3	29.9	45.4	17.1	57.3	48.9
China		29.1	16.6	27.9	10.5	22.5	19.2
India		11.9	6.8	5.3	2.0	21.0	17.9
Excluding China and India	27	11.3	6.4	12.2	4.6	13.8	11.8
Emerging and Developing Europe	12	5.7	3.3	8.9	3.3	2.8	2.4
Latin America and the Caribbean	32	15.1	8.6	13.8	5.2	9.9	8.5
Brazil		5.3	3.0	3.0	1.1	3.3	2.8
Mexico		3.5	2.0	4.7	1.8	2.0	1.7
Middle East, North Africa, Afghanistan, and Pakistan	22	13.3	7.6	17.3	6.5	10.5	9.0
Middle East and North Africa	20	11.8	6.8	16.9	6.4	6.9	5.9
Sub-Saharan Africa	45	5.4	3.1	5.1	1.9	14.7	12.6
Excluding Nigeria and South Africa	43	2.6	1.5	2.9	1.1	11.0	9.4
Analytical Groups[3]							
By Source of Export Earnings							
Fuel	29	20.6	11.8	27.7	10.5	12.4	10.6
Nonfuel	123	79.4	45.4	72.3	27.3	87.6	74.8
Of Which, Primary Products	29	4.9	2.8	4.6	1.7	7.7	6.6
By External Financing Source							
Net Debtor Economies	118	50.4	28.8	45.4	17.1	64.8	55.3
Net Debtor Economies by Debt-Servicing Experience							
Economies with Arrears and/or Rescheduling during 2010–14	19	3.1	1.8	2.3	0.9	5.7	4.8
Other Groups							
Heavily Indebted Poor Countries	38	2.4	1.4	1.9	0.7	11.1	9.5
Low-Income Developing Countries	59	7.3	4.2	6.2	2.3	22.3	19.0

[1]The GDP shares are based on the purchasing-power-parity valuation of economies' GDP. The number of economies comprising each group reflects those for which data are included in the group aggregates.

[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

[3]South Sudan is omitted from the net external position groups composite for lack of a fully developed database.

Table B. Advanced Economies by Subgroup

Major Currency Areas		
United States		
Euro Area		
Japan		
Euro Area		
Austria	Greece	Netherlands
Belgium	Ireland	Portugal
Cyprus	Italy	Slovak Republic
Estonia	Latvia	Slovenia
Finland	Lithuania	Spain
France	Luxembourg	
Germany	Malta	
Major Advanced Economies		
Canada	Italy	United States
France	Japan	
Germany	United Kingdom	
Other Advanced Economies		
Australia	Israel	Singapore
Czech Republic	Korea	Sweden
Denmark	New Zealand	Switzerland
Hong Kong SAR[1]	Norway	Taiwan Province of China
Iceland	San Marino	

[1]On July 1, 1997, Hong Kong was returned to the People's Republic of China and became a Special Administrative Region of China.

Table C. European Union

Austria	Germany	Poland
Belgium	Greece	Portugal
Bulgaria	Hungary	Romania
Croatia	Ireland	Slovak Republic
Cyprus	Italy	Slovenia
Czech Republic	Latvia	Spain
Denmark	Lithuania	Sweden
Estonia	Luxembourg	United Kingdom
Finland	Malta	
France	Netherlands	

Table D. Emerging Market and Developing Economies by Region and Main Source of Export Earnings

	Fuel	Nonfuel Primary Products
Commonwealth of Independent States[1]		
	Azerbaijan	Uzbekistan
	Kazakhstan	
	Russia	
	Turkmenistan	
Emerging and Developing Asia		
	Brunei Darussalam	Mongolia
	Timor-Leste	Papua New Guinea
		Solomon Islands
		Tuvalu
Latin America and the Caribbean		
	Bolivia	Argentina
	Colombia	Chile
	Ecuador	Guyana
	Trinidad and Tobago	Paraguay
	Venezuela	Suriname
		Uruguay
Middle East, North Africa, Afghanistan, and Pakistan		
	Algeria	Afghanistan
	Bahrain	Mauritania
	Iran	Sudan
	Iraq	
	Kuwait	
	Libya	
	Oman	
	Qatar	
	Saudi Arabia	
	United Arab Emirates	
	Yemen	
Sub-Saharan Africa		
	Angola	Burkina Faso
	Chad	Burundi
	Republic of Congo	Central African Republic
	Equatorial Guinea	Democratic Republic of the Congo
	Gabon	Côte d'Ivoire
	Nigeria	Eritrea
	South Sudan	Guinea
		Guinea-Bissau
		Liberia
		Malawi
		Mali
		Niger
		Sierra Leone
		South Africa
		Zambia

[1]Turkmenistan, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarity in economic structure.

Table E. Emerging Market and Developing Economies by Region, Net External Position, and Status as Heavily Indebted Poor Countries and Low-Income Developing Countries

	Net External Position[1]	Heavily Indebted Poor Countries[2]	Low-Income Developing Countries
Commonwealth of Independent States[3]			
Armenia	*		
Azerbaijan	•		
Belarus	*		
Georgia	*		
Kazakhstan	*		
Kyrgyz Republic	*		*
Moldova	*		*
Russia	•		
Tajikistan	*		*
Turkmenistan	•		
Ukraine	*		
Uzbekistan	•		*
Emerging and Developing Asia			
Bangladesh	*		*
Bhutan	*		*
Brunei Darussalam	•		
Cambodia	*		*
China	•		
Fiji	*		
India	*		
Indonesia	*		
Kiribati	•		*
Lao P.D.R.	*		*
Malaysia	*		
Maldives	*		
Marshall Islands	•		
Micronesia	*		
Mongolia	*		*
Myanmar	*		*
Nepal	•		*
Palau	•		
Papua New Guinea	*		*
Philippines	*		
Samoa	*		
Solomon Islands	*		*
Sri Lanka	*		
Thailand	*		
Timor-Leste	•		
Tonga	*		
Tuvalu	*		
Vanuatu	*		
Vietnam	*		*
Emerging and Developing Europe			
Albania	*		
Bosnia and Herzegovina	*		
Bulgaria	*		
Croatia	*		
Hungary	*		
Kosovo	*		
FYR Macedonia	*		
Montenegro	*		
Poland	*		
Romania	*		
Serbia	*		
Turkey	*		
Latin America and the Caribbean			
Antigua and Barbuda	*		
Argentina	•		
The Bahamas	*		
Barbados	*		
Belize	*		
Bolivia	•	•	*
Brazil	*		
Chile	*		
Colombia	*		
Costa Rica	*		
Dominica	*		
Dominican Republic	*		
Ecuador	*		
El Salvador	*		
Grenada	*		
Guatemala	*		
Guyana	*	•	
Haiti	*	•	*
Honduras	*	•	*
Jamaica	*		
Mexico	*		
Nicaragua	*	•	*
Panama	*		
Paraguay	*		
Peru	*		
St. Kitts and Nevis	*		
St. Lucia	*		
St. Vincent and the Grenadines	*		
Suriname	*		
Trinidad and Tobago	•		
Uruguay	*		
Venezuela	•		

Table E. Emerging Market and Developing Economies by Region, Net External Position, and Status as Heavily Indebted Poor Countries and Low-Income Developing Countries *(continued)*

	Net External Position[1]	Heavily Indebted Poor Countries[2]	Low-Income Developing Countries
Middle East, North Africa, Afghanistan, and Pakistan			
Afghanistan	•	•	*
Algeria	•		
Bahrain	•		
Djibouti	*		*
Egypt	*		
Iran	•		
Iraq	•		
Jordan	*		
Kuwait	•		
Lebanon	*		
Libya	•		
Mauritania	*	•	*
Morocco	*		
Oman	•		
Pakistan	*		
Qatar	•		
Saudi Arabia	•		
Sudan	*	*	*
Syria	*		
Tunisia	*		
United Arab Emirates	•		
Yemen	*		*
Sub-Saharan Africa			
Angola	•		
Benin	*	•	*
Botswana	•		
Burkina Faso	*	•	*
Burundi	*	•	*
Cabo Verde	*		
Cameroon	*	•	*
Central African Republic	*	•	*
Chad	*	•	*
Comoros	*	•	*
Democratic Republic of the Congo	*	•	*
Republic of Congo	*	•	*
Côte d'Ivoire	*	•	*
Equatorial Guinea	*		
Eritrea	*	*	*
Ethiopia	*	•	*
Gabon	•		
The Gambia	*	•	*
Ghana	*	•	*
Guinea	*	•	*
Guinea-Bissau	*	•	*
Kenya	*		*
Lesotho	*		*
Liberia	*	•	*
Madagascar	*	•	*
Malawi	*	•	*
Mali	*	•	*
Mauritius	•		
Mozambique	*	•	*
Namibia	•		
Niger	*	•	*
Nigeria	•		*
Rwanda	*	•	*
São Tomé and Príncipe	*	•	*
Senegal	*	•	*
Seychelles	*		
Sierra Leone	*	•	*
South Africa	*		
South Sudan[4]	. . .		*
Swaziland	*		
Tanzania	*	•	*
Togo	•	•	*
Uganda	*	•	*
Zambia	*	•	*
Zimbabwe	*		*

[1]Dot (star) indicates that the country is a net creditor (net debtor).

[2]Dot instead of star indicates that the country has reached the completion point.

[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

[4]South Sudan is omitted from the net external position group composite for lack of a fully developed database.

Table F. Economies with Exceptional Reporting Periods[1]

	National Accounts	Government Finance
The Bahamas		Jul/Jun
Bangladesh		Jul/Jun
Barbados		Apr/Mar
Belize		Apr/Mar
Bhutan	Jul/Jun	Jul/Jun
Botswana		Apr/Mar
Dominica		Jul/Jun
Egypt	Jul/Jun	Jul/Jun
Ethiopia	Jul/Jun	Jul/Jun
Haiti	Oct/Sep	Oct/Sep
Hong Kong SAR		Apr/Mar
India	Apr/Mar	Apr/Mar
Iran	Apr/Mar	Apr/Mar
Jamaica		Apr/Mar
Lao P.D.R.		Oct/Sep
Lesotho		Apr/Mar
Malawi		Jul/Jun
Marshall Islands	Oct/Sep	Oct/Sep
Micronesia	Oct/Sep	Oct/Sep
Myanmar	Apr/Mar	Apr/Mar
Namibia		Apr/Mar
Nepal	Aug/Jul	Aug/Jul
Pakistan	Jul/Jun	Jul/Jun
Palau	Oct/Sep	Oct/Sep
Qatar		Apr/Mar
Samoa	Jul/Jun	Jul/Jun
Singapore		Apr/Mar
St. Lucia		Apr/Mar
Swaziland		Apr/Mar
Thailand		Oct/Sep
Trinidad and Tobago		Oct/Sep

[1]Unless noted otherwise, all data refer to calendar years.

Table G. Key Data Documentation

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Afghanistan	Afghan Afghani	NSO	2013	2002	SNA 1993		NSO	2014
Albania	Albanian lek	IMF staff	2012	1996	SNA 1993	From 1996	NSO	2014
Algeria	Algerian dinar	NSO	2013	2001	SNA 1993	From 2005	NSO	2014
Angola	Angolan kwanza	MEP	2013	2002	ESA 1995		NSO	2014
Antigua and Barbuda	Eastern Caribbean dollar	CB	2014	2006[6]	SNA 1993		NSO	2014
Argentina	Argentine peso	MEP	2014	2004	SNA 2008		NSO	2014
Armenia	Armenian dram	NSO	2014	2005	SNA 1993		NSO	2014
Australia	Australian dollar	NSO	2014	2012/13	SNA 2008	From 1980	NSO	2014
Austria	Euro	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
Azerbaijan	Azerbaijan manat	NSO	2014	2003	SNA 1993	From 1994	NSO	2014
The Bahamas	Bahamian dollar	NSO	2014	2006	SNA 1993		NSO	2014
Bahrain	Bahrain dinar	MoF	2014	2010	SNA 2008		NSO	2014
Bangladesh	Bangladesh taka	NSO	2013	2005	SNA 1993		NSO	2014
Barbados	Barbados dollar	NSO and CB	2013	1974[6]	SNA 1993		CB	2014
Belarus	Belarusian rubel	NSO	2013	2009	ESA 1995	From 2005	NSO	2014
Belgium	Euro	CB	2014	2012	ESA 2010	From 1995	CB	2014
Belize	Belize dollar	NSO	2013	2000	SNA 1993		NSO	2013
Benin	CFA franc	NSO	2012	2000	SNA 1993		NSO	2013
Bhutan	Bhutanese ngultrum	NSO	2011/12	2000[6]	Other		CB	2013
Bolivia	Bolivian boliviano	NSO	2014	1990	Other		NSO	2014
Bosnia and Herzegovina	Convertible marka	NSO	2014	2010	ESA 2010	From 2000	NSO	2014
Botswana	Botswana pula	NSO	2012	2006	SNA 1993		NSO	2013
Brazil	Brazilian real	NSO	2014	1995	SNA 2008		NSO	2014
Brunei Darussalam	Brunei dollar	NSO and PMO	2014	2010	SNA 1993		NSO and PMO	2014
Bulgaria	Bulgarian lev	NSO	2014	2010	ESA 2010	From 1996	NSO	2014
Burkina Faso	CFA franc	NSO and MEP	2014	1999	SNA 1993		NSO	2014
Burundi	Burundi franc	NSO	2011	2005	SNA 1993		NSO	2012
Cabo Verde	Cabo Verde escudo	NSO	2014	2007	SNA 2008	From 2011	NSO	2014
Cambodia	Cambodian riel	NSO	2013	2000	SNA 1993		NSO	2014
Cameroon	CFA franc	NSO	2014	2000	SNA 1993		NSO	2014
Canada	Canadian dollar	NSO	2014	2007	SNA 2008	From 1980	NSO	2014
Central African Republic	CFA franc	NSO	2012	2005	SNA 1993		NSO	2014
Chad	CFA franc	CB	2013	2005	Other		NSO	2014
Chile	Chilean peso	CB	2014	2008	SNA 2008	From 2003	NSO	2014
China	Chinese yuan	NSO	2014	1990[6]	SNA 2008		NSO	2014
Colombia	Colombian peso	NSO	2014	2005	Other	From 2000	NSO	2014
Comoros	Comorian franc	NSO	2013	2000	Other		NSO	2013
Democratic Republic of the Congo	Congo franc	NSO	2006	2005	SNA 1993		CB	2014
Republic of Congo	CFA franc	NSO	2014	1990	SNA 1993		NSO	2014
Costa Rica	Costa Rican colón	CB	2014	1991	SNA 1993		CB	2014

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Afghanistan	MoF	2013	2001	CG	C	NSO	2013	BPM 5
Albania	IMF staff	2014	1986	CG,LG,SS,MPC, NFPC	Other	CB	2012	BPM 6
Algeria	CB	2014	1986	CG	C	CB	2014	BPM 5
Angola	MoF	2013	2001	CG,LG	Other	CB	2013	BPM 5
Antigua and Barbuda	MoF	2014	2001	CG	C	CB	2014	BPM 5
Argentina	MEP	2014	1986	CG,SG,LG,SS	C	CB	2014	BPM 5
Armenia	MoF	2014	2001	CG	C	CB	2014	BPM 5
Australia	MoF	2013/14	2001	CG,SG,LG,TG	A	NSO	2014	BPM 6
Austria	NSO	2014	2001	CG,SG,LG,SS	A	CB	2014	BPM 6
Azerbaijan	MoF	2014	Other	CG	C	CB	2014	BPM 5
The Bahamas	MoF	2014/15	2001	CG	C	CB	2014	BPM 5
Bahrain	MoF	2014	1986	CG	C	CB	2014	BPM 5
Bangladesh	MoF	2013/14	Other	CG	C	CB	2013	BPM 4
Barbados	MoF	2014/15	1986	CG,SS,NFPC	C	CB	2014	BPM 5
Belarus	MoF	2013	2001	CG,LG,SS	C	CB	2013	BPM 6
Belgium	CB	2014	ESA 2010	CG,SG,LG,SS	A	CB	2014	BPM 6
Belize	MoF	2013/14	1986	CG,MPC	C/A	CB	2013	BPM 5
Benin	MoF	2013	2001	CG	C	CB	2012	BPM 5
Bhutan	MoF	2012/13	1986	CG	C	CB	2011/12	BPM 6
Bolivia	MoF	2014	2001	CG,LG,SS,MPC, NMPC, NFPC	C	CB	2013	BPM 5
Bosnia and Herzegovina	MoF	2014	2001	CG,SG,LG,SS	A	CB	2014	BPM 6
Botswana	MoF	2011/12	1986	CG	C	CB	2012	BPM 5
Brazil	MoF	2014	2001	CG,SG,LG,SS, MPC,NFPC	C	CB	2014	BPM 6
Brunei Darussalam	MoF	2014	Other	CG, BCG	C	MEP	2013	BPM 5
Bulgaria	MoF	2014	2001	CG,LG,SS	C	CB	2014	BPM 6
Burkina Faso	MoF	2014	2001	CG	Other	CB	2014	BPM 5
Burundi	MoF	2013	2001	CG	A	CB	2012	BPM 6
Cabo Verde	MoF	2014	2001	CG,SS	A	NSO	2014	BPM 6
Cambodia	MoF	2014	1986	CG,LG	A	CB	2014	BPM 5
Cameroon	MoF	2014	2001	CG,NFPC	C	MoF	2013	BPM 5
Canada	MoF	2014	2001	CG,SG,LG,SS	A	NSO	2014	BPM 6
Central African Republic	MoF	2014	2001	CG	C	CB	2012	BPM 5
Chad	MoF	2014	1986	CG,NFPC	C	CB	2012	BPM 5
Chile	MoF	2014	2001	CG,LG	A	CB	2014	BPM 6
China	MoF	2014	2001	CG,LG	C	SAFE	2014	BPM 6
Colombia	MoF	2014	2001	CG,SG,LG,SS	C/A	CB and NSO	2014	BPM 5
Comoros	MoF	2013	1986	CG	C/A	CB and IMF staff	2013	BPM 5
Democratic Republic of the Congo	MoF	2013	2001	CG,LG	A	CB	2013	BPM 5
Republic of Congo	MoF	2014	2001	CG	A	CB	2007	BPM 5
Costa Rica	MoF and CB	2014	1986	CG	C	CB	2014	BPM 5

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Côte d'Ivoire	CFA franc	NSO	2012	2009	SNA 1993		NSO	2014
Croatia	Croatian kuna	NSO	2014	2005	ESA 2010		NSO	2014
Cyprus	Euro	Eurostat	2014	2005	ESA 2010	From 1995	Eurostat	2014
Czech Republic	Czech koruna	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
Denmark	Danish krone	NSO	2014	2010	ESA 2010	From 1980	NSO	2014
Djibouti	Djibouti franc	NSO	2014	1990	Other		NSO	2014
Dominica	Eastern Caribbean dollar	NSO	2014	2006	SNA 1993		NSO	2014
Dominican Republic	Dominican peso	CB	2014	2007	SNA 2008	From 2007	CB	2014
Ecuador	U.S. dollar	CB	2013	2007	SNA 1993		NSO and CB	2014
Egypt	Egyptian pound	MEP	2014/15	2011/12	SNA 1993		NSO	2014/15
El Salvador	U.S. dollar	CB	2014	1990	Other		NSO	2014
Equatorial Guinea	CFA franc	MEP and CB	2013	2006	SNA 1993		MEP	2014
Eritrea	Eritrean nakfa	IMF staff	2006	2005	SNA 1993		NSO	2009
Estonia	Euro	NSO	2013	2010	ESA 2010	From 1995	NSO	2013
Ethiopia	Ethiopian birr	NSO	2013/14	2010/11	SNA 1993		NSO	2014
Fiji	Fiji dollar	NSO	2013	2008[6]	SNA 1993/ 2008		NSO	2013
Finland	Euro	NSO	2014	2010	ESA 2010	From 1980	NSO and Eurostat	2014
France	Euro	NSO	2014	2010	ESA 2010	From 1980	NSO	2014
Gabon	CFA franc	MoF	2013	2001	SNA 1993		MoF	2014
The Gambia	Gambian dalasi	NSO	2012	2004	SNA 1993		NSO	2013
Georgia	Georgian lari	NSO	2014	2000	SNA 1993	From 1996	NSO	2014
Germany	Euro	NSO	2014	2010	ESA 2010	From 1991	NSO	2014
Ghana	Ghanaian cedi	NSO	2014	2006	SNA 1993		NSO	2014
Greece	Euro	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
Grenada	Eastern Caribbean dollar	NSO	2014	2006	SNA 1993		NSO	2013
Guatemala	Guatemalan quetzal	CB	2014	2001	SNA 1993	From 2001	NSO	2014
Guinea	Guinean franc	NSO	2009	2003	SNA 1993		NSO	2014
Guinea-Bissau	CFA franc	NSO	2011	2005	SNA 1993		NSO	2011
Guyana	Guyana dollar	NSO	2012	2006[6]	SNA 1993		NSO	2012
Haiti	Haitian gourde	NSO	2014/15	1986/87	SNA 2008		NSO	2014/15
Honduras	Honduran lempira	CB	2013	2000	SNA 1993		CB	2013
Hong Kong SAR	Hong Kong dollar	NSO	2014	2013	SNA 2008	From 1980	NSO	2014
Hungary	Hungarian forint	NSO	2014	2005	ESA 1995	From 2005	NSO	2014
Iceland	Icelandic króna	NSO	2014	2005	ESA 2010	From 1990	NSO	2014
India	Indian rupee	NSO	2014/15	2011/12	SNA 1993		NSO	2014/15
Indonesia	Indonesian rupiah	NSO	2014	2010	SNA 2008		NSO	2014
Iran	Iranian rial	CB	2014/15	2004/05	SNA 1993		CB	2014/15
Iraq	Iraqi dinar	NSO	2014	2007	Other		NSO	2014
Ireland	Euro	NSO	2014	2013	ESA 2010	From 2012	NSO	2014

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Côte d'Ivoire	MoF	2014	1986	CG	A	CB	2012	BPM 6
Croatia	MoF	2014	2001	CG,LG	A	CB	2013	BPM 6
Cyprus	Eurostat	2014	ESA 2010	CG,LG,SS	C	Eurostat	2014	BPM 5
Czech Republic	MoF	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6
Denmark	NSO	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6
Djibouti	MoF	2014	2001	CG	A	CB	2014	BPM 5
Dominica	MoF	2013/14	1986	CG	C	CB	2014	BPM 5
Dominican Republic	MoF	2014	2001	CG,SG,LG,SS	A	CB	2014	BPM 6
Ecuador	CB and MoF	2013	1986	CG,SG,LG,SS, NFPC	C	CB	2013	BPM 5
Egypt	MoF	2014/15	2001	CG,LG,SS,MPC	C	CB	2014/15	BPM 5
El Salvador	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 6
Equatorial Guinea	MoF	2014	1986	CG	C	CB	2013	BPM 5
Eritrea	MoF	2008	2001	CG	C	CB	2008	BPM 5
Estonia	MoF	2013	1986/2001	CG,LG,SS	C	CB	2013	BPM 6
Ethiopia	MoF	2013/14	1986	CG,SG,LG,NFPC	C	CB	2014/15	BPM 5
Fiji	MoF	2013	2001	CG	C	CB	2013	BPM 6
Finland	MoF	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6
France	NSO	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
Gabon	IMF staff	2014	2001	CG	A	CB	2014	BPM 5
The Gambia	MoF	2013	2001	CG	C	CB and IMF staff	2012	BPM 4
Georgia	MoF	2014	2001	CG,LG	C	NSO and CB	2014	BPM 5
Germany	NSO and Eurostat	2014	2001	CG,SG,LG,SS	A	CB	2014	BPM 6
Ghana	MoF	2014	2001	CG,SG,LG	C	CB	2014	BPM 5
Greece	MoF	2014	1986	CG,LG,SS	A	CB	2014	BPM 5
Grenada	MoF	2014	2001	CG	C	CB	2013	BPM 5
Guatemala	MoF	2014	1986	CG	C	CB	2014	BPM 5
Guinea	MoF	2014	2001	CG	Other	CB and MEP	2013	BPM 6
Guinea-Bissau	MoF	2011	2001	CG	A	CB	2011	BPM 6
Guyana	MoF	2012	2001	CG,SS	C	CB	2012	BPM 5
Haiti	MoF	2014/15	2001	CG	C	CB	2014/15	BPM 5
Honduras	MoF	2013	1986	CG,LG,SS,NFPC	A	CB	2013	BPM 5
Hong Kong SAR	NSO	2014/15	2001	CG	C	NSO	2014	BPM 6
Hungary	MEP and Eurostat	2014	2001	CG,LG,SS,NMPC	A	CB	2014	BPM 6
Iceland	NSO	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
India	MoF	2013/14	2001	CG,SG	A	CB	2014/15	BPM 5
Indonesia	MoF	2014	2001	CG,LG	C	CB	2014	BPM 6
Iran	MoF	2014/15	2001	CG	C	CB	2014/15	BPM 5
Iraq	MoF	2014	2001	CG	C	CB	2014	BPM 5
Ireland	MoF	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Israel	New Israeli shekel	NSO	2014	2010	SNA 2008	From 1995	Haver Analytics	2014
Italy	Euro	NSO	2014	2010	ESA 2010	From 1980	NSO	2014
Jamaica	Jamaica dollar	NSO	2014	2007	SNA 1993		NSO	2014
Japan	Japanese yen	Cabinet Office	2014	2005	SNA 1993	From 1980	MIAC	2014
Jordan	Jordanian dinar	NSO	2013	1994	Other		NSO	2013
Kazakhstan	Kazakhstani tenge	NSO	2014	2007	Other	From 1994	CB	2014
Kenya	Kenya shilling	NSO	2014	2009	SNA 2008		NSO	2014
Kiribati	Australian dollar	NSO	2013	2006	Other		NSO	2014
Korea	Korean won	CB	2014	2010	SNA 2008	From 1980	MoF	2014
Kosovo	Euro	NSO	2013	2013	ESA 2010		NSO	2013
Kuwait	Kuwaiti dinar	MEP and NSO	2014	2010	SNA 1993		NSO and MEP	2014
Kyrgyz Republic	Kyrgyz som	NSO	2014	1995	SNA 1993		NSO	2014
Lao P.D.R.	Lao kip	NSO	2013	2002	SNA 1993		NSO	2013
Latvia	Euro	NSO	2013	2010	ESA 1995	From 1995	Eurostat	2013
Lebanon	Lebanese pound	NSO	2011	2000	SNA 2008	From 2010	NSO	2013
Lesotho	Lesotho loti	NSO	2012	2004	Other		NSO	2013
Liberia	U.S. dollar	CB	2011	1992	SNA 1993		CB	2014
Libya	Libyan dinar	MEP	2014	2003	SNA 1993		NSO	2014
Lithuania	Euro	NSO	2013	2010	ESA 2010	From 2005	NSO	2013
Luxembourg	Euro	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
FYR Macedonia	Macedonian denar	NSO	2014	2005	ESA 2010		NSO	2014
Madagascar	Malagasy ariary	NSO	2014	2000	Other		NSO	2014
Malawi	Malawi kwacha	NSO	2014	2010	SNA 2008		NSO	2014
Malaysia	Malaysian ringgit	NSO	2014	2010	SNA 2008		NSO	2014
Maldives	Maldivian rufiyaa	MoF and NSO	2014	2003[6]	SNA 1993		CB	2014
Mali	CFA franc	MoF	2011	1987	SNA 1993		MoF	2013
Malta	Euro	Eurostat	2013	2010	ESA 2010	From 2000	Eurostat	2013
Marshall Islands	U.S. dollar	NSO	2012/13	2003/04	Other		NSO	2013
Mauritania	Mauritanian ouguiya	NSO	2014	2004	SNA 1993		NSO	2014
Mauritius	Mauritian rupee	NSO	2014	2006	SNA 1993	From 1999	NSO	2013
Mexico	Mexican peso	NSO	2014	2008	SNA 2008		NSO	2014
Micronesia	U.S. dollar	NSO	2013	2004	Other		NSO	2013
Moldova	Moldovan leu	NSO	2014	1995	SNA 1993		NSO	2014
Mongolia	Mongolian togrog	NSO	2014	2010	SNA 1993		NSO	2014
Montenegro	Euro	NSO	2014	2006	ESA 1995		NSO	2014
Morocco	Moroccan dirham	NSO	2014	2007	SNA 1993	From 1998	NSO	2014
Mozambique	Mozambican metical	NSO	2014	2009	SNA 1993		NSO	2014
Myanmar	Myanmar kyat	MEP	2013/14	2010/11	Other		NSO	2013/14
Namibia	Namibia dollar	NSO	2014	2000	SNA 1993		NSO	2014
Nepal	Nepalese rupee	NSO	2013/14	2000/01	SNA 1993		CB	2013/14
Netherlands	Euro	NSO	2014	2010	ESA 2010	From 1980	NSO	2014
New Zealand	New Zealand dollar	NSO	2014	2009/10	Other	From 1987	NSO	2014
Nicaragua	Nicaraguan córdoba	IMF staff	2014	2006	SNA 1993	From 1994	CB	2014

