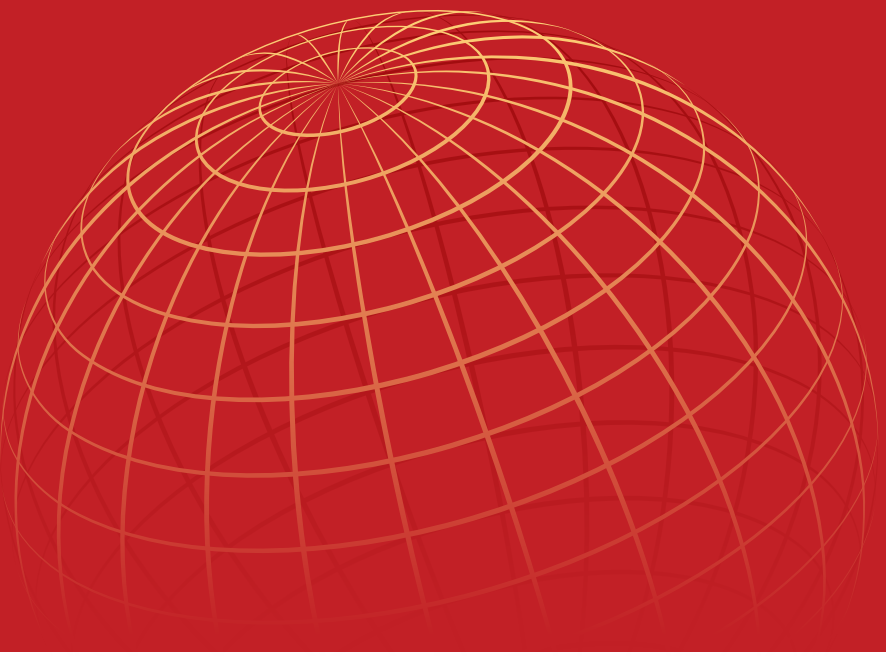


SPECIAL FOCUS 1

With the Benefit of Hindsight: The Impact of the 2014-16 Oil Price Collapse

With the Benefit of Hindsight: The Impact of the 2014-16 Oil Price Collapse

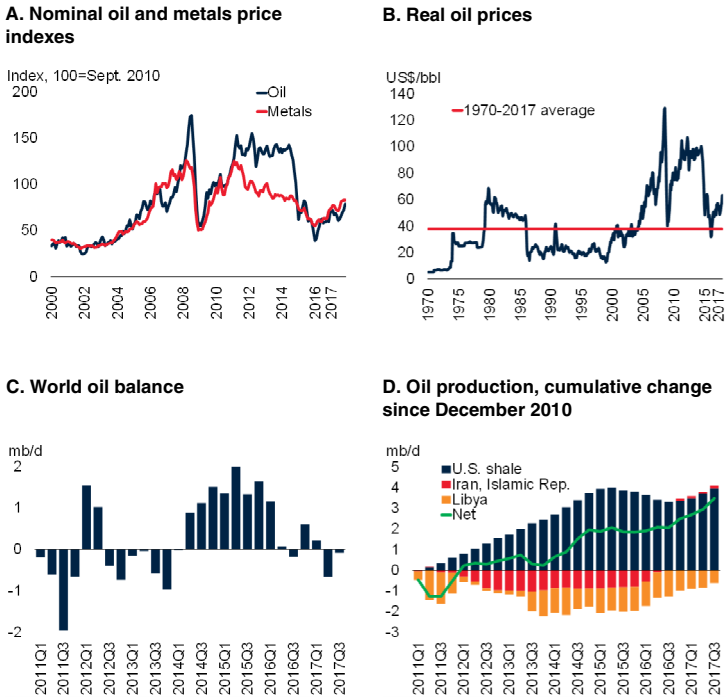
The 2014-16 collapse in oil prices was one of the largest in modern history, but failed to provide an expected boost to global growth and was a missed opportunity for reforms in a number of countries. The decline in oil prices was caused by a boom and rapid efficiency gains in U.S. shale oil production, a diminished effect of geopolitical risks, the inability of OPEC to regulate global oil supply, and softening demand prospects. The short-term benefits of falling oil prices to global growth were muted by several factors. These include the low responsiveness of activity in key oil-importing emerging markets, ongoing economic rebalancing in China, and the dampening impact of a sharp contraction in energy investment and a rapid appreciation of the U.S. dollar on growth in the United States. Among oil-exporting countries, those with flexible exchange rates, more diversified economies, and larger fiscal buffers fared better than others. Since 2014, many countries have taken advantage of lower prices to reduce energy subsidies, and some have implemented broader structural reforms. Limited prospects of a substantial recovery in oil prices from current levels could have lasting implications for potential growth in oil exporters. This calls for accelerated reforms to increase diversification.

Introduction

Between mid-2014 and early 2016, the global economy faced one of the largest oil-price shocks in modern history. The 70 percent price drop over that period was one of the three largest declines since World War II, and the most persistent since the supply-driven collapse of 1986. The decline—triggered by a combination of surging U.S. shale oil production, receding geopolitical risks involving some key producers, shifts in policies by the Organization of Petroleum Exporting Countries (OPEC), and weakening global growth prospects—brought oil prices in line with other industrial commodities and ended a prolonged period of historically elevated prices that started in 2003 (Figure SF1.1). International prices have rebounded since their early 2016 trough, reaching nearly $60 per barrel at the end of 2017, in part due to prospects of strengthening demand and extensions of production cuts agreed by OPEC and non-OPEC producers. In constant U.S. dollar terms, oil prices are still somewhat above their long-term (1970–2017) historical average. The oil price decline followed a broad-based commodity price boom that started in the early 2000s and lasted more than a decade. The boom, which

FIGURE SF1.1 The oil price plunge of 2014-16 in perspective

The 2014-16 plunge brought oil prices in line with other industrial commodity prices, and closer to long-term historical averages. It followed a mounting supply glut, supported by surging U.S. shale oil output and later by the recovery of production in Libya and the Islamic Republic of Iran.



Sources: Energy Information Administration, International Energy Agency, World Bank.
A. Last observation is November 2017.
B. Real oil prices are calculated as the nominal price deflated by the international manufacturers unit value index, in which 100=2010. World Bank crude oil average. Last observation is November 2017.
C. Oil supply balance is the difference between global oil production and consumption, in million barrels per day (mb/d). Last observation is 2017Q3.
D. Last observation is 2017Q3.
Click here to download data and charts.

Note: This Special Focus was prepared by Marc Stocker, John Baffes, and Dana Vorisek, with contributions from Carlos Arteta, Raju Huidrom, Atsushi Kawamoto, Seong Tae Kim, Yirbehogre Modeste Some, Shane S. Streifel, and Collette M. Wheeler. Research assistance was provided by Anh Mai Bui and Xinghao Gong.

unfolded after two decades of relatively low and stable prices, was mainly driven by surging demand prospects from emerging market and developing economies (EMDEs), especially China.[1]

The individual factors contributing to the oil price plunge have been extensively analyzed, but their respective roles remain subject to debate. Moreover, lower oil prices did not provide the expected boost to global activity, and policy responses and outcomes have varied considerably across countries. To shed light on these issues, this Special Focus addresses three questions:

- What were the main drivers of the oil price plunge from mid-2014 to early 2016?
- How did the recent oil price collapse impact the global economy?
- What was the policy response in oil exporters and oil importers?

The Special Focus concludes with an assessment of the outlook for oil prices and its implications for oil-exporting economies.[2]

What were the main drivers of the oil price plunge?

Several key developments in the global oil market occurred prior to and during the plunge in prices that began in mid-2014: A growing role of the U.S. shale oil industry as the marginal cost producer, a shift in OPEC policy, a reassessment of geopolitical risks, and deteriorating global growth prospects. Although supply factors appear to have been the dominant force in the sudden price collapse in 2014, weakening demand prospects were also an important contributor, particularly in 2015–16. The latter could partly explain why the oil price plunge failed to provide the anticipated boost to global activity.

U.S. shale oil production

A surge in U.S. shale oil production was one of the main drivers of the global oil supply glut in the period leading up to the price collapse in the second half of 2014. While U.S. shale oil represents less than 6 percent of world oil output, it accounted for nearly half of the growth in global oil production from 2010 to 2014. This rapid expansion was initially underestimated, as reflected in repeated upward revisions to the outlook for U.S. oil production by the International Energy Agency (IEA).[3] It was also overshadowed by a series of supply disruptions in the Middle East, which held back global oil output. These disruptions included conflict in Libya, the impact of sanctions on the Islamic Republic of Iran, and fears of supply outages in Iraq. Concurrent with the dissipation of some of these geopolitical concerns during 2014, shale oil production continued to grow rapidly, reaching a peak of more than 5 million barrels per day (mb/d) in late 2014. That year, gains in U.S. oil production alone exceeded those of global oil demand.

The technology to extract natural gas and oil from shale formations (hydraulic fracturing and horizontal drilling) has existed for decades, but its application became widespread in the oil sector only in the late 2000s, as oil prices peaked (Wang and Krupnick 2013). Such an endogenous supply response to elevated oil prices was observed in the past. In particular, during the early 1980s, high prices led to a similar expansion of oil extraction from Alaska, Mexico, and the North Sea, which contributed to a subsequent supply glut and price collapse in 1986. During the recent oil price plunge, however, shale technology proved more flexible and resilient (Bjørnland, Nordvik, and Rohrer 2017). Production from existing U.S. shale oil wells was sustained during the price collapse

[1] China's share of global oil consumption increased from 6 percent in 2000 to 12 percent in 2014. The increase in China's metal and coal consumption share was even larger: increasing from less than 10 percent to almost 50 percent of global consumption during the same period.

[2] A country is classified as an oil exporter when, on average in 2012-14, exports of crude oil accounted for 20 percent or more of total exports. Countries for which this threshold is met as a result of re-exports are excluded. When data are not available, judgment is used. The list of oil-exporting emerging market and developing economies is presented in Annex Table SF1.1.

[3] From a total of 72 updates, IEA undertook 66 upward revisions to U.S. production over that period, implying that the organization was underestimating the importance of U.S. shale.

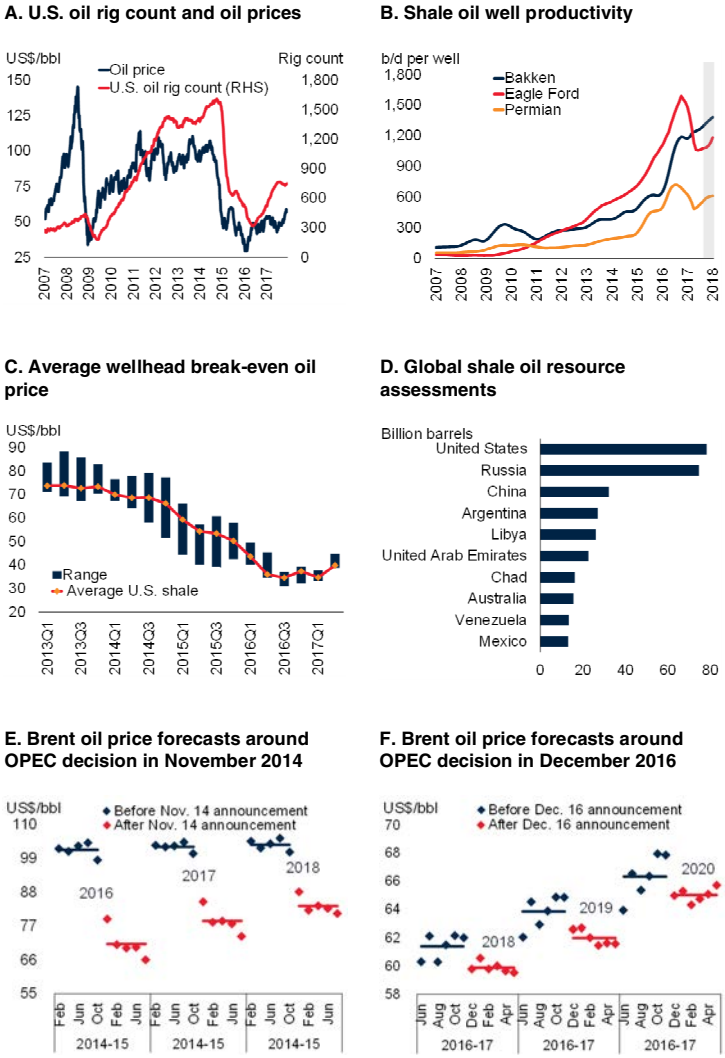
from mid-2014 to early 2016, but drilling fell nearly 80 percent, about five times more than the estimated response of conventional oil drilling to price fluctuations (Newell and Prest 2017; Anderson, Kellogg, and Salant forthcoming; Figure SF1.2).

