SPECIAL FOCUS:

OPEC in historical context: Commodity agreements and market fundamentals

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On September 28, members of the Organization of the Petroleum Exporting Countries (OPEC) agreed to limit crude oil output to 32.5-33.0 million barrels per day, effectively ending two years of unrestrained production. This marked an important policy shift, especially for Saudi Arabia, the organization's largest producer. The details of OPEC's plan are to be worked out and announced at the group's meeting on November 30. The Islamic Republic of Iran, Libya, and Nigeria, all OPEC members, are likely to be exempted from the production limits because of earlier production losses. The plan, if implemented, would be the first production cut since 2008. OPEC is also preparing a framework for consultations with non-OPEC producers. Against this background, this Special Focus section addresses the following questions: (1) What does OPEC's new plan entail? (2) How does OPEC compare with earlier formal commodity agreements? (3) What do market forces over the past decade imply for OPEC's ability to control prices? It concludes that formal commodity agreements have limited ability to influence the market and eventually collapse, often with unintended consequences. In the case of OPEC, the only surviving commodity organization seeking to influence markets, guiding global oil prices will be challenging in the presence of unconventional oil producers, notably U.S. shale oil.

OPEC's new plan

On September 28, 2016, OPEC members (which currently account for one-third of global production) agreed to limit output to 32.5-33.0 mb/d, but details and a final decision are being deferred until a meeting on November 30 (Figure 1).

Specifics of the plan are to be worked out by a high-level committee, which is also tasked with preparing a framework for consultations with non-OPEC producers. The Russian Federation has tentatively agreed to support OPEC's decision to limit production. The Islamic Republic of Iran, Libya, and Nigeria are likely to be given exemptions because of earlier production losses.

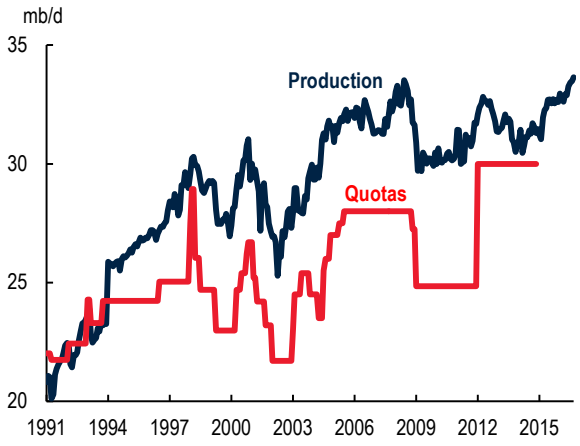
The plan, which effectively ends two years of unrestrained production, marks an important policy shift for Saudi Arabia, OPEC's largest producer.

OPEC members must agree on a number of issues, including individual member quotas, the base period for any cuts, the timing of implementation, and at what level excluded countries would cap production. A cut to 32.5 mb/d would entail a 1.0 mb/d reduction from current output, or 0.5 mb/d if the ceiling were set at 33.0 mb/d. Should the Islamic Republic of Iran, Libya, and Nigeria raise production significantly in the coming months, larger cuts would be warranted by other producers to meet their overall targets (Figure F2).

Comparison of OPEC with earlier commodity agreements[1]

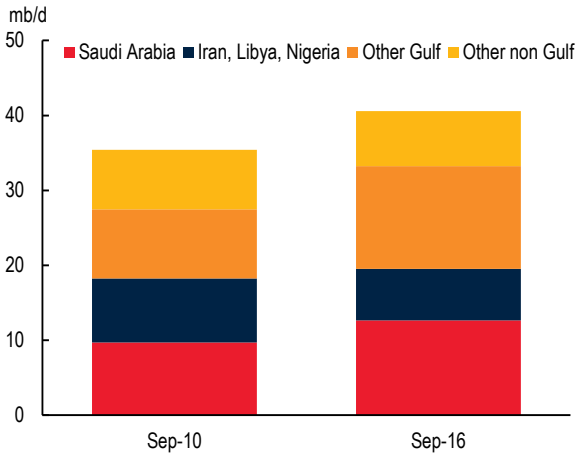
The decision by OPEC to abandon production quotas in favor of a market-share strategy in November 2014 and its recent decision to again limit production

F1 OPEC oil production and quotas



Sources: World Bank, International Energy Agency.
Note: Last observation is September 2016. Quotas ceased after November 2014.

