

Global growth in 2014 was a modest 3.4 percent, reflecting a pickup in growth in advanced economies relative to the previous year and a slowdown in emerging market and developing economies. Despite the slowdown, emerging market and developing economies still accounted for three-fourths of global growth in 2014.

Complex forces that affected global activity in 2014 are still shaping the outlook. These include medium- and long-term trends, such as population aging and declining potential growth; global shocks, such as lower oil prices; and many country- or region-specific factors, such as crisis legacies and exchange rate swings triggered by actual and expected changes in monetary policies. Overall, global growth is projected to reach 3.5 percent and 3.8 percent in 2015 and 2016, respectively, in line with the projections in the January 2015 World Economic Outlook (WEO) Update. Growth is projected to be stronger in 2015 relative to 2014 in advanced economies, but weaker in emerging markets, reflecting more subdued prospects for some large emerging market economies and oil exporters.

Medium-term prospects have become less optimistic for advanced economies, and especially for emerging markets, in which activity has been slowing since 2010. At the same time, the distribution of risks to global growth is now more balanced relative to the October 2014 WEO, but is still tilted to the downside. A greater boost to demand from oil prices is an important upside risk, while on the downside, the most salient risks identified in the October 2014 WEO remain relevant, including those related to geopolitical tensions, disruptive asset price shifts in financial markets, and, in advanced economies, stagnation and low inflation.

In this setting, raising actual and potential output continues to be a general policy priority. In many advanced economies, accommodative monetary policy remains essential to support economic activity and lift inflation expectations. There is also a strong case for increasing infrastructure investment in some economies, and for implementing structural reforms to tackle legacies of the crisis and boost potential output. In many emerging market economies, macroeconomic policy space to support growth remains limited. But in some,

lower oil prices will help reduce inflation and external vulnerabilities, thereby reducing pressure on central banks to raise policy interest rates. Structural reforms to raise productivity, with a varied agenda across countries, are of the essence to sustain potential output.

Recent Developments and Prospects

The World Economy in Recent Months

Four key developments have shaped the global outlook since the release of the October 2014 WEO.

Uneven Global Growth, Slower Inflation in 2014

While preliminary statistics indicate that global growth in the second half of 2014 was broadly in line with the October 2014 projections (Figure 1.1), these broad numbers masked marked growth surprises pointing to more divergence among major economies, with the U.S. recovery stronger than expected, but economic performance in many other parts of the world falling short of expectations. Specifically:

- Growth in the United States was stronger than expected, averaging about 4 percent annualized in the last three quarters of 2014. Consumption—the main engine of growth—has benefited from steady job creation and income growth, lower oil prices, and improved consumer confidence. The unemployment rate declined to 5.5 percent in February, more than 1 percentage point below its level of a year ago.
- In Japan, after a weak second half of the year, growth in 2014 was close to zero, reflecting weak consumption and plummeting residential investment.
- In the euro area, activity was weaker than expected in the middle part of 2014 but showed signs of a pickup in the fourth quarter and in early 2015, with consumption supported by lower oil prices and higher net exports.
- Although activity was broadly in line with the forecast, investment growth in China declined in the second half of 2014, reflecting a correction in

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

	Year over Year						Q4 over Q4		
	2013	2014	Projections		Difference from January 2015 WEO Update ¹		2014	Projections	
			2015	2016	2015	2016		2015	2016
World Output²	3.4	3.4	3.5	3.8	0.0	0.1	3.2	3.5	3.7
Advanced Economies	1.4	1.8	2.4	2.4	0.0	0.0	1.7	2.5	2.3
United States	2.2	2.4	3.1	3.1	-0.5	-0.2	2.4	3.1	2.8
Euro Area ³	-0.5	0.9	1.5	1.6	0.3	0.2	0.9	1.7	1.6
Germany	0.2	1.6	1.6	1.7	0.3	0.2	1.5	1.7	1.7
France	0.3	0.4	1.2	1.5	0.3	0.2	0.2	1.6	1.3
Italy	-1.7	-0.4	0.5	1.1	0.1	0.3	-0.5	1.0	1.1
Spain	-1.2	1.4	2.5	2.0	0.5	0.2	2.0	2.4	1.8
Japan	1.6	-0.1	1.0	1.2	0.4	0.4	-0.7	2.4	0.5
United Kingdom	1.7	2.6	2.7	2.3	0.0	-0.1	2.7	2.7	2.2
Canada	2.0	2.5	2.2	2.0	-0.1	-0.1	2.6	1.8	2.0
Other Advanced Economies ⁴	2.2	2.8	2.8	3.1	-0.2	-0.1	2.6	3.0	3.1
Emerging Market and Developing Economies⁵	5.0	4.6	4.3	4.7	0.0	0.0	4.6	4.4	5.0
Commonwealth of Independent States	2.2	1.0	-2.6	0.3	-1.2	-0.5	-1.2	-4.9	1.7
Russia	1.3	0.6	-3.8	-1.1	-0.8	-0.1	0.1	-6.4	2.0
Excluding Russia	4.2	1.9	0.4	3.2	-2.0	-1.2	...	...	...
Emerging and Developing Asia	7.0	6.8	6.6	6.4	0.2	0.2	6.7	6.8	6.4
China	7.8	7.4	6.8	6.3	0.0	0.0	7.2	6.8	6.3
India ⁶	6.9	7.2	7.5	7.5	1.2	1.0	6.8	7.9	7.5
ASEAN-5 ⁷	5.2	4.6	5.2	5.3	0.0	0.0	5.0	5.0	5.5
Emerging and Developing Europe ⁸	2.9	2.8	2.9	3.2	0.0	0.1	2.7	4.1	2.1
Latin America and the Caribbean	2.9	1.3	0.9	2.0	-0.4	-0.3	1.1	0.5	2.4
Brazil	2.7	0.1	-1.0	1.0	-1.3	-0.5	-0.2	-1.4	2.3
Mexico	1.4	2.1	3.0	3.3	-0.2	-0.2	2.6	3.3	3.2
Middle East, North Africa, Afghanistan, and Pakistan	2.4	2.6	2.9	3.8	-0.4	-0.1	...	...	...
Saudi Arabia	2.7	3.6	3.0	2.7	0.2	0.0	2.0	2.8	2.7
Sub-Saharan Africa	5.2	5.0	4.5	5.1	-0.4	-0.1	...	...	...
Nigeria	5.4	6.3	4.8	5.0	0.0	-0.2	...	...	...
South Africa	2.2	1.5	2.0	2.1	-0.1	-0.4	1.3	1.6	2.4
<i>Memorandum</i>									
European Union	0.1	1.4	1.8	1.9	0.2	0.1	1.4	2.0	2.0
Low-Income Developing Countries	6.1	6.0	5.5	6.0	-0.4	-0.1	...	...	...
Middle East and North Africa	2.3	2.4	2.7	3.7	-0.5	-0.1	...	...	...
World Growth Based on Market Exchange Rates	2.5	2.6	2.9	3.2	-0.1	0.0	2.4	2.9	3.1
World Trade Volume (goods and services)	3.5	3.4	3.7	4.7	-0.1	-0.6	...	...	...
Imports									
Advanced Economies	2.1	3.3	3.3	4.3	-0.4	-0.5	...	...	...
Emerging Market and Developing Economies	5.5	3.7	3.5	5.5	0.3	-0.6	...	...	...
Exports									
Advanced Economies	3.1	3.3	3.2	4.1	-0.3	-0.5	...	...	...
Emerging Market and Developing Economies	4.6	3.4	5.3	5.7	0.0	-0.5	...	...	...
Commodity Prices (U.S. dollars)									
Oil ⁹	-0.9	-7.5	-39.6	12.9	1.5	0.3	-28.7	-16.4	8.0
Nonfuel (average based on world commodity export weights)	-1.2	-4.0	-14.1	-1.0	-4.8	-0.3	-7.6	-10.0	0.1
Consumer Prices									
Advanced Economies	1.4	1.4	0.4	1.4	-0.6	-0.1	1.0	0.6	1.6
Emerging Market and Developing Economies ⁵	5.9	5.1	5.4	4.8	-0.3	-0.6	5.1	5.7	4.5
London Interbank Offered Rate (percent)									
On U.S. Dollar Deposits (six month)	0.4	0.3	0.7	1.9	0.0	0.0	...	...	...
On Euro Deposits (three month)	0.2	0.2	0.0	0.0	0.0	-0.1	...	...	...
On Japanese Yen Deposits (six month)	0.2	0.2	0.1	0.2	0.0	0.1	...	...	...

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 6–March 6, 2015. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. Lithuania is included in the advanced economies. In the January 2015 WEO Update, Lithuania was included in the emerging market and developing economies.

¹Difference based on rounded figures for both the current and January 2015 WEO Update forecasts.

²The quarterly estimates and projections account for 90 percent of the world purchasing-power-parity weights.

³Excludes Lithuania, which joined the euro area in January 2015. Data for Lithuania are not included in the euro area aggregates because Eurostat has not fully released the consolidated data for the group.

⁴Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries but includes Lithuania.

⁵The quarterly estimates and projections account for approximately 80 percent of the emerging market and developing economies.

⁶Data 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. Growth rates in the January 2015 WEO Update were based on the GDP at market prices with FY2004/05 as a base year.

⁷Indonesia, Malaysia, Philippines, Thailand, Vietnam.

⁸The projections for Lithuania are included in the January 2015 WEO Update but are excluded in the columns comparing the current forecasts with those in the January 2015 WEO Update.

⁹Simple 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 \$58.14 in 2015 and \$65.65 in 2016.

the real estate sector, and high-frequency indicators point to some further slowdown.

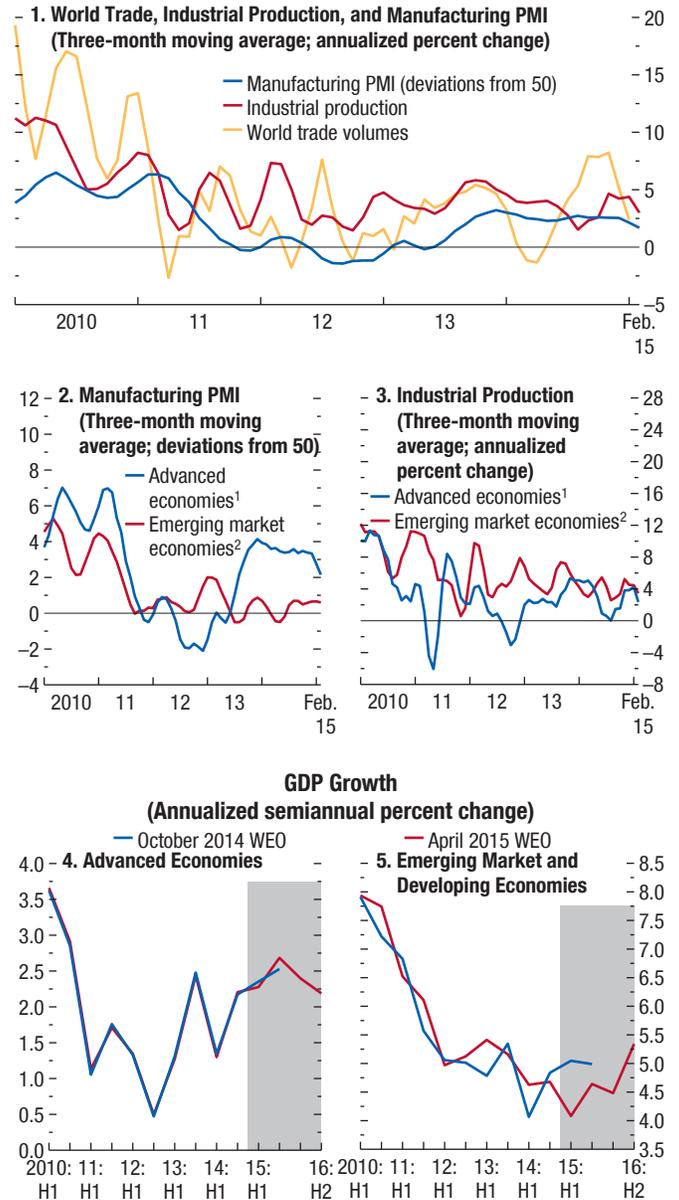
- Growth in Latin America in the second half of 2014 was modest, reflecting weak activity in Brazil, lower-than-expected growth in Mexico, and weakening momentum in other economies in the region.
- Economic performance in Russia was a bit stronger than expected in the second half of 2014, but the increase in geopolitical tensions, declining confidence, and the repercussions of the oil price decline point to a more severe weakening of the outlook in the Commonwealth of Independent States (CIS) as a whole at the start of the year.

Headline inflation has declined in advanced economies (Figure 1.2), reflecting the decline in oil prices, softer prices for other commodities, and a weakening of demand in a number of countries already experiencing below-target inflation, such as the euro area and Japan. This decline in inflation, together with changes in the growth outlook and announcements by the Bank of Japan in October and the European Central Bank (ECB) in January of larger-than-expected asset purchase programs, has strengthened expectations of a protracted divergence in monetary policy stances across the main advanced economies, widening long-term interest rate differentials (Figure 1.3). 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, with the notable exception of countries suffering sizable exchange rate depreciations, such as Russia.

The weaker-than-expected growth for emerging markets, coming on the heels of sequential negative growth surprises for the past four years, has led to diminished expectations for their medium-term growth prospects, as also noted in recent WEO reports, implying a weaker global outlook. In retrospect, the strong economic performance in emerging markets in the immediate postcrisis period partly reflected high growth in China, particularly in investment, which contributed importantly to the strength in commodity prices, as well as an easing of global financial conditions. The gradual slowdown in China and the partly related decline in commodity prices (which also reflected a sizable supply response) weakened the growth momentum to some extent in commodity-exporting countries and others with close trade links to China, and the eas-

Figure 1.1. Global Activity Indicators

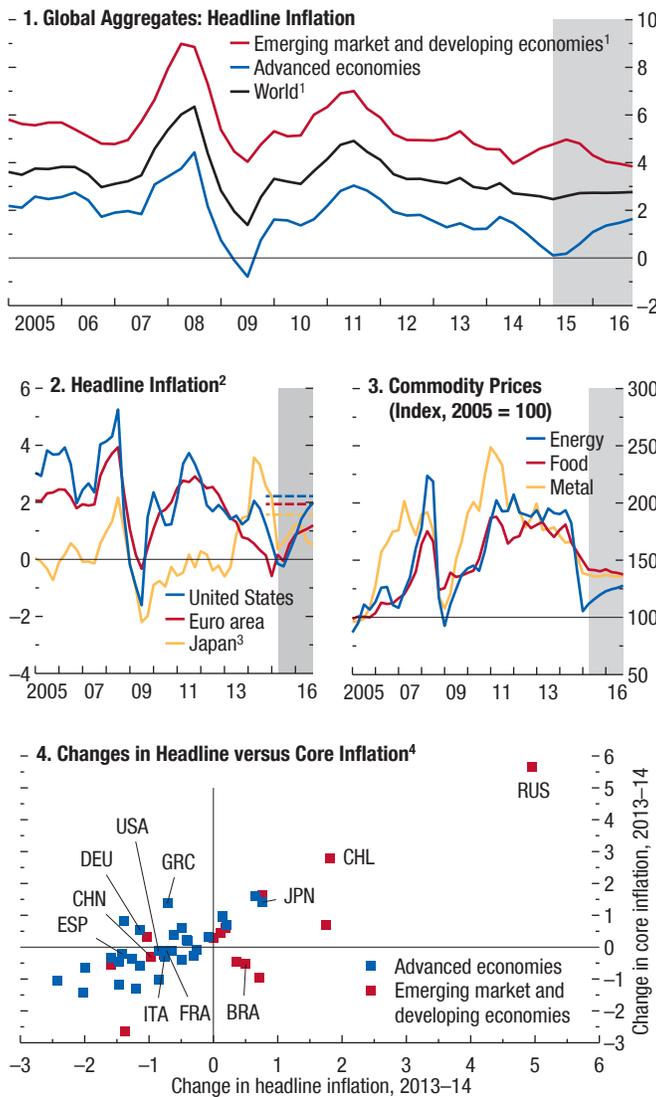
Global growth in the second half of 2014 was broadly in line with October 2014 projections, but this masks marked growth surprises, which point to greater divergence among major economies. While U.S. activity was stronger than expected, economic performance in other major economies fell short of expectations.



Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff estimates.
 Note: IP = industrial production; PMI = purchasing managers' index.
¹Australia, 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.
²Argentina (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).

Figure 1.2. Global Inflation
(Year-over-year percent change, unless noted otherwise)

Headline inflation has declined in advanced economies, reflecting the decline in oil prices, softer prices for other commodities, and a weakening of demand in a number of countries already experiencing below-target inflation, such as the euro area and Japan. With regard to emerging markets, lower prices for oil and other commodities have generally contributed to reductions in inflation through 2014, with the notable exception of countries suffering sizable exchange rate depreciations, such as Russia.



Sources: Consensus Economics; IMF, Primary Commodity Price System; and IMF staff estimates.

Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

¹Excludes Venezuela.

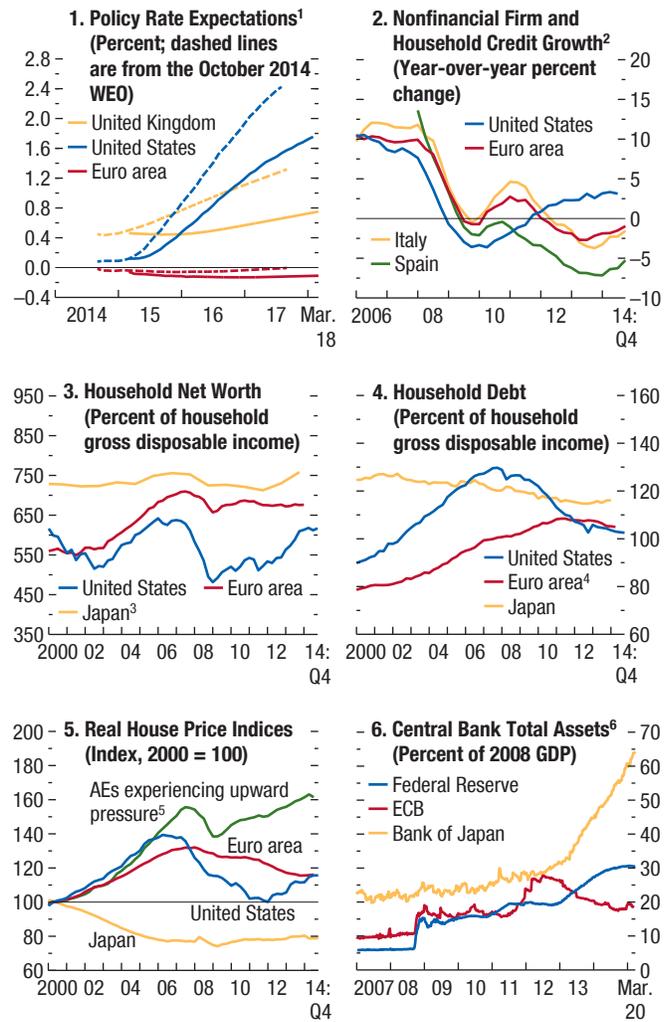
²Dashed lines are the six- to ten-year inflation expectations.

³In Japan, the increase in inflation in 2014 reflects, to a large extent, the increase in the consumption tax.

⁴Changes in inflation are calculated as the year-over-year inflation rate in December 2014 minus the year-over-year inflation rate in December 2013.

Figure 1.3. Advanced Economies: Monetary Conditions

The decline in headline inflation, together with changes in the growth outlook and the announcements by the Bank of Japan in October and the European Central Bank in January of larger-than-expected asset purchase programs, has strengthened expectations of a protracted divergence in monetary policy stances across the main advanced economies, widening long-term interest differentials.



Sources: Bank of Spain; Bloomberg, L.P.; European Central Bank (ECB); Haver Analytics; Organisation for Economic Co-operation and Development; and IMF staff calculations.

¹Expectations are based on the federal funds rate futures for the United States, the sterling overnight interbank average rate for the United Kingdom, and the euro interbank offered forward rate for the euro area; updated March 27, 2015.

²Flow-of-funds data are used for the euro area, Spain, and the United States.

Italian bank loans to Italian residents are corrected for securitizations.

³Interpolated from annual net worth as a percentage of disposable income.

⁴Includes subsector employers (including self-employed workers).

⁵Upward-pressure countries are those with a residential real estate vulnerability index above the median for advanced economies (AEs): Australia, Austria, Belgium, Canada, Estonia, France, Hong Kong SAR, Israel, New Zealand, Norway, Portugal, Sweden, and the United Kingdom.

⁶Data are through March 20, 2015, except in the case of the ECB (March 6, 2015). ECB calculations are based on the Eurosystem's weekly financial statement.

ing of financial conditions for emerging markets after the crisis likely contributed to higher output, but not to a steadily higher growth rate. And increased geopolitical tensions played a role in explaining the growth slowdown, particularly in CIS countries and some in the Middle East.

These developments in emerging markets come on top of concerns about slowing potential output in advanced economies, reflecting long-term factors such as demographics and a protracted period of weak investment following the crisis. These topics are discussed in more detail in Chapter 3 (potential output) and Chapter 4 (investment).

Decline in Oil Prices

Oil prices have declined by about 45 percent since September (Figure 1.4). A variety of factors have played a part: weaker-than-expected global activity; weaker demand for oil, given activity; and greater supply.

Unexpected demand weakness in some major economies, in particular emerging market economies, has clearly played a role in the oil price decrease. Some of this demand weakness may have materialized early in 2014 (and hence already be reflected in the October 2014 WEO), with its impact on oil prices initially muted by an increase in precautionary demand, resulting from rising geopolitical tensions. Declines in prices of other commodities (such as industrial metals) also suggest some weakening in demand.

