

A photograph of several oil pumpjacks (jack-o'-lanterns) in an oil field. The scene is captured during sunset or sunrise, with the sky showing soft orange and blue tones. The pumpjacks are silhouetted against the sky, with their long walking beams and counterweights clearly visible. A semi-transparent red box is overlaid on the left side of the image, containing the report title.

# Oil Market Intelligence Report Regaining Balance?

February 2017

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# Macro Factors

## GDP and PMI

### GDP

China's GDP growth is projected to stabilize, despite realized levels being higher than expected recently. "Many analysts believe this year's better than expected growth in China has been the by-product of a dangerous expansion in credit, especially for real estate developments and state-backed infrastructure projects" (Yang, 2016). For this reason, the PMI index, which is recovering back to August 2014 levels, could be misleading.

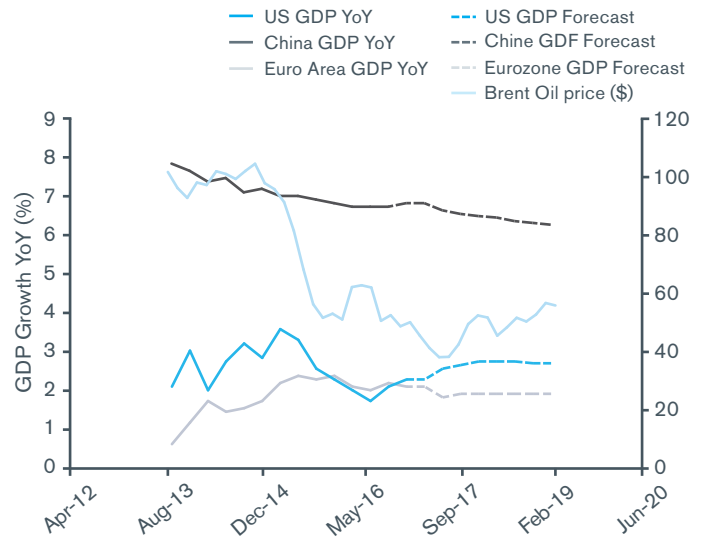
However, Chinese GDP growth is on track with government's target and policy to stabilize toward a sustainable growth, as oil usage remains strong and steady (see Figure 9).

Recent growth in U.S. GDP is largely attributable to an increase in consumer spending. This growth is expected to continue into the next quarter as incomes are expected to increase. The United States is benefiting from increased oil prices, with investment in domestic oil and gas production ramping up. This is factored into the recent PMI index, which is recovering.

The election of Donald Trump, and the new president's emphasis on reindustrialization and revised government regulation, might support fossil fuel consumption.

For Euro Area GDP, given the high level of political uncertainty affecting the euro market, GDP growth is expected to slow. The euro and pound sterling have depreciated, and Europe is no longer able to benefit from low oil prices. This situation is, however, expected to stabilize as unemployment decreases and levels of investment increase, as illustrated in the recent increase in PMI.

Figure 1: GDP Growth Data



Source Bloomberg

# Macro Factors

## GDP and PMI

### Manufacturing PMI Index

China's PMI is recovering from Q1 turmoil. The Euro Area and the United States have similar PMI values, consistent with their respective GDP's growth.

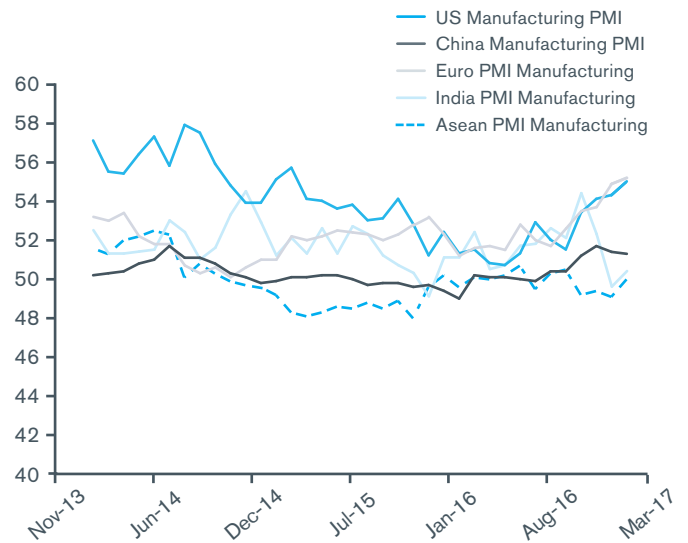
As shown below, with the exception of ASEAN countries and more recently India, PMI indexes are following an upward trend, signalling a stronger manufacturing activity and a higher energy demand on a global scale, as reflected in U.S. Energy Information Administration (EIA) projections (see Figure 4). The U.S. and Eurozone PMI trend is very positive and augurs a stronger economic recovery in developed countries.

The drop of India's PMI in Q4 2016 is believed to be due to the government's move in November to withdraw overnight the 500 and 1,000 rupee notes, representing 86% of the currency in circulation. A small rebound occurred in January seems to confirm that it was a temporary effect.

