Crude Oil – The Next 5 Years

LONG TERM OUTLOOK FOR CRUDE OIL IS INCREASINGLY BULLISH

OPEC’s 2016 shift back to its former strategy has led to a sharp decline in global inventories and a rally in spot prices. It has also reintroduced the problem that OPEC spare capacity deters global oil companies from investing in future production. This problem is now exacerbated by increased hedging activity from shale oil producers. As a result, non-OPEC output ex-shale will start to decline in about 2-3 years, just when shale oil production begins to struggle offsetting ever increasing decline rates. We believe the next big move in oil will be in longer-dated prices, which will need to go higher in order to secure future supply.

OPEC once again changed strategy...

In 2016 we published a note with the title “OPEC at the crossroads” (June 06, 2016). In that note we described the difficult choice OPEC had to make: Should it continue to let the market play out as it did for the past couple of years, hoping that low prices will push out or at least curtail the shale oil producers over the long run; or, should it return to its former strategy and try to balance the market. While OPEC seemed initially reluctant to do the latter, in late 2016, the OPEC members changed their mind and agreed to curtail output. The new stated strategy sounded much like the old: OPEC would curtail production until global inventories normalized.
...which lead to a dramatic decline in inventories...

As we have explained before, OPEC cannot influence the price of oil directly. It can only manage inventories. What do we mean by that? Longer-dated oil prices are set by the marginal cost of future supply, or in other words, what long-term price is needed in order secure future supply? Spot prices can fluctuate widely around this longer dated price, depending on how much inventory there is. Hence, by letting inventories decline, OPEC can push the curve into backwardation, which is exactly what happened since the production cuts. Importantly, by the time OPEC decided to curtail output, the market was already balanced and inventories were drawing in line with seasonal patterns. The production cut pushed the market immediately into a deficit. As a result, global inventories have been drawing over 300 million barrels more than normal since mid-2016 and days of supply cover is back to normal levels.

Exhibit 1: Global inventories have declined sharply and are back to normal levels...

Days of supply cover (global stocks / 1-month forward demand)

This led to a USD30/bbl rally in crude oil spot prices. In order to fully understand this...

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1 Backwardation describes a market where spot and near-dated futures trade above longer-dated futures. The term-structure is downward sloping. An upward sloping term-structure is called Contango. Sometimes, part of the curve trades in Contango and part of it in Backwardation. In an environment of low inventories, the market typically trades in backwardation and vice versa.
price move, it is important to highlight the strong inverse relationship between inventories and time-spreads. A commodity price curve tends to trade in contango when inventories are high and in backwardation when inventories are low (see Exhibit 2). The reason is that in an environment of low inventories, consumers of a commodity are willing to pay a premium for immediate delivery. For example, an airline is willing to pay a premium for jet fuel delivered today rather than in six months if jet fuel inventories are low. If the airline runs out of jet fuel, the planes will be grounded, which will be much costlier than paying a premium for prompt delivery of fuel. In contrast, when inventories are very high, consumers of a commodity are not worried that they could run out of this input good. Because it costs money to store commodities (storage cost, insurance costs) and there is a time-value attached to money, consumers of a commodity prefer to get delivery only when they really need it. As a result, spot prices will trade below forward prices in such an environment.

The sharp decline in oil inventories over the past two years lead to a massive shift in time-spreads. In early 2016, the Brent curve was in steep contango. Prompt month prices traded USD15 below the 5-year forward. As of today, it is trading USD15/bbl above the 5-year forward (see Exhibit 3). Longer dated price remained practically unchanged for the past two years. Hence, the entire move in the spot price was due to the shift in the curve, which was driven by the inventory decline. Importantly, the change in the spot prices does not imply that the market somehow changed its view on how much it costs to produce oil. Longer-dated prices, which are set by the marginal cost of future supply, are still below USD60/bbl. This means that the market still

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2 Contango describes a commodity price curve where spot prices and near-dated futures trade below longer-dated futures. The opposite is called backwardation, where spot prices and near-dated futures trade above longer-dated future. Exhibit 4 shows a contango term structure (black curve) and a backwarded term structure (golden curve).
believes that USD55-60/bbl gives enough incentive to producers to make the necessary investments to meet future demand. The spot price rally thus was simply due to the decline in inventories.