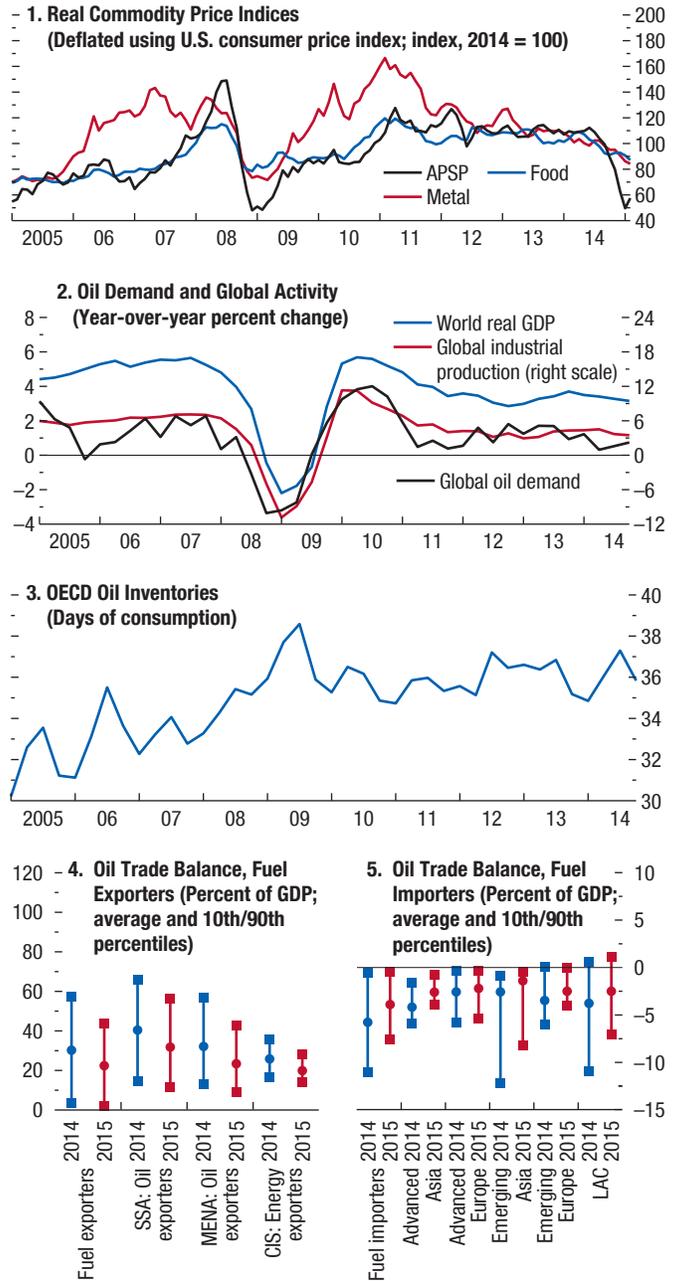
But several facts point to important contributions from other factors (see Box 1.1 for a discussion). For instance, oil prices have declined much more sharply than prices of other commodities in recent months, suggesting that factors specific to the oil market—as opposed to global demand—have played an important role. These factors include greater-than-expected supply as well as some weakness in the demand for oil driven by improvements in energy efficiency rather than by weak global aggregate demand.

Supply factors include the steady rise in production in countries not belonging to the Organization of the Petroleum Exporting Countries (OPEC), especially the United States; the faster-than-expected recovery of production in some stressed OPEC producers (for example, Iraq); and especially OPEC’s November 2014 decision to maintain production levels despite the sharp decline in prices.

With regard to oil-specific demand, reports by the International Energy Agency suggest that, even with

Figure 1.4. Commodity and Oil Markets

Oil prices have declined by about 45 percent since September owing to a variety of factors. Unexpected demand weakness in some major economies, in particular emerging market economies, has clearly played a role. However, a sharper decline in oil prices relative to other commodities suggests that factors specific to the oil market—as opposed to global aggregate demand—are also at work. These include greater-than-expected oil supply as well as some weakness in oil demand driven by improvements in energy efficiency.



Sources: Organisation for Economic Co-operation and Development; and IMF staff estimates.

Note: APSP = average petroleum spot price; CIS = Commonwealth of Independent States; LAC = Latin American and the Caribbean; MENA = Middle East and North Africa; OECD = Organisation for Economic Co-operation and Development; SSA = sub-Saharan Africa.

aggregate demand developments taken into account, oil demand has fallen short of expectations.

The global impact of lower oil prices depends largely on how persistent they are expected to be. Oil futures prices point to a partial recovery in oil prices in coming years, consistent with the expected negative impact of lower oil prices on investment and future capacity growth in the oil sector (see the Special Feature), but prices are expected to remain well below the October 2014 WEO baseline into the medium term (for instance, projected prices for 2019 declined from \$93 to \$73 a barrel). At the same time, uncertainty about the future path of oil prices has increased, as discussed further in the “Risks” section later in this chapter.

To highlight the implications of lower oil prices for the global outlook, the chapter presents Scenario Box 1, which builds on Arezki and Blanchard 2014. The model underlying the scenario assumes that the oil price path is in line with futures prices, and for simplicity, that the decline in prices is entirely driven by higher supply. In this regard, the model’s results are an upper bound on the global stimulus provided by lower oil prices.

The model simulations take into account differences across countries in energy intensity and oil production and in the size of the oil price decline in domestic currency, in light of the sharp currency movements discussed further later in the chapter, as well as differences in the pass-through of lower oil prices to private sector consumers and producers due to changes in government policy (such as changes in subsidies). Specifically, many countries, especially emerging market and developing economies and oil producers, control the prices of petroleum products through a variety of instruments, including subsidies, tariffs, and pricing formulas. These mechanisms typically translate into an incomplete pass-through from international to domestic prices. The model simulations use an indicator that ranges between 0 and 1 for each of the countries included, with 1 denoting fully managed prices and 0 denoting market-based prices. The simulations assess the extent of the pass-through in a particular country based on the petroleum product pricing mechanism in place in that country before the oil price slump.¹

¹The information regarding the pricing mechanism is based on an update of Kojima 2013 for emerging market and developing economies and assumes that advanced economies have full pass-through from international to domestic prices.

Overall, the model implies that the oil shock would provide a sizable boost to economic activity, with global output being higher by about 1 percentage point by 2016 in the case of full pass-through from international to domestic prices, reflecting in particular higher demand in large oil importers. If the pass-through of lower oil prices to consumers and producers is incomplete (as assumed in the WEO baseline), the expansionary effect in some large emerging markets would be dampened, but global output would still rise by more than ½ percentage point over the same horizon.

Two factors could imply a weaker boost to global activity than suggested by the model simulations. First, declines in global demand have affected oil prices to some extent. And second, macroeconomic distress in large oil exporters could extend beyond the pure impact of the terms-of-trade loss captured in the model, given interaction with other shocks or initial conditions.

Large Exchange Rate Movements

Exchange rate movements in recent months have been sizable, reflecting—arguably with some delay—changes in expectations about growth and monetary policy across major economies as well as the large decline in oil prices (see “External Sector Developments” later in the chapter for further discussion). Among major currencies, as of February 2015, the U.S. dollar had appreciated by about 10 percent in real effective terms relative to the values used in the October 2014 WEO, with a particularly marked real appreciation (14 percent) against the currencies of major advanced economies.² The strengthening of the U.S. currency implies that most countries experienced a somewhat smaller decline in oil prices relative to the headline U.S. dollar figure. The renminbi, which has remained broadly stable against the dollar, had appreciated by about 11 percent in real effective terms as of February. Among other major currencies, the euro and the yen had both depreciated by about 7 percent. And since the abandonment of the exchange rate floor relative to the euro on January 15, the Swiss franc has appreciated substantially.

The currencies of major oil exporters with floating exchange rates had depreciated as of February 2015. The decline was particularly sharp for

²The real effective exchange rate figures are based on relative consumer prices.

Scenario Box 1. The Global Impact of Lower Oil Prices

Two simulations of the IMF's G20 Model are used in this scenario to explore the potential impact on global activity of the decline in the expected price of oil since August 2014, as depicted in Scenario Figure 1. Relative to the path expected for global oil prices at the time of the October 2014 *World Economic Outlook*, expected oil prices are now roughly 40 percent lower for 2015, with that decline expected to moderate gradually to roughly 20 percent by 2020. For simplicity, the simulations assume that an increase in oil supply drives the full decline in the oil price path. Consequently, the simulations do not account for the implications of the decline in demand for oil that underlies a portion of the actual fall in oil prices. In addition, each country's domestic-currency price of oil has been adjusted to reflect the change in its bilateral U.S. dollar exchange rate since August 2014; however, the simulations do not include implications of the exchange rate changes for any other parts of the economy.

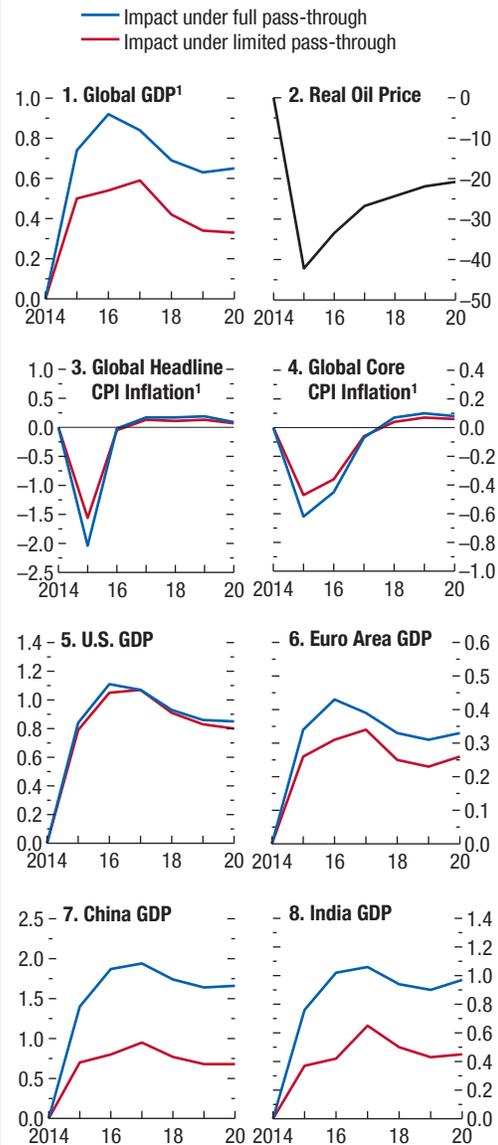
The first simulation (blue lines in Scenario Figure 1) assumes that the decline in oil prices is passed on fully to households and firms in all countries. The second simulation (red lines) accounts for the fact that in some countries included in the simulations (such as Brazil, China, India, and Russia), domestic oil prices are managed to some extent.

In these countries, the difference between the managed domestic price and the global price accrues to the fiscal authority. With global oil prices falling and only some of that decline passing through to final domestic prices, fiscal or quasi-fiscal revenues rise in the case of the oil importers among these price-managing countries and fall in the case of the oil exporters among them.

It is assumed that for the first two years, the fiscal authorities in the oil importers save the additional revenue, but after two years, it is used to increase transfers to households. In the case of the oil exporters among these price-managing countries, the loss in revenue is offset in part by lower subsidies.

To summarize the results of the simulations: if this decline in global oil prices were to be fully passed through to final prices, the model estimates suggest that global GDP, excluding those countries in which oil supply is increasing, would rise by roughly 1 percent by 2016. If on the other hand the decline in oil prices were not to be fully passed through and the resulting increase in fiscal revenue were to be saved, the increase in global GDP would be reduced

Scenario Figure 1. Potential Impact of the Decline in Oil Prices since August 2014
(Percent change)



Source: IMF, G20 Model simulations.

Note: CPI = consumer price index.

¹Excluding other oil exporters: Algeria, Angola, Azerbaijan, Bahrain, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Islamic Republic of Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Uzbekistan, Venezuela, and Yemen.

Scenario Box 1 (continued)

by almost half. This outcome reflects a notably more modest boost to real activity in countries with managed prices. The impact on output of more limited pass-through elsewhere in advanced economies with market-based oil prices (for example, the euro area

and the United States) would be limited to the spillovers from weaker activity in countries with managed prices. More limited pass-through would also moderate the impact of the decline in oil prices on global inflation.

the Russian ruble (a depreciation of 30 percent in real effective terms). Among advanced economies' currencies, the Canadian dollar and the Norwegian krone had depreciated by 8 percent and 7 percent, respectively. Among the remaining major emerging markets, India—a major oil importer—saw its currency strengthen by close to 10 percent in real effective terms, whereas the Brazilian *real* had depreciated by 9 percent, reflecting a weaker outlook. More generally, movements in real effective exchange rates in recent months have broadly reflected changes in growth forecasts as well as differences in the exposure to lower oil prices—as discussed further in “External Sector Developments.”

In principle, exchange rate movements redistribute demand across countries and hence primarily affect relative economic prospects, as opposed to global growth. But these changes should help support the global recovery for a couple of reasons:

- To the extent that they redistribute demand toward countries that would want to ease monetary policy but are constrained by the zero lower bound on policy interest rates and away from countries that can ease monetary policy, these exchange rate movements can imply a boost to global demand. This boost would occur because those countries constrained by the zero lower bound would not raise rates in response to a depreciation, while those countries able to do so would ease monetary policy relative to the baseline in response to an appreciation. An additional benefit for countries with depreciating currencies and inflation below target would be higher domestic prices.
- Relatedly, a redistribution of demand toward countries experiencing more difficult macroeconomic conditions can be beneficial because it can reduce risks of more severe distress in these economies and its possible spillovers.

On the other hand, sharp exchange rate movements can also cause disruptions—for example, such move-

ments could lead to rapid increases in the value of foreign-currency debt for countries whose currencies are depreciating. This concern is of particular relevance for countries that have seen a large increase in corporate foreign-currency exposures in recent years, as discussed in the April 2015 *Global Financial Stability Report* (GFSR). These issues are discussed further in the “Risks” section of this chapter.

Scenario Box 2 explores the implications of these exchange rate movements for the global outlook. To isolate the impact of these movements, and in line with the notion that at least part of the exchange rate adjustment reflects a delayed response to differences in economic prospects and expected monetary policy stance, the scenario assumes that the change in exchange rates is generated by a “portfolio preference shock”—in other words, an increased willingness by international investors to hold financial instruments issued by the countries with appreciating currencies and vice versa.³ Under this scenario, global GDP is boosted by about ½ percentage point, for the reasons discussed earlier, with an expansionary boost to countries and regions with depreciating currencies (such as the euro area and Japan) and weaker growth in countries with appreciating currencies (such as China and the United States). The peak impact on activity is found to be somewhat muted in the case of delayed response of trade flows to exchange rate fluctuations.

Lower Long-Term Interest Rates, More Accommodative Financial Conditions

Long-term government bond yields have declined further in major advanced economies (Figure 1.5). This decline reflects in part lower inflation expectations, resulting from continuing weakness in inflation

³The simulations can be augmented with shifts in relative prospects for aggregate demand. Because these shifts typically result in relatively modest exchange rate movements, the impact on activity can be gauged by roughly adding such shifts in demand to the impact on activity of the portfolio preference shift.

Scenario Box 2. Global Implications of Exchange Rate Movements

Two simulations of the IMF’s G20 Model are used in this scenario to examine the potential macroeconomic impact of the shifts in real exchange rates since August 2014, as depicted in Scenario Figure 2. Both simulations replicate all bilateral changes in Group of 20 countries’ real exchange rates relative to the U.S. dollar between August 2014 and February 2015 using shocks that represent changes in investor preferences for U.S.-dollar-denominated assets. The exchange rate shifts are assumed to be persistent, dissipating only gradually during the next five years. One simulation uses the base case version of the model (solid line in Scenario Figure 2), and the other uses a version of the model in which trade responds more gradually to the exchange rate movements (dashed line) to capture the possibility that lags in the transmission of exchange rates to trade have lengthened with the fragmentation of production chains.

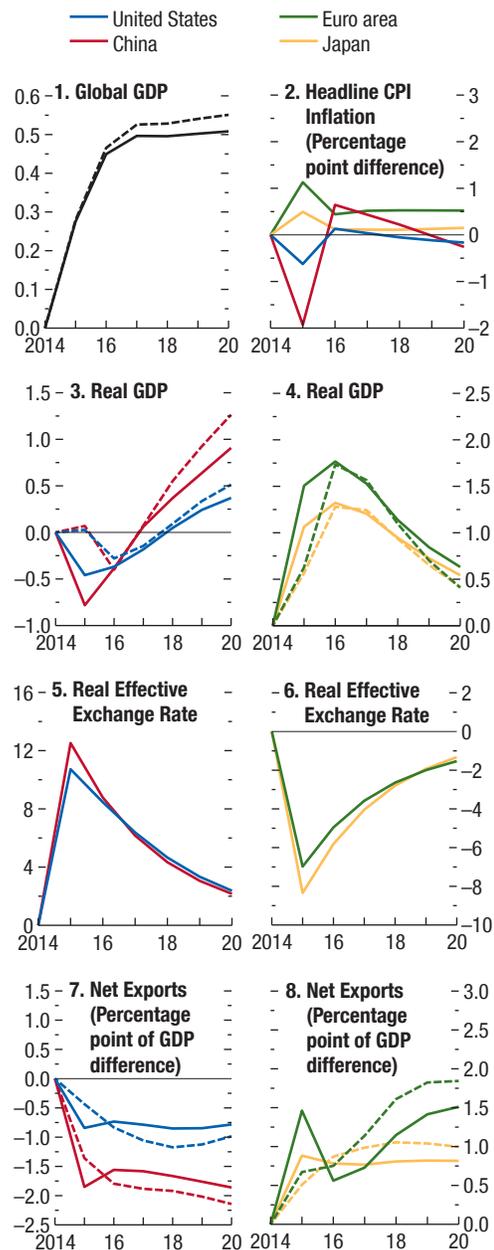
The impact on GDP under the simulations is negative for countries whose currencies are appreciating (for example, China and the United States) and positive for countries whose currencies are depreciating (for example, the euro area and Japan). The magnitudes of the impact depend on the extent of the exchange rate shift, the degree of openness of the country’s economy, and the responsiveness of trade volumes to the changes in relative international prices. To the extent that conventional monetary policy space is available, countries experiencing an appreciation respond by easing monetary policy to help support output. Except for the euro area and Japan, countries experiencing expansions owing to depreciating currencies respond by tightening monetary policy. Baseline cycle positions in the euro area and Japan allow the expansions generated by the depreciations to be accommodated, and thus monetary policy is not tightened.

With monetary policy rates unchanged and inflation rising in the euro area and Japan, falling real interest rates help support domestic demand and amplify the expansions. Because the euro area and Japan are able to accommodate their expansions, while China and the United States are able to ease monetary policy, these exchange rate shifts generate a mild expansion of global GDP.

In the simulation in which trade volumes respond more gradually to the change in international relative prices than in the base case (dashed lines), the initial declines in output in appreciating countries are milder, while the expansions in depreciating countries are more modest. The more gradual response of trade volumes has a minimal impact on global GDP relative to the first simulation.

Scenario Figure 2. Impact of Exchange Rate Shifts since August 2014

(Percent difference, unless noted otherwise)

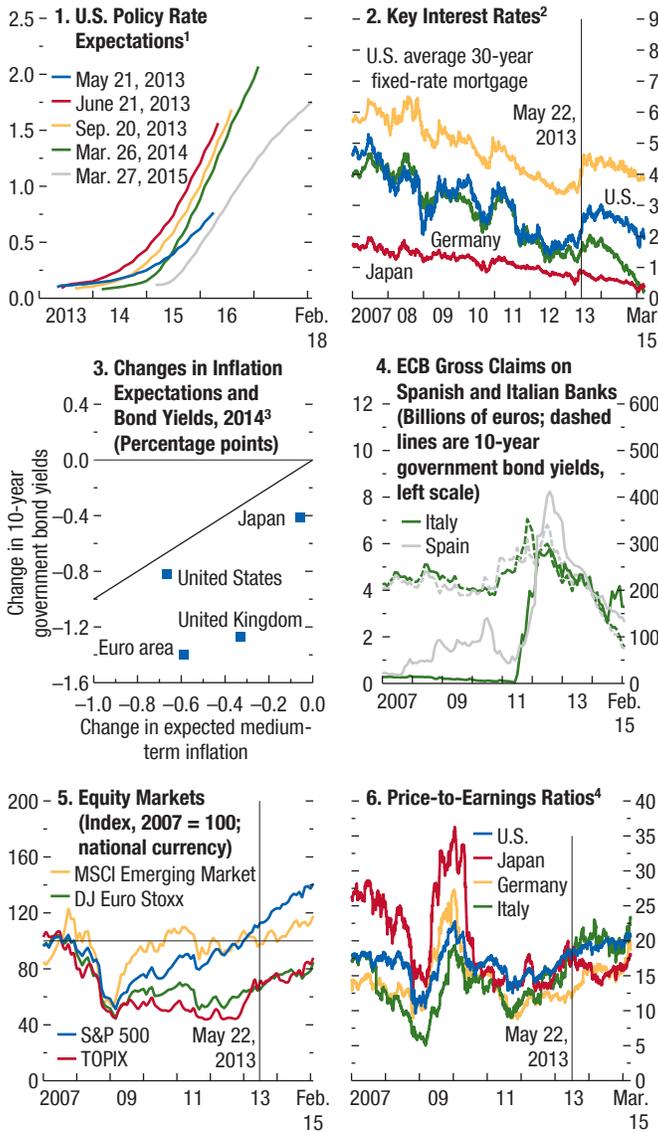


Source: IMF, G-20 Model simulations.

Note: Solid lines denote base case trade response; dashed lines denote gradual trade response. CPI = consumer price index.

Figure 1.5. Financial Market Conditions in Advanced Economies
(Percent, unless noted otherwise)

Long-term government bond yields have declined further in major advanced economies, reflecting lower inflation expectations, the drop in oil prices, weak domestic demand in some cases, and lower expected short-term neutral rates. Very accommodative monetary conditions have also played a role by reducing term premiums.



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.
¹Expectations are based on the federal funds rate futures for the United States.
²Interest rates are 10-year government bond yields, unless noted otherwise. Data are through March 20, 2015.
³Changes are calculated from the beginning of 2014 to the beginning of 2015. Interest rates are measured by 10-year government bond yields. Expected medium-term inflation is measured by the implied rate from 5-year 5-year-forward inflation swaps.
⁴Data are through March 26, 2015.

outcomes, the sharp decline in oil prices, and (in the euro area and especially in Japan) weak domestic demand. But the decline in long-term nominal interest rates appears to reflect primarily a decline in real interest rates, including a compression of term premiums and reductions in the expected short-term neutral rate (see the April 2015 GFSR). Very accommodative monetary conditions have clearly played a role in the reduction in term premiums—in October 2014 the Bank of Japan expanded its quantitative and qualitative monetary easing framework, and in January of this year the ECB announced a larger-than-expected program of asset purchases, including government bonds. And although in the United States the Federal Reserve wound down its asset purchases in late 2014 and the country's economic recovery has been stronger than expected, increased demand for U.S. assets, as reflected in a sharp appreciation of the dollar, as well as subdued inflation pressure, has exerted downward pressure on long-term Treasury yields (with the 10-year yield falling 80 basis points between October and January).

With declining bond yields and easier financial conditions in advanced economies, monetary policy conditions have also eased in several emerging market oil importers, which have reduced policy rates as lower oil prices and slowing demand pressures have reduced inflation rates (Figure 1.6). In contrast, policy rates have been raised sharply in Russia, which is facing pressure on the ruble, and monetary policy has been tightened in Brazil as well. More generally, risk spreads have risen and currencies have depreciated in a number of commodity exporters, and risk spreads on high-yield bonds and other products exposed to energy prices have also widened.

Overall, the decline in long-term interest rates, looser monetary policy conditions, and compressed spreads in advanced economies are supportive of economic recovery and have favorable impacts on debt dynamics. But they also raise some concerns, as discussed in the "Risks" section. Low inflation expectations, particularly in the euro area and Japan, highlight the risk of a disanchoring of such expectations. 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.