The ASEAN countries (comprised of 10 southeast Asian states, including Thailand, Singapore and Malaysia) have a PMI Index below 50, suggesting that the manufacturing sector's confidence has been hit. The increasing inflation pressure in the region has deteriorated production prospects, but improving external conditions might have a positive impact on the manufacturing conditions.

All of these factors speak to the prospect of a mildly to steadily increasing pace of oil demand. We discuss this further in the following sections.

Figure 2: PMI Index



Source Bloomberg

# Macro Factors

## U.S. Monetary Policy

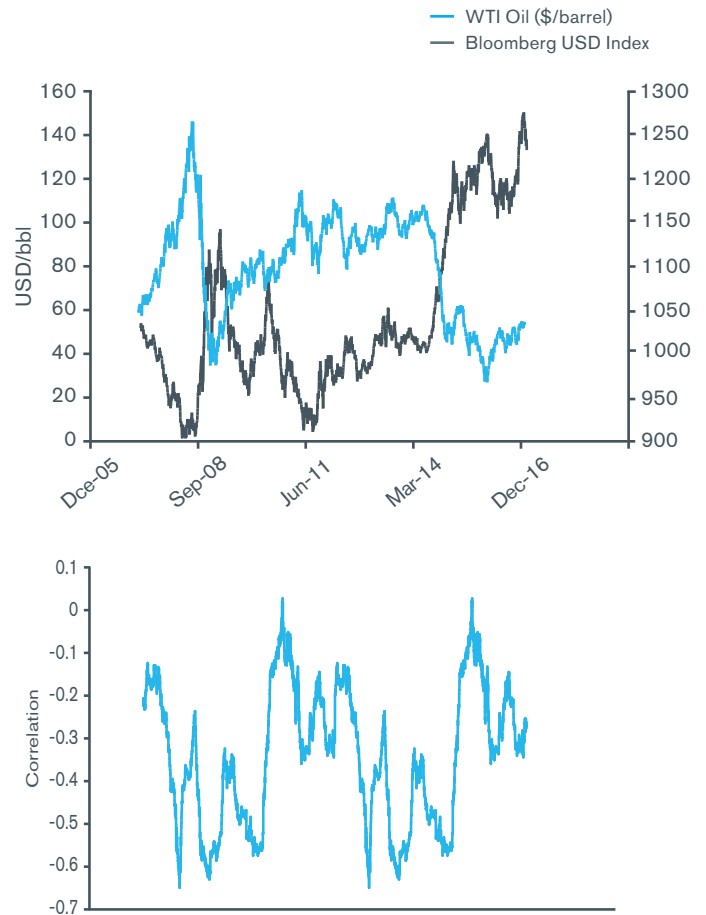
### U.S. Monetary Policy Relation with Oil Prices

A good indicator of U.S. dollar strength is the Bloomberg Dollar Spot Index. This index tracks U.S. dollar performance against a representative basket of currencies; the weights take into account the various countries' trade relationship with the United States. The basket of currencies includes the euro, Japanese yen, Canadian dollar, Mexican peso, British pound sterling, Australian dollar, Swiss franc, South Korean won, Chinese renminbi and the Brazilian real.

There is a strong correlation between the U.S. dollar and oil prices. The following chart includes the WTI Crude Oil price, the Bloomberg Dollar Spot Index and their correlation, which is calculated using daily returns. In the past 10 years, the correlation has been almost always in negative territory.

Between July 14 and March 15, while the USD Index rallied, the correlation with WTI went from almost 0 to -30%. We can expect to see the correlation remaining negative while the Fed continues to head toward normalization of interest rates. The consensus is both a stronger dollar, thanks to increasing Fed fund rates, and a mildly bullish oil price (see Figure 19). This dynamic is likely to maintain a negative correlation.

Figure 3: The WTI Oil Price and the Bloomberg USD Index and graphs, along with the correlation coefficient for movements over the last 9 months:



Source Bloomberg

## Fundamentals

### “Oil Market heading toward balance”

#### Global supply and demand should meet in Q3 2017

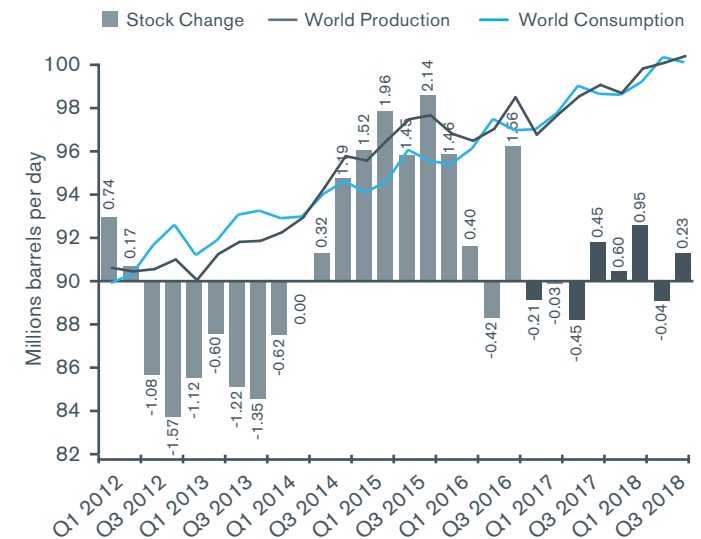
In its last report, the U.S. Energy Information Department (EIA) forecasted that a balance in oil supply and demand will be achieved in the second half of 2017. Existing surplus has already reduced significantly, and the recent OPEC agreement to cut oil output in 2017 will move the market to a deficit more rapidly than forecasted.

