



OPEC at the Crossroads

1. Introduction

Almost halfway through 2018 and the annual average Brent price (year-to-date) is already \$15/b or 26% higher than a year before, standing at \$77/b as of May. The OPEC+ output cutbacks amid strong global oil demand have managed to cut through the surplus in OECD stocks, which fell below the five-year average metric for the first time since 2014.¹ The latter has been the most widely cited measure of the success of the OPEC+ output cutbacks since the accord was first implemented, albeit often characterised as imperfect. In any case, eliminating the global stocks overhang marks an important milestone for the rebalancing of the oil market and in light of a deteriorating geopolitical environment amid falling stocks and low spare capacity, supply disruptions are expected to have a much bigger impact on oil price movements.

As the OPEC oil ministers prepare to meet for their semi-annual Ordinary Meeting on June 22nd, they are faced with some difficult choices. On the one hand, by extending the output cutbacks amidst higher risk of output disruptions, OPEC risks overtightening the oil market, pushing oil prices higher and leading to an inevitable demand response. The United States along with the fastest-growing oil consumers China and India have already raised their concerns about the impact of higher oil prices on their economies and called for OPEC to ensure adequate supplies.² Moreover, involuntary cuts originating mainly from Venezuela, Angola and Mexico that alone amounted to 0.92 mb/d as of April 2018 in excess of their pledged targets, mean that the oil market is tightening more quickly than anticipated. On the other hand, by exiting the agreement too early OPEC runs the risk of prices falling if such a decision is not supported by favourable market conditions especially as 'the clouds over global economy are getting darker by the day',³ while it endangers dismantling a historic coalition of OPEC/NOPEC producers which took massive diplomatic effort to put together and whose coordination proved critical for the rebalancing effort. Reaching a collective decision to reverse the cuts and increase output is not straightforward. For the OPEC oil producers to collectively agree on raising output, the few that can actually raise their production (i.e. Saudi Arabia, Kuwait and the UAE) must engage in delicate negotiations to convince the many with little or no spare capacity to accept more realistic quotas consistent with their actual capacity and to concede market share. This would not be the first time that OPEC is confronted with this challenge: whenever there has been an output disruption in the past, those producers with spare capacity and the ability to hike output often acted unilaterally and increased their share at the expense of the disrupted countries.

In this Energy Insight, we consider the hard realities of oil market and price dynamics for 2018 and 2019 to draw, analyse and assess the most prevailing oil output policy scenarios that are likely to

¹ IEA (2018), 'Oil Market Report', 16 May.

² Financial Times, 'In an era of strongman politics, oil's rally still speaks loudest', 31 May 2018.

³ Reuters, 'Clouds over the global economy have darkened since G7 summit, says IMF's Lagarde', 11 June 2018.

drive the discussion during the upcoming OPEC Ministerial Meeting, through the lens of a structural VAR model of the global oil market. The study does not take a stance on what will be the outcome of the June 22nd OPEC Meeting, but rather it attempts to quantify and evaluate the risks associated with each policy scenario in terms of the impact on oil prices and global demand growth for the remainder of 2018 and 2019. The impact of higher oil prices on global oil demand has dominated the recent debate not only from the point of view of the major oil-importing economies but also from the view of the largest oil producers within the oil-exporters coalition. There has been much speculation that Saudi Arabia and Russia have plans to raise output by 1-1.5 mb/d or close to 1-1.5% of global oil demand in the next meeting in response to a tightened and geopolitically charged market, preempting any potential supply shortages that would push prices to levels that could harm oil demand.⁴ In its May *Oil Market Report*, the IEA warned that the impact of higher oil prices on global demand is likely to be stronger than in the past (p. 5). This focus on the potential impact of higher oil prices on demand is important given that the robustness of demand growth played a catalytic role in sustaining the price recovery and hence, it is reasonable to expect that OPEC's decision about its future output policy will hinge heavily on the prospects of global oil demand.⁵

2. A review of the structural VAR methodology

Our analysis builds on the recently developed five-variable structural VAR model of the global oil market due to Economou et al. (2017)⁶, based on which we conduct our forecasting scenario analysis in the tradition of Baumeister and Kilian (2014)⁷. The model is re-estimated based on monthly data extending to April 2018, pertaining to: (1) the real Brent price expressed in April 2018 terms; (2) a measure of geopolitical disruptions in OPEC crude oil production; (3) a newly constructed index designed to capture any deviations of global oil production from the equilibrium production path (referred to as *oil supply balances*); (4) an index of global real economic activity due to Kilian (2009)⁸; and (5) a proxy of changes in global oil inventories based on OECD oil stocks.⁹ The model allows for two-years of lags and it is designed to identify the supply and demand shocks underlying the real oil price, based on a combination of sign restrictions and bounds on the short-run price elasticity of oil supply and oil demand.¹⁰ There are five structural shocks:

- Shocks to oil supply that are caused by exogenous geopolitical events in oil-producing countries, referred to as *exogenous supply shocks*;
- Shocks to oil supply that arise by the output decisions of oil producers, referred to as *endogenous supply shocks*;
- Shocks to oil demand for immediate consumption associated with fluctuations in the global business cycle, referred to as *flow demand shocks*;

⁴ Financial Times, 'OPEC and Russia set to boost oil output after Trump pressure', 25 May 2018.

⁵ Fattouh, B. and Economou, A. (2018), 'Oil Supply Balances: The Four Cycles of the OPEC Oil Output Policy', OIES Presentation, April.

⁶ Economou, A., Agnolucci, P., Fattouh, B. and De Lipsis, V. (2017), 'A Structural Model of the World Oil Market: The Role of Investment Dynamics and Capacity Constraints in Explaining the Evolution of Real Price of Oil', OIES Energy Insight 23, Oxford: Oxford Institute for Energy Studies.

⁷ Baumeister, C. and Kilian, L. (2014), 'Real-Time Analysis of Oil Price Risks Using Forecast Scenarios', IMF Economic Review, 62(1), pp. 119-145.

⁸ 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), pp. 1053-1069.

⁹ For details on the definition and construction of the supply-based measures, the reader is referred to Economou (2016, 'Oil Price Shocks: A Measure of the Exogenous and Endogenous Supply Shocks of Crude Oil', OIES WPM 68, Oxford: Oxford Institute for Energy Studies). Further details on the construction of the real economic activity index are found in Kilian (2009), while the rationale for using OECD oil stocks as a proxy for global oil inventories is discussed in Kilian and Murphy (2014, 'The Role of Inventories and Speculative Trading in the Global Market for Crude Oil', Journal of Applied Econometrics, 29: 454-478).

¹⁰ For a detailed discussion of the key identifying assumptions the reader is referred to Economou et al. (2017). The estimates of the responses of each model variable to each oil supply and oil demand shock are shown in Appendix A.

- Shocks to stock demand arising from the forward-looking behaviour of the market participants, referred to as *speculative demand shocks*;
- Other idiosyncratic shocks not otherwise captured by the preceding structural shocks, referred to as *residual shocks*.

To explore the implications of global oil demand growth under the alternative OPEC+ output policy scenarios, we employ a four-variable forecasting model based on a newly designed structural VAR model of global oil demand. The sample period extends from February 1990 to April 2018 and the structural model contains four variables: (1) the monthly changes in global oil liquids consumption; (2) the real Brent price expressed in April 2018 terms; (3) the monthly changes in global oil production; and (4) the index of global real economic activity due to Kilian (2009).¹¹ The model is designed to distinguish between four structural shocks:

- Shocks to the real price of oil that arise from the crude oil market and are channelled directly to immediate consumption and oil consumers' behaviour, referred to as *direct oil price shocks*;
- Shocks to flow supply that are channelled indirectly to immediate consumption through the impact of supply changes on the real oil price, referred to as *indirect oil price shocks*;
- Shocks to the demand for all industrial commodities that arise by shifts in the global business cycle, referred to as *global growth shocks*;
- Other idiosyncratic shocks not otherwise captured by the preceding structural shocks, referred to as *other demand shocks*.

The structural shocks in the model are jointly identified based on restrictions on the signs of the impact responses of the four variables to each structural shock. First, conditional on past data, a positive *direct oil price shock* causes the real oil price to increase as real economic activity rises and global oil production falls, leading to a decline in global oil consumption on impact. Second, a positive *indirect oil price shock* causes oil consumption and the real economic activity to decrease, as the real oil price increases due to an unanticipated disruption in global oil production. The feature that distinguishes between the direct and the indirect oil price shocks is that the former necessarily involves an increase in real economic activity, whereas the latter does not. Third, a positive *global growth shock* causes real economic activity, oil consumption and the real oil price to increase, as well as the global oil production to increase as a response. In addition to these sign restrictions, the model imposes the restriction that the short-run impact price elasticity of oil demand cannot exceed its long-run price elasticity, consistent with conventional views in the literature. Finally, our analysis focuses on the structural model that yields an impact price elasticity of oil demand closest to the posterior median of this elasticity among the candidate models that satisfy all identifying assumptions.¹²

Our approach in formally exploring the risks inherent in the future growth of global oil demand under alternative oil price paths, reflecting the different OPEC+ output policy scenarios, builds on the forecasting scenario analysis pioneered by Baumeister and Kilian (2014)¹³. The strategy is to project the growth of global demand for the remainder of 2018 and 2019 by feeding the structural moving-average representation of the VAR model of global oil demand with the sequences of oil price shocks obtained by our baseline forecasting model of the global oil market for the same period. Although, oil prices are not the only factor affecting oil demand, our analysis explicitly focuses on the price responsiveness of global demand for oil.