The resilience of the shale oil industry to lower oil prices was also echoed in rapid efficiency gains that became increasingly evident after mid-2014. Production costs fell considerably, dropping by around 25 percent since the start of the oil price decline, reflecting the improved design of wells, shorter drilling and completion times, and higher initial production rates (Curtis 2015). Overall, efficiency gains and technological innovation helped spur a near tripling of output per well in the Eagle Ford and Bakken basins (Curtis 2016). The combined impact of lower production costs and efficiency gains caused average break-even prices for the shale oil industry to fall from more than $70 per barrel (bbl) in 2012 to less than $50/bbl in 2016–17 (Rystad Energy 2017). The resilience also reflects the decline in input costs (especially labor and rental equipment), as well as the ability of shale producers to hedge their entire production, as the shale oil cycle spans only a few years (as opposed to conventional oil, which spans decades).

The U.S. shale oil industry is likely to remain the marginal cost producer in coming years, and thus will continue to cap global oil prices (IEA 2017). Even if oil prices were at $30/bbl, about 50 percent of technically recoverable U.S. shale reserves would be economically viable (Smith and Lee 2017). U.S. shale oil reserves are assessed to be approximately 80 billion barrels (Bbbl), or around 20 percent of global shale reserves (EIA 2015; BP 2017). Technological improvements achieved in the United States could also stimulate faster production elsewhere. Shale reserves in the Russian Federation are close to those in the United States, at an estimated 75 Bbbl. China and Argentina follow, with 32 and 27 Bbbl of reserves, respectively. Although shale oil reserves represent a relatively small share of global reserves (around 10 percent), greater flexibility in production implies that shale oil will continue to have a major effect on prices.

FIGURE SF1.2 U.S. shale oil activity and OPEC policy

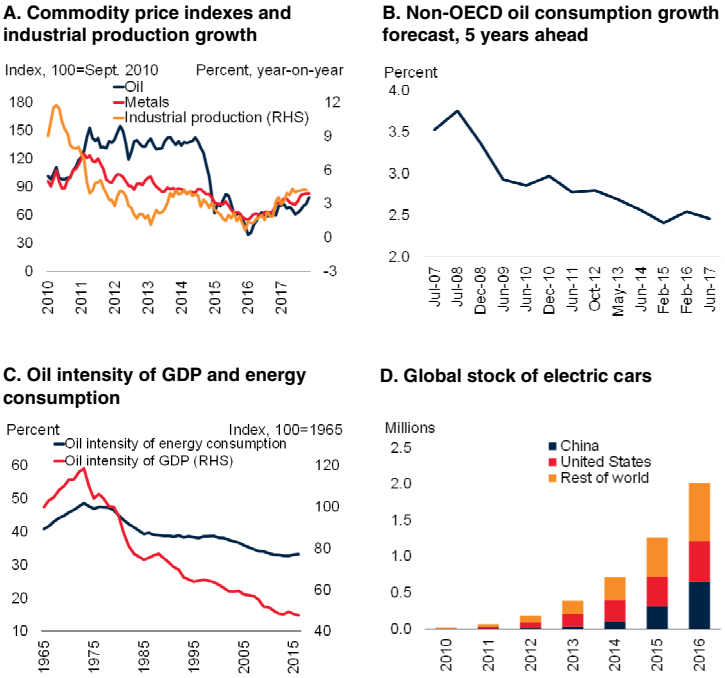
Advancement in U.S. shale oil played a significant role in the oil price plunge from mid-2014 to early 2016. Oil drilling responded flexibly to changes in oil prices, but production was resilient and efficiency gains lowered break-even prices considerably in recent years. OPEC's decision to abandon price controls in November 2014 led to a significant drop in current and expected oil prices. Prices also fell following OPEC's agreement to reinstate production targets amid ample supply, suggesting OPEC's diminishing capacity to stabilize prices.



Sources: Baker Hughes, Bloomberg, Consensus Economics, Energy Information Administration, Rystad Energy NASWellCube Premium.
A. Weekly data. Last observation is December 15, 2017. WTI is West Texas Intermediate.
B. Shaded area indicates forecasts. Data for December 2017 are estimates.
C. Does not include test activity, where well was shut-down after completion. Last observation is 2017Q2.
D. Technically recoverable oil from low permeability tight formations, which includes shale.
E. Median Brent oil price forecasts reported from February 2014 through August 2015.
F. Median Brent oil price forecasts reported from June 2016 through May 2017.
Click here to download data and charts.

FIGURE SF1.3 Oil demand trends

Evidence of slowing demand prospects became visible around 2011, as global industrial production growth and major industrial commodity prices started trending down, and long-term projections for non-OECD oil consumption continued to be downgraded. The declining oil intensity of global GDP and increased uptake of technologies that consume less fossil fuels were also underlying trends.



Sources: BP Statistical Review of World Energy, International Energy Agency Global EV Outlook, World Bank.

A. Oil and metals prices are nominal. Last observation is November 2017 for oil and metals and October 2017 for industrial production.

B. Last observation is June 2017.

C. Oil intensity of energy consumption measured as oil consumption in percent of total primary energy consumption. Oil intensity of real GDP measured as oil consumption relative to real GDP. Last observation is 2016.

D. Electric car stock includes battery-electric vehicles and plug-in hybrid electric vehicles.

Click here to download data and charts.

The role of OPEC policies

Despite the shale oil boom, oil prices remained high over the period 2011–14, supported by supply disruptions and heightened geopolitical concerns involving some key producers, as well as expectations that OPEC members would continue to adjust production to stabilize prices. Following the beginning of the price collapse in mid-2014, however, OPEC decided against reducing output, as it had done in the past, including during the price plunge in 2009. Instead, it announced in November 2014 that its objective was to retain its market share; a policy shift that reflected the increasing clout of shale oil and reduced cohesiveness within the cartel (Behar and Ritz 2016). That decision, which defined OPEC's strategy throughout 2015 and 2016, was followed by a large and sustained decline in oil prices.[4]

Amid mounting fiscal pressures and in view of shale oil's resilience, several OPEC members, along with 10 non-OPEC countries led by Russia, agreed to revert to production cuts to shore up prices (World Bank 2016a). The initial six-month agreement, which went into effect in January 2017, was subsequently extended twice: first to March 2018 and then to December 2018. Relatively high compliance with the agreed cuts, especially by Saudi Arabia (the dominant OPEC member) and Russia (the most important non-OPEC oil producer) contributed to some rebalancing of oil markets during 2017. However, actual and expected prices did not rise following policy announcements, illustrating the reduced ability of OPEC to influence market conditions as U.S. shale oil has effectively become the new marginal cost producer.[5]

The role of demand conditions

Changing demand conditions for oil, including short-run movements in market sentiment and expectations, play an important role in driving oil price fluctuations (Lippi and Nobili 2012; Alquist and Coibion 2014; Jacks and Stürmer 2016). This was particularly visible during the boom years from 2003–08, when a positive reassessment of demand prospects from EMDEs contributed to a near doubling of the real price of oil (Baumeister and Peersman 2013; Kilian and Hicks 2013). That process reversed after the global financial crisis, as long-term prospects for advanced economies and, later, for EMDEs began to be downgraded.

Evidence of the slowdown became more visible around 2011, as global industrial production, goods trade, shipping freight, and major industrial commodity prices all trended down (Figure SF1.3; Kilian and Zhou 2017). Deteriorating growth

[4] This was comparable to OPEC's decision to reclaim market shares in 1986, which contributed to a collapse in prices after unsuccessful attempts to support prices through production cuts (McNally 2017).

[5] OPEC's reduced ability to influence the oil market is also consistent with the lower price volatility experienced during and after the 2014 collapse (World Bank 2015a; Baffes and Kshirsagar 2015).

prospects for EMDEs led to a continued decline in oil consumption expectations for these economies. Concerns about global growth prospects intensified during 2015 and early 2016, amid signs of a simultaneous slowdown in China, major commodity-exporting EMDEs, and the United States. In January 2016, oil prices reached a 15-year low of $31/bbl.

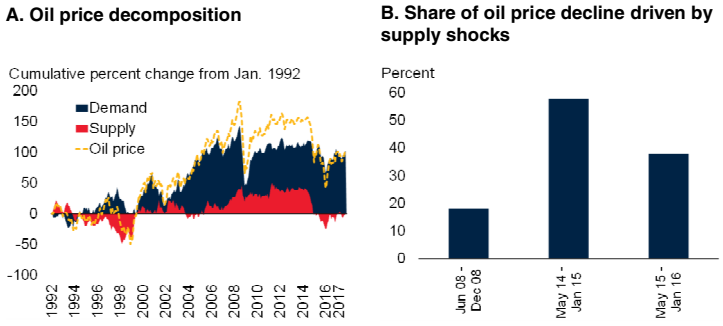
A decline in the average oil intensity of global GDP, which has nearly halved since the 1970s, also explains an undercurrent of weakening long-term demand. By 2016, the level of oil consumption in advanced economies, which had begun to fall prior to the global financial crisis, was nearly 7 percent below its 2005 peak. Technological improvements and substitution away from oil have been significant driving factors underlying the slowdown in oil consumption since 2005.[6] In non-OECD countries, technology and environmental policies have also started to influence crude oil demand patterns. For example, China became the world's largest user of energy-efficient vehicles in 2015, reflecting in part policies to reduce air pollution (Ma, Fan, and Feng 2017). Electric vehicles continue to account for a low share of global transportation, but could become an important force affecting oil demand prospects over time (Cherif, Hasanov, and Pande 2017). From a long-term perspective, technological improvements on the consumption side, along with policies to limit fossil fuel usage and increase energy efficiency, are likely to constrain demand growth, thus preventing oil prices from reverting to levels seen during the boom years (IEA 2017).

The oil price collapse: The relative importance of supply and demand

While changes in underlying supply and demand conditions pre-dated the start of the oil price plunge in mid-2014, a convergence of geopolitical factors triggered a sudden and abrupt price realignment, later amplified by OPEC's policy shift and signs of a further weakening of global growth.

FIGURE SF1.4 Oil supply and demand shock decomposition

Empirical results suggest that the initial drop in oil prices from mid-2014 to early 2015 was primarily driven by supply factors. However, demand factors played an increasing role during the second stage of the plunge from mid-2015 to early 2016.



Source: World Bank.
A. B. Based on the decomposition of oil price changes from a structural vector autoregressive (SVAR) model including global industrial production, global oil production, oil and metals prices. The identification scheme is comparable to that suggested in Caldara, Cavallo, and Iacoviello (2016), putting restrictions on short-term oil supply and demand elasticities based on a survey of the literature.
A. Last observation is October 2017.
Click here to download data and charts.