The Forecast

Policy Assumptions

Fiscal consolidation is projected to moderate in advanced economies over the forecast horizon (Figure 1.7). In emerging markets, the fiscal policy stance is projected to remain broadly unchanged—albeit with marked differences across countries and regions, as discussed in the April 2015 *Fiscal Monitor*. On the monetary policy front, U.S. policy rates are expected to increase beginning in the second half of the year (see Figure 1.3). Monetary policy normalization in the United Kingdom is projected not to begin before mid-2016. In the euro area, where monthly purchases of government bonds started on March 9, 2015, as well as Japan, very accommodative policy stances are expected to remain in place. Policy rates are generally expected to be on hold in a number of emerging market economies until rate increases start in the United States (Figures 1.5 and 1.8).

Other Assumptions

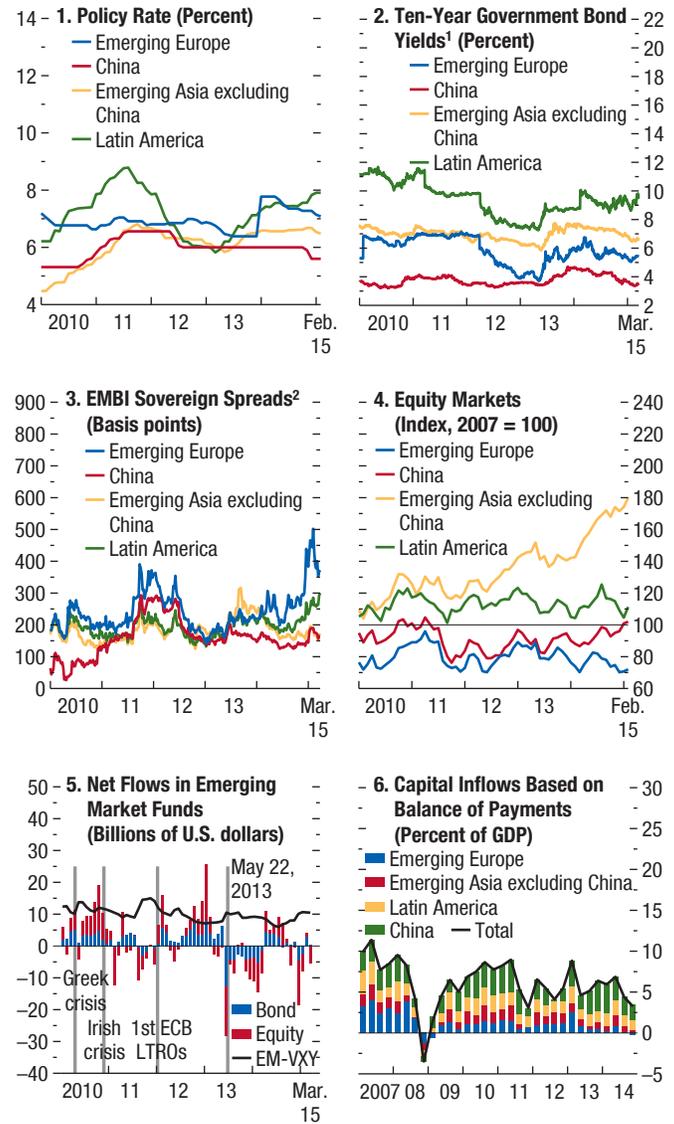
Global financial conditions are assumed to remain accommodative, with some gradual tightening reflected in, among other things, rising 10-year yields on U.S. Treasury bonds as the expected date for liftoff from the zero bound in the United States approaches. The process of normalizing monetary policy in the United Kingdom and the United States is assumed to proceed smoothly, without large and protracted increases in financial market volatility or sharp movements in long-term interest rates. Fuel prices are projected to increase gradually over the forecast horizon, from an average of \$51 a barrel in 2015 to about \$64 a barrel in 2017. In contrast, nonfuel commodity prices are expected to stabilize at lower levels after recent declines in both food and metals prices. Geopolitical tensions are assumed to stay elevated, with the situation in Russia and 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 increase slightly from 3.4 percent in 2014 to 3.5 percent in 2015 and

Figure 1.6. Financial Market Conditions and Capital Flows in Emerging Market Economies

As financial conditions have eased in advanced economies, financial conditions have also eased in several emerging market oil importers, which have reduced policy rates as lower oil prices and slowing demand pressures have lowered inflation. Brazil and Russia are notable exceptions where policy rates have instead risen. More generally, risk spreads have risen and currencies have depreciated in a number of commodity exporters, and risk spreads on high-yield bonds and other products exposed to energy prices have also widened.



Sources: Bloomberg, L.P.; EPFR Global; Haver Analytics; IMF, *International Financial Statistics*; and IMF staff calculations.

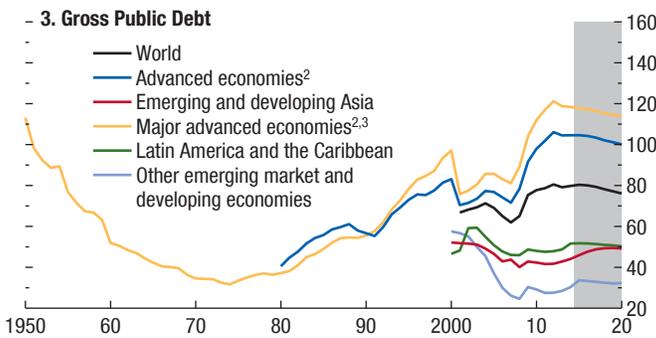
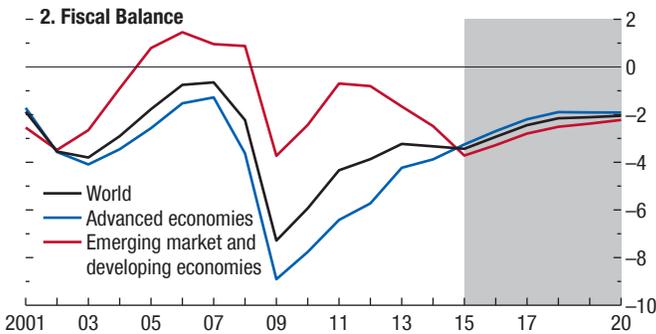
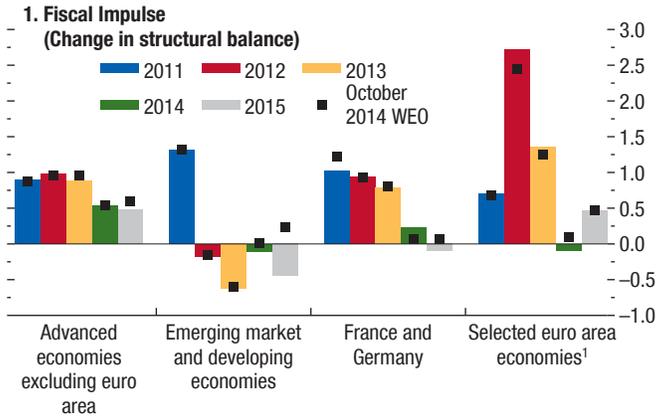
Note: Emerging Asia excluding China comprises India, Indonesia, Malaysia, the Philippines, and Thailand; emerging Europe comprises Poland, Romania (capital inflows only), Russia, and Turkey; Latin America comprises Brazil, Chile, Colombia, Mexico, and Peru. ECB = European Central Bank; EMBI = J.P. Morgan Emerging Market Bond Index; LTROs = longer-term refinancing operations; EM-VXY = J.P. Morgan Emerging Market Volatility Index.

¹Data are through March 18, 2015.

²Data are through March 20, 2015.

Figure 1.7. Fiscal Policies
(Percent of GDP, unless noted otherwise)

Fiscal consolidation is projected to moderate in advanced economies over the forecast horizon. In emerging markets, the fiscal policy stance is projected to remain broadly unchanged—albeit with marked differences across countries and regions.



Source: IMF staff estimates.

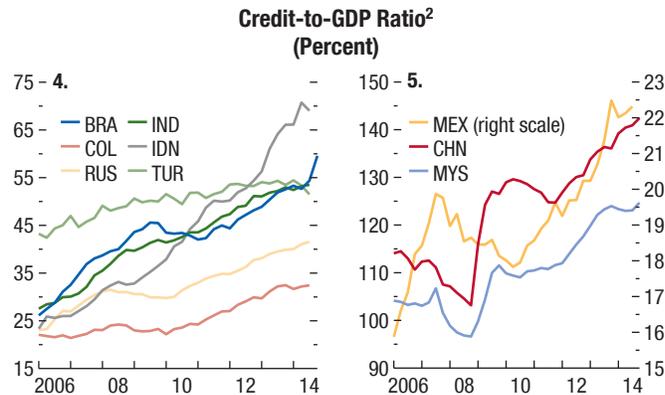
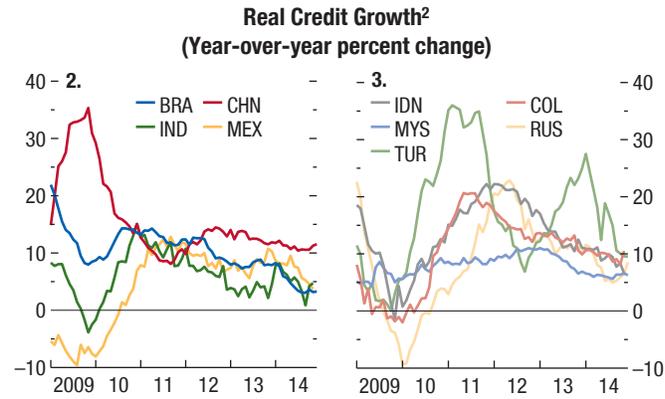
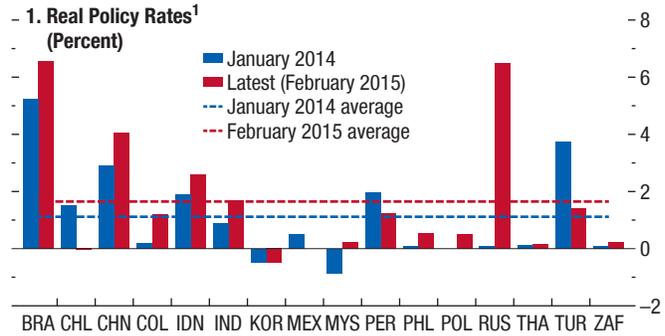
¹Euro area countries (Greece, Ireland, Italy, Portugal, Spain) with high borrowing spreads during the 2010–11 sovereign debt crisis.

²Data up to 2000 exclude the United States.

³Canada, France, Germany, Italy, Japan, United Kingdom, United States.

Figure 1.8. Monetary Policies and Credit in Emerging Market Economies

Real policy rates have, on average, remained close to their January 2014 levels and below precrisis levels in many emerging market economies. Bank credit growth has continued to slow, although it remains rapid in some economies. Economy-wide leverage, as measured by the ratio of bank credit to GDP, has therefore continued to increase.



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.

¹Deflated by two-year-ahead WEO inflation projections.

²Credit 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.

then to pick up further in 2016 to an annual rate of 3.8 percent (see Table 1.1). The increase in growth in 2015 will be driven by a rebound in advanced economies, supported by the decline in oil prices, with the United States playing the most important role (Figure 1.9). This rebound will contribute to reducing still-sizeable output gaps.

In emerging markets, in contrast, growth is projected to decline in 2015—for the fifth year in a row. A variety of factors explain this decline: sharp downward revisions to growth for oil exporters, especially countries facing difficult initial conditions in addition to the oil price shock (for example, Russia and Venezuela); a slowdown in China that reflects a move toward a more sustainable pattern of growth that is less reliant on investment; and a continued weakening of the outlook for Latin America resulting from a softening of other commodity prices. As discussed earlier, in emerging market oil importers, a more limited pass-through to consumers of the windfall gains from lower oil prices is expected to mute the attendant boost to growth, with lower prices assumed to accrue in part to governments (for example, in the form of savings from lower energy subsidies—see the April 2015 *Fiscal Monitor*), where they may be used to shore up public finances.

- A pickup in emerging markets is assumed to drive the global growth rebound in 2016, primarily reflecting a partial waning of setbacks to domestic demand and production (including from geopolitical tensions) in a number of economies, including Brazil and Russia.

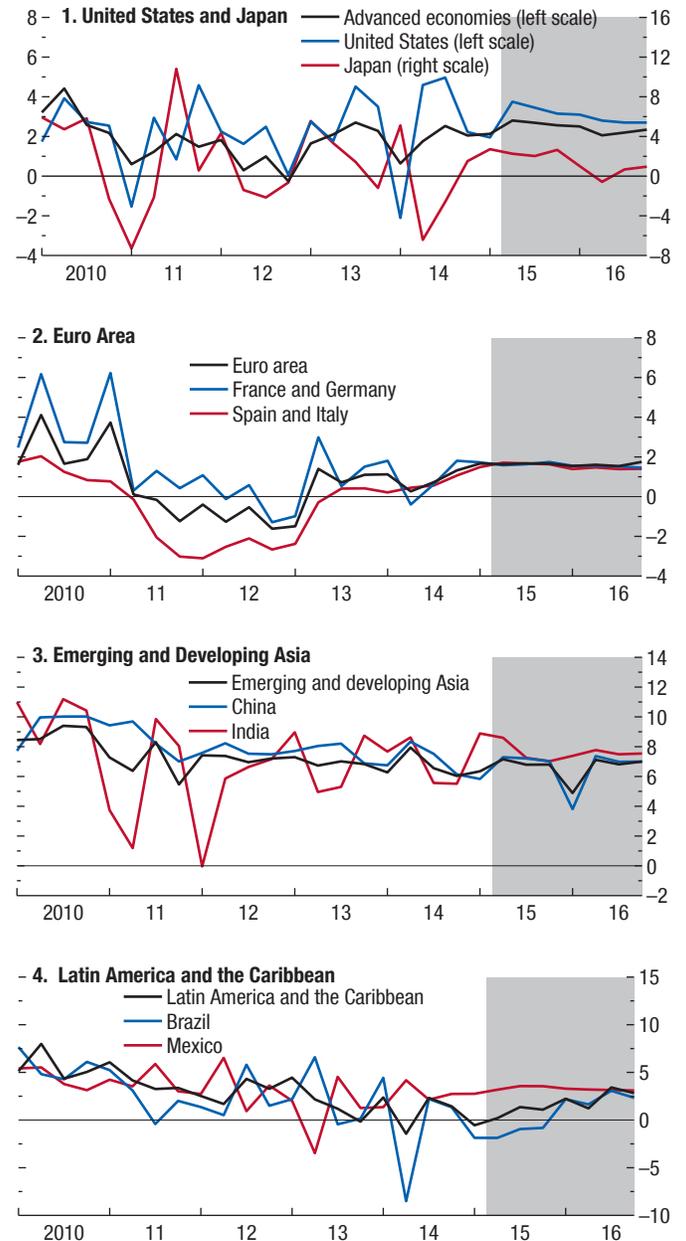
The outlook for 2015 is broadly in line with the one in the January 2015 *WEO Update*. Relative to the October 2014 WEO, global growth has been revised downward by 0.3 percentage point in 2015 and 0.2 percentage point in 2016, entirely reflecting weaker projected growth in emerging markets. (Growth forecast comparisons in the remainder of this WEO report are made in relation to those in the October 2014 WEO.)

Global Outlook for the Medium Term

Global growth is forecast to increase marginally beyond 2016, reflecting a further pickup in growth in emerging market and developing economies that would offset more modest growth in advanced economies. This pickup primarily reflects the assumption of a gradual return to more “normal” rates of growth in countries and regions under stress or growing well below potential in 2015–16 (such as Russia, Brazil, the rest of Latin America, and parts of the Middle

Figure 1.9. GDP Growth Forecasts
(Annualized quarterly percent change)

Global growth is projected to increase slightly to 3.5 percent in 2015 and then to rise further in 2016 to 3.7 percent. The increase in 2015 will be driven by a rebound in advanced economies, supported by the decline in oil prices, with the United States playing the most important role. In emerging markets, in contrast, growth is projected to decline in 2015, reflecting downward revisions for oil exporters, a slowdown in China that reflects a move toward more sustainable growth that is less reliant on investment, and a weaker outlook for Latin America resulting from a softening of other commodity prices.



Source: IMF staff estimates.

East). On the other hand, advanced economies are projected to grow at more modest rates from 2017 onward, reflecting the gradual closure of output gaps—particularly in the euro area and the United States (where the persistence of crisis legacies and policy uncertainty play a role)—as well as the effects of demographics on labor supply and hence on potential output (Chapter 3).

Growth Outlook for Individual Countries and Regions

- A solid recovery is expected to continue in the *United States*, where growth averaged about 4 percent in the last three quarters of 2014. Conditions remain in place for robust economic performance in 2015. Markedly lower energy prices, tame inflation, reduced fiscal drag, strengthened balance sheets, and an improving housing market are expected to sustain the momentum of the past three quarters. 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 3.1 percent in 2015 as well as 2016, in line with the October forecast. However, the picture over a longer horizon is less upbeat, with potential growth estimated to be only about 2 percent, weighed down by an aging population and weaker total factor productivity growth.
- The *euro area* continued to recover during the past year, but private investment remained weak, with Ireland, Spain, and Germany being notable exceptions. Lower oil prices, lower interest rates, and euro depreciation, as well as the shift to a broadly neutral fiscal stance, are projected to boost activity in 2015–16. At the same time, potential growth remains weak—a result of crisis legacies, but also 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. Specifically, growth is expected to increase from 0.9 percent in 2014 to 1.5 percent this year and 1.6 percent in 2016, slightly stronger in 2015 than envisioned last October. Growth is forecast to pick up for 2015 and 2016 in *Germany* (1.6 percent in 2015 and 1.7 percent in 2016), in *France* (1.2 percent in 2015 and 1.5 percent in 2016), in *Italy* (0.5 percent in 2015 and 1.1 percent in 2016), and especially in *Spain* (2.5 percent in 2015 and 2 percent in 2016).
- Activity in *Japan* disappointed following the April 2014 consumption tax hike, which caused a sharper-than-predicted contraction in consumption. GDP growth is projected to rise from –0.1 percent in 2014 to 1 percent in 2015 and 1.2 percent in 2016, a slight upward revision relative to the October 2014 WEO. The gradual pickup reflects support from the weaker yen, higher real wages, 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. In the *United Kingdom*, continued steady growth is expected (2.7 percent in 2015), supported by lower oil prices and improved financial market conditions. *Canada's* growth of 2.2 percent this year will be supported by the strength of the U.S. recovery. *Australia's* projected growth of 2.8 percent in 2015 is broadly unchanged from the October prediction, as lower commodity prices and resource-related investment are offset by supportive monetary policy and a somewhat weaker exchange rate. The robust recovery in *Sweden* (2.7 percent growth projected in 2015) is supported by consumption and double-digit housing investment. But in *Switzerland*, the sharp exchange rate appreciation is likely to weigh on growth in the near term, with 2015 growth projected to be 0.8 percent, a downward revision of 0.8 percentage point. And lower oil prices will weigh on *Norway*, where GDP is projected to grow by 1 percent this year, a downward revision of about 0.9 percentage point.
- Growth in *China* is expected to decline to 6.8 percent this year and 6.3 percent in 2016. These projections have been revised downward by $\frac{1}{4}$ and $\frac{1}{2}$ percentage point, respectively, as previous excesses in real estate, credit, and investment continue to unwind. The Chinese authorities are now expected to put greater weight on reducing vulnerabilities from recent rapid credit and investment growth, and hence the forecast assumes less of a policy response to the underlying moderation. Ongoing implementation of structural reforms and lower oil and commodity prices are expected to expand consumer-oriented activities, partly buffering the slowdown.
- Elsewhere in *emerging and developing Asia*, *India's* growth is expected to strengthen from 7.2 percent

- last year to 7.5 percent this year and next.⁴ Growth will benefit from recent policy reforms, a consequent pickup in investment, and lower oil prices. Trends within the Association of Southeast Asian Nations–5 will continue to diverge. *Malaysia's* growth is expected to slow markedly to 4.8 percent this year (a downward revision of 0.4 percentage point) on weaker terms of trade. But growth is expected to pick up in *Thailand*, as a result of reduced policy uncertainty, and in the *Philippines*, owing to stronger consumption resulting from the oil price windfall. *Indonesia's* growth forecast of 5.2 percent this year is broadly in line with last year's growth.
- Growth in *Latin America and the Caribbean* declined for the fourth consecutive year to 1.3 percent last year. With no apparent impulse for a near-term pickup in activity, lower commodity prices, and reduced policy space in many economies, regional growth is projected at 0.9 percent this year (1.3 percentage points less than previously projected and well below the 4.2 percent average growth observed in 2004–13) before recovering to 2 percent in 2016. Downward revisions are concentrated among South American commodity exporters. *Bolivia, Chile, Colombia, Ecuador, and Peru* have all seen downward revisions to their 2015 growth projections of ½ to 2 percentage points. *Brazil's* economy is projected to contract by 1 percent this year—more than 2 percentage points below the October 2014 forecast. Private sector sentiment remains stubbornly weak because of unaddressed competitiveness challenges, the risk of near-term electricity and water rationing, and the fallout from the Petrobras investigation; greater-than-expected need for fiscal tightening also plays a role in the downward revisions. *Mexico's* projected growth of 3 percent this year is a ½ percentage point downward revision. *Argentina's* economic prospects for 2015 have improved relative to October as balance of payments pressures have moderated, but GDP is still expected to contract slightly (–0.3 percent). In *Venezuela* activity is projected to contract sharply (–7 percent) as the oil price decline has compounded an already difficult situation.
 - Economies in the *Commonwealth of Independent States* slowed further in the latter half of 2014, and the outlook for the region has deteriorated markedly. The downward revisions are driven by *Russia*, whose economy is now expected to contract by 3.8 percent this year, more than 4 percentage points below the previous forecast, and by 1.1 percent in 2016. Falling oil prices and international sanctions have compounded the country's underlying structural weaknesses and have undermined confidence, resulting in a significant depreciation of the ruble. The remainder of the CIS is projected to grow at 0.4 percent in 2015, 3.6 percentage points below the previous forecast. *Ukraine's* economy is expected to bottom out in 2015 as activity stabilizes with the beginning of reconstruction work, but the economy is still projected to contract by 5.5 percent. Elsewhere in the region, lower commodity prices and spillovers from Russia (through trade, foreign direct investment, and especially remittances) are also dampening the outlook, particularly in light of existing structural vulnerabilities, resulting in large downward revisions to 2015 growth projections for *Armenia, Belarus, Georgia, and Kazakhstan*, among others.
 - Growth in *emerging and developing Europe* is projected to rise slightly from 2.8 percent last year to 2.9 percent this year (unchanged from the previous forecast) and to 3.2 percent in 2016. Lower oil prices and the gradual recovery in the euro area are expected to provide a lift to the region, offsetting the effects of the contraction in Russia and still-elevated corporate debt levels. *Turkey* is projected to grow by 3.1 percent this year, up from 2.3 percent last year and a 0.1 percentage point upward revision, as consumption will be boosted by lower energy prices. Growth in *Hungary* is projected to decline this year to 2.7 percent on account of lower investment growth and less supportive fiscal conditions. Growth in *Poland* is projected to increase to 3.5 percent in 2015, supported by domestic demand and improved conditions in trading partners.
 - Growth remained tepid across the *Middle East, North Africa, Afghanistan, and Pakistan* last year, and only a modest strengthening is expected this year. Growth is projected to rise from 2.6 percent in 2014 to 2.9 percent this year and to 3.8 percent in 2016. This year's projected growth is 1 percentage point

⁴Following a revision of national accounts statistics, now using fiscal year 2011/12 as the base year, India's GDP growth rate at market prices in 2013 and 2014 was revised upward substantially.

below the previous projection, with the region's oil-exporting economies accounting for all of the downward revision, mostly due to the decline in oil prices. Saudi Arabia's growth forecast of 3 percent this year is a downward revision of 1½ percentage points, although nearly half of this revision is due to a rebasing of real GDP data. Other oil exporters, including Iraq, the Islamic Republic of Iran, and the United Arab Emirates, have also seen substantial downward revisions to their growth forecasts. Growth in the region's oil importers is expected to strengthen from 3 percent last year to 4 percent this year and to 4.4 percent in 2016, as domestic demand is expected to strengthen with improved confidence, monetary easing, lower oil prices, and reduced fiscal drag.