¹¹ We follow the literature in estimating the model at monthly frequency using seasonal dummies and 24 autoregressive lags.

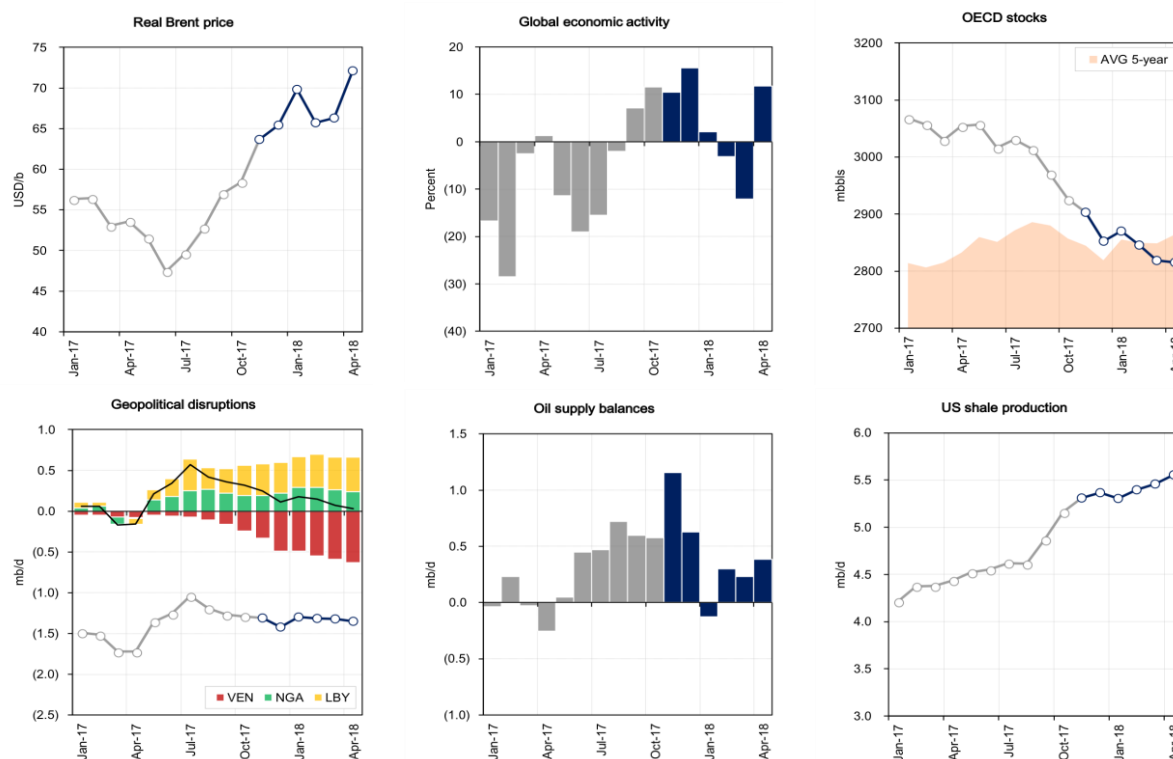
¹² The benchmark posterior median estimate obtained by the admissible models is -0.04. The estimates of the responses of each model variable to each structural shock are shown in Appendix B.

¹³ Baumeister, C. and Kilian, L. (2014), 'Real-Time Analysis of Oil Price Risks Using Forecast Scenarios', IMF Economic Review, 62(1), pp. 119-145.

3. Global view of the crude oil market

A critical debate that will lay the groundwork for OPEC to decide the future of its current oil output policy relates to the progress achieved towards accomplishing the rebalancing of the market fundamentals, as well as to the future evolution of these fundamentals and the risks associated therein for the remainder of 2018 and 2019. A cursory view of the key oil market indicators reveals that since OPEC last met in November 2017, the oil market has tightened and oil prices have been on an upward trajectory. The monthly average Brent price continued its rally above \$70/b, gaining close to \$20/b or 35% compared to a year ago, supported by a progressively robust global economic growth and tightening crude oil supply balances. Compared to its peak of 2.0 mb/d in September 2014, our data show that the global supply overhang in the first quarter of 2018 averaged at 0.13 mb/d, almost 1.9 mb/d lower. That is, despite US shale production growth maintaining its strong pace, albeit slowing down in early-2018. Since January 2018 to date, US shale production has increased by 0.2 mb/d, 0.1 mb/d lower relative to its growth a year before. Consequently, OECD oil stocks as of March 2018 fell below their five-year average for the first time since 2014, depicting the bigger picture of tighter supply-demand balances.

Figure 1: Oil market developments since November 2017



Notes: The monthly Brent price benchmark is expressed in real terms, deflated by the US consumer price index in April 2018 USD. The index of global real economic activity is due to Kilian (2009). The data on OECD oil stocks are obtained by the International Energy Agency and preliminary estimates for April 2018 are based on IEA's *Oil Market Report* of May. The measures of geopolitical supply disruptions and oil supply balances are due to Economou (2016). US shale oil production estimates are based on the US Energy Information Administration.

Source: Constructed by the authors.

Another important development in recent months is the deterioration of the geopolitical environment. Although, geopolitical supply disruptions remained relatively stable close to 1.5 mb/d on aggregate since mid-2017, this stability hides the fact that the Venezuelan output has fallen dramatically since July 2017 by about 0.65 mb/d. This fall however was matched by gains in Libyan and Nigerian production. Nevertheless, as production from Libya now operates near its maximum capacity with risks to its production tilted to the downside, while further growth in Nigerian output is constrained by

its aging infrastructure and perpetual theft and sabotage, the continuation of the Venezuelan output decline will be felt more strongly on balances and prices. Since 2016, Venezuelan output declined by about 1.0 mb/d close to 1.4 mb/d as of April 2018, while IEA warns that by the end of 2018 it could fall below the 1.0 mb/d mark for the first time since the Venezuelan Oil Crisis of December 2002.¹⁴

Notwithstanding, the US withdrawal from the Joint Comprehensive Plan of Action (JCPOA) in May 2018 amid the renewal of all nuclear-related US sanctions on Iran, adds to the heightened uncertainty about the future availability of oil supplies by threatening Iranian oil exports as well as the longer-term prospects for Iranian oil production. Against this backdrop, while it is not yet clear what will be the exact size of the potential loss of Iranian barrels, the refusal of most of the countries importing Iranian oil today to take part in the unilateral US sanctions implies that the lost volumes will be below the 1.4 mb/d decline caused by sanctions in 2012 with many estimating a loss of between 0.35 mb/d and 0.5 mb/d.¹⁵ Moreso, considering that there is a three to six months wind-down period before the US sanctions are fully reinstated, there is little expectation of immediate big losses of Iranian barrels. This may provide OPEC with some flexibility to avoid dealing with the Iranian sanctions in its upcoming meeting and move any discussions on the matter to its November 2018 meeting which is closer to the end of the 180-days wind down period (on November 4). That said, both Venezuela and Iran are likely to refrain from supporting a potential proposal that sees the producers who have the capacity to raise their production, as such action will be considered supportive of the US sanctions against them.

An immediate outcome from the geopolitically charged uncertainty engulfing the oil market in recent months is the wide divergence of expectations about the key factors shaping the oil market, confusing the signals both about current and long-term market fundamentals.¹⁶ In a rising market characterised by declining stocks and low availability of spare capacity, the ability of the oil market to absorb any unexpected disruptions in supply (or demand for that matter) is limited, and hence such fears about the future availability of oil supplies put significant upward pressure on oil prices. The latter being essentially exacerbated by the increase in financial flows attracted by the promise of higher returns in a tightened market with low spare capacity and heightened risks of geopolitical disruptions.