**BALANCING THE MARKET – THEN AND NOW**

OPEC’s decision to return to a balancing strategy has vast implications for inventories, prices, volatility and term-structure. To get a better understanding of this, we need to look at how OPEC and non-OPEC producers have operated historically and how this has changed with shale oil.

In the past, OPEC held large amounts of spare capacity which it was able bring online in a matter of months, sometimes just weeks, when a shortfall occurred, for example during the first gulf war. In contrast, non-OPEC producers have almost always produced at maximum capacity. Global major oil companies have no incentive to keep any capacity idle, unless operating costs exceed the price of oil (which happened for example in 2008-2009 and again in 2014-2015). That means that over the short to medium term (<5y), non-OPEC production follows a set path and is almost completely price-inelastic.\(^3\)

The advent of shale oil changed that somewhat. Shale oil producers still produce at capacity, but there is much more price-elasticity. But while shale oil producers can ramp up production much faster than conventional non-OPEC producers, it would still take years to compensate for large shortfalls. There is also a considerable time-lag between changes in price and changes in production. For example, by the time US shale output finally peaked in April 2015, spot prices had been falling for almost a year. And by the time production bottomed in September 2016, prices had been recovering for almost a year as well.

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\(^3\) As long as prices remain above operating costs. There is no price-elasticity to the upside. Production reacts only to extreme cases of price declines.
Thus, in our previous note on the topic, we concluded that if OPEC would continue to let the market play out rather than trying to balance the market, it would likely require permanently high inventories as a buffer for unforeseen outages as there would no longer be any spare capacity. Permanently high inventories would imply that the crude oil curve would be in Contagno all the time. We also argued that if OPEC stops balancing the market, this could lead to more spot price volatility, the reason being that in a world where OPEC no longer holds any spare capacity, supply shortages would lead to sharp inventory drawdowns and the market would have to be balanced primarily via demand destruction over the short run. This would imply that changes to term-structure and prices would be much more extreme.

However, as we have highlighted above, after letting market forces play out for a while, OPEC decided in 2016 to return to its former strategy and tried to push down inventories by curtailing supply. Consequently, OPEC is now again holding some capacity idle, albeit a lot less than in the past. While returning to its former strategy might mean less spot price volatility going forward, it reintroduces an old problem. The last time OPEC tried to balance the market in the 1980s, it was subsequently sitting on a massive amount of spare capacity for over 15 years (see Exhibit 5). While this was costly for OPEC members themselves, it also led to a period of severe underinvestment by non-OPEC producers. Facing seemingly unlimited idle capacity, longer-dated oil

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**Exhibit 4: Shale oil producers are price elastic, but there is a long lag between prices and output**

Thousand b/d (LHS), USD/bbl (RHS)

*Source: Bloomberg, EIA, Goldmoney Research*
prices were stuck below USD20/bbl for over 10 years\(^4\). That was a powerful price signal to the global oil majors not to invest in any new capacity. As a result, when OPEC capacity eventually began to dry up towards the end of the 1990s, the oil market realized too late that significant investments would be needed to meet future demand.

Exhibit 5: The massive overhang in OPEC spare capacity in the 1990s prevented any meaningful investment in the sector by non-OPEC producers

Source: Goldmoney Research, EIA, Bloomberg, BP

By the early 2000s, longer-dated oil prices finally began to move higher, which gave producers the economic incentive to invest. Initially, spot prices rose more than longer-dated prices, indicating that the market believed that the rise in longer-dated prices gave enough incentive to the global majors to bring on new supply over the medium term, while higher spot prices were needed to ensure that demand would not grow too fast in the meantime. Hence, by mid-2004 when the world faced the outage of significant capacity from Venezuela, 5-year forward Brent prices had risen 70% from their 1990s levels while spot prices were up 130%.