- Growth in *sub-Saharan Africa* remains strong but is expected to slow this year to 4.5 percent (from 5 percent in 2014 and a substantial downward revision of 1¼ percentage points) in the face of headwinds from declining commodity prices and the epidemic in Ebola-affected countries. The oil price decline will have a severe impact on the region's oil exporters, including *Nigeria*, with 2015 growth for those countries marked down by more than 2½ percentage points. In contrast, projected growth in the region's oil importers is broadly unchanged, as the favorable impact of lower oil prices is offset to a large extent by lower prices of commodity exports. *South Africa's* growth is expected to rise to 2 percent this year, a 0.3 percentage point revision downward, and 2.1 percent in 2016, reflecting more binding electricity supply constraints and a tighter fiscal stance in 2016 than previously expected.

Global Inflation

Inflation is projected to decline in 2015 in both advanced economies and most emerging market and developing economies, reflecting primarily the impact of the decline in 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 advanced economies, inflation is projected to rise in 2016 and thereafter, but to remain generally below central bank targets.
- In the euro area, headline inflation turned negative in December 2014, and medium-term inflation expectations have dropped substantially since mid-2014, although they have stabilized somewhat after the ECB's recent actions. The projected mod-

est pickup in economic activity, together with the partial recovery in oil prices and the impact of the euro depreciation, is assumed to imply an increase in both headline and core inflation starting in the second quarter of 2015, but both measures of price increases are expected to remain below the ECB's medium-term price stability objective.

- In Japan, the projected modest pickup in growth and the waning downward pressure on prices from lower commodity prices as well as higher real wage growth on tight labor market conditions are expected to help push up underlying prices next year, but under current policies and constant real exchange rates, inflation is projected to rise only gradually to about 1½ percent in the medium term.
- In the United States, annual inflation in 2015 is projected to decline to 0.4 percent, increasing gradually beginning in midyear as the effects of the oil price decline wear off, while the effects of dollar appreciation and muted wage dynamics 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. Consumer prices are projected to decline in both 2015 and 2016 in Switzerland, following the sharp appreciation of the currency in January, and to remain subdued elsewhere, notably in the Czech Republic and Sweden.

In emerging market economies the decline in oil prices and a slowdown in activity are expected to contribute to lower inflation in 2015, even though not all the decline in the price of oil will be passed on to end-user prices. Countries that experienced large nominal exchange rate depreciations are a notable exception to this trend. In subsequent years the effect of lower oil prices is expected to be phased out, but this effect is projected to be offset by a gradual decline in underlying inflation toward medium-term inflation targets.

- In China, consumer price index inflation is forecast to be 1.2 percent in 2015, reflecting the decline in commodity prices, the sharp appreciation of the renminbi, and some weakening in domestic demand, but to increase gradually thereafter.
- In India, inflation is expected to remain close to target in 2015. In Brazil, inflation is expected to rise above the ceiling of the tolerance band this year, 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 spike to about 18 percent in 2015 in Russia, reflecting the large depreciation of the ruble, and to decline to about 10 percent next year.

- A few emerging markets, especially some in Europe, are projected to experience headline inflation well below target in 2015, with modest increases in 2016. These economies include Poland and a number of smaller countries whose currencies are tightly linked to the euro.

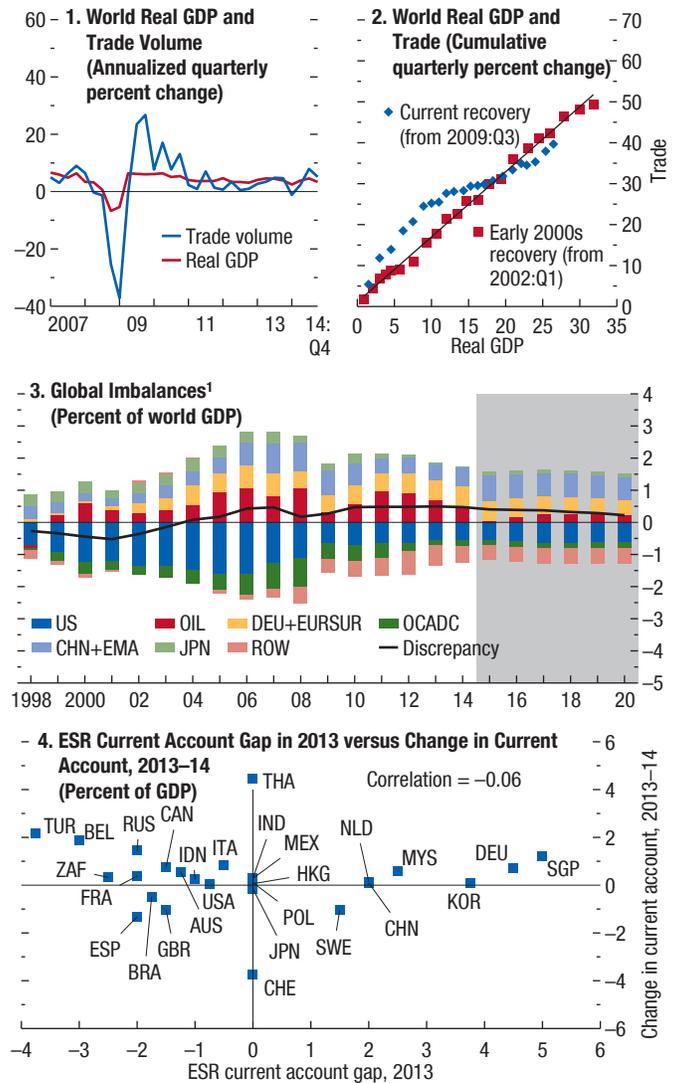
External Sector Developments

Preliminary data suggest a further slowdown in global trade in 2014 (Figure 1.10), reflecting to an important extent weaker trade dynamics in emerging market and developing economies. Part of this slowdown is related to weaker-than-expected GDP growth, but the growth in trade volumes remains relatively modest even after developments in overall economic activity are taken into account. Box 1.2 discusses the extent to which cyclical and structural factors can account for the more subdued pace of trade growth. The evidence indicates that both cyclical and structural factors are important—the cyclical weakness in (trade-intensive) investment clearly plays a role, but the long-term relationship between world trade and GDP is also changing, possibly reflecting a more modest pace in the fragmentation of global production processes (value chains) after years of rapid change.

Capital flows to and from advanced economies have remained relatively subdued, in line with the postcrisis pattern. And capital flows to emerging markets slowed in the second half of 2014 after a strong first half of the year (Figure 1.6), also reflecting the increase in geopolitical tensions and concerns about weaker growth prospects, particularly for commodity exporters. Global current account imbalances remained broadly stable in 2014, after several years of contraction. Changes in current account balances relative to GDP in 2014 generally went in the direction of narrowing the current account gaps for 2013 discussed in the *2014 Pilot External Sector Report* (IMF 2014) (Figure 1.10, panel 4). These gaps measure deviations of current account balances from a level consistent with underlying fundamentals and desirable policies. Movements in real effective exchange rates in 2014 relative to 2013 were also consistent with a reduction of the exchange rate gaps identified for 2013 by the *2014 Pilot External Sector Report* (Figure 1.11, panel 1). Exchange rate

Figure 1.10. External Sector

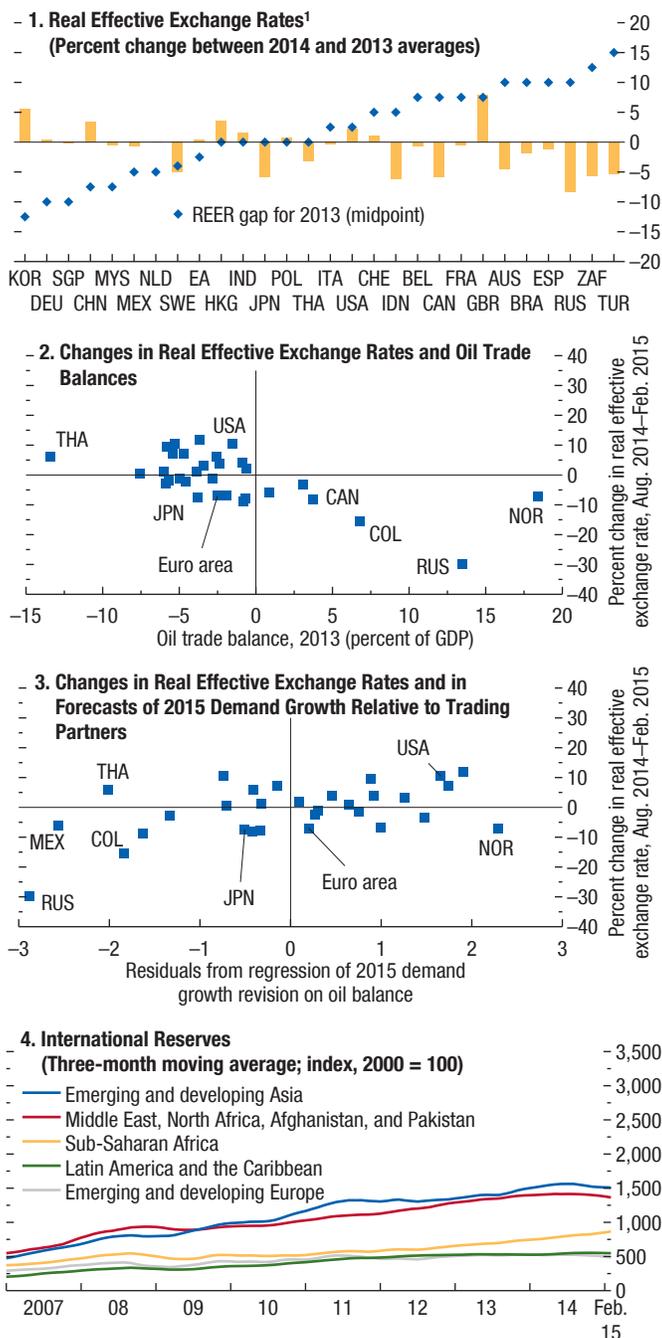
Global trade growth slowed further in 2014, reflecting to an important extent weaker trade dynamics in emerging market and developing economies. Part of this slowdown is related to weaker-than-expected GDP growth, but the growth in trade remains modest even after developments in overall economic activity are taken into account. Global current account imbalances remained broadly stable in 2014, after several years of contraction, and are projected to remain so for the next five years. Changes in current account balances relative to GDP in 2014 generally went in the direction of narrowing the current account gaps for 2013 discussed in the IMF’s *2014 Pilot External Sector Report* (IMF 2014).



Sources: CPB Netherlands Bureau for Economic Policy Analysis; IMF, *2014 Pilot External Sector Report* (ESR); and IMF staff estimates.
 Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
¹CHN+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 precrisis current account deficit countries (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 1.11. Exchange Rates and Reserves

Movements in real effective exchange rates in 2014 were consistent with a reduction of the gaps identified for 2013 by the IMF’s *2014 Pilot External Sector Report* (IMF 2014). For countries with floating exchange rates, exchange rate changes since fall 2014 have been correlated with shifts in underlying fundamentals: their dependence on oil and revisions in the outlook for domestic demand relative to external demand. Reserve accumulation has slowed in Latin America and emerging and developing Europe, reflecting lower capital inflows and reserve losses from foreign exchange interventions.



Sources: Global Insight; IMF, *2014 Pilot External Sector Report*; IMF, *International Financial Statistics*; and IMF staff calculations.
 Note: EA = euro area; REER = real effective exchange rate. Data labels in the figure use International Organization for Standardization (ISO) country codes.
¹REER gaps and classifications are based on the 2014 *Pilot External Sector Report*.

changes have been particularly large across a broad set of currencies since fall 2014. As shown in Figure 1.11, for countries with floating exchange rates, these movements are strongly correlated with shifts in underlying fundamentals: their dependence on oil, proxied by the size of their oil balance in relation to GDP (panel 2), and revisions in the outlook for domestic demand relative to external demand during this period (panel 3).⁵

These exchange rate changes, together with the large oil price changes, are projected to imply shifts in global current account balances in 2015. The most notable development in this respect is the projected disappearance of the aggregate current account surplus in fuel exporters in 2015, for the first time since 1998. Oil exporters are projected to return to current account surpluses with the recovery in oil prices, but these surpluses are expected to be smaller than during the past decade.

As discussed earlier in this chapter, the decline in oil prices and the real exchange rate changes occurring in recent months have been supportive of the recovery. Their overall impact on global current account imbalances is, however, mixed. The oil price and real exchange rate changes of the past few months help rebalancing in countries that would benefit from a strengthening of their external positions (such as Spain) but also tend to further boost surpluses in other countries in Europe with large initial surpluses (such as Germany and the Netherlands). For both China and the United States, exchange rate movements weaken the current account balance, whereas the decline in oil prices strengthens it, with projections showing a slight widening in the Chinese surplus and in the U.S. deficit. Overall, WEO projections—which are based on stable real effective exchange rates at levels prevailing in early 2015—suggest broadly stable current account imbalances as a share of global GDP for the next five years (Figure 1.12, panel 2).

Risks

The distribution of risks to global growth is more balanced than that presented in the October 2014 WEO but is still tilted to the downside. A greater boost to demand from lower oil prices is an important upside risk. And downside risks have moderated given a lower baseline path for growth in emerging market economies.

⁵For the same set of countries, however, the correlation of exchange rate changes between February and August 2014 with these variables is in contrast virtually zero, further highlighting the difficulty of systematically explaining short-term exchange rate movements using macroeconomic fundamentals.

In particular, after a series of downward revisions to the baseline growth forecasts, risks of a sharper slowdown in China and still-lower potential output growth in emerging market economies have decreased. The most salient downside risks identified in the October 2014 WEO remain relevant, including geopolitical risks, disruptive asset price shifts in financial markets, and risks of stagnation and low inflation in advanced economies.

Oil also presents new downside risks, because prices could rise faster than expected. Similarly, the recent exchange rate realignment is helpful in raising demand in economies that have faced weaker activity, but there are balance sheet and funding risks, especially in emerging market economies, if dollar appreciation continues.

Global GDP Forecast

The fan chart for the global GDP forecast suggests a broadly symmetric confidence interval around the projected path for global growth (Figure 1.12, panel 1), consistent with the view that the risks are now more balanced. The width of the interval, however, has increased compared with the October WEO. This means that the likelihood of either substantially higher growth or a global recession is higher now than in October.

Two factors explain the implied higher uncertainty around the forecast, on both the upside and the downside:

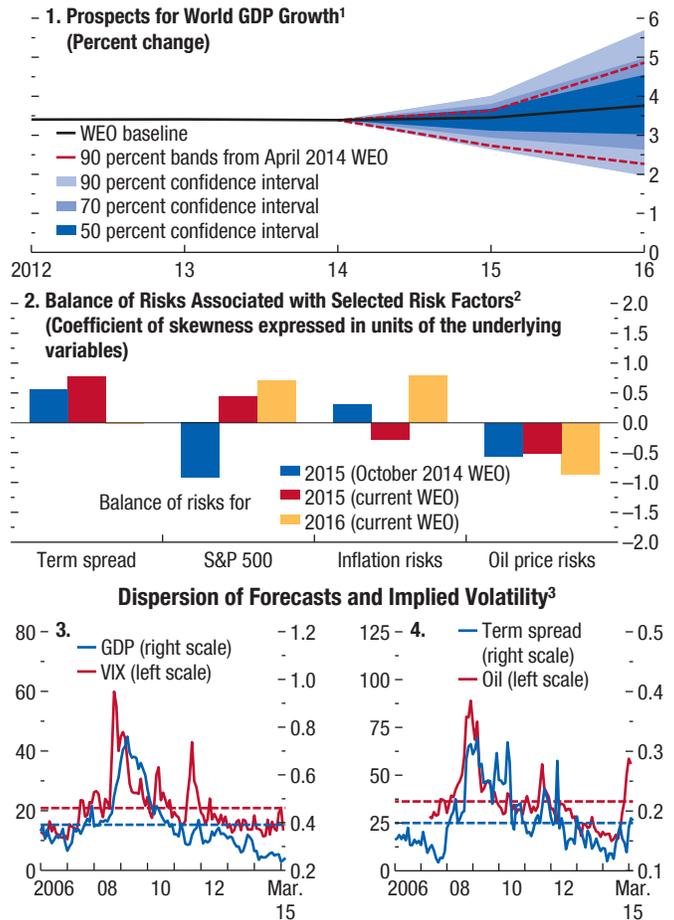
- First, baseline uncertainty has increased because the forecast horizon for the current and next year is longer compared with October, when more data affecting both current- and next-year outcomes were already known.⁶
- Second, the underlying indicators for oil-price- and, to a lesser extent, inflation-related risks suggest increases in uncertainty. For both variables, the dispersion in related Consensus Economics *Consensus Forecasts* has increased (Figure 1.12, panel 4). For oil prices, the implied volatility in oil futures options has also risen (Figure 1.12, panel 4). These increases are indicative of greater divergence in views about underlying prospects—clearly affected by substantial surprises in both variables during the past year.

The greater divergence in views about key variables that could affect growth outcomes does not necessar-

⁶The forecast errors for both current- and next-year forecasts tend to be larger for the April than for the October WEO reports. See Timmermann 2006 for a discussion.

Figure 1.12. Risks to the Global Outlook

The fan chart, which indicates the degree of uncertainty about the global growth outlook, suggests that the distribution of risks is more balanced than that presented in the October 2014 WEO. The width of the confidence interval around the projected path for global growth has increased, however, for two main reasons: higher baseline uncertainty because the forecast horizon for the current and next year is longer compared with October, and higher uncertainty regarding risks related to oil prices and, to a lesser extent, inflation.



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

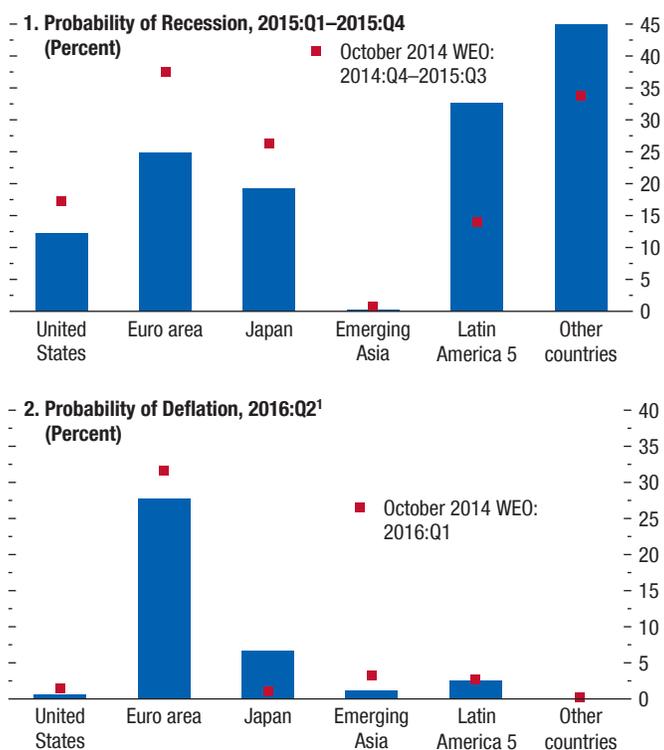
¹The fan chart shows the uncertainty around the WEO central forecast with 50, 70, and 90 percent confidence intervals. As shown, the 70 percent confidence interval includes the 50 percent interval, and the 90 percent confidence interval includes the 50 and 70 percent intervals. See Appendix 1.2 in the April 2009 WEO for details. The 90 percent intervals for the current-year and one-year-ahead forecasts from the April 2014 WEO report are shown relative to the current baseline.

²The 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. Note that the risks associated with the Standard & Poor's (S&P) 500 for 2016 are based on options contracts for December 2016.

³GDP 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 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 1.13. Recession and Deflation Risks

The IMF staff's Global Projection Model suggests a decrease in the probability of a recession in many major economies and regions over a four-quarter horizon compared with the October 2014 WEO. The decrease largely reflects stronger growth starting points. The probability of a recession has, however, increased for Latin America and the rest of the world. Deflation risks are primarily a concern for the euro area, where the probabilities are still high despite some decline. In other economies and regions, they are well below 10 percent.



Source: IMF staff estimates.

Note: Emerging Asia comprises China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand; Latin America 5 comprises Brazil, Chile, Colombia, Mexico, Peru; Other countries comprise Argentina, Australia, Bulgaria, Canada, Czech Republic, Denmark, Estonia, Israel, New Zealand, Norway, Russia, South Africa, Sweden, Switzerland, Turkey, United Kingdom, Venezuela.

¹Deflation is defined as a fall in the price level on a year-over-year basis in the quarter indicated in the chart.

ily imply larger forecast errors for the WEO baseline projections in the period ahead. Indeed, simulations using the IMF's Global Projection Model, which draw on past shocks over a longer horizon, suggest a decrease in the probability of a recession in the major advanced economies over a four-quarter horizon relative to October 2014 (Figure 1.13). However, the risk of a recession is now higher in Latin America and the "other countries" group, reflecting weaker initial conditions for their forecasts.

Immediate and Short-Term Risks

Low oil prices: Oil prices present a two-sided risk. One concerns the oil price path, which presents downside risks to global growth. The other concerns the growth impact of the oil price change under the baseline, which offers upside risks.