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Israel	MoF	2014	2001	CG,SS	Other	Haver Analytics	2014	BPM 6
Italy	NSO	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6
Jamaica	MoF	2014/15	1986	CG	C	CB	2014	BPM 5
Japan	Cabinet Office	2013	2001	CG,LG,SS	A	CB	2014	BPM 6
Jordan	MoF	2013	2001	CG,NFPC	C	CB	2013	BPM 5
Kazakhstan	IMF staff	2014	2001	CG,LG	A	CB	2014	BPM 6
Kenya	MoF	2014	2001	CG	A	CB	2013	BPM 5
Kiribati	MoF	2013	1986	CG,LG	C	NSO	2012	BPM 5
Korea	MoF	2014	2001	CG	C	CB	2014	BPM 6
Kosovo	MoF	2013	Other	CG,LG	C	CB	2013	BPM 5
Kuwait	MoF	2014	1986	CG	C/A	CB	2014	BPM 5
Kyrgyz Republic	MoF	2014	Other	CG,LG,SS	C	MoF	2014	BPM 5
Lao P.D.R.	MoF	2012/13	2001	CG	C	CB	2013	BPM 5
Latvia	MoF	2013	Other	CG,LG,SS,NFPC	C	CB	2013	BPM 5
Lebanon	MoF	2013	1986	CG	C	CB and IMF staff	2012	BPM 5
Lesotho	MoF	2012/13	2001	CG,LG	C	CB	2012	BPM 6
Liberia	MoF	2013	2001	CG	A	CB	2013	BPM 5
Libya	MoF	2014	1986	CG,SG,LG	C	CB	2014	BPM 5
Lithuania	MoF	2013	2001	CG,LG,SS	A	CB	2013	BPM 6
Luxembourg	MoF	2014	2001	CG,LG,SS	A	NSO	2014	BPM 6
FYR Macedonia	MoF	2014	1986	CG,SG,SS	C	CB	2014	BPM 6
Madagascar	MoF	2014	1986	CG,LG	C	CB	2014	BPM 5
Malawi	MoF	2014/15	1986	CG	C	NSO	2014	BPM 5
Malaysia	MoF	2013	1986	CG,SG,LG	C	NSO	2014	BPM 6
Maldives	MoF and Treasury	2014	1986	CG	C	CB	2014	BPM 6
Mali	MoF	2013	2001	CG	C/A	CB	2011	BPM 5
Malta	Eurostat	2013	2001	CG,SS	A	NSO	2014	BPM 6
Marshall Islands	MoF	2012/13	2001	CG,LG,SS	A	NSO	2013	Other
Mauritania	MoF	2014	1986	CG	C	CB	2013	BPM 5
Mauritius	MoF	2013	2001	CG,SG,LG,NFPC	C	CB	2013	BPM 5
Mexico	MoF	2014	2001	CG,SS,NFPC	C	CB	2014	BPM 5
Micronesia	MoF	2012/13	2001	CG,SG,LG,SS	Other	NSO	2013	Other
Moldova	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 5
Mongolia	MoF	2014	2001	CG,SG,LG,SS	C	CB	2014	BPM 5
Montenegro	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 5
Morocco	MEP	2014	2001	CG	A	FEO	2014	BPM 5
Mozambique	MoF	2013	2001	CG,SG	C/A	CB	2014	BPM 5
Myanmar	MoF	2013/14	2001	CG,NFPC	C/A	IMF staff	2013/14	Other
Namibia	MoF	2014/15	2001	CG	C	CB	2013	BPM 5
Nepal	MoF	2013/14	2001	CG	C	CB	2013/14	BPM 5
Netherlands	MoF	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
New Zealand	MoF	2013/14	2001	CG	A	NSO	2014	BPM 6
Nicaragua	MoF	2014	1986	CG,LG,SS	C	IMF staff	2014	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Niger	CFA franc	NSO	2013	2000	SNA 1993		NSO	2014
Nigeria	Nigerian naira	NSO	2014	2010	SNA 2008		NSO	2014/15
Norway	Norwegian krone	NSO	2014	2012	ESA 2010	From 1980	NSO	2014
Oman	Omani rial	NSO	2012	2010	SNA 1993		NSO	2014
Pakistan	Pakistan rupee	NSO	2014/15	2005/06	SNA 1968/ 1993		NSO	2014/15
Palau	U.S. dollar	MoF	2013/14	2005	Other		MoF	2013/14
Panama	U.S. dollar	NSO	2014	1996	SNA 1993		NSO	2014
Papua New Guinea	Papua New Guinea kina	NSO and MOF	2013	1998	SNA 1993		NSO	2013
Paraguay	Paraguayan guaraní	CB	2014	1994	SNA 1993		CB	2014
Peru	Peruvian nuevo sol	CB	2014	2007	SNA 1993		CB	2014
Philippines	Philippine peso	NSO	2014	2000	SNA 2008		NSO	2014
Poland	Polish zloty	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
Portugal	Euro	NSO	2014	2011	ESA 2010	From 1980	NSO	2014
Qatar	Qatari riyal	NSO and MEP	2014	2013	SNA 1993		NSO and MEP	2014
Romania	Romanian leu	NSO and Eurostat	2014	2010	ESA 2010	From 2000	NSO	2014
Russia	Russian ruble	NSO	2014	2008	SNA 1993	From 1995	NSO	2014
Rwanda	Rwanda franc	MoF	2014	2011	SNA 1993		MoF	2014
Samoa	Samoa tala	NSO	2013/14	2009/10	SNA 1993		NSO	2013/14
San Marino	Euro	NSO	2013	2007	Other		NSO	2014
São Tomé and Príncipe	São Tomé and Príncipe dobra	NSO	2012	2000	SNA 1993		NSO	2014
Saudi Arabia	Saudi Arabian riyal	NSO and MEP	2014	2010	SNA 1993		NSO and MEP	2014
Senegal	CFA franc	NSO	2013	2000	SNA 1993		NSO	2011
Serbia	Serbian dinar	NSO	2014	2010	ESA 2010	From 2010	NSO	2014
Seychelles	Seychelles rupee	NSO	2013	2006	SNA 1993		NSO	2014
Sierra Leone	Sierra Leonean leone	NSO	2013	2006	SNA 1993	From 2010	NSO	2014
Singapore	Singapore dollar	NSO	2014	2010	SNA 1993	From 2010	NSO	2014
Slovak Republic	Euro	Eurostat	2014	2010	ESA 2010	From 1997	Eurostat	2014
Slovenia	Euro	NSO	2014	2000	ESA 2010	From 2000	NSO	2014
Solomon Islands	Solomon Islands dollar	CB	2013	2004	SNA 1993		NSO	2013
South Africa	South African rand	CB	2014	2010	SNA 1993		NSO	2014
South Sudan	South Sudanese pound	NSO	2014	2010	SNA 1993		NSO	2014
Spain	Euro	NSO	2014	2010	ESA 2010	From 1995	NSO	2014
Sri Lanka	Sri Lanka rupee	CB	2014	2002	SNA 1993		NSO	2014
St. Kitts and Nevis	Eastern Caribbean dollar	NSO	2013	2006[6]	SNA 1993		NSO	2013
St. Lucia	Eastern Caribbean dollar	NSO	2014	2006	SNA 1993		NSO	2014

Table G. Key Data Documentation *(continued)*

Country	Government Finance					Balance of Payments		
	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Niger	MoF	2014	1986	CG	A	CB	2013	BPM 6
Nigeria	MoF	2014	2001	CG,SG,LG,NFPC	C	CB	2014	BPM 5
Norway	NSO and MoF	2014	2001	CG,SG,SS	A	NSO	2014	BPM 6
Oman	MoF	2013	2001	CG	C	CB	2013	BPM 5
Pakistan	MoF	2014/15	1986	CG,SG,LG	C	CB	2014/15	BPM 5
Palau	MoF	2013/14	2001	CG	Other	MoF	2013/14	BPM 6
Panama	MEP	2014	1986	CG,SG,LG,SS, NFPC	C	NSO	2014	BPM 5
Papua New Guinea	MoF	2013	1986	CG	C	CB	2013	BPM 5
Paraguay	MoF	2014	2001	CG,LG	C	CB	2014	BPM 5
Peru	MoF	2014	1986	CG,SG,LG,SS	C	CB	2014	BPM 5
Philippines	MoF	2014	2001	CG,LG,SS	C	CB	2014	BPM 6
Poland	MoF and Eurostat	2014	ESA 2010	CG,LG,SS	A	CB	2014	BPM 6
Portugal	NSO	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
Qatar	MoF	2013/14	1986	CG	C	CB and IMF staff	2014	BPM 5
Romania	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 6
Russia	MoF	2014	2001	CG,SG,SS	C/A	CB	2014	BPM 6
Rwanda	MoF	2014	2001	CG,LG	C/A	CB	2014	BPM 5
Samoa	MoF	2013/14	2001	CG	A	CB	2012/13	BPM 6
San Marino	MoF	2013	Other	CG	Other	…	…	…
São Tomé and Príncipe	MoF and Customs	2014	2001	CG	C	CB	2014	BPM 5
Saudi Arabia	MoF	2014	1986	CG	C	CB	2014	BPM 5
Senegal	MoF	2011	1986	CG	C	CB and IMF staff	2011	BPM 5
Serbia	MoF	2014	Other	CG,SG,LG,SS	C	CB	2014	BPM 6
Seychelles	MoF	2013	1986	CG,SS	C	CB	2014	BPM 6
Sierra Leone	MoF	2013	1986	CG	C	CB	2013	BPM 5
Singapore	MoF	2013/14	2001	CG	C	NSO	2014	BPM 6
Slovak Republic	Eurostat	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
Slovenia	MoF	2014	1986	CG,SG,LG,SS	C	NSO	2014	BPM 6
Solomon Islands	MoF	2013	1986	CG	C	CB	2013	BPM 6
South Africa	MoF	2013/14	2001	CG,SG,SS	C	CB	2013	BPM 6
South Sudan	MoF	2014	Other	CG	C	Other	2014	BPM 5
Spain	MoF and Eurostat	2014	2001	CG,SG,LG,SS	A	CB	2014	BPM 6
Sri Lanka	MoF	2014	2001	CG,SG,LG,SS	C	CB	2012	BPM 5
St. Kitts and Nevis	MoF	2013	2001	CG	C	CB	2013	BPM 5
St. Lucia	MoF	2013/14	1986	CG	C	CB	2014	BPM 5

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
St. Vincent and the Grenadines	Eastern Caribbean dollar	NSO	2014	2006[6]	SNA 1993		NSO	2014
Sudan	Sudanese pound	NSO	2013	2007	Other		NSO	2013
Suriname	Surinamese dollar	NSO	2011	2007	SNA 1993		NSO	2014
Swaziland	Swaziland lilangeni	NSO	2010	2000	SNA 1993		NSO	2014
Sweden	Swedish krona	NSO	2014	2014	ESA 2010	From 1993	NSO	2014
Switzerland	Swiss franc	NSO	2014	2010	ESA 2010	From 1980	NSO	2014
Syria	Syrian pound	NSO	2010	2000	SNA 1993		NSO	2011
Taiwan Province of China	New Taiwan dollar	NSO	2014	2011	SNA 2008		NSO	2014
Tajikistan	Tajik somoni	NSO	2014	1995	SNA 1993		NSO	2014
Tanzania	Tanzania shilling	NSO	2012	2007	SNA 1993		NSO	2013
Thailand	Thai baht	NESDB	2014	2002	SNA 1993	From 1993	MoC	2014
Timor-Leste	U.S. dollar	MoF	2013	2010[6]	Other		NSO	2014
Togo	CFA franc	MoF and NSO	2014	2000	SNA 1993		NSO	2014
Tonga	Tongan pa'anga	CB	2012	2010	SNA 1993		CB	2013
Trinidad and Tobago	Trinidad and Tobago dollar	NSO	2012	2000	SNA 1993		NSO	2013
Tunisia	Tunisian dinar	NSO	2014	2004	SNA 1993	From 2009	NSO	2014
Turkey	Turkish lira	NSO	2014	1998	ESA 1995		NSO	2014
Turkmenistan	New Turkmen manat	NSO	2014	2005	SNA 1993	From 2000	NSO	2014
Tuvalu	Australian dollar	PFTAC advisors	2012	2005	Other		NSO	2013
Uganda	Uganda shilling	NSO	2013	2010	SNA 1993		CB	2013/14
Ukraine	Ukrainian hryvnia	NSO	2014	2010	SNA 2008	From 2005	NSO	2014
United Arab Emirates	U.A.E. dirham	NSO	2014	2007	SNA 1993		NSO	2014
United Kingdom	Pound sterling	NSO	2014	2011	ESA 2010	From 1980	NSO	2014
United States	U.S. dollar	NSO	2014	2009	Other	From 1980	NSO	2014
Uruguay	Uruguayan peso	CB	2014	2005	SNA 1993		NSO	2014
Uzbekistan	Uzbek sum	NSO	2014	1995	SNA 1993		NSO	2012
Vanuatu	Vanuatu vatu	NSO	2013	2006	SNA 1993		NSO	2014
Venezuela	Venezuelan bolívar fuerte	CB	2013	1997	SNA 2008		CB	2013
Vietnam	Vietnamese dong	NSO	2014	2010	SNA 1993		NSO	2014
Yemen	Yemeni rial	IMF staff	2008	1990	SNA 1993		NSO and CB	2009
Zambia	Zambian kwacha	NSO	2013	2010	SNA 1993		NSO	2014
Zimbabwe	U.S. dollar	NSO	2013	2009	Other		NSO	2014

Table G. Key Data Documentation *(continued)*

Country	Government Finance					Balance of Payments		
	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
St. Vincent and the Grenadines	MoF	2014	1986	CG	C	CB	2014	BPM 5
Sudan	MoF	2013	2001	CG	A	CB	2013	BPM 5
Suriname	MoF	2014	1986	CG	C	CB	2014	BPM 5
Swaziland	MoF	2012/13	2001	CG	A	CB	2013	BPM 6
Sweden	MoF	2012	2001	CG,LG,SS	A	NSO	2014	BPM 6
Switzerland	MoF	2012	2001	CG,SG,LG,SS	A	CB	2013	BPM 6
Syria	MoF	2009	1986	CG	C	CB	2009	BPM 5
Taiwan Province of China	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 6
Tajikistan	MoF	2014	1986	CG,LG,SS	C	CB	2014	BPM 5
Tanzania	MoF	2013	2001	CG,LG	C	CB	2011	BPM 5
Thailand	MoF	2013/14	2001	CG,BCG,LG,SS	A	CB	2014	BPM 6
Timor-Leste	MoF	2013	2001	CG	C	CB	2014	BPM 5
Togo	MoF	2014	2001	CG	C	CB	2013	BPM 5
Tonga	CB and MoF	2012	2001	CG	C	CB and NSO	2014	BPM 6
Trinidad and Tobago	MoF	2012/13	1986	CG,NFPC	C	CB and NSO	2012	BPM 5
Tunisia	MoF	2014	1986	CG	C	CB	2014	BPM 5
Turkey	MoF	2014	2001	CG,LG,SS	A	CB	2014	BPM 6
Turkmenistan	MoF	2014	1986	CG,LG	C	NSO and IMF staff	2013	BPM 5
Tuvalu	IMF staff	2013	Other	CG	C/A	IMF staff	2013	BPM 6
Uganda	MoF	2013	2001	CG	C	CB	2013	BPM 6
Ukraine	MoF	2014	2001	CG,SG,LG,SS	C	CB	2014	BPM 5
United Arab Emirates	MoF	2014	2001	CG,BCG,SG,SS	C	CB	2014	BPM 5
United Kingdom	NSO	2014	2001	CG,LG	A	NSO	2014	BPM 6
United States	BEA	2014	2001	CG,SG,LG	A	NSO	2014	BPM 6
Uruguay	MoF	2014	1986	CG,LG,SS,MPC, NFPC	A	CB	2014	BPM 6
Uzbekistan	MoF	2014	Other	CG,SG,LG,SS	C	MEP	2014	BPM 5
Vanuatu	MoF	2014	2001	CG	C	CB	2013	BPM 5
Venezuela	MoF	2010	2001	CG,LG,SS,NFPC	C	CB	2012	BPM 5
Vietnam	MoF	2014	2001	CG,SG,LG	C	CB	2014	BPM 5
Yemen	MoF	2013	2001	CG,LG	C	IMF staff	2009	BPM 5
Zambia	MoF	2014	1986	CG	C	CB	2014	BPM 6
Zimbabwe	MoF	2014	1986	CG	C	CB and MoF	2013	BPM 4

Note: BPM = Balance of Payments Manual (number in parentheses following abbreviation signifies edition); CPI = consumer price index; ESA = European System of National Accounts; SNA = System of National Accounts.

[1]BEA = U.S. Bureau of Economic Analysis; CB = Central Bank; FEO = Foreign Exchange Office; IFS = IMF, International Financial Statistics; MEP = Ministry of Economy and/or Planning; MIAC = Ministry of Internal Affairs and Communications; MoC = Ministry of Commerce; MoF = Ministry of Finance; NESDB = National Economic and Social Development Board; NSO = National Statistics Office; OECD = Organisation for Economic Co-operation and Development; PFTAC = Pacific Financial Technical Assistance Centre; PMO = Prime Minister's Office; SAFE = State Administration of Foreign Exchange.

[2]National accounts base year is the period with which other periods are compared and the period for which prices appear in the denominators of the price relationships used to calculate the index.

[3]Use of chain-weighted methodology allows countries to measure GDP growth more accurately by reducing or eliminating the downward biases in volume series built on index numbers that average volume components using weights from a year in the moderately distant past.

[4]For some countries, the structures of government consist of a broader coverage than specified for the general government. Coverage: BCG = Budgetary Central Government; CG = Central Government; LG = Local Government; MPC = Monetary Public Corporation, including Central Bank; NMPC = Nonmonetary Financial Public Corporations; NFPC = Nonfinancial Public Corporations; SG = State Government; SS = Social Security Funds; TG = Territorial Governments.

[5]Accounting Standard: A = Accrual; C = Cash.

[6]Nominal GDP is not measured in the same way as real GDP.

Box A1. Economic Policy Assumptions Underlying the Projections for Selected Economies

Fiscal Policy Assumptions

The short-term fiscal policy assumptions used in the *World Economic Outlook* (WEO) 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. For cases in which 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 indicated otherwise. Specific assumptions used in regard to some of the advanced economies follow. (See also Tables B5 to B9 in the online section of the Statistical Appendix for data on fiscal net lending/borrowing and structural balances.)[1]

Argentina: Fiscal projections are based on the available information regarding budget outturn for the federal government and budget plans for provinces and on IMF staff macroeconomic projections.

Australia: Fiscal projections are based on Australian Bureau of Statistics data, the 2015–16 budget documents, and IMF staff estimates.

Austria: For 2014, the creation of a defeasance structure for Hypo Alpe Adria is assumed to increase the general-government-debt-to-GDP ratio by 4.3 percentage points, and the deficit effect arising from Hypo is assumed to be 1.4 percentage points.

Belgium: Projections reflect the authorities' 2015 budget (updated for new developments) and the 2015–18 Stability Programme objectives, adjusted for differences in the IMF staff's macroeconomic framework.

Brazil: For 2014, outturn estimates are based on the information available as of February 2015. Projections for 2015 take into account budget performance until April 2015, adjustment measures approved by the Congress and the Senate through May 2015, and the budget freeze (*contingeciamento*) announced by the government at the end of May 2015. In outer years, projections are consistent with the announced primary surplus objectives.

Canada: Projections use the baseline forecasts in the Economic Action Plan 2015 and 2015 provincial budgets as available. The IMF staff makes adjustments to this forecast for differences in macroeconomic projections. The IMF staff forecast also incorporates the most recent data releases from Statistics Canada's Canadian System of National Economic Accounts, including federal, provincial, and territorial budgetary outturns through the end of the second quarter of 2015.

Chile: Projections are based on the authorities' budget projections, adjusted to reflect the IMF staff's projections for GDP and copper prices.

China: The pace of fiscal consolidation is likely to be more gradual, reflecting reforms to strengthen social safety nets and the social security system announced as part of the Third Plenum reform agenda.

Denmark: Projections for 2014–15 are aligned with the latest official budget estimates and the underlying economic projections, adjusted where appropriate for the IMF staff's macroeconomic assumptions. For 2016–20, the projections incorporate key features of the medium-term fiscal plan as embodied in the authorities' 2014 Convergence Programme submitted to the European Union (EU).

France: Projections for 2015 reflect the budget law. For 2016–17, they are based on the multiyear budget and the April 2015 Stability Programme, adjusted for differences in assumptions on macro and financial variables, and revenue projections. Historical fiscal data reflect the statistical institute's May 2015 revision and update of the fiscal accounts and national accounts.

Germany: The IMF staff's projections for 2015 and beyond reflect the authorities' adopted core federal government budget plan and the German Stability Programme: 2015 Update, adjusted for the differences in the IMF staff's macroeconomic framework. The estimate of gross debt includes portfolios of impaired

[1] The output gap is actual minus potential output, as a percentage of potential output. Structural balances are expressed as a percentage of potential output. The structural balance is the actual net lending/borrowing minus the effects of cyclical output from potential output, corrected for one-time and other factors, such as asset and commodity prices and output composition effects. Changes in the structural balance consequently include effects of temporary fiscal measures, the impact of fluctuations in interest rates and debt-service costs, and other noncyclical fluctuations in net lending/borrowing. The computations of structural balances are based on IMF staff estimates of potential GDP and revenue and expenditure elasticities. (See Annex I of the October 1993 WEO.) Net debt is calculated as gross debt minus financial assets corresponding to debt instruments. Estimates of the output gap and of the structural balance are subject to significant margins of uncertainty.

Box A1 *(continued)*

assets and noncore business transferred to institutions that are winding up, as well as other financial sector and EU support operations.

Greece: The fiscal projections for 2015 and the medium term are IMF staff estimates based on the fiscal package included in the European Stability Mechanism program agreed between Greece and its European partners and on information available as of August 12, 2015.

Hong Kong SAR: Projections are based on the authorities' medium-term fiscal projections on expenditures.

Hungary: Fiscal projections include IMF staff projections of the macroeconomic framework and of the impact of recent legislative measures, as well as fiscal policy plans announced in the 2015 budget.

India: Historical data are based on budgetary execution data. Projections are based on available information on the authorities' fiscal plans, with adjustments for IMF staff assumptions. Subnational data are incorporated with a lag of up to two years; general government data are thus finalized well after central government data. IMF and Indian presentations differ, particularly regarding divestment and license auction proceeds, net versus gross recording of revenues in certain minor categories, and some public sector lending.

Indonesia: IMF projections are based on moderate tax policy and administration reforms, fuel subsidy pricing reforms introduced in January 2015, and a gradual increase in social and capital spending over the medium term in line with fiscal space.

Ireland: Fiscal projections are based on the 2015 budget, adjusted for differences between the IMF staff's macroeconomic projections and those of the Irish authorities.

Italy: IMF staff estimates and projections are based on the fiscal plans included in the government's 2015 Budget, April 2015 Economic and Financial Document, and subsequently approved measures. Estimates of the cyclically adjusted balance include the expenditures to clear capital arrears in 2013, which are excluded from the structural balance. After 2015, the IMF staff projects convergence to a structural balance in line with Italy's fiscal rule, which implies corrective measures in some years, as yet unidentified.

Japan: The projections include fiscal measures already announced by the government, including consumption tax increases, earthquake reconstruction spending, and the stimulus package.

Korea: The medium-term forecast incorporates the government's announced medium-term consolidation path.

Mexico: Fiscal projections for 2015 are broadly in line with the approved budget; projections for 2016 onward assume compliance with rules established in the Fiscal Responsibility Law.

Netherlands: Fiscal projections for the period 2015–20 are based on the authorities' Bureau for Economic Policy Analysis budget projections, after differences in macroeconomic assumptions are adjusted for. Historical data were revised following the June 2014 Central Bureau of Statistics release of revised macro data because of the adoption of the European System of National and Regional Accounts (ESA 2010) and the revisions of data sources.

New Zealand: Fiscal projections are based on the authorities' 2015–16 budget documents and on IMF staff estimates.

Portugal: For 2014, the general government fiscal balance does not include a one-off transaction arising from banking support, pending a decision on statistical classification by the Instituto Nacional de Estatística (INE)/Eurostat. The projection for 2015 reflects the authorities' 2015 budget and first-half outturn; projections thereafter are based on IMF staff's macroeconomic forecast, under the assumption of unchanged policies.

Russia: Projections for 2015–20 are based on the oil-price-based fiscal rule introduced in December 2012, with adjustments by the IMF staff.

Saudi Arabia: IMF staff projections of oil revenues are based on WEO baseline oil prices. On the expenditure side, wage bill estimates incorporate 13th-month pay awards every three years in accordance with the lunar calendar; projections assume that, to adjust to lower oil prices, capital spending falls as a percentage of GDP over the medium term as large-scale projects currently being implemented are completed and that spending in the January and April 2015 fiscal packages is not repeated.

Singapore: For fiscal years 2014/15 and 2015/16, projections are based on budget numbers. For the remainder of the projection period, the IMF staff assumes unchanged policies.

South Africa: Fiscal projections are based on the authorities' 2015 Budget Review.

Spain: For 2015 and beyond, fiscal projections are based on the measures specified in the Stabil-

Box A1 *(continued)*

ity Programme Update 2014–17, the 2015 budget plan issued in October 2014, and the 2015 budget approved in December 2014.

Sweden: Fiscal projections take into account the authorities' projections based on the Spring Fiscal Policy Bill 2015. The impact of cyclical developments on the fiscal accounts is calculated using the Organisation for Economic Co-operation and Development's 2005 elasticity to take into account output and employment gaps.

Switzerland: The projections assume that fiscal policy is adjusted as necessary to keep fiscal balances in line with the requirements of Switzerland's fiscal rules.

Turkey: Fiscal projections assume that both current and capital spending will be in line with the authorities' 2014–16 Medium Term Programme based on current trends and policies.

United Kingdom: Fiscal projections are based on the U.K. Treasury's 2015 Summer Budget, published in July 2015. However, on the revenue side, the authorities' projections are adjusted for differences between IMF staff forecasts of macroeconomic variables (such as GDP growth) and the forecasts of these variables assumed in the authorities' fiscal projections. IMF staff data exclude public sector banks and the effect of transferring assets from the Royal Mail Pension Plan to the public sector in April 2012. Real government consumption and investment are part of the real GDP path, which, according to the IMF staff, may or may not be the same as projected by the U.K. Office for Budget Responsibility.

United States: Fiscal projections are based on the August 2015 Congressional Budget Office baseline adjusted for the IMF staff's policy and macroeconomic assumptions. The baseline incorporates the key provisions of the Bipartisan Budget Act of 2013, including a partial rollback of the sequester spending cuts in fiscal years 2014 and 2015. The rollback is fully offset by savings elsewhere in the budget. In fiscal years 2016 through 2021, the IMF staff assumes that the sequester cuts will continue to be partially replaced, in proportions similar to those agreed upon under the Bipartisan Budget Act for fiscal years 2014 and 2015, with back-loaded measures generating savings in mandatory programs and additional revenues. Fiscal projections are adjusted to reflect the IMF staff's forecasts for key macroeconomic and financial variables and different accounting treatment of financial sector support and of defined-benefit pension plans and are converted to a general government basis. Historical data start at 2001 for most series because data compiled according to the 2001 *Government Finance Statistics Manual* (GFSM 2001) may not be available for earlier years.

Monetary Policy Assumptions

Monetary policy assumptions are based on the established policy framework in each country. In most cases, this implies a nonaccommodative stance over the business cycle: official interest rates will increase when economic indicators suggest that inflation will rise above its acceptable rate or range; they will decrease when indicators suggest that inflation will not exceed the acceptable rate or range, that output growth is below its potential rate, and that the margin of slack in the economy is significant. On this basis, the London interbank offered rate (LIBOR) on six-month U.S.-dollar deposits is assumed to average 0.4 percent in 2015 and 1.2 percent in 2016 (see Table 1.1). The rate on three-month euro deposits is assumed to average 0.0 percent in 2015 and 2016. The interest rate on six-month Japanese yen deposits is assumed to average 0.1 percent in 2015 and 2016.

Australia: Monetary policy assumptions are in line with market expectations.

Brazil: Monetary policy assumptions are consistent with gradual convergence of inflation toward the middle of the target range over the relevant horizon.

Canada: Monetary policy assumptions are in line with market expectations.

China: Monetary policy will remain broadly unchanged from its current status, consistent with the authorities' announcement of maintaining stable economic growth.

Denmark: The monetary policy is to maintain the peg to the euro.

Euro area: Monetary policy assumptions for euro area member countries are in line with market expectations.

Hong Kong SAR: The IMF staff assumes that the currency board system remains intact.

India: The policy (interest) rate assumption is consistent with an inflation rate within the Reserve Bank of India's targeted band.

Box A1 *(continued)*

Indonesia: Monetary policy assumptions are in line with a reduction of inflation to within the central bank's targeted band by the end of 2015.

Japan: The current monetary policy conditions are maintained for the projection period, and no further tightening or loosening is assumed.

Korea: Monetary policy assumptions are in line with market expectations.

Mexico: Monetary assumptions are consistent with attaining the inflation target.

Russia: Monetary projections assume increasing exchange rate flexibility as part of the transition to the new full-fledged inflation-targeting regime, as indicated in recent statements by the Central Bank of Russia. Specifically, policy rates are assumed to remain at the current levels, gradually reducing the number of interventions in the foreign exchange markets.

Saudi Arabia: Monetary policy projections are based on the continuation of the exchange rate peg to the U.S. dollar.

Singapore: Broad money is projected to grow in line with the projected growth in nominal GDP.

South Africa: Monetary projections are consistent with South Africa's 3–6 percent inflation target range.

Sweden: Monetary projections are in line with Riksbank projections.

Switzerland: Monetary policy variables reflect historical data from the national authorities and the market.

Turkey: Broad money and the long-term bond yield are based on IMF staff projections. The short-term deposit rate is projected to evolve with a constant spread against the interest rate of a similar U.S. instrument.

United Kingdom: Projections assume no change in monetary policy or the level of asset purchases until 2016, consistent with market expectations.

United States: With employment conditions improving but wage growth yet to exert significant price pressure, the IMF staff expects the federal funds target to remain near zero until the end of 2015.