3.1. The release of stocks has eased the pressure on prices

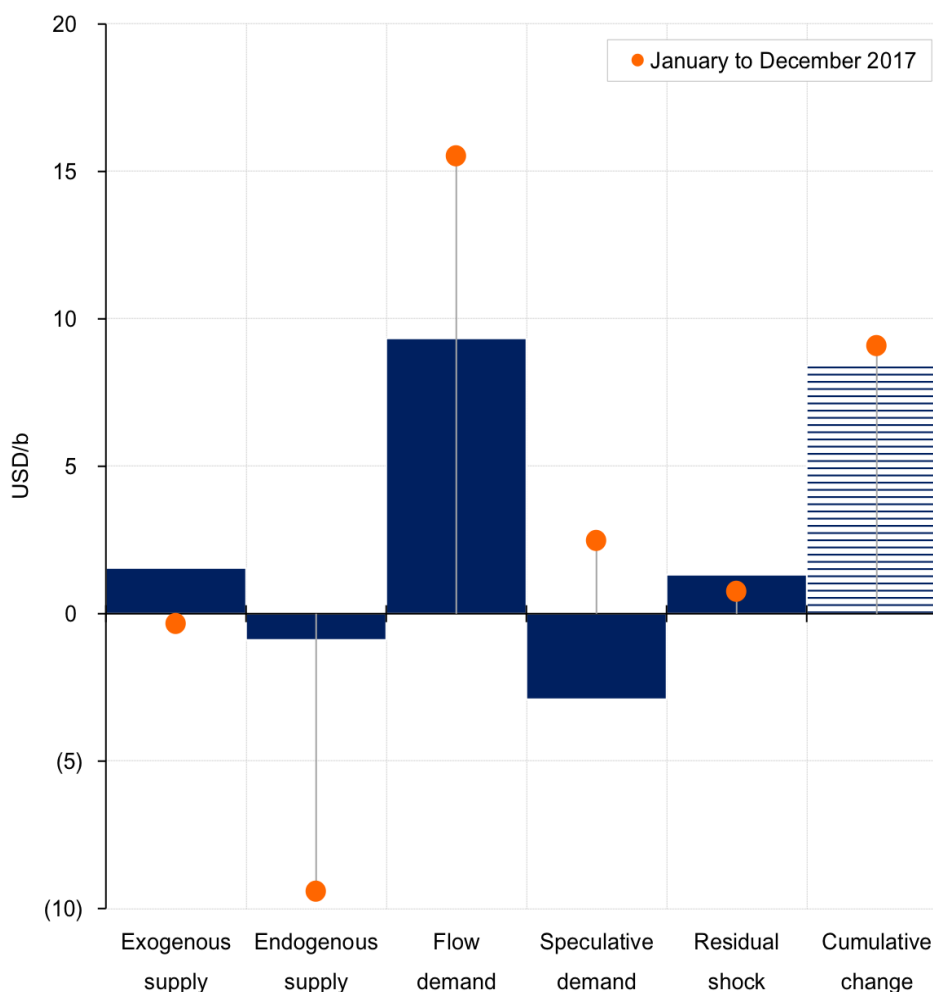
Figure 2 shows by how many dollars per barrel each oil supply and oil demand component underlying the price of oil, including speculative demand, contributed to the about \$9/b increase in the Brent price so far in 2018 (as of April). Clearly, the robust growth of global oil demand has been the main contributor to the price increase, adding over \$9/b (*flow demand*). Geopolitical disruptions (*exogenous supply*) added a further \$2/b, while the continued strong OPEC+ compliance to the output cutbacks offset by gains in the US and Canadian production had a net neutral contribution to the price increase of less than \$1/b (*endogenous supply*). Compared to the price dynamics in 2017, however, the impact of endogenous supply on oil prices has come a long way from being net negative by about \$10/b towards becoming almost net positive, underscoring the effectiveness of the current OPEC+ oil output policy in reducing the global supply overhang. Lastly, there is no indication that *speculative demand* pressures contributed to the price rise, but instead, the release of stocks has helped ease the hike by about \$3/b. Taken together, the evidence suggests that changes in market fundamentals remain the most important determinant of the oil price so far in 2018.

¹⁴ IEA. (2018), 'Oil Market Report', 13 June.

¹⁵ Jalilvand, D.R. (2018), 'The US Exit from the JCPOA: What Consequences for Iranian Energy?', Oxford Energy Comment, June.

¹⁶ See, for example, Fattouh, B. (2018), 'The Oil Market's Mixed Price Signals', Oxford Energy Comment, May.

Figure 2: Drivers of the real Brent price so far in 2018

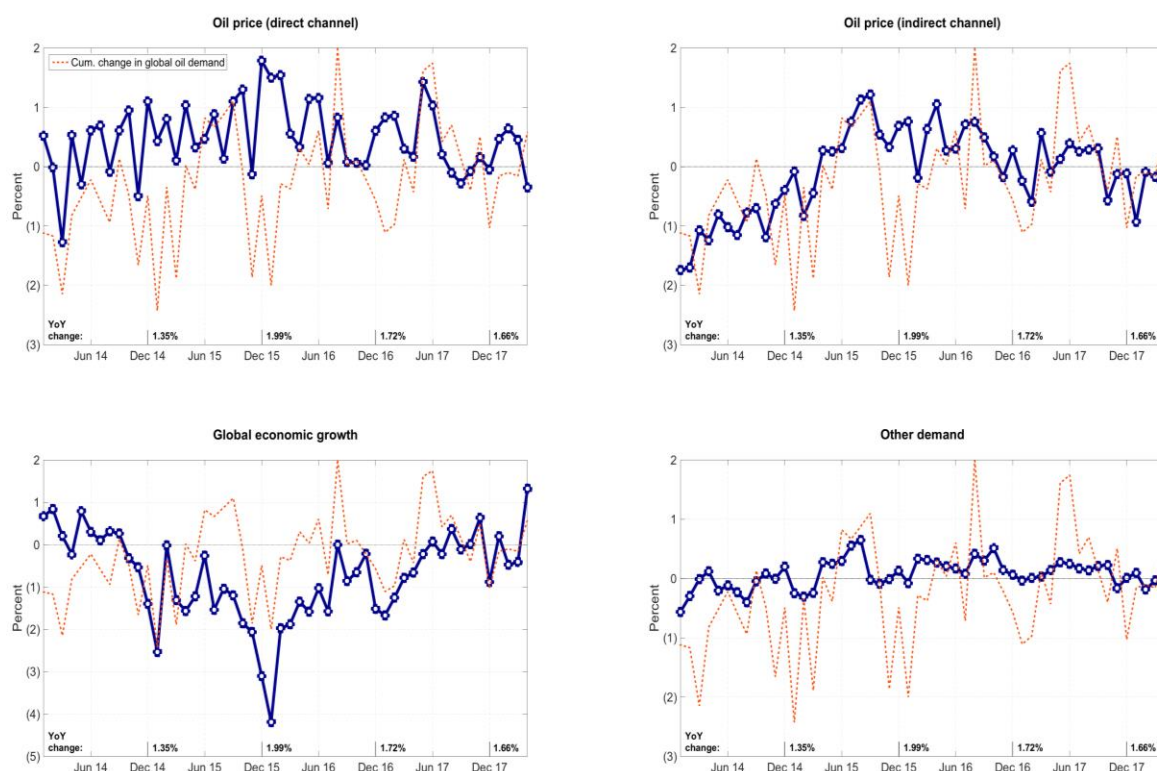


Source: Constructed by the authors.

3.2. How did OPEC oil output policy decisions affect global oil demand, so far?

Before assessing the implications of global oil demand under alternative OPEC+ oil output scenarios, it is useful to understand the evolution of demand growth in the recent price cycle, especially following OPEC's oil output policy decisions. Figure 3 shows the cumulative effect of each structural shock to the growth of global oil demand from January 2014 to April 2018. A line that is increasing over time indicates that the structural shock in question exerted upward pressure on the growth of global oil demand, and vice versa. The main focus of this exercise is on the *indirect oil price shocks* that refer to shocks to flow supply that are channeled indirectly to oil demand through the impact of supply changes on oil prices.

Figure 3: Decomposing the growth of global oil demand by structural shock



Source: Constructed by the authors.

Figure 3 shows that notwithstanding the apparent contribution of global economic growth on oil demand, changes in oil supply operating through their effect on oil prices played an important role driving global demand in recent years. The demand surge was exacerbated in 2015 following OPEC's decision to defend its market share by boosting its production, before reversing in two instances. The first is observed in the period from late-2015 to mid-2016 due to the stagnation and decline in US shale production. The second period relates to January 2017 onwards when the OPEC+ oil output cutbacks took effect, although the impact grows larger progressively as both voluntary and involuntary cuts become deeper. That said, global demand growth in 2018 remained largely supported by the robustness of global economic growth.