F2 OPEC production, 2010 and 2016



Source: International Energy Agency.
Notes: Other Gulf is Iraq, Kuwait, Qatar, United Arab Emirates. Other non Gulf is Algeria, Angola, Ecuador, Gabon, Indonesia, República Bolivariana de Venezuela.

have led to a debate about the effectiveness of OPEC managing markets. OPEC production has fluctuated significantly, especially in the 1980s, as it sought to first cut production to maintain high prices, and later abandoned that effort to regain market share (Figures F3 and F4).

Efforts to manage world commodity markets to achieve price objectives have not been unique to the oil market. The historical record of such arrangements may offer insights about what lies in store for OPEC. A number of formal commodity agreements, often negotiated among producing and consuming nations to stabilize prices at levels deemed fair to both, were put in place after World War II. These arrangements covered coffee, olive oil, sugar, tin, and wheat (Swerling 1968). A renewed effort to establish commodity agreements took place after the 1970s price boom. Such accords were typically backed by the United Nations and were extended to other commodities, including cocoa and natural rubber (Gilbert 1996). Participants agreed to legally binding ways to manage markets, including export restrictions and inventory management. However, these laws proved to be the agreements' undoing. Over the long term, price and trade restrictions imposed by some of the agreements either encouraged the emergence of competitor products, such as aluminum for tin, or the entry of new producers, as Vietnam in the case of coffee. With the exception of OPEC, all of these agreements have collapsed.

Tin

First negotiated in 1954 with the objective of maintaining tin prices within a desired range through the management of buffer stocks, the International Tin Agreement (ITA) collapsed in 1985 following several years of insufficient funds to maintain stocks (Chandrasekhar 1989). Because tin prices under the agreement were higher and more stable than before, new tin producers outside the agreement entered the market: Brazil, for example, increased its market share from 1 percent in the 1960s to 10 percent in the 1980s. In addition, higher tin prices under the ITA encouraged the development of a substitute, aluminum, which gained market share by capturing growing demand from beverage can producers. Between the 1950s and 2000s, global tin output grew by 65 percent while aluminum output grew twice as much.

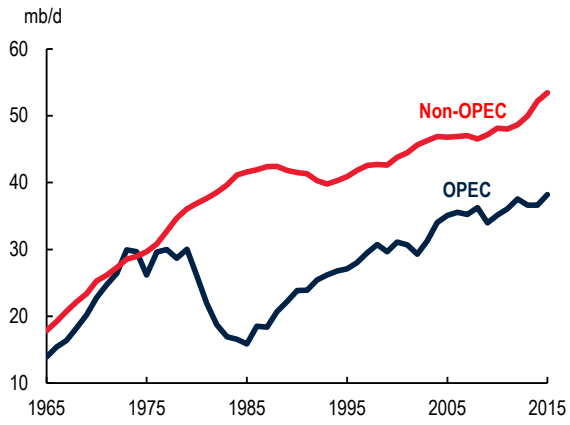
Coffee

In 1962, coffee-producing countries accounting for 90 percent of global coffee output joined with almost all developed coffee-consuming countries to sign the International Coffee Agreement (ICA) with the objective of stabilizing world coffee prices through mandatory export quotas (Akiyama and Varangis 1990). Higher coffee prices encouraged the emergence of new producers. For example, before the agreement collapsed in 1989, two non-ICA members, the Union of Soviet Socialist Republics and the German Democratic Republic, provided Vietnam with technical and financial assistance to develop its coffee industry (Baffes, Lewin, and Varangis 2005). In 1970, Vietnam produced just 0.7 percent of the 59 million bags of annual global production. By the early 2000s, it had overtaken Colombia as the world's second-largest coffee producer after Brazil. It now accounts for 20 percent of global coffee production.

Natural Rubber

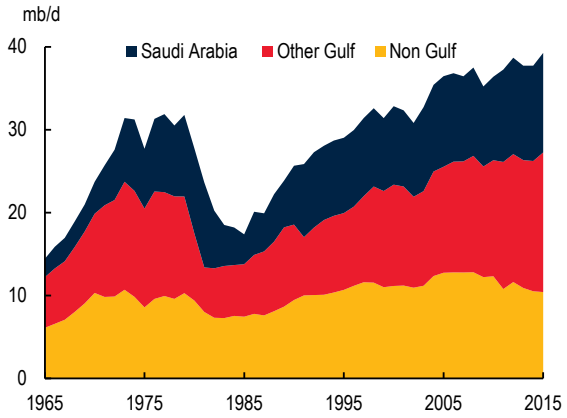
Another arrangement, covering natural rubber, collapsed during the Asian financial crisis due to currency volatility of three key producers: Indonesia, Malaysia, and Thailand. A buffer stock of rubber was used to maintain prices within a desired range. The buffer stock manager was authorized to buy or sell

F3 World oil production



Source: International Energy Agency.