List of Tables

Table A1. Summary of World Output[1]

(Annual percent change)

	Average									Projections		
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
World	**4.0**	**5.7**	**3.1**	**0.0**	**5.4**	**4.2**	**3.4**	**3.3**	**3.4**	**3.1**	**3.6**	**4.0**
Advanced Economies	**2.8**	**2.8**	**0.2**	**–3.4**	**3.1**	**1.7**	**1.2**	**1.1**	**1.8**	**2.0**	**2.2**	**1.9**
United States	3.3	1.8	–0.3	–2.8	2.5	1.6	2.2	1.5	2.4	2.6	2.8	2.0
Euro Area[2]	2.3	3.0	0.5	–4.6	2.0	1.6	–0.8	–0.3	0.9	1.5	1.6	1.6
Japan	0.9	2.2	–1.0	–5.5	4.7	–0.5	1.7	1.6	–0.1	0.6	1.0	0.7
Other Advanced Economies[3]	3.6	4.1	1.2	–2.0	4.6	2.8	1.7	2.1	2.8	2.2	2.4	2.6
Emerging Market and Developing Economies	**5.4**	**8.7**	**5.8**	**3.1**	**7.5**	**6.3**	**5.2**	**5.0**	**4.6**	**4.0**	**4.5**	**5.3**
Regional Groups												
Commonwealth of Independent States[4]	5.5	9.0	5.3	–6.3	4.6	4.8	3.4	2.2	1.0	–2.7	0.5	2.5
Emerging and Developing Asia	7.1	11.2	7.3	7.5	9.6	7.9	6.8	7.0	6.8	6.5	6.4	6.5
Emerging and Developing Europe	4.1	5.5	3.1	–3.0	4.8	5.4	1.3	2.9	2.8	3.0	3.0	3.4
Latin America and the Caribbean	3.1	5.7	3.9	–1.3	6.1	4.9	3.1	2.9	1.3	–0.3	0.8	2.8
Middle East, North Africa, Afghanistan, and Pakistan	4.8	6.3	5.2	2.2	4.9	4.5	5.0	2.3	2.7	2.5	3.9	4.5
Middle East and North Africa	4.9	6.4	5.2	2.2	5.2	4.6	5.0	2.1	2.6	2.3	3.8	4.3
Sub-Saharan Africa	5.0	7.6	6.0	4.1	6.6	5.0	4.3	5.2	5.0	3.8	4.3	5.1
Memorandum												
European Union	2.6	3.3	0.7	–4.3	2.1	1.8	–0.4	0.2	1.5	1.9	1.9	1.9
Low-Income Developing Countries	6.0	7.4	5.9	5.9	7.1	5.3	5.2	6.1	6.0	4.8	5.8	6.0
Analytical Groups												
By Source of Export Earnings												
Fuel	5.0	7.7	5.4	–0.9	5.1	5.1	4.8	2.5	2.3	0.1	2.2	3.5
Nonfuel	5.6	9.0	6.0	4.3	8.1	6.7	5.3	5.6	5.2	4.9	5.1	5.7
Of Which, Primary Products	3.8	6.7	3.8	1.0	6.5	5.6	3.1	4.1	2.5	2.2	2.1	3.3
By External Financing Source												
Net Debtor Economies	4.4	6.7	4.3	1.9	6.7	5.1	4.1	4.5	4.1	3.7	4.4	5.3
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2010–14	5.2	6.8	5.2	–0.3	3.6	3.0	2.3	2.7	1.3	1.6	3.8	4.8
Memorandum												
Median Growth Rate												
Advanced Economies	3.5	4.2	1.0	–3.8	2.3	2.1	0.8	1.4	2.3	2.2	2.4	2.1
Emerging Market and Developing Economies	4.4	6.2	5.0	1.8	4.8	4.5	4.1	3.9	3.6	3.2	3.6	4.0
Low-Income Developing Countries	4.7	5.2	5.6	3.9	6.2	5.8	5.2	5.4	5.4	4.3	5.2	5.8
Output per Capita												
Advanced Economies	2.1	2.0	–0.6	–4.1	2.5	1.2	0.6	0.6	1.2	1.4	1.7	1.5
Emerging Market and Developing Economies	4.1	7.2	4.3	2.0	6.3	5.2	3.9	3.9	3.3	2.9	3.4	4.2
Low-Income Developing Countries	3.7	5.2	3.8	3.7	5.0	4.2	2.8	4.0	3.9	2.8	3.7	4.0
World Growth Rate Based on Market Exchange	**3.1**	**3.9**	**1.5**	**–2.0**	**4.1**	**3.0**	**2.4**	**2.4**	**2.7**	**2.5**	**3.0**	**3.2**
Value of World Output (billions of U.S. dollars)												
At Market Exchange Rates	37,621	57,516	63,014	59,683	65,339	72,423	73,777	75,467	77,269	73,507	76,321	96,193
At Purchasing Power Parities	54,442	78,743	82,644	83,045	88,523	94,013	98,714	103,554	108,777	113,162	118,519	149,464

[1]Real GDP.
[2]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.
[3]Excludes the United States, euro area countries, and Japan.
[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A2. Advanced Economies: Real GDP and Total Domestic Demand[1]

(Annual percent change)

	Average									Projections			Fourth Quarter[2]	Projections	
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020	2014:Q4	2015:Q4	2016:Q4
Real GDP															
Advanced Economies	**2.8**	**2.8**	**0.2**	**–3.4**	**3.1**	**1.7**	**1.2**	**1.1**	**1.8**	**2.0**	**2.2**	**1.9**	**1.8**	**2.0**	**2.3**
United States	3.3	1.8	–0.3	–2.8	2.5	1.6	2.2	1.5	2.4	2.6	2.8	2.0	2.5	2.5	2.8
Euro Area[3]	2.3	3.0	0.5	–4.6	2.0	1.6	–0.8	–0.3	0.9	1.5	1.6	1.6	0.9	1.5	1.7
Germany	1.5	3.4	0.8	–5.6	3.9	3.7	0.6	0.4	1.6	1.5	1.6	1.3	1.5	1.6	1.6
France	2.4	2.4	0.2	–2.9	2.0	2.1	0.2	0.7	0.2	1.2	1.5	1.9	0.1	1.5	1.5
Italy	1.5	1.5	–1.0	–5.5	1.7	0.6	–2.8	–1.7	–0.4	0.8	1.3	1.0	–0.4	1.2	1.5
Spain	3.9	3.8	1.1	–3.6	0.0	–0.6	–2.1	–1.2	1.4	3.1	2.5	1.8	2.0	3.2	2.2
Netherlands	2.8	3.7	1.7	–3.8	1.4	1.7	–1.1	–0.5	1.0	1.8	1.9	2.1	1.5	0.8	2.8
Belgium	2.4	3.0	1.0	–2.6	2.5	1.6	0.1	0.3	1.1	1.3	1.5	1.5	1.0	1.7	1.4
Austria	2.5	3.6	1.5	–3.8	1.9	2.8	0.8	0.3	0.4	0.8	1.6	1.1	–0.2	1.3	2.2
Greece	4.1	3.5	–0.4	–4.4	–5.4	–8.9	–6.6	–3.9	0.8	–2.3	–1.3	2.4	1.4	–5.4	3.0
Portugal	2.3	2.5	0.2	–3.0	1.9	–1.8	–4.0	–1.6	0.9	1.6	1.5	1.2	0.6	1.6	1.5
Ireland	7.3	5.5	–2.2	–5.6	0.4	2.6	0.2	1.4	5.2	4.8	3.8	2.5	6.0	2.6	2.6
Finland	3.9	5.2	0.7	–8.3	3.0	2.6	–1.4	–1.1	–0.4	0.4	0.9	1.6	–0.5	1.0	0.4
Slovak Republic	4.3	10.7	5.4	–5.3	4.8	2.7	1.6	1.4	2.4	3.2	3.6	3.1	2.6	3.4	3.8
Lithuania	6.4	11.1	2.6	–14.8	1.6	6.1	3.8	3.3	2.9	1.8	2.6	3.6	2.6	1.2	3.6
Slovenia	4.1	6.9	3.3	–7.8	1.2	0.6	–2.7	–1.1	3.0	2.3	1.8	2.0	2.4	1.8	2.1
Luxembourg	4.9	8.4	–0.8	–5.4	5.7	2.6	–0.7	4.4	5.6	4.4	3.4	3.0	8.5	2.8	3.5
Latvia	7.6	9.8	–3.2	–14.2	–2.9	5.0	4.8	4.2	2.4	2.2	3.3	4.0	2.0	2.1	4.0
Estonia	7.1	7.7	–5.4	–14.7	2.5	7.6	5.2	1.6	2.9	2.0	2.9	3.4	3.4	3.1	3.0
Cyprus[4]	4.0	4.9	3.6	–2.0	1.4	0.3	–2.4	–5.4	–2.3	0.5	1.4	1.8	–1.8	. . .	. . .
Malta	2.3	3.9	3.3	–2.5	3.5	2.1	2.5	2.4	3.5	3.4	3.5	2.6	4.1	3.3	3.5
Japan	0.9	2.2	–1.0	–5.5	4.7	–0.5	1.7	1.6	–0.1	0.6	1.0	0.7	–0.8	1.3	1.3
United Kingdom	3.1	2.6	–0.3	–4.3	1.9	1.6	0.7	1.7	3.0	2.5	2.2	2.1	3.4	2.2	2.2
Korea	4.9	5.5	2.8	0.7	6.5	3.7	2.3	2.9	3.3	2.7	3.2	3.6	2.7	3.8	2.0
Canada	3.4	2.0	1.2	–2.7	3.4	3.0	1.9	2.0	2.4	1.0	1.7	2.0	2.5	0.5	2.0
Australia	3.6	4.5	2.7	1.6	2.3	2.7	3.6	2.1	2.7	2.4	2.9	2.8	2.5	2.5	3.2
Taiwan Province of China	4.9	6.5	0.7	–1.6	10.6	3.8	2.1	2.2	3.8	2.2	2.6	3.2	3.2	2.5	2.9
Switzerland	2.2	4.2	2.2	–2.1	2.9	1.9	1.1	1.8	1.9	1.0	1.3	1.9	2.0	0.5	1.5
Sweden	3.4	3.4	–0.6	–5.2	6.0	2.7	–0.3	1.3	2.3	2.8	3.0	2.1	2.6	2.6	3.0
Singapore	5.4	9.1	1.8	–0.6	15.2	6.2	3.4	4.4	2.9	2.2	2.9	3.2	2.2	2.1	2.7
Hong Kong SAR	3.7	6.5	2.1	–2.5	6.8	4.8	1.7	3.1	2.5	2.5	2.7	3.3	2.3	2.7	3.1
Norway	2.6	2.9	0.4	–1.6	0.6	1.0	2.7	0.7	2.2	0.9	1.3	2.0	3.0	–0.7	2.8
Czech Republic	3.1	5.5	2.7	–4.8	2.3	2.0	–0.9	–0.5	2.0	3.9	2.6	2.2	1.3	3.5	2.4
Israel	3.7	6.1	3.1	1.3	5.5	5.0	2.9	3.3	2.6	2.5	3.3	2.9	2.9	1.9	4.0
Denmark	2.3	0.8	–0.7	–5.1	1.6	1.2	–0.7	–0.5	1.1	1.6	2.0	2.2	1.4	1.7	0.9
New Zealand	3.4	3.7	–0.8	0.5	2.0	1.3	2.9	2.5	3.3	2.2	2.4	2.5	4.2	1.8	2.2
Iceland	4.5	9.5	1.5	–4.7	–3.6	2.0	1.2	3.9	1.8	4.8	3.7	2.4	1.9	4.4	3.2
San Marino	. . .	7.1	1.7	–12.8	–4.6	–9.5	–7.5	–4.5	–1.0	1.0	1.1	1.3	. . .	. . .	. . .
Memorandum															
Major Advanced Economies	2.5	2.1	–0.2	–3.8	2.9	1.6	1.4	1.2	1.7	1.9	2.2	1.7	1.6	1.9	2.2
Real Total Domestic Demand															
Advanced Economies	**2.9**	**2.3**	**–0.3**	**–3.7**	**3.0**	**1.4**	**0.8**	**0.8**	**1.8**	**2.2**	**2.5**	**2.0**	**1.7**	**2.3**	**2.6**
United States	3.7	1.1	–1.3	–3.8	2.9	1.6	2.1	1.2	2.5	3.2	3.5	2.1	2.9	3.2	3.5
Euro Area[3]	2.3	2.8	0.3	–4.0	1.4	0.7	–2.3	–0.7	0.9	1.4	1.6	1.5	1.0	1.3	1.7
Germany	0.9	1.8	1.0	–3.2	2.9	3.0	–0.9	0.9	1.3	1.2	1.5	1.4	1.5	1.1	1.7
France	2.5	3.1	0.5	–2.5	2.1	2.0	–0.3	0.7	0.6	1.1	1.5	1.9	0.4	1.3	1.8
Italy	1.9	1.3	–1.2	–4.1	2.0	–0.6	–5.5	–2.5	–0.7	0.9	1.0	1.0	–1.0	1.4	1.3
Spain	4.8	4.1	–0.4	–6.0	–0.5	–2.7	–4.2	–2.7	2.3	3.7	2.4	1.4	2.8	4.4	1.1
Japan	0.5	1.1	–1.3	–4.0	2.9	0.4	2.6	1.9	–0.1	0.4	0.8	0.6	–1.8	1.6	0.9
United Kingdom	3.4	2.5	–1.3	–4.4	2.5	0.3	1.4	1.8	3.5	2.3	2.3	2.3	2.8	2.3	2.2
Canada	3.6	3.4	2.8	–2.7	5.2	3.3	2.2	1.8	1.3	0.3	0.8	1.9	1.3	–0.8	2.0
Other Advanced Economies[5]	3.3	4.9	1.7	–2.6	6.3	3.0	1.8	1.3	2.3	2.4	2.9	3.1	1.8	2.6	3.3
Memorandum															
Major Advanced Economies	2.7	1.6	–0.7	–3.7	2.9	1.4	1.1	1.1	1.7	2.1	2.4	1.8	1.6	2.3	2.5

[1]In this and other tables, when countries are not listed alphabetically, they are ordered on the basis of economic size.
[2]From the fourth quarter of the preceding year.
[3]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.
[4]Owing to the unusual macroeconomic uncertainty, quarterly real GDP projections are not available.
[5]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

Table A3. Advanced Economies: Components of Real GDP

(Annual percent change)

	Averages										Projections	
	1997–2006	2007–16	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Private Consumer Expenditure												
Advanced Economies	**3.0**	**1.3**	**2.4**	**0.1**	**–1.1**	**1.9**	**1.4**	**0.9**	**1.2**	**1.7**	**2.3**	**2.7**
United States	3.8	1.7	2.2	–0.3	–1.6	1.9	2.3	1.5	1.7	2.7	3.2	3.5
Euro Area[1]	2.1	0.4	1.8	0.3	–1.1	0.8	0.0	–1.2	–0.6	0.9	1.8	1.5
Germany	1.0	0.8	0.0	0.5	0.3	0.3	1.3	0.9	0.8	1.0	1.8	1.4
France	2.5	1.0	2.5	0.4	0.2	1.8	0.5	–0.2	0.4	0.6	1.8	1.8
Italy	1.7	–0.5	1.2	–1.1	–1.5	1.2	0.0	–4.0	–2.8	0.3	0.7	1.1
Spain	3.9	0.1	3.3	–0.7	–3.6	0.3	–2.0	–2.9	–2.3	2.4	4.1	2.8
Japan	0.9	0.7	0.9	–0.9	–0.7	2.8	0.3	2.3	2.1	–1.3	–0.5	2.2
United Kingdom	4.0	1.0	2.6	–0.5	–3.1	0.4	0.1	1.1	1.7	2.5	3.1	2.6
Canada	3.5	2.5	4.2	2.9	0.3	3.4	2.3	1.9	2.5	2.7	2.3	2.8
Other Advanced Economies[2]	3.5	2.4	4.7	1.1	0.1	3.7	2.9	2.1	2.2	2.3	2.5	2.8
Memorandum												
Major Advanced Economies	2.8	1.3	1.9	–0.2	–1.1	1.8	1.4	1.0	1.3	1.7	2.3	2.8
Public Consumption												
Advanced Economies	**2.6**	**1.0**	**1.9**	**2.4**	**3.0**	**1.0**	**–0.6**	**0.3**	**–0.4**	**0.6**	**1.1**	**0.9**
United States	2.1	0.3	1.4	2.5	3.7	0.1	–2.7	–0.9	–2.5	–0.5	0.6	1.2
Euro Area[1]	1.8	1.0	2.1	2.4	2.4	0.8	–0.1	–0.1	0.2	0.8	1.0	0.6
Germany	0.8	1.7	1.5	3.4	3.0	1.3	0.9	1.3	0.8	1.7	1.9	1.2
France	1.3	1.4	1.8	1.1	2.4	1.3	1.0	1.6	1.7	1.5	1.3	0.6
Italy	1.4	–0.2	0.4	1.0	0.4	0.6	–1.8	–1.2	–0.3	–1.0	0.2	0.0
Spain	4.5	1.1	6.2	5.9	4.1	1.5	–0.3	–3.7	–2.9	0.1	0.5	–0.2
Japan	2.1	1.1	1.1	–0.1	2.3	1.9	1.2	1.7	1.9	0.2	1.6	–0.9
United Kingdom	2.8	1.1	1.2	2.0	1.2	0.0	0.0	2.3	–0.3	1.6	2.0	0.8
Canada	2.1	1.3	2.8	4.6	3.3	2.7	0.8	1.2	0.4	0.2	–1.8	–0.7
Other Advanced Economies[2]	2.8	2.5	3.0	3.0	3.4	2.8	1.6	2.0	2.2	2.4	2.0	2.2
Memorandum												
Major Advanced Economies	1.9	0.7	1.4	2.1	2.9	0.7	–1.0	0.2	–0.8	0.2	0.9	0.7
Gross Fixed Capital Formation												
Advanced Economies	**3.3**	**0.5**	**2.4**	**–2.6**	**–11.1**	**1.9**	**2.9**	**2.2**	**0.9**	**2.9**	**2.6**	**3.4**
United States	4.6	0.6	–1.2	–4.8	–13.1	1.1	3.7	6.3	2.4	4.1	4.0	5.4
Euro Area[1]	3.1	–0.7	4.9	–0.6	–11.3	–0.4	1.6	–3.6	–2.6	1.2	2.1	2.6
Germany	1.0	1.2	4.1	0.8	–9.9	5.0	7.4	0.1	–1.3	3.5	1.9	1.9
France	3.5	0.0	5.5	0.8	–9.1	2.1	2.1	0.2	–0.6	–1.2	–0.4	1.6
Italy	3.0	–3.0	1.6	–3.1	–9.9	–0.5	–1.9	–9.3	–5.8	–3.3	1.0	2.2
Spain	7.0	–2.9	4.4	–3.9	–16.9	–4.9	–6.3	–8.1	–3.8	3.4	5.9	3.8
Japan	–1.1	–0.7	0.3	–4.1	–10.6	–0.2	1.4	3.4	3.2	2.6	–0.5	–1.4
United Kingdom	2.3	1.5	5.3	–4.7	–14.4	5.9	2.3	0.7	3.4	8.6	5.5	4.6
Canada	5.9	0.7	3.2	1.6	–12.0	11.3	4.8	4.8	0.4	0.2	–3.3	–1.8
Other Advanced Economies[2]	3.5	2.4	6.6	0.3	–4.8	6.4	3.8	2.5	2.1	1.6	2.7	3.6
Memorandum												
Major Advanced Economies	3.0	0.3	0.9	–3.3	–11.9	2.1	3.2	3.3	1.4	3.1	2.4	3.3

Table A3. Advanced Economies: Components of Real GDP *(continued)*

(Annual percent change)

	Averages										Projections	
	1997–2006	2007–16	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Final Domestic Demand												
Advanced Economies	**2.9**	**1.1**	**2.3**	**–0.1**	**–2.6**	**1.7**	**1.3**	**1.0**	**0.9**	**1.8**	**2.2**	**2.5**
United States	3.7	1.3	1.4	–0.9	–3.1	1.5	1.7	1.9	1.2	2.5	3.0	3.6
Euro Area[1]	2.3	0.3	2.6	0.5	–2.7	0.5	0.3	–1.5	–0.9	1.0	1.7	1.5
Germany	1.0	1.1	1.1	1.1	–1.4	1.4	2.5	0.8	0.3	1.7	1.9	1.5
France	2.4	0.9	3.0	0.7	–1.5	1.8	0.9	0.3	0.5	0.5	1.2	1.5
Italy	1.9	–0.9	1.1	–1.2	–2.9	0.8	–0.8	–4.5	–2.8	–0.6	0.6	1.1
Spain	4.8	–0.5	4.1	–0.5	–5.9	–0.7	–2.6	–4.2	–2.7	2.1	3.8	2.4
Japan	0.6	0.5	0.8	–1.6	–2.3	2.0	0.7	2.4	2.3	–0.2	0.0	0.8
United Kingdom	3.4	1.1	2.8	–0.7	–4.1	1.1	0.4	1.3	1.5	3.3	3.3	2.6
Canada	3.8	1.9	3.7	2.9	–1.9	5.0	2.5	2.5	1.5	1.6	0.1	1.0
Other Advanced Economies[2]	3.2	2.4	4.8	1.2	–0.6	4.4	2.8	2.1	2.1	2.1	2.6	3.0
Memorandum												
Major Advanced Economies	2.7	1.0	1.6	–0.5	–2.7	1.6	1.4	1.3	1.0	1.7	2.1	2.5
Stock Building[3]												
Advanced Economies	**0.0**	**0.0**	**0.0**	**–0.2**	**–1.2**	**1.3**	**0.1**	**–0.2**	**0.0**	**0.0**	**0.0**	**0.0**
United States	0.0	0.0	–0.2	–0.5	–0.8	1.5	–0.1	0.1	0.1	0.1	0.3	0.0
Euro Area[1]	0.0	–0.1	0.2	–0.2	–1.2	0.9	0.4	–0.9	0.2	–0.1	–0.2	0.0
Germany	–0.1	–0.1	0.7	–0.1	–1.7	1.4	0.5	–1.6	0.5	–0.3	–0.6	0.0
France	0.1	0.0	0.1	–0.2	–1.1	0.3	1.1	–0.6	0.2	0.2	–0.1	0.0
Italy	0.0	0.0	0.2	–0.1	–1.2	1.3	0.2	–1.1	0.3	–0.1	0.2	–0.1
Spain	0.0	0.0	0.0	0.1	–0.2	0.2	0.0	–0.2	–0.1	0.2	0.0	0.0
Japan	0.0	0.0	0.3	0.2	–1.5	0.9	–0.2	0.2	–0.4	0.1	0.4	0.0
United Kingdom	0.0	–0.1	–0.1	–0.5	–0.6	1.5	–0.2	0.1	0.3	0.3	–1.0	–0.3
Canada	0.1	0.0	–0.1	0.0	–0.8	0.2	0.8	–0.2	0.4	–0.2	0.1	–0.2
Other Advanced Economies[2]	0.0	0.0	0.1	0.4	–2.0	1.9	0.2	–0.3	–0.8	0.2	0.0	0.0
Memorandum												
Major Advanced Economies	0.0	0.0	0.0	–0.3	–1.0	1.2	0.1	–0.2	0.1	0.0	0.1	–0.1
Foreign Balance[3]												
Advanced Economies	**–0.1**	**0.2**	**0.4**	**0.5**	**0.3**	**0.1**	**0.3**	**0.4**	**0.3**	**0.0**	**–0.2**	**–0.2**
United States	–0.6	0.1	0.6	1.1	1.2	–0.5	0.0	0.1	0.2	–0.2	–0.8	–0.8
Euro Area[1]	0.1	0.4	0.3	0.1	–0.6	0.6	1.0	1.5	0.4	0.0	0.1	0.2
Germany	0.5	0.3	1.6	–0.1	–2.6	1.1	0.9	1.5	–0.4	0.4	0.4	0.1
France	–0.1	–0.1	–0.8	–0.3	–0.4	–0.1	0.0	0.5	0.0	–0.5	0.0	0.0
Italy	–0.4	0.4	0.2	0.2	–1.3	–0.3	1.2	2.8	0.7	0.3	–0.1	0.4
Spain	–0.8	0.9	–0.6	1.6	2.8	0.5	2.1	2.2	1.4	–0.8	–0.6	0.2
Japan	0.4	0.0	1.0	0.2	–2.0	2.0	–0.8	–0.8	–0.2	0.3	0.2	0.2
United Kingdom	–0.5	0.1	–0.4	1.1	0.7	–0.9	1.4	–0.8	0.0	–0.6	0.2	–0.1
Canada	–0.3	–0.3	–1.5	–1.9	0.0	–2.0	–0.4	–0.4	0.2	1.1	0.7	0.9
Other Advanced Economies[2]	0.6	0.5	0.8	0.3	1.5	–0.1	0.4	0.5	0.8	0.4	0.0	0.0
Memorandum												
Major Advanced Economies	–0.2	0.1	0.5	0.5	0.0	0.0	0.1	0.2	0.1	0.0	–0.3	–0.3

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.
[2]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.
[3]Changes expressed as percent of GDP in the preceding period.

Table A4. Emerging Market and Developing Economies: Real GDP

(Annual percent change)

	Average									Projections		
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
Commonwealth of Independent States[1,2]	**5.5**	**9.0**	**5.3**	**–6.3**	**4.6**	**4.8**	**3.4**	**2.2**	**1.0**	**–2.7**	**0.5**	**2.5**
Russia	5.0	8.5	5.2	–7.8	4.5	4.3	3.4	1.3	0.6	–3.8	–0.6	1.5
Excluding Russia	6.6	10.4	5.6	–2.5	5.0	6.2	3.6	4.2	1.9	–0.1	2.8	4.6
Armenia	9.4	13.7	6.9	–14.1	2.2	4.7	7.1	3.5	3.4	2.5	2.2	3.5
Azerbaijan	12.5	25.0	10.8	9.3	5.0	0.1	2.2	5.8	2.8	4.0	2.5	3.4
Belarus	7.6	8.7	10.3	0.1	7.7	5.5	1.7	1.0	1.6	–3.6	–2.2	1.6
Georgia	6.4	12.6	2.6	–3.7	6.2	7.2	6.4	3.3	4.8	2.0	3.0	5.0
Kazakhstan	7.4	8.9	3.3	1.2	7.3	7.5	5.0	6.0	4.3	1.5	2.4	4.5
Kyrgyz Republic	4.3	8.5	7.6	2.9	–0.5	6.0	–0.9	10.5	3.6	2.0	3.6	5.3
Moldova	3.3	3.0	7.8	–6.0	7.1	6.8	–0.7	9.4	4.6	–1.0	1.5	4.0
Tajikistan	7.2	7.8	7.9	3.9	6.5	7.4	7.5	7.4	6.7	3.0	3.4	5.0
Turkmenistan	11.9	11.1	14.7	6.1	9.2	14.7	11.1	10.2	10.3	8.5	8.9	8.2
Ukraine[3]	4.6	8.2	2.2	–15.1	0.3	5.5	0.2	0.0	–6.8	–9.0	2.0	4.0
Uzbekistan	5.2	9.5	9.0	8.1	8.5	8.3	8.2	8.0	8.1	6.8	7.0	6.5
Emerging and Developing Asia	**7.1**	**11.2**	**7.3**	**7.5**	**9.6**	**7.9**	**6.8**	**7.0**	**6.8**	**6.5**	**6.4**	**6.5**
Bangladesh	5.6	6.5	5.5	5.3	6.0	6.5	6.3	6.0	6.3	6.5	6.8	6.7
Bhutan	7.0	12.6	10.8	5.7	9.3	10.1	6.4	4.9	6.4	7.7	8.4	6.5
Brunei Darussalam	1.9	0.1	–2.0	–1.8	2.7	3.7	0.9	–2.1	–2.3	–1.2	3.2	5.0
Cambodia	8.9	10.2	6.7	0.1	6.0	7.1	7.3	7.4	7.0	7.0	7.2	7.3
China	9.4	14.2	9.6	9.2	10.6	9.5	7.7	7.7	7.3	6.8	6.3	6.3
Fiji	2.2	–0.9	1.0	–1.4	3.0	2.7	1.8	4.6	5.3	4.3	3.7	3.7
India	6.6	9.8	3.9	8.5	10.3	6.6	5.1	6.9	7.3	7.3	7.5	7.7
Indonesia	2.5	6.3	7.4	4.7	6.4	6.2	6.0	5.6	5.0	4.7	5.1	6.0
Kiribati	1.9	2.2	–0.8	0.3	–0.9	–0.2	3.4	2.4	3.7	3.1	1.8	1.5
Lao P.D.R.	6.2	7.8	7.8	7.5	8.1	8.0	7.9	8.0	7.4	7.5	8.0	7.4
Malaysia	4.3	6.3	4.8	–1.5	7.5	5.3	5.5	4.7	6.0	4.7	4.5	5.0
Maldives	8.4	10.8	13.3	–1.8	6.6	6.6	1.6	–4.8	6.1	2.9	3.1	4.7
Marshall Islands	. . .	3.8	–2.0	–1.7	6.1	0.0	4.7	3.0	0.5	1.7	2.2	1.6
Micronesia	0.5	–2.1	–2.5	0.9	3.2	1.8	0.0	–3.9	–1.6	–0.2	1.7	0.7
Mongolia	5.3	8.8	7.8	–2.1	7.3	17.3	12.3	11.6	7.8	3.5	3.6	9.1
Myanmar	. . .	12.0	3.6	5.1	5.3	5.6	7.3	8.4	8.5	8.5	8.4	7.7
Nepal	4.0	3.4	6.1	4.5	4.8	3.4	4.8	4.1	5.4	3.4	4.4	3.8
Palau	. . .	0.0	–4.8	–10.5	3.7	4.7	3.2	–1.8	4.9	4.0	2.7	2.0
Papua New Guinea	1.0	7.2	6.6	6.1	7.7	10.7	8.1	5.5	8.5	12.3	3.0	3.2
Philippines	4.0	6.6	4.2	1.1	7.6	3.7	6.7	7.1	6.1	6.0	6.3	6.5
Samoa	3.6	1.1	2.9	–6.4	–2.3	6.2	1.2	–1.1	1.9	2.6	1.6	2.0
Solomon Islands	0.3	6.4	7.1	–4.7	6.9	12.9	4.7	3.0	1.5	3.3	3.0	3.6
Sri Lanka	4.5	6.8	6.0	3.5	8.0	8.2	6.3	7.3	7.4	6.5	6.5	6.5
Thailand	3.0	5.4	1.7	–0.7	7.5	0.8	7.3	2.8	0.9	2.5	3.2	3.2
Timor-Leste[4]	. . .	11.4	14.2	13.0	9.4	9.5	6.4	2.8	4.5	4.3	5.0	6.0
Tonga	1.0	–1.1	1.8	2.6	3.1	1.3	–1.1	–0.3	2.3	2.7	2.4	0.7
Tuvalu	. . .	6.4	8.0	–4.4	–2.7	8.5	0.2	1.3	2.2	3.5	4.0	1.6
Vanuatu	2.5	5.2	6.5	3.3	1.6	1.2	1.8	2.0	2.3	–2.0	5.0	2.5
Vietnam	6.9	7.1	5.7	5.4	6.4	6.2	5.2	5.4	6.0	6.5	6.4	6.0
Emerging and Developing Europe	**4.1**	**5.5**	**3.1**	**–3.0**	**4.8**	**5.4**	**1.3**	**2.9**	**2.8**	**3.0**	**3.0**	**3.4**
Albania	5.1	5.9	7.5	3.4	3.7	2.5	1.6	1.4	1.9	2.7	3.4	4.2
Bosnia and Herzegovina	7.8	6.0	5.6	–2.7	0.8	1.0	–1.2	2.5	1.1	2.0	3.0	4.0
Bulgaria	3.5	6.9	5.8	–5.0	0.7	2.0	0.5	1.1	1.7	1.7	1.9	2.5
Croatia	3.8	5.2	2.1	–7.4	–1.7	–0.3	–2.2	–1.1	–0.4	0.8	1.0	1.8
Hungary	4.0	0.5	0.9	–6.6	0.8	1.8	–1.5	1.5	3.6	3.0	2.5	2.1
Kosovo	. . .	8.3	4.5	3.6	3.3	4.4	2.8	3.4	2.7	3.2	3.8	4.1
FYR Macedonia	2.9	6.5	5.5	–0.4	3.4	2.3	–0.5	2.7	3.8	3.2	3.2	3.8
Montenegro	. . .	10.7	6.9	–5.7	2.5	3.2	–2.5	3.3	1.5	3.2	4.9	3.3
Poland	4.2	7.2	3.9	2.6	3.7	4.8	1.8	1.7	3.4	3.5	3.5	3.6
Romania	2.7	6.9	8.5	–7.1	–0.8	1.1	0.6	3.4	2.8	3.4	3.9	3.3
Serbia	. . .	5.9	5.4	–3.1	0.6	1.4	–1.0	2.6	–1.8	0.5	1.5	4.0
Turkey	4.3	4.7	0.7	–4.8	9.2	8.8	2.1	4.2	2.9	3.0	2.9	3.5