But it turned out that all the low hanging fruit had already been harvested. New projects had substantially higher costs attached to them than in the past and lead times were much longer. Consequently, longer dated prices moved relentlessly higher from

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\(^4\) On average, both spot prices and 5-year forward prices traded at around USD17/bbl from 1992-2000. By the end of 1998 Brent crude oil prices hit rock-bottom. Spot prices traded at USD10/bbl and 5-year forward prices were at USD15/bbl.
2004 to 2008. It was not until the global financial crisis brought global economic growth to a standstill which resulted in declining oil demand. By that time, 5-year forward oil prices had risen almost seven-fold.\

**HOW MUCH SPARE CAPACITY DOES OPEC CURRENTLY HAVE?**

On paper, OPEC currently sits on about 2.8 million b/d of spare capacity. But how much OPEC spare capacity there really is depends on what is included. Libya for example currently produces 0.5 million b/d below its theoretical capacity, the reason being the ongoing conflict between different factions within the country. While there is a chance that full production might eventually resume, this cannot be counted as spare capacity as it cannot be turned on at will to offset an unexpected shortfall. Then there is another 0.5 million b/d of capacity in the neutral zone between Saudi Arabia and Kuwait that has been idle since 2015. Officially, Saudi Arabia, which manages production at these fields, shut in production due to environmental reasons, but the spat between the two countries is more likely political in nature. The two countries agreed in 2017 to bring back production, but since then those efforts have hit setbacks and production is still at zero. Arguably there is a greater chance that this capacity would be brought back in case of a global shortfall, but for now it is offline. On top of that, output from Venezuela has been in steep decline, down 0.4mb/d year-over-year on average over the past 6 months (and accelerating). Because of this sharp fall in Venezuelan output, OPEC production has dropped to 31.8 million b/d, 0.7mb/d below the current production ceiling. While this doesn’t affect spare capacity directly - because Venezuela never had any spare capacity - other OPEC members will eventually have to step in and replace those barrels. On net, OPEC spare capacity is realistically closer to 1.5mb/d (see Exhibit 6).

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5 Importantly, as we have shown before, this sharp rise in longer-dated energy prices was the main driver for the gold price rally over that time-period

6 There is an equally high risk that Libyan production will collapse again should conflicts flare up.
WILL WE SEE A REPLICATION OF THE 1990s?

Arguably, OPEC’s spare capacity of 1.5-2.8 million b/d is hardly comparable to 10 million b/d in the early 1990s. So that alone would most likely not deter global oil majors from investing in future capacity. But there are other forces at hand that keep back-end oil prices depressed, which once again inhibits global oil majors from investing in new long-term capacity;

1. Unlike the large global oil majors, shale oil producers tend to hedge large parts of their forward production, often to secure loans from banks. This has been a permanent source of forward selling. Shale oil producers have reacted swiftly to the recent rise in spot prices. This means also that there is more forward production to be hedged.

2. Shale oil production is not cheap, but it is significantly cheaper than the highest-cost projects that were considered shortly before the global financial crisis. More importantly, costs per barrel produced have been in a declining trend over the past years. Conventional oil producers are afraid that expensive investments with lead times of 10 years and more, could turn out to be outpriced by shale oil if the technology keeps progressing at the same speed.
3. Peak oil supply fears have been replaced with peak oil demand concerns. The outlook from a huge shift in the transportation sector away from oil makes it difficult for producers to sanction a project with a 30-year life span. These projects cost billions of dollars, some even tens of billions, and could potentially become worthless. Instead, even the major oil producers push increasingly into the shale space.

Hence, despite the fact that spot prices have rallied over 100% since the bottom, longer-dated prices remain stuck in a narrow USD50-60/bbl price range. As a result, the pipeline for new conventional non-OPEC projects is drying up rather quickly. According to Wood Mackenzie (WoodMac), a well renowned industry consultant, global upstream capex has peaked in 2014 at around USD700bn and has declined to just USD400bn last year. WoodMac estimates that close to USD1 trillion of upstream CAPEX has been axed for the 2015-2020 period. This will only be felt in a few years from now. Every new project that came only over the past few years and all projects coming online for the next few years were sanctioned a long time ago, some even prior to the financial crisis. Yet despite the massive CAPEX spending prior to 2015, the new projects coming online hardly make a dent. In 2017 we saw only 0.2mb/d of non-OPEC production growth ex-shale (see Exhibit 7). And there is not any improvement in sight. 2018 and 2019 will look similar and beyond that, non-OPEC ex-shale output will outright decline.