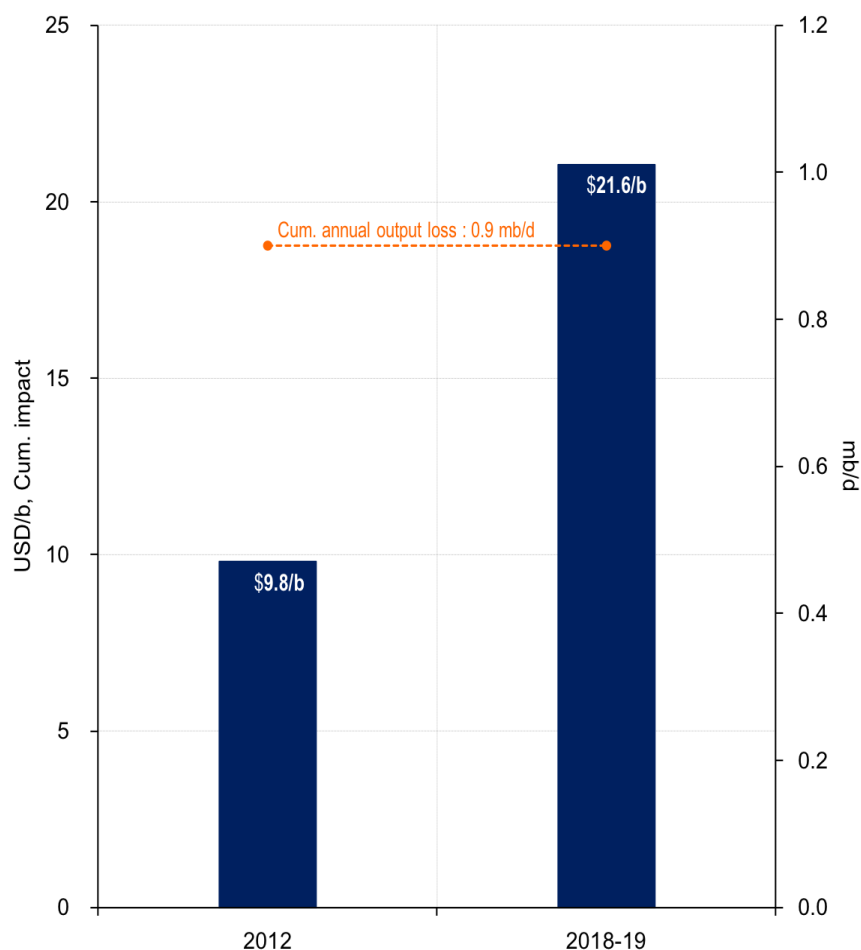
3.3. What is the expected price response to a new round of Iranian output losses?

Although the threat from the US sanctions to Iranian output is highly uncertain and the potential price implications are not likely to be felt in 2018, this episode remains important for forming price expectations in 2019. Considering that the size of the potential losses of Iranian barrels remains highly speculative, we assess the impact of a potential disruption in Iranian output on the Brent price by considering a scenario that simulates the repetition of the Iranian losses occurred in 2012 under current market conditions. These correspond to a loss of 0.9 mb/d of Iranian oil production within twelve months and hence, the impact on the oil price is estimated cumulatively across a full year.

Figure 4 shows that if the renewed US sanctions were to result in the same size of losses in Iranian production as those occurred by the sanctions in 2012, the impact on oil prices under current market conditions would be twice as large as in 2012. Indicatively, within a year, the oil price increases by as much as \$21/b, all else remaining equal, compared to the actual impact of about \$10/b experienced back in 2012. These results are consistent with the currently limited ability of the oil market to buffer against unexpected or expected disturbances due to declining stocks and lower spare capacity. Hence, despite the fact that most estimates regarding the size of the potential losses of Iranian

exports lie close to a third of the 1.4 mb/d decline caused by the sanctions in 2012, this does not eliminate the risk of sharp price rises.

Figure 4: Projected price response to the US renewal of the Iranian sanctions

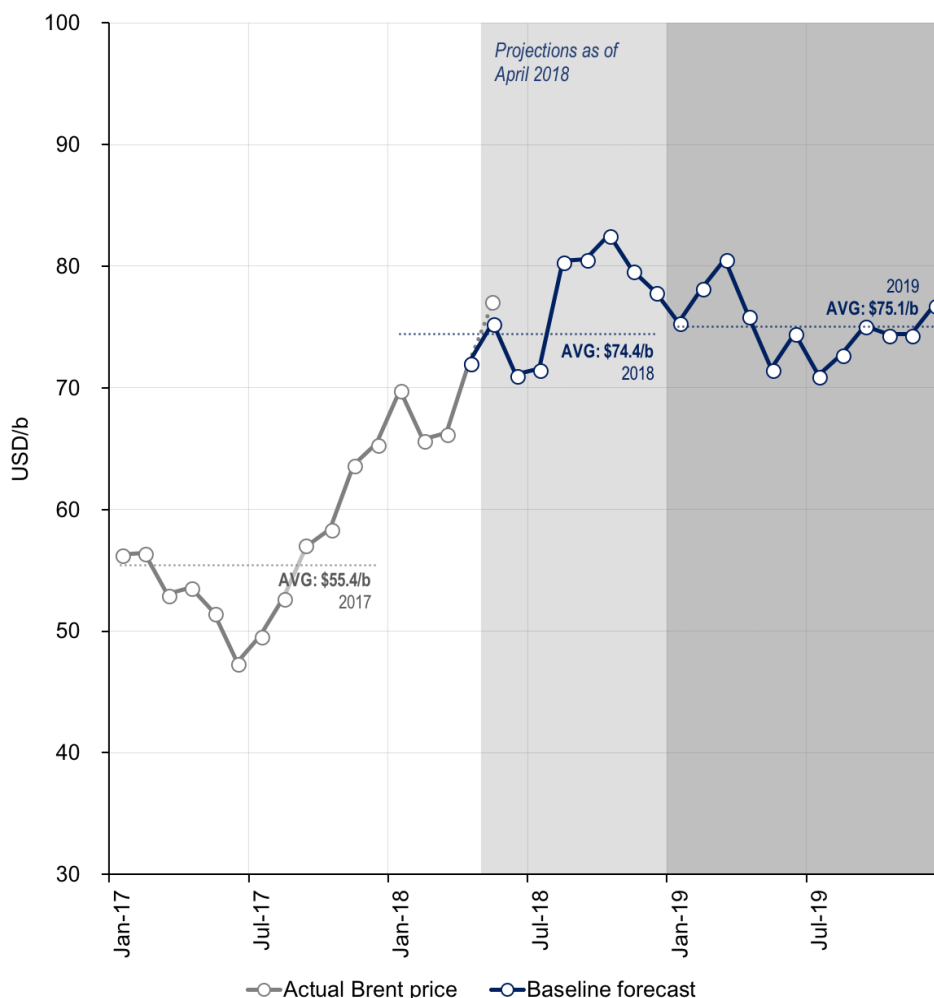


Source: Constructed by the authors.

3.4. What does the future hold under current market conditions?

Figure 5 presents the baseline forecast starting in May 2018 and extending for the entire year of 2019, based on all available information as of April 2018. The baseline forecast predicts the out-of-sample expected change in the Brent price, conditional on the assumption that there is no change in the future oil supply and oil demand conditions. This approach allows us to assess the future evolution of the price of oil based explicitly on prevailing market conditions at the time of the forecast. As Figure 5 shows, the baseline forecast projects an annual average oil price in 2018 of \$74/b, before gaining only slightly by less than \$1/b in 2019. Overall, oil prices through 2019 are expected to remain within a narrow range of about \$10/b, hovering between \$70-80/b. That said, the second half of 2018 appears to be the strongest, as oil prices are expected to average near \$79/b before gradually declining by \$5/b ending-2019.

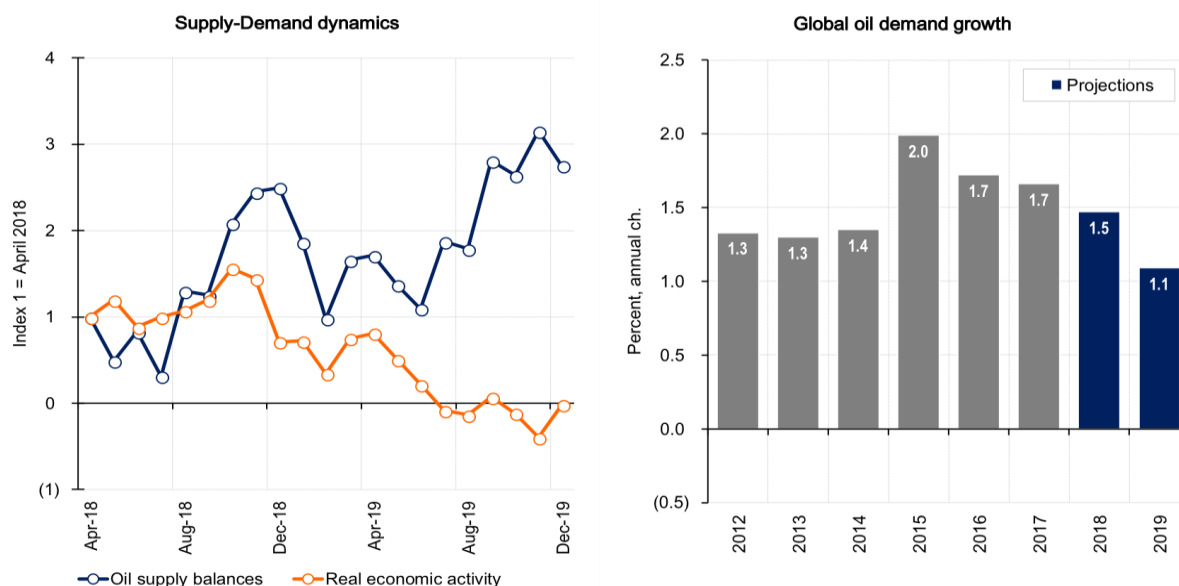
Figure 5: Oil price outlook for 2018 and 2019



Source: Constructed by the authors.