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
Latin America and the Caribbean	**3.1**	**5.7**	**3.9**	**–1.3**	**6.1**	**4.9**	**3.1**	**2.9**	**1.3**	**–0.3**	**0.8**	**2.8**
Antigua and Barbuda	4.5	7.1	1.5	–10.7	–8.5	–1.9	3.6	1.5	4.2	2.2	2.1	2.7
Argentina[5]	2.6	8.0	3.1	0.1	9.5	8.4	0.8	2.9	0.5	0.4	–0.7	0.2
The Bahamas	3.2	1.4	–2.3	–4.2	1.5	0.6	2.2	0.0	1.0	1.2	2.2	1.5
Barbados	2.5	1.8	0.4	–4.0	0.3	0.8	0.3	0.0	0.2	1.0	1.1	2.0
Belize	6.0	1.1	3.2	0.7	3.3	2.1	3.8	1.5	3.6	2.2	3.2	2.4
Bolivia	3.3	4.6	6.1	3.4	4.1	5.2	5.1	6.8	5.5	4.1	3.5	3.5
Brazil	2.7	6.0	5.0	–0.2	7.6	3.9	1.8	2.7	0.1	–3.0	–1.0	2.5
Chile	4.1	5.2	3.2	–1.0	5.7	5.8	5.5	4.3	1.9	2.3	2.5	3.5
Colombia	2.7	6.9	3.5	1.7	4.0	6.6	4.0	4.9	4.6	2.5	2.8	4.1
Costa Rica	5.3	7.9	2.7	–1.0	5.0	4.5	5.2	3.4	3.5	3.0	4.0	4.3
Dominica	2.0	6.4	7.1	–1.2	0.7	–0.1	–1.3	0.6	3.9	2.8	3.3	1.9
Dominican Republic	5.5	8.5	3.1	0.9	8.3	2.8	2.6	4.8	7.3	5.5	4.5	4.0
Ecuador	3.2	2.2	6.4	0.6	3.5	7.9	5.2	4.6	3.8	–0.6	0.1	1.8
El Salvador	2.9	3.8	1.3	–3.1	1.4	2.2	1.9	1.8	2.0	2.3	2.5	2.0
Grenada	5.0	6.1	0.9	–6.6	–0.5	0.8	–1.2	2.3	5.7	3.4	2.4	2.5
Guatemala	3.5	6.3	3.3	0.5	2.9	4.2	3.0	3.7	4.2	3.8	3.7	3.5
Guyana	1.3	7.0	2.0	3.3	4.4	5.4	4.8	5.2	3.8	3.2	4.9	3.2
Haiti	0.8	3.3	0.8	3.1	–5.5	5.5	2.9	4.2	2.7	2.5	3.2	3.5
Honduras	4.3	6.2	4.2	–2.4	3.7	3.8	4.1	2.8	3.1	3.5	3.6	4.0
Jamaica	1.0	1.4	–0.8	–3.4	–1.5	1.4	–0.5	0.2	0.4	1.1	2.1	2.7
Mexico	3.3	3.1	1.4	–4.7	5.1	4.0	4.0	1.4	2.1	2.3	2.8	3.3
Nicaragua	3.9	5.3	2.9	–2.8	3.2	6.2	5.1	4.5	4.7	4.0	4.2	4.0
Panama	5.0	12.1	10.1	3.9	7.5	10.9	10.8	8.4	6.2	6.0	6.3	6.0
Paraguay	1.5	5.4	6.4	–4.0	13.1	4.3	–1.2	14.2	4.4	3.0	3.8	4.1
Peru	3.9	8.5	9.1	1.0	8.5	6.5	6.0	5.8	2.4	2.4	3.3	4.0
St. Kitts and Nevis	3.7	4.8	3.4	–3.8	–3.8	–1.9	–0.9	6.2	6.1	5.0	3.5	2.5
St. Lucia	2.4	0.6	2.8	–0.5	–1.7	0.7	–1.1	0.1	0.5	1.8	1.4	2.2
St. Vincent and the Grenadines	4.1	3.0	–0.5	–2.0	–2.3	0.2	1.3	2.3	–0.2	2.1	2.5	3.0
Suriname	4.1	5.1	4.1	3.0	5.1	5.3	3.1	2.8	1.8	1.5	0.5	3.0
Trinidad and Tobago	8.5	4.8	3.4	–4.4	–0.1	0.0	1.4	1.7	0.8	1.0	1.4	1.7
Uruguay	1.1	6.5	7.2	4.2	7.8	5.2	3.3	5.1	3.5	2.5	2.2	3.1
Venezuela	2.6	8.8	5.3	–3.2	–1.5	4.2	5.6	1.3	–4.0	–10.0	–6.0	0.0
Middle East, North Africa, Afghanistan, and Pakistan	**4.8**	**6.3**	**5.2**	**2.2**	**4.9**	**4.5**	**5.0**	**2.3**	**2.7**	**2.5**	**3.9**	**4.5**
Afghanistan	. . .	13.3	3.9	20.6	8.4	6.5	14.0	3.9	1.3	2.0	3.0	6.0
Algeria	4.1	3.4	2.4	1.6	3.6	2.8	2.6	2.8	3.8	3.0	3.9	3.5
Bahrain	5.2	8.3	6.2	2.5	4.3	2.1	3.6	5.3	4.5	3.4	3.2	3.3
Djibouti	2.2	5.1	5.8	5.0	3.5	4.5	4.8	5.0	6.0	6.5	7.0	6.0
Egypt	5.0	7.1	7.2	4.7	5.1	1.8	2.2	2.1	2.2	4.2	4.3	5.0
Iran[6]	4.4	9.1	0.9	2.3	6.6	3.7	–6.6	–1.9	4.3	0.8	4.4	4.4
Iraq	. . .	1.9	8.2	3.4	6.4	7.5	13.9	6.6	–2.1	0.0	7.1	7.1
Jordan	5.4	8.2	7.2	5.5	2.3	2.6	2.7	2.8	3.1	2.9	3.7	4.5
Kuwait	5.7	6.0	2.5	–7.1	–2.4	10.6	7.7	0.8	0.1	1.2	2.5	2.9
Lebanon	3.2	9.4	9.1	10.3	8.0	0.9	2.8	2.5	2.0	2.0	2.5	4.0
Libya	3.5	6.4	2.7	–0.8	5.0	–62.1	104.5	–13.6	–24.0	–6.1	2.0	13.5
Mauritania	4.7	2.8	1.1	–1.0	4.8	4.4	6.0	5.5	6.9	4.1	6.4	4.0
Morocco	4.0	3.5	5.9	4.2	3.8	5.2	3.0	4.7	2.4	4.9	3.7	5.4
Oman	2.5	4.5	8.2	6.1	4.8	4.1	5.8	4.7	2.9	4.4	2.8	1.0
Pakistan	4.5	5.5	5.0	0.4	2.6	3.6	3.8	3.7	4.0	4.2	4.5	5.2
Qatar	11.8	18.0	17.7	12.0	19.6	13.4	4.9	4.6	4.0	4.7	4.9	2.8
Saudi Arabia	3.9	6.0	8.4	1.8	4.8	10.0	5.4	2.7	3.5	3.4	2.2	3.2
Sudan[7]	15.8	8.5	3.0	4.7	3.0	–1.3	–3.4	3.9	3.6	3.5	4.0	5.8
Syria[8]	2.9	5.7	4.5	5.9	3.4	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	4.9	6.3	4.5	3.1	2.6	–1.9	3.7	2.3	2.3	1.0	3.0	4.7
United Arab Emirates	6.2	3.2	3.2	–5.2	1.6	4.9	7.2	4.3	4.6	3.0	3.1	3.8
Yemen	4.5	3.3	3.6	3.9	7.7	–12.7	2.4	4.8	–0.2	–28.1	11.6	4.7

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
Sub-Saharan Africa	**5.0**	**7.6**	**6.0**	**4.1**	**6.6**	**5.0**	**4.3**	**5.2**	**5.0**	**3.8**	**4.3**	**5.1**
Angola	8.8	22.6	13.8	2.4	3.4	3.9	5.2	6.8	4.8	3.5	3.5	5.2
Benin	4.4	4.6	5.0	2.7	2.6	3.3	5.4	5.6	5.4	5.5	5.3	6.0
Botswana	4.7	8.3	6.2	–7.7	8.6	6.0	4.8	9.3	4.4	2.6	3.2	4.4
Burkina Faso	6.1	4.1	5.8	3.0	8.4	6.6	6.5	6.6	4.0	5.0	6.0	6.6
Burundi	2.8	3.4	4.9	3.8	5.1	4.2	4.0	4.5	4.7	–7.2	5.2	5.2
Cabo Verde	7.4	9.2	6.7	–1.3	1.5	4.0	1.1	1.0	1.8	3.5	3.7	4.2
Cameroon	4.0	3.3	2.9	1.9	3.3	4.1	4.6	5.6	5.7	5.3	5.4	5.5
Central African Republic	1.6	4.6	2.1	1.7	3.0	3.3	4.1	–36.0	1.0	5.5	5.7	4.0
Chad	8.4	3.3	3.1	4.2	13.5	0.1	8.9	5.7	6.9	6.9	4.2	2.8
Comoros	2.4	0.5	1.0	1.8	2.1	2.2	3.0	3.5	2.0	1.0	2.2	4.0
Democratic Republic of the Congo	–0.1	6.3	6.2	2.9	7.1	6.9	7.1	8.5	9.2	8.4	7.3	5.2
Republic of Congo	3.4	–1.6	5.6	7.5	8.7	3.4	3.8	3.3	6.8	1.0	6.5	0.4
Côte d'Ivoire	1.1	1.8	2.5	3.3	2.0	–4.4	10.7	8.7	7.9	8.2	7.6	6.8
Equatorial Guinea	37.8	12.3	9.9	–4.5	–3.8	1.9	5.8	–6.5	–0.3	–10.2	–0.8	–1.8
Eritrea	1.5	1.4	–9.8	3.9	2.2	8.7	7.0	1.3	1.7	0.2	2.2	3.8
Ethiopia	5.6	11.8	11.2	10.0	10.6	11.4	8.7	9.8	10.3	8.7	8.1	7.5
Gabon	0.2	6.3	1.7	–2.3	6.3	7.1	5.3	5.6	4.3	3.5	4.9	5.5
The Gambia	3.6	3.6	5.7	6.4	6.5	–4.3	5.6	4.8	–0.2	4.7	5.5	5.9
Ghana	5.1	4.5	9.3	5.8	7.9	14.0	8.0	7.3	4.0	3.5	5.7	3.6
Guinea	3.3	1.8	4.9	–0.3	1.9	3.9	3.8	2.3	1.1	0.0	4.9	7.5
Guinea-Bissau	0.9	3.2	3.2	3.3	4.4	9.4	–1.8	0.8	2.5	4.7	4.8	5.0
Kenya	2.9	6.9	0.2	3.3	8.4	6.1	4.6	5.7	5.3	6.5	6.8	6.9
Lesotho	3.0	5.0	5.1	4.5	6.9	4.5	5.3	3.6	3.4	2.6	2.9	3.6
Liberia	. . .	12.7	6.0	5.1	6.1	7.4	8.2	8.7	0.7	0.9	5.6	7.6
Madagascar	3.4	6.4	7.2	–4.7	0.3	1.5	3.0	2.3	3.3	3.4	4.6	5.0
Malawi	2.8	9.6	7.6	8.3	6.9	4.9	1.9	5.2	5.7	4.0	5.0	6.0
Mali	4.9	4.3	5.0	4.5	5.8	2.7	0.0	1.7	7.2	5.0	5.0	4.5
Mauritius	4.3	5.9	5.5	3.0	4.1	3.9	3.2	3.2	3.6	3.2	3.8	3.6
Mozambique	8.5	7.4	5.8	6.5	7.1	7.4	7.1	7.4	7.4	7.0	8.2	17.6
Namibia	4.2	3.6	2.6	0.3	6.0	5.1	5.1	5.1	4.5	4.8	5.0	4.4
Niger	4.4	3.2	9.6	–0.7	8.4	2.2	11.8	4.6	6.9	4.3	5.4	9.0
Nigeria	7.2	9.1	8.0	9.0	10.0	4.9	4.3	5.4	6.3	4.0	4.3	5.1
Rwanda	8.4	7.6	11.2	6.2	6.3	7.5	8.8	4.7	6.9	6.5	7.0	7.5
São Tomé and Príncipe	3.8	0.6	8.1	4.0	4.5	4.8	4.5	4.0	4.5	5.0	5.2	6.0
Senegal	4.4	4.9	3.7	2.4	4.2	1.8	4.4	3.6	4.7	5.1	5.9	7.3
Seychelles	2.8	10.4	–2.1	–1.1	5.9	7.9	6.6	6.0	3.3	3.5	3.7	3.4
Sierra Leone	9.4	8.1	5.4	3.2	5.3	6.0	15.2	20.1	7.1	–23.9	–0.7	6.9
South Africa	3.4	5.4	3.2	–1.5	3.0	3.2	2.2	2.2	1.5	1.4	1.3	2.6
South Sudan	. . .	. . .	. . .	. . .	. . .	. . .	–52.4	29.3	2.9	–5.3	0.7	7.4
Swaziland	3.4	4.0	4.3	1.9	1.4	1.2	3.0	2.9	2.5	1.9	0.7	1.4
Tanzania	5.5	8.5	5.6	5.4	6.4	7.9	5.1	7.3	7.0	6.9	7.0	6.9
Togo	1.3	2.1	2.4	3.5	4.1	4.8	5.9	5.4	5.0	5.4	5.6	5.5
Uganda	6.8	8.1	10.4	8.1	7.7	6.8	2.6	3.9	4.8	5.2	5.5	6.4
Zambia	5.1	8.4	7.8	9.2	10.3	6.4	6.8	6.7	5.6	4.3	4.0	6.8
Zimbabwe[9]	. . .	–3.4	–16.6	7.5	11.4	11.9	10.6	4.5	3.3	1.4	2.4	3.4

[1]Data for some countries refer to real net material product (NMP) or are estimates based on NMP. 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.
[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[3]Data are based on the 2008 System of National Accounts. The revised national accounts data are available beginning in 2000 and exclude Crimea and Sevastopol from 2010 onward.
[4]In this table only, the data for Timor-Leste are based on non-oil GDP.
[5]The data for Argentina are officially reported data as revised in May 2014. On February 1, 2013, the IMF issued a declaration of censure, and in December 2013 called on Argentina to implement specified actions to address the quality of its official GDP data according to a specified timetable. On June 3, 2015, the Executive Board recognized the ongoing discussions with the Argentine authorities and their material progress in remedying the inaccurate provision of data since 2013, but found that some specified actions called for by the end of February 2015 had not yet been completely implemented. The Executive Board will review this issue again by July 15, 2016, and in line with the procedures set forth in the IMF legal framework.
[6]For Iran, data and forecasts are based on GDP at market prices. Corresponding data used by the IMF staff for GDP growth at factor prices are 3.0 percent, –1.9 percent, and –6.8 percent for 2014/15, 2013/14, and 2012/13, respectively.
[7]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[8]Data for Syria are excluded for 2011 onward because of the ongoing conflict and related lack of data.
[9]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates. Real GDP is in constant 2009 prices.

Table A5. Summary of Inflation

(Percent)

	Average									Projections		
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
GDP Deflators												
Advanced Economies	**1.7**	**2.2**	**1.9**	**0.8**	**1.0**	**1.3**	**1.2**	**1.2**	**1.3**	**1.0**	**1.1**	**1.8**
United States	2.1	2.7	2.0	0.8	1.2	2.1	1.8	1.6	1.6	1.0	1.2	2.2
Euro Area[1]	1.7	2.5	2.0	1.0	0.7	1.1	1.3	1.3	0.9	1.2	1.0	1.5
Japan	–1.0	–0.9	–1.3	–0.5	–2.2	–1.9	–0.9	–0.6	1.7	1.9	0.1	0.6
Other Advanced Economies[2]	2.0	2.8	2.9	1.0	2.3	2.0	1.3	1.3	1.2	0.6	1.6	2.2
Consumer Prices												
Advanced Economies	**2.0**	**2.2**	**3.4**	**0.2**	**1.5**	**2.7**	**2.0**	**1.4**	**1.4**	**0.3**	**1.2**	**2.1**
United States	2.5	2.9	3.8	–0.3	1.6	3.1	2.1	1.5	1.6	0.1	1.1	2.4
Euro Area[1,3]	2.0	2.2	3.3	0.3	1.6	2.7	2.5	1.3	0.4	0.2	1.0	1.7
Japan	–0.1	0.1	1.4	–1.3	–0.7	–0.3	0.0	0.4	2.7	0.7	0.4	1.5
Other Advanced Economies[2]	1.9	2.1	3.8	1.4	2.4	3.3	2.1	1.7	1.5	0.6	1.6	2.2
Emerging Market and Developing Economies	**8.7**	**6.6**	**9.4**	**5.2**	**5.8**	**7.3**	**6.0**	**5.8**	**5.1**	**5.6**	**5.1**	**4.5**
Regional Groups												
Commonwealth of Independent States[4]	20.5	9.7	15.5	11.1	7.1	9.8	6.2	6.4	8.1	15.9	8.9	4.8
Emerging and Developing Asia	4.2	5.4	7.6	2.8	5.1	6.5	4.7	4.8	3.5	3.0	3.2	3.7
Emerging and Developing Europe	24.2	6.0	8.0	4.8	5.6	5.4	6.0	4.3	3.8	2.9	3.5	4.2
Latin America and the Caribbean[5]	8.9	5.2	8.0	6.1	5.7	6.5	5.7	6.7	7.9	11.2	10.7	8.0
Middle East, North Africa, Afghanistan, and Pakistan	5.6	10.3	11.8	7.1	6.5	9.2	9.8	9.1	6.7	6.2	5.4	4.1
Middle East and North Africa	5.5	10.6	11.7	6.0	6.2	8.7	9.7	9.3	6.5	6.5	5.5	4.0
Sub-Saharan Africa	11.2	5.5	13.0	9.8	8.2	9.5	9.4	6.6	6.4	6.9	7.3	5.8
Memorandum												
European Union	3.5	2.4	3.7	0.9	2.0	3.1	2.6	1.5	0.5	0.1	1.1	1.9
Low-Income Developing Countries	10.0	7.8	14.6	8.3	9.1	11.8	10.0	8.0	7.3	7.5	7.2	5.8
Analytical Groups												
By Source of Export Earnings												
Fuel	13.1	10.0	13.4	8.4	7.3	9.1	8.4	9.1	8.2	12.4	10.5	6.9
Nonfuel	7.4	5.5	8.2	4.3	5.4	6.8	5.3	5.0	4.3	4.0	3.8	3.9
Of Which, Primary Products[6]	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
By External Financing Source												
Net Debtor Economies	9.6	5.9	9.3	6.8	6.3	7.4	6.7	6.2	5.6	5.5	5.1	4.4
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2010–14	10.7	10.6	15.1	13.8	10.1	10.0	7.8	6.6	10.7	15.6	8.5	5.4
Memorandum												
Median Inflation Rate												
Advanced Economies	2.1	2.2	4.0	0.9	1.8	3.3	2.6	1.3	0.7	0.2	1.4	2.0
Emerging Market and Developing Economies	5.0	6.0	10.3	3.9	4.2	5.5	4.6	4.0	3.3	3.4	3.4	3.4

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.
[2]Excludes the United States, euro area countries, and Japan.
[3]Based on Eurostat's harmonized index of consumer prices.
[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[5]Excludes Argentina. See note 6 to Table A7.
[6]Data are missing because of Argentina, which accounts for more than 30 percent of the weights of the group. See note 6 to Table A7.

Table A6. Advanced Economies: Consumer Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020	2014	2015	2016
Advanced Economies	**2.0**	**2.2**	**3.4**	**0.2**	**1.5**	**2.7**	**2.0**	**1.4**	**1.4**	**0.3**	**1.2**	**2.1**	**0.7**	**0.8**	**1.4**
United States	2.5	2.9	3.8	–0.3	1.6	3.1	2.1	1.5	1.6	0.1	1.1	2.4	0.6	0.9	1.4
Euro Area[3,4]	2.0	2.2	3.3	0.3	1.6	2.7	2.5	1.3	0.4	0.2	1.0	1.7	–0.2	0.7	1.1
Germany	1.4	2.3	2.7	0.2	1.2	2.5	2.1	1.6	0.8	0.2	1.2	1.9	0.2	0.2	1.2
France	1.6	1.6	3.2	0.1	1.7	2.3	2.2	1.0	0.6	0.1	1.0	1.7	0.0	0.1	1.0
Italy	2.3	2.0	3.5	0.8	1.6	2.9	3.3	1.3	0.2	0.2	0.7	1.3	–0.1	1.9	0.8
Spain	2.9	2.8	4.1	–0.3	1.8	3.2	2.4	1.4	–0.2	–0.3	0.9	1.5	–1.0	0.7	0.9
Netherlands	2.4	1.6	2.2	1.0	0.9	2.5	2.8	2.6	0.3	1.0	1.3	1.9	–0.1	1.2	1.4
Belgium	1.8	1.8	4.5	0.0	2.3	3.4	2.6	1.2	0.5	0.7	1.1	1.7	–0.4	1.3	0.9
Austria	1.5	2.2	3.2	0.4	1.7	3.6	2.6	2.1	1.5	1.0	1.7	2.0	0.8	1.2	1.8
Greece	3.6	2.9	4.2	1.2	4.7	3.3	1.5	–1.2	–1.5	–0.4	0.0	1.4	–2.6	1.5	0.6
Portugal	2.8	2.4	2.7	–0.9	1.4	3.6	2.8	0.4	–0.2	0.6	1.3	1.7	–0.3	0.0	3.4
Ireland	3.1	2.9	3.1	–1.7	–1.6	1.2	1.9	0.5	0.3	0.2	1.5	2.0	0.2	0.2	0.8
Finland	1.5	1.6	3.9	1.6	1.7	3.3	3.2	2.2	1.2	0.0	1.3	2.0	0.6	0.4	1.3
Slovak Republic	6.9	1.9	3.9	0.9	0.7	4.1	3.7	1.5	–0.1	–0.1	1.4	2.0	–0.1	0.5	1.6
Lithuania	2.6	5.8	11.1	4.2	1.2	4.1	3.2	1.2	0.2	–0.4	1.6	2.0	–0.2	0.2	1.5
Slovenia	6.1	3.6	5.7	0.9	1.8	1.8	2.6	1.8	0.2	–0.4	0.7	1.7	0.2	–0.2	1.9
Luxembourg	2.4	2.7	4.1	0.0	2.8	3.7	2.9	1.7	0.7	0.3	1.6	2.4	–0.9	1.3	2.2
Latvia	4.4	10.1	15.2	3.2	–1.2	4.2	2.3	0.0	0.7	0.4	1.8	2.0	0.3	1.8	1.7
Estonia	4.9	6.7	10.6	0.2	2.7	5.1	4.2	3.2	0.5	0.2	1.6	2.2	0.0	0.4	2.1
Cyprus[3]	2.7	2.2	4.4	0.2	2.6	3.5	3.1	0.4	–0.3	–1.0	0.9	1.9	–1.0	–1.0	0.9
Malta	2.8	0.7	4.7	1.8	2.0	2.5	3.2	1.0	0.8	1.0	1.4	2.1	0.4	1.0	1.8
Japan	–0.1	0.1	1.4	–1.3	–0.7	–0.3	0.0	0.4	2.7	0.7	0.4	1.5	2.6	0.1	0.6
United Kingdom[3]	1.5	2.3	3.6	2.2	3.3	4.5	2.8	2.6	1.5	0.1	1.5	2.0	0.9	0.3	1.7
Korea	3.4	2.5	4.7	2.8	2.9	4.0	2.2	1.3	1.3	0.7	1.8	3.0	0.8	1.3	2.5
Canada	2.1	2.1	2.4	0.3	1.8	2.9	1.5	1.0	1.9	1.0	1.6	2.1	1.9	1.1	2.0
Australia	2.6	2.3	4.4	1.7	2.9	3.4	1.7	2.4	2.5	1.8	2.6	2.5	1.6	2.4	2.5
Taiwan Province of China	0.8	1.8	3.5	–0.9	1.0	1.4	1.9	0.8	1.2	–0.1	1.0	2.0	0.6	0.6	1.1
Switzerland	0.8	0.7	2.4	–0.5	0.7	0.2	–0.7	–0.2	0.0	–1.1	–0.2	1.0	–0.3	–1.2	0.3
Sweden	1.5	1.7	3.3	1.9	1.9	1.4	0.9	0.4	0.2	0.5	1.1	2.0	0.3	0.4	1.5
Singapore	0.7	2.1	6.6	0.6	2.8	5.2	4.6	2.4	1.0	0.0	1.8	1.8	0.0	0.7	2.6
Hong Kong SAR	–0.4	2.0	4.3	0.6	2.3	5.3	4.1	4.3	4.4	2.9	3.0	3.5	4.8	2.9	3.0
Norway	2.1	0.7	3.8	2.2	2.4	1.3	0.7	2.1	2.0	2.3	2.2	2.5	2.1	2.3	2.3
Czech Republic	3.9	2.9	6.3	1.0	1.5	1.9	3.3	1.4	0.4	0.4	1.5	2.0	0.1	0.5	1.9
Israel	3.1	0.5	4.6	3.3	2.7	3.5	1.7	1.5	0.5	–0.1	2.0	2.0	–0.2	0.7	2.2
Denmark	2.1	1.7	3.4	1.3	2.3	2.8	2.4	0.8	0.6	0.5	1.8	2.0	0.3	0.5	1.8
New Zealand	2.1	2.4	4.0	2.1	2.3	4.0	1.1	1.1	1.2	0.2	1.5	2.0	0.8	0.4	1.8
Iceland	3.9	5.1	12.7	12.0	5.4	4.0	5.2	3.9	2.0	2.1	4.5	2.5	0.8	3.6	4.8
San Marino	. . .	2.5	4.1	2.4	2.6	2.0	2.8	1.3	1.1	0.4	0.9	1.4	1.1	0.4	0.9
Memorandum															
Major Advanced Economies	1.8	2.2	3.2	–0.1	1.4	2.6	1.9	1.3	1.5	0.2	1.1	2.1	0.8	0.7	1.3

[1]Movements in consumer prices are shown as annual averages.
[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.
[3]Based on Eurostat's harmonized index of consumer prices.
[4]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.

Table A7. Emerging Market and Developing Economies: Consumer Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020	2014	2015	2016
Commonwealth of Independent States[3,4]	**20.5**	**9.7**	**15.5**	**11.1**	**7.1**	**9.8**	**6.2**	**6.4**	**8.1**	**15.9**	**8.9**	**4.8**	**11.4**	**14.5**	**8.5**
Russia	21.8	9.0	14.1	11.7	6.9	8.4	5.1	6.8	7.8	15.8	8.6	4.0	11.4	13.5	8.5
Excluding Russia	16.8	11.7	19.3	9.7	7.8	13.2	9.1	5.6	8.7	16.3	9.6	6.5	11.5	16.8	8.4
Armenia	4.1	4.6	9.0	3.5	7.3	7.7	2.5	5.8	3.0	4.3	3.4	4.0	4.6	3.4	4.0
Azerbaijan	2.6	16.6	20.8	1.6	5.7	7.9	1.0	2.4	1.4	5.0	4.2	4.5	–0.1	7.9	0.5
Belarus	61.8	8.4	14.8	13.0	7.7	53.2	59.2	18.3	18.1	15.1	14.2	11.4	16.2	16.9	12.3
Georgia	7.1	9.2	10.0	1.7	7.1	8.5	–0.9	–0.5	3.1	3.7	5.0	4.0	2.0	5.0	5.0
Kazakhstan	9.0	10.8	17.1	7.3	7.1	8.3	5.1	5.8	6.7	6.3	8.6	6.0	7.4	9.0	8.0
Kyrgyz Republic	11.0	10.2	24.5	6.8	7.8	16.6	2.8	6.6	7.5	8.3	9.0	5.5	10.5	10.1	7.8
Moldova	14.9	12.4	12.7	0.0	7.4	7.6	4.6	4.6	5.1	8.4	7.4	6.5	4.7	9.0	7.3
Tajikistan	26.4	13.2	20.4	6.4	6.5	12.4	5.8	5.0	6.1	10.8	8.2	6.0	7.4	11.7	6.5
Turkmenistan	16.6	6.3	14.5	–2.7	4.4	5.3	5.3	6.8	6.0	7.0	6.0	4.7	4.2	4.7	7.3
Ukraine[5]	12.4	12.8	25.2	15.9	9.4	8.0	0.6	–0.3	12.1	50.0	14.2	5.0	24.9	45.8	12.0
Uzbekistan	24.0	12.3	12.7	14.1	9.4	12.8	12.1	11.2	8.4	9.7	9.2	10.0	9.8	9.1	9.5
Emerging and Developing Asia	**4.2**	**5.4**	**7.6**	**2.8**	**5.1**	**6.5**	**4.7**	**4.8**	**3.5**	**3.0**	**3.2**	**3.7**	**3.1**	**3.0**	**3.2**
Bangladesh	5.3	9.1	8.9	4.9	9.4	11.5	6.2	7.5	7.0	6.4	6.6	6.2	6.1	6.4	6.8
Bhutan	5.3	5.2	6.3	7.1	4.8	8.6	10.1	8.6	9.6	7.2	6.1	5.6	8.9	7.4	7.6
Brunei Darussalam	0.3	1.0	2.1	1.0	0.2	0.1	0.1	0.4	–0.2	0.0	0.1	0.1	–0.2	0.0	0.1
Cambodia	4.1	7.7	25.0	–0.7	4.0	5.5	2.9	3.0	3.9	1.1	1.8	3.2	1.0	1.9	2.8
China	0.9	4.8	5.9	–0.7	3.3	5.4	2.6	2.6	2.0	1.5	1.8	3.0	1.5	1.8	1.8
Fiji	2.9	4.8	7.7	3.7	3.7	7.3	3.4	2.9	0.5	2.8	2.8	2.8	0.1	2.8	2.8
India	5.4	5.9	9.2	10.6	9.5	9.4	10.2	10.0	5.9	5.4	5.5	4.9	5.3	5.4	5.6
Indonesia	14.0	6.7	9.8	5.0	5.1	5.3	4.0	6.4	6.4	6.8	5.4	4.1	8.4	4.6	4.7
Kiribati	1.7	3.6	13.7	9.8	–3.9	1.5	–3.0	–1.5	2.1	1.4	0.3	2.1	3.1	1.4	0.3
Lao P.D.R.	25.6	4.5	7.6	0.0	6.0	7.6	4.3	6.4	5.5	5.3	1.5	3.3	5.0	5.5	10.1
Malaysia	2.5	2.0	5.4	0.6	1.7	3.2	1.7	2.1	3.1	2.4	3.8	3.0	2.7	2.4	3.8
Maldives	1.9	6.8	12.0	4.5	6.1	11.3	10.9	4.0	2.5	1.0	2.5	4.1	1.2	1.3	3.0
Marshall Islands	. . .	2.6	14.7	0.5	1.8	5.4	4.3	1.9	1.1	–0.6	1.0	2.3	0.5	–0.6	1.0
Micronesia	1.9	3.6	6.6	7.7	3.7	4.3	6.3	2.1	0.9	–1.0	1.9	2.0	0.9	–1.0	1.9
Mongolia	9.9	8.2	26.8	6.3	10.2	7.7	15.0	8.6	12.9	7.6	7.5	6.5	10.7	7.1	6.8
Myanmar	. . .	30.9	11.5	2.2	8.2	2.8	2.8	5.7	5.9	12.2	11.8	6.6	7.4	13.3	10.2
Nepal	5.7	6.2	6.7	12.6	9.5	9.6	8.3	9.9	9.0	7.2	8.0	6.1	8.1	7.6	8.5
Palau	. . .	3.0	10.0	4.7	1.1	2.6	5.4	2.8	4.0	1.8	2.0	2.0	3.8	1.8	2.0
Papua New Guinea	8.9	0.9	10.8	6.9	5.1	4.4	4.5	5.0	5.3	6.0	5.4	5.0	6.3	6.0	5.0
Philippines	5.5	2.9	8.2	4.2	3.8	4.7	3.2	2.9	4.2	1.9	3.4	3.5	2.7	3.1	2.7
Samoa	4.6	5.6	11.6	6.3	0.8	5.2	2.0	0.6	–0.4	1.3	2.2	3.0	0.2	3.0	2.1
Solomon Islands	8.8	7.7	17.3	7.1	0.9	7.4	5.9	5.4	5.2	3.8	3.3	4.5	4.2	4.4	3.8
Sri Lanka	9.2	15.8	22.4	3.5	6.2	6.7	7.5	6.9	3.3	1.7	3.4	5.0	2.1	3.2	3.6
Thailand	3.1	2.2	5.5	–0.9	3.3	3.8	3.0	2.2	1.9	–0.9	1.5	2.2	0.6	–0.3	2.3
Timor-Leste	. . .	8.6	7.4	–0.2	5.2	13.2	10.9	9.5	0.7	1.1	2.4	3.3	0.3	1.9	2.9
Tonga	7.0	7.4	7.5	3.5	3.9	4.6	2.0	1.5	1.4	0.9	1.6	3.3	1.2	1.3	1.9
Tuvalu	. . .	2.3	10.4	–0.3	–1.9	0.5	1.4	2.0	3.3	4.7	3.5	2.6	3.3	4.4	3.3
Vanuatu	2.4	3.8	4.2	5.2	2.7	0.7	1.4	1.3	1.0	3.1	3.0	3.0	1.1	3.2	3.0
Vietnam	4.4	8.3	23.1	6.7	9.2	18.7	9.1	6.6	4.1	2.2	3.0	4.9	1.8	2.5	3.6
Emerging and Developing Europe	**24.2**	**6.0**	**8.0**	**4.8**	**5.6**	**5.4**	**6.0**	**4.3**	**3.8**	**2.9**	**3.5**	**4.2**	**3.1**	**3.6**	**3.7**
Albania	6.8	2.9	3.4	2.3	3.6	3.4	2.0	1.9	1.6	2.2	2.5	3.0	0.7	2.3	2.7
Bosnia and Herzegovina	2.8	1.5	7.4	–0.4	2.1	3.7	2.0	–0.1	–0.9	0.5	1.1	2.1	–0.5	1.0	1.6
Bulgaria	36.2	7.6	12.0	2.5	3.0	3.4	2.4	0.4	–1.6	–0.8	0.6	2.1	–2.0	0.3	0.9
Croatia	3.5	2.9	6.1	2.4	1.0	2.3	3.4	2.2	–0.2	–0.4	1.1	2.2	–0.5	0.4	1.3
Hungary	8.5	7.9	6.1	4.2	4.9	3.9	5.7	1.7	–0.2	0.3	2.3	3.0	–0.9	2.0	2.4
Kosovo	. . .	4.4	9.4	–2.4	3.5	7.3	2.5	1.8	0.4	–0.5	0.5	1.8	–0.4	0.0	1.5
FYR Macedonia	1.8	2.8	7.2	–0.6	1.7	3.9	3.3	2.8	–0.1	0.1	1.3	2.0	–0.4	0.8	1.7
Montenegro	. . .	3.4	9.0	3.6	0.7	3.1	3.6	2.2	–0.7	1.7	1.4	1.7	–0.3	1.8	1.5
Poland	5.8	2.5	4.2	3.4	2.6	4.3	3.7	0.9	0.0	–0.8	1.0	2.5	–1.0	0.1	1.6
Romania	35.7	4.8	7.8	5.6	6.1	5.8	3.3	4.0	1.1	–0.4	–0.2	2.5	0.8	–0.5	1.1
Serbia	26.7	6.0	12.4	8.1	6.1	11.1	7.3	7.7	2.1	1.6	3.4	4.0	1.8	2.5	4.1
Turkey	41.3	8.8	10.4	6.3	8.6	6.5	8.9	7.5	8.9	7.4	7.0	6.5	8.2	8.0	6.5