- On the *upside*, the impact on domestic demand of sizable real income gains due to the oil price windfall could be stronger than currently incorporated in the baseline (see Scenario Box 1). The forecasts are relatively conservative, and for a number of large emerging market oil importers, they assume limited pass-through to domestic end users and higher public or public sector savings. But these savings could be lower than the forecasts assume if governments instead use the windfall to fund other reforms, including, for example, higher infrastructure spending.
- On the *downside*, oil prices could rebound faster than expected for at least two reasons (not related to a stronger pickup in global demand, which would support global growth). The first is a correction for an earlier overreaction as market participants decide that the price path currently embedded in futures contracts is too low given forecasts of demand and supply. The second is a stronger negative supply response to lower prices, which would mean a shorter-lived and smaller boost to global demand.

Disruptive asset price shifts and financial market turmoil:

These remain a downside risk, as elaborated in the April 2015 GFSR. Two reasons underpin this risk. First, term premiums and risk premiums in bond markets are still very low (see the earlier discussion on low long-term interest rates). At the same time, financial market volatility, although slightly higher than six months ago, has also been low from a historical perspective. Second, the context underlying this asset price configuration—in particular, very accommodative monetary policies in the major advanced economies—is expected to start changing in 2015. News that changes expectations about these fault lines and unexpected portfolio shifts more broadly could trigger turmoil, as relative risks and returns would change. The unexpected end to the Swiss National Bank's floor for the Swiss franc–euro exchange rate is a case in point.

A particular concern in this respect are surprises about the first interest rate increase in the United States after a long period of very accommodative monetary policy. Market expectations of the pace of interest rate increases in the United States (as measured by the rates implied

by federal funds futures contracts) incorporate a much slower pace of interest rate normalization relative to the median interest rate forecast of members of the Federal Open Market Committee, even though market forecasts for economic growth appear to be broadly in line with those of committee members.

Emerging market economies are particularly exposed: they could face a reversal in capital flows, particularly if U.S. long-term interest rates increase rapidly, as they did during May–August 2013. Given the sharp fall in oil prices, oil exporters have become more vulnerable to these risks, in light of their higher external and balance sheet vulnerabilities, whereas many oil importers have gained buffers.

In addition, financial stress in the euro area triggered by policy uncertainty associated with Greece or political turbulence in the euro area could reemerge and reintensify the links between banks and sovereigns and the real economy.

A further sizable strengthening of the U.S. dollar:

This also represents a risk. Recent dollar appreciation largely reflects changing fundamentals and policies, as discussed earlier, including relative domestic demand strength, expected monetary policy divergence among major advanced economies, and changing external positions with lower oil prices. U.S. dollar appreciation against most currencies could possibly 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. This concern is particularly relevant for emerging market economies with high degrees of international financial integration, in which, as discussed in the April 2015 GFSR, foreign-currency corporate debt has increased substantially over the past few years. An important part of the increase has been in the energy sector, in which much of the revenue is in U.S. dollars, a natural hedge against depreciation (but not against declines in energy prices in dollars). But foreign-currency debt has also increased in firms operating in other sectors, with some of them, especially in the nontradables sectors, lacking natural revenue hedges. The balance sheet shock generated by the sudden large appreciation of the Swiss franc on some countries in central and eastern Europe with sizable domestic mortgage lending denominated in that currency highlights the nature of these risks.

Protracted low inflation or deflation: The impact on activity of protracted low inflation or outright

deflation in advanced economies with high public or private debt continues to be an important concern. The oil price decline has led to further declines in headline inflation, accentuating the undershooting of the target in many advanced economies. As discussed in earlier WEO reports, the problem is the combination of protracted undershooting and constraints on monetary policy at the zero lower bound for nominal interest rates.⁷ If the undershooting sets off a downward drift in medium-term inflation expectations, longer-term real interest rates would start rising, hampering the recovery and potentially exacerbating debt overhang problems. In this regard, the decline of some indicators for such expectations in the second half of 2014 (for example, the break-even inflation rate implied by five-year five-year-forward inflation swaps) is a concern, even though these indicators have stabilized this year. And persistently low inflation in the euro area would have spillovers onto a number of smaller European countries whose currencies are closely tied to the euro.

But in principle, two factors should mitigate such concerns. First, to the extent that further declines in inflation (or price-level declines) primarily reflect the fall in oil prices, the effect on inflation (price-level effect) should be temporary, unless the second-round effects, which experience from the recent commodity price boom suggests should be small, instead turn out to be sizable. Second, in oil importers the effects of oil prices on inflation tend to be strongest for consumer prices, given the substantial weight of imported energy in those prices, and much smaller for the price of domestic value added, as measured by the GDP deflator, since the latter includes only second-round effects on wages and other domestic factors. As the GDP deflator is the more relevant price measure for real interest rates for firms (and obviously the relevant measure for the public-debt-to-GDP ratio), the potentially negative impact on debt ratios from the oil price fall should be smaller.

Deflation probabilities from the IMF's Global Projection Model indicate that risks of deflation, defined as a price-level decline in a four-quarter window, during the period from the third quarter of 2015 through the second quarter of 2016 are primarily a concern

⁷Some central banks, including the ECB, have opted for slightly negative interest rates on bank deposits, and yields on government bonds of countries such as Germany and Switzerland have turned negative even at longer maturities.

for the euro area (Figure 1.13), but the probability has decreased below 30 percent. In other economies and regions, they are well below 10 percent. The model's probabilities for a price-level decline during the period exclude temporary disinflationary effects due to lower oil prices and thus reflect only the risks from other shocks to activity.

Geopolitical risks: Ongoing events in Russia and 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.

Near-term growth risks in China: Investment growth slowed in China in 2014, including in the real estate sector, after a boom in 2009–12. Some further slowdown is already factored into the baseline, but it could be stronger than expected, as striking a balance between reducing vulnerabilities, supporting growth, and implementing reforms remains challenging. Moreover, the impact of slowing investment on aggregate demand has been cushioned by policy stimulus, but the Chinese authorities are now expected to put greater weight on reducing vulnerabilities from recent rapid credit and investment growth. As a result, investors might be more concerned about risks of a further slowdown, which could feed into current investment.

Medium-Term Risks

Low potential growth in advanced economies: As discussed in Chapter 3, potential growth is likely to be lower than it was before the crisis, reflecting predictable effects from demographics—such as aging and declining fertility rates—as well as protracted crisis effects, notably lower growth in the capital stock (see also Chapter 4). Despite considerable two-sided risks to projections of potential output, crisis legacies—namely financial sector weakness, still-high public debt ratios, and private debt overhang—remain an important concern in some economies, particularly in the euro area, and could continue to negatively affect investment for longer if they are not addressed. In turn, a protracted period of large negative output gaps and high and increasingly long-term unemploy-

ment could lead to higher permanent losses in skills and labor force participation.

Secular stagnation in advanced economies: The risk of secular stagnation (discussed in more detail in a scenario analysis in the October 2014 WEO) will remain as long as demand is weak and inflation is expected to stay below target for an extended period, amid constraints on monetary policy at the zero lower bound. After six years of demand weakness, the likelihood of damage to potential output is increasingly a concern, and the considerations previously presented apply.

Lower potential growth in emerging market economies: As noted in Chapter 3, potential growth in major emerging market economies has been decreasing since the global financial crisis. A sequence of downward revisions to medium-term growth forecasts for many economies during the past three years indicates that this has been a broader development. The baseline projections already incorporate some decline in potential growth, in part due to demographic factors.

Risks to potential growth stem from two sources. Capital growth could slow further, especially if relevant structural constraints are not addressed or if commodity prices continue to fall. Total factor productivity growth could fall more than expected under current convergence expectations. Other macroeconomic factors, notably a tightening of financial conditions in emerging market economies, if protracted, could also lead to lower potential growth as discussed earlier.

Hard landing in China: Since the policy stimulus deployed during the global financial crisis, booming credit and investment have been key sources of growth in China, and vulnerabilities have been building. This is a medium-term risk because the Chinese government still has sufficient buffers to prevent a sharp growth slowdown by using public resources and state influence. The current reform effort to rebalance the economy is important to reduce this risk, since without reforms to change the pattern of growth, vulnerabilities will continue to increase, and the available policy space will shrink.

Policies

Global growth is expected to strengthen modestly in 2015–16, helped in part by the boost to global demand from lower oil prices and policy changes. But the recovery remains fragile in a number of advanced economies, marked by weak investment, and medium-term growth is low in many economies. Raising actual

and potential output therefore continues to be a general policy priority.

Macroeconomic policy requirements vary from country group to country group and among individual countries. In many advanced economies, accommodative monetary policy remains essential to prevent real interest rates from rising prematurely, given persistent and sizable output gaps as well as strong disinflation dynamics and associated risks (Figure 1.14). A strong case can be made for increasing infrastructure investment in some economies. In many emerging market economies, macroeconomic policy space to support growth remains constrained. With limited fiscal space, a general rebalancing of fiscal policy through budget-neutral tax changes and reprioritization of spending can help support growth. In oil importers, lower oil prices will reduce the burden on monetary policy to deal with inflation pressure and external vulnerabilities and, in the case of economies with oil subsidies, may provide some fiscal space. Oil exporters have to absorb a large terms-of-trade shock and face greater fiscal and external vulnerabilities.

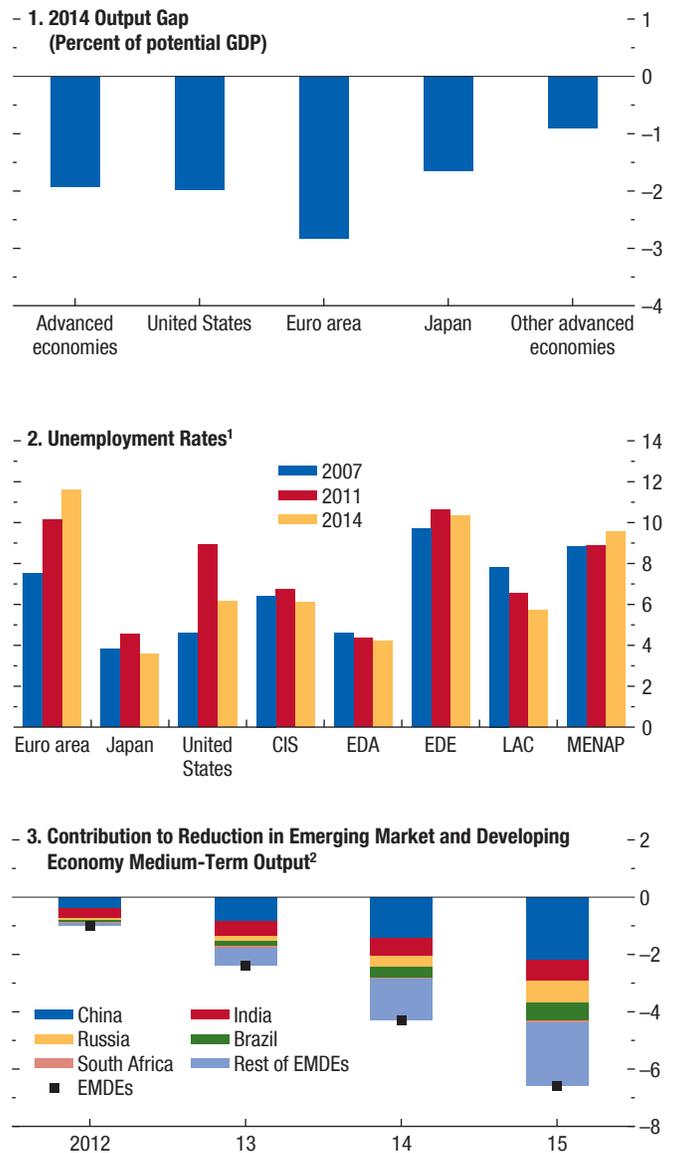
There is a broad need for structural reforms in many economies, advanced and emerging market alike. In this regard, lower oil prices also offer an opportunity to reform energy subsidies and taxes in many oil exporters and importers.

Continuing to Fight Low Inflation in Advanced Economies

Lower oil prices provide a welcome boost to demand in most advanced economies, but by lowering oil-related consumer prices, they contribute temporarily to further downward pressure on inflation. This is primarily a problem in advanced Europe, notably the euro area, and in Japan. With policy rates at the zero lower bound, monetary policy must stay accommodative through unconventional measures (including large-scale asset purchases) to prevent real interest rates from rising. Monetary policy efforts should be accompanied by a cleanup of bank balance sheets to improve credit supply. Complementary fiscal policy action in countries with fiscal space is also needed, as are demand-supporting structural reforms, in particular to improve productivity and stimulate investment. And as discussed in the April 2015 *Fiscal Monitor*, dealing with high public debt in a low-growth and low-inflation environment remains a key challenge in many advanced economies.

Figure 1.14. Capacity, Unemployment, and Output Trends
(Percent, unless noted otherwise)

Economic activity across the main countries and regions remains uneven. In advanced economies, the brakes placed on growth by high public and private debt are coming off, but at different rates across countries, and unemployment levels and output gaps are still high in some cases. Medium-term growth prospects have also been revised downward in many economies, particularly among major emerging markets, compared to the projections made in the September 2011 WEO.



Source: IMF staff estimates.
 Note: CIS = Commonwealth of Independent States; EDA = emerging and developing Asia; EDE = emerging and developing Europe; EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan.
¹Sub-Saharan Africa is omitted because of data limitations.
²Relative to the September 2011 WEO.

Within these broad contours, challenges differ considerably across countries.

In the euro area, notwithstanding the pickup in activity, the recovery remains fragile and uneven, with sizable output gaps and euro-area-wide inflation expected to remain substantially below target beyond normal monetary policy horizons. Hence, further policy action is needed to ensure a stronger euro-area-wide recovery, especially in private investment (Chapter 4).

On the monetary policy front, the ECB's decision to expand its asset purchase program through sovereign asset purchases until the path of inflation is consistent with achieving the ECB's price stability target is welcome. These monetary policy efforts should be supported by measures that aim to strengthen bank balance sheets, which would help to improve monetary policy transmission and credit market conditions. Stricter regulation of nonperforming loans and measures to improve insolvency and foreclosure procedures are a priority in this regard.

On the fiscal policy front, the broadly neutral euro-area-wide fiscal policy stance in 2015–16 strikes a better balance between supporting demand and improving debt sustainability. Nevertheless, countries with fiscal space, notably Germany, could do more to encourage growth, especially by undertaking much-needed public investment. Countries with limited fiscal space should use the new flexibility under the Stability and Growth Pact to undertake public investment and structural reforms and rebalance their economies. Should activity and inflation disappoint, threatening a descent into a bad deflationary equilibrium, additional fiscal support should be considered to complement further monetary easing.

In *Japan*, economic activity has rebounded after a short recession in mid-2014. Inflation has started to decline again, however, and oil prices will add to downward pressure on prices, 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 consider strengthening its policies along two dimensions as necessary to the attainment of the 2 percent inflation target. First, the portfolio-rebalancing effects of its asset purchases could be strengthened by increasing the share of private assets in purchases and extending the program to longer-maturity government bonds. Second, more forecast-oriented monetary policy communication would increase the transparency of its assessment of inflation prospects and signal its com-

mitment to the inflation target, mainly through the discussion of envisaged policy changes if inflation is not on track.

On the fiscal front, the stronger-than-expected contraction in consumption after the consumption tax increase last April highlights that it is critical for fiscal policy consolidation to be attuned to economic conditions and prospects. But risks to public debt sustainability remain a key concern given high public debt ratios, and a credible medium-term strategy for fiscal adjustment with specific measures is urgently needed to maintain market confidence.

In the *United States*, growth rebounded strongly in much of 2014 and is expected to run above trend in 2015–16. The main near-term policy issue is the appropriate timing and pace of monetary policy normalization. On one hand, although uncertainty remains about the extent of underlying labor market slack, particularly in light of the decline in labor force participation, a broad range of other labor market indicators suggests a notable improvement in the labor market. On the other, the appreciation of the dollar will put some downward pressure on GDP growth by dampening external demand, and there is little evidence of meaningful wage and price pressures so far.

The Federal Reserve has communicated that the timing for the liftoff of interest rates will depend on progress toward its goals of maximum employment and 2 percent inflation and that interest rate normalization will be gradual. After the liftoff—expected later this year—market participants generally expect an even more gradual rate increase to a lower natural rate than forecast by Federal Open Market Committee members, as noted in the “Risks” discussion. At the same time, long-term U.S. interest rates have fallen further as a result of still-weak conditions in many other major economies, strong demand for safe U.S. assets, and expectations of future dollar strength, and there is potential for a rapid increase in those long-term rates. This divergence in expectations carries the possibility of surprises and disruptive market adjustments and further underscores the importance of an effective policy communication strategy.

On the fiscal policy front, the priority remains to agree on a credible medium-term fiscal consolidation plan to prepare for rising aging-related fiscal costs; this plan will need to include higher tax revenue.

Boosting Potential Output

As discussed in Chapter 3, potential output growth in advanced economies is expected to strengthen

only very moderately in 2015–20 even though crisis legacies are slowly waning. The main reason for the subdued forecast is population aging, which underlies the projected low growth and possible decline in trend employment under current policies affecting labor force participation. This picture highlights the general need for structural policies to strengthen both labor force participation and trend employment.

- In Japan, where female labor force participation is below average, removing tax disincentives and improving child care options would increase incentives for women to work.
- 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 address protracted low demand, priorities include fewer tax 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, removing tax disincentives and providing targeted support to low-income families for child care would help raise labor force participation.

As discussed in the October 2014 WEO, 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, such investment would also provide much-needed short-term support to domestic demand in some of these economies.

In other areas, priorities for spurring medium-term growth vary considerably:

- 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 energy markets. 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 to 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.

Emerging Market and Developing Economies

Growth in emerging market economies has fallen short of expectations during the past few years after a decade of very rapid growth. The shortfall reflects in part weak growth in advanced economy trading partners since the global financial crisis and the growth moderation in China, but a variety of country-specific factors are also at play.⁸ Efforts to rebalance growth toward domestic sources in recent years have supported domestic activity, but they have also increased macroeconomic vulnerabilities and reduced policy space in some economies. Several countries have experienced inflation above target or weaker fiscal positions than before the crisis—or both.

Reducing vulnerabilities against the backdrop of still-high risks of capital flow reversals must remain an important policy goal. Macroeconomic weaknesses would be costly if this risk materialized. In particular, stronger growth in advanced economies and the expected normalization of monetary policy in the United States later this year could lead to a more persistent reversal of the substantial capital flows to emerging market economies in search of higher returns since the crisis—reversals so far have been short lived and with limited reductions in flows, especially to Latin America (see Figure 1.5).

In this context, the sharp oil price decline in the second half of 2014 has mitigated external vulnerabilities in oil importers. But the decline has also introduced new growth challenges and increased external and fiscal vulnerabilities in oil exporters:

- Many oil importers have successfully lowered their vulnerability to adverse shocks during the past year by adopting tighter macroeconomic policies to reduce inflation and narrow external current account deficits. Lower oil prices will further alleviate infla-

⁸See Chapter 4 in the April 2014 WEO for details.

tion pressure and reduce external vulnerabilities with lower bills for oil imports. The trade-off between supporting demand if there is economic slack and reducing macroeconomic vulnerabilities has become less pronounced as a result, which may allow some central banks in economies with slack to reduce policy rates.

- In oil importers in which external borrowing has risen strongly over the past few years and exposure to external funding risks remains high, efforts to strengthen public finances and raise domestic savings must continue. In economies with oil subsidies, windfall gains from lower oil prices will lead to higher public sector savings, except where some or all of the gains are used to increase spending or reduce taxes. Whether all the gains should be saved depends on the extent of economic slack in a particular economy, the strength of its fiscal position, and its needs. In particular, these gains may provide an opportunity to finance critical structural reforms, notably energy subsidy reforms, or growth-enhancing spending, including on infrastructure.

In oil exporters, addressing higher external and fiscal vulnerabilities has become a priority, although the urgency varies considerably across countries. Some oil exporters increased fiscal savings while oil prices were high and accumulated funds that can now be used to smooth the adjustment in public spending to lower prices. Nevertheless, with some of the oil price decline expected to be permanent, it will be important not to delay such adjustment, to ensure intergenerational equity in using oil wealth and preserve some policy space for future shocks. In oil exporters with limited policy space, allowing substantial exchange rate depreciation will be the main avenue available to cushion the impact of the shock on their economies. Some will have to strengthen their monetary frameworks to forestall the risk that depreciation will lead to persistently higher inflation and further depreciation pressures.

More broadly, emerging market and developing economies not relying on exchange rate pegs should be ready to respond to external financial shocks by allowing more exchange rate flexibility, complemented with other measures such as foreign exchange intervention to limit excessive market volatility. This may require strengthening the credibility of the macroeconomic policy framework in some, and the macroprudential policy framework must be ready to keep balance sheet exposures to foreign exchange risks manageable

(Indonesia, Malaysia, Turkey). Enforcing or (if needed) strengthening prudential regulation and supervision as well as macroprudential frameworks will also be important in economies in which rapid recent credit growth and increased private sector leverage have led to sharply higher credit-to-GDP ratios and higher credit-related vulnerabilities (including Brazil, China, Thailand, and Turkey; see also Figure 1.8).

In China, rebalancing toward domestic demand has so far been driven primarily by rapid growth in investment and credit, an unsustainable pattern of growth that has led to rising vulnerabilities in the corporate, financial, and government sectors. To avoid a further buildup of attendant risks, policies need to be carefully calibrated to simultaneously contain vulnerabilities, manage the corresponding slowdown, and unleash sustainable sources of growth. In this light, implementing the authorities' structural reforms to give market mechanisms a more decisive role, eliminate distortions, and strengthen institutions is crucial. Implementing these reforms should help achieve more efficient use of resources and hence faster productivity growth, as well as boost living standards across the income spectrum. 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.

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, 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 (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). In India, the postelection recovery of confidence and lower oil prices offer an opportunity to pursue such structural reforms.

Navigating the Risks Posed by Lower Commodity Prices in Low-Income Countries

Growth in low-income countries as a group has stayed high while growth in advanced and emerging market economies has weakened. But growth challenges and vulnerabilities have increased as a result of weaker activity in advanced and emerging market economies and lower commodity prices. And greater access to foreign market financing has increased some low-income countries' exposure to volatility in international financial markets.

Near-term growth prospects have already been revised downward for low-income countries as a group during the past year as a result, albeit less so than for other country groups. In a number of these countries, fiscal deficits have increased and public debt ratios have risen. The sharp drop in oil prices has amplified the growth challenge for low-income oil exporters. Maintaining sound fiscal and external positions will also become more challenging, given the strain on budget revenues and foreign exchange earnings.

Policies must respond to 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 the broadening of the revenue base and adjusting nonessential expenditure while maintaining essential investment 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 those oil exporters with limited buffers, fiscal adjustment will be both inevitable and urgent. It will also be critical to manage foreign-currency exposures in balance sheets carefully.