A closer examination of the factors driving the baseline forecast as shown in Figure 6, reveals that conditional on current supply-demand dynamics, the oil market is expected to remain well into balance and relatively tight for the remainder of 2018, before gradually weakening towards the second-half of 2019. The latter is driven by the anticipated gains in global oil supplies (mainly from US shale) amid a systematic slowdown in global economic activity commencing from late-2018 onwards. The annual average global oil demand for 2018 is expected to grow by 1.5% year-over-year, while for 2019 growth falls to 1.1%.

Figure 6: Oil market outlook for 2018 and 2019



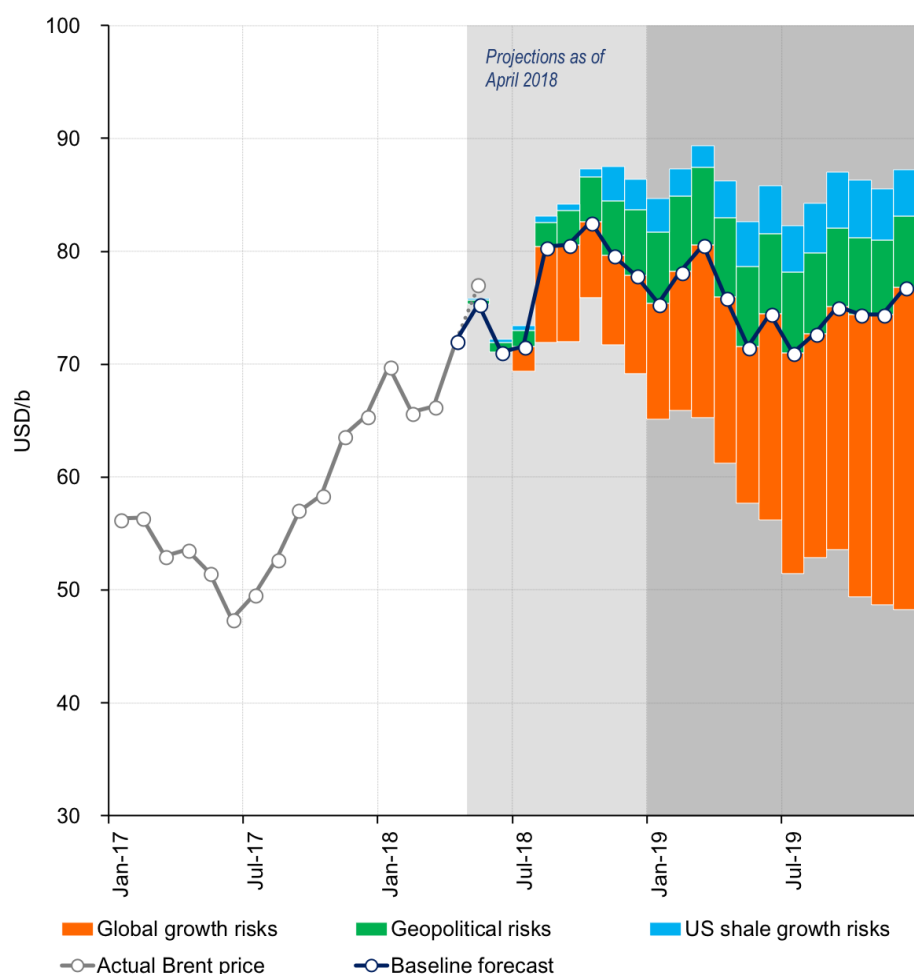
Source: Constructed by the authors.

Figure 7 sets out the main risks to the baseline forecast. On the downside, increasing global trade tensions following the US tariffs announcement on steel and aluminum imports from China (among a range of other products), the EU, Canada and Mexico, as well as the tit-for-tat retaliatory tariffs announcements targeted back to the US, pose an imminent risk on global economic activity and in turn global oil demand. In its October 2016 *World Economic Outlook*, the IMF projected that a growing level of trade barriers at the global level such that import prices hypothetically rise by 10%, would lower global output by almost 1.5% within three years and by almost 2% in the long-run. The same report finds that global trade, which is a significant component of oil demand will take the biggest hit, declining by more than 10% in the same period.¹⁷ Based on our scenario analysis a negative revision of global growth by 1.5%, such that the annual average growth falls from 3.9% to 2.5% in both 2018 and 2019, will cause oil prices to plunge by about \$4/b in 2018 and \$19/b in 2019. By the final quarter of 2019, the oil price stabilises around \$50/b compared to \$75/b in the baseline forecast. These results underscore the paramount importance of the impact of positive demand shocks on current price dynamics, while suggesting that safeguarding global demand growth in the near-term should be a top priority for OPEC.

But the upside potential of oil price risks is also high, as the geopolitical supply disruptions from Venezuela and Iran alone can push prices well above \$80/b. The higher impact however lies in 2019, driven by the risk of Iranian supply losses. Downward revisions to the growth of US shale production due to logistical bottlenecks weigh also to the upside, but by the time these constraints are expected to take a toll on oil prices in late-2019, some of the pipeline capacity constraints would have been resolved.

¹⁷ IMF, 'World Economic Outlook', October 2016, Scenario Box 1, pp. 37-39.

Figure 7: Balance of risks to the baseline forecast



Assumptions

Forecast scenarios	2018	2019
Global economic growth risks	+ 2.5% (- 1.5% chg. from base)	+ 2.5% (- 1.5% chg. from base)
Geopolitical risks	- 0.8 mb/d	- 0.15 mb/d
US shale growth risks	+1.0 mb/d yr-end	n/a

Balance of Risks (USD/b)

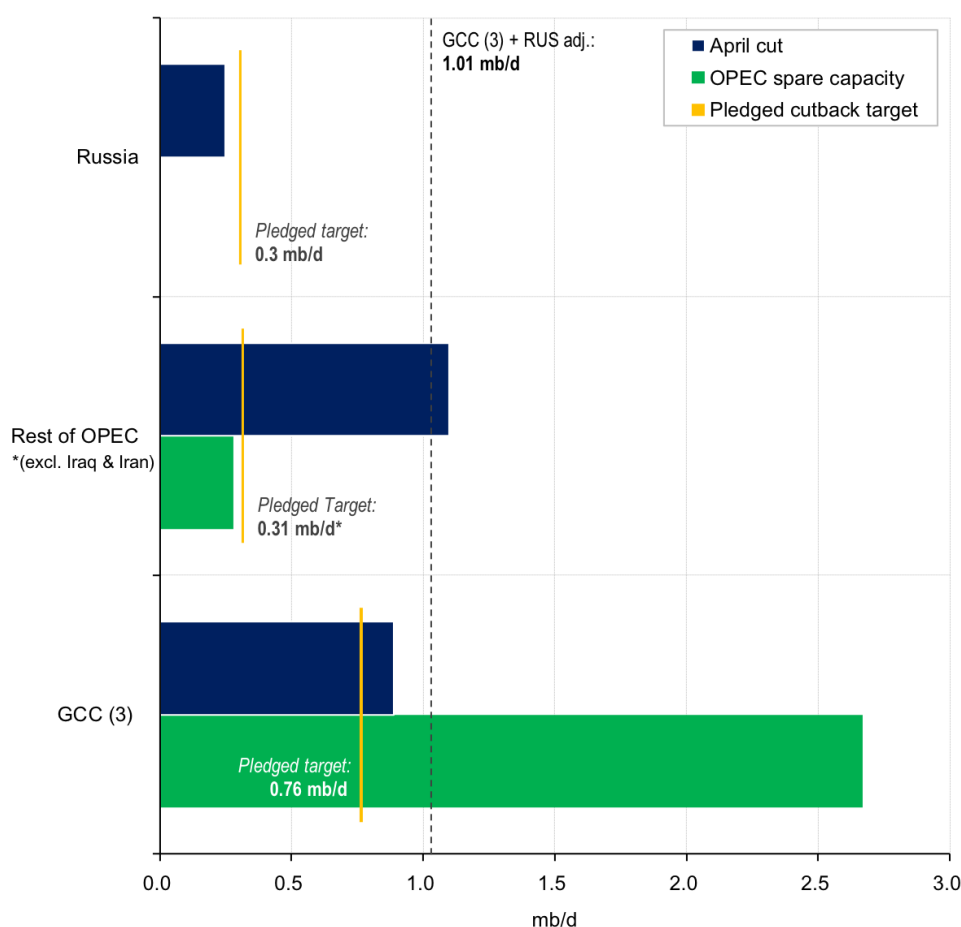
	2018		2019	
	Ann. AVG	Chg. From Base	Ann. AVG	Chg. From Base
Baseline forecast	74.4	n/a	75.1	n/a
Global economic growth risks	70.9	(3.6)	56.3	(18.8)
Geopolitical risks	76.3	1.9	81.9	6.8
US shale growth risks	75.1	0.7	78.9	3.8

Source: Constructed by the authors.