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020	2014	2015	2016
Latin America and the Caribbean[6]	**8.9**	**5.2**	**8.0**	**6.1**	**5.7**	**6.5**	**5.7**	**6.7**	**7.9**	**11.2**	**10.7**	**8.0**	**8.2**	**12.0**	**10.5**
Antigua and Barbuda	1.7	1.4	5.3	–0.6	3.4	3.5	3.4	1.1	1.1	0.8	1.2	2.5	1.3	0.5	1.6
Argentina[6]	. . .	8.8	8.6	6.3	10.5	9.8	10.0	10.6	. . .	16.8	25.6	21.1	23.9	19.3	26.4
The Bahamas	1.7	2.4	4.4	1.7	1.6	3.1	1.9	0.4	1.2	1.7	1.3	2.0	0.2	1.6	1.3
Barbados	2.8	4.0	8.1	3.7	5.7	9.4	4.5	1.8	1.9	1.2	0.8	2.4	2.3	0.6	1.1
Belize	1.6	2.3	6.4	–1.1	0.9	1.7	1.2	0.5	1.2	0.1	1.2	2.0	–0.2	0.7	1.7
Bolivia	3.9	6.7	14.0	3.3	2.5	9.9	4.5	5.7	5.8	4.3	4.9	5.0	5.2	4.2	5.0
Brazil	6.9	3.6	5.7	4.9	5.0	6.6	5.4	6.2	6.3	8.9	6.3	4.6	6.4	9.3	5.5
Chile	3.5	4.4	8.7	1.5	1.4	3.3	3.0	1.9	4.4	4.4	3.7	3.0	4.6	4.2	3.5
Colombia	9.3	5.5	7.0	4.2	2.3	3.4	3.2	2.0	2.9	4.4	3.5	3.0	3.7	4.2	3.3
Costa Rica	11.3	9.4	13.4	7.8	5.7	4.9	4.5	5.2	4.5	2.3	3.1	4.0	5.1	2.1	4.0
Dominica	1.5	3.2	6.4	0.0	2.8	1.1	1.4	0.0	0.8	–0.2	0.6	2.1	0.5	0.8	0.3
Dominican Republic	12.4	6.1	10.6	1.4	6.3	8.5	3.7	4.8	3.0	1.1	3.5	4.0	1.6	2.0	3.5
Ecuador	25.4	2.3	8.4	5.2	3.6	4.5	5.1	2.7	3.6	4.1	2.9	1.5	3.7	3.7	2.5
El Salvador	3.1	4.6	7.3	0.5	1.2	5.1	1.7	0.8	1.1	–1.2	1.2	2.0	0.5	–1.0	2.0
Grenada	2.0	3.9	8.0	–0.3	3.4	3.0	2.4	0.0	–0.8	–0.7	2.0	1.9	–0.6	0.3	2.2
Guatemala	7.1	6.8	11.4	1.9	3.9	6.2	3.8	4.3	3.4	2.9	2.8	4.0	2.9	2.8	3.3
Guyana	5.4	12.2	8.1	3.0	4.3	4.4	2.4	2.2	1.0	1.1	2.3	3.9	1.2	1.0	3.5
Haiti	15.9	9.0	14.4	3.4	4.1	7.4	6.8	6.8	3.9	7.4	8.9	5.0	5.3	10.3	5.9
Honduras	10.3	6.9	11.4	5.5	4.7	6.8	5.2	5.2	6.1	3.8	5.4	5.4	5.8	4.7	5.2
Jamaica	9.3	9.2	22.0	9.6	12.6	7.5	6.9	9.4	6.7	5.0	6.5	6.0	4.0	6.1	6.8
Mexico	8.9	4.0	5.1	5.3	4.2	3.4	4.1	3.8	4.0	2.8	3.0	3.0	4.1	2.6	3.0
Nicaragua	8.8	11.1	19.8	3.7	5.5	8.1	7.2	7.1	6.0	5.4	7.0	7.0	6.5	5.7	7.0
Panama	1.2	4.2	8.8	2.4	3.5	5.9	5.7	4.0	2.6	1.0	2.0	2.0	1.0	3.0	2.0
Paraguay	8.7	8.1	10.2	2.6	4.7	8.3	3.7	2.7	5.0	3.3	4.2	4.5	4.2	3.8	4.5
Peru	3.4	1.8	5.8	2.9	1.5	3.4	3.7	2.8	3.2	3.2	2.8	2.0	3.2	3.3	2.5
St. Kitts and Nevis	3.8	4.5	5.3	2.1	0.7	7.1	1.4	1.0	0.8	–0.8	–0.3	1.7	0.6	–2.2	1.7
St. Lucia	2.5	2.8	5.5	–0.2	3.3	2.8	4.2	1.5	3.5	0.6	2.7	1.5	3.7	0.5	3.7
St. Vincent and the Grenadines	1.5	7.0	10.1	0.4	0.8	3.2	2.6	0.8	0.2	–1.0	1.8	2.0	0.1	0.5	1.6
Suriname	20.5	6.6	14.9	–0.4	6.8	17.7	5.0	1.9	3.4	3.7	4.3	3.3	3.9	5.2	3.2
Trinidad and Tobago	4.4	7.9	12.0	7.6	10.5	5.1	9.3	5.2	7.0	8.1	6.8	5.4	8.5	7.8	5.9
Uruguay	9.8	8.1	7.9	7.1	6.7	8.1	8.1	8.6	8.9	8.4	8.1	6.4	8.3	9.0	7.9
Venezuela	23.8	18.7	30.4	27.1	28.2	26.1	21.1	40.6	62.2	159.1	204.1	162.5	68.5	190.0	210.0
Middle East, North Africa, Afghanistan, and Pakistan	**5.6**	**10.3**	**11.8**	**7.1**	**6.5**	**9.2**	**9.8**	**9.1**	**6.7**	**6.2**	**5.4**	**4.1**	**6.5**	**5.7**	**5.2**
Afghanistan	. . .	8.7	26.4	–6.8	2.2	11.8	6.4	7.4	4.7	–1.9	2.8	5.0	1.5	–1.2	1.9
Algeria	3.1	3.7	4.9	5.7	3.9	4.5	8.9	3.3	2.9	4.2	4.1	4.0	5.3	2.0	4.1
Bahrain	0.9	3.3	3.5	2.8	2.0	–0.4	2.8	3.3	2.7	2.0	2.1	2.5	2.5	1.6	2.6
Djibouti	2.0	5.0	12.0	1.7	4.0	5.1	3.7	2.4	2.9	3.0	3.5	3.0	2.8	3.0	3.0
Egypt	4.7	11.0	11.7	16.2	11.7	11.1	8.6	6.9	10.1	11.0	8.8	7.0	8.2	11.4	10.4
Iran	14.8	18.4	25.3	10.8	12.4	21.5	30.5	34.7	15.5	15.1	11.5	5.0	16.2	14.0	9.0
Iraq	. . .	30.8	2.7	–2.2	2.4	5.6	6.1	1.9	2.2	1.9	3.0	3.0	1.6	3.0	3.0
Jordan	2.6	4.7	14.0	–0.7	4.8	4.2	4.5	4.8	2.9	0.2	3.1	2.0	1.7	1.9	2.5
Kuwait	1.8	5.5	6.3	4.6	4.5	4.9	3.2	2.7	2.9	3.3	3.3	3.6	2.9	3.3	3.3
Lebanon	2.1	4.1	10.8	1.2	4.0	5.0	6.6	4.8	1.9	0.1	1.5	3.0	–0.7	1.0	2.0
Libya	–1.0	6.2	10.4	2.4	2.5	15.9	6.1	2.6	2.8	8.0	9.2	1.8	3.7	11.7	7.2
Mauritania	6.2	7.3	7.5	2.1	6.3	5.7	4.9	4.1	3.5	3.6	4.2	5.0	4.7	3.6	4.2
Morocco	1.7	2.0	3.9	1.0	1.0	0.9	1.3	1.9	0.4	1.5	2.0	2.0	1.6	1.6	2.0
Oman	0.4	5.9	12.6	3.5	3.3	4.0	2.9	1.2	1.0	0.4	2.0	2.8	1.0	0.4	2.0
Pakistan	6.0	7.8	12.0	18.1	10.1	13.7	11.0	7.4	8.6	4.5	4.7	5.0	8.2	3.2	6.0
Qatar	4.0	13.6	15.2	–4.9	–2.4	1.9	1.9	3.1	3.0	1.6	2.3	2.3	2.9	1.6	2.3
Saudi Arabia	–0.2	5.0	6.1	4.1	3.8	3.7	2.9	3.5	2.7	2.1	2.3	2.9	2.4	2.1	2.3
Sudan[7]	14.6	14.8	14.3	11.3	13.0	18.1	35.5	36.5	36.9	19.8	12.7	5.2	25.7	15.5	10.0
Syria[8]	2.3	4.7	15.2	2.8	4.4	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	2.5	3.0	4.3	3.7	3.3	3.5	5.1	5.8	4.9	5.0	4.0	3.8	4.8	4.4	4.0
United Arab Emirates	3.8	11.1	12.3	1.6	0.9	0.9	0.7	1.1	2.3	3.7	3.0	3.4	3.0	3.3	3.0
Yemen	10.3	7.9	19.0	3.7	11.2	19.5	9.9	11.0	8.2	30.0	15.0	6.0	10.0	20.0	12.0

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1997–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020	2014	2015	2016
Sub-Saharan Africa	**11.2**	**5.5**	**13.0**	**9.8**	**8.2**	**9.5**	**9.4**	**6.6**	**6.4**	**6.9**	**7.3**	**5.8**	**6.3**	**7.8**	**7.1**
Angola	114.5	12.2	12.5	13.7	14.5	13.5	10.3	8.8	7.3	10.3	14.2	9.4	7.5	13.9	13.0
Benin	3.2	1.3	7.4	0.9	2.2	2.7	6.7	1.0	–1.1	0.5	2.3	2.8	–0.8	2.3	2.4
Botswana	8.3	7.1	12.6	8.1	6.9	8.5	7.5	5.8	3.9	4.0	4.4	4.4	3.7	4.3	4.4
Burkina Faso	2.4	–0.2	10.7	0.9	–0.6	2.8	3.8	0.5	–0.3	0.7	1.8	2.0	–0.1	1.6	1.8
Burundi	11.0	8.4	24.4	10.6	6.5	9.6	18.2	7.9	4.4	7.4	6.2	5.0	3.7	11.8	4.4
Cabo Verde	2.5	4.4	6.8	1.0	2.1	4.5	2.5	1.5	–0.2	1.0	2.5	2.5	–0.4	2.0	2.5
Cameroon	2.6	1.1	5.3	3.0	1.3	2.9	2.4	2.1	1.9	2.0	2.1	2.2	2.6	2.0	2.1
Central African Republic	1.9	0.9	9.3	3.5	1.5	1.2	5.9	6.6	11.6	5.7	4.9	3.0	8.4	9.4	2.5
Chad	2.6	–7.4	8.3	10.1	–2.1	1.9	7.7	0.2	1.7	4.3	3.1	3.0	3.7	3.2	3.0
Comoros	3.3	4.5	4.8	4.8	3.9	2.2	5.9	1.6	1.3	2.0	2.2	2.2	0.0	4.0	0.1
Democratic Republic of the Congo	97.3	16.7	18.0	46.2	23.5	15.5	2.1	0.8	1.0	1.0	1.7	2.5	1.2	0.9	2.5
Republic of Congo	3.4	2.6	6.0	4.3	5.0	1.8	5.0	4.6	0.9	0.9	1.7	2.5	0.5	1.8	2.2
Côte d'Ivoire	3.3	1.9	6.3	1.0	1.4	4.9	1.3	2.6	0.4	1.6	1.5	2.0	0.9	2.0	1.8
Equatorial Guinea	5.4	2.8	4.7	5.7	5.3	4.8	3.4	3.2	4.3	3.5	2.9	2.8	4.3	3.5	2.9
Eritrea	14.7	9.3	19.9	33.0	12.7	13.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3
Ethiopia	4.5	17.2	44.4	8.5	8.1	33.2	24.1	8.1	7.4	10.0	9.0	8.3	7.1	12.3	8.2
Gabon	0.8	–1.0	5.3	1.9	1.4	1.3	2.7	0.5	4.5	0.6	2.5	2.5	1.7	1.1	2.5
The Gambia	5.9	5.4	4.5	4.6	5.0	4.8	4.6	5.2	6.2	6.5	5.3	5.0	6.9	6.0	4.7
Ghana	19.3	10.7	16.5	13.1	6.7	7.7	7.1	11.7	15.5	15.3	10.1	7.4	17.0	12.0	8.0
Guinea	11.6	22.9	18.4	4.7	15.5	21.4	15.2	11.9	9.7	9.0	8.7	5.0	9.0	9.4	8.0
Guinea-Bissau	6.3	4.6	10.4	–1.6	1.1	5.1	2.1	0.8	–1.0	1.3	2.3	3.0	–0.1	2.0	2.5
Kenya	6.6	4.3	15.1	10.6	4.3	14.0	9.4	5.7	6.9	6.3	5.9	5.0	6.0	6.3	5.4
Lesotho	7.1	9.2	10.7	5.9	3.4	6.0	5.5	5.0	3.8	3.9	4.1	5.0	2.6	4.1	5.0
Liberia	. . .	11.4	17.5	7.4	7.3	8.5	6.8	7.6	9.9	7.9	8.2	6.4	7.7	8.0	8.5
Madagascar	9.4	10.3	9.3	9.0	9.2	9.5	5.7	5.8	6.1	7.6	7.4	5.2	6.0	8.1	7.2
Malawi	19.6	8.0	8.7	8.4	7.4	7.6	21.3	28.3	23.8	20.1	14.0	7.4	24.2	18.7	9.1
Mali	1.5	1.5	9.1	2.2	1.3	3.1	5.3	–0.6	0.9	2.4	3.6	2.6	1.2	3.1	2.6
Mauritius	5.9	8.8	9.7	2.5	2.9	6.5	3.9	3.5	3.2	2.0	3.0	3.0	0.2	3.0	3.0
Mozambique	9.5	8.2	10.3	3.3	12.7	10.4	2.1	4.2	2.3	4.0	5.6	5.6	1.1	5.5	5.6
Namibia	7.7	6.5	9.1	9.5	4.9	5.0	6.7	5.6	5.3	4.8	6.0	5.7	4.6	5.2	5.5
Niger	2.1	0.1	11.3	4.3	–2.8	2.9	0.5	2.3	–0.9	1.3	2.1	1.8	–0.6	2.6	1.5
Nigeria	11.8	5.4	11.6	12.5	13.7	10.8	12.2	8.5	8.1	9.1	9.7	7.0	7.9	10.5	9.5
Rwanda	6.2	9.1	15.4	10.3	2.3	5.7	6.3	4.2	1.8	2.1	4.2	5.0	2.1	3.5	5.0
São Tomé and Príncipe	20.4	18.6	32.0	17.0	13.3	14.3	10.6	8.1	7.0	5.8	4.6	3.0	6.4	5.2	4.0
Senegal	1.4	5.9	6.3	–2.2	1.2	3.4	1.4	0.7	–1.1	0.6	2.1	1.3	–0.8	3.0	1.4
Seychelles	2.9	5.3	37.0	31.8	–2.4	2.6	7.1	4.3	1.4	4.3	2.9	3.0	0.5	4.9	3.8
Sierra Leone	11.9	11.6	14.8	9.2	17.8	18.5	13.8	9.8	8.3	10.2	12.7	7.5	9.8	12.0	10.2
South Africa	5.6	7.1	11.5	7.1	4.3	5.0	5.7	5.8	6.1	4.8	5.9	5.5	5.8	5.5	5.7
South Sudan	. . .	. . .	. . .	. . .	. . .	. . .	45.1	0.0	1.7	41.1	14.4	0.5	9.9	25.0	35.0
Swaziland	6.9	8.1	12.7	7.4	4.5	6.1	8.9	5.6	5.7	5.2	5.7	5.2	6.2	6.1	5.4
Tanzania	7.2	7.0	10.3	12.1	7.2	12.7	16.0	7.9	6.1	5.6	5.9	5.1	4.8	6.6	5.4
Togo	2.4	0.9	8.7	3.7	1.4	3.6	2.6	1.8	0.2	1.9	2.1	2.5	1.8	2.2	2.3
Uganda	4.7	6.1	12.0	13.1	4.0	18.7	14.0	4.8	4.6	5.7	6.5	5.0	4.9	6.4	6.6
Zambia	21.1	10.7	12.4	13.4	8.5	8.7	6.6	7.0	7.8	7.3	7.5	5.0	7.9	8.0	7.0
Zimbabwe[9]	–7.2	–72.7	157.0	6.2	3.0	3.5	3.7	1.6	–0.2	–1.6	0.0	2.2	–0.8	–0.7	0.5

[1]Movements in consumer prices are shown as annual averages.

[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.

[3]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.

[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

[5]Starting in 2014 data exclude Crimea and Sevastopol.

[6]Consumer price data from December 2013 onward reflect the new national CPI (IPCNu), which differs substantively from the preceding CPI (the CPI for the Greater Buenos Aires Area, CPI-GBA). Because of the differences in geographical coverage, weights, sampling, and methodology, the IPCNu data cannot be directly compared to the earlier CPI-GBA data. Because of this structural break in the data, the average CPI inflation for 2014 is not reported in the October 2015 *World Economic Outlook*. Following a declaration of censure by the IMF on February 1, 2013, the public release of a new national CPI by the end of March was one of the specified actions in the IMF Executive Board's December 2013 decision calling on Argentina to address the quality of its official CPI data. On June 3, 2015, the Executive Board recognized the ongoing discussions with the Argentine authorities and their material progress in remedying the inaccurate provision of data since 2013, but found that some specified actions called for by the end of February 2015 had not yet been completely implemented. The Executive Board will review this issue again by July 15, 2016, and in line with the procedures set forth in the IMF legal framework.

[7]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.

[8]Data for Syria are excluded for 2011 onward because of the ongoing conflict and related lack of data.

[9]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates.

Table A8. Major Advanced Economies: General Government Fiscal Balances and Debt[1]

(Percent of GDP unless noted otherwise)

	Average							Projections		
	1997–2006	2009	2010	2011	2012	2013	2014	2015	2016	2020
Major Advanced Economies										
Net Lending/Borrowing	–3.4	–10.0	–8.8	–7.5	–6.4	–4.5	–4.0	–3.5	–3.1	–2.6
Output Gap[2]	0.7	–4.6	–2.9	–2.4	–2.2	–2.3	–2.0	–1.5	–1.0	0.0
Structural Balance[2]	–3.8	–6.4	–7.4	–6.4	–5.1	–3.7	–3.3	–2.8	–2.5	–2.6
United States										
Net Lending/Borrowing[3]	–3.1	–13.1	–10.9	–9.6	–7.9	–4.7	–4.1	–3.8	–3.6	–4.2
Output Gap[2]	1.6	–5.0	–3.7	–3.4	–2.7	–2.9	–2.2	–1.6	–1.0	0.0
Structural Balance[2]	–3.5	–7.6	–9.4	–8.1	–6.2	–4.1	–3.6	–3.1	–3.0	–4.1
Net Debt	41.3	62.0	69.5	76.0	79.3	80.8	80.1	79.9	80.7	81.2
Gross Debt	60.2	86.0	94.7	99.0	102.5	104.8	104.8	104.9	106.0	106.2
Euro Area[4]										
Net Lending/Borrowing	–2.2	–6.2	–6.1	–4.1	–3.6	–2.9	–2.4	–2.0	–1.7	–0.2
Output Gap[2]	–0.3	–3.0	–1.6	–0.7	–2.0	–2.7	–2.6	–2.1	–1.6	–0.1
Structural Balance[2]	–2.1	–4.5	–4.5	–3.7	–2.0	–1.2	–1.0	–0.9	–0.8	–0.2
Net Debt	48.7	52.5	56.1	58.2	66.3	69.0	70.0	70.1	69.7	64.1
Gross Debt	68.9	78.6	83.9	86.4	91.0	93.1	94.2	93.7	92.8	85.2
Germany										
Net Lending/Borrowing	–2.5	–3.0	–4.1	–0.9	0.1	0.1	0.3	0.5	0.3	1.0
Output Gap[2]	–0.6	–4.0	–1.3	1.0	0.4	–0.4	–0.2	–0.1	0.2	0.4
Structural Balance[2]	–2.3	–0.9	–2.2	–1.3	0.0	0.4	0.6	0.5	0.2	0.8
Net Debt	44.4	54.5	56.2	54.6	54.0	53.1	51.4	48.4	46.4	38.1
Gross Debt	61.6	72.7	80.6	77.9	79.3	77.0	74.6	70.7	68.2	57.9
France										
Net Lending/Borrowing	–2.6	–7.2	–6.8	–5.1	–4.8	–4.1	–4.0	–3.8	–3.4	–0.7
Output Gap[2]	0.0	–2.5	–1.6	–0.6	–1.4	–1.7	–2.5	–2.4	–2.1	0.0
Structural Balance[2]	–2.7	–5.7	–5.8	–4.7	–3.8	–2.9	–2.4	–2.1	–2.0	–0.7
Net Debt	53.1	70.1	73.7	76.4	81.7	84.6	87.9	89.4	90.3	85.4
Gross Debt	61.9	78.8	81.5	85.0	89.4	92.3	95.6	97.1	98.0	93.1
Italy										
Net Lending/Borrowing	–3.0	–5.3	–4.2	–3.5	–3.0	–2.9	–3.0	–2.7	–2.0	–0.2
Output Gap[2]	–0.7	–3.2	–1.4	–0.6	–3.0	–4.3	–4.6	–3.9	–3.1	–0.7
Structural Balance[2,5]	–3.4	–4.2	–3.7	–3.8	–1.5	–0.5	–0.8	–0.5	–0.3	0.2
Net Debt	90.1	94.2	96.3	98.4	102.9	109.6	112.6	113.5	112.8	104.8
Gross Debt	105.0	112.5	115.3	116.4	123.1	128.5	132.1	133.1	132.3	123.0
Japan										
Net Lending/Borrowing	–6.0	–10.4	–9.3	–9.8	–8.8	–8.5	–7.3	–5.9	–4.5	–4.1
Output Gap[2]	–1.0	–7.1	–3.1	–3.7	–2.4	–1.2	–1.7	–1.5	–0.9	0.0
Structural Balance[2]	–5.7	–7.4	–7.8	–8.4	–7.8	–8.2	–6.8	–5.5	–4.3	–4.1
Net Debt	65.3	106.2	113.1	127.2	129.0	122.9	126.1	126.0	128.1	132.1
Gross Debt[6]	155.0	210.2	215.8	229.7	236.6	242.6	246.2	245.9	247.8	251.7
United Kingdom										
Net Lending/Borrowing	–1.5	–10.8	–9.7	–7.6	–7.8	–5.7	–5.7	–4.2	–2.8	0.1
Output Gap[2]	1.5	–2.2	–1.9	–2.5	–3.0	–2.7	–1.4	–0.7	–0.4	0.0
Structural Balance[2]	–2.5	–9.7	–8.0	–5.8	–5.6	–3.6	–4.3	–3.6	–2.5	0.1
Net Debt	36.2	58.8	69.1	73.4	77.1	78.7	80.9	80.3	79.5	69.3
Gross Debt	40.6	65.8	76.4	81.8	85.8	87.3	89.4	88.9	88.0	77.8
Canada										
Net Lending/Borrowing	1.1	–4.5	–4.9	–3.7	–3.1	–2.7	–1.6	–1.7	–1.3	–0.3
Output Gap[2]	0.9	–3.5	–2.1	–1.0	–1.0	–0.9	–0.4	–1.3	–1.3	0.0
Structural Balance[2]	0.6	–2.5	–3.7	–3.2	–2.5	–2.2	–1.6	–1.0	–0.7	–0.3
Net Debt	46.0	29.9	32.9	34.6	36.4	37.1	36.4	37.8	38.0	34.1
Gross Debt	81.3	83.0	84.6	85.3	87.9	87.7	87.9	90.4	89.4	79.9

Note: The methodology and specific assumptions for each country are discussed in Box A1. The country group composites for fiscal data are calculated as the sum of the U.S. dollar values for the relevant individual countries.

[1]Debt data refer to the end of the year and are not always comparable across countries. Gross and net debt levels reported by national statistical agencies for countries that have adopted the System of National Accounts (SNA) 2008 (Australia, Canada, Hong Kong SAR, United States) are adjusted to exclude unfunded pension liabilities of government employees' defined-benefit pension plans. Fiscal data for the aggregated Major Advanced Economies and the United States start in 2001, and the average for the aggregate and the United States is therefore for the period 2001–07.

[2]Percent of potential GDP.

[3]Figures reported by the national statistical agency are adjusted to exclude items related to the accrual-basis accounting of government employees defined-benefit pension plans.

[4]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.

[5]Excludes one-time measures based on the authorities' data and, in the absence of the latter, receipts from the sale of assets.

[6]Includes equity shares; nonconsolidated basis.