On the production side, oil supply rose to 97.8 million barrels per day (mb/d) in October, according to the latest IEA. World oil output was 800,000 barrels per day higher than it was a year ago. This is mainly explained by the production recovery in Nigeria, Libya and Iraq.

Oil demand growth is now seen at 1.4 mb/d in 2016, driven mainly by the stronger than expected growth in Europe and China. In 2017, demand growth is expected to remain strong at 1.6 mb/d. India and China are expected to be the main drivers in the increase in oil demand in the coming years.

Global production surplus declined sharply from 2.14 mb/d in Q415 to a deficit of 420,000 barrels per day in Q316. Whether OPEC producers and Russia respect their agreement to reduce oil output will be a key driver of the market supply/demand balance. A decrease in the oil stockpile and the associated increase in oil prices might make additional U.S. shale oil producers economically viable and result in increased production. In Figure 4, the values in dark blue are EIA projections.

Figure 4: World Consumption vs. Production



Source: IEA

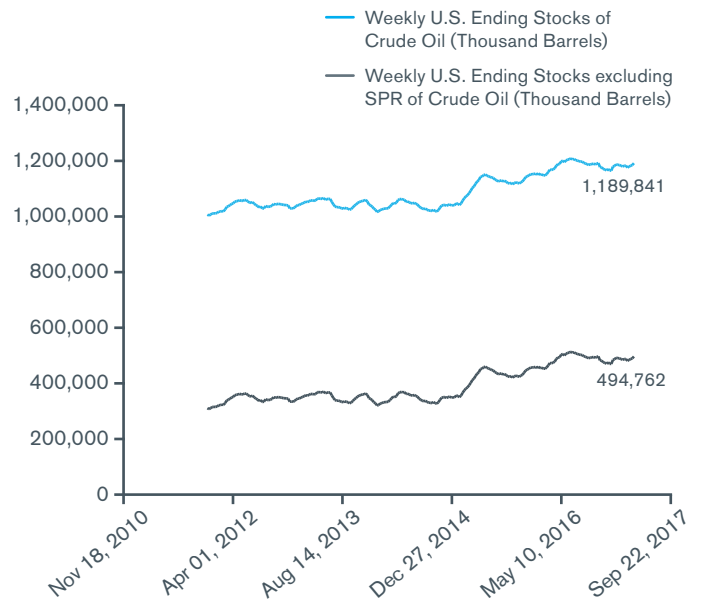
# Fundamentals

## U.S. Market

In the United States, oil stocks seem to stabilize around 494 million barrels, down from 512 million in April, reflecting global trends.

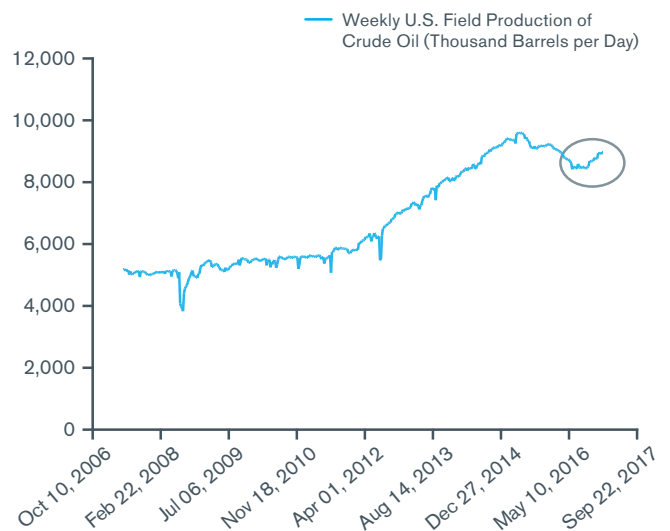
U.S. oil production is stabilizing to 9 mb/d (Figure 6), adding more than 5500 kb/d from the lowest production level seen in 2 years, which was reached in July this year. The evolution of OPEC production, as well as production in Russia, will shape the growth of U.S. production.