Exhibit 7: After a wave of project ramp-ups in 2017-2019, non-OPEC ex shale production will start to outright decline by 2021
Thousand b/d (LHS), USD/bbl (RHS)

Source: Goldmoney Research. EIA, Bloomberg, BP
WoodMac has recently reported that CAPEX spending seems to have bottomed and we will see a slight increase in spending next year. However, not only is part of that rise due to cost inflation, it also goes entirely towards shale oil. WoodMac predicts that conventional outlay will fall by 7% until 2020.

On net, we expect non-OPEC supply to grow by 0.2mb/d in this year and next, after that, growth will slow down to less than 0.1mb/d by 2020. From 2021 onwards, non-OPEC supply will begin to outright decline (see Exhibit 8). Importantly, the chances for an upside surprise to this forecast are extremely slim regardless of how prices develop over the next five years, because this was all set in motion many years ago. Practically none of the large projects that are sanctioned now will come online before 2022. But if no new projects are sanctioned today, then non-OPEC ex-shale production risks falling off a cliff in five years from now.

**WITH SHALE OIL, DOES IT REALLY MATTER THAT THERE IS NO INVESTMENT IN LARGE CONVENTIONAL PROJECTS?**

In 2004, oil majors faced the outlook that the entire future production growth had to be met by conventional oil production. Today there is shale oil and we agree that US shale oil output will continue to grow at a rapid pace. However, with non-OPEC conventional production declining and OPEC being cautious with investments, the burden to secure supply growth over the next five if not ten years lies almost entirely on US shale oil producers.

The fact is, shale producers have shown an astonishing ability to grow production and an even more astonishing resilience to low prices. At its peak, US oil output grew by 1.5 million b/d, almost all from shale producers. This rapid production growth eventually led to a price collapse in 2014 from USD110/bbl to as low as USD30/bbl. As a result, US production growth slowed to 1mb/d in 2015 and declined by 0.4mb/d in 2016. But with prices now at over USD60/bbl in 2018, US production is again growing at around 1.2 mb/d year-over-year. While production growth has slightly leveled-off over the past months, we believe production will accelerate to around 1.5mb/d for the remainder of the year.
Can US shale oil sustainably grow at the peak rate of 1.5 million b/d? One of the arguments we often hear is that shale gas producers have clearly shown that the technology allows them to scale up production at will. However, shale oil and shale gas differ in key aspects:

First, **shale oil production will plateau much faster than shale gas**: Shale gas and shale oil production are both characterized by very high decline rates. Consequently, the larger the base production there is, the more incremental supply is needed just to offset the natural declines. While this is true for both shale gas and shale oil, shale oil has much higher decline rates. In a recent report, Goldman Sachs found that shale oil wells show decline rates of up to 70% in year one. The analysts compared base production declines in the Eagle Ford (mostly oil) and the Marcellus shale (mostly gas) and found that oil base production in the Eagle Ford had declined 70% since 2015 compared to just 40% for gas in the Marcellus. Moreover, while shale gas drillers have managed to shift their production profile over the years towards lower initial production and slower decline rates, in oil we have seen the exact opposite: Average initial well production went from under 300 b/d in 2010 to 700b/d by 2017 but production curves all converge by year 3, implying much steeper decline rates for the most recent wells.
By the end of 2017, US shale oil output was already at 5 million b/d and at this level, the annual decline in base production exceeds 1 million b/d. This increases to 1.5 million b/d in 2018. We estimate that with a continued production growth of 1.5 million b/d per annum, decline rates will reach 4 million b/d by 2022. That means, in order to maintain production growth of 1.5 million b/d in 2022, drillers would have to bring 5.5 million b/d of new supply online that year, more than the entire current output.