4. OPEC at the crossroads

Ahead of its upcoming Ministerial Meeting on June 22nd, OPEC is facing some hard choices. The question is not only whether or not to increase its oil production, but also by how much to increase production and whether to do it in a gradual manner or not. Answering these questions will be challenging as the few members of the coalition that can actually raise their production must engage in delicate negotiations to convince the many with little or no spare capacity to accept more realistic quotas consistent with their actual capacity and to concede market share. The first group consists of the GCC (3) – Saudi Arabia, Kuwait and the UAE – and Russia, while all the rest members within and outside OPEC fall in the second group. Although Iraq currently retains over 0.3 mb/d of available spare capacity (as of April 2018), almost 0.25 mb/d or 85% of that amount remains bound to the unresolved dispute between the Iraqi government and the KRG.¹⁸ These hard realities mean that if the OPEC+ were to pull back from the deal, they could release up to 1.01 mb/d originating from the GCC (3) and Russia. For our output policy scenario analysis, we postulate that this estimate is the maximum increase of supplies that could result from the upcoming OPEC negotiations, although some higher numbers up to 1.5 mb/d are also being suggested.

Figure 8: OPEC+ output cutbacks vs. available spare capacity in April 2018

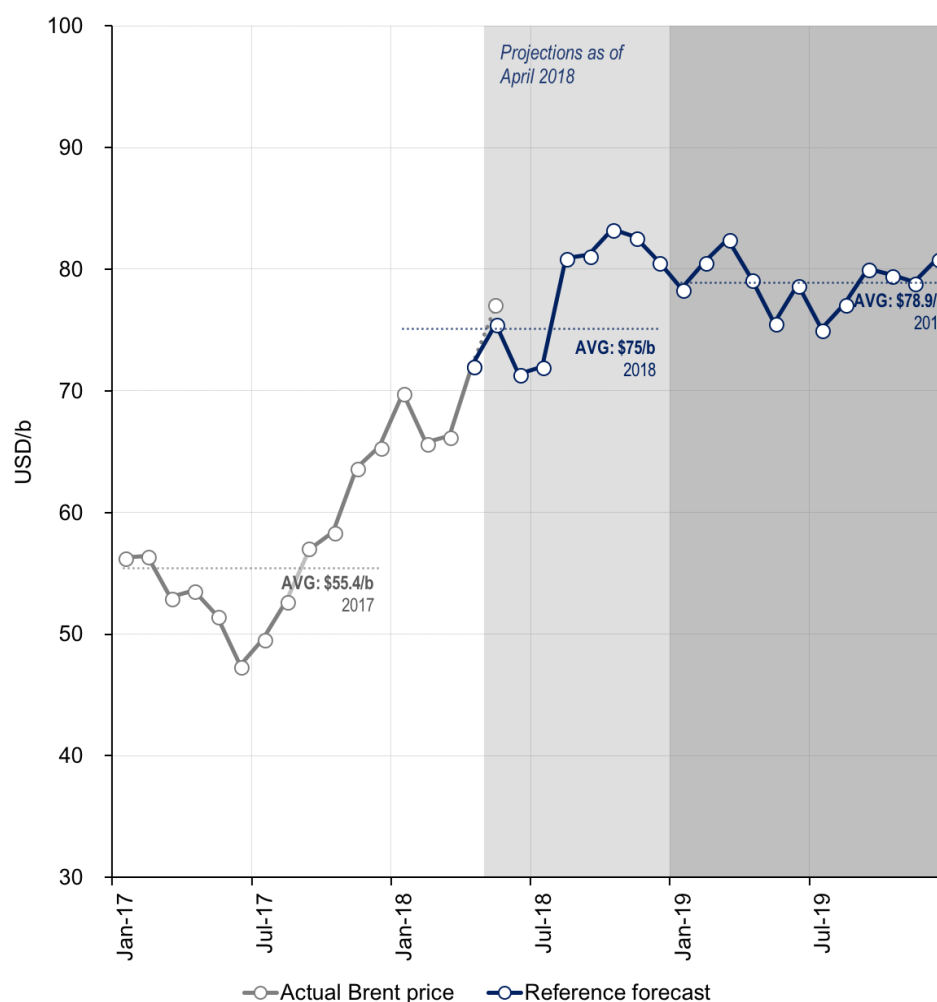


Source: Constructed by the authors based on IEA estimates.

¹⁸ See IEA (2018), 'Oil Market Report', 16 May, p. 17.

As discussed earlier, the task of assessing and evaluating the most prevailing OPEC+ oil output policy scenarios that are likely to drive the discussion during the upcoming OPEC meeting, as well as the oil price risks inherent therein for the remainder of 2018 and 2019, relies on the use of forecasting scenarios constructed from our structural VAR model of the global oil market. To convey however how sensitive changes in oil market and price dynamics are under these alternative output policy options, these forecasting scenarios must be interpreted in conjunction with a reference forecast.

Figure 9: Reference forecast for 2018 and 2019



Assumptions		
Reference scenario	2018	2019
Global economic growth	+3.9%	+3.8%
Geopolitical disruptions	- 0.8 mb/d	- 0.15 mb/d
US shale production growth	+1.4 mb/d yr-end	+ 1.2 mb/d yr-end

Source: Constructed by the authors.

The *reference scenario* essentially depicts to the best of our knowledge how the underlying supply and demand dynamics are expected to unfold through 2018 and 2019, conditional that the OPEC oil output policy remains unchanged for the entire period. This scenario may also be interpreted as OPEC deciding to extend the current agreement of output cutbacks. Such a decision would be in line

with the outcome of its 173rd Ministerial Meeting on November 2017, during which OPEC amended its production adjustments to take effect till December 2018.¹⁹ For the reference scenario we assume that global economic growth remains supportive at 3.9% and 3.8% in 2018 and 2019 respectively; crude oil production from Venezuela falls by another 0.3 mb/d this year, before losing another 0.15 mb/d in 2019; as the US sanctions take effect Iranian output progressively declines by 0.5 mb/d from November 2018 onwards; and US shale production grows by 1.4 mb/d ending-2018, before easing to 1.2 mb/d in 2019.

Figure 9 shows that our reference forecast projects that the oil price gains momentum in the second-half of 2018, averaging at \$80/b, and sustaining that momentum well into 2019. In 2018, the average annual Brent price is expected to increase to \$75/b or 35% higher than 2017, followed by a further annual increase of about \$4/b in 2019 (\$79/b) and ending the year at \$81/b. Compared to the baseline forecast the estimates for 2019 are tilted to the upside reflecting expectations of tighter market conditions in conjunction with heightened geopolitical disruptions originating mainly from Iran. These results suggest that OPEC is now faced with a reality of oil prices hovering around \$80/b in the near-term, which might be good news for the producers in the short-run (e.g. by boosting their revenues), but they could prove damaging in the long-run by prompting a demand response as well as encouraging new supplies entering the market. Moving forward, it is worth noting that our confidence to these results is supported by the fact that upside and downside risks to the reference forecast are broadly balanced. For example, an unexpected downward revision of global growth in 2019 is likely to be offset by higher-than-expected losses stemming from Iranian or Venezuelan oil production, especially since our assumptions regarding the latter are fairly conservative.²⁰