To help disentangle the contribution of supply and demand shocks around the 2014–16 collapse, a Bayesian structural vector autoregressive model was estimated (see Annex SF1.1 for a description). The model explores interactions between international oil prices; global oil output; and common demand indicators such as global industrial production and metals prices, the latter of which co-move with oil prices in the presence of demand-driven shocks.[7]

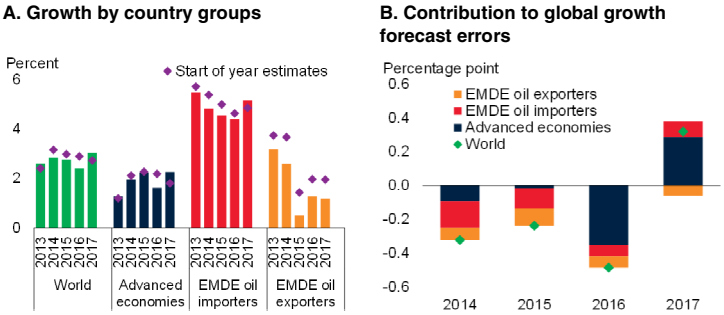
Results confirm that changing supply conditions played a dominant role in triggering the initial oil price decline from mid-2014 to early 2015, explaining about 60 percent of the drop (Figure SF1.4). These results are consistent with previous analyses (Baffes et al. 2015; Arezki and Blanchard 2015). The role of oil demand shocks, however, strengthened in the second half of 2015 and early 2016, when global activity showed signs of deceleration and metals prices continued to slide. Around that period, changes in supply conditions are estimated to have accounted for about 40 percent of the price drop. Various other indicators

[6] For example, in the context of identifying the sources of the decline in CO_2 emissions in the U.S. during 1997–2013, Feng et al. (2015) concluded that the change in fuel mix and productivity improvements played a key role in the lower use of oil.

[7] The selected identification method uses a combination of sign restrictions and bound estimates of short-term elasticities of oil supply and oil demand (Baumeister and Hamilton 2015; Caldara, Cavallo, and Iacoviello 2016).

FIGURE SF1.5 Global activity

In contrast with initial expectations, the oil price plunge was followed by a slowdown in global growth in 2015 and 2016. The disappointing pace of global growth during those years was mostly accounted for by a failed recovery in oil-importing EMDEs and advanced economies.



Source: World Bank.
A. B. Aggregate growth rates calculated using constant 2010 U.S. dollar GDP weights. Country classification is presented in Annex Table SF1.1.
A. Purple diamonds correspond to growth forecasts at beginning of each calendar year from *Global Economic Prospects*. Bars represent actual data up to 2016 and estimates for 2017.
B. Forecast errors computed as the difference between actual global growth and forecasts at the beginning of each calendar year. Sample includes the 153 countries with forecast data available in 2014.
Click here to download data and charts.

used to proxy demand shifts in commodity markets also point to downward demand pressures on oil prices (Kilian and Zhou 2017).

How did the recent oil price collapse impact the global economy?

The plunge in oil prices that began in mid-2014 led to expectations of global growth windfalls (Baffes et al. 2015). Estimates produced at the time suggested that a 50 percent supply-driven decline in oil prices could lift global GDP by around 0.8 percent over the medium term. Such a boost to global aggregate demand was expected to result from a transfer of income and wealth from oil-exporting economies, which tend to have a high aggregate savings rate, to oil-importing economies, where the propensity to spend is higher. And while lower oil prices were anticipated to negatively impact investment in the oil industry, this was expected to have been more than offset by lower energy costs for consumers and for energy-intensive sectors, including transportation, manufacturing, and agricultural sectors.

Rather than lifting activity, however, the oil price plunge was accompanied by a global slowdown (Figure SF1.5). Global growth moderated from 2.8 percent in 2014 and 2015, to a post-crisis low of 2.4 percent in 2016, amid weakening global trade, subdued capital flows to EMDEs, and broad-based weakness in commodity prices. A sudden contraction in government spending, domestic demand, and imports in oil-exporting economies had some dampening effects, but the most important factor behind disappointing global growth during and after the oil price plunge was a failed recovery in oil-importing EMDEs and advanced economies, particularly the United States. Growth disappointments among oil importers were partially reversed in 2017, as a broad-based cyclical recovery got underway (Chapter 1). However, forecast downgrades continued among a number of oil-exporting EMDEs. Overall, global growth was overestimated by an average of 0.2 percentage point per year over the period 2014-17, with 40 percent explained by oil-exporting EMDEs, 34 percent by oil-importing EMDEs, and the remainder by advanced economies.

While the impact of low oil prices on growth in oil-importing EMDEs was less than expected, lower oil prices have helped reduce vulnerabilities in some of these countries, as reflected in improved current account positions and lower inflation. In turn, reduced vulnerabilities supported investor confidence and allowed monetary policy authorities to regain some space for policy easing (World Bank 2016b).

Impact on oil exporters

The oil price plunge from mid-2014 to early 2016 had broad-based and long-lasting effects on economic activity in oil exporters. More than 70 percent of oil-exporting EMDEs registered slowing growth in 2015 and 2016, with many facing a collapse in consumption (e.g., Nigeria, Russia, the United Arab Emirates, República Bolivariana de Venezuela) and investment (e.g., Angola, Russia, Venezuela; Figure SF1.6). Terms-of-trade shocks can impact both actual and potential output growth, particularly for oil-exporting countries, which are generally less diversified than other commodity exporters (Aslam et al. 2016). Investment growth tends to respond particularly strongly to a deterioration in terms of trade, which can in turn negatively affect

capital deepening and total factor productivity growth (World Bank 2017a).

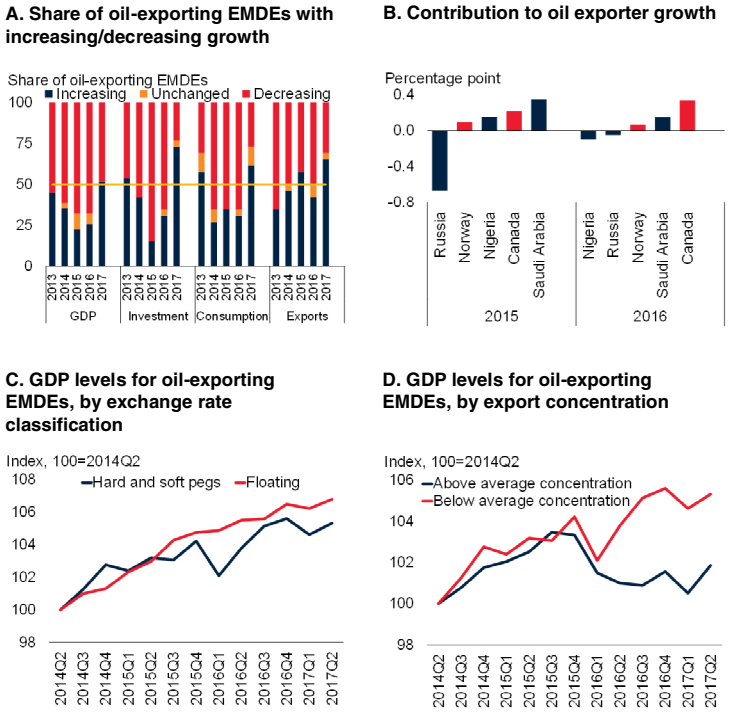
The oil price plunge quickly depleted oil revenues, forcing abrupt cuts in government spending that accentuated the slowdown in private sector activity in many regions (World Bank 2016b, 2016c, 2017a; Danforth, Medas, and Salins 2016). This effect was amplified in countries that entered the most recent oil price decline with weaker fiscal positions and higher private sector debt than in previous episodes. This contributed to a more pronounced slowdown in aggregate demand, particularly in investment, in the Middle East, Sub-Saharan Africa, and Eastern Europe (BIS 2016; Chapter 2).

The effects of the price shock were also exacerbated by idiosyncratic factors, including sanctions on Russia, and conflict and geopolitical tensions in the Middle East and North Africa region. Headwinds in Russia and the Gulf Cooperation Council (GCC) economies also had adverse spillovers through reduced within-region flows of trade, remittances, foreign direct investment, and grants (World Bank 2015b, 2016d). Oil-exporting low-income countries (e.g., Chad, South Sudan) were hit particularly hard, as the effect of the oil price shock was exacerbated by conflict and deteriorating security conditions. Delayed adjustments contributed to a depletion of reserves and a sharp increase in public debt.

In general, activity in oil exporters with floating exchange rate regimes (e.g., Albania, Russia) and a relatively high degree of economic diversification (e.g., Bahrain, Ghana, Malaysia, Qatar) recovered more quickly from the fall in oil prices than those with fixed exchange rates and low diversification.[8] Oil exporters with relatively large foreign reserves and low historical inflation volatility also showed greater resilience (Grigoli, Herman, and Swiston 2017; World Bank 2016b). High income inequality and political instability also weakened the ability of oil-exporting economies to weather low oil prices (Ianchovichina and Onder 2017).

FIGURE SF1.6 Activity in oil-exporting EMDEs

More than 70 percent of oil-exporting EMDEs registered slowing growth in 2015 and 2016. The impact of the slowdown or recession in a few large economies was particularly significant. Activity was generally more resilient in countries with more flexible exchange rate regimes and more diversified economies.



Sources: International Monetary Fund, United Nations Conference on Trade and Development (UNCTAD), World Bank.

A. Aggregate growth rates calculated using constant 2010 U.S. dollar GDP weights. Increasing/decreasing growth are changes of at least 0.1 percentage point from the previous year. Countries with a slower pace of contraction from one year to the next are included in the increasing growth category.

B. Blue bars indicate EMDEs, red bars indicate advanced economies.

C. D. Sample includes 11 oil-exporting EMDEs (Albania, Bahrain, Bolivia, Colombia, Ecuador, Kazakhstan, Malaysia, Nigeria, Qatar, Russia, and Saudi Arabia) for which quarterly GDP data is available, and excludes the Islamic Republic of Iran due to the large effect of sanctions. Figures show median for the separate categories.

C. Exchange rate classification is based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions database, in which countries are ranked 0 (no separate legal tender) to 10 (free float). "Hard and soft pegs" refers to countries with a ranking of 1 to 6, while "floating" denotes those with rankings of 7 to 10 and includes countries with horizontal bands and other managed arrangements.

D. "Above average concentration" and "below average concentration" groups are defined by countries above or below the sample average for export concentration in 2014. Concentration index measures the degree of product concentration, where values closer to 1 indicate a country's exports are highly concentrated on a few products. The average for the sample is 0.6, where 1 is the most concentrated.

Click here to download data and charts.

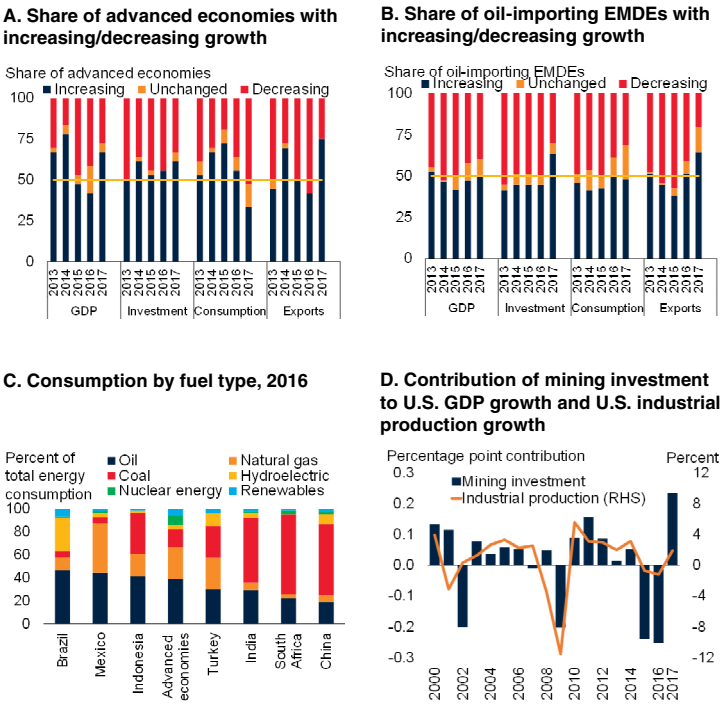
Impact on oil importers

Contrary to expectations in 2014–15, the collapse in world oil prices did not provide a boost to activity among oil-importing economies, most of which experienced slowing growth in 2015–16 (Figure SF1.7). Growth disappointments were concentrated in EMDE oil importers, but an

[8] Although Qatar is primarily a liquefied natural gas (LNG) exporter, it is classified here as an oil exporter because the natural gas market is tightly connected to the crude oil market. From 2013 to 2015, the years before and after the oil price collapse, oil prices (World Bank average) declined 51 percent, while LNG dropped 36 percent.