Second, the collapse in US natgas prices was mainly due to the relatively small size of the market rather than relentless production growth: Arguably, the emergence of shale gas had a devastating and permanent impact on US gas prices. In 2008, Henry Hub prices were as high as USD15/MMbtu. Over the past couple years, US natgas prices have been trading in the USD2-4/MMbtu range, despite record cold winters. This may give the impression that US natgas production, driven by shale gas, has been growing relentlessly over the past 10 years. However, US dry gas production grew on average only 3.4% p.a. since 2009 and it never exceeded 7.5% in a single year. Unlike the US oil market, the US natgas market is a relatively insulated national market with very low imports and exports. Because of that, this production growth was enough to permanently depress US gas prices. In contrast, the US oil market is part of a global market, with massive import and export flows. US crude production accounts for only about 11% of global supply and shale oil for about 6%. Hence, if US oil producers are supposed to deliver 100% of global demand growth and offset declines elsewhere, this is a much bigger task. To put that into perspective, US total crude oil production would have to grow by over 10% p.a. on average for the next five years meaning that shale oil production would have to grow by close to 20% per annum. Taking decline rates into account, production growth from new wells has to be close to 60% p.a.

Thus, a sustained production growth rate of 1.5 million b/d is very unlikely in our view.
The only time US production ever grew that fast was for a very short period in 2015. Importantly, US production was already bumping into physical constraints back then; Despite billions of dollars in infrastructure investments, pipelines, tank capacity as well as fracking sand capacity could barely keep up with regional crude oil production growth, which repeatedly led to sharply discounted local crude oil prices and massive cost inflation.

On top of all this, there is a growing mismatch in crude oil quality and refinery demand. Prior to the shale oil boom, US refineries invested tens of billions of dollars to upgrade their facilities to run heavy sour crude. Global light sweet crude oil production was declining and most new projects in the pipeline would deliver heavy crude oil. All new crude coming from Canada – which was supposed to be the life saver of the US refining industry - was heavy crude oil from oil sands. However, shale oil is typically extremely light. In fact, a large share of production is not even crude oil but NGLs (Natural Gas Liquids) which are processed in petrochemical plants rather than refineries. Despite the shale oil boom, there are no major refinery expansions in the US in the pipeline which would increase light sweet demand, let alone a new refinery. In fact, the only way US production was able to continue to grow at all was to lift the 40-year old ban on crude exports, which happened in 2015. But the problem simply shifted elsewhere. Due to the law, there was very little export capacity when the ban was lifted. Export capacity is now expanding, but there is a limit to how fast that can happen. And on top of that, US producers will compete with Canadian producers, which will also increasingly rely on US ports to export their crude. In addition, practically all new refineries built outside the US are also designed to run heavy sour crude. For now, there is enough global capacity for light sweet crude oil to deal with growing US exports, but if more than 100% of global production growth is going to be light sweet crude and NGLs, at some point the issue can no longer be exported away.

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7 Even though for historical reasons NGLs are counted as crude oil in crude oil balances (because petrochemical plants would switch between petroleum products and NGLs as feedstock), NGLs can’t be turned into gasoline and diesel at this point, only into plastics. While it’s technically possible to turn almost any hydrocarbon source into transportation fuel (e.g. gas to liquids plants), it is not just technically challenging, but all attempts so far have turned out to be extremely costly. To our knowledge, there is no commercial size project in the making that is designed to use NGLs as a feedstock for the production of transportation fuels.
Overall there are a number of limiting factors which will pose great challenges for US crude oil production growth over the next couple years. We do not think that US production can grow at 1.5 million b/d or even higher beyond 2019. However, we think that is what is currently priced into longer-dated prices.

**BRINGING IT ALL TOGETHER: THE NEXT 12-18 MONTHS**

After three years of extremely high inventories, global petroleum stocks are now back to normal levels. US stocks have declined more than others, with Cushing inventories falling below 2014 levels early this year. Given the OPEC curtailment this was something we had expected although not at such a rapid rate. The reason is that global decline rates have also accelerated. Non-OPEC ex-shale producers have clearly reacted to the sharp fall in prices, and this reaction came somewhat with a lag. In 2017, 1.4 million b/d from new non-OPEC ex-shale projects came online, but output grew only 100kb/d, implying a base decline rate of close to 3% for the year. More real-term data suggests that decline rates have further accelerated in early 2018. Arguably, prices have recovered quite a bit from last year, and there is reason to believe that the downward trend in decline rates will partially reverse. This will allow for non-OPEC ex-shale production to grow by 0.2mb/d in 2018 and 2019. **US shale production** grew 0.7mb/d in 2017 and we expect this to increase to 1.5mb/d in 2018 and 2019. On net,
we expect total non-OPEC supply to grow by 1.7 million b/d over the next 2 years.