Figure 5



Source eia

Figure 6: Weekly US Field Production of Crude Oil



Source eia

# Fundamentals

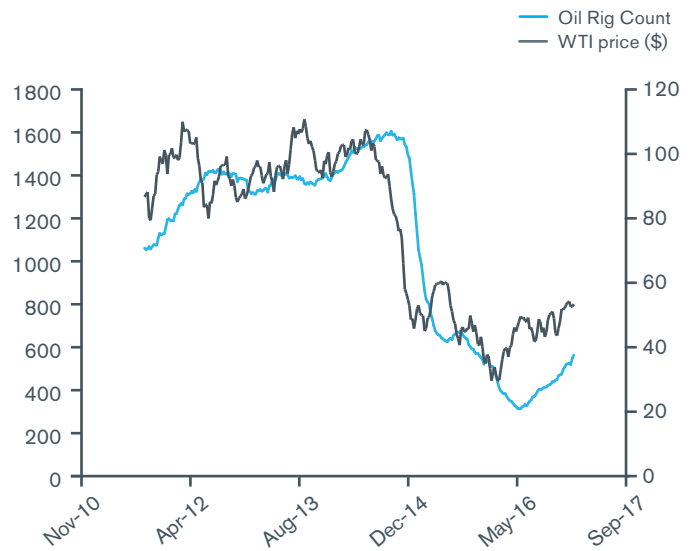
## U.S. Market

### "Price recovery" since Q1 brought back some rigs to production

The number of rigs operating in the United States rebounded from 316 in May to 566 on January 27, which is consistent with the U.S. oil production rebound described in Figure 6.

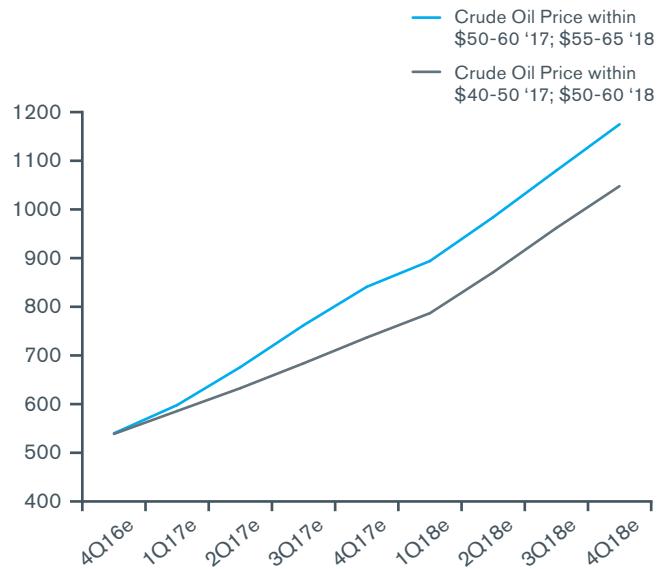
If oil prices remain in a range between \$40 and \$60 per barrel in 2017 and 2018, Bloomberg Intelligence suggests that the number of rigs operating in the United States will increase sharply, reaching more than 1,000 rigs by the end of 2018.

Figure 7: US Oil Weekly Rig Count



Source: BakerHughes

Figure 8: US Rig Count Forecast



Source Bloomberg

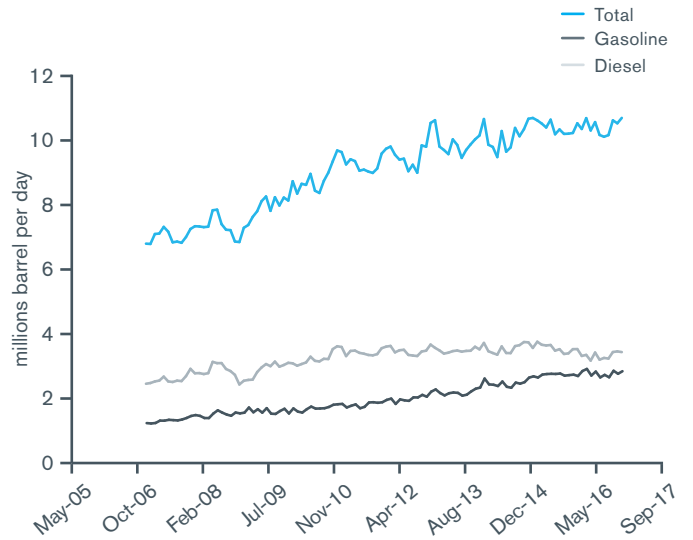
# Fundamentals

## China Demand

### China

In China, the pace of oil consumption growth is slowing down, following the same pattern as GDP growth. Demand for gasoline has been a strong driver, increasing from 2 mb/day in mid-2013 to 2.7 mb/day at the end of 2016. For diesel, demand remained strong and steady. While manufacturing activity is picking up, we can reasonably expect the Chinese consumption dynamic to remain strong.