FIGURE SF1.7 Activity in oil-importing economies

A majority of advanced economies and oil-importing EMDEs experienced slowing growth in 2015-16, driven by weakening investment and export growth. In China, the positive effect was muted by a low share of oil in the energy consumption mix. A sharp contraction in U.S. mining investment dragged U.S. GDP growth down.



Sources: BP Statistical Review, Federal Reserve Bank of St. Louis, World Bank.

A. B. Aggregate growth rates calculated using constant 2010 U.S. dollar GDP weights. Increasing/decreasing growth are changes of at least 0.1 percentage point from the previous year. Countries with a slower pace of contraction from one year to the next are included in the increasing growth category.

C. Oil consumption is measured in million tonnes; other fuels in million tonnes of oil equivalent. Renewables are based on gross generation from renewable sources including wind, geothermal, solar, biomass, and waste, but not accounting for cross-border electricity supply.

D. Mining investment is real private fixed investment of nonresidential structures for mining exploration, shafts, and wells. Data for 2017 are estimated.

Click here to download data and charts.

unexpected slowdown in the United States in 2016 also had an outsized effect. Adjustments costs and uncertainty associated with large oil price changes could have disrupted activity and investment in the short term (Hamilton 2011; Jo 2014). The most important factors behind the lack of a positive growth response to lower oil prices are assessed to be the following:

China's energy mix and rebalancing needs. China is the second-largest oil importer in the world, but the share of oil in its overall energy consumption is the lowest among G20 economies. Instead, China relies heavily on coal, which accounted for 65 percent of energy consumption in 2016. Regulated fuel costs and a low energy and transportation weight in consumer baskets also mean that lower oil prices lead to limited real income gains for consumers (World Bank 2015c). Thus, the direct impact of the oil price plunge on China was relatively modest. Meanwhile, a near halving of investment growth since 2012 has weighed significantly on activity, and is estimated to have accounted for 40 to 50 percent of the import deceleration in 2014–15, with significant knock-on effects for trading partners (Kang and Liao 2016). Since much of investment is resource-intensive, the impact of slower investment growth was particularly significant for industrial commodity prices and activity in commodity-exporting EMDEs (World Bank 2016b; Huidrom, Kose, and Ohnsorge 2017).

Lower sensitivity of other oil-importing EMDEs to oil shocks. A number of recent empirical studies suggest that activity in oil-importing EMDEs is less responsive to oil supply shocks than that in major advanced economies (Aastveit, Bjørnland, and Thorsrud 2014; Caldara, Cavallo, and Iacoviello 2016). These studies explore several factors, including different energy mixes, consumption patterns, and energy price controls that limit the pass-through of world prices to domestic retail prices. Since many oil-importing EMDEs took advantage of lower world prices to reduce energy subsidies, real income gains from declining oil prices for consumers were more limited, even if it created potential fiscal savings. For non-oil commodity exporters, which represent approximately half of oil-importing EMDEs, adjustments to past terms-of-trade shocks continued to weigh heavily on activity in 2014–16.[9] Because investment has responded strongly to deteriorating terms of trade since 2011, both actual and potential output growth may have been negatively affected (World Bank 2017b). Some oil-importing EMDEs had also made significant investments in new oil production capacity and biofuels during the period of high oil prices,

[9] A country is classified as "non-oil commodity exporter" when, on average in 2012–14, either (i) total commodities exports accounted for 30 percent or more of total exports; or (ii) exports of any single commodity other than energy accounted for 20 percent or more of total exports. The classification of EMDEs into energy exporters, non-energy commodity exporters, and commodity importers is presented in Annex Table SF1.1.

including in a number of low-income countries (World Bank 2015d). The reduced profitability of these projects as prices collapsed led to a sharp contraction in capital expenditures in those sectors. The fact that oil-importing EMDEs have become a major source of global growth and international spillovers could help explain the lack of a global stimulus effect from falling oil prices (Huidrom, Kose, and Ohnsorge 2017).

The impact of low oil prices on investment in the United States. In the United States, the boost to private consumption from lower oil prices was partly offset by a sharper-than-expected contraction in capital spending in the energy sector (Baumeister and Kilian 2016). Mining investment was cut in half in the two years that followed the mid-2014 oil price plunge. This dragged private investment down, curtailing GDP growth by 0.2 percentage point in both 2015 and 2016. The collapse of energy investment reflected both the magnitude of oil price changes and the specific nature of shale oil production, where capital expenditures are more price elastic than conventional production (Bjørnland, Nordvik, and Rohrer 2017; Newell and Prest 2017). U.S. business activity was also dampened by the sharp appreciation of the U.S. dollar, which adversely affected manufacturing exports and profits.

Monetary policy constraints in the Euro Area and Japan. Declining oil prices coincided with a drop in long-term inflation expectations in a number of advanced economies, raising particular concerns about persistent deflationary pressures in the Euro Area and Japan (Arteta et al. 2016). With these economies experiencing interest rates close to their lower bounds before the oil price collapse, reduced inflation expectations could have resulted in upward pressures on real interest rates. Central banks in both the Euro Area and Japan responded to these deflationary risks by pursuing more aggressive monetary policy accommodation, including negative interest rate policies and expanded asset purchase programs. Coupled with more supportive fiscal policies, these steps helped to support an acceleration of activity. Hence, there is little evidence that monetary policy constraints were a key factor explaining the muted response of global demand to lower oil prices since 2014.

What was the policy response in oil exporters and oil importers?

The sharp oil price decline elicited widely different monetary, fiscal, and structural policy responses in oil-exporting and oil-importing economies. Monetary policy and fiscal policy was nearly universally tightened among oil-exporting EMDEs, while the policy response in oil importers was varied. Among oil-exporting EMDEs, those with flexible exchange rates or lower-than-average reliance on oil for government revenue experienced less abrupt deterioration in fiscal balances than those with fixed exchange rates or higher-than-average reliance on oil revenues. For some major oil-exporting EMDEs, the oil price plunge triggered structural reforms, including subsidy reforms, which may in turn support the longstanding need for economic diversification, but more sustained efforts are required. Although some oil-importing EMDEs took advantage of the period of depressed oil prices to reform energy subsidies, there has been no noticeable improvement in fiscal sustainability since 2014.

Policy response in oil exporters

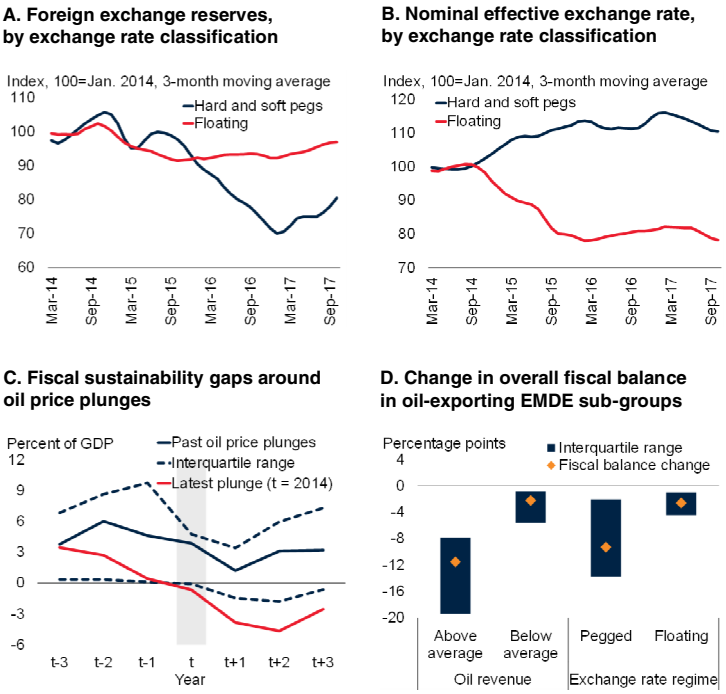
Monetary policy

Many oil-exporting EMDEs experienced sharp currency depreciation or rapid declines in foreign exchange reserves in 2014–16. Countries with floating exchange rates were better able to stabilize reserves, but generally suffered sharper initial depreciations (Figure SF1.8). Monetary authorities in several countries intervened in foreign exchange markets to support their currencies (e.g., Angola, Azerbaijan, Bolivia, Kazakhstan, Malaysia, Nigeria, Russia, Sudan, Turkmenistan), and many hiked policy interest rates in response to rising inflation (e.g., Angola, Azerbaijan, Colombia, Ghana, Kazakhstan, Nigeria, Russia, Trinidad and Tobago) or to support currency pegs (e.g., Bahrain, Kuwait, the United Arab Emirates).

The erosion of foreign reserves contributed to the welcome adoption of more flexible exchange rate regimes in Azerbaijan, Nigeria, and Russia as part

FIGURE SF1.8 Policy response in oil-exporting EMDEs

Many oil-exporting EMDEs experienced a rapid decline in foreign exchange reserves or sharp currency depreciation during 2015 and 2016; countries with floating and pegged exchange rates were impacted differently. Fiscal sustainability deteriorated more significantly during the recent oil price plunge than in past episodes, particularly in countries with high reliance on oil-related revenue and pegged exchange rates.



Sources: Bank for International Settlements, Haver Analytics, International Monetary Fund, World Bank.

A. B. D. Exchange rate classification is based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions database, in which countries are ranked 0 (no separate legal tender) to 10 (free float). "Pegged" denotes countries ranked 1 to 6. "Floating" denotes countries ranked 7 to 10.

A. Sample includes 9 oil-exporting EMDEs for which data is available (Albania, Angola, Bolivia, Colombia, Kazakhstan, Malaysia, Nigeria, Qatar, and Russia). Last observation is October 2017.

B. Sample includes 7 oil-exporting EMDEs for which data is available (Algeria, Colombia, Malaysia, Nigeria, Russia, Saudi Arabia, and the United Arab Emirates). Last observation is October 2017.

C. Sustainability gap is measured as the difference between the primary balance and the debt-stabilizing primary balance, assuming historical median (1990–2016) interest rates and growth rates. A negative gap indicates that government debt is on a rising trajectory; a positive gap indicates government debt is on a falling trajectory. Year *t* refers to the year of oil price plunges. Past oil price plunges include collapses in global oil prices in 1991, 1998, 2001, and 2008 (World Bank 2015b). The blue line represents the simple averages of 35 EMDE oil exporters in all episodes. The red line indicates the latest plunge starting in 2014. Blue dashed lines are the interquartile range for the past episodes.

D. Sample includes 27 oil-exporting EMDEs (excludes Albania, Bolivia, Brunei Darussalam, Ghana, Libya, Myanmar, South Sudan, and Turkmenistan). Change in overall fiscal balance is measured from 2014-16. Above average and below average oil revenue groups are defined by countries above or below the sample average of oil revenues as a share of GDP based on 2014 data.