This supply growth faces demand growth of 1.5 million b/d, the same as last year\(^8\). However, in 2017 the global oil balance was in deficit by 0.5 million b/d. Commercial inventories are now at the low end of the range, meaning that stocks can’t decline much further before refineries run into trouble. Consequently, in order to bring the market back to balance, global supply has to grow by 2 million b/d in 2018. Hence, OPEC will have to increase its production by 0.3mb/d this year, which means rather than building more spare capacity, OPEC will have to draw on some of its spare capacity (see Table 1). We think the market is currently unaware of this. In our view, the prevailing market view is that OPEC needs to keep at least its current production curtailments in place for the 2018-2019 period to avoid a renewed inventory build.

The problem is exacerbated in our view by the fact that some OPEC producers are in outright decline. Production from Venezuela for example has been declining by 0.4mb/d year-over-year over the past six months, and the declines are accelerating and are currently closer to 0.6mb/d. This means that core OPEC producers (Saudi Arabia, Kuwait, Qatar, UEA) will have to bring back a substantial amount of spare capacity just to offset Venezuela.

On top of that is the uncertain outlook for Iranian exports. President Trump announced on Tuesday 8 May 2018 that the US will withdraw from the 2015 nuclear deal, which he described as “defective at its core”. Sanctions that were in place prior to the deal will be gradually reinstated. While ultimately sanctions on entities importing crude oil would only come into effect November 2, 2018, the Treasury Department has issued a notice advising those entities seeking for a waiver (common practice under the old sanctions regime) should being reducing imports now in order to show good faith. Hence, Iranian exports are likely to decline instantaneously. While President Trump left the door open for a new deal, this decline in Iranian exports (and thus production) will impact OPEC production for the coming months. However, the last time the US and its allies imposed sanctions on Iranian exports, it was immediately followed by a coordinated release of oil from strategic petroleum reserves (SPR) in which the US contributed the lions share.

However, historically, the global SPR release to offset the production loss caused by the Iranian sanctions was much smaller than what was lost in supply. Iranian production was impacted by 1 million b/d from mid-2012 until early 2016, resulting in a total loss of over 1 billion barrels of Iranian production. In contrast, only 60 million barrels of oil

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\(^8\) While slightly higher global economic growth would lead to stronger demand, this impact is offset by continued headwinds from higher prices.
from SPR was approved to be sold into the market and only about half was ultimately drawn on. Arguably back then, the world didn’t need more oil form SPR. Core OPEC members ramped up production almost instantly, offsetting the loss. Hence it’s unclear how much more crude would have been released if it were necessary. Importantly, it would be a much bigger issue today if the world had to rely on OPEC spare capacity to offset a loss in Iranian exports of the same magnitude. However, we believe that the US would likely be prepared to release more crude from SPR this time around. Rapidly growing US production and the ensuing expansion of domestic commercial inventories have drastically reduced the need for SPR over the past couple years, which led to a strategic decision to sell some of the government-held inventories under the Obama administration. The Trump administration has continued this strategy and there are already more barrels scheduled for release later this year. Moreover, in 2017, the Trump administration proposed to sell 270 million barrels over a period of 10 years, completely unrelated to the Iranian situation. Hence the current administration is clearly not opposed to releasing SPR if necessary. In our view, any near-term loss in Iranian crude production as refiners reduce imports globally in order to secure waivers can and most likely will be offset with US SPR release. However, that requires that a new deal is struck relatively soon. A return to full sanctions that reduces exports by 1 million b/d could not be met by SPR release and would result in a draw on OPEC’s spare capacity, which is a lot lower than it was in 2012.

Hence, from a fundamental perspective, we expect inventories will remain at these low levels throughout 2018 and 2019. This implies that the market will remain in backwardation. We also think there is very little downside for longer-dated prices from here. In fact, we think the next move in oil will be that longer-dated prices will start to move higher, as we explain that in more detail below. With a floor at the back end of the curve and strong time-spreads, we therefore don’t think spot prices (Brent) have much downside from here and the risk is skewed to the upside.