Low-income countries also need to make progress in meeting the Sustainable Development Goals, which are set to replace the Millennium Development Goals in September 2015. Despite strong growth in a majority of these countries, 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 increased growth challenges and vulnerabilities discussed earlier will be important for progress on these development goals. In addition, policies will need to focus on sustainable resource mobilization to boost growth. 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.

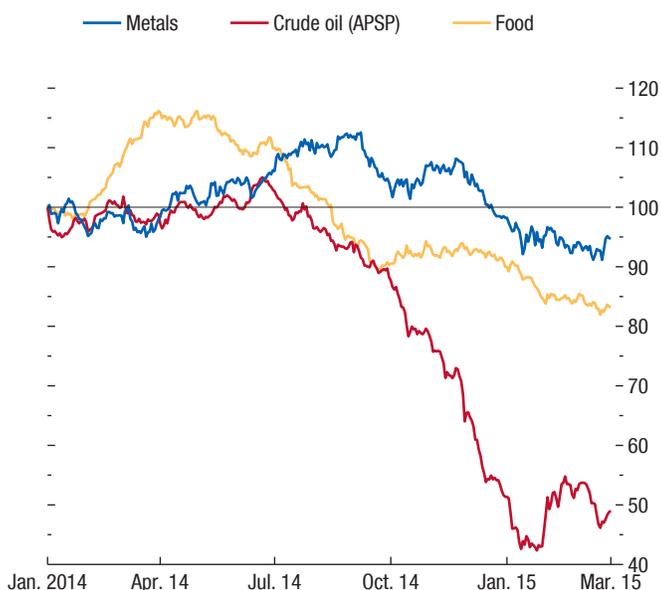
Special Feature: Commodity Market Developments and Forecasts, with a Focus on Investment in an Era of Low Oil Prices

Commodity prices have fallen markedly since the release of the October 2014 World Economic Outlook (WEO), led by a dramatic drop in crude oil prices driven by both supply and demand factors. Metal prices have fallen because of slowing demand growth in China and significant increases in the supply of most metals. Food prices have declined mostly on account of favorable harvests.

Commodity prices have declined 28 percent since September 2014, mainly owing to a 38 percent drop in energy prices (Figure 1.SF.1). Much of that decline is the result of a 43 percent decrease in crude oil prices; natural gas and coal prices declined by less, partly because contracts are indexed to oil prices with a lag. Nonfuel commodity prices also fell: those for metals by

The authors of this feature are Rabah Arezki (team leader), Akito Matsumoto, Shane Streifel, and Hongyan Zhao with research assistance from Vanessa Diaz Montelongo and Rachel Fan. The authors are grateful to Rystad Energy and Per Magnus Nysveen in particular for kindly providing proprietary data on capital expenditures and cost structures.

Figure 1.SF.1. Commodity Price Indices
(January 1, 2014 = 100)



Sources: Bloomberg, L.P.; and IMF, Primary Commodity Price System.

Note: Metals index is a weighted index of aluminum, copper, lead, nickel, tin, and zinc. Food index is a weighted index of barley, corn, wheat, rice, soybean meal, soybeans, soybean oil, swine, palm oil, poultry, and sugar. Data are through March 25, 2015. APSP = average petroleum spot price—average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted.

15 percent and those for agricultural commodities by 6 percent.

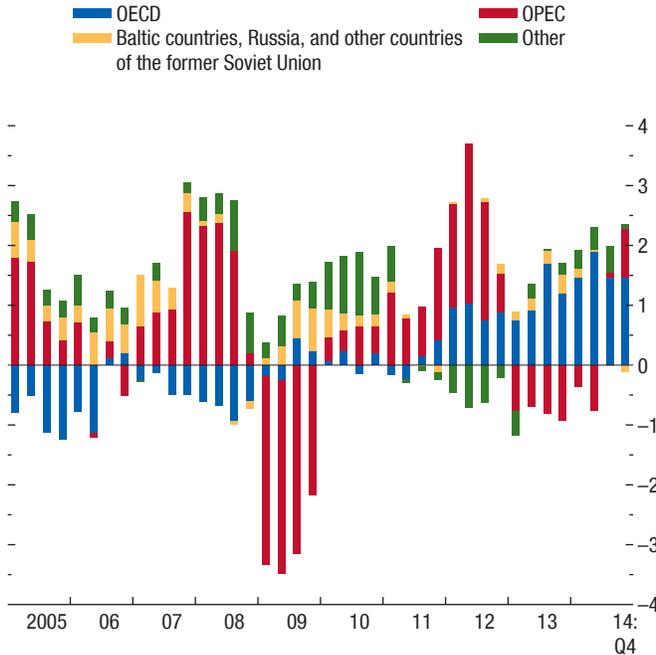
The large fall in oil prices was driven by both demand and supply factors, as discussed in Arezki and Blanchard 2014 (see also Box 1.1). On the supply side, three factors were particularly relevant:

- *Surprise increases in oil production of the Organization of the Petroleum Exporting Countries (OPEC):* These increases resulted in part from the faster-than-expected recovery of oil production in some OPEC members, including Iraq and, at times, Libya, after earlier outages and declines (Figure 1.SF.2).
- *Production increases outside OPEC:* Although these increases were broadly in line with expectations in the second half of 2014, they surpassed expectations in 2013 and early 2014. Overall, production outside OPEC rose by nearly 1.3 million barrels a day (mbd) in 2013 and more than 2.0 mbd in 2014. Most of the supply increases reflect growing production in North America, led by shale oil in the United States.
- *An unexpected shift in the OPEC supply function:* In November 2014, OPEC members decided not to lower production in response to the emergence of a positive net flow supply (the difference between global production and global consumption). Instead, they decided to maintain their collective production target of 30 mbd, despite increasing oil inventories (associated with the positive net flow supply).

Global growth in oil consumption slowed significantly during 2014 to about 0.7 mbd (a 0.7 percent increase from 2013), about half the growth recorded in 2012–13. The slowdown primarily reflects renewed consumption declines in Organisation for Economic Co-operation and Development (OECD) countries (mainly in Europe and the Pacific) after an unusual increase in consumption in 2013 (OECD oil demand has generally been declining since 2005). Oil consumption growth in emerging market economies remained low at about 1.1 mbd (2.5 percent increase from previous year) but accounted for the entire net growth in consumption.

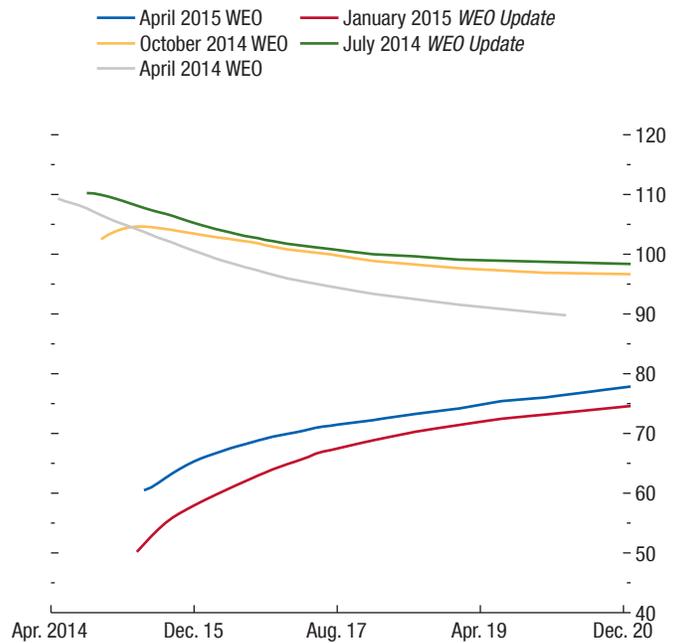
With supply running well ahead of demand, OECD crude oil inventories have increased, particularly in North America. Stocks at Cushing, Oklahoma, the pricing point of New York Mercantile Exchange West Texas Intermediate (WTI) futures, have surged this

Figure 1.SF.2. Oil Supply Growth
(Million barrels a day; year-over-year percent change)



Sources: International Energy Agency; and IMF staff calculations.
Note: OECD = Organisation for Economic Co-operation and Development; OPEC = Organization of the Petroleum Exporting Countries.

Figure 1.SF.3. Brent Futures Curves
(U.S. dollars a barrel; expiration dates on x-axis)



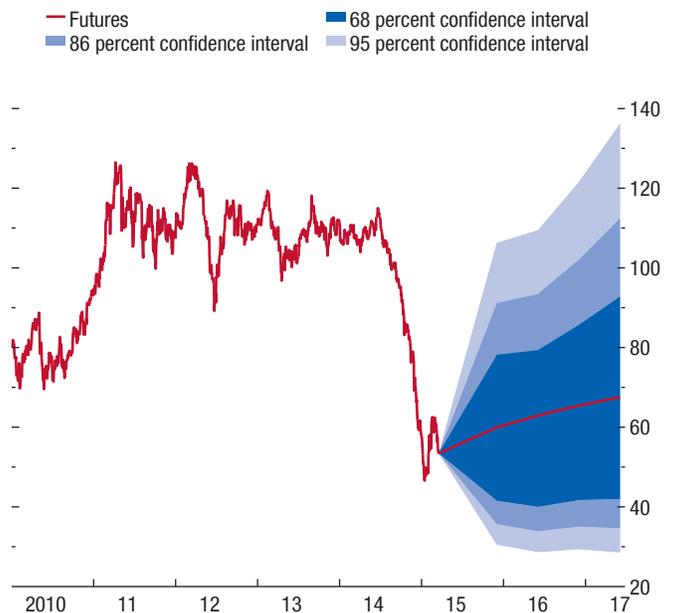
Sources: Bloomberg, L.P.; and IMF staff estimates.

year, and WTI is again trading at a large discount to internationally traded Brent.¹ The inventory buildup at Cushing has resulted from continuing increases in U.S. production and Canadian imports, a decline in refinery activity because of maintenance, and the seasonal drop in oil consumption with the approach of spring. According to the International Energy Agency (IEA), OECD oil inventories may approach all-time highs in mid-2015, but global oil balances are expected to tighten in the second half of the year and into 2016.

Prices of oil futures point to rising prices (Figure 1.SF.3). The baseline assumptions for the IMF's average petroleum spot price, which are based on futures prices, suggest average annual prices of \$58.10 a barrel in 2015, \$65.70 in 2016, and \$69.20 in 2017 (Figure 1.SF.4). This pattern of increases likely reflects market perceptions that production growth will slow as weak oil prices dampen incentives for oil investment and drilling.

There is substantial uncertainty around the baseline assumptions for oil prices. On the upside, changes to

Figure 1.SF.4. Brent Price Prospects, March 17, 2015
(U.S. dollars a barrel)



Sources: Bloomberg, L.P.; and IMF staff estimates.

¹Incidentally, the U.S. Department of Energy recently announced that it will resume Strategic Petroleum Reserve purchases.

OPEC policy could be a major factor. In addition, oil demand could be somewhat higher with stronger economic growth after the oil price decline in 2014. Geopolitical risks remain ever present, with added stress for troubled oil-producing countries arising from lower oil export revenues. Risks to the downside include a prolonged surplus due to more subdued aggregate demand growth and sustained oil production growth. Should the industry adjust more quickly than anticipated to lower oil prices and reduce costs, production may exceed expectations, and the market could remain in surplus into 2016.

A key factor in the oil market adjustment to lower prices is the response of investment and, in turn, future oil production. Capital expenditures on oil development have already started to fall. According to Rystad Energy, overall capital expenditure among major oil companies was 7 percent lower in the third quarter of 2014 compared with average quarterly levels in 2013. Projections from the same source indicate that such capital expenditures will fall markedly throughout 2017. Moreover, production from some high-cost sources of supply may not be sustained if current oil prices do not cover variable costs. The second part of this special feature is dedicated to the response of investment to low oil prices.

Metal prices have declined 15 percent since September 2014 following slower demand growth in China and substantial supply increases for most metals, notably iron ore. The higher supply reflects additional increases on top of an already substantial increase in capacity during the past few years, and metal prices are now 44 percent below their 2011 peak. The slowdown in growth in China is occurring in most sectors, but most notably in construction. China consumes about 47 percent of the world's base metals (up from 13 percent in 2000) and accounted for the bulk of global consumption growth during 2000–14. Global metal consumption is expected to continue growing moderately, with slowing growth in China partly offset by higher demand growth in the rest of the world as economic activity recovers. Average annual metal prices are expected to decline 17 percent in 2015, largely on account of the decreases in the second half of 2014, and then fall slightly in 2016. Subsequently, prices are expected to broadly stabilize as markets rebalance, mainly from the supply side. The largest price decline in 2015 is expected for iron ore, which has seen the greatest increase in production capacity from Australia and Brazil.

Prices of agricultural commodities have declined by 6 percent overall. Food prices have decreased 7 percent relative to September 2014, with declines in all main indices except that for seafood, which increased slightly. Relative to their 2011 peak, food prices have declined by 23 percent following record or near-record harvests for major crops. Prices of beverages and agricultural raw materials are also down relative to September 2014 and their highs in 2011. A notable exception is tea prices, which have climbed because of dry-weather concerns in Kenya. Arabica coffee prices rose sharply in 2014 as a result of weather-related supply shortfalls in Brazil, but production is expected to rebound this year, and prices have moderated. Meat prices also jumped last year on tight supply in the United States but have since dropped because of the impact on demand and with expected expansion of herds.

Annual food prices are projected to decline by 16 percent in 2015 and 3 percent in 2016 with expected further improvement in supply conditions for many food commodities—assuming favorable weather. Large declines are expected for principal cereal and vegetable oil prices, particularly those for wheat and soybeans. Lower fuel costs will also improve agricultural producer profitability and curb demand for biofuels, particularly for biodiesel from sugar and palm oil. Ethanol production from corn in the United States is largely driven by government mandates. The one exception to the otherwise downward price trajectory is for meat prices, which are expected to rise moderately during the forecast period on strong demand and relatively tight supply.

Investment in an Era of Lower Oil Prices

Against the backdrop of lower oil prices, global investment in the oil sector—in which oil is an output—has decreased noticeably during the past nine months, reflecting lower investment in oil sands, deepwater oil, and to a lesser extent shale oil.² Low oil prices render exploration and extraction activities less profitable and, at times, not economical, leading to a reduction in investment. Growth in global oil production is expected to decline moderately, but with a significant delay. In some instances, oil production could be halted in fields with marginal costs that exceed oil prices—a possibility for some oil sand and

²The analysis presented in this subsection focuses on crude oil production and excludes natural gas liquids and condensate and refinery gains.

deepwater oil production. Low oil prices are, nevertheless, expected to lead to significant efficiency gains that will bring down costs and limit somewhat the adjustment in investment and production.

Understanding the dynamic response of investment in the oil sector to the fall in oil prices is important for at least two reasons. First, at the global level, the response of oil investment conditions the response of oil production and in turn feeds back into oil prices. Given the expected delayed response of oil production, oil prices will, all else equal, rebound to higher levels—but only gradually. Second, for selected countries, investment in the oil sector can be a large portion of total investment and may have important macroeconomic consequences.

In the non-oil sector—in which oil is an input—lower oil prices translate into lower costs, boosting profits and investment. Obviously, the more energy intensive the non-oil sector in a particular country, the bigger the boost for that country. For instance, oil consumption as a share of GDP is 3.7 percent in Japan, whereas it is 12.4 percent in Thailand. This implies that the Thai economy might benefit more from lower oil prices than might the Japanese economy. Chapter 4 covers the issue in more depth. Notwithstanding the policy response to the fall in international oil prices, the economic structure of any given country will determine the relative strength of the consumption and investment channels.

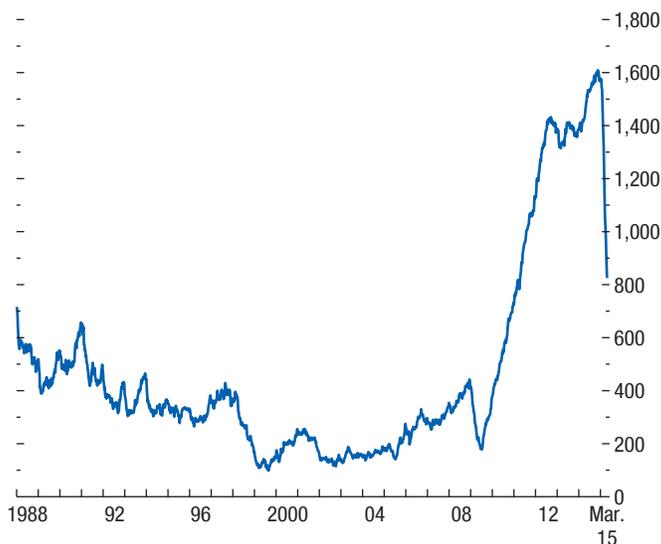
The next subsection addresses the following questions:

- How does investment in the oil sector respond to the decline in oil prices?
- How does oil production respond to the decline in oil prices?

Investment in the Oil Sector

Investment in the oil sector has fallen as a result of the recent oil price slump. Press reports since September 2014 indicate that firms in the upstream sector around the world are cutting back on capital expenditures and laying off workers. In the United States, the number of oil rigs—apparatuses for on-land oil drilling—in use has fallen markedly since September 2014, albeit by far less than the increase in the number of rigs during the past few years (Figure 1.SF.5). A cursory exploration of these data suggests that the lag between the onset of the fall in oil prices and the change in rig count is between three and six months.

Figure 1.SF.5. United States: Weekly Rig Count
(Number of rigs in operation)



Source: Baker Hughes Inc.

Historically, global investment in the oil sector has closely followed oil price developments (Figure 1.SF.6).³ The increase in global capital expenditure in the oil sector in the 2000s is unprecedented and reflects a prolonged era of high oil prices. Indeed, the rapid increase in oil demand, especially from large emerging market economies such as China and India, has driven up oil prices and encouraged further investment in tight oil formations that were previously uneconomical at lower oil prices.⁴

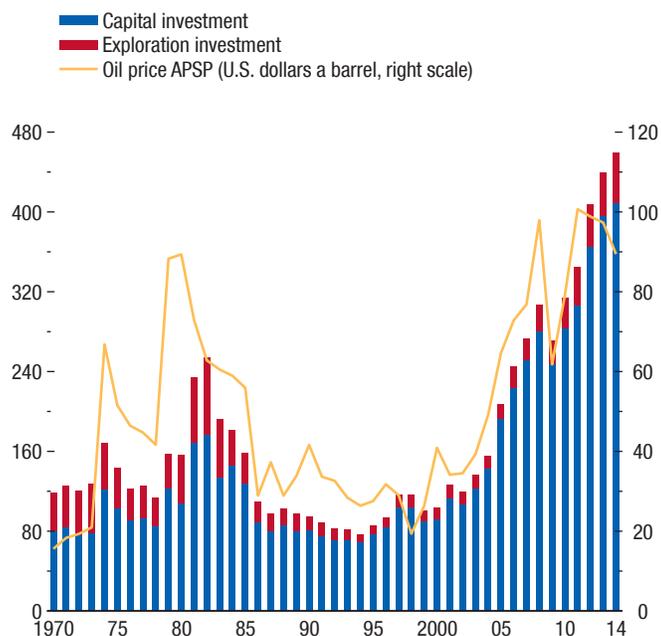
During previous episodes of dramatic price declines, investment in the oil sector has plummeted—particularly in the 1980s, when Saudi Arabia voluntarily stopped being the swing producer, which sent oil prices plunging from \$27 to \$14 a barrel.⁵ At the outset of that episode, exploration spending, a risky activity, dropped more than nonexploration expendi-

³Investment and oil price series are deflated using a price index for private fixed investment in mining and oil field machinery in the United States obtained from the Bureau of Economic Analysis website.

⁴See, for instance, Blanchard and Galí 2009, Hamilton 2003, Kilian 2009, and Cashin and others 2014 for systematic investigations of the relative role of demand and supply factors in oil prices. See Aastveit, Bjørnland, and Thorsrud, forthcoming, for a study focusing on the role of demand from emerging markets.

⁵A swing producer is a supplier that adjusts production with the aim of achieving a target price for a particular commodity.

Figure 1.SF.6. Global Oil Investment and Oil Price
(Billions of constant 2010 U.S. dollars, unless noted otherwise)



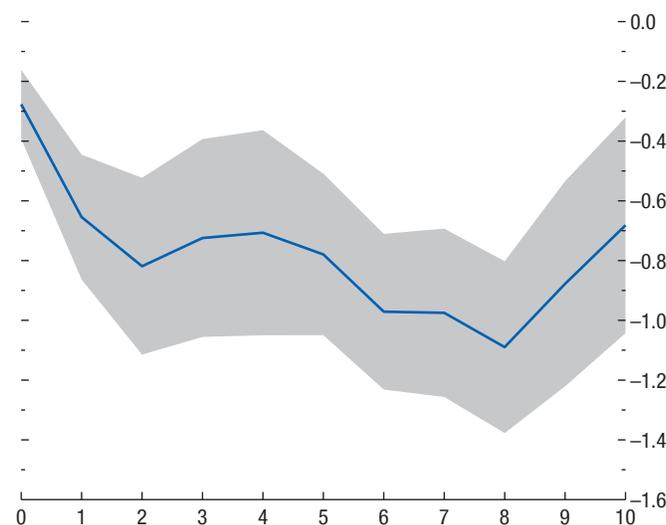
Sources: IMF, Primary Commodity Price System; Rystad Energy research and analysis; and IMF staff calculations.
Note: APSP = average petroleum spot price—average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted.

ture. Another dramatic (but more transitory) decline in prices occurred in late 2008 during the global financial crisis. Oil investment dropped markedly then but rebounded sharply the following year.

An empirical investigation using annual and historical data from Rystad for the period 1970 to 2014 including 41 countries—representing more than 90 percent of the world’s oil investment and production—confirms the rapid and quantitatively large effect of lower oil prices on investment in the oil sector. Results are obtained from a simple panel distributed-lag regression that includes the growth rate of real investment as the dependent variable and the growth rate of the price of crude oil among the explanatory variables (Figure 1.SF.7). According to the estimates, a 1 percent reduction in the price of crude oil is associated with a decrease of more than 0.6 percent in the deviation from trend investment after three years. These results suggest that the impact of lower oil prices on investment is felt within one year,⁶ confirming that the

⁶These estimates imply that the decline in oil prices in the WEO baseline would be associated with a 14 percent decline in invest-

Figure 1.SF.7. Response of Oil Investment to Oil Prices
(Percent change; years forward on x-axis)



Source: IMF staff estimates.
Note: The figure shows the deviation of oil investment from trend in response to a change in oil prices. The computed cumulative response is based on the regression of the first difference in the logs of oil investment on the distributed lags (10) of the first difference in the logs of oil prices after country fixed effects are controlled for. Shaded areas correspond to 95 percent confidence intervals.

recent decline in oil prices is already having a marked impact on investment in the oil sector.⁷

Uncertainty about the future course of oil prices has also increased. Documenting increased uncertainty is not easy, but a basic measure of uncertainty based on information derived from oil futures options between July 2014 and January 2015 suggests that in recent months, markets have anticipated a significantly higher probability of extremes in oil prices.⁸ This increased uncertainty may reduce investment growth in the oil sector and could even limit investment growth in non-oil

ment relative to trend in the first year and cumulative declines of 30 percent over three years and 20 percent over five years.