Click here to download data and charts.

of the adjustment to low oil prices. In contrast, GCC countries, with larger reserves before the oil price decline, were able to use their reserves to maintain their currency pegs, despite intermittent periods of pressure on exchange rates (World Bank 2016c).

Central banks in oil-exporting EMDEs also took steps to mitigate tightening banking sector liquidity as oil prices declined. In a small number of countries where liquidity pressure was severe, the monetary authorities responded with unconventional measures, such as placing deposits from sovereign wealth funds (SWFs; e.g., Azerbaijan) and pension funds (e.g., Kazakhstan) in commercial banks (Sommer et al. 2016).

In oil-exporting advanced economies, Canada and Norway, inflation remained better anchored than in EMDEs. In light of weakened growth prospects, monetary authorities in these countries were able to pursue accommodative monetary policy—each lowered policy rates two times during 2015—as a complement to an easing fiscal stance.

Fiscal policy

Many EMDE oil exporters, which rely heavily on hydrocarbon revenues, undertook severe fiscal consolidation to realign spending with revenues despite rising economic slack and diminishing long-term growth prospects (e.g., Algeria, Angola, Azerbaijan, Iraq, the Islamic Republic of Iran, Kuwait, Nigeria, Russia, Saudi Arabia, the United Arab Emirates; Danforth, Medas, and Salins 2016). Compared with previous episodes of declining oil prices, the impact on public finances in EMDE oil exporters was compounded by weaker initial fiscal positions. Fiscal sustainability gaps continued to widen in 2015 and 2016, and government debt ratios rose on average by 11.4 percentage points, compared with an average of only 0.9 percentage point in past episodes (IMF 2017a; World Bank 2017a).

The need for fiscal adjustment was greater in oil-exporting EMDEs that lacked the necessary buffers (Husain et al. 2015; World Bank 2015d). Oil-exporting EMDEs with higher reliance on oil-related revenues faced a more pronounced deterioration in fiscal balances than in those economies that managed to diversify government revenue away from oil before 2014. Fiscal balances also fared better in oil-exporting EMDEs with more flexible exchange rate regimes, in part because real exchange rate depreciation mitigated revenue declines and spurred needed adjustment within the private sector.

A number of oil exporters that had previously built up buffers in SWFs—approximately 60 percent of oil-exporting EMDEs have at least one SWF—appropriately used these resources to alleviate fiscal and exchange rate pressures (e.g., Algeria, Azerbaijan, Kazakhstan, Kuwait, Saudi Arabia, the United Arab Emirates; World Bank 2015c). However, policymakers continue to face tradeoffs in their choices between drawing down assets—in particular, from SWFs—and issuing sovereign debt to finance budget deficits. Given benign global financing conditions, many have chosen to issue debt (Lopez-Martin, Leal, and Martinez 2016; Alberola-Ila et al. forthcoming).

Expenditure cuts have helped lower the fiscal break-even oil price in most oil-exporting EMDEs since 2015, although they remain higher than the current oil price in some countries (e.g., Bahrain, Saudi Arabia, Oman, Libya, the United Arab Emirates; Baffes et al. 2015; World Bank 2017b; World Bank 2017c). Absent a stronger-than-expected rebound in oil prices, further fiscal reforms in many oil-exporting EMDEs will be necessary. Contingent liabilities associated with potential bailouts of stated-owned oil companies and banks also remain a source of fiscal vulnerability, highlighting the importance of strengthening fiscal frameworks to mitigate such risks (Bova et al. 2016).

For some oil-exporting EMDEs, the fall in oil prices has helped spur longer-term fiscal reforms, including the introduction or planned introduction of additional indirect taxes (Malaysia, GCC countries). However, only one-fourth of oil-exporting EMDEs have fiscal rules to act as buffers to smooth the impact of oil price cycles on activity and public finances. Moreover, some countries failed to satisfy their existing fiscal rules (e.g., Nigeria), or subsequently modified them (e.g., Russia). This suggests the need for stronger fiscal frameworks to help reduce the procyclicality of fiscal policy and to establish a firmer foundation for long-term fiscal sustainability (Mendes and Pennings 2017). Oil price hedging and indexation of government bonds to oil prices could also help reduce exposure to short-term fluctuations in oil prices (Frankel 2017).

In oil-exporting advanced economies (e.g., Canada and Norway), the availability of fiscal buffers provided space to loosen fiscal stances, as measured by changes in the structural budget balance (i.e., the budget balance adjusted for the gap between actual and potential output levels). For example, Norway's fiscal rule of allowing up to 4 percent of its SWF to be drawn down to fund fiscal deficits provided a countercyclical policy tool to support growth.

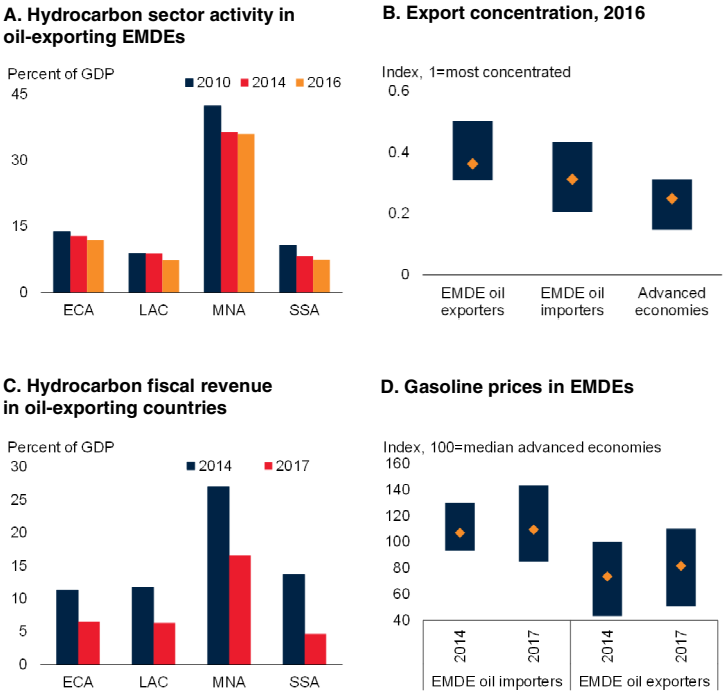
Structural policy

Many oil-exporting EMDEs entered the 2014 oil price bust still heavily reliant on oil (Figure SF1.9). Hydrocarbon sector activity represented more than one-third of GDP in a number of countries in Central Asia, Sub-Saharan Africa, and, in particular, the Middle East. Oil production represented the majority of government revenue and exports in most oil-exporting EMDEs in 2013. Cross-country studies underscore that greater diversification of exports and government revenues can bolster long-term growth prospects and resilience to external shocks and increase per-capita income growth (Lederman and Maloney 2007; Hesse 2008; IMF 2016). In oil-exporting EMDEs that have previously successfully diversified, a combination of measures to stimulate non-energy exports and broad reforms to improve the business environment, education, and skills acquisition have been vital (e.g., Malaysia, Mexico; Callen et al. 2014). Efforts to attract capital flows to non-resource sectors may also encourage diversification.

Following the recent oil price collapse, several large oil-exporting EMDEs have laid out medium- to long-term plans to reshape their economies by reducing reliance on the energy sector. For instance, Saudi Arabia's 2016 National Transformation Program targets an increase in non-oil commodity exports of 62 percent and non-oil government revenues of almost 225 percent by 2020 (Kingdom of Saudi Arabia 2016; World Bank 2016d). A GCC-wide implementation of a 5 percent value-added tax, expected to become effective in 2018, is intended to boost non-oil revenues in these countries. Nigeria has identified several sectors to promote greater diversification of

FIGURE SF1.9 Oil dependency in oil-exporting EMDEs

Oil exporters still have among the lowest levels of export diversification in EMDEs, and oil tax revenues still account for a large share of government revenues, particularly in the Middle East and North Africa. Despite subsidy reforms, gasoline prices are still significantly lower in oil-exporting EMDEs than in oil-importing ones.



Sources: GlobalPetrolPrices, Haver Analytics, International Monetary Fund, United Nations Conference on Trade and Development (UNCTAD), World Bank.

A. C. ECA = Europe and Central Asia, LAC = Latin America and the Caribbean, MNA = Middle East and North Africa, and SSA = Sub-Saharan Africa.

A. Regional aggregates are medians. Sample includes 19 oil-exporting EMDEs (Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Cameroon, Colombia, Ecuador, Ghana, the Islamic Republic of Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, the United Arab Emirates, and Venezuela). For Angola and Venezuela, 2016 reflects 2015 data.

B. Orange diamonds denote the median and blue bars represent the interquartile range of individual country groups. Sample includes 34 oil-exporting EMDEs (excludes South Sudan), 116 oil-importing EMDEs, and 36 advanced economies. Concentration index measures the degree of product concentration, where values closer to 1 indicate a country's exports are highly concentrated on a few products.

C. Regional aggregates are medians. Sample includes 24 oil-exporting EMDEs (Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Cameroon, Chad, Colombia, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, the Islamic Republic of Iran, Iraq, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, Sudan, Trinidad and Tobago, and the United Arab Emirates).

D. Retail gasoline prices benchmarked against the median for advanced economies. Local prices converted using 2014 exchange rates against the U.S. dollar. Sample includes 6 oil-exporting EMDEs (Bolivia, Colombia, Ghana, Kuwait, Malaysia, and Russia) and 45 oil-importing EMDEs. Last observation is November 2017.

Click here to download data and charts.

export earnings and government revenues.[10] Kazakhstan's "100 Concrete Steps" program, adopted in 2015, aims to diversify the economy and improve competitiveness and transparency.

Other recent examples of efforts to encourage diversification include: reducing labor market rigidities (e.g., Saudi Arabia, Oman), supporting foreign investment (e.g., Saudi Arabia), expanding infrastructure investment (e.g., Malaysia), and broadly improving the business environment (e.g., Algeria, Bahrain, Brunei Darussalam, Kazakhstan, Nigeria, the United Arab Emirates; Figure SF1.10). Reforms have also been encouraged by multilateral initiatives, including the World Bank's assistance to diversification efforts in some countries (e.g., the Republic of Congo, Nigeria, Qatar, and members of the Central African Economic and Monetary Community). However, in some cases, the structural reform agenda has faced legislative or implementation delays (e.g., Algeria, Kazakhstan) or has been scaled back as fiscal pressures recede (e.g., privatization efforts in Russia).

The sharp reduction in government revenues among oil-exporting EMDEs has also led to an increased emphasis on energy subsidy reforms. These have been aimed at restoring fiscal space, discouraging wasteful energy consumption, and generating capacity for programs that better target the poor (IMF 2017b). Between mid-2014 and end-2016, more than half of oil-exporting EMDEs reformed energy subsidies, including a geographically diverse set of countries in the Middle East and North Africa, Sub-Saharan Africa, East Asia, Latin America, and Central Asia.[11] A number of oil exporters have reduced utility subsidies as well.

In some cases—for instance, in GCC countries—subsidy reform was a significant break from past policy (Krane and Hung 2016; World Bank 2017c). Yet the need for reforms in this area is underscored by the fact that energy subsidies represented an average of nearly 6 percent of GDP as of 2014 among those oil-exporting EMDEs where subsidy reform occurred between 2014 and 2016. Encouragingly, the design and implementation of recently-implemented energy

[10] Nigeria aims to raise manufacturing sector growth to an average of 8.5 percent in 2018–20 and agricultural sector growth to 6.9 percent in 2017–20 (Nigeria Ministry of Budget and National Planning 2017).