Table A9. Summary of World Trade Volumes and Prices

(Annual percent change)

	Averages										Projections	
	1997–2006	2007–16	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Trade in Goods and Services												
World Trade[1]												
Volume	6.8	3.5	7.9	2.9	–10.3	12.5	6.7	2.9	3.3	3.3	3.2	4.1
Price Deflator												
In U.S. Dollars	1.4	0.6	7.9	11.6	–10.5	5.7	11.2	–1.7	–0.6	–1.8	–12.1	–0.5
In SDRs	1.3	1.0	3.7	8.1	–8.3	6.8	7.5	1.3	0.2	–1.8	–4.8	–1.0
Volume of Trade												
Exports												
Advanced Economies	6.2	2.9	7.0	2.1	–11.2	12.1	5.9	2.2	2.9	3.4	3.1	3.4
Emerging Market and Developing Economies	8.1	4.6	9.4	4.5	–8.0	13.6	7.6	4.5	4.4	2.9	3.9	4.8
Imports												
Advanced Economies	6.6	2.4	5.3	0.4	–11.7	11.5	5.1	1.1	2.0	3.4	4.0	4.2
Emerging Market and Developing Economies	8.3	6.0	15.4	9.3	–8.0	14.5	10.3	5.9	5.2	3.6	1.3	4.4
Terms of Trade												
Advanced Economies	–0.2	0.0	0.2	–2.3	2.7	–0.9	–1.7	–0.7	0.8	0.4	1.6	0.1
Emerging Market and Developing Economies	1.9	0.1	2.0	3.7	–4.9	2.4	3.9	0.6	–0.3	–0.5	–4.7	–1.0
Trade in Goods												
World Trade[1]												
Volume	7.1	3.3	7.2	2.5	–11.8	14.3	6.7	2.5	3.0	3.1	3.0	3.9
Price Deflator												
In U.S. Dollars	1.3	0.5	8.1	12.4	–11.7	6.5	12.6	–1.7	–1.0	–2.4	–13.2	–0.8
In SDRs	1.2	0.9	3.9	8.9	–9.5	7.6	8.9	1.3	–0.2	–2.4	–6.0	–1.3
World Trade Prices in U.S. Dollars[2]												
Manufactures	0.3	0.8	5.7	6.2	–5.6	2.4	6.4	0.5	–1.1	–0.6	–4.1	–0.7
Oil	12.2	–2.4	10.7	36.4	–36.3	27.9	31.6	1.0	–0.9	–7.5	–46.4	–2.4
Nonfuel Primary Commodities	2.2	0.4	13.9	7.9	–15.8	26.5	17.9	–10.0	–1.2	–4.0	–16.9	–5.1
Food	–0.1	2.0	14.8	24.5	–14.8	11.9	19.9	–2.4	1.1	–4.1	–16.8	–4.7
Beverages	0.2	4.5	13.8	23.3	1.6	14.1	16.6	–18.6	–11.9	20.7	–4.7	–1.2
Agricultural Raw Materials	–0.6	1.0	5.0	–0.7	–17.1	33.2	22.7	–12.7	1.6	1.9	–11.8	–1.4
Metal	8.9	–3.0	17.4	–7.8	–19.2	48.2	13.5	–16.8	–4.3	–10.3	–22.3	–9.4
World Trade Prices in SDRs[2]												
Manufactures	0.1	1.3	1.6	2.9	–3.3	3.5	2.8	3.6	–0.3	–0.5	3.9	–1.2
Oil	12.0	–2.0	6.4	32.2	–34.8	29.3	27.2	4.1	–0.1	–7.5	–41.9	–2.9
Nonfuel Primary Commodities	2.1	0.8	9.5	4.6	–13.7	27.9	13.9	–7.3	–0.4	–3.9	–9.9	–5.6
Food	–0.2	2.5	10.3	20.6	–12.7	13.1	15.8	0.6	1.9	–4.1	–9.9	–5.2
Beverages	0.1	4.9	9.4	19.5	4.1	15.3	12.7	–16.1	–11.2	20.8	3.2	–1.6
Agricultural Raw Materials	–0.8	1.5	0.9	–3.8	–15.1	34.6	18.6	–10.0	2.4	2.0	–4.4	–1.9
Metal	8.8	–2.5	12.8	–10.7	–17.2	49.8	9.7	–14.3	–3.5	–10.2	–15.8	–9.8
World Trade Prices in Euros[2]												
Manufactures	0.4	2.0	–3.1	–1.1	–0.2	7.5	1.5	8.8	–4.2	–0.6	14.5	–1.2
Oil	12.3	–1.3	1.4	27.1	–32.7	34.3	25.5	9.3	–4.1	–7.6	–35.9	–2.9
Nonfuel Primary Commodities	2.3	1.6	4.3	0.5	–11.0	32.8	12.4	–2.6	–4.3	–4.0	–0.7	–5.6
Food	0.0	3.2	5.1	15.9	–9.9	17.4	14.3	5.7	–2.1	–4.2	–0.7	–5.1
Beverages	0.3	5.7	4.2	14.8	7.3	19.8	11.2	–11.9	–14.7	20.7	13.8	–1.6
Agricultural Raw Materials	–0.5	2.2	–3.8	–7.5	–12.5	39.8	17.0	–5.5	–1.6	1.8	5.4	–1.9
Metal	9.1	–1.8	7.5	–14.1	–14.6	55.5	8.3	–10.0	–7.3	–10.3	–7.2	–9.8

Table A9. Summary of World Trade Volumes and Prices *(continued)*

(Annual percent change)

	Averages										Projections	
	1997–2006	2007–16	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Trade in Goods												
Volume of Trade												
Exports												
Advanced Economies	6.1	2.6	6.1	1.3	–13.2	14.6	5.7	1.6	2.5	3.2	2.8	3.1
Emerging Market and Developing Economies	8.7	4.5	8.7	3.8	–8.4	14.4	7.5	4.9	4.2	2.9	3.5	4.6
Fuel Exporters	5.0	2.3	4.5	3.5	–7.4	4.9	5.6	5.6	0.6	–0.5	3.3	3.7
Nonfuel Exporters	10.2	5.4	10.6	4.0	–9.0	18.4	8.3	4.5	6.0	4.4	3.5	4.9
Imports												
Advanced Economies	6.8	2.1	4.7	0.0	–13.4	13.4	5.2	0.2	1.7	3.3	3.7	4.0
Emerging Market and Developing Economies	8.6	5.7	14.9	9.2	–9.5	15.4	10.5	5.5	4.7	2.7	1.5	4.3
Fuel Exporters	8.8	4.9	24.3	15.1	–12.5	8.8	9.5	10.6	4.3	0.7	–8.9	2.1
Nonfuel Exporters	8.5	5.9	12.7	7.7	–8.7	17.1	10.7	4.4	4.8	3.2	3.9	4.8
Price Deflators in SDRs												
Exports												
Advanced Economies	0.4	0.5	3.5	6.1	–7.1	4.4	6.7	0.1	0.5	–1.7	–5.4	–1.2
Emerging Market and Developing Economies	3.9	1.8	6.0	14.9	–13.4	13.2	12.7	2.7	–0.8	–3.4	–7.9	–1.8
Fuel Exporters	8.6	0.2	7.8	25.3	–25.5	22.8	23.6	3.6	–1.4	–6.7	–27.7	–3.2
Nonfuel Exporters	2.1	2.3	5.2	10.2	–7.1	9.2	8.2	2.3	–0.5	–2.0	0.2	–1.4
Imports												
Advanced Economies	0.7	0.5	3.2	8.2	–10.2	6.0	8.9	1.1	–0.3	–1.9	–6.7	–1.2
Emerging Market and Developing Economies	2.2	1.7	4.0	9.8	–8.4	10.7	8.5	2.2	–0.7	–2.9	–3.7	–1.2
Fuel Exporters	1.5	1.9	3.7	7.9	–5.7	7.1	6.6	2.2	–0.4	–2.0	1.1	–0.6
Nonfuel Exporters	2.4	1.6	4.1	10.3	–9.1	11.7	8.9	2.2	–0.7	–3.1	–4.8	–1.4
Terms of Trade												
Advanced Economies	–0.2	–0.1	0.2	–2.0	3.4	–1.5	–2.0	–1.0	0.9	0.2	1.4	0.0
Emerging Market and Developing Economies	1.7	0.2	1.9	4.7	–5.4	2.3	4.0	0.5	–0.1	–0.6	–4.3	–0.6
Regional Groups												
Commonwealth of Independent States[3]	5.4	–0.9	2.0	16.3	–17.9	13.0	11.7	1.9	–1.2	–1.1	–24.9	–0.9
Emerging and Developing Asia	–1.5	0.8	0.4	–1.0	3.1	–6.2	–2.3	1.1	1.1	2.2	9.3	0.7
Emerging and Developing Europe	–0.3	0.1	2.5	–0.6	3.0	–3.6	–2.1	–0.9	1.7	1.3	0.7	–0.9
Latin America and the Caribbean	2.5	0.2	3.3	4.7	–4.8	8.4	5.9	–1.1	–1.7	–2.4	–7.7	–1.9
Middle East, North Africa, Afghanistan, and Pakistan	6.3	–1.9	3.3	13.0	–18.2	11.1	14.4	–0.4	–0.8	–5.5	–24.8	–3.2
Middle East and North Africa	6.6	–1.9	3.3	13.7	–18.6	11.1	14.7	0.1	–0.8	–5.6	–25.4	–3.5
Sub-Saharan Africa	2.2	0.2	5.0	9.3	–11.7	12.6	11.3	–1.4	–2.4	–3.5	–13.7	0.0
Analytical Groups												
By Source of Export Earnings												
Fuel	7.0	–1.7	4.0	16.2	–20.9	14.7	16.0	1.4	–1.0	–4.8	–28.5	–2.6
Nonfuel	–0.3	0.7	1.0	–0.1	2.2	–2.2	–0.7	0.0	0.2	1.2	5.3	0.0
Memorandum												
World Exports in Billions of U.S. Dollars												
Goods and Services	9,165	20,568	17,141	19,642	15,758	18,742	22,216	22,489	23,162	23,471	21,188	21,870
Goods	7,291	16,323	13,661	15,731	12,261	14,928	17,911	18,092	18,521	18,611	16,531	16,984
Average Oil Price[4]	12.2	–2.4	10.7	36.4	–36.3	27.9	31.6	1.0	–0.9	–7.5	–46.4	–2.4
In U.S. Dollars a Barrel	31.21	82.03	71.13	97.04	61.78	79.03	104.01	105.01	104.07	96.25	51.62	50.36
Export Unit Value of Manufactures[5]	0.3	0.8	5.7	6.2	–5.6	2.4	6.4	0.5	–1.1	–0.6	–4.1	–0.7

[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 and accounting for 83 percent of the advanced economies' trade (export of goods) weights; the average of U.K. Brent, Dubai Fateh, 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]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[4]Percent change of average of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil prices.
[5]Percent change for manufactures exported by the advanced economies.

Table A10. Summary of Current Account Balances

(Billions of U.S. dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	2016	2020
Advanced Economies	**–353.5**	**–583.1**	**–80.7**	**2.4**	**–50.2**	**–9.3**	**193.4**	**189.5**	**230.1**	**143.7**	**–16.2**
United States	–718.6	–690.8	–384.0	–442.0	–460.4	–449.7	–376.8	–389.5	–460.6	–551.5	–746.9
Euro Area[1]	10.6	–223.5	–21.8	11.7	10.0	154.1	236.6	274.8	364.6	363.7	326.8
Germany	232.5	210.9	196.5	192.5	229.0	240.8	238.7	286.4	286.3	277.9	270.3
France	–8.0	–28.0	–22.5	–22.2	–29.6	–32.0	–22.7	–26.2	–5.2	–9.2	–7.9
Italy	–31.3	–68.1	–42.3	–73.9	–70.1	–8.9	19.9	41.1	37.0	42.7	10.1
Spain	–142.9	–152.0	–64.3	–56.2	–47.4	–3.8	20.0	11.2	10.6	13.9	22.4
Japan	212.1	142.6	145.3	221.0	129.8	59.7	40.7	24.4	124.3	126.5	130.7
United Kingdom	–81.3	–103.5	–64.5	–62.7	–43.3	–98.2	–119.8	–173.9	–135.8	–130.6	–86.1
Canada	11.4	1.8	–40.0	–56.7	–47.7	–60.0	–54.6	–37.5	–45.8	–36.0	–30.4
Other Advanced Economies[2]	192.8	165.6	203.1	273.6	257.9	266.6	337.6	338.9	319.7	305.9	312.7
Emerging Market and Developing Economies	**623.2**	**681.1**	**246.5**	**281.4**	**394.0**	**360.2**	**180.9**	**158.0**	**–23.9**	**–57.6**	**–286.3**
Regional Groups											
Commonwealth of Independent States[3]	65.3	108.2	42.8	69.2	107.9	67.4	18.2	56.7	43.1	44.0	72.5
Russia	71.3	103.9	50.4	67.5	97.3	71.3	34.1	59.5	61.8	63.9	80.5
Excluding Russia	–6.0	4.3	–7.6	1.7	10.7	–3.9	–15.9	–2.8	–18.8	–19.8	–8.0
Emerging and Developing Asia	395.8	425.7	275.3	233.8	99.4	120.8	103.4	208.2	329.6	311.9	0.0
China	353.2	420.6	243.3	237.8	136.1	215.4	148.2	219.7	347.8	344.4	95.3
India	–15.7	–27.9	–38.2	–48.1	–78.2	–88.2	–32.4	–27.5	–30.4	–37.3	–86.5
ASEAN-5[4]	53.3	31.1	65.8	43.9	48.9	6.5	–2.6	23.4	26.8	22.9	9.5
Emerging and Developing Europe	–124.7	–148.0	–53.4	–87.0	–118.6	–80.7	–72.5	–55.7	–34.8	–42.1	–84.1
Latin America and the Caribbean	5.9	–39.4	–30.1	–94.9	–102.2	–137.9	–173.1	–175.5	–162.9	–148.1	–170.4
Brazil	1.6	–28.2	–24.3	–77.3	–73.2	–84.4	–90.9	–103.6	–72.8	–63.2	–78.2
Mexico	–14.7	–20.4	–8.4	–5.0	–13.2	–16.4	–30.5	–25.0	–27.9	–24.3	–31.9
Middle East, North Africa, Afghanistan, and Pakistan	264.9	334.1	41.4	171.2	417.3	419.1	344.0	192.5	–113.4	–138.1	–14.2
Sub-Saharan Africa	15.9	0.5	–29.5	–10.9	–9.7	–28.5	–39.1	–68.2	–85.5	–85.3	–90.1
South Africa	–16.1	–15.9	–8.1	–5.6	–9.0	–19.7	–21.1	–19.1	–13.7	–14.8	–15.9
Analytical Groups											
By Source of Export Earnings											
Fuel	421.6	580.5	135.0	308.9	626.5	599.5	461.0	296.7	–67.9	–80.7	93.5
Nonfuel	201.6	100.6	111.6	–27.5	–232.5	–239.3	–280.2	–138.7	44.0	23.1	–379.8
Of Which, Primary Products	–1.9	–20.9	–4.7	–10.4	–24.1	–56.4	–60.6	–48.0	–43.3	–51.0	–55.1
By External Financing Source											
Net Debtor Economies	–175.6	–326.8	–155.3	–278.5	–366.5	–466.5	–442.9	–376.0	–324.0	–337.9	–487.5
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2010–14	–6.5	–15.9	–15.3	–16.5	–22.9	–40.4	–41.5	–27.2	–31.0	–37.5	–47.9
Memorandum											
World	**269.7**	**98.0**	**165.9**	**283.8**	**343.8**	**350.9**	**374.2**	**347.5**	**206.2**	**86.1**	**–302.5**
European Union	–86.6	–241.7	–7.2	11.6	89.5	201.7	307.0	309.4	351.9	354.6	345.5
Low-Income Developing Countries	6.2	–10.2	–24.3	–17.6	–27.2	–39.0	–43.8	–59.9	–84.8	–93.2	–92.4
Middle East and North Africa	268.6	347.7	49.1	174.0	416.0	422.5	345.0	194.4	–112.0	–137.1	–10.7

Table A10. Summary of Current Account Balances *(continued)*

(Percent of GDP)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	2016	2020
Advanced Economies	**–0.9**	**–1.3**	**–0.2**	**0.0**	**–0.1**	**0.0**	**0.4**	**0.4**	**0.5**	**0.3**	**0.0**
United States	–5.0	–4.7	–2.7	–3.0	–3.0	–2.8	–2.3	–2.2	–2.6	–2.9	–3.4
Euro Area[1]	0.1	–1.6	–0.2	0.1	0.1	1.2	1.8	2.0	3.2	3.0	2.3
Germany	6.7	5.6	5.7	5.6	6.1	6.8	6.4	7.4	8.5	8.0	6.8
France	–0.3	–1.0	–0.8	–0.8	–1.0	–1.2	–0.8	–0.9	–0.2	–0.4	–0.3
Italy	–1.4	–2.8	–1.9	–3.5	–3.1	–0.4	0.9	1.9	2.0	2.3	0.5
Spain	–9.6	–9.3	–4.3	–3.9	–3.2	–0.3	1.4	0.8	0.9	1.1	1.5
Japan	4.9	2.9	2.9	4.0	2.2	1.0	0.8	0.5	3.0	3.0	2.8
United Kingdom	–2.7	–3.7	–2.8	–2.6	–1.7	–3.7	–4.5	–5.9	–4.7	–4.3	–2.2
Canada	0.8	0.1	–2.9	–3.5	–2.7	–3.3	–3.0	–2.1	–2.9	–2.3	–1.6
Other Advanced Economies[2]	3.8	3.1	4.1	4.8	4.0	4.1	5.0	5.0	5.1	4.7	4.0
Emerging Market and Developing Economies	**3.8**	**3.5**	**1.3**	**1.2**	**1.5**	**1.3**	**0.6**	**0.5**	**–0.1**	**–0.2**	**–0.7**
Regional Groups											
Commonwealth of Independent States[3]	3.8	5.0	2.6	3.4	4.3	2.5	0.7	2.2	2.4	2.5	2.8
Russia	5.5	6.3	4.1	4.4	5.1	3.5	1.6	3.2	5.0	5.4	4.5
Excluding Russia	–1.5	0.8	–1.8	0.4	1.8	–0.6	–2.3	–0.4	–3.3	–3.5	–1.0
Emerging and Developing Asia	6.5	5.8	3.4	2.4	0.9	1.0	0.7	1.4	2.0	1.8	0.0
China	10.0	9.2	4.8	3.9	1.8	2.5	1.6	2.1	3.1	2.8	0.6
India	–1.3	–2.3	–2.8	–2.8	–4.2	–4.8	–1.7	–1.3	–1.4	–1.6	–2.5
ASEAN-5[4]	4.6	2.3	4.9	2.6	2.5	0.3	–0.1	1.1	1.3	1.1	0.3
Emerging and Developing Europe	–7.9	–8.0	–3.4	–5.1	–6.4	–4.5	–3.8	–2.9	–2.1	–2.4	–3.8
Latin America and the Caribbean	0.2	–0.9	–0.7	–1.9	–1.7	–2.4	–2.9	–3.0	–3.3	–3.0	–2.8
Brazil	0.1	–1.7	–1.5	–3.5	–2.8	–3.5	–3.8	–4.4	–4.0	–3.8	–3.8
Mexico	–1.4	–1.9	–0.9	–0.5	–1.1	–1.4	–2.4	–1.9	–2.4	–2.0	–2.1
Middle East, North Africa, Afghanistan, and Pakistan	12.5	12.7	1.8	6.2	13.0	12.0	10.2	5.6	–3.6	–4.3	–0.3
Sub-Saharan Africa	1.7	0.0	–2.8	–0.9	–0.7	–1.9	–2.4	–4.1	–5.7	–5.5	–4.5
South Africa	–5.4	–5.5	–2.7	–1.5	–2.2	–5.0	–5.8	–5.4	–4.3	–4.5	–4.0
Analytical Groups											
By Source of Export Earnings											
Fuel	10.7	11.7	3.3	6.2	10.4	9.2	7.1	4.7	–1.4	–1.6	1.4
Nonfuel	1.6	0.7	0.8	–0.2	–1.1	–1.1	–1.2	–0.6	0.2	0.1	–1.1
Of Which, Primary Products	–0.2	–1.8	–0.4	–0.8	–1.5	–3.4	–3.6	–3.0	–2.7	–3.2	–2.8
By External Financing Source											
Net Debtor Economies	–2.0	–3.2	–1.6	–2.4	–2.8	–3.6	–3.3	–2.7	–2.6	–2.6	–2.8
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2010–14	–1.4	–2.9	–3.0	–2.8	–3.5	–5.8	–5.6	–3.8	–4.3	–5.0	–4.5
Memorandum											
World	**0.5**	**0.2**	**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.3**	**0.1**	**–0.3**
European Union	–0.5	–1.3	0.0	0.1	0.5	1.2	1.7	1.7	2.2	2.1	1.7
Low-Income Developing Countries	0.7	–0.9	–2.2	–1.3	–1.8	–2.4	–2.4	–3.1	–4.5	–4.7	–3.5
Middle East and North Africa	13.7	14.2	2.2	6.8	14.0	13.0	11.0	6.1	–4.0	–4.7	–0.3

Table A10. Summary of Current Account Balances *(continued)*

(Percent of exports of goods and services)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	2016	2020
Advanced Economies	**–3.0**	**–4.5**	**–0.8**	**0.0**	**–0.4**	**–0.1**	**1.4**	**1.3**	**1.7**	**1.1**	**–0.1**
United States	–43.5	–37.5	–24.3	–23.8	–21.6	–20.3	–16.5	–16.6	–20.4	–24.7	–28.6
Euro Area[1]	0.4	–7.3	–0.9	0.4	0.3	4.8	7.0	7.8	. . .	. . .	. . .
Germany	15.7	12.9	15.2	13.3	13.6	14.8	14.0	16.2	17.9	16.6	12.8
France	–1.1	–3.4	–3.4	–3.1	–3.6	–4.0	–2.7	–3.0	–0.6	–1.0	–0.7
Italy	–5.2	–10.5	–8.6	–13.8	–11.4	–1.5	3.2	6.5	6.7	7.3	1.5
Spain	–37.5	–36.5	–18.9	–15.3	–11.0	–0.9	4.6	2.5	2.7	3.3	4.0
Japan	26.4	16.0	21.7	25.4	13.9	6.5	4.9	2.8	16.0	16.1	14.0
United Kingdom	–10.7	–13.4	–10.3	–9.1	–5.4	–12.4	–14.9	–20.8	–17.4	–15.8	–8.0
Canada	2.3	0.3	–10.3	–12.1	–8.7	–10.8	–9.8	–6.6	–9.5	–7.3	–4.7
Other Advanced Economies[2]	6.9	5.2	7.7	8.4	6.7	6.9	8.4	8.5	9.0	8.4	7.0
Emerging Market and Developing Economies	**11.3**	**10.1**	**4.6**	**4.2**	**4.8**	**4.2**	**2.0**	**1.8**	**–0.3**	**–0.7**	**–2.6**
Regional Groups											
Commonwealth of Independent States[3]	11.2	13.7	8.2	10.3	12.2	7.4	2.0	6.7	7.1	7.1	8.9
Russia	18.3	19.9	14.7	15.3	17.0	12.1	5.8	10.6	15.7	15.8	15.3
Excluding Russia	–3.1	1.6	–4.2	0.8	3.4	–1.2	–5.1	–1.0	–8.9	–9.3	–2.8
Emerging and Developing Asia	18.1	16.6	12.5	8.2	2.9	3.3	2.7	5.2	8.3	7.5	0.0
China	28.1	28.1	19.5	14.5	6.8	9.9	6.3	8.9	14.1	13.6	3.2
India	–6.1	–9.5	–13.7	–12.6	–17.3	–19.5	–6.9	–5.8	–6.7	–7.6	–12.1
ASEAN-5[4]	8.7	4.4	10.9	5.9	5.5	0.7	–0.3	2.4	2.9	2.3	0.7
Emerging and Developing Europe	–23.3	–22.7	–10.2	–14.8	–17.1	–11.7	–9.7	–7.1	–4.8	–5.5	–8.5
Latin America and the Caribbean	0.7	–3.9	–3.8	–9.5	–8.4	–11.1	–13.8	–14.3	–14.8	–12.9	–11.4
Brazil	0.8	–12.3	–13.4	–33.1	–24.9	–29.9	–32.3	–39.2	–30.2	–26.1	–25.9
Mexico	–5.1	–6.6	–3.4	–1.6	–3.6	–4.2	–7.6	–6.0	–6.7	–5.3	–4.9
Middle East, North Africa, Afghanistan, and Pakistan	25.9	25.1	4.3	14.5	27.3	25.4	21.1	12.6	–9.9	–11.8	–0.4
Sub-Saharan Africa	4.9	0.1	–9.8	–2.8	–2.0	–6.0	–8.1	–15.0	–23.3	–22.3	–17.8
South Africa	–17.3	–15.5	–9.8	–5.2	–7.1	–16.7	–18.6	–17.4	–12.8	–13.7	–12.5
Analytical Groups											
By Source of Export Earnings											
Fuel	25.9	26.8	9.1	16.6	25.0	22.5	17.5	12.1	–3.9	–4.6	4.3
Nonfuel	5.2	2.2	2.9	–0.6	–4.0	–4.0	–4.5	–2.2	0.7	0.4	–4.6
Of Which, Primary Products	–0.6	–5.9	–1.6	–2.7	–5.4	–13.4	–14.4	–11.8	–11.6	–13.7	–11.9
By External Financing Source											
Net Debtor Economies	–6.6	–10.4	–5.9	–8.7	–9.6	–12.0	–11.1	–9.3	–8.6	–8.5	–9.1
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2010–14	–4.1	–7.7	–9.7	–8.8	–10.5	–19.0	–19.1	–13.5	–17.5	–20.3	–19.3
Memorandum											
World	**1.6**	**0.5**	**1.1**	**1.5**	**1.5**	**1.6**	**1.6**	**1.5**	**1.0**	**0.4**	**–1.1**
European Union	–1.3	–3.2	–0.1	0.2	1.2	2.7	4.0	3.9	4.9	4.7	3.6
Low-Income Developing Countries	2.2	–2.8	–8.1	–4.6	–5.6	–7.8	–8.2	–10.9	–16.7	–16.9	–11.9
Middle East and North Africa	26.9	26.6	5.2	15.1	27.8	26.2	21.6	13.0	–10.0	–12.0	–0.2

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.
[2]Excludes the United States, euro area countries, and Japan.
[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[4]Indonesia, Malaysia, Philippines, Thailand, Vietnam.

Table A11. Advanced Economies: Balance on Current Account

(Percent of GDP)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	2016	2020
Advanced Economies	**–0.9**	**–1.3**	**–0.2**	**0.0**	**–0.1**	**0.0**	**0.4**	**0.4**	**0.5**	**0.3**	**0.0**
United States	–5.0	–4.7	–2.7	–3.0	–3.0	–2.8	–2.3	–2.2	–2.6	–2.9	–3.4
Euro Area[1]	0.1	–1.6	–0.2	0.1	0.1	1.2	1.8	2.0	3.2	3.0	2.3
Germany	6.7	5.6	5.7	5.6	6.1	6.8	6.4	7.4	8.5	8.0	6.8
France	–0.3	–1.0	–0.8	–0.8	–1.0	–1.2	–0.8	–0.9	–0.2	–0.4	–0.3
Italy	–1.4	–2.8	–1.9	–3.5	–3.1	–0.4	0.9	1.9	2.0	2.3	0.5
Spain	–9.6	–9.3	–4.3	–3.9	–3.2	–0.3	1.4	0.8	0.9	1.1	1.5
Netherlands	6.0	4.1	5.8	7.4	9.1	10.9	10.8	10.2	9.6	9.2	8.3
Belgium	1.5	–1.0	–1.1	1.8	–1.1	–0.7	–0.2	1.6	2.1	2.1	2.3
Austria	3.8	4.5	2.6	2.9	1.6	1.5	1.0	0.7	1.6	1.7	1.6
Greece	–14.0	–14.5	–10.9	–10.1	–9.9	–2.5	0.6	0.9	0.7	1.5	–0.2
Portugal	–9.7	–12.1	–10.4	–10.1	–6.0	–2.0	1.4	0.6	0.7	1.6	0.4
Ireland	–5.4	–5.7	–3.0	0.6	0.8	–1.5	3.1	3.6	3.2	3.0	2.0
Finland	3.8	2.2	1.9	1.2	–1.8	–1.9	–1.8	–1.9	–1.1	–0.7	–0.3
Slovak Republic	–4.8	–6.5	–3.5	–4.7	–5.0	0.9	1.5	0.1	0.1	0.1	2.1
Lithuania	–14.9	–12.9	2.1	–0.3	–3.8	–1.2	1.6	0.1	–2.2	–2.4	–2.2
Slovenia	–4.1	–5.3	–0.6	–0.1	0.2	2.6	5.6	7.0	6.7	6.2	4.1
Luxembourg	9.8	7.3	7.6	6.9	5.8	5.7	4.7	5.1	5.6	5.6	5.1
Latvia	–20.8	–12.3	8.0	2.3	–2.8	–3.3	–2.3	–3.1	–1.7	–2.7	–2.1
Estonia	–15.0	–8.7	2.5	1.8	1.3	–2.4	–1.1	0.1	0.6	0.3	–1.1
Cyprus	–10.8	–14.3	–9.8	–9.0	–3.1	–6.3	–1.6	–4.5	–4.2	–3.8	–4.0
Malta	–3.9	–1.1	–6.6	–4.7	–2.5	1.4	3.2	3.3	1.5	1.3	3.5
Japan	4.9	2.9	2.9	4.0	2.2	1.0	0.8	0.5	3.0	3.0	2.8
United Kingdom	–2.7	–3.7	–2.8	–2.6	–1.7	–3.7	–4.5	–5.9	–4.7	–4.3	–2.2
Korea	1.1	0.3	3.7	2.6	1.6	4.2	6.2	6.3	7.1	6.7	4.7
Canada	0.8	0.1	–2.9	–3.5	–2.7	–3.3	–3.0	–2.1	–2.9	–2.3	–1.6
Australia	–6.7	–5.0	–4.7	–3.6	–2.9	–4.3	–3.4	–3.0	–4.0	–4.1	–3.3
Taiwan Province of China	8.6	6.6	10.9	8.9	8.2	9.9	10.8	12.4	12.4	11.8	9.6
Switzerland	10.8	3.0	8.0	14.8	7.7	10.3	11.1	7.3	7.2	7.0	7.0
Sweden	8.9	8.5	5.9	6.0	6.9	6.6	6.7	6.2	6.7	6.7	5.7
Singapore	26.0	14.4	16.8	23.7	22.0	17.2	17.9	19.1	20.8	18.0	13.8
Hong Kong SAR	13.0	15.0	9.9	7.0	5.6	1.6	1.5	1.9	2.2	2.5	3.5
Norway	12.2	15.7	10.6	10.9	12.4	12.4	10.0	9.4	7.0	5.4	6.0
Czech Republic	–4.3	–1.9	–2.4	–3.7	–2.1	–1.6	–0.5	0.6	1.7	1.2	–0.1
Israel	4.0	1.1	3.5	3.6	2.3	1.5	3.0	4.3	4.6	4.7	3.9
Denmark	1.4	2.7	3.3	5.7	5.7	5.6	7.2	6.3	7.0	7.2	6.0
New Zealand	–6.8	–7.7	–2.3	–2.3	–2.8	–4.0	–3.2	–3.3	–4.7	–5.6	–4.3
Iceland	–14.0	–22.8	–9.7	–6.6	–5.3	–4.2	5.7	3.4	4.6	3.4	0.7
San Marino	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Memorandum											
Major Advanced Economies	–1.2	–1.6	–0.7	–0.7	–0.8	–1.0	–0.8	–0.8	–0.6	–0.8	–1.1
Euro Area[2]	0.2	–0.7	0.5	0.5	0.8	2.1	2.8	3.2	3.7	3.6	2.9

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*; corrected for reporting discrepancies in intra-area transactions.
[2]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*; calculated as the sum of the balances of individual euro area countries.