Figure 9: China Apparent Oil Consumption



Source Bloomberg



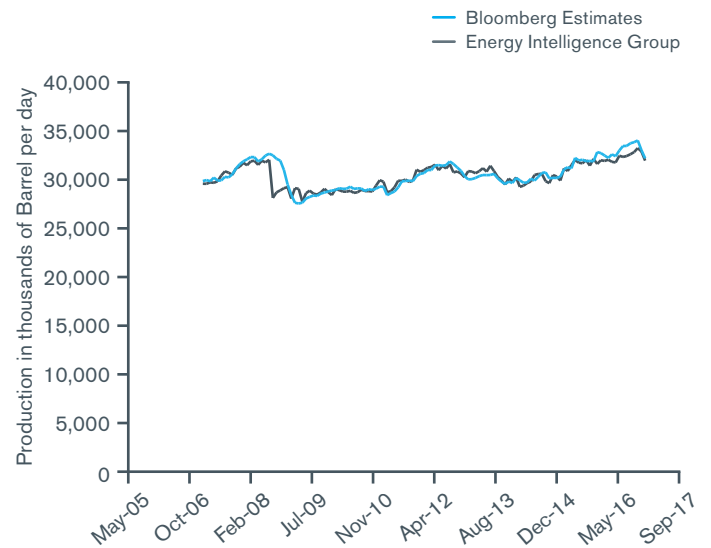
# Fundamentals

## OPEC Production

### OPEC

The following chart shows two different but consistent estimations aggregating producers' data and data from secondary sources. OPEC supply has increased by more than 10% from 30.5 mb/d on November 14 to 34 mb/d on November 16. The recent deal between OPEC and Russia should reduce production by 1.8 mb/d, counting for 2% of the global supply. As a result, Brent oil prices have surged approximately 20% in December, helped also by the stronger-than-expected economic outlook in Europe and the United States.

Figure 10: OPEC Production Output Estimates

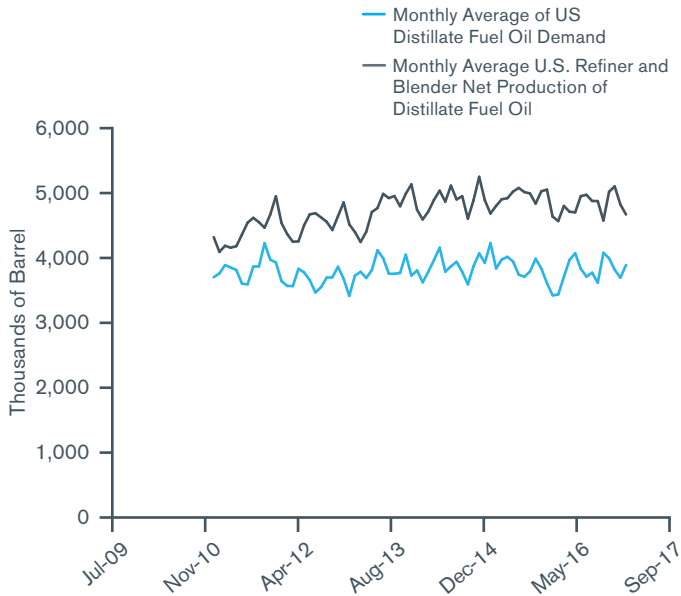


# Oil Distillates

## U.S. Distillates

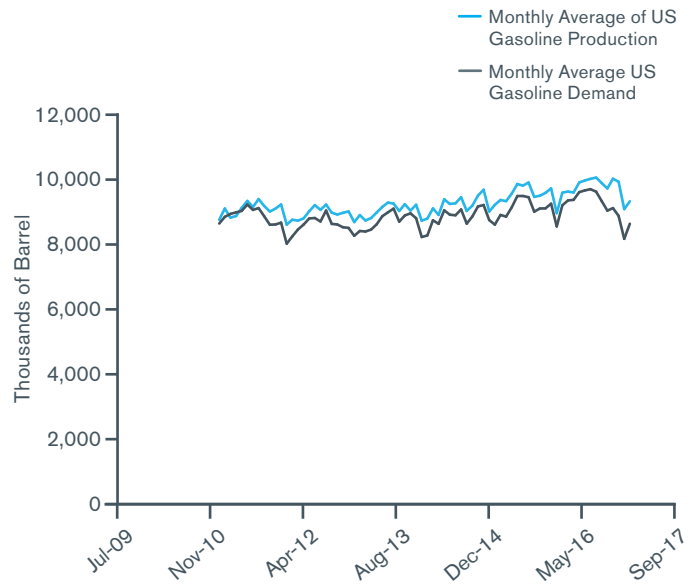
U.S. distillates and gasoline prices have been stable over time. They have been driven by neither seasonal demands nor crude feedstock costs.