F4 OPEC oil production



Source: International Energy Agency.
Note: Other Gulf is Iraq, Kuwait, Qatar, United Arab Emirates. Non Gulf is Algeria, Angola, Ecuador, Gabon, Indonesia, Libya, Nigeria, and República Bolivariana de Venezuela.

rubber when its price (indexed into the domestic currencies of these three producers) dropped or exceeded a certain level (Khan 1980). Because of weak global demand (partly due to the Asian crisis), U.S. dollar-denominated rubber prices declined and should have triggered production cuts. However, the currencies of the three main rubber-producing countries devalued sharply during the Asian crisis and raised the local-currency prices of rubber, triggering a production expansion in the rubber pricing mechanism. This inconsistency eventually led to the collapse of the agreement.

Crude oil

The largest player in the global crude oil market is OPEC, which was founded in 1960 to "co-ordinate and unify petroleum policies among Member Countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry" (OPEC 2016). At present, the organization consists of 14 members.[2] OPEC began to significantly affect the oil market in 1973 following its decision to impose an embargo on oil exports and the subsequent quadrupling of its official oil prices—from $2.70/bbl in September 1973 to more than $10/bbl in 1974. Following the substantial loss of Iranian oil during the 1989-90 revolution, oil prices spiked to over $40/bbl, but OPEC decided to set its official price of Saudi Light oil at $34/bbl. Saudi Arabia became the swing producer through 1985. But this role caused production to fall by two-thirds, leading it to abandon that role and regain its market share.[3]

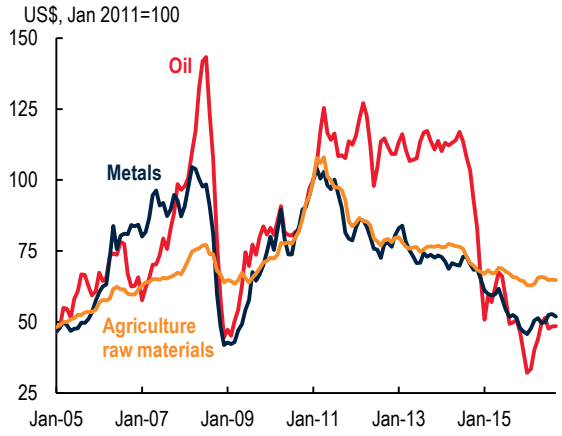
Over the next three decades, OPEC influenced oil prices through individual member quotas, adjusting them during the ebb and flow of oil prices, oil demand, and non-OPEC supply. Production cuts in 1998-99 during the East Asian financial crisis and 2008-09 during the deep global recession were instrumental in lifting oil prices. Overall, high oil prices during the commodity price boom stimulated new supplies, which again challenged the organization's ability to influence the oil market. A key difference between OPEC and the earlier formal commodity agreements is that OPEC does not have contractual rules dictating whether and how to intervene in markets. Thus, the organization has endured and responded flexibly to changing circumstances.

Implications of market forces over the past decade

Following two decades of relative stability, most commodity prices began increasing in the early 2000s, leading to the longest, most broad-based commodity price boom since the Second World War. Oil prices briefly approached $150/bbl in July 2008. The causes of the boom were numerous, and included a surge in growth by emerging markets (especially China), low investment prior to the boom (partly a result of the 2-decade long low commodity prices), and abundant financial liquidity. As global demand collapsed, oil prices halved during the global financial crisis. After the financial crisis, virtually all commodity prices rebounded, led by oil due to large production cuts by OPEC and strong emerging market demand. Commodity prices reached a new peak in early 2011 (Figure F5). However, markets then began to tilt into surplus due to weaker growth prospects for emerging markets and supply that had begun to build up.