Table A12. Emerging Market and Developing Economies: Balance on Current Account

(Percent of GDP)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	2016	2020
Commonwealth of Independent States[1]	**3.8**	**5.0**	**2.6**	**3.4**	**4.3**	**2.5**	**0.7**	**2.2**	**2.4**	**2.5**	**2.8**
Russia	5.5	6.3	4.1	4.4	5.1	3.5	1.6	3.2	5.0	5.4	4.5
Excluding Russia	–1.5	0.8	–1.8	0.4	1.8	–0.6	–2.3	–0.4	–3.3	–3.5	–1.0
Armenia	–8.5	–15.0	–17.6	–13.6	–10.4	–10.0	–7.6	–7.3	–5.9	–6.4	–5.7
Azerbaijan	27.3	35.5	23.0	28.0	26.5	21.8	16.4	14.1	3.0	2.7	5.1
Belarus	–6.7	–8.2	–12.6	–15.0	–8.5	–2.9	–10.4	–6.7	–4.9	–4.3	–4.1
Georgia	–19.8	–22.0	–10.5	–10.2	–12.8	–11.7	–5.7	–9.7	–10.7	–9.6	–5.4
Kazakhstan	–8.0	4.7	–3.6	0.9	5.4	0.5	0.4	2.1	–3.0	–4.1	0.0
Kyrgyz Republic	–6.0	–15.3	–2.2	–6.1	–9.6	–15.6	–15.0	–16.8	–17.7	–15.7	–9.9
Moldova	–15.2	–16.1	–8.2	–7.5	–11.0	–7.4	–5.0	–3.7	–6.2	–6.4	–3.8
Tajikistan	–8.6	–7.6	–5.9	–1.1	–4.8	–2.5	–2.9	–9.2	–7.5	–6.1	–3.0
Turkmenistan	15.5	16.5	–14.7	–10.6	2.0	0.0	–7.3	–5.8	–13.6	–12.1	–2.6
Ukraine[2]	–3.5	–6.8	–1.4	–2.2	–6.3	–8.1	–9.2	–4.7	–1.7	–1.6	–2.5
Uzbekistan	7.3	8.7	2.2	6.2	5.8	1.8	2.9	1.7	0.2	0.3	0.5
Emerging and Developing Asia	**6.5**	**5.8**	**3.4**	**2.4**	**0.9**	**1.0**	**0.7**	**1.4**	**2.0**	**1.8**	**0.0**
Bangladesh	0.7	1.2	2.4	0.4	–1.0	0.7	1.2	–0.1	–0.9	–1.1	–1.5
Bhutan	14.2	–2.2	–2.2	–9.9	–23.5	–19.0	–22.7	–23.1	–26.8	–25.0	–6.5
Brunei Darussalam	43.1	43.5	41.6	44.0	38.8	29.6	29.4	28.3	–3.1	–2.1	12.5
Cambodia	–1.9	–6.6	–6.9	–6.8	–10.2	–11.0	–12.2	–12.2	–11.1	–10.6	–6.3
China	10.0	9.2	4.8	3.9	1.8	2.5	1.6	2.1	3.1	2.8	0.6
Fiji	–10.1	–15.9	–4.2	–4.1	–4.9	–1.1	–20.7	–9.0	–6.3	–6.6	–7.4
India	–1.3	–2.3	–2.8	–2.8	–4.2	–4.8	–1.7	–1.3	–1.4	–1.6	–2.5
Indonesia	1.4	0.0	1.8	0.7	0.2	–2.7	–3.2	–3.0	–2.2	–2.1	–1.7
Kiribati	–18.3	–19.3	–22.5	–16.3	–31.0	–24.5	–21.8	4.1	–24.9	–26.8	–13.1
Lao P.D.R.	–13.6	–19.2	–22.1	–20.1	–17.3	–30.2	–27.8	–27.8	–28.3	–22.7	–14.8
Malaysia	14.9	16.5	15.0	10.1	10.9	5.2	3.5	4.3	2.2	2.1	1.1
Maldives	–15.2	–28.8	–10.4	–8.1	–16.9	–7.4	–4.4	–6.1	–4.6	–5.8	–3.8
Marshall Islands	–0.9	0.9	–14.9	–26.6	–5.3	–8.7	–13.4	–17.8	–1.0	–4.0	–12.1
Micronesia	–9.5	–16.6	–18.9	–15.1	–17.9	–12.6	–10.1	4.6	0.2	–0.7	–4.2
Mongolia	4.9	–8.9	–6.9	–13.0	–26.5	–27.4	–25.1	–8.2	–8.4	–19.5	–6.2
Myanmar	–0.7	–4.2	–1.2	–1.1	–1.9	–4.2	–5.2	–6.1	–8.9	–8.3	–6.7
Nepal	–0.1	2.7	4.2	–2.4	–1.0	4.8	3.3	4.6	5.0	–2.7	–0.9
Palau	–17.9	–21.3	–7.4	–7.8	–10.5	–17.0	–10.3	–12.7	–7.9	–8.4	–9.3
Papua New Guinea	3.9	8.5	–15.2	–21.5	–23.6	–53.6	–31.8	–4.2	7.5	7.3	4.0
Philippines	5.4	0.1	5.0	3.6	2.5	2.8	4.2	4.4	5.0	4.5	2.5
Samoa	–13.5	–5.5	–5.3	–6.8	–4.0	–8.7	–2.6	–8.0	–6.9	–5.4	–4.1
Solomon Islands	–15.6	–18.2	–21.9	–33.3	–8.6	1.5	–4.5	–4.9	–11.2	–14.0	–11.9
Sri Lanka	–4.3	–9.5	–0.5	–2.2	–7.8	–6.7	–3.8	–2.7	–2.0	–2.0	–2.0
Thailand	6.0	0.7	7.8	2.9	2.4	–0.4	–0.9	3.3	6.2	5.4	0.8
Timor-Leste	40.2	46.1	38.7	41.2	40.6	40.2	42.7	21.4	15.9	15.7	3.4
Tonga	–7.0	–7.3	–7.6	–6.3	–7.5	–5.4	–1.7	–3.1	–6.0	–6.4	1.2
Tuvalu	–13.0	7.1	–1.0	–42.0	–61.3	–25.2	–24.1	–26.1	–36.8	–58.0	–16.4
Vanuatu	–7.3	–10.8	–7.9	–6.5	–8.4	–9.4	–1.4	0.5	–13.5	–13.0	–7.1
Vietnam	–9.0	–11.0	–6.5	–3.8	0.2	6.0	4.5	4.9	0.7	–0.9	2.5
Emerging and Developing Europe	**–7.9**	**–8.0**	**–3.4**	**–5.1**	**–6.4**	**–4.5**	**–3.8**	**–2.9**	**–2.1**	**–2.4**	**–3.8**
Albania	–10.6	–15.8	–15.9	–11.3	–13.2	–10.2	–10.7	–13.0	–13.2	–13.5	–7.3
Bosnia and Herzegovina	–9.4	–14.1	–6.6	–6.2	–9.6	–8.9	–5.8	–7.7	–7.7	–7.6	–5.0
Bulgaria	–24.3	–22.4	–8.6	–1.5	0.1	–1.1	2.3	0.0	1.0	0.2	–1.5
Croatia	–7.1	–8.8	–5.1	–1.1	–0.8	–0.1	0.8	0.7	1.7	1.5	–1.3
Hungary	–7.1	–7.1	–0.8	0.3	0.7	1.8	4.0	4.0	5.0	4.3	1.3
Kosovo	–10.2	–16.2	–9.2	–11.7	–13.7	–7.5	–6.4	–8.0	–8.0	–10.5	–8.7
FYR Macedonia	–6.9	–12.8	–6.8	–2.0	–2.5	–2.9	–1.8	–1.3	–3.2	–4.4	–3.5
Montenegro	–39.5	–49.8	–27.9	–22.9	–17.7	–18.7	–14.6	–15.4	–17.0	–20.8	–14.0
Poland	–6.3	–6.6	–4.0	–5.5	–5.0	–3.4	–1.3	–1.3	–0.5	–1.0	–2.9
Romania	–13.5	–11.5	–4.5	–4.6	–4.6	–4.5	–0.8	–0.4	–0.7	–1.5	–3.7
Serbia	–17.2	–21.0	–6.2	–6.4	–8.6	–11.5	–6.1	–6.0	–4.0	–3.8	–4.0
Turkey	–5.8	–5.5	–2.0	–6.2	–9.7	–6.2	–7.9	–5.8	–4.5	–4.7	–5.5

Table A12. Emerging Market and Developing Economies: Balance on Current Account *(continued)*

(Percent of GDP)

									Projections		
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
Latin America and the Caribbean	**0.2**	**–0.9**	**–0.7**	**–1.9**	**–1.7**	**–2.4**	**–2.9**	**–3.0**	**–3.3**	**–3.0**	**–2.8**
Antigua and Barbuda	–29.9	–26.7	–14.0	–14.7	–10.4	–14.6	–14.8	–14.5	–10.5	–10.2	–12.7
Argentina[3]	2.0	1.5	2.0	–0.4	–0.7	–0.3	–0.8	–1.0	–1.8	–1.6	–1.1
The Bahamas	–11.5	–10.6	–10.3	–10.1	–15.1	–18.3	–17.7	–22.2	–12.9	–8.9	–5.8
Barbados	–5.4	–10.6	–6.7	–5.8	–12.8	–9.3	–9.3	–8.5	–4.8	–4.6	–4.5
Belize	–4.0	–10.6	–4.9	–2.4	–1.1	–1.2	–4.4	–7.6	–6.3	–7.1	–6.5
Bolivia	11.4	11.9	4.3	3.9	0.3	7.2	3.4	0.0	–4.5	–5.0	–2.8
Brazil	0.1	–1.7	–1.5	–3.5	–2.8	–3.5	–3.8	–4.4	–4.0	–3.8	–3.8
Chile	4.1	–3.2	2.0	1.7	–1.2	–3.6	–3.7	–1.2	–0.7	–1.6	–2.2
Colombia	–2.9	–2.6	–2.0	–3.0	–2.9	–3.1	–3.3	–5.2	–6.2	–5.3	–3.9
Costa Rica	–6.3	–9.3	–2.0	–3.5	–5.4	–5.3	–5.0	–4.9	–3.8	–3.9	–4.6
Dominica	–20.6	–28.3	–22.7	–16.2	–13.5	–18.8	–13.3	–13.1	–12.8	–18.9	–12.2
Dominican Republic	–5.0	–9.4	–4.8	–7.4	–7.5	–6.6	–4.1	–3.2	–2.4	–2.5	–4.2
Ecuador	3.7	2.9	0.5	–2.3	–0.3	–0.2	–1.0	–0.6	–2.6	–2.8	–1.8
El Salvador	–6.1	–7.1	–1.5	–2.5	–4.8	–5.4	–6.5	–4.7	–2.6	–2.9	–4.5
Grenada	–30.6	–29.0	–24.3	–23.7	–23.6	–21.1	–23.2	–15.5	–13.7	–13.1	–15.2
Guatemala	–5.2	–3.6	0.7	–1.4	–3.4	–2.6	–2.5	–2.4	–1.7	–1.9	–2.0
Guyana	–9.5	–13.7	–9.1	–9.6	–13.0	–11.6	–13.3	–15.6	–14.9	–18.9	–9.1
Haiti	–1.5	–3.1	–1.9	–1.5	–4.3	–5.7	–6.3	–6.3	–4.3	–3.4	–4.1
Honduras	–9.1	–15.4	–3.8	–4.3	–8.0	–8.5	–9.5	–7.4	–6.5	–6.4	–5.1
Jamaica	–15.3	–17.7	–11.0	–8.0	–12.1	–10.7	–8.7	–7.4	–4.6	–2.9	–1.9
Mexico	–1.4	–1.9	–0.9	–0.5	–1.1	–1.4	–2.4	–1.9	–2.4	–2.0	–2.1
Nicaragua	–15.7	–17.8	–8.6	–8.9	–11.8	–10.6	–11.1	–7.1	–6.6	–7.0	–6.5
Panama	–8.0	–10.9	–0.7	–11.4	–15.9	–9.8	–12.2	–12.0	–9.8	–9.6	–5.7
Paraguay	5.7	1.0	3.0	–0.3	0.5	–0.9	2.2	0.1	–2.0	–1.9	–1.2
Peru	1.5	–4.3	–0.5	–2.4	–1.9	–2.7	–4.2	–4.0	–3.7	–3.8	–3.5
St. Kitts and Nevis	–17.4	–26.8	–25.7	–20.8	–15.9	–9.8	–6.6	–7.6	–12.6	–18.6	–15.8
St. Lucia	–29.4	–28.5	–11.5	–16.2	–18.8	–13.5	–11.2	–6.7	–6.6	–7.0	–8.5
St. Vincent and the Grenadines	–29.4	–33.1	–29.2	–30.6	–29.4	–27.6	–30.9	–29.6	–26.9	–25.1	–19.7
Suriname	11.1	9.2	2.9	14.9	5.7	3.3	–3.9	–7.4	–9.4	–7.8	–6.4
Trinidad and Tobago	23.9	30.5	8.5	19.8	11.9	3.4	7.0	5.7	0.7	–0.8	–1.8
Uruguay	–0.9	–5.7	–1.2	–1.8	–2.7	–5.0	–4.9	–4.4	–3.7	–3.7	–3.4
Venezuela	7.2	11.0	1.0	3.2	8.2	3.7	2.4	5.3	–3.0	–1.9	2.4
Middle East, North Africa, Afghanistan, and Pakistan	**12.5**	**12.7**	**1.8**	**6.2**	**13.0**	**12.0**	**10.2**	**5.6**	**–3.6**	**–4.3**	**–0.3**
Afghanistan	36.8	2.7	13.1	7.5	6.1	6.0	7.4	6.1	4.7	2.4	–1.0
Algeria	22.7	20.1	0.3	7.5	9.9	5.9	0.4	–4.5	–17.7	–16.2	–9.1
Bahrain	13.4	8.8	2.4	3.0	11.2	7.2	7.8	3.3	–4.8	–5.9	–3.3
Djibouti	–21.4	–24.3	–9.3	0.6	–13.7	–20.3	–23.3	–25.6	–31.4	–26.8	–15.4
Egypt	2.1	0.5	–2.3	–2.0	–2.6	–3.9	–2.4	–0.8	–3.7	–4.5	–4.2
Iran	9.7	5.8	2.4	5.9	10.5	4.0	7.0	3.8	0.4	1.3	2.8
Iraq	0.8	15.9	–6.8	3.0	12.0	6.7	1.3	–2.8	–12.7	–11.0	3.9
Jordan	–16.8	–9.4	–5.2	–7.1	–10.3	–15.2	–10.3	–6.8	–7.4	–6.5	–4.9
Kuwait	36.8	40.9	26.7	31.8	42.7	45.2	41.2	31.0	9.3	7.0	9.3
Lebanon	–7.2	–11.1	–12.5	–20.7	–15.1	–24.3	–26.7	–24.9	–21.0	–19.3	–12.9
Libya	44.1	42.5	14.9	19.5	9.1	29.1	13.6	–30.1	–62.2	–49.1	–13.1
Mauritania	–14.5	–13.2	–13.4	–7.6	–6.0	–26.6	–24.4	–28.9	–18.3	–25.6	–17.3
Morocco	–2.5	–7.1	–5.3	–4.4	–7.9	–9.5	–7.9	–5.5	–2.3	–1.6	–1.5
Oman	6.0	8.5	–1.1	8.9	13.2	10.3	6.6	2.0	–16.9	–24.3	–16.5
Pakistan	–4.5	–8.1	–5.5	–2.2	0.1	–2.1	–1.1	–1.3	–0.8	–0.5	–0.9
Qatar	14.4	23.1	6.5	19.1	30.7	32.6	30.9	26.1	5.0	–4.5	0.5
Saudi Arabia	22.5	25.5	4.9	12.7	23.7	22.4	18.2	10.3	–3.5	–4.7	–0.3
Sudan[4]	–6.0	–1.6	–9.6	–2.1	–0.4	–9.3	–8.9	–7.7	–5.8	–5.6	–4.7
Syria[5]	–0.2	–1.3	–2.9	–2.8	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	–2.4	–3.8	–2.8	–4.8	–7.5	–8.2	–8.3	–8.8	–8.5	–7.0	–3.5
United Arab Emirates	12.5	7.1	3.1	2.5	14.7	21.3	18.4	13.7	2.9	3.1	7.3
Yemen	–7.0	–4.6	–10.1	–3.4	–3.0	–1.7	–3.1	–1.7	–5.3	–5.4	–3.9

Table A12. Emerging Market and Developing Economies: Balance on Current Account *(continued)*

(Percent of GDP)

									Projections		
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2020
Sub-Saharan Africa	**1.7**	**0.0**	**–2.8**	**–0.9**	**–0.7**	**–1.9**	**–2.4**	**–4.1**	**–5.7**	**–5.5**	**–4.5**
Angola	17.5	8.5	–10.0	9.1	12.6	12.0	6.7	–1.5	–7.6	–5.6	–3.0
Benin	–10.2	–8.1	–8.9	–8.7	–7.8	–8.4	–10.4	–8.0	–9.3	–9.1	–8.9
Botswana	15.1	–1.1	–11.0	–6.4	–0.6	–3.4	8.8	16.1	2.8	0.1	0.2
Burkina Faso	–8.3	–11.5	–4.5	–2.0	–1.5	–4.5	–6.6	–6.1	–7.9	–7.8	–7.2
Burundi	–5.4	–1.0	1.7	–12.2	–13.6	–17.3	–18.4	–17.6	–11.3	–9.7	–9.3
Cabo Verde	–12.9	–13.7	–14.6	–12.4	–16.3	–12.6	–4.9	–7.6	–9.7	–6.6	–3.9
Cameroon	1.4	–1.2	–3.1	–2.8	–2.7	–3.6	–3.8	–4.6	–5.0	–5.2	–4.2
Central African Republic	–6.2	–9.9	–9.1	–10.2	–7.6	–4.6	–3.0	–6.1	–11.8	–11.2	–6.6
Chad	8.2	3.7	–9.2	–9.0	–5.6	–8.7	–9.2	–8.9	–10.4	–9.3	–5.5
Comoros	–10.1	–18.7	–15.4	–5.8	–14.0	–17.6	–16.2	–11.5	–15.7	–17.0	–14.7
Democratic Republic of the Congo	3.2	–0.8	–6.1	–10.5	–5.2	–6.2	–10.6	–9.2	–7.6	–8.0	–12.0
Republic of Congo	–6.5	–0.5	–14.1	7.5	4.7	–2.4	–4.5	–9.4	–15.2	–14.6	–4.0
Côte d'Ivoire	–0.7	1.9	6.6	1.9	10.5	–1.2	–1.4	–0.7	–1.0	–1.9	–3.3
Equatorial Guinea	26.6	3.6	–23.1	–34.4	–0.1	–2.2	–4.0	–10.0	–8.7	–3.1	0.7
Eritrea	–6.1	–5.5	–7.6	–5.6	0.6	2.3	0.3	–0.9	–2.2	–3.0	–5.4
Ethiopia	–4.2	–6.7	–6.7	–1.4	–2.5	–6.9	–5.9	–8.0	–12.5	–9.3	–6.3
Gabon	14.4	22.0	4.7	8.7	12.8	15.9	12.3	8.3	–7.0	–4.2	–5.1
The Gambia	–8.3	–12.2	–12.5	–16.3	–12.3	–7.9	–10.2	–13.1	–13.5	–10.2	–8.9
Ghana	–8.7	–11.9	–5.4	–8.6	–9.0	–11.7	–11.9	–9.6	–8.3	–7.2	–4.2
Guinea	–10.8	–9.7	–7.9	–9.7	–18.8	–28.7	–24.0	–24.2	–16.7	–36.8	–13.6
Guinea-Bissau	–3.2	–2.5	–5.4	–8.7	–1.5	–8.8	–4.4	–1.2	–3.5	–4.6	–7.9
Kenya	–3.2	–5.5	–4.6	–5.9	–9.1	–8.4	–8.9	–10.4	–9.6	–9.2	–6.5
Lesotho	21.8	21.1	3.9	–10.0	–14.7	–9.8	–10.3	–7.9	–6.3	–13.9	–7.8
Liberia	–6.2	–46.6	–23.2	–32.0	–27.5	–21.4	–28.2	–28.7	–41.6	–37.1	–28.4
Madagascar	–12.7	–20.6	–21.1	–9.7	–6.9	–6.7	–5.6	–0.2	–1.3	–2.2	–4.0
Malawi	0.8	–7.8	–3.9	–1.0	–4.1	–2.4	–1.2	–3.6	–2.6	–2.5	–1.6
Mali	–8.1	–12.1	–7.3	–12.6	–6.1	–2.6	–3.4	–7.3	–3.3	–4.2	–6.4
Mauritius	–5.4	–10.1	–7.4	–10.3	–13.8	–7.3	–6.3	–5.6	–4.8	–4.8	–5.5
Mozambique	–9.5	–11.6	–11.0	–10.6	–23.1	–42.3	–40.0	–34.7	–41.0	–45.3	–40.7
Namibia	8.6	3.0	–1.5	–3.5	–3.0	–5.6	–3.9	–9.9	–12.1	–16.3	–7.1
Niger	–8.2	–12.0	–24.4	–19.8	–22.3	–14.6	–15.3	–15.2	–19.1	–23.4	–9.7
Nigeria	10.7	9.0	5.1	3.9	3.0	4.4	3.6	0.2	–1.8	–1.2	–0.3
Rwanda	–2.3	–5.0	–7.1	–7.3	–7.5	–11.4	–7.4	–11.9	–10.6	–9.6	–7.9
São Tomé and Príncipe	–29.0	–33.1	–23.2	–21.7	–25.5	–21.3	–23.4	–27.7	–12.4	–15.2	–11.4
Senegal	–11.8	–14.2	–6.8	–4.4	–8.2	–10.9	–10.4	–8.8	–6.1	–5.2	–4.5
Seychelles	–10.8	–19.1	–14.8	–19.1	–21.6	–19.9	–11.5	–21.0	–15.2	–14.7	–11.5
Sierra Leone	–7.4	–9.0	–13.3	–22.7	–65.3	–22.0	–10.4	–9.7	–11.4	–14.5	–9.4
South Africa	–5.4	–5.5	–2.7	–1.5	–2.2	–5.0	–5.8	–5.4	–4.3	–4.5	–4.0
South Sudan	. . .	. . .	. . .	. . .	18.4	–19.6	–1.2	2.7	–4.8	–3.6	–7.2
Swaziland	–1.9	–7.1	–11.6	–8.6	–6.8	3.1	5.2	2.9	1.1	–2.8	–1.7
Tanzania	–8.6	–7.8	–7.6	–7.7	–10.8	–11.7	–10.3	–9.3	–8.2	–7.1	–6.8
Togo	–8.6	–7.0	–5.6	–6.3	–8.0	–7.5	–13.0	–12.9	–12.2	–11.5	–10.2
Uganda	–4.5	–7.7	–6.4	–9.1	–10.8	–8.0	–7.2	–9.7	–10.5	–11.3	–11.0
Zambia	–1.2	–3.3	6.0	7.5	4.6	5.5	–0.6	–1.4	–1.4	–2.6	1.8
Zimbabwe[6]	–5.4	–16.6	–47.1	–16.0	–30.9	–24.6	–25.4	–22.0	–22.9	–21.8	–22.6

[1]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[2]Starting in 2014 data exclude Crimea and Sevastopol.
[3]Calculations are based on Argentina's official GDP data. See note 5 to Table A4.
[4]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[5]Data for Syria are excluded for 2011 onward because of the ongoing conflict and related lack of data.
[6]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates.

Table A13. Summary of Financial Account Balances

(Billions of U.S. dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	Projections 2016
Advanced Economies										
Financial Account Balance	–284.4	–721.8	–4.6	–50.4	–198.6	–94.4	227.9	480.7	520.6	399.1
Direct Investment, Net	529.5	659.5	306.6	355.9	378.4	194.5	180.7	364.2	100.8	215.3
Portfolio Investment, Net	–1,008.5	–1,200.7	–367.8	–733.0	–685.6	–105.4	–277.2	–152.7	137.8	–50.2
Financial Derivatives, Net	175.4	337.2	–129.8	–87.7	1.8	–71.1	48.4	–62.6	–77.4	–88.6
Other Investment, Net	–47.8	–594.9	–293.6	66.7	–40.1	–383.6	123.3	196.6	243.5	251.5
Change in Reserves	67.2	74.2	482.3	347.7	340.5	270.4	153.7	135.8	114.2	70.9
United States										
Financial Account Balance	–617.3	–730.6	–231.0	–437.0	–515.8	–441.2	–395.8	–239.6	–198.8	–289.7
Direct Investment, Net	192.9	19.0	159.9	95.2	183.0	145.9	112.0	225.4	–26.3	111.7
Portfolio Investment, Net	–775.8	–808.0	18.5	–620.8	–226.3	–508.2	–25.7	–167.0	119.5	–85.3
Financial Derivatives, Net	–6.2	32.9	–44.8	–14.1	–35.0	7.1	2.2	–54.4	–63.4	–33.0
Other Investment, Net	–28.2	20.6	–416.9	100.9	–453.4	–90.4	–481.2	–240.1	–224.5	–283.1
Change in Reserves	0.1	4.8	52.3	1.8	15.9	4.5	–3.1	–3.6	–4.2	0.0
Euro Area[1]										
Financial Account Balance	92.2	–78.1	33.2	–86.0	–154.1	288.1	544.4	391.5	. . .	. . .
Direct Investment, Net	107.6	305.0	73.7	93.5	151.0	8.4	18.2	26.2	. . .	. . .
Portfolio Investment, Net	–108.4	–289.8	–380.7	–126.9	–442.7	–51.6	–14.7	125.2	. . .	. . .
Financial Derivatives, Net	8.5	35.5	29.5	–4.4	5.3	43.4	43.5	60.3	. . .	. . .
Other Investment, Net	82.4	–128.5	250.7	–62.5	118.9	267.7	491.1	173.8	. . .	. . .
Change in Reserves	2.1	–0.3	60.0	14.3	13.4	20.2	6.3	6.0	. . .	. . .
Germany										
Financial Account Balance	253.4	182.0	184.4	123.7	167.7	202.3	276.5	323.2	286.3	277.9
Direct Investment, Net	89.8	67.1	43.0	60.6	10.3	45.6	11.1	110.3	20.9	21.5
Portfolio Investment, Net	–215.4	–44.5	119.2	154.1	–51.4	70.6	218.1	168.2	148.9	144.6
Financial Derivatives, Net	116.4	44.0	–7.5	17.6	39.8	31.2	32.3	42.3	37.4	36.3
Other Investment, Net	261.3	110.6	17.4	–110.7	165.1	53.1	13.9	5.8	79.0	75.4
Change in Reserves	1.2	2.7	12.4	2.1	3.9	1.7	1.2	–3.3	0.0	0.0
France										
Financial Account Balance	2.3	–46.6	–50.9	1.6	–72.9	–52.7	–23.7	–14.4	–2.8	–6.7
Direct Investment, Net	47.2	66.0	70.3	34.3	19.4	14.7	–17.9	27.7	28.0	32.9
Portfolio Investment, Net	166.1	–37.8	–328.7	–155.0	–141.7	–50.6	–80.5	–9.8	22.2	40.7
Financial Derivatives, Net	–6.8	40.0	–15.5	–4.1	–19.4	–18.4	–22.3	–31.8	–53.3	–81.2
Other Investment, Net	–204.9	–102.3	214.7	118.7	269.9	–3.6	98.9	–1.6	–1.3	–1.3
Change in Reserves	0.7	–12.5	8.4	7.7	–7.7	5.2	–1.9	1.0	1.7	2.3
Italy										
Financial Account Balance	–40.0	–49.0	–55.3	–116.4	–96.1	–19.0	15.0	66.7	38.8	44.6
Direct Investment, Net	52.5	76.2	–0.3	21.3	17.1	6.8	4.8	12.0	10.4	9.6
Portfolio Investment, Net	–7.6	–110.7	–55.4	56.4	13.5	–33.3	–19.3	–5.9	–15.0	–9.5
Financial Derivatives, Net	3.8	–0.4	–6.9	6.6	–10.1	7.5	4.0	–4.8	0.0	0.0
Other Investment, Net	–90.7	–22.3	–1.6	–202.1	–118.0	–1.9	23.5	66.6	43.4	44.5
Change in Reserves	2.1	8.2	8.8	1.4	1.3	1.9	2.0	–1.3	0.0	0.0

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	Projections 2016
Spain										
Financial Account Balance	–137.5	–147.6	–70.8	–56.9	–41.4	0.3	53.9	35.4	15.8	19.2
Direct Investment, Net	72.9	–2.3	2.7	–1.9	12.8	–29.7	–15.9	9.1	6.0	5.7
Portfolio Investment, Net	–122.3	1.9	–69.6	–46.6	43.1	53.7	–59.8	–1.4	–3.8	–4.7
Financial Derivatives, Net	5.6	10.4	8.4	–11.4	2.9	–10.7	1.4	2.2	0.0	0.0
Other Investment, Net	–93.9	–158.6	–18.4	1.9	–114.1	–15.8	127.5	20.4	13.5	18.2
Change in Reserves	0.2	0.9	6.0	1.1	13.9	2.8	0.7	5.2	0.0	0.0
Japan										
Financial Account Balance	224.3	181.6	168.8	247.3	158.4	53.9	–9.6	51.1	142.4	123.5
Direct Investment, Net	51.7	89.1	61.2	72.5	117.8	117.5	139.4	110.9	100.5	95.8
Portfolio Investment, Net	–68.3	289.0	211.7	147.9	–162.9	28.8	–280.6	–42.9	32.9	33.3
Financial Derivatives, Net	–2.9	–24.9	–10.5	–11.9	–17.1	6.7	58.1	32.9	29.9	30.3
Other Investment, Net	207.3	–202.3	–120.9	–5.5	43.4	–61.1	34.8	–58.2	–30.7	–45.4
Change in Reserves	36.5	30.8	27.2	44.3	177.3	–37.9	38.7	8.5	9.8	9.5
United Kingdom										
Financial Account Balance	–71.2	–84.1	–49.0	–44.4	–23.6	–77.9	–102.3	–171.7	–134.5	–129.2
Direct Investment, Net	137.7	95.5	–70.1	–12.3	66.0	–30.5	–62.7	–126.4	–64.4	–61.9
Portfolio Investment, Net	–216.4	–453.3	–48.7	20.9	11.1	331.9	–49.1	–164.5	–101.3	–130.9
Financial Derivatives, Net	54.0	223.2	–45.4	–39.4	4.9	–47.6	21.8	–23.0	0.0	–11.0
Other Investment, Net	–48.8	53.0	106.2	–23.0	–113.5	–343.8	–20.1	130.4	21.9	64.2
Change in Reserves	2.4	–2.5	9.0	9.4	7.9	12.1	7.8	11.7	9.3	10.4
Canada										
Financial Account Balance	14.7	–2.6	–41.0	–55.0	–54.6	–59.2	–54.1	–33.6	–57.7	–49.0
Direct Investment, Net	–52.2	17.7	16.9	6.3	12.5	14.7	–20.0	–0.3	18.0	5.0
Portfolio Investment, Net	73.5	–40.8	–89.7	–96.1	–83.1	–48.4	–13.4	–3.4	–34.0	–28.0
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–10.8	18.9	21.7	30.9	7.8	–27.2	–25.4	–35.2	–41.7	–26.0
Change in Reserves	4.3	1.6	10.2	3.9	8.1	1.7	4.7	5.3	0.0	0.0
Other Advanced Economies[2]										
Financial Account Balance	124.6	66.5	146.3	282.0	283.0	256.0	359.6	351.6	317.1	300.6
Direct Investment, Net	11.3	19.3	16.6	96.4	–10.9	–22.7	9.0	0.8	36.4	33.4
Portfolio Investment, Net	180.5	180.4	–106.8	–51.7	41.7	139.4	115.2	145.6	68.5	103.8
Financial Derivatives, Net	–0.6	–12.6	19.9	–17.9	41.0	–26.3	–24.8	–26.8	–22.5	–22.7
Other Investment, Net	–78.3	–163.9	–112.5	–19.0	96.4	–106.7	159.5	125.0	137.0	140.1
Change in Reserves	11.9	42.6	331.6	274.2	114.9	271.6	101.8	107.4	97.4	47.5
Emerging Market and Developing Economies										
Financial Account Balance	582.3	610.5	75.7	140.2	246.2	143.6	16.0	–72.8	–6.0	–43.1
Direct Investment, Net	–439.3	–464.5	–330.4	–430.3	–518.1	–469.2	–495.3	–453.1	–343.9	–357.3
Portfolio Investment, Net	–24.4	136.9	–78.9	–261.2	–158.8	–270.2	–161.5	–127.0	–54.3	–109.6
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–174.2	229.2	–39.9	–6.3	170.2	448.3	102.2	391.0	852.1	375.7
Change in Reserves	1,218.8	701.8	524.9	835.6	751.3	439.2	572.6	113.8	–459.5	50.7