Figure 11: US Distillate Fuel Oil Supply Demand



Source eia

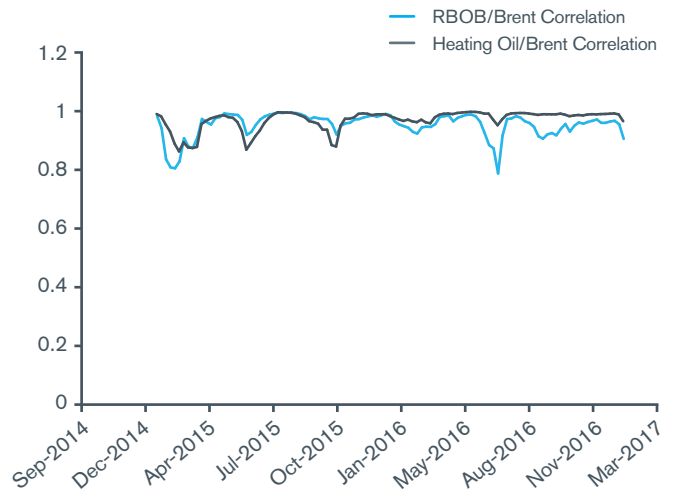
Figure 12: US Gasoline Supply vs Demand



Source eia

The correlation between distillates (RBOB and heating oil) and crude oil is generally close to one. We can see some seasonality effects that tend to reduce the correlation between the refined products and crude oil.

Figure 13: Refined products vs Brent: Correlation

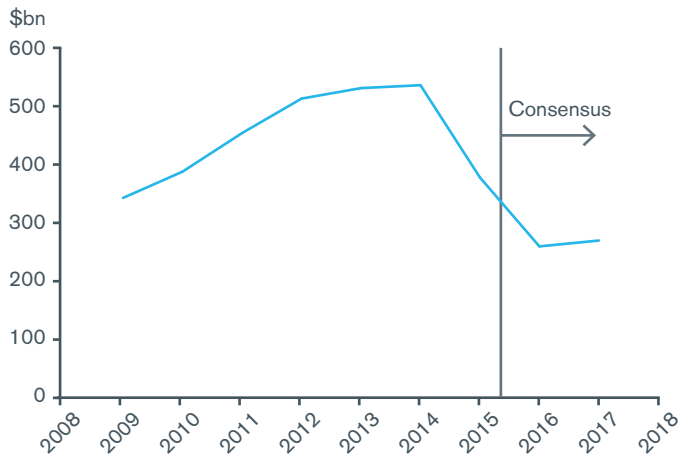


## Industry Investment

### Global Oil and Gas Industry Investment

Following the supply glut that started in 2014, companies have been cutting investments quite significantly. The following chart reveals this trend and also shows that CAPEX is expected to increase in the coming months. While oil prices stabilize around \$50 per barrel, the Oil and Gas industry seems to prepare for higher levels of investment in 2017.

Figure 14: Oil and Gas Global Upstream company CAPEX history and forecast



Source Bloomberg

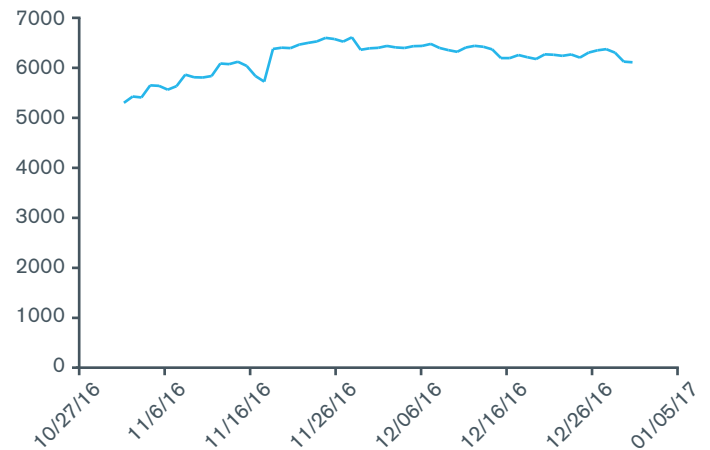
### Oil Cost of Production

Investment in oil production and exploration has returned since the increase in oil price. In a study published last year, Wood Mackenzie estimated that 98% of oil fields were generating positive cash flow above \$40 a barrel.

### Oil Sector Market Sentiment

In November and December 2016, the S&P Oil & Gas Exploration & Production Industry Index has been over-performing the S&P 500 index, moving from 5,300 early November to 6,100 by the end of January (+15%). The energy market sentiment has been quite bullish since the OPEC/Russia production cut deal.