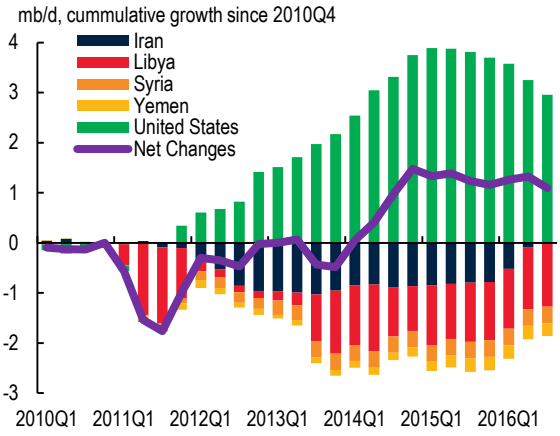
Industrial commodity prices began falling in 2011, but oil prices remained high for nearly four more years. OPEC production restraint, and outages in a number of countries—notably the Islamic Republic

F5 Commodity price indices



Source: World Bank.
Note: Last observation is September 2016.

F6 Crude oil supply growth



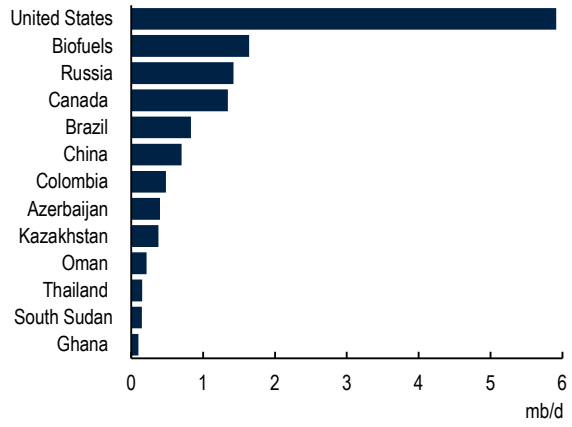
Source: International Energy Agency.
Note: Last observation is 2016Q3.

of Iran, Libya, Nigeria, and Yemen—offset the large growth in non-OPEC supply, which came mainly from U.S. shale (Figure F6). However, global oil supply was building, not only from shale, but also from other unconventional sources including biofuels, Canadian oil sands, and from non-OPEC members such as Brazil, China, and Russia (Figure F7). By 2014, global oil supplies had begun to exceed demand by nearly 1 mb/d, led by U.S. oil production growth. OPEC members faced a decision of either cutting production and preserving high oil prices, or seeking to protect market share by allowing prices to drop. They chose the latter, and prices fell to less than $30/bbl in January 2016.[4]

A new development over the two decades that altered the landscape of the energy industry has been the development of U.S. shale deposits. U.S. shale technologies—the combined use of hydraulic fracturing and horizontal drilling—were first used to develop natural gas shale deposits. Substantial growth in shale gas production led to a collapse in U.S. gas prices and eventually drilling for shale gas (Figure F8). "New" natural gas basins were developed in the U.S. northeast and elsewhere. Production has expanded to the extent that the country has begun exporting liquefied natural gas abroad, in addition to increasing pipeline exports to Mexico. Despite expanded production, the United States remains a net importer of natural gas, mainly from Canada.

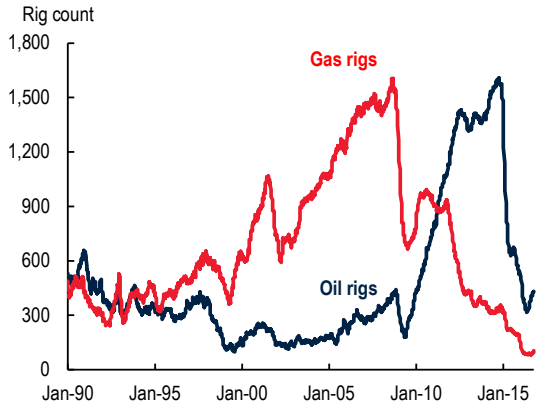
Spurred by shale technologies and high prices, shale oil production grew quickly and became the main source of growth in U.S. oil production (Figure F9). It now accounts for more than 5 percent of global oil production. Production from shale wells follows a much shorter cycle than conventional development. Wells deplete rapidly and are usually 70 percent

F7 Non-OPEC oil supply growth 2005-2015



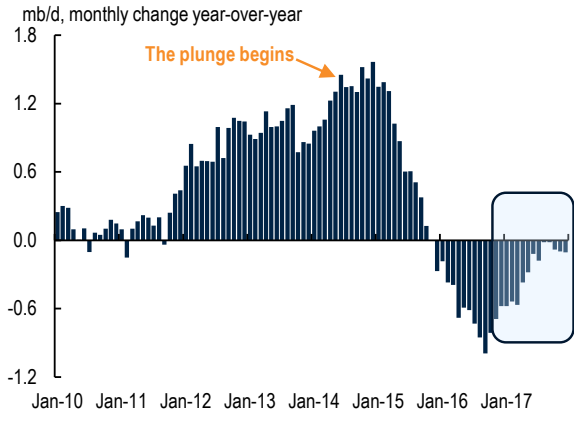
Source: International Energy Agency.
Note: Biofuels are not included in country totals. The numbers represent cumulative additions from 2005 to 2015.