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	Projections 2016
Regional Groups										
Commonwealth of Independent States[3]										
Financial Account Balance	49.6	92.7	23.1	66.0	91.9	48.2	–1.5	13.7	48.3	47.7
Direct Investment, Net	–28.3	–49.4	–17.2	–9.4	–16.1	–27.8	–4.9	18.3	–16.4	–17.9
Portfolio Investment, Net	3.8	35.8	–6.3	–14.4	17.9	3.5	–0.1	27.7	19.7	5.7
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–93.7	131.8	36.3	35.9	65.0	44.5	26.8	80.7	90.1	60.4
Change in Reserves	167.8	–26.7	7.2	52.0	23.9	26.6	–23.8	–113.1	–44.7	0.2
Emerging and Developing Asia										
Financial Account Balance	412.4	448.6	215.6	141.9	60.2	3.3	21.7	44.2	317.0	302.5
Direct Investment, Net	–172.4	–151.9	–115.6	–223.0	–278.2	–223.0	–272.4	–275.6	–138.1	–124.1
Portfolio Investment, Net	–56.4	8.1	–65.6	–99.4	–59.0	–116.9	–65.6	–152.1	–11.1	–20.6
Financial Derivatives, Net	. . .	. . .	. . .	0.4	–0.3	–3.2	2.0	–5.5	–0.2	–0.2
Other Investment, Net	22.0	114.4	–63.4	–102.5	–35.7	208.5	–93.5	276.2	714.9	279.2
Change in Reserves	619.1	476.4	462.4	566.7	434.6	135.2	451.5	196.1	–248.7	167.8
Emerging and Developing Europe										
Financial Account Balance	–126.5	–160.1	–53.4	–89.5	–108.1	–64.1	–67.6	–39.5	–15.9	–34.5
Direct Investment, Net	–69.9	–63.7	–30.6	–27.0	–40.1	–26.5	–26.7	–26.2	–25.6	–28.1
Portfolio Investment, Net	6.1	14.4	–10.1	–45.4	–53.2	–70.2	–39.8	–19.4	2.2	–12.3
Financial Derivatives, Net	1.4	2.5	0.9	0.0	1.5	–2.9	–1.4	0.1	0.1	–1.7
Other Investment, Net	–98.7	–119.7	–41.5	–52.8	–30.4	7.6	–15.6	5.4	0.2	6.2
Change in Reserves	35.6	5.9	29.6	35.7	14.5	28.0	18.4	–0.1	7.4	1.5
Latin America and the Caribbean										
Financial Account Balance	17.2	–37.4	–24.4	–116.2	–113.8	–164.6	–212.8	–201.0	–171.9	–147.4
Direct Investment, Net	–94.6	–101.3	–71.8	–91.9	–132.1	–139.1	–165.2	–137.2	–114.0	–119.4
Portfolio Investment, Net	–44.6	–6.7	–23.8	–131.4	–118.4	–114.6	–105.0	–111.7	–69.9	–71.9
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	24.8	28.1	15.2	15.8	23.3	30.4	50.6	6.9	32.8	56.5
Change in Reserves	130.7	41.3	55.5	90.7	111.0	59.4	6.2	37.6	–22.3	–14.1
Middle East, North Africa, Afghanistan, and Pakistan										
Financial Account Balance	223.5	272.4	–35.6	140.0	323.4	340.7	325.7	181.5	–104.4	–130.1
Direct Investment, Net	–52.0	–61.9	–66.1	–45.2	–21.5	–22.0	–5.0	–10.8	–18.3	–29.0
Portfolio Investment, Net	72.8	61.9	35.3	29.4	69.7	53.7	65.8	142.1	14.1	0.3
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–35.0	85.1	17.5	64.0	129.7	138.1	143.8	49.1	39.9	0.1
Change in Reserves	237.7	187.3	–22.3	91.7	145.4	171.0	121.1	1.1	–140.1	–101.5
Sub-Saharan Africa										
Financial Account Balance	6.1	–5.6	–49.6	–1.9	–7.5	–20.0	–49.5	–71.8	–79.1	–81.3
Direct Investment, Net	–22.0	–36.3	–29.1	–33.8	–30.2	–30.7	–21.1	–21.5	–31.5	–38.8
Portfolio Investment, Net	–6.2	23.6	–8.4	–0.1	–15.8	–25.7	–16.8	–13.4	–9.3	–10.9
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	6.4	–10.5	–4.0	33.4	18.3	19.1	–9.8	–27.4	–25.8	–26.7
Change in Reserves	27.9	17.6	–7.5	–1.2	21.8	19.0	–0.9	–7.7	–11.0	–3.2

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	Projections 2015	Projections 2016
Analytical Groups										
By Source of Export Earnings										
Fuel										
Financial Account Balance	344.8	457.9	10.7	250.8	502.2	491.4	378.2	213.9	–61.4	–76.3
Direct Investment, Net	–53.5	–84.8	–62.0	–28.3	–28.5	–40.7	4.8	16.8	–29.8	–39.3
Portfolio Investment, Net	86.2	99.3	12.0	21.8	77.7	38.3	65.4	162.6	30.0	0.8
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–84.2	270.1	107.7	142.5	254.4	240.9	209.6	153.3	172.2	102.5
Change in Reserves	396.2	172.1	–49.8	113.2	197.4	252.1	98.1	–119.2	–233.6	–139.5
Nonfuel										
Financial Account Balance	237.5	152.6	65.0	–110.6	–256.0	–347.8	–362.3	–286.7	55.4	33.2
Direct Investment, Net	–385.8	–379.7	–268.4	–402.0	–489.6	–428.5	–500.1	–469.8	–314.2	–318.1
Portfolio Investment, Net	–110.6	37.7	–90.9	–283.0	–236.4	–308.5	–227.0	–289.6	–84.4	–110.4
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–89.9	–40.9	–147.6	–148.9	–84.2	207.5	–107.4	237.7	679.9	273.2
Change in Reserves	822.6	529.7	574.6	722.4	553.9	187.1	474.5	233.0	–225.9	190.2
By External Financing Source										
Net Debtor Economies										
Financial Account Balance	–156.8	–308.3	–159.6	–292.8	–377.5	–485.9	–457.0	–381.5	–316.0	–332.6
Direct Investment, Net	–258.7	–280.2	–192.0	–196.3	–262.4	–260.1	–286.5	–275.5	–245.2	–272.7
Portfolio Investment, Net	–86.0	73.2	–71.3	–266.9	–205.7	–251.8	–176.1	–216.2	–99.7	–137.1
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–161.1	–159.0	–63.2	–81.4	–81.4	–63.2	–50.6	–8.0	–9.7	–17.5
Change in Reserves	347.3	52.2	170.2	251.2	172.0	95.2	58.6	115.9	38.6	96.4
Net Debtor Economies by Debt-Servicing Experience										
Economies with Arrears and/or Rescheduling during 2010–14										
Financial Account Balance	–9.4	–14.7	–10.4	–1.7	–18.0	–43.7	–45.2	–24.3	–29.6	–35.9
Direct Investment, Net	–28.2	–30.8	–16.7	–20.6	–18.3	–22.3	–18.0	–13.7	–17.7	–22.8
Portfolio Investment, Net	–7.7	4.8	15.4	–8.1	3.0	1.2	–10.7	–1.1	0.2	–2.5
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	9.4	2.3	–1.2	13.4	6.8	0.7	–14.0	1.0	–30.0	–18.7
Change in Reserves	17.0	9.0	–7.8	13.6	–9.6	–23.4	–2.5	–10.6	17.9	8.2
Memorandum										
World										
Financial Account Balance	297.9	–111.3	71.0	89.8	47.5	49.2	243.8	407.9	514.6	356.0

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. Some group aggregates for the financial derivatives are not shown because of incomplete data. Projections for the euro area are not available because of data constraints.

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.

[2]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A14. Summary of Net Lending and Borrowing

(Percent of GDP)

	Averages								Projections		
	1997–2006	2001–08	2009	2010	2011	2012	2013	2014	2015	2016	Average 2017–20
Advanced Economies											
Net Lending and Borrowing	–0.6	–0.9	–0.2	0.0	–0.1	0.0	0.5	0.4	0.5	0.3	0.1
Current Account Balance	–0.6	–0.9	–0.2	0.0	–0.1	0.0	0.4	0.4	0.5	0.3	0.1
Savings	22.6	21.9	19.2	20.3	20.8	21.2	21.4	21.7	21.5	21.2	21.5
Investment	22.9	22.6	19.6	20.4	20.9	20.8	20.6	20.8	20.8	20.9	21.5
Capital Account Balance	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
United States											
Net Lending and Borrowing	–4.0	–4.8	–2.7	–3.0	–3.0	–2.7	–2.3	–2.2	–2.6	–3.0	–3.3
Current Account Balance	–4.0	–4.8	–2.7	–3.0	–3.0	–2.8	–2.3	–2.2	–2.6	–2.9	–3.3
Savings	19.3	17.8	14.3	15.0	15.7	17.7	18.2	18.8	18.2	17.7	17.8
Investment	22.6	22.2	17.5	18.4	18.5	19.4	19.5	19.9	20.3	20.6	21.1
Capital Account Balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Euro Area[1]											
Net Lending and Borrowing	. . .	–0.1	0.0	0.2	0.2	1.3	2.0	2.3	. . .	. . .	. . .
Current Account Balance	–0.4	–0.2	–0.2	0.1	0.1	1.2	1.8	2.0	3.2	3.0	2.6
Savings	23.0	23.0	20.8	21.5	22.3	22.2	22.3	22.7	22.9	23.0	23.1
Investment	22.4	22.7	20.4	21.0	21.5	20.1	19.6	19.4	19.1	19.3	20.0
Capital Account Balance	. . .	0.1	0.1	0.1	0.2	0.1	0.2	0.2	. . .	. . .	. . .
Germany											
Net Lending and Borrowing	1.3	3.7	5.7	5.7	6.1	6.9	6.4	7.5	8.5	8.0	7.2
Current Account Balance	1.3	3.8	5.7	5.6	6.1	6.8	6.4	7.4	8.5	8.0	7.2
Savings	22.6	23.9	23.8	25.2	27.2	26.1	25.8	26.7	27.3	27.0	26.5
Investment	21.3	20.2	18.1	19.6	21.1	19.3	19.4	19.3	18.8	19.0	19.3
Capital Account Balance	0.0	0.0	–0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0
France											
Net Lending and Borrowing	1.7	0.4	–0.7	–0.8	–1.0	–1.2	–0.7	–0.8	–0.1	–0.3	–0.3
Current Account Balance	1.7	0.3	–0.8	–0.8	–1.0	–1.2	–0.8	–0.9	–0.2	–0.4	–0.4
Savings	23.2	22.8	20.5	21.1	22.2	21.5	21.5	21.2	21.5	21.2	21.7
Investment	21.5	22.5	21.3	21.9	23.2	22.6	22.3	22.2	21.7	21.6	22.1
Capital Account Balance	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Italy											
Net Lending and Borrowing	0.4	–0.9	–1.9	–3.5	–3.0	–0.2	0.9	2.1	2.1	2.4	1.3
Current Account Balance	0.3	–0.9	–1.9	–3.5	–3.1	–0.4	0.9	1.9	2.0	2.3	1.2
Savings	21.0	20.5	17.5	17.1	17.4	17.4	18.2	18.4	18.3	18.6	18.6
Investment	20.7	21.4	19.4	20.5	20.4	17.8	17.3	16.5	16.3	16.3	17.4
Capital Account Balance	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.1	0.1
Spain											
Net Lending and Borrowing	–3.6	–5.9	–4.0	–3.5	–2.8	0.2	2.1	1.2	1.3	1.5	1.7
Current Account Balance	–4.4	–6.6	–4.3	–3.9	–3.2	–0.3	1.4	0.8	0.9	1.1	1.3
Savings	22.4	22.4	20.3	19.6	18.7	19.9	20.4	20.3	20.6	21.0	21.3
Investment	26.9	29.0	24.6	23.5	21.9	20.2	19.0	19.5	19.8	19.9	20.0
Capital Account Balance	0.8	0.7	0.3	0.5	0.4	0.5	0.7	0.4	0.4	0.4	0.4
Japan											
Net Lending and Borrowing	2.9	3.3	2.8	3.9	2.2	1.0	0.7	0.5	2.9	3.0	2.8
Current Account Balance	3.0	3.4	2.9	4.0	2.2	1.0	0.8	0.5	3.0	3.0	2.9
Savings	27.1	26.3	22.6	23.8	22.4	21.9	22.0	22.4	24.8	24.3	24.5
Investment	24.1	22.8	19.7	19.8	20.2	20.9	21.1	21.9	21.8	21.3	21.6
Capital Account Balance	–0.2	–0.1	–0.1	–0.1	0.0	0.0	–0.2	0.0	–0.1	–0.1	–0.1
United Kingdom											
Net Lending and Borrowing	–1.7	–2.2	–2.7	–2.5	–1.6	–3.7	–4.4	–5.8	–4.7	–4.2	–2.6
Current Account Balance	–1.7	–2.2	–2.8	–2.6	–1.7	–3.7	–4.5	–5.9	–4.7	–4.3	–2.7
Savings	17.4	16.4	12.3	13.7	14.6	12.6	12.5	11.9	12.8	13.4	15.8
Investment	19.1	18.6	15.0	16.3	16.3	16.3	17.0	17.8	17.5	17.7	18.4
Capital Account Balance	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0

Table A14. Summary of Net Lending and Borrowing *(continued)*

(Percent of GDP)

	Averages								Projections		
	1997–2006	2001–08	2009	2010	2011	2012	2013	2014	2015	2016	Average 2017–20
Canada											
Net Lending and Borrowing	1.0	1.4	–3.0	–3.5	–2.7	–3.3	–3.0	–2.1	–2.9	–2.3	–2.3
Current Account Balance	1.0	1.4	–2.9	–3.5	–2.7	–3.3	–3.0	–2.1	–2.9	–2.3	–2.3
Savings	22.3	23.5	18.9	19.8	21.5	21.6	21.5	21.9	21.0	20.8	20.6
Investment	21.3	22.1	21.8	23.3	24.1	24.9	24.5	24.0	23.6	22.7	22.6
Capital Account Balance	0.0	0.0	–0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Advanced Economies[2]											
Net Lending and Borrowing	3.6	3.9	4.1	4.9	4.0	4.1	5.1	4.8	5.1	4.7	4.2
Current Account Balance	3.6	4.0	4.1	4.8	4.0	4.1	5.0	5.0	5.1	4.7	4.3
Savings	29.5	29.9	28.9	31.0	30.8	30.5	30.6	30.5	30.4	30.3	30.3
Investment	26.0	25.9	24.7	25.9	26.7	26.4	25.4	25.5	25.3	25.5	26.1
Capital Account Balance	–0.1	–0.1	0.0	0.0	0.0	0.0	0.1	–0.1	0.0	–0.1	–0.1
Emerging Market and Developing Economies											
Net Lending and Borrowing	1.6	3.0	1.4	1.5	1.6	1.4	0.7	0.5	0.0	–0.1	–0.4
Current Account Balance	1.5	2.9	1.3	1.2	1.5	1.3	0.6	0.5	–0.1	–0.2	–0.5
Savings	26.5	29.7	31.3	32.3	33.0	32.8	32.0	32.1	31.9	31.7	30.6
Investment	25.3	27.0	30.1	31.1	31.6	31.6	31.4	31.6	31.9	31.7	31.0
Capital Account Balance	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Regional Groups											
Commonwealth of Independent States[3]											
Net Lending and Borrowing	6.1	5.8	1.9	3.9	4.3	2.4	0.7	0.6	2.4	2.6	3.1
Current Account Balance	6.4	6.7	2.6	3.4	4.3	2.5	0.7	2.2	2.4	2.5	3.1
Savings	26.7	29.3	21.9	26.2	28.9	26.6	23.1	23.4	23.8	23.3	24.2
Investment	20.6	22.8	19.1	22.6	24.5	24.0	22.3	21.0	21.0	20.3	20.8
Capital Account Balance	–0.4	–0.9	–0.7	0.4	0.0	–0.2	0.0	–1.6	0.0	0.0	0.0
Emerging and Developing Asia											
Net Lending and Borrowing	2.7	3.9	3.5	2.5	0.9	1.0	0.8	1.4	2.1	1.9	0.5
Current Account Balance	2.6	3.8	3.4	2.4	0.9	1.0	0.7	1.4	2.0	1.8	0.5
Savings	34.7	38.4	43.6	43.8	43.0	42.8	42.3	42.7	42.1	41.0	38.0
Investment	32.6	35.0	40.2	41.4	42.1	41.8	41.6	41.3	40.0	39.2	37.4
Capital Account Balance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0
Emerging and Developing Europe											
Net Lending and Borrowing	–3.7	–4.9	–2.7	–4.4	–5.6	–3.5	–2.7	–1.6	–1.1	–1.6	–2.7
Current Account Balance	–3.9	–5.1	–3.4	–5.1	–6.4	–4.5	–3.8	–2.9	–2.1	–2.4	–3.5
Savings	17.7	16.9	16.1	15.9	16.7	16.5	16.7	17.7	18.8	18.9	18.2
Investment	21.6	22.1	19.4	21.0	23.1	21.0	20.5	20.5	20.8	21.2	21.6
Capital Account Balance	0.2	0.3	0.7	0.7	0.8	1.0	1.2	1.4	1.0	0.8	0.8
Latin America and the Caribbean											
Net Lending and Borrowing	–1.0	0.1	–0.7	–1.7	–1.7	–2.4	–2.9	–3.0	–3.2	–3.0	–2.8
Current Account Balance	–1.1	0.0	–0.7	–1.9	–1.7	–2.4	–2.9	–3.0	–3.3	–3.0	–2.9
Savings	18.8	20.6	19.6	19.8	20.4	19.3	18.6	18.0	16.8	16.5	17.2
Investment	19.9	20.6	20.4	21.7	22.1	21.7	21.6	21.2	20.0	19.5	20.1
Capital Account Balance	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Middle East, North Africa, Afghanistan, and Pakistan											
Net Lending and Borrowing	6.6	10.2	1.6	6.4	13.0	11.9	10.1	5.6	–3.6	–4.2	–0.8
Current Account Balance	6.4	9.9	1.8	6.2	13.0	12.0	10.2	5.6	–3.6	–4.3	–1.1
Savings	31.5	36.0	32.1	34.9	38.6	38.3	35.5	31.5	23.6	23.4	26.2
Investment	24.8	26.1	30.7	29.1	25.9	26.4	24.9	25.5	25.9	26.1	25.7
Capital Account Balance	0.3	0.2	–0.1	0.1	0.0	–0.1	–0.1	0.1	0.0	0.1	0.0
Sub-Saharan Africa											
Net Lending and Borrowing	1.1	2.3	–2.0	0.8	–0.2	–1.3	–2.0	–3.7	–5.3	–5.1	–4.5
Current Account Balance	–0.2	0.9	–2.8	–0.9	–0.7	–1.9	–2.4	–4.1	–5.7	–5.5	–4.8
Savings	17.6	19.9	18.7	19.7	19.3	18.6	17.5	16.3	15.4	15.8	17.0
Investment	20.1	19.3	21.7	20.4	20.1	20.4	20.3	20.5	21.3	21.5	21.9
Capital Account Balance	1.3	1.4	0.8	1.7	0.5	0.6	0.4	0.3	0.4	0.4	0.4

Table A14. Summary of Net Lending and Borrowing *(continued)*

(Percent of GDP)

	Averages								Projections		
	1997–2006	2001–08	2009	2010	2011	2012	2013	2014	2015	2016	Average 2017–20
Analytical Groups											
By Source of Export Earnings											
Fuel											
Net Lending and Borrowing	7.4	10.0	3.0	6.6	10.4	9.1	7.1	4.0	–1.4	–1.6	1.2
Current Account Balance	7.4	10.2	3.3	6.2	10.4	9.2	7.1	4.7	–1.4	–1.6	1.0
Savings	30.8	34.4	28.7	31.6	34.9	34.1	30.6	28.3	23.7	23.5	25.6
Investment	23.5	24.5	25.6	25.4	24.8	24.9	23.3	23.4	23.9	23.8	23.4
Capital Account Balance	0.0	–0.2	–0.3	0.3	0.0	–0.1	0.0	–0.7	0.0	0.0	0.0
Nonfuel											
Net Lending and Borrowing	0.0	0.9	1.0	0.1	–1.0	–1.0	–1.1	–0.4	0.3	0.2	–0.7
Current Account Balance	–0.2	0.7	0.8	–0.2	–1.1	–1.1	–1.2	–0.6	0.2	0.1	–0.8
Savings	25.3	28.3	32.1	32.5	32.4	32.4	32.3	33.1	33.6	33.2	31.6
Investment	25.9	27.7	31.3	32.6	33.5	33.5	33.6	33.6	33.4	33.1	32.4
Capital Account Balance	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
By External Financing Source											
Net Debtor Economies											
Net Lending and Borrowing	–1.1	–1.0	–1.4	–2.0	–2.6	–3.4	–3.0	–2.5	–2.3	–2.4	–2.6
Current Account Balance	–1.4	–1.3	–1.6	–2.4	–2.8	–3.6	–3.3	–2.7	–2.6	–2.6	–2.8
Savings	20.5	21.8	22.2	22.8	23.1	21.8	21.2	21.4	21.5	21.6	22.2
Investment	22.3	23.4	23.9	25.1	25.8	25.3	24.5	24.1	24.0	24.2	25.0
Capital Account Balance	0.3	0.3	0.2	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2010–14											
Net Lending and Borrowing	0.1	0.3	–3.2	–1.3	–2.9	–5.7	–6.0	–3.8	–4.3	–4.8	–4.8
Current Account Balance	–0.3	0.0	–3.0	–2.8	–3.5	–5.8	–5.6	–3.8	–4.3	–5.0	–5.0
Savings	18.9	20.6	16.6	18.2	16.8	14.4	13.1	13.8	12.6	12.4	13.0
Investment	22.9	20.8	19.6	20.8	20.4	20.2	18.8	17.5	17.0	17.5	17.9
Capital Account Balance	0.4	0.3	–0.3	1.5	0.6	0.1	–0.4	–0.1	0.0	0.2	0.2
Memorandum											
World											
Net Lending and Borrowing	–0.1	0.1	0.3	0.5	0.6	0.5	0.6	0.5	0.3	0.2	–0.1
Current Account Balance	–0.1	0.0	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.1	–0.2
Savings	23.4	23.8	23.0	24.4	25.3	25.6	25.5	25.7	25.6	25.4	25.3
Investment	23.4	23.7	22.8	24.0	24.8	24.9	24.8	25.0	25.2	25.2	25.4
Capital Account Balance	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1

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*, in which the composites were weighted by GDP valued at purchasing power parities as a share of total world GDP. The estimates of gross national savings and investment (or gross capital formation) are from individual countries' national accounts statistics. The estimates of the current account balance, the capital account balance, and the financial account balance (or net lending/net borrowing) are from the balance of payments statistics. The link between domestic transactions and transactions with the rest of the world can be expressed as accounting identities. Savings (S) minus investment (I) is equal to the current account balance (CAB) ($S - I = CAB$). Also, net lending/net borrowing (NLB) is the sum of the current account balance and the capital account balance (KAB) ($NLB = CAB + KAB$). In practice, these identities do not hold exactly; imbalances result from imperfections in source data and compilation as well as from asymmetries in group composition due to data availability.

[1]Data for Lithuania are included in the euro area aggregates but were excluded in the April 2015 *World Economic Outlook*.

[2]Includes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A15. Summary of World Medium-Term Baseline Scenario

	Averages				Projections		Averages	
	1997–2006	2007–16	2013	2014	2015	2016	2013–16	2017–20
			Annual Percent Change					
World Real GDP	**4.0**	**3.5**	**3.3**	**3.4**	**3.1**	**3.6**	**3.4**	**3.9**
Advanced Economies	2.8	1.3	1.1	1.8	2.0	2.2	1.8	2.1
Emerging Market and Developing Economies	5.4	5.5	5.0	4.6	4.0	4.5	4.5	5.1
Memorandum								
Potential Output								
Major Advanced Economies	2.3	1.3	1.2	1.3	1.5	1.6	1.4	1.7
World Trade, Volume[1]	**6.8**	**3.5**	**3.3**	**3.3**	**3.2**	**4.1**	**3.5**	**4.6**
Imports								
Advanced Economies	6.6	2.4	2.0	3.4	4.0	4.2	3.4	4.5
Emerging Market and Developing Economies	8.3	6.0	5.2	3.6	1.3	4.4	3.6	5.2
Exports								
Advanced Economies	6.2	2.9	2.9	3.4	3.1	3.4	3.2	4.1
Emerging Market and Developing Economies	8.1	4.6	4.4	2.9	3.9	4.8	4.0	5.2
Terms of Trade								
Advanced Economies	–0.2	0.0	0.8	0.4	1.6	0.1	0.7	0.1
Emerging Market and Developing Economies	1.9	0.1	–0.3	–0.5	–4.7	–1.0	–1.6	–0.7
World Prices in U.S. Dollars								
Manufactures	0.3	0.8	–1.1	–0.6	–4.1	–0.7	–1.6	0.8
Oil	12.2	–2.4	–0.9	–7.5	–46.4	–2.4	–16.8	5.7
Nonfuel Primary Commodities	2.2	0.4	–1.2	–4.0	–16.9	–5.1	–7.0	–0.2
Consumer Prices								
Advanced Economies	2.0	1.6	1.4	1.4	0.3	1.2	1.1	1.9
Emerging Market and Developing Economies	8.7	6.2	5.8	5.1	5.6	5.1	5.4	4.6
Interest Rates			*Percent*					
Real Six-Month LIBOR[2]	2.0	–0.2	–1.1	–1.1	–0.6	–0.3	–0.8	1.2
World Real Long-Term Interest Rate[3]	2.5	1.2	0.8	0.5	1.5	1.2	1.0	1.4
Current Account Balances			*Percent of GDP*					
Advanced Economies	–0.6	–0.1	0.4	0.4	0.5	0.3	0.4	0.1
Emerging Market and Developing Economies	1.5	1.4	0.6	0.5	–0.1	–0.2	0.2	–0.5
Total External Debt								
Emerging Market and Developing Economies	33.8	26.0	25.9	26.0	27.1	27.5	26.6	26.3
Debt Service								
Emerging Market and Developing Economies	9.3	8.6	8.8	9.2	9.7	9.0	9.2	9.0

[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 Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

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IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, SEPTEMBER 2015

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the World Economic Outlook, Global Financial Stability Report, *and* Fiscal Monitor *on September 21, 2015.*

Executive Directors broadly shared the assessment of global economic prospects and risks. They noted that global growth remains modest and uneven across countries and regions, while financial market volatility has increased in recent months. Downside risks to the global outlook have risen, with emerging market and developing economies particularly exposed to the declining commodity prices and tighter global financial conditions. Directors observed that persistent weak growth in advanced economies and the fifth consecutive year of growth declines in emerging market economies reflect both country-specific developments and common forces of a medium- and long-term nature. Forceful policy action on all fronts, as well as enhanced international cooperation, has become more crucial than ever to reverse this trend and promote stronger, more balanced global growth.

Directors broadly concurred that, in advanced economies, the foundations for a modest recovery in 2015–16 are still intact, while financial stability has generally improved. They noted that a sustained recovery in the euro area, a return to positive growth in Japan, and continued robust activity in the United States are positive forces, although increased market volatility may pose financial stability challenges in the near term. Medium-term prospects remain subdued, reflecting unfavorable demographics, weak productivity growth, and high unemployment, as well as legacy issues from the crisis—including high indebtedness, low investment, and financial sector weakness. A key risk is a further decline of already-low growth that could turn into near stagnation, especially if slower growth in emerging market economies dampens global demand. In this context, persistent below-target inflation could become more entrenched.

Directors noted that the overall outlook for emerging market and developing economies is generally weakening, reflecting tighter global financial conditions, China's transition toward consumption-driven sustainable growth, a weaker commodity market outlook, and geopolitical tensions. However, growth prospects differ considerably across countries. Emerging market economies are vulnerable to shifts in exchange rates and a reversal of capital flows. Meanwhile, further declines in commodity prices could weaken the outlook for commodity exporters. While China's transition and the ensuing slowdown have long been anticipated, a sharper-than-expected growth decline, if it materialized, could generate considerable spillovers and risks for other countries.

Directors acknowledged that the global financial outlook is clouded by increased emerging market vulnerabilities, legacy issues from the crisis in advanced economies, and concerns about weak market liquidity. They noted in particular high corporate leverage and foreign-currency exposures in emerging market economies, headwinds from balance sheet weaknesses in advanced economies, and remaining gaps in the euro area financial architecture. In the context of rising policy rates, the global financial system may see adjustment as financial conditions tighten and risk premiums rise from historically low levels. Directors recognized that interest rate normalization in the United States driven by robust activity will benefit the world economy and also reduce uncertainty—and hence should take place in a timely, data-dependent manner.

Directors underscored that raising both actual and potential output continues to be a policy priority, requiring mutually reinforcing measures for demand support and structural reforms. They concurred that the main policy recommendations are appropriate, although the right balance of policy mix will vary from country to country. A collective effort is needed to boost trade growth, avoid trade protectionist measures, refrain from competitive devaluations, and reduce the persistent global imbalances.

Directors agreed with the policy priorities for full employment and stable inflation in advanced

economies. Accommodative monetary policy remains essential, particularly in Japan and the euro area, while efforts should continue, where needed, to enhance policy transmission and address financial system risks through continued balance sheet repair and macroprudential policies. Fiscal policy should remain prudent, yet flexible and growth friendly, anchored in sound medium-term strategies. Countries with fiscal space and sizable output gaps or significant current account surpluses should ease their fiscal stance in the near term, especially by increasing investment in high-quality, high-return infrastructure projects. Structural reforms should aim to strengthen labor force participation and trend employment, facilitate labor market adjustment, tackle legacy debt overhang, and lower barriers to entry in product markets, especially in services.

Directors recognized that emerging market and developing economies in general are now better prepared for the current, less favorable environment—with stronger fundamentals, buffers, and policy frameworks. Nevertheless, they face a difficult trade-off between supporting demand and reducing vulnerabilities. The scope for further easing macroeconomic policies varies considerably across countries, depending on the extent of economic slack and inflationary pressures and fiscal space, as well as external, financial, and fiscal vulnerabilities. Directors agreed that exchange rate flexibility, where feasible, in the context of a well-specified policy framework, can help absorb external shocks. They stressed that, in many countries, structural reforms are urgently needed to raise productivity and remove bottlenecks to production.

Directors concurred that, in a more difficult external environment, developments in low-income countries should be given particular attention. Many of these countries are commodity exporters whose initial conditions have already been strained, fiscal and external balances are deteriorating, and absorptive capacity is limited. Appropriate policy advice and adequate financial assistance from development partners, including the Fund, will be essential to support low-income countries in their adjustment efforts and advancement toward the Sustainable Development Goals. Their priorities generally include economic diversification, domestic revenue mobilization, and financial sector deepening.

Directors highlighted the importance of preserving financial stability, safeguarding against market illiquidity, and maintaining confidence in policymaking. For advanced economies, priorities should include continued clear and effective communication of monetary policy intentions, and a comprehensive strategy to tackle nonperforming loans and complete the financial architecture in the euro area. Liquidity conditions, especially for nonbanks, should be closely monitored, and market structure solutions to liquidity shortages should be explored. Completing the global financial regulatory reform agenda requires further progress on implementation, finalization of outstanding reforms, and addressing emerging risks.

Directors emphasized the need to address both cyclical and structural challenges in emerging market economies. They agreed that policymakers should rely on micro- and macro-prudential tools to discourage the buildup of excessive leverage, strengthen provisioning by banks, and improve regulations on credit quality classification. Foreign-currency exposures warrant special attention and the reform of corporate insolvency regimes should continue. Rebalancing and deleveraging in China will require a careful pacing and sequencing of market-based reforms, a further strengthening of the financial system, and strong implementation of the reform agenda.

Directors noted that lower oil prices present both opportunities and challenges. In many oil-importing countries, lower oil prices have eased the burden on monetary policy and created some fiscal policy space. Exporters of oil and other commodities with worsening terms of trade will need to adjust public spending in the face of lower commodity-related revenue. These countries should also continue to upgrade their fiscal policy frameworks and provide a longer-term anchor to guide policy decisions. Reforms of energy subsidies and taxation remain an important priority for many countries.

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