Figure 15: S&P Oil and Gas Exploration and Production Industry Index



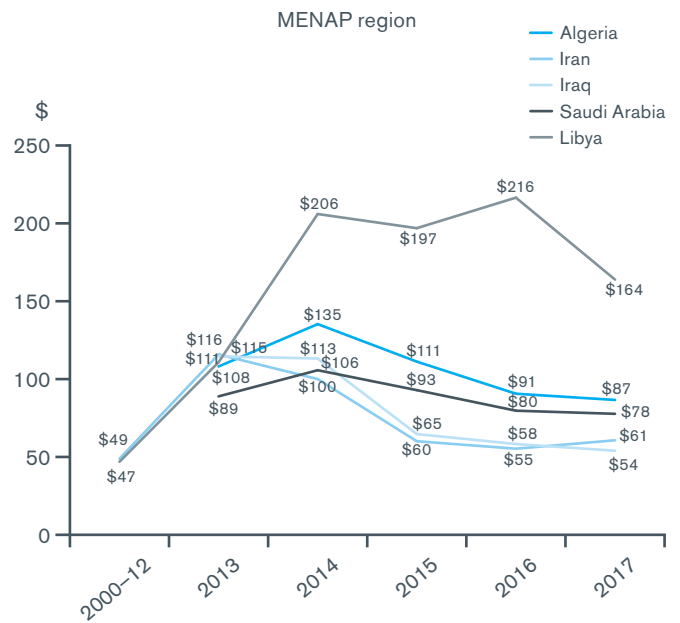
## Industry Investment

### Fiscal Breakeven in the Middle East

In last October's report, the IMF published updated data regarding the fiscal breakeven oil price for Middle East oil producers. This fiscal breakeven oil price is the oil price at which the fiscal balance is null.

This enlightens the financial challenges those countries have faced since the pump-at-will oil policy adopted by Saudi Arabia 2 years ago. Saudi Arabia's government budget went from a 13.6% GDP surplus in 2012 to an estimated 15% deficit in 2015 due to the slump in oil prices. This data shows how crucial a deal to cut production and support oil prices was for those countries.

Figure 16: Fiscal Breakeven oil exporters country



Source IMF

# Derivatives Market Signals

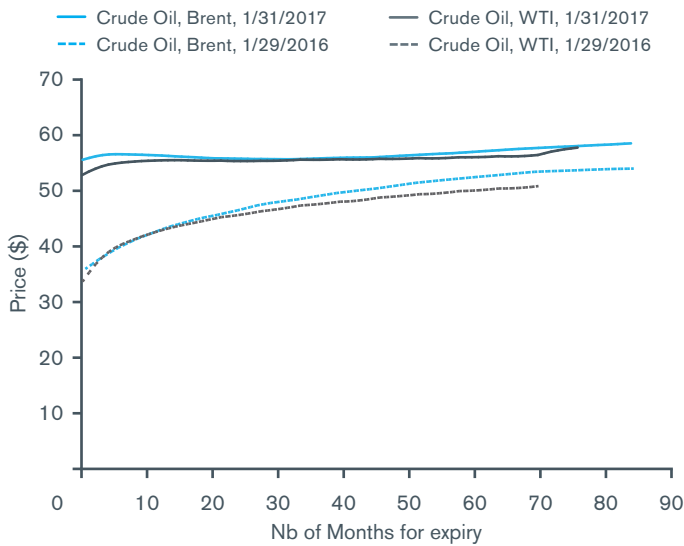
## Futures Term Structure

### Future Term Structure

The spread between WTI and Brent crude oil prices has widened significantly from zero a year ago to around \$2 currently. The high level of crude stocks in the United States has put a downward pressure on WTI futures.

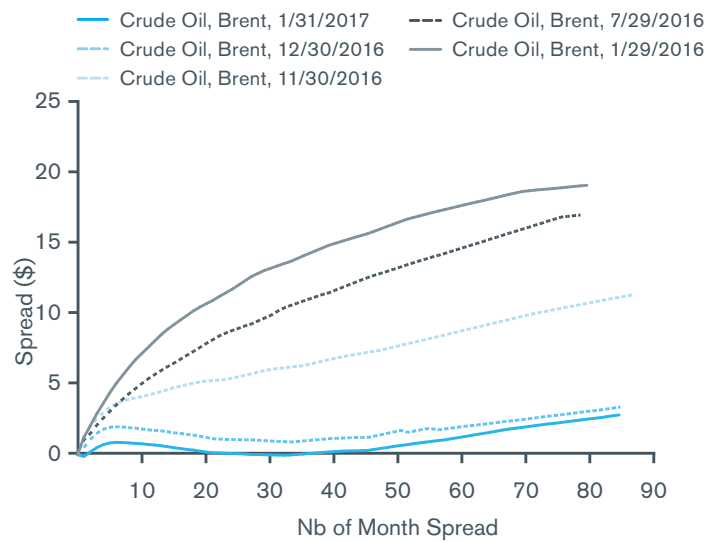
The shape of the term structure (Brent and WTI) has flattened. The spread stands below \$2 for the closest expiries; a year ago, the time spread was above \$25 for the latest expirations.

Figure 17: Brent and WTI Term Structure YoY comparison



The Brent forward curve flattened significantly since November for long-term expirations. For closer expiries (i.e., Feb 2017 to Dec 2017), the spread with the Front Month has decreased, and the market anticipates tighter oil outputs for that period. Traders are certainly anticipating a production cut in OPEC countries and Russia following their agreement.