4.1. OPEC+ oil output policy scenarios

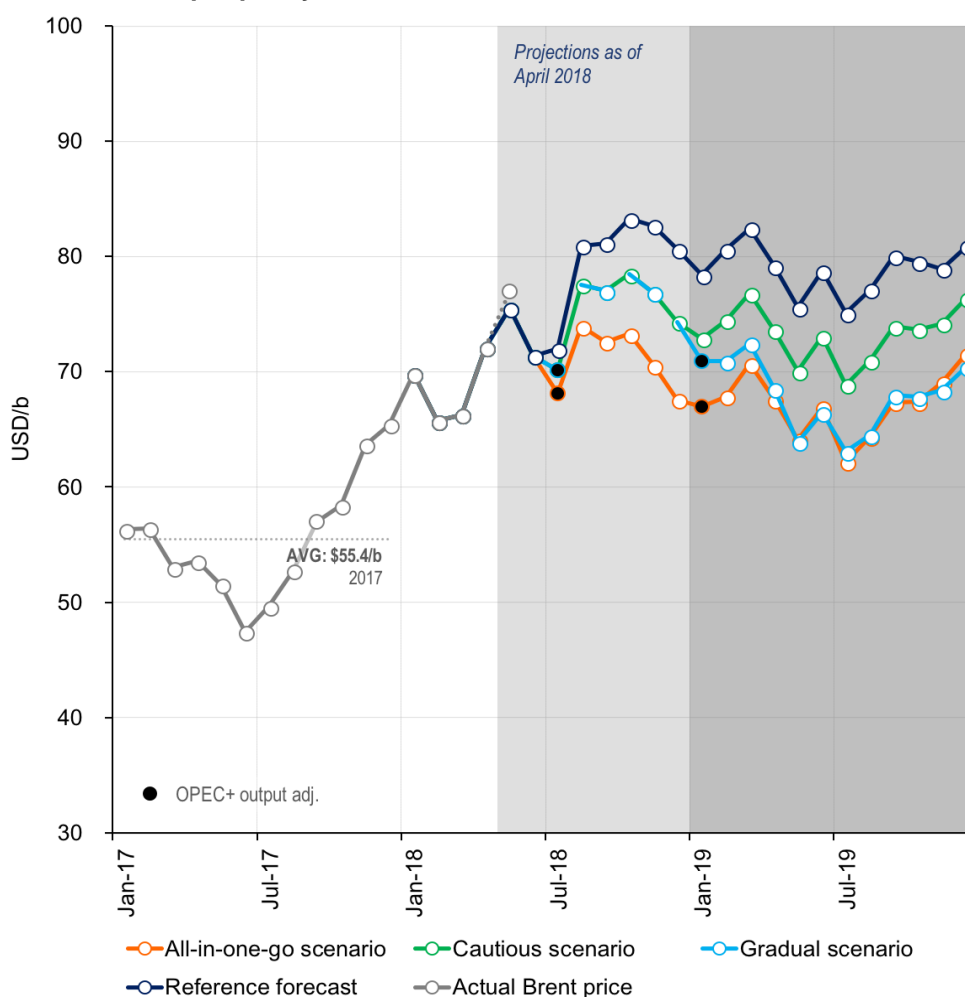
Having considered some of the key factors influencing OPEC's ability to coordinate its oil output policy, the question remaining is how the oil producers who have the capacity to increase their production could decide to unwind the current output cutback deal. We assess three principal scenarios reflecting the prevailing options facing OPEC+ and in particular the GCC (3) and Russia:

- The *all-in-one-go scenario*, according to which the OPEC+ oil producers exit the deal in July 2018, releasing all 1.0 mb/d of crude currently held under the agreement back into the market;
- The *gradual scenario*, according to which the OPEC+ oil producers exit the deal gradually, lifting their production by 0.5 mb/d in July 2018 and releasing the rest in January 2019;
- The *cautious scenario*, according to which the OPEC+ oil producers increase their production by 0.5 mb/d in July 2018, while retaining their flexibility to reassess the prevailing market conditions in November 2018 before committing to any further increases.

¹⁹ OPEC, 'OPEC 173rd Meeting concludes', Press Release, 1 December 2017.

²⁰ In fact, at the time of writing, reports from Venezuela's PDVSA see about 0.6 mb/d of oil production from the Orinoco heavy oil belt under immediate threat due to extended repairs and the ongoing logistical bottlenecks in storage and loading infrastructure. According to the same report, the timetable for completing these repairs could possibly extend for three months adding to the uncertainty on whether the shut-in production will be able to return (see Argus, 'PdV shutting down upgraders to ease export bottleneck', 12 June 2018).

Figure 10: OPEC+ oil output policy scenarios



Assumptions

Output policy options	July 2018	January 2019
All-in-one-go scenario	+1.01 mb/d	n/a
Gradual scenario	+ 0.5 mb/d	+ 0.51 mb/d
Cautious scenario	+0.5 mb/d	n/a

Price outcome (USD/b)

	2018		2019	
	Ann. AVG	Chg. From Ref	Ann. AVG	Chg. From Ref
Reference scenario	75.1	n/a	78.9	n/a
All-in-one-go scenario	70.6	(4.6)	67.2	(11.7)
Gradual scenario	72.9	(2.2)	67.9	(10.9)
Cautious scenario	72.9	(2.2)	73.2	(5.6)

Source: Constructed by the authors.

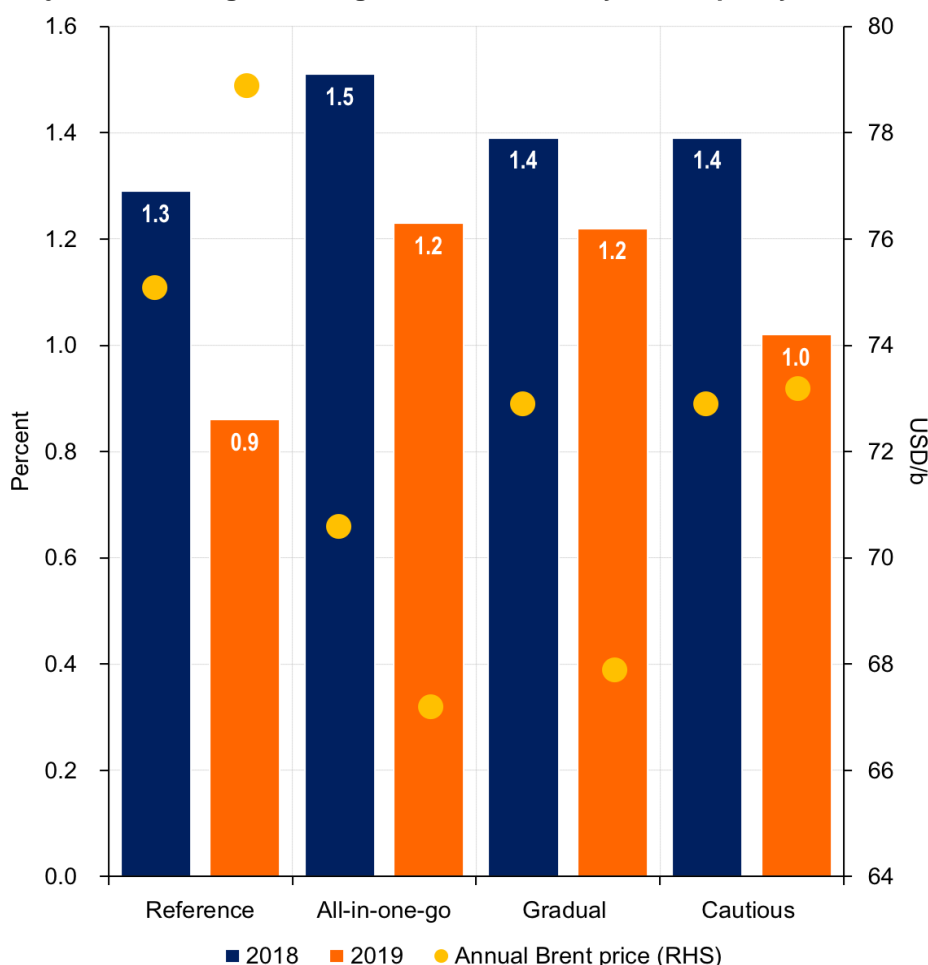
Figure 10 shows the expected evolution of the oil price under the alternative OPEC+ output policy scenarios for the remainder of 2018 and 2019. As can be seen from the figure, if OPEC chooses the *all-in-one-go* option, the oil price will decline by \$10/b within six months and fall below \$70/b by the end of 2018. In 2019, the oil price is expected to oscillate within the \$60/b range for most of the year, before recovering again back to \$70/b as lower spare capacity starts to put upward pressure on the oil price. The annual average price in 2018 holds just above \$70/b and retreats to \$67/b in 2019. That is \$12/b lower than the reference annual average price in the same period (\$79/b). In the case that OPEC chooses to increase its production by the same amount but to do it *gradually*, the impact on prices in 2018 will be halved relative to the all-in-one-go option, but as we progress in 2019 the two scenarios converge as expected. The gains observed in the gradual scenario relative to the all-in-one-go option in 2018 are close to \$2.5/b on average, but on a monthly basis they become more substantial as we progress through the year (up to \$7/b year-ending). Lastly, a *cautious* approach will help the producers to keep a solid floor on the oil price at \$70/b for both 2018 and 2019, while eliminating all of the upside potential in the latter period compared to the reference forecast. This implies that while there is strong evidence suggesting that an output increase to ease balances in 2018 might be in order, committing to any further adjustment actions for 2019 at this stage could prove premature.

Focusing on the *all-in-one-go* and *cautious* scenarios (both involve a one-off adjustment in July 2018) we may observe that on the one hand an output increase that lies on the lower end of the range – from 0.5 mb/d to 1.0 mb/d – might not be enough to place a ceiling at \$80/b in 2018. On the other hand, moving towards the higher end of the range aggravates the sensitivity of the 2019 outlook to the downside. This evidence suggests that there is a fine balance between how much the size of the output increase should be, for OPEC to safeguard a solid price range whose upper and lower boundaries could be sustained both in 2018 and 2019.