**Exhibit 12: OPEC will have to bring back spare capacity already in 2018**

Thousand barrels

**Exhibit 13: Time-spreads as predicted by global inventories and spec positioning**

%, 1-60 month, Brent

*Source: Goldmoney Research*  
*Source: Bloomberg, Goldmoney Research*
The **main risk to this outlook is economic growth.** Arguably, US growth data has been strong overall over the past few months. But globally we see cracks, and even in the US, the latest Chicago PMI data has looked less than stellar. We currently expect global economic growth of 4.1% in 2018, up from 3.8% in 2017. Due to the headwinds from rising oil prices, this translates into demand growth of only 1.5 million b/d, the same as last year. A change of 1% in global economic growth translates roughly into 850 thousand b/d of demand growth. Hence, a modest slowdown in economic growth would just push back the clock on when OPEC spare capacity had to come back online. In our view, it would take a more severe global economic shock, similar to the one in 2008, to change this outlook significantly.

The **other risk to price comes from positioning.** Combined Brent and WTI net spec length is close to record highs. In Brent it is just a tad below the record from January. There are several reasons for this. First, trend-following CTA strategies have bought into a rallying market as oil spot prices have been going up for 2 straight years and fundamentals remain extremely strong. Second, future positions are a zero-sum game. Any short position of a producer needs a long equivalent by a non-producer. With US production rapidly accelerating due to higher prices, producers need to sell more production forward and just because producers need to sell more doesn’t mean consumers want to buy more, which is where speculators come in. However, this would mostly impact WTI and we see an even higher net spec length in Brent. Third, the threat of renewed sanctions on Iranian exports have clearly helped to push speculative positions to these levels. Interestingly, Crude oil prices sold off sharply into the announcement by President Trump that the US was to abandon the Iranian nuclear deal. In our view, the announcement, and particularly the note from the US Treasury advising importers to reduce Iranian purchases now in order to secure waivers later, was harsher than what the market had expected. The consensus view was the deal would somehow be suspended but leaving the door open for renegotiations. But very few people had expected an immediate impact on exports. Hence the fact that prices immediately sold off despite a clearly bullish outcome suggests that the current length in the market is unstable and could be tested again when an SPR release is announced. Whatever the cause, a reduction in net spec length would have a meaningful impact on the term structure. Our time-spread model implies that roughly half of the 1-60 month time-spread in Brent is driven by the extreme spec position. In other words, with a neutral spec position, our model would predict Brent spot prices to be roughly 10% lower. We think a sell-off due to an unwinding of the record spec net length would offer a great entry opportunity as fundamentally the market looks strong for the next 18 months.
Bring It All Together: The Next Five Years and Beyond

The period from 2020-2022 will be marked by declining non-OPEC ex-shale production and a slowdown in US shale oil production. This means that OPEC will not just have to bring back all its spare capacity, OPEC must build new capacity and it has to build it fast. We believe that this will prove challenging and there is a very high risk that in a few years, the market will have to be balanced by demand destruction again, which will be achieved through higher spot prices.

However, we think before that happens, longer-dated prices will have to start moving higher in order to trigger large scale investments in future conventional non-OPEC production. At USD55/bbl, this is clearly not happening. A longer-dated price of USD55/bbl signals that the market believes that shale oil producers will deliver all future production growth. As we pointed out above, that is simply not possible. We need major investments in conventional projects and we need new investments from OPEC for 2022 and beyond as well.

Hence, regardless of where spot prices are going in the near term, we think the next big move has to be in longer-dated prices. We think a price increase of at least 35% is needed to get enough investments to eventually catch up to demand. That is with no cost inflation. The longer the back end of the curve remains depressed, the worse the

Exhibit 14: Net speculative length in WTI and Brent is close to an all-time high

Source: Bloomberg, Goldmoney Research
problem will get in a few years. Importantly, unlike the rally in spot prices, which had no impact on gold prices, a rally in longer-dated oil prices can be expected to push gold sharply higher. We will explore this in more detail in an upcoming report over the coming weeks.

Table 1: Global petroleum supply demand table under constant OPEC output

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<td>505</td>
<td>530</td>
<td>558</td>
<td>421</td>
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Source: Goldmoney Research

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