[11] Energy subsidies were reformed between mid-2014 and late 2017 in Algeria, Bahrain, Cameroon, Ecuador, Gabon, Ghana, the Islamic Republic of Iran, Iraq, Kazakhstan, Kuwait, Malaysia, Nigeria, Oman, Qatar, Saudi Arabia, Sudan, Trinidad and Tobago, Turkmenistan, the United Arab Emirates, and Yemen.

subsidy reforms has been superior to past efforts, which were poorly phased and hampered by insufficient communication to the public about the rationale for reform (Clements et al. 2013; Asamoah, Hanedar, and Shang 2017). In many cases, recent reforms have also helpfully included measures to mitigate the impact on the poor and to strengthen social safety nets (e.g., Algeria, Angola, Saudi Arabia). Available data suggests that fuel price reforms since mid-2014 have succeeded in raising gasoline and diesel prices in oil-exporting EMDEs closer to international prices.

Policy response in oil importers

Monetary policy

The plunge in oil prices, coupled with a weak global growth environment, exacerbated the existing disinflation trend in many oil-importing EMDEs. In this context, several central banks cut interest rates, or otherwise pursued accommodative monetary policy during 2015–16 (e.g., China, Croatia, Dominican Republic, Hungary, India, Pakistan, Poland, Romania, Thailand). Yet, a number of non-oil commodity exporters raised rates during part of the 2015–16 period because they experienced significant currency depreciation, in part due to increasing concerns about external vulnerability (e.g., Brazil, Kenya, Mongolia, Peru, South Africa, Uganda, Ukraine, Zambia) and above-target inflation (e.g., Brazil, Mexico, Peru, Sri Lanka, Ukraine).

For major advanced economies, the fall in oil prices put significant downward pressure on inflation in 2015 and 2016. Several central banks responded by further cutting policy rates or expanding unconventional measures after reaching the zero lower bound of policy rates. In particular, the European Central Bank and Bank of Japan introduced negative interest rate policies and expanded their asset purchase programs.

Fiscal policy

Depressed oil prices were expected to provide oil importers an opportunity to rebuild fiscal space, but fiscal positions instead worsened in a number of these countries over the period 2014-16 (e.g., Argentina, Brazil, Turkey). In fact, cyclically-adjusted fiscal balances of oil-importing EMDEs deteriorated significantly, and government debt ratios increased (Figure SF1.11). In some cases, this reflected the effects of the broader decline in commodity prices, which reduced government revenues and necessitated spending cuts (e.g., Mongolia, Mozambique, Namibia, Rwanda, Ukraine). But even in countries where growth remained relatively robust and output gaps positive, governments missed the opportunity of lower energy prices to rebuild necessary fiscal space (Kose et al. 2017).

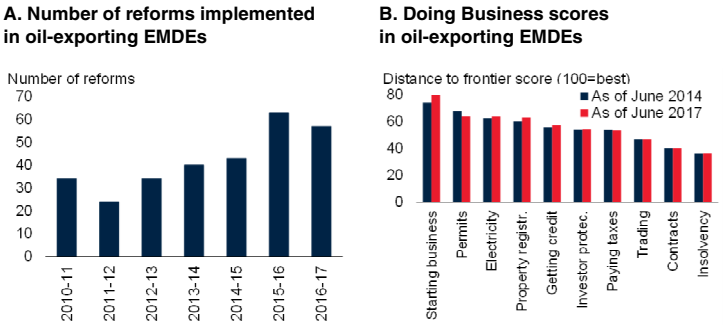
For advanced economies, fiscal stances continued to tighten in 2014-15, on average, but then became slightly expansionary in 2016, amid concerns about persistently weak growth and increasingly constrained monetary policies (IMF 2017a). Lower oil prices implied smaller direct fiscal windfalls in advanced economies compared to EMDEs given the smaller prevalence of subsidies (Coady et al. 2017; IEA 2016).

Structural policy

Like oil-exporting EMDEs, oil-importing EMDEs have taken advantage of declining oil prices to begin dismantling energy subsidies, which tend to benefit high-income earners, can crowd out public investment, and encourage more intensive use of fossil fuels (Arze del Granado, Coady, and Gillingham 2012). Since mid-2014, a number of

FIGURE SF1.10 Reforms and Doing Business scores

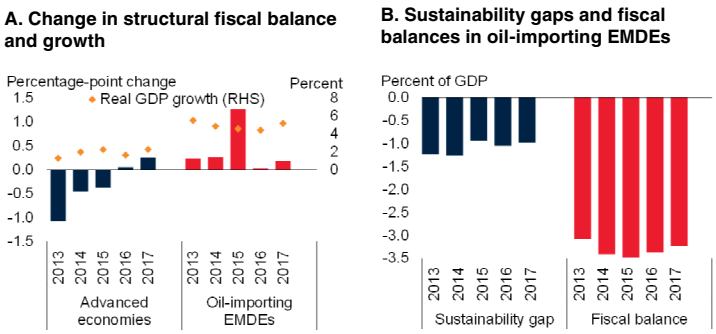
Oil-exporting EMDEs have accelerated reforms to improve the business environment since the oil price plunge, but more reforms will be needed to improve the environment in many areas.



Source: World Bank Doing Business.
A. B. Sample includes 35 oil-exporting EMDEs.
B. The full names of the reform areas given on the x-axis are: making it easier to start a business, making it easier to deal with construction permits, making it easier to get electricity, making it easier to register property, making it easier to get credit, making it easier to protect minority investors, making it easier to pay taxes, making it easier to trade across borders, making it easier to enforce contracts, and making it easier to resolve insolvency.
Click here to download data and charts.

FIGURE SF1.11 Policy response in oil-importing economies

In oil-importing EMDEs, fiscal balances worsened as expenditure growth outpaced revenues, despite the reduction or removal of energy subsidies in some countries, while little progress was made in closing sustainability gaps.



Sources: International Monetary Fund, World Bank.
A. Structural balance is the fiscal balance adjusted for the economic cycle and for one-off effects. Positive values indicate fiscal expansion, while negative values indicate contraction. Figure shows GDP-weighted average in each country group. Sample includes 34 advanced-economy oil importers and 30 EMDE oil importers. Aggregate growth rates calculated using constant 2010 U.S. dollar GDP weights.
B. Sustainability gap is measured as the difference between the primary balance and the debt-stabilizing primary balance, assuming historical average (1990 to 2016) interest rates and growth rates. A negative gap indicates that government debt is on a rising trajectory; a positive gap indicates government debt is on a falling trajectory. Figure shows median for EMDE oil importers. Sample includes 54 oil-importing EMDEs.
Click here to download data and charts.

countries have implemented such reform (e.g., China, the Arab Republic of Egypt, Mexico, Morocco, Tunisia), while others have raised energy taxes (e.g., China, Rwanda, South Africa, Vietnam; IEA 2015; IMF 2016; Kojima 2016). These steps have also included measures to avoid energy subsidies re-emerging if oil prices rebound—automatic pricing mechanisms or full energy price liberalization have been common (e.g., China, Côte d'Ivoire, India, Jordan, Madagascar, Mexico, Thailand, Ukraine; Asamoah, Hanedar, and Shang 2017; Beylis and Cunha 2017).

Concluding remarks and implications for the future

The plunge in oil prices from June 2014 to January 2016, one of the three largest declines since World War II, was accompanied by an unexpected slowdown in global growth and a host of policy responses in oil-exporting and oil-importing economies. The key takeaways are as follows:

What were the main drivers of the price plunge from mid-2014 to early 2016? Supply factors appear to have played a predominant role, particularly during the initial drop from mid-2014 to early 2015. Rising production and efficiency gains in U.S. shale oil, diminishing supply disruptions in the Middle East, and OPEC's decision in November 2014 to abandon price controls amplified market perception of a significant supply glut. However, disappointing global growth, particularly from mid-2015 to early 2016, played a significant role as well, underpinning expectations of weakening demand.

How did the recent oil price shock impact the global economy? In contrast to earlier expectations, the oil price plunge did not provide a noticeable boost to global activity, and was instead accompanied by slowing growth from 2014 to 2016. Despite a significant upturn in 2017, global growth was overestimated by an average of 0.2 percentage point per year over the period 2014-17, with 40 percent explained by oil-exporting EMDEs, another 34 percent by oil-importing EMDEs, and the remainder by advanced economies. In oil importers, the shortfall reflected the low responsiveness of activity to falling oil prices, ongoing economic rebalancing in China, and the dampening impact of a sharp contraction in U.S. energy investment and a rapid appreciation of the U.S. dollar on growth in the United States. Growth slowdowns in oil exporters were sharper and longer-lasting than expected, contributing to global growth shortfalls despite the limited size of these economies.

What was the policy response in oil exporters and importers? The collapse in oil prices provided a new impetus to implement policy reforms in oil-exporting EMDEs. Some have adopted more flexible currency regimes, which appear to have buffered the negative fiscal impact of falling oil prices in countries where they were already in place in 2014, while a large number of these countries have reduced or eliminated fiscally costly energy subsidies. Some oil exporters have started reducing or are planning to reduce their reliance on the energy sector. A number of oil-importing EMDEs have also lowered energy subsidies.

What are long-term prospects for oil prices and for oil-exporting EMDEs? Looking forward, oil prices are likely to remain markedly below levels prevailing before 2014. In particular, shale oil has altered long-term price expectations, increasing global recoverable oil reserves, and turning an energy scarcity challenge in the late 2000s into a "supply glut." Forecasts in 2014, which envisioned the Canadian oil sands as the world's marginal oil supplier, projected a nominal oil price of $100/bbl in 2025 (Figure SF1.12). Yet technological advancements and rising productivity in the U.S. shale oil industry, coupled with efficiency improvements on the consumption side and substitution away from oil, have brought the 2025 nominal oil forecast down to $65/bbl.

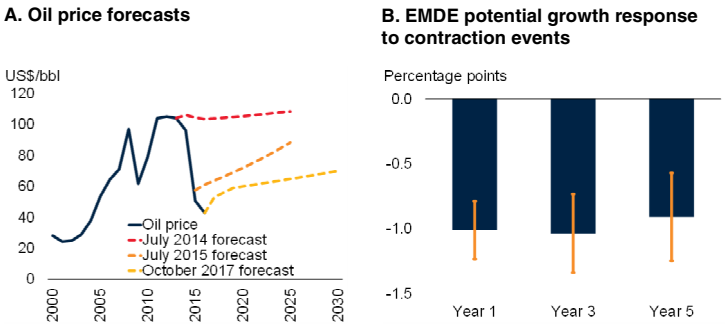
Despite a rebound in oil prices in the second half of 2017, which was supported by prospects of strengthening demand and production cuts by OPEC and non-OPEC producers, numerous factors limit upside risks to the outlook. First, greater price responsiveness of shale compared with conventional oil should ensure a rapid recovery in supply if upward price pressures materialize. Second, on the demand front, an accelerated uptake of more fuel-efficient technologies (e.g., electric vehicles and natural gas-powered commercial trucks), or new technological breakthroughs (e.g., self-driving cars or fuel cell technology) could considerably reduce oil consumption prospects (Cherif, Hasanov, and Pande 2017; International Energy Agency 2017). Third, environmental concerns (driven by pollution or climate-change considerations) could accelerate the use of policy tools that favor renewable energy. However, oil supply shocks (notably geopolitically-driven disruptions) or demand shocks (especially from large EMDEs, such as India and China, where most demand growth is expected to originate) could still trigger sharp fluctuations in oil prices and overshooting in both directions (Arezki et al. 2017).

The episode of falling oil prices in 2014-16 illustrates that large price changes can have disruptive effects on global activity, including by discouraging investment in both energy and some non-energy sectors. While persistently low oil prices could help sustain aggregate demand in oil-importing economies, positive effects would likely be limited in view of the recent experience. Low oil prices could also deter oil conservation efforts and incentives to develop renewable energies, which carry significant economic opportunities, including in low-income countries (World Bank and International Energy Agency 2015).