⁷This specification controls for country-specific fixed effects, which in turn control for time-invariant characteristics such as cross-country differences in oil endowment and institutions. For instance, Deacon and Bohn (2000) present empirical evidence that ownership risk slows resource use in some circumstances. The regression thus relies solely on variation in oil prices to explain within-country variation in investment. The results should be interpreted with some caution, however, given that they represent correlations rather than a causal relationship.

⁸Other measures of uncertainty about oil prices include indices of oil volatility, which have recently increased sharply, even though the increase is in part mechanical and has resulted from the fall in oil prices.

sectors that use oil intensively.⁹ The effect of uncertainty is compounded by the largely irreversible nature of investment in the conventional oil sector.¹⁰ The literature on aggregate investment has documented, both theoretically and empirically, the importance of uncertainty in raising the option value of waiting to invest, especially in a context of partial irreversibility (see, for instance, Bertola and Caballero 1994; Bloom, Bond, and Van Reenen 2007). There is also direct evidence that uncertainty reduces investment in the oil sector.¹¹

This special feature now turns to the impact that reduced investment in the oil sector may have on oil production.

Production in the Oil Sector

Growth in oil production is not expected to slow significantly in the short term as a result of the recent oil price slump. Historically, episodes of falling oil prices and, in turn, falling oil investment have not been immediately followed by a decrease in production. The response of oil production is typically delayed because of the long gestation period involved in translating new investment into production. More precisely, falling oil prices do little to change the incentives of producers that have already installed their production capacity. Instead, lower oil prices affect future production through lower exploration expenditures and less investment in the development of new fields.¹²

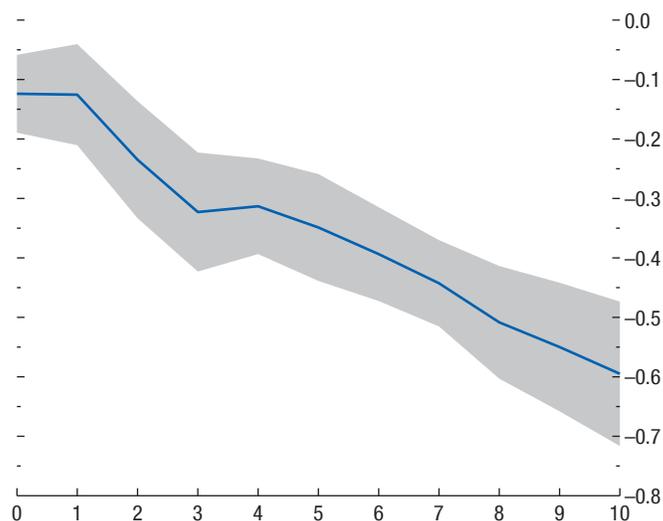
⁹For an investigation into the effect of oil price uncertainty on world real economic activity, see, for instance, Soojin 2014 and Elder and Serletis 2010. The latter suggests that the effect of uncertainty is both economically and statistically significant, even though methodological challenges remain in the measurement of uncertainty and in determining its impact independent of lower oil prices.

¹⁰Unconventional oil production, in particular tight oil production, requires less in the way of sunk costs and thus may be less subject to uncertainty about future oil prices.

¹¹For instance, Kellogg (2014) estimates the response of investment to changes in uncertainty using data on oil drilling in Texas and the expected volatility of the future price of oil. The author finds that drilling activity responds to changes in price volatility on a scale consistent with the optimal response prescribed in theory and that the cost of failing to respond to volatility shocks is economically significant.

¹²Anderson, Kellogg, and Salant (2014) document empirically that changes in oil prices affect producers' incentives at the extensive margin rather than at the intensive margin. In other words, changes in oil prices affect exploration expenditures and the decision to invest in new fields but do not substantially affect production from existing fields. To explain these facts, Anderson, Kellogg, and Salant (2014) reformulate Hotelling's (1931) classic model of exhaustible resource extraction as a drilling problem: firms choose when to drill, but production from existing wells is constrained by reservoir pressure,

Figure 1.SF.8. Response of Oil Production to Oil Investment
(Percent change; years forward on x-axis)



Source: IMF staff estimates.

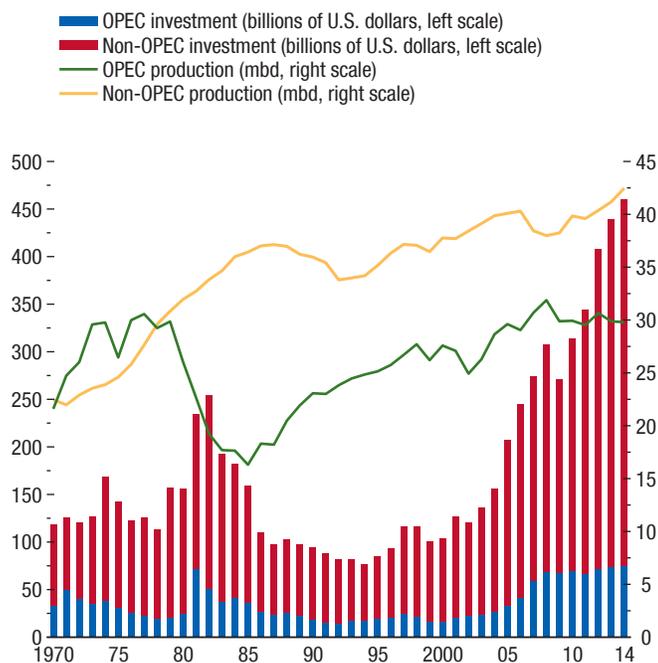
Note: The figure shows the deviation of oil production from trend in response to a change in oil investment. The computed cumulative response is based on the regression of the first difference in the logs of oil production on the distributed lags (10) of the first difference in the logs of oil investment after country fixed effects are controlled for. Shaded areas correspond to 95 percent confidence intervals.

Empirical evidence—from the same sample of 41 countries for the period 1970–2014 referred to earlier—confirms the slow response of production to the fall in investment in the oil sector. Results from a simple panel distributed-lag regression including oil production as a dependent variable and oil investment as an explanatory variable suggest that a 1 percent reduction in investment is associated with a 0.4 percent downward deviation in production from its trend, but only after five years (Figure 1.SF.8).¹³ There are caveats to interpreting these results as reflecting a causal relationship, although investment changes naturally precede changes in production. The implications of lower oil prices for investment and future production are already reflected in market participants' expectations; the oil futures curve is upward sloping, which implies higher expected future spot prices. The IEA also lowered its forecasts for non-OPEC

which declines as oil is extracted. The model incorporates a modified Hotelling rule for drilling revenues net of costs and explains why production is typically constrained.

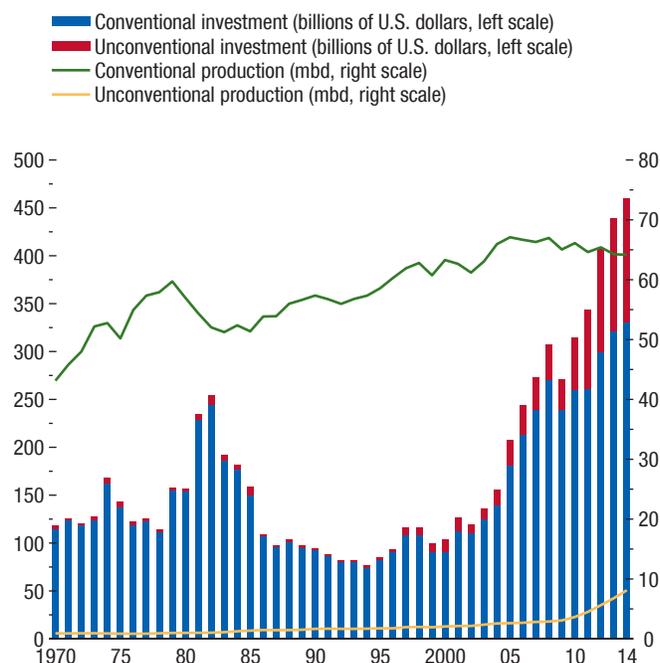
¹³These estimates imply that the fall in investment induced by the decline in oil prices in the WEO baseline would be associated with a 4.4 percent decline in production relative to trend over three years and a decline of more than 10 percent over five years.

Figure 1.SF.9. OPEC and Non-OPEC Oil Production and Investment



Sources: Rystad Energy research and analysis; and IMF staff calculations.
 Note: mbd = million barrels a day; OPEC = Organization of the Petroleum Exporting Countries.

Figure 1.SF.10. Conventional and Unconventional Oil Production and Investment



Sources: Rystad Energy research and analysis; and IMF staff calculations.
 Note: mbd = million barrels a day.

oil production—as a result of reductions in capital expenditure growth—in its latest *Medium-Term Oil Market Report* (IEA 2015), although sizable changes in future production are not expected for a few years. For the near term, the IEA raised its production forecast for 2015; however, production growth is expected to slow noticeably in North America.

The production of OPEC members and in particular of Saudi Arabia—the biggest oil producer within OPEC—is also guided by strategic considerations. OPEC has explicitly sought to influence oil prices, which suggests that the oil market is not a fully competitive market in which producers are atomistic and take prices as given. For example, faced with the increase in production from non-OPEC sources in the 1980s, Saudi Arabia reduced production significantly during the course of a few years (Figure 1.SF.9). The production cuts were not sufficient to curb the fall in oil prices, and Saudi Arabia changed course in 1986, which led to a further decline in oil prices (see Gately 1986). A similar situation seems to have played out with the increase in production in unconventional oil from North America (Figure 1.SF.10). In the past few months, Saudi Arabia

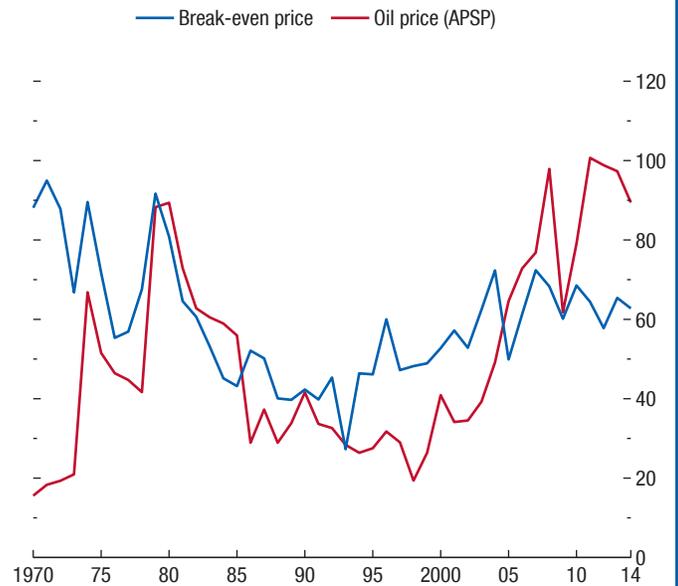
has openly stated that it will not cut production in the face of growing production from non-OPEC countries and in turn lower oil prices, despite pressures from other OPEC members. Some commentators have argued that this strategy is aimed at easing relatively costlier oil extraction activities out of the market. As discussed later in this subsection, U.S. oil production will be somewhat affected by oil prices at their current lower levels but less so than some non-OPEC production.

There is a possibility that oil production may respond more quickly to lower prices than it has in the past. The evolution of global break-even prices—oil prices at which it becomes worthwhile to extract—shows that prices during the 2000s were hovering well above break-even prices until the recent slump, when it became unprofitable for some fields to operate (Figure 1.SF.11). Despite relatively large decommissioning costs, the sizable gap that has emerged between current (approximately \$52 a barrel as of March 2015) and break-even oil prices will eventually lead to a halt in production in some fields that are no longer profitable. Of course, active cost-reduction measures and other efficiency gains, including from consolidation in the oil industry,

will limit the effect of lower oil prices on oil investment and, in turn, on oil production. In addition, average production costs for shale oil, which has been driving global production growth, are now likely to be closer to marginal costs because field depletion rates tend to be higher than those of conventional oil. The spatial distribution of operating costs per barrel suggests that Canada, the North Sea, and the United Kingdom are among the most expensive places to operate oil fields (Figure 1.SF.12).¹⁴ As a result, the oil price slump will affect production in those locations earlier and more intensely than in other locations. A detailed investigation of the cost structure associated with U.S. shale oil production suggests that shale oil production has experienced rapid efficiency gains, considering that it is still relatively early in the investment cycle. Projections from Rystad show that lower oil prices are expected to have a smaller impact on production of shale oil in the United States than on deepwater and oil sand production, especially in Brazil, Canada, and the United Kingdom.

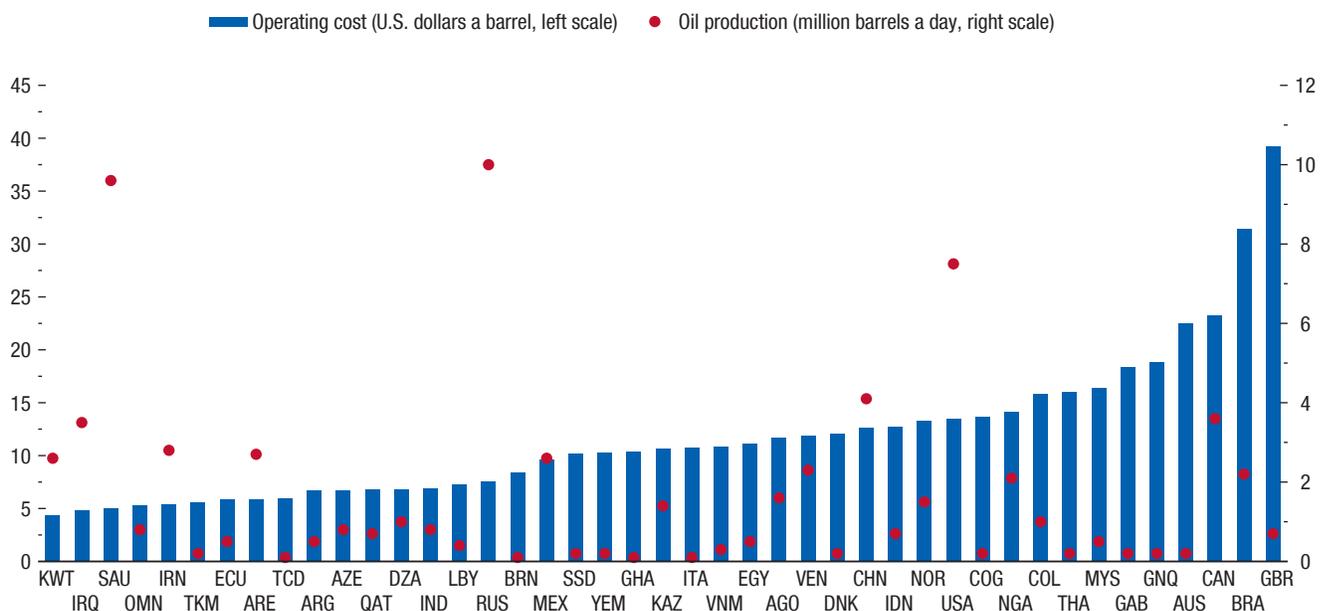
¹⁴Shale oil production in the United States appears to be more resilient to falling oil prices, considering growing efficiency gains. Rates of return will be significantly lower, however, and some highly leveraged firms that did not hedge against lower prices are already under financial stress and have been cutting their capital expenditures significantly and laying off substantial numbers of workers.

Figure 1.SF.11. Evolution of Break-Even Prices
(Constant 2010 U.S. dollars a barrel)



Sources: IMF, Primary Commodity Price System; Rystad Energy research and analysis; and IMF staff calculations.
Note: APSP = average petroleum spot price—average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted.

Figure 1.SF.12. Oil Production and Operating Costs by Country



Sources: Rystad Energy research and analysis; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

Box 1.1. The Oil Price Collapse: Demand or Supply?

Oil prices fell by half between June and December 2014. The implications of this decline for the global economy depend crucially on the underlying factors. If the decline was driven by increased oil supply, it would boost global growth through several channels—particularly by raising real incomes of oil consumers. If, however, it was driven by lower economic activity, the price decline would merely be a symptom of weaker global demand.

Identifying the shocks underlying the decline is challenging. Crude oil is a storable good, and as such, a real asset: its current price depends not only on current demand and supply conditions, but also on expectations of future market conditions. These expectations in turn depend on many factors, including global economic prospects, but they also affect prospects (for instance, pessimism about future oil supply would lead to higher prices and hence lower activity). This box discusses two useful approaches to disentangling the supply and demand shocks behind the oil price collapse in 2014. Since identification of the shocks depends on the underlying model, the two sets of results present a broad picture of the likely factors behind the oil price collapse rather than a precise quantitative assessment.

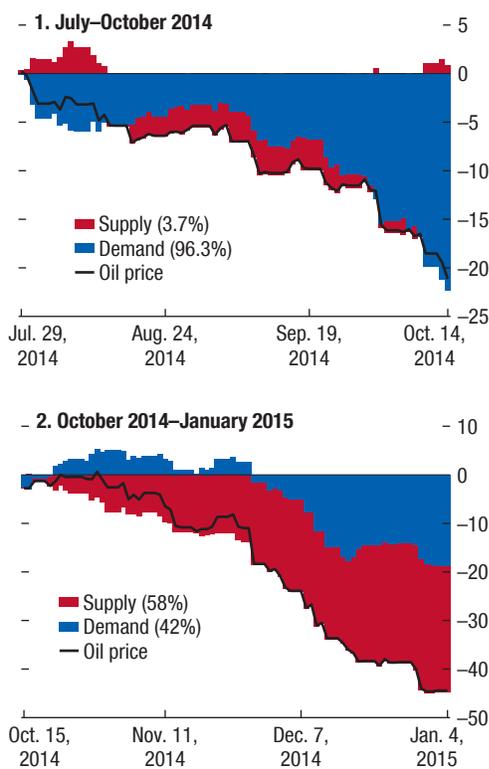
The first approach disentangles oil demand and supply shocks by examining the comovement of oil prices and stock prices. Specifically, it estimates a vector autoregression (VAR) model with daily data on oil prices (Brent crude oil variety prices) and global stock prices (Morgan Stanley Capital International [MSCI] All Country World Index) from January 2, 1991, to January 5, 2015. Demand and oil supply shocks are identified by assuming that a positive (negative) demand shock is associated with an increase (decrease) in both stock and oil prices, whereas a supply shock has opposite effects on oil and stock prices: higher (lower) oil supply reduces (increases) oil prices and increases (reduces) stock prices.¹

The results indicate that the sharp decline in oil prices since mid-2014 has been driven by both demand and supply shocks, with the relative contribution of these factors changing over time. Whereas the fall in oil prices between July and mid-October 2014 can be explained mostly by weak demand (Figure 1.1.1, panel 1), higher

The authors of this box are Samya Beidas-Strom and Carolina Osorio Buitron.

¹The methodology for identification through contemporaneous sign restrictions follows Matheson and Stavrev 2014.

Figure 1.1.1. Drivers of Oil Prices: Daily Two-Variable Model, July 2014–January 2015
(Cumulative change in log oil prices in percent)



Source: IMF staff calculations.

oil supply was the largest contributor during the mid-October 2014 to early January 2015 period, accounting for about 64 percent of the oil price decline during that time (Figure 1.1.1, panel 2).²

²Estimates based on an alternative stock price index, the MSCI World Index for advanced economies, are broadly unchanged relative to the benchmark. The relative contributions of demand and supply factors change somewhat if U.S. stock prices (Standard & Poor's [S&P] 500) are used to capture oil demand shocks, but the results are qualitatively similar. The results are also robust to excluding energy stocks. Fluctuations in energy stock prices need not be related to demand shocks in the oil market, as they may reflect changes in expectations about the profitability of companies in this sector. Hence, the identification is enhanced by focusing on non-energy stock prices in the

Box 1.1 (continued)

A look at past episodes suggests that the oil price collapse during the global financial crisis is mostly explained by demand shocks (Figure 1.1.2, panel 1), whereas in 1986 the collapse was driven predominantly by supply shocks (Figure 1.1.2, panel 2).³ This difference is consistent with the fact that in the 1986 episode, members of the Organization of the Petroleum Exporting Countries (OPEC) decided to raise production to increase their market share (Gately 1986).

The second approach is based on a structural VAR model for the global oil market, estimated with quarterly data from 1985 to 2014. It includes four variables: global industrial production (as a proxy for global demand conditions), global oil production, Organisation for Economic Co-operation and Development member countries' oil inventories, and the real price of oil.⁴ The identification method is similar to the one in the previous approach, with additional restrictions.⁵ Prices and global demand move together when there are shocks to demand; they move in opposite directions for supply shocks. In addition, if inventory demand rises (driven, for instance, by precautionary motives), oil prices, inventories, and oil supply will move together, while global demand will move in the other direction.

The results suggest that contemporaneous and past supply and demand surprises explain roughly two-thirds of the oil price decline between the second and fourth quarters of 2014, with supply accounting for a larger share of that two-thirds (Figure 1.1.3, panel 1). Shocks to inventory demand do not appear to explain the fall in prices during that period. Instead, a positive shock to inventory demand explains much of the observed actual increase in oil prices in the second quarter of 2014, plausibly as a result of increased geopolitical tensions in the Middle East and elsewhere at the time. Such positive shocks to inventory demand persisted through

United States (U.S. non-energy stock prices are used because of the lack of sectoral data for global stock prices). The results are very similar to those obtained with the S&P 500.

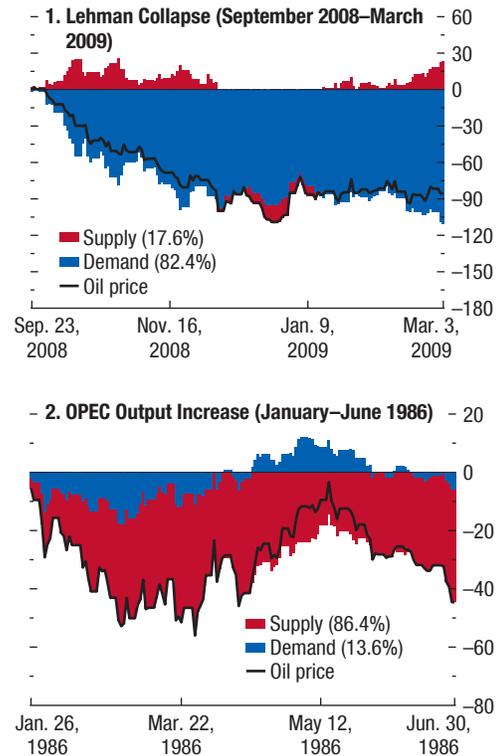
³The 1986 episode is based on estimates of the model using the MSCI World Index, for which data are available before 1991.