F8 U.S. rotary rigs



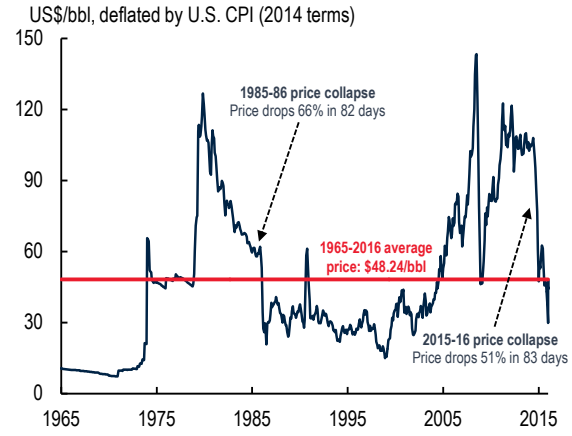
Source: Baker Hughes.
Note: Weekly frequency. Last observation is October 14, 2016.

F9 U.S. crude oil production



Source: International Energy Agency.
Note: Shaded area (October 2016 to December 2018) represents IEA projections.

F10 Oil prices



Source: World Bank.
Note: Last observation is September 2016.

tapped in the first year—compared with just a few percent in conventional wells that can last decades. The shale industry is still relatively new and continues to make significant gains in productivity, technology, and operating practices.[5] With the collapse in oil prices over the past two years, production costs have fallen significantly. Rystad Energy (2016) reports that the average shale wellhead breakeven price decreased on average by 22 percent year-over-year from 2013 to 2016. In addition, U.S. shale oil producers benefit from the fact that they are able to hedge (sell) the bulk of their production forward on futures markets and receive a predictable revenue stream.

OPEC's decision to reinstate quotas comes as the oil market adjusts its balance of stocks and supply to a period of lower prices. The organization's decision also comes as prices are near their long term 50-year average (Figure 10). Should OPEC and other producers succeed in restraining production and lifting prices meaningfully, investment in oil production and non-OPEC supply would likely rise—especially in view of the flexible nature of shale oil production. This is likely to test OPEC's ability to lift oil prices in the medium term.

Endnotes

1. This section draws heavily from Baffes, Kose, Ohnsorge, and Stocker (2015).

2. OPEC was created at the Baghdad Conference on September 10-14, 1960, by Islamic Republic of Iran, Iraq, Kuwait, República Bolivariana de Venezuela, and Saudi Arabia. The five founding members were later joined by nine other Members: Qatar (1961), Indonesia (1962; it suspended its membership from January 2009 to December 2015, before rejoining), Libya (1962), United Arab Emirates (1967), Algeria (1969), Nigeria (1971), Ecuador (1973; it suspended its membership from December 1992 to October 2007, before rejoining), Angola (2007), and Gabon (1975; which terminated its membership in January 1995 but rejoined in July 2016). Currently OPEC's membership consists of 14 countries.

3. Swing producer is defined as a large producer with the ability to lower and raise production to affect the level of prices.

4. The 2014-15 oil price plunge shares a number of similarities with the 1985-86 collapse. Both price collapses took place after a long period of high oil prices, in part supported by OPEC. In both cases, high prices brought new oil supplies: North Sea, Gulf of Mexico, and Alaska prior to 1985 (accounting for about 9 percent of global oil supply in 1985) and Canadian oil sands, biofuels, and U.S. shale oil prior to 2014 (accounting for about 8 percent of global oil supply in 2014). In both cases the oil collapse was aided by OPEC's actions.

5. For example, well productivity in the Bakken shale basin in North Dakota has risen from less than 300 barrels per well to 1,000 barrels per well from 2012 to 2016. Key operating improvements include shorter drilling cycles, longer laterals, multi-well drilling pads, tighter well spacing, greater proppant use, improved geo-steering, and refracting of wells.

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