For oil exporters, the 2014–16 oil price plunge has cast a long shadow, as significant declines in investment and output tend to lead to weaker potential output growth in subsequent years. The expectation that oil prices will remain markedly lower than previously expected increases the urgency of reforms to restore growth and fiscal sustainability, whereas efforts so far have been mixed. The successful diversification experience of some energy producers (e.g., Malaysia, Mexico) suggests the need for both vertical diversification in oil, gas, and petrochemical sectors, as well as horizontal diversification beyond these sectors, with an emphasis on technological upgrades and competitiveness. Policy should help support investment in human capital, entrepreneurship, and employment in the non-oil private sector.

FIGURE SF1.12 Long-term outlook

Long-term oil price forecasts have been considerably downgraded over the last few years. The growth potential of oil-exporting EMDEs will likely suffer from past contractions in activity and investment, making reforms ever more urgent.



Source: World Bank.
A. Forecasts from various editions of World Bank's "Commodity Markets Outlook" report.
B. Contractions are defined as the years of negative output growth from the year after the output peak to output trough. Sample includes up to 45 EMDEs from 1989-2016. Dependent variable defined as cumulative slowdown in potential growth after a contraction event. Bars show coefficient estimates, while vertical lines show shock +/- 1.64 standard deviations (10 percent confidence bands). The methodology is described in Chapter 3.
Click here to download data and charts.

ANNEX TABLE SF1.1 Country classification

EMDE oil exporters[1]	EMDE non-oil commodity exporters[2]	EMDE commodity importers[3]
Albania	Argentina	Afghanistan
Algeria	Armenia	Antigua and Barbuda
Angola	Belize	Bahamas, The
Azerbaijan	Benin	Bangladesh
Bahrain	Botswana	Barbados
Bolivia*	Brazil	Belarus
Brunei Darussalam	Burkina Faso	Bhutan
Cameroon	Burundi	Bosnia and Herzegovina
Chad	Central African Republic	Bulgaria
Colombia	Chile	Cambodia
Congo, Rep.	Congo, Dem. Rep.	Cabo Verde
Ecuador	Costa Rica	China
Equatorial Guinea	Côte d'Ivoire	Comoros
Gabon	Ethiopia	Croatia
Ghana	Gambia, The	Djibouti
Iran, Islamic Rep.	Guatemala	Dominica
Iraq	Guinea	Dominican Republic
Kazakhstan	Guinea-Bissau	Egypt, Arab Rep.
Kuwait	Guyana	El Salvador
Libya	Honduras	Eritrea
Malaysia*	Indonesia	Fiji
Myanmar*	Kenya	Georgia
Nigeria	Kosovo	Grenada
Oman	Kyrgyz Republic	Haiti
Qatar*	Lao PDR	Hungary
Russia	Liberia	India
Saudi Arabia	Madagascar	Jamaica
South Sudan	Malawi	Jordan
Sudan	Mali	Kiribati
Timor-Leste	Mauritania	Lebanon
Trinidad and Tobago	Mongolia	Lesotho
Turkmenistan*	Morocco	Macedonia, FYR
United Arab Emirates	Mozambique	Maldives
Venezuela, RB	Namibia	Marshall Islands
Yemen, Rep.*	Nicaragua	Mauritius
	Niger	Mexico
	Papua New Guinea	Micronesia, Fed. Sts.
	Paraguay	Moldova
	Peru	Montenegro
	Rwanda	Nauru
	São Tomé and Príncipe	Nepal
	Senegal	Pakistan
	Sierra Leone	Palau
	South Africa	Panama
	Suriname	Philippines
	Tajikistan	Poland
	Tanzania	Romania
	Togo	Serbia
	Tonga	Seychelles
	Uganda	Solomon Islands
	Ukraine	Somalia
	Uruguay	Sri Lanka
	Uzbekistan	St. Kitts and Nevis
	West Bank and Gaza	St. Lucia
	Zambia	St. Vincent and the Grenadines
	Zimbabwe	Swaziland
		Syrian Arab Republic
		Thailand
		Tunisia
		Turkey
		Tuvalu
		Vanuatu
		Vietnam

* Primarily natural gas exporter.

[1] A country is classified as oil exporter when, on average in 2012–14, exports of crude oil and natural gas accounted for 20 percent or more of total exports. Countries for which this threshold is met as a result of re-exports are excluded. Countries that are primarily exporters of natural gas are included in this category, as the price of natural gas is tightly connected to crude oil. When data are not available, judgment is used.

[2] A country is classified as non-oil commodity exporter when, on average in 2012–14, either (i) total commodities exports accounted for 30 percent or more of total exports; or (ii) exports of any single commodity other than oil and gas accounted for 20 percent or more of total exports. Countries for which these thresholds are met as a result of re-exports are excluded. When data are not available, judgment is used. This taxonomy results in the classification of some well-diversified economies as importers, even if they are exporters of certain commodities.

[3] Commodity importers are EMDE economies that are not classified as commodity exporters.

ANNEX SF1.1 Decomposition of supply and demand shocks to oil prices: Bayesian structural vector autoregressive model approach

Oil supply and demand shocks are not observable and must be inferred from complex interactions between oil price fluctuations and changes in selected demand and supply indicators. Such statistical inference relies on a set of structural identification restrictions. This annex elaborates on the Bayesian structural vector autoregressive (SVAR) approach used to distinguish supply and demand shocks and assess their respective roles in the 2014–16 oil price plunge.

The use of structural VAR models to identify shifts in oil supply and demand curves was first introduced by Kilian (2009) and then extended by Kilian and Murphy (2012) and Baumeister and Peersman (2013). Their identification strategy was based on the notion that a favorable supply shock should lead to a combination of rising oil production, higher economic activity, and lower oil prices. In contrast, a favorable demand shock should lead to an increase in economic activity and oil production, and higher oil prices. In this context, shocks are identified based on sign restrictions, occasionally complemented by an assumption that the oil supply response to short term price movements is close to zero (Kilian and Murphy 2012). Further research undertaken by Baumeister and Hamilton (2015) demonstrated that some of these identification strategies can lead to implausible estimates of oil demand and supply elasticities. Following Caldara, Cavallo, and Iacoviello (2016), a more flexible approach was selected, which complements sign restrictions on the short-term supply and demand elasticities with prior ranges based on a survey of the literature.

The specification of the model is as follows:

$$AY_t = B(L)Y_{t-1} + \varepsilon_t \qquad (1)$$

$Y_t = [q_t, p_t^o, y_t, p_t^m]'$ denotes the vector of four endogenous variables and includes global oil production (q_t), international oil prices (p_t^o), global industrial production (y_t), and metals prices (p_t^m); A and $B(L)$ are coefficients matrices capturing instantaneous and dynamic relationships of the system; and ε_t is a vector of error terms. The first and second equations of the system capture oil supply and demand conditions, while the third and fourth equations capture global demand conditions proxied by global industrial production and metals prices. The identification strategy consists of imposing prior distributions that map the parameters space of the matrix A to their respective empirical ranges, as follows:

$$A = \begin{bmatrix} 1 & -\alpha_s & 0 & 0 \\ 1 & -\beta_d & -\beta_y & 0 \\ -\gamma_s & 0 & 1 & 0 \\ -\delta_s & \delta_d & -\delta_y & 1 \end{bmatrix}$$

The parameters $\alpha_s \geq 0$ and $\beta_d \leq 0$ capture short-term supply and demand elasticities of oil, respectively. The elasticity of oil price with respect to economic activity is captured by $\beta_y \geq 0$. Only changes in oil quantity directly affect manufacturing production through the parameter $\beta_s \geq 0$, while changes in oil prices have an indirect effect via their impact on oil quantity. The metals price index (p_t^m) is a leading indicator capturing global economic activity not accounted for by industrial production (Kilian and Zhou 2017; Baumeister and Kilian 2016; Alquist and Coibion 2014; Delle Chiaie, Ferrara, and Giannone 2016). It is assumed that both oil prices and quantities affect metals prices through the parameters δ_s and δ_d. Industrial production is positively correlated with metals prices ($\delta_y \geq 0$). In the estimation, the prior distributions of α_s and β_d are restricted to be centered at median values of 0.1 and -0.1. These values were taken from a literature survey of 32 studies (including Baumeister and Peersman 2013; Kilian 2009; Kilian and Murphy 2012, Asali 2011; Lin and Prince 2013). The model was estimated based on monthly data over the period 1991–2017.

While the identification strategy is more flexible and offers more plausible estimates of short term oil supply and demand elasticities, results tend to confirm the conclusions of earlier studies—namely, that an oil price decline driven by a favorable supply shock should be expected to

support global industrial production over time, while a price decline resulting from a drop in demand is associated with a subsequent slowdown in global activity. The model also suggests that demand shocks played a major role in driving oil price fluctuations during the 2000s, in line with findings of Baumeister and Peersman (2013) and Kilian and Hicks (2013). However, the relative importance of supply factors was substantially higher during the 2014-16 oil price plunge.

References

Aastveit, K. A., H. C. Bjørnland, and L. A. Thorsrud. 2014. "What Drives Oil Prices? Emerging versus Developed Economies." *Journal of Applied Econometrics* 30 (7): 1013-1028.

Alberola-Ila, E., J. Aizenman, R. Moreno, and F. Zampolli. Forthcoming. "The Commodity Cycle: Macroeconomic and Financial Stability Implications, An Introduction." *Journal of International Money and Finance*.

Alquist, R., and O. Coibion. 2014. "Commodity-Price Comovement and Global Economic Activity." NBER Working Paper No. 200003, National Bureau of Economic Research, Cambridge, MA.

Anderson, S. T., R. Kellogg, and S. W. Salant. Forthcoming. "Hotelling Under Pressure." *Journal of Political Economy*.

Arezki, R., and O. Blanchard. 2015. "The 2014 Oil Price Slump: Seven Key Questions." VoxEU.org, January 13. http://voxeu.org/article/2014-oil-price-slump-seven-key-questions.

Arezki, R., Z. Jakab, D. Laxton, A. Matsumoto, A. Nurbekyan, H. Wang, and J. Yao. 2017. "Oil Prices and the Global Economy." IMF Working Paper 17/15, International Monetary Fund, Washington, DC.

Arteta, C., M. A. Kose, M. Stocker, and T. Taskin. 2016. "Negative Interest Rate Policies: Sources and Implications." CEPR Discussion Paper 11433, Centre for Economic Policy Research, London.

Arze del Granado, F. J., D. Coady, and R. Gillingham. 2012. "The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries." *World Development* 40: 2234-2248.

Asali, M. 2011. "Income and Price Elasticities and Oil-Saving Technological Changes in ARDL Models of Demand for Oil in G7 and BRIC." *OPEC Energy Review* 35 (3): 189–219.

Asamoah, A., E. Hanedar, and B. Shang. 2017. "Energy Subsidy Reform: Difficult yet Progressing." VoxEU.org, June 12. http://voxeu.org/article/energy-subsidy-reform-difficult-yet-progressing.

Aslam, A., S. Beidas-Strom, R. Bems, O. Celasun, S. K. Celik, and Z. Koczan. 2016. "Trading on Their Terms? Commodity Exporters in the Aftermath of the Commodity Boom." IMF Working Paper 16/27, International Monetary Fund, Washington, DC.

Baffes, J., M. A. Kose, F. L. Ohnsorge, and M. Stocker. 2015. "The Great Plunge in Oil Prices: Causes, Consequences, and Policy Responses." Policy Research Note 1, World Bank, Washington, DC.

Baffes, J., and V. Kshirsagar. 2015. "Sources of Volatility during Four Oil Price Crashes." *Applied Economics Letters* 23 (6): 402-406.

Baumeister, C., and G. Peersman. 2013. "Time-Varying Effects of Oil Supply Shocks on the U.S. Economy." *American Economic Journal: Macroeconomics* 5 (4): 1-28.