⁴The real oil price is defined here as U.S. refiners' acquisition cost of imported crude oil as reported by the U.S. Energy Information Agency.

⁵The identification scheme is based on sign restrictions and follows Kilian and Murphy 2014. The VAR results are updated estimates of the VAR model specification in Beidas-Strom and Pescatori 2014. For alternative approaches using a global vector autoregression (GVAR) model, see Cashin and others 2014.

Figure 1.1.2. Drivers of Oil Prices: Daily Two-Variable Model, 1986 and 2008

(Cumulative change in log oil prices in percent)



Source: IMF staff calculations.

Note: OPEC = Organization of the Petroleum Exporting Countries.

the remainder of the year, providing some offset to the negative price effects of other shocks.

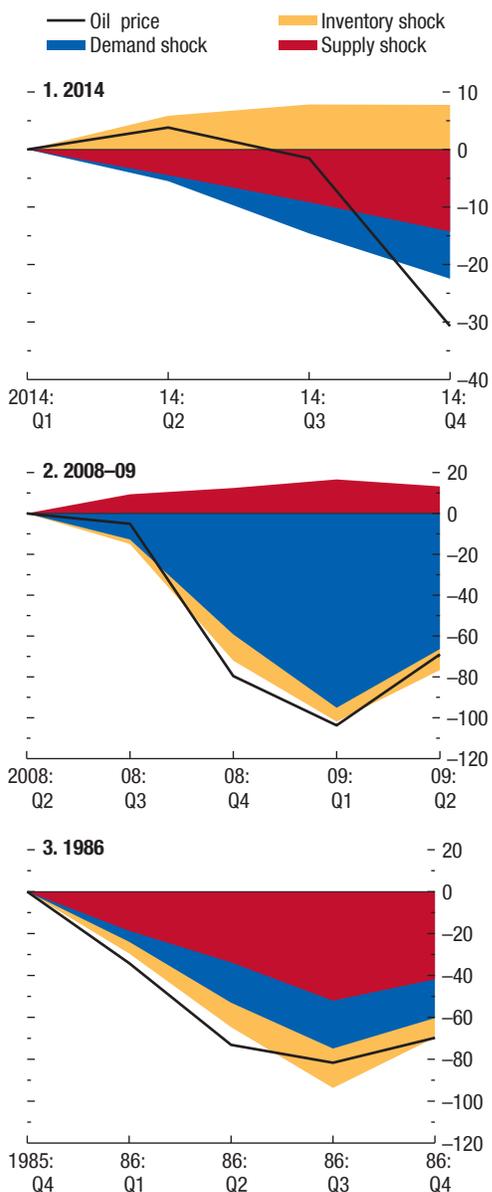
The sizable unexplained component (a residual shock in the model) during 2014 is consistent with the view that the oil price collapse reflected in part expected changes in oil market fundamentals. The model does not capture such expectations if they involve changes in patterns relative to those captured by past data.⁶

⁶The surge in shale and tight oil production in North America, the change in OPEC's supply function and consequent oil price regime, expectations of production disruptions, backstop technologies reducing oil intensity, and changes in world real interest rates, among others, were not fully predictable using past patterns in the data. See Beidas-Strom and Pescatori 2014 for more details.

Box 1.1 (continued)

Figure 1.1.3. Drivers of Oil Prices: Quarterly Four-Variable Model

(Cumulative change in log deviation from mean oil price in percent)^{1,2}



Source: IMF staff calculations.

¹From a sign-restricted structural vector autoregression (SVAR) model that picks the median impulse response function for the historical decomposition.

²The difference between the oil price deviation and the identified shocks is an unidentified residual shock.

Shock decompositions for past episodes of oil price declines based on the second approach are in line with conventional narratives. Specifically, the model identifies positive supply shocks as the main factor explaining the oil price decline in 1986, and demand shocks as the main factor explaining the collapse in prices during 2008 and early 2009 (Figure 1.1.3, panels 2 and 3).

In sum, the results of the two approaches suggest that both demand and supply factors played a role in the oil price collapse in 2014. They also suggest that current market conditions do not explain all of the decline. Indeed, Baumeister and Kilian (2015) emphasize the contributions of oil-market-specific developments before June 2014 to the oil price collapse, whereas the second approach presented here would suggest that changes in expectations also played a role. It is difficult to disentangle supply and demand factors in expectations, but recent revisions to the global growth outlook for 2015–20 alone seem too small to justify a predominant role of demand in those changes in expectations. Standard estimates of short- and medium-term price elasticities of demand and supply would have required larger revisions to the growth forecasts.

Box 1.2. Understanding the Role of Cyclical and Structural Factors in the Global Trade Slowdown

Global trade growth has been weak since the global financial crisis, outside of an initial rebound in 2010 (Figure 1.2.1). Weak economic growth during this period, especially in advanced economies, is widely seen as a key explanatory factor. Indeed, growth forecast errors for global trade and global GDP are highly correlated. Nevertheless, the ratio of trade growth to GDP growth, the so-called income elasticity of trade, has also been declining. Indeed, this trend started before the crisis—the income elasticity of trade was slightly above 2 in 1986–2000 but stood at only 1.3 in 2001–14.

This box aims to shed light on the factors contributing to the slowdown in trade by analyzing cyclical factors—focusing on the 2012–14 period—as well as structural factors, taking a longer-term view. Quantifying the contributions of these factors is important to developing an understanding of prospects for global trade when global growth strengthens, as is currently projected.

Cyclical Factors

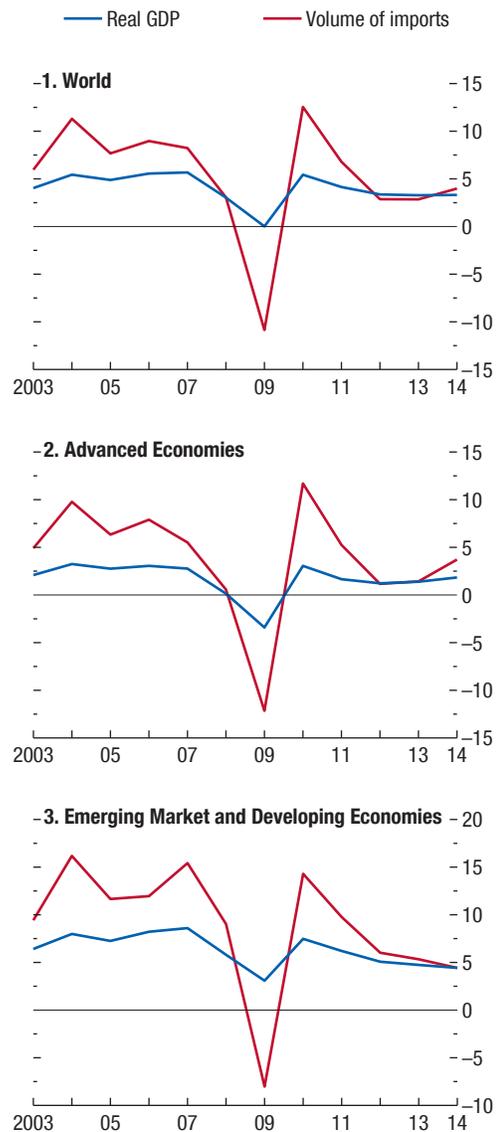
Highly synchronized output contractions took place across advanced economies during the global financial crisis. Contractions were larger in deficit economies in which external adjustment resulted from expenditure reduction, as is shown in Chapter 4 in the October 2014 *World Economic Outlook*. Sharp collapses in domestic demand and output in these deficit economies led to declines in their imports.

To quantify the impact of weak demand on imports, a standard econometric model is employed to link import volumes to domestic GDP, using data for a panel of 18 Organisation for Economic Co-operation and Development (OECD) countries through the second quarter of 2014.¹ Figure 1.2.2 shows actual trade volumes, the model’s predictions, and the predictions of a linear trend. Dating the beginning of the recent slowdown in trade at the end of 2011 shows cumulative 4.6 percent real import growth. The linear trend fitted for the 1985–2014 period predicts cumulative 13.2 percent real import growth—almost three times what is observed in the data. The standard import

The authors of this box are Emine Boz and Michele Ruta.

¹The estimated model is $\Delta \ln(M_{c,t}) = \delta_c + \beta_D \Delta \ln(D_{c,t}) + \beta_P \Delta \ln(P_{c,t}) + \epsilon_{c,t}$ in which $M_{c,t}$, $D_{c,t}$, and $P_{c,t}$ denote real imports, real aggregate demand, and relative import prices, respectively. Aggregate demand is measured using GDP in this standard empirical import equation.

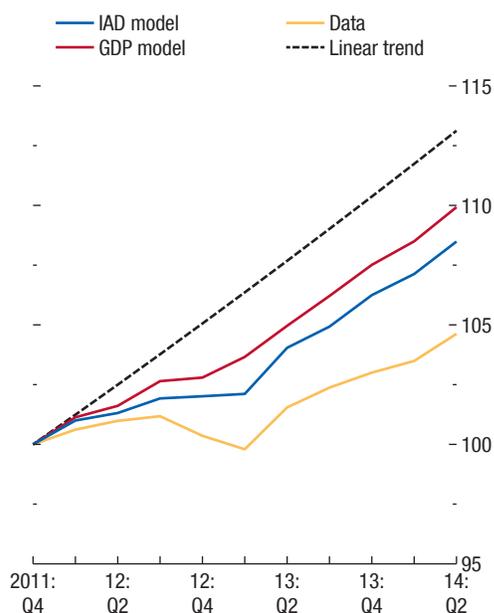
Figure 1.2.1. Growth in Real GDP and Volume of Imports (Percent)



Source: IMF staff calculations.

Box 1.2 (continued)

Figure 1.2.2. Cumulative Import Volumes: Data, Model, and Linear Trend
(Index, 2011:Q4 = 100)



Source: IMF staff calculations.
Note: IAD = import-intensity-adjusted demand.

model accounts for a little more than one-third of the slowdown: it predicts cumulative import growth of 10 percent for the same period.

In addition to weak economic activity and slow global trade growth, the past few years have also been characterized by weak investment. The slowdowns in import growth and in investment and export growth may be interconnected. Investment and exports tend to have high import components, so weaker demand for those elements of expenditure may lead to weaker demand for imports.

Bussière and others (2013) construct an *import-intensity-adjusted demand* (IAD) measure that weights the components of GDP according to their relative trade intensity computed from input-output tables.²

²Boz, Bussière, and Marsilli (2014) use this approach to tease out the role of the compositional shifts in aggregate demand in the recent period of weak trade growth. Import-intensity-adjusted demand is formally defined as $\ln(IAD)_t = \omega_{C,t} \ln(C)_t +$

As shown in Figure 1.2.2, the IAD model, which takes into account not only weakness in demand but also shifts in expenditures toward less-import-intensive components, predicts import growth for 2012–14 of 8.6 percent, accounting for about half of the gap between observed import growth and what is implied by the linear trend. Hence, compositional shifts alone contributed 1.4 percentage points to the slowdown, a significant magnitude given that imports grew by only 4.6 percent in that period. Nevertheless, about half of the slowdown in OECD imports during the past three years remains unexplained; therefore, the analysis turns to exploring structural factors.

Structural Factors

Although cyclical factors explain part of the global trade slowdown, the changing long-term relationship between world trade and GDP may also be at play. The growth rate of world trade volumes was roughly double that of real income growth, which is usually proxied by global real GDP growth for 1986–2000. This period, dubbed the “long 1990s,” appears to have been exceptional when compared with the preceding and subsequent periods, when trade volumes grew only slightly faster than real GDP.

The relationship between trade and income is examined here by using an error correction model to estimate the long-term income elasticity of trade (trade elasticity).³

The results suggest that during 1970–2013, long-term trade elasticity was 1.7. Within that period, however, trade elasticity varied considerably (Figure 1.2.3). In the period 1986–2000, a 1 percent increase in world real GDP was associated with a 2.2 percent increase in the volume of world trade. This elasticity is substantially higher than that in either the preceding (1970–85) or the subsequent (2001–13) periods, when trade elasticity was 1.3.

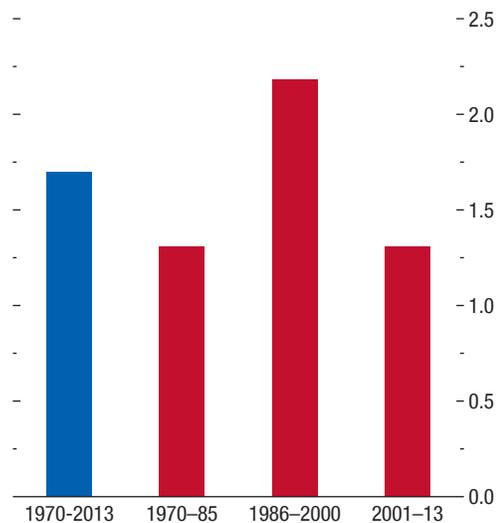
Further decomposition of global trade into components—manufacturing goods, commodities, and ser-

$\omega_{G,t} \ln(G)_t + \omega_{I,t} \ln(I)_t + \omega_{X,t} \ln(X)_t$, in which ω is the weight capturing the import content of the corresponding component of final demand expenditure.

³This analysis draws on Constantinescu, Mattoo, and Ruta 2015, which estimates the following equation: $\Delta \ln(M_t) = \alpha + \beta \Delta \ln(Y_t) + \gamma \ln(M_{t-1}) + \delta \ln(Y_{t-1}) + \varepsilon_t$, in which M and Y are real imports and real GDP, respectively, and ε is an error term. The approach follows Irwin 2002 and Ecaith, Lindenberg, and Miroudot 2010.

Box 1.2 (continued)

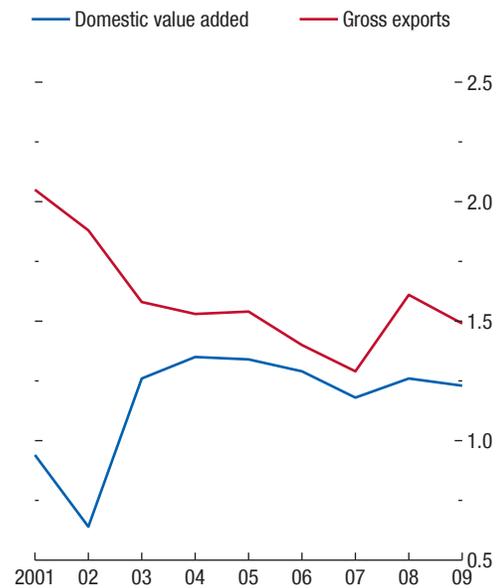
Figure 1.2.3. Long-Term Elasticity



Source: IMF staff calculations.

vinces—suggests that the main force underlying lower world trade elasticity was the decline in trade elasticity for goods in the 2000s, which was driven by manufacturing trade. The factors behind the decline in trade elasticity, particularly of manufacturing trade, could range from protectionism to the changing structure of trade or aggregate demand. The evidence provided in this box suggests that an important explanation lies in changes in international vertical specialization. The long-term trade elasticity increased during the long 1990s as production fragmented internationally into global supply chains, and decreased in the 2000s as the pace of this process decelerated.

China offers a good illustration of these changing international production relationships. To a large extent, the manufacturing supply chain between China and the advanced economies consisted of China's importation of parts and components that were then assembled into final goods exported to advanced economies. The share of imports of parts and components in China's merchandise exports declined from a peak of 60 percent in the mid-1990s to the current share of approximately 35 percent. The lower share of imported parts and components reflects the replacement of foreign with

Figure 1.2.4. Long-Term Elasticities
(X-axis indicates final year of seven-year period)

Source: IMF staff calculations.

domestic inputs by Chinese firms, a finding corroborated by evidence of increasing domestic value added in Chinese firms (Kee and Tang 2014).

To analyze the impact of global supply chains more systematically, the long-term elasticities of value-added trade with respect to income are estimated on a seven-year rolling basis and compared with those of gross trade calculated in the same way.⁴ Intuitively, if the slower expansion of global supply chains is a contributing factor to the trade slowdown, the gap between the gross and value-added trade elasticities would be expected to close over time, with the former converging to the value of the latter. Figure 1.2.4 shows that the world long-term elasticities of gross trade to GDP did indeed decrease over time, approaching the

⁴Data on world domestic value added and foreign value added in gross exports from the Organisation for Economic Co-operation and Development–World Trade Organization (OECD-WTO) data set are available only beginning in 1995 and for selected years. The regressions use a time series Duval and others (2014) developed by interpolating the OECD-WTO data.

Box 1.2 (continued)

lower and more stable estimates of value-added trade elasticities.

Overall, both cyclical and structural factors seem to have played a role in the recent slowdown in trade. A combination of weak economic activity and compositional shifts in demand toward less-import-intensive goods can account for roughly half of the observed slowdown. Global supply chains' slower expansion, evident in the decline in the long-term income elasticity of trade, appears to have contributed to the slowdown as well.

Other factors not analyzed in this box may also have contributed to the trade slowdown. These include a slower pace of trade liberalization as well as narrowing wage differentials between advanced and emerging market economies. Finally, uncertainty about the accuracy of trade data, particularly for the services sector, complicates the task of drawing definitive conclusions about the true size of the trade slowdown.

References

- Aastveit, Knut Are, Hilde C. Bjørnland, and Leif Anders Thorsrud. Forthcoming. "What Drives Oil Prices? Emerging versus Developed Economies." *Journal of Applied Econometrics*.
- Anderson, Soren T., Ryan Kellogg, and Stephen W. Salant. 2014. "Hotelling under Pressure." NBER Working Paper 20280, National Bureau of Economic Research, Cambridge, Massachusetts.
- Arezki, Rabah, and Olivier J. Blanchard. 2014. "Seven Questions about the Recent Oil Price Slump," iMFdirect (blog), International Monetary Fund, December 22. <http://blog-imfdirect.imf.org/2014/12/22/seven-questions-about-the-recent-oil-price-slump>.
- Baumeister, Christiane, and Lutz Kilian. 2015. "Understanding the Decline in the Price of Oil since June 2014." CFS Working Paper 501, Center for Financial Studies (CFS), Goethe University, Frankfurt am Main, Germany.
- Beidas-Strom, Samya, and Andrea Pescatori. 2014. "Oil Price Volatility and the Role of Speculation." IMF Working Paper 14/218, International Monetary Fund, Washington.
- Bertola, Giuseppe, and Ricardo J. Caballero. 1994. "Irreversibility and Aggregate Investment." *Review of Economic Studies* 61 (2): 223–46.
- Blanchard, Olivier J., and Jordi Galí. 2009. "The Macroeconomic Effects of Oil Price Shocks: Why Are the 2000s So Different from the 1970s?" In *International Dimensions of Monetary Policy*, edited by Jordi Galí and M. Gertler, 373–428. Chicago: University of Chicago Press.
- Bloom, Nick, Stephen Bond, and John Van Reenen. 2007. "Uncertainty and Investment Dynamics." *Review of Economic Studies* 74 (2): 391–415.
- Boz, Emine, Matthieu Bussière, and Clément Marsilli. 2014. "Recent Slowdown in Global Trade: Cyclical or Structural." *VoxEU*, November 12.
- Bussière, Matthieu, Giovanni Callegari, Fabio Ghironi, Giulia Sestieri, and Norihiko Yamano. 2013. "Estimating Trade Elasticities: Demand Composition and the Trade Collapse of 2008–09." *American Economic Journal: Macroeconomics* 5 (3): 118–51.
- Cashin, Paul, Kamiar Mohaddes, Maziar Raissi, and Mehdi Raissi. 2014. "The Differential Effects of Oil Demand and Supply Shocks on the Global Economy." *Energy Economics* 44 (July): 113–34.
- Constantinescu, Cristina, Aaditya Mattoo, and Michele Ruta. 2015. "The Global Trade Slowdown: Cyclical or Structural?" IMF Working Paper 15/6, International Monetary Fund, Washington.
- Deacon, Robert T., and Henning Bohn. 2000. "Ownership Risk, Investment, and the Use of Natural Resources." *American Economic Review* 90 (3): 526–49.
- Duval, Romain, Kevin Cheng, Kum Hwa Oh, Richa Saraf, and Dulani Seneviratne. 2014. "Trade Integration and Business Cycle Synchronization: A Reappraisal with Focus on Asia." IMF Working Paper 14/52, International Monetary Fund, Washington.
- Elder, John, and Apostolos Serletis. 2010. "Oil Price Uncertainty." *Journal of Money, Credit and Banking* 42 (6): 1137–59.
- Escaith, Hubert, Nannette Lindenberg, and Sébastien Miroudot. 2010. "International Supply Chains and Trade Elasticity in Times of Global Crisis." WTO Staff Working Paper ERS-D-2010-08, World Trade Organization, Geneva.
- Gately, Dermot. 1986. "Lessons from the 1986 Oil Price Collapse." *Brookings Papers on Economic Activity* 17 (2): 237–84.
- Hamilton, James D. 2003. "What Is an Oil Shock?" *Journal of Econometrics* 113 (2): 363–98.
- Hotelling, Harold. 1931. "The Economics of Exhaustible Resources." *Journal of Political Economy* 39 (2): 137–75.
- International Energy Agency (IEA). 2015. *Oil: Medium-Term Oil Market Report 2015—Market Analysis and Forecasts to 2020*. Paris.
- International Monetary Fund (IMF). 2014. *2014 Pilot External Sector Report*. Washington.
- Irwin, Douglas. 2002. "Long-Run Trends in World Trade and Income." *World Trade Review* 1 (1): 89–100.
- Kee, Hiau Looi, and Heiwai Tang. 2014. "Domestic Value Added in Exports: Theory and Firm Evidence from China." Unpublished, World Bank, Washington.
- Kellogg, Ryan. 2014. "The Effect of Uncertainty on Investment: Evidence from Texas Oil Drilling." *American Economic Review* 104 (6): 1698–734.
- Kilian, Lutz. 2009. "Not All Oil Price Shocks Are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market." *American Economic Review* 99 (3): 1053–69.
- , and Daniel P. Murphy. 2014. "The Role of Inventories and Speculative Trading in the Global Market for Crude Oil." *Journal of Applied Econometrics* 29 (3): 454–78.
- Kojima, Masami. 2013. "Petroleum Product Pricing and Complementary Policies: Experience of 65 Developing Countries since 2009." Policy Research Working Paper 6396, World Bank, Washington.
- Matheson, Troy, and Emil Stavrev. 2014. "News and Monetary Shocks at a High Frequency: A Simple Approach." *Economics Letters* 125 (2): 282–86.
- Soojin, Jo. 2014. "The Effects of Oil Price Uncertainty on Global Real Economic Activity." *Journal of Money, Credit, and Banking* 46 (6): 1113–35.
- Timmermann, Allan. 2006. "An Evaluation of the *World Economic Outlook Forecasts*." IMF Working Paper 06/59, International Monetary Fund, Washington.