4.2. Assessing the expected price responsiveness of global oil demand

Figure 11 charts the risks inherent in the projected growth of global oil demand under the alternative OPEC+ oil output policy options. It is immediately obvious from the figure that regardless of the outcome of the upcoming OPEC meeting, the growth of global oil demand in 2019 is set to ease to about 0.2% to 0.4% lower from the year before. Having said that, the potential of an OPEC+ output increase could counter that drop by as much as 0.3 percentage points. In this case, the size of the output adjustment matters and particular in the long run. For example, our estimates show that any increase below the 0.5 mb/d mark will be difficult to boost the annual global demand in 2019 by more than 1% on average. For 2018, however, regardless of the size of the output increase, the demand response is constrained to a mere 0.1%. The latter further strengthens the case of a *cautious* approach, conditional that OPEC reassesses prevailing market conditions later in the year and retains its flexibility to lift production further if it is deemed necessary. Whether OPEC decides to implement an output increase gradually or not matters little to the future evolution of global oil demand, as the long run impact on balances essentially remains the same. Overall, for OPEC, the future demand growth (especially in 2019) hinges heavily on the outcome of its upcoming meeting, just as the success of its oil output policy hinges heavily on the prospects of global demand remaining healthy.

Figure 11: Projected annual growth of global oil demand by OPEC+ policy scenario



Source: Constructed by the authors.

5. Conclusions

OPEC members, and particularly its dominant player Saudi Arabia, are facing some hard choices. The decision for members that have the capacity to increase production is not only whether to increase or not to increase output, but also by how much to increase production and whether to do it in a gradual manner. Another key decision that the key members of the OPEC+ coalition (mainly Saudi Arabia and its Gulf allies and Russia) have to face is whether they would increase output within the current framework of cooperation. Regarding the first decision, our results call for a cautious approach in which OPEC increases output gradually and reassess their options in November as this will help keep a solid floor on the oil price, which remains a key objective for all producers. Increasing output by around 1 million b/d in the current context could result in a sharp fall in the oil price and affect negatively market sentiment. Also, the impact of such a move may be short-lived as increasing production reduces the level of spare capacity in the system keeping the upward pressure on the oil price, especially given that stocks have already fallen. But it is important to note that a cautious approach causes a slower demand growth in 2019 compared to the other scenarios.

But how OPEC decides to implement the output increase also matters. If the decision is to increase output, then it is in the interest of OPEC+ to reach a collective decision. However, in the current context, this may prove difficult, as producers who don't have the capacity to increase production and those who are subject to US sanctions will resist such a recommendation. If it is not possible to reach

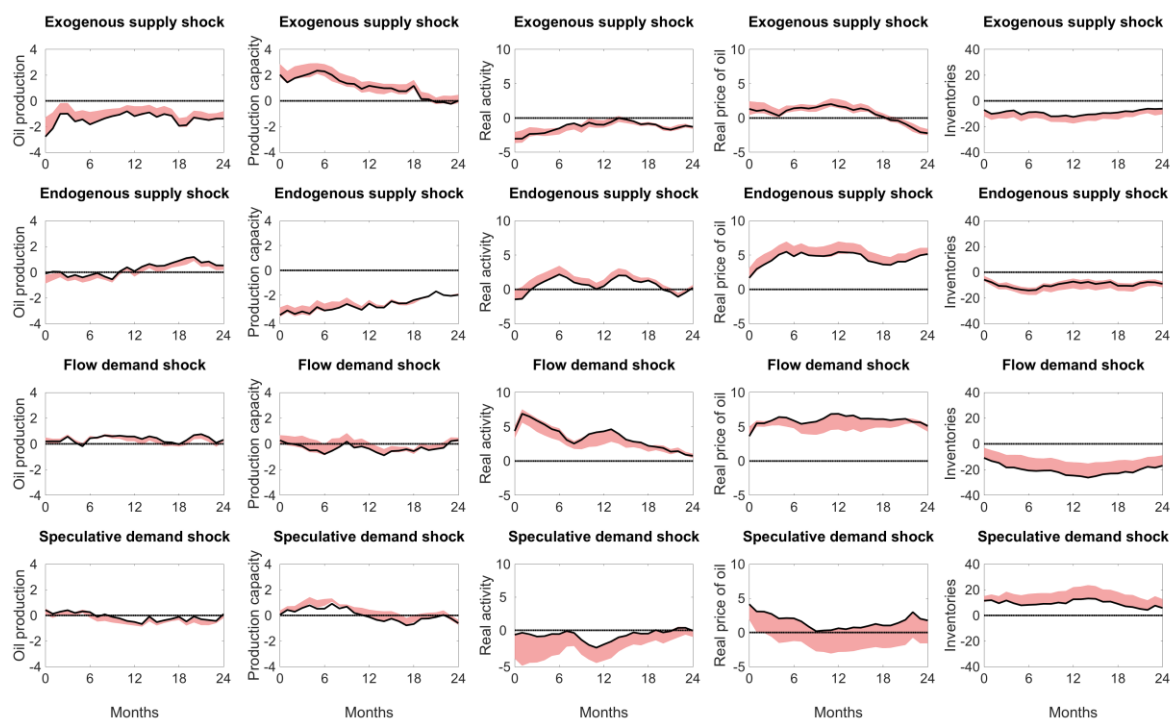
a collective agreement on increasing output, the producers who have the capacity, and who could really influence market outcome are then faced with three options:

- to extend the current agreement of output cuts in order to maintain the cohesiveness of the coalition;
- to exit the deal altogether and announce that they would increase their output regardless of the actions of other producers, bringing to an end the framework of cooperation;
- not to dismantle the OPEC+ deal in the next meeting and to postpone the difficult negotiations until November, while still going ahead and increasing output individually.

While the last two options are not very different in terms of their impact on market balances (as the impact on balances will depend on the size of the increase and whether this increase is gradual or not), the choice of exit will affect sentiment and prices at least in the short-term. This shows the balancing role that OPEC has to play and the importance the key players should attach to retaining their flexibility. Sending a strong and clear signal may not always be the best option for OPEC. Some constructive ambiguity where producers with capacity to increase production show strong willingness to act on the upside without committing to a specific number or timing may be the preferred option in this current context.

Appendix A

Figure A1: Responses of the global oil market VAR model variables to the structural shocks

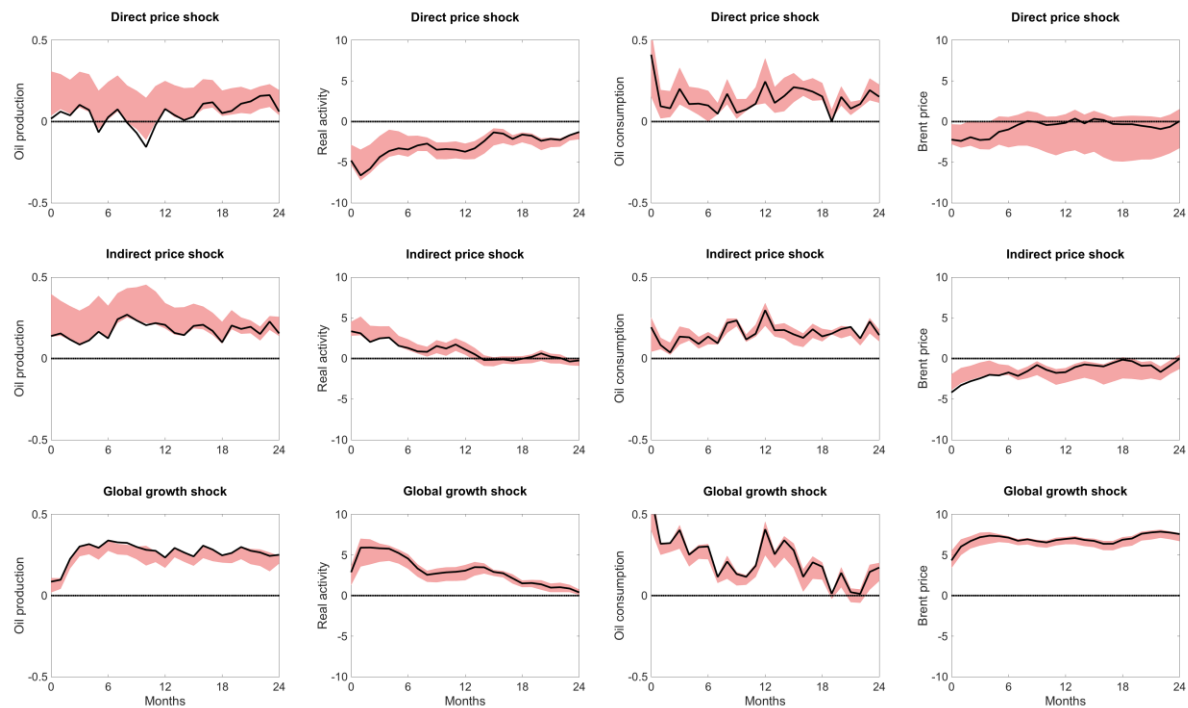


Notes: The red area indicates the corresponding pointwise 68% posterior error bands. All responses but the inventory responses are expressed in percentages. The inventory responses are in million barrels. All structural shocks have been normalised such that they imply an increase in the real price of oil.

Source: Constructed by the authors.

Appendix B

Figure B1: Responses of the global oil demand VAR model variables to the structural shocks



Notes: The red area indicates the corresponding pointwise 68% posterior error bands. All responses are expressed in percentages. All structural shocks have been normalised such that they imply an increase in global oil consumption.

Source: Constructed by the authors.