Baumeister, C., and J. D. Hamilton. 2015. "Structural Interpretation of Vector Autoregressions with Incomplete Identification: Revisiting the Role of Oil Supply and Demand Shocks." Working Paper, University of California at San Diego.

Baumeister, C., and L. Kilian. 2016. "Understanding the Decline in the Price of Oil since June 2014." *Journal of the Association of Environmental and Resource Economists* 3 (1): 131-158.

Behar, A., and R. Ritz. 2016. "An Analysis of OPEC's Strategic Actions, U.S. Shale Growth and the 2014 Oil Price Crash." IMF Working Paper 16/131, International Monetary Fund, Washington, DC.

Beylis, G., and B. Cunha. 2017. *Energy Pricing Policies for Inclusive Growth in Latin America and the Caribbean*. Washington, DC: World Bank.

BIS (Bank for International Settlements). 2016. "Uneasy Calm Gives Way to Turbulence." *BIS Quarterly Review* (March): 1-14.

Bjørnland, H. C., F. M. Nordvik, and M. Rohrer. 2017. "Supply Flexibility in the Shale Patch: Evidence from North Dakota." CAMP Working Paper Series 2/2017, Centre for Applied Macro- and Petroleum Economics, BI Norwegian Business School, Oslo.

Bova, E., M. Ruiz-Arranz, F. G. Toscani, and H. E. Ture. 2016. "The Fiscal Costs of Contingent Liabilities: A New Dataset." IMF Working Paper 16/14, International Monetary Fund, Washington, DC.

BP. 2017. *BP Statistical Review of World Energy 2017*. London: British Petroleum Company.

Caldara, D., M. Cavallo, and M. Iacoviello. 2016. "Oil Price Elasticities and Oil Price Fluctuations." International Finance Discussion Paper 1173, Board of Governors of the Federal Reserve System, Washington, DC.

Callen, T., R. Cherif, F. Hasanov, A. Hegazy, and P. Khandelwal. 2014. "Economic Diversification in the GCC: Past, Present, and Future." IMF Staff Discussion Note 14/12, International Monetary Fund, Washington, DC.

Cherif, R., F. Hasanov, and A. Pande. 2017. "Riding the Energy Transition: Oil Beyond 2040." IMF Working Paper 17/120, International Monetary Fund, Washington, DC.

Clements, B., D. Coady, S. Fabrizio, S. Gupta, T. Alleyne, and C. Sdralevich. 2013. *Energy Subsidy Reform: Lessons and Implications.* Washington, DC: International Monetary Fund.

Coady, D., I. Parry, L. Sears, and B. Shang. 2017. "How Large Are Global Fossil Fuel Subsidies?" *World Development* 91: 11–27.

Curtis, T. 2015. "U.S. Shale Oil Dynamics in a Low Price Environment." Oxford Institute of Energy Studies, Oxford, United Kingdom.

——. 2016. "Unravelling the U.S. Shale Productivity Gains." Oxford Institute for Energy Studies, Oxford, United Kingdom.

Danforth, J., P. A. Medas, and V. Salins. 2016. *How to Adjust to a Large Fall in Commodity Prices*. Washington, DC: International Monetary Fund.

Delle Chiaie, S., Ferrara, L., and D. Giannone. 2016. "Common Factors in Commodity Prices," Manuscript, Federal Reserve Bank of New York, New York.

EIA (U.S Energy Information Administration). 2015. "World Shale Resource Assessments." September 24. U.S. Energy Information Administration, Washington, DC.

Feng, K., S. J. Davis, L. Sun, and K. Hubacek. 2015. "Drivers of CO_2 Emissions 1997-2013." *Nature Communications* 6 (7714): 1-8.

Frankel, J. A. 2017. "How to Cope with Volatile Commodity Export Prices: Four Proposals." Working Papers 335, Center for International Development at Harvard University, Cambridge, MA.

Grigoli, F., A. Herman, and A. Swiston. 2017. "A Crude Shock: Explaining the Impact of the 2014-16 Oil Price Decline Across Exporters." IMF Working Paper 17/160, International Monetary Fund, Washington, DC.

Hamilton, J. D. 2011. "Nonlinearities and the Macroeconomic Effects of Oil Prices." *Macroeconomic Dynamics* 15(S3): 364-378.

Hesse, H. 2008. "Export Diversification and Economic Growth." Working Paper 21, Commission on Growth and Development, World Bank, Washington, DC.

Huidrom, R., M. A. Kose, and F. L. Ohnsorge. 2017. "How Important are Spillovers from Major Emerging Markets?" Discussion Paper No. 12022, Center for Economic and Policy Research, Washington, DC.

Husain, A. M., R. Arezki, P. Breuer, V. Haksar, T. Helbling, P. Medas, and M. Sommer. 2015. "Global Implications of Lower Oil Prices." IMF Staff Discussion Notes No. 15, International Monetary Fund, Washington, DC.

Ianchovichina, E., and H. Onder. 2017. "Dutch Disease: An Economic Illness Easy to Catch, Difficult to Cure." Future Developments, The Brookings Institution, Washington, DC.

IEA (International Energy Agency). 2015. *World Energy Outlook 2015*. Paris: International Energy Agency.

———. 2016. *World Energy Outlook 2016*. Paris: International Energy Agency.

———. 2017. *World Energy Outlook 2017*. Paris: International Energy Agency.

IMF (International Monetary Fund). 2016. "Economic Diversification in Oil-Exporting Arab Countries." Annual Meeting of Arab Ministers of Finance.

———. 2017a. *Fiscal Monitor: Achieving More with Less*. Washington, DC: International Monetary Fund.

———. 2017b. "If Not Now, When? Energy Price Reform in Arab Countries." Note Prepared for Annual Meeting of Arab Ministers of Finance, International Monetary Fund, Washington, DC.

Jacks, D. S., and M. Stürmer. 2016. "What Drives Commodity Price Booms and Busts?" Research

Department Working Paper No. 1614, Federal Reserve Bank of Dallas, Dallas, TX.

Jo, S. 2014. "The Effects of Oil Price Uncertainty on Global Real Economic Activity." *Journal of Money, Credit and Banking* 46: 1113-1135.

Kang, J., and W. Liao. 2016. "Chinese Imports: What's Behind the Slowdown?" IMF Working Paper 16/106, International Monetary Fund, Washington, DC.

Kilian, L. 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.

Kilian, L., and B. Hicks. 2013. "Did Unexpectedly Strong Economic Growth Cause the Oil Price Shock of 2003–2008?" *Journal of Forecasting* 32 (5): 385-94.

Kilian, L., and D. P. Murphy. 2012. "Why Agnostic Sign Restrictions Are Not Enough: Understanding the Dynamics of Oil Market VAR Models." *Journal of the European Economic Association* 10 (5): 1166-188.

Kilian, L., and X. Zhou. 2017. "Modeling Fluctuations in the Global Demand for Commodities." CEPR Discussion Paper DP12357, Centre for Economic and Policy Research (CEPR), Washington, DC.

Kingdom of Saudi Arabia. 2016. "National Transformation Program 2020." Kingdom of Saudi Arabia, Riyadh.

Kojima, M. 2016. "Fossil Fuel Subsidy and Pricing Policies: Recent Developing Country Experience." Policy Research Working Paper 7531, World Bank, Washington, DC.

Kose, M. A., S. Kurlat, F. L. Ohnsorge, and N. Sugawara. 2017. "A Cross-Country Database of Fiscal Space." Policy Research Working Paper No. 8157, World Bank, Washington, DC.

Krane, J., and S. Y. Hung. 2016. "Energy Subsidy Reform in the Persian Gulf: The End of the Big Oil Giveaway." Issue Brief 04/28/16, Baker Institute for Public Policy, Rice University, Houston, TX.

Lederman, D., and W. Maloney. 2007. "Trade Structure and Growth" In *Natural Resources: Neither Curse nor Destiny,* edited by D. Lederman and W. Maloney. Washington, DC: World Bank.

Lippi, F., and A. Nobili. 2012. "Oil and the Macro-economy: A Quantitative Structural Analysis." *Journal of the European Economic Association* 10 (5): 1059-83.

Lin, C., and L. Prince. 2013. "Gasoline Price Volatility and the Elasticity of Demand for Gasoline." *Energy Economics* 38: 111–117.

Lopez-Martin, B., J. Leal, and A. Martinez. 2016. "Commodity Price Risk Management and Fiscal Policy in a Sovereign Default Model." BIS Working Paper No. 620, Bank for International Settlements, Basel.

Ma, S.-C., Y. Fan, and L. Feng. 2017. "An Evaluation of Government Incentives for New Energy Vehicles in China Focusing on Vehicle Purchasing Restrictions." *Energy Policy* 11: 609-18.

McNally, R. 2017. *Crude Volatility: The History and the Future of Boom-Bust Oil Prices.* New York: Center on Global Energy Policy Series, Columbia University Press.

Mendes, A., and S. Pennings. 2017. "Consumption Smoothing and Shock Persistence: Optimal Simple Fiscal Rules for Commodity Exporters." Policy Research Working Paper 8035, World Bank, Washington, DC.

Newell, R., and B. Prest, 2017. "The Unconventional Oil Supply Boom: Aggregate Price Response from Microdata." NBER Working Paper No. 23973, National Bureau of Economic Research, Cambridge, MA.

Nigeria Ministry of Budget and National Planning. 2017. "Nigeria Economic Recovery and Growth Plan: 2017–20." Nigeria Ministry of Budget and National Planning, Abuja.

Rystad Energy. 2017. Supply Data Services. Rystad Energy, Oslo.

Smith, J. L., and T. K. Lee. 2017. "The Price Elasticity of U.S. Shale Oil Reserves." U.S. Energy Information Administration, Washington, DC.

Sommer, M., G. Auclair, A. Fouejieu, I. Lukonga, S. Quayyum, A. Sadeghi, G. Shbaikat, A. Tiffin, J. Trevino, and B. Versailles. 2016. "Learning to Live with Cheaper Oil: Policy Adjustment in Oil-Exporting Countries of the Middle East and Central Asia." Middle East and Central Asia Departmental Paper No. 16/03, International Monetary Fund, Washington, DC.

Wang, Z., and A. Krupnick. 2013. "A Retrospective Review of Shale Gas Development in the United States." Resources for the Future, Washington, DC.

World Bank. 2015a. "Commodity Markets Outlook: Anatomy of the Last Four Oil Price Crashes." World Bank, Washington, DC.

———. 2015b. "MENA Quarterly Economic Review: Plunging Oil Prices." World Bank, Washington, DC.

———. 2015c. *Global Economic Prospects: Having Fiscal Space and Using It*. Washington, DC: World Bank.

———. 2015d. *Global Economic Prospects: The Global Economy in Transition*. Washington, DC: World Bank.

———. 2016a. "Commodity Markets Outlook: OPEC in Historical Context." World Bank, Washington, DC.

———. 2016b. *Global Economic Prospects: Divergences and Risks*. Washington, DC: World Bank.

———. 2016c. "MENA Quarterly Economic Review: Whither Oil Prices." World Bank, Washington, DC.

———. 2016d. *Global Economic Prospects: Spillovers amid Weak Growth*. Washington, DC: World Bank.

———. 2017a. *Global Economic Prospects: Weak Investment in Uncertain Times*. Washington, DC: World Bank.

———. 2017b. *Global Economic Prospects: A Fragile Recovery*. Washington, DC: World Bank.

———. 2017c. "Gulf Economic Monitor: Sustaining Fiscal Reforms in the Long-Term." World Bank, Washington, DC.

World Bank and International Energy Agency. 2015. *Sustainable Energy for All 2015: Progress Toward Sustainable Energy*. Washington, DC: World Bank.