Figure 18: Brent Forward Curve



Source Bloomberg

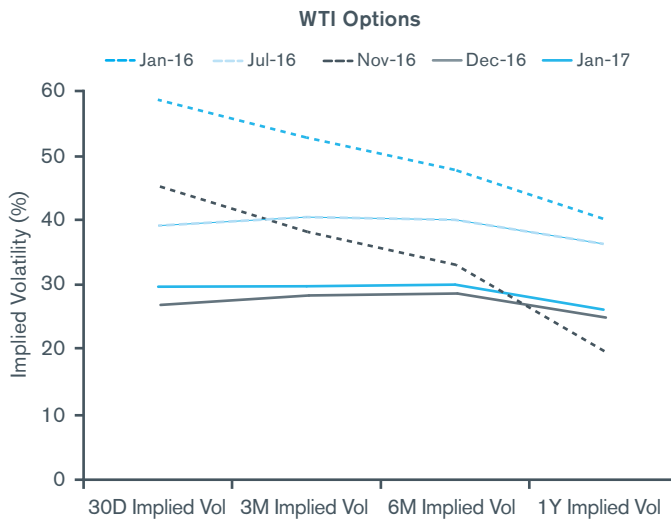
# Derivatives Market Signals

## Options Implied volatility and Smile

### Implied Volatility Term Structure

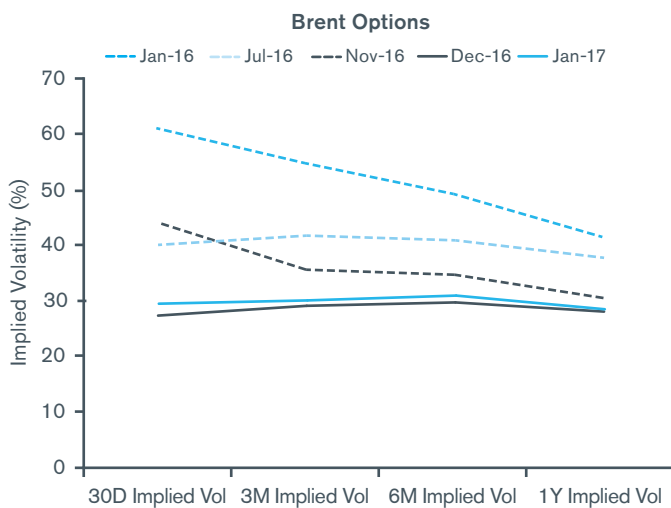
As illustrated below, at-the-money (ATM) implied volatility surged in November 2016 and eased in December and January. This was pushed by both the American election and the deal between OPEC and Russia to cut production in 2017. The shape of the ATM implied volatility also reveals that market risk sentiment is focused on the shorter term of the curve. ATM implied volatility for options expiring in 6 months is lower than ATM implied volatility of options expiring in 10 days. Even from a historical standpoint, the 6-month ATM implied volatility is significantly low.

Figure 19: At-the-Money Volatility



Source Bloomberg

Figure 20: At-the-money Volatility



Source Bloomberg

# Derivatives Market Signals

## Options Implied volatility and Smile

### Implied Volatility Smile

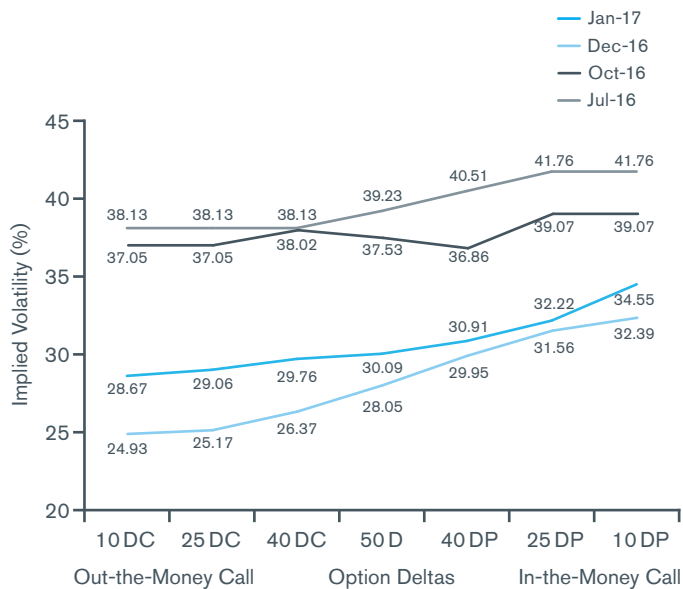
Figure 21 successfully illustrates the increase in the implied volatility in November 2016 following the aftermath of the U.S. election. It also shows how the implied volatility has eased since November, with a sharp decrease to 28% in December from 40% for the ATM volatility.

The shape of the volatility smile for WTI options expiring in a month has changed as a result of the recent OPEC and Russia deal to cut production in 2017 and the U.S. election. The volatility smile was quite flat, with 2% implied volatility premium between the highest (39%) and the lowest (37%), and almost no difference between the 10% delta Call and 25% delta Call, or the 10% delta Put and 25% delta Put. Market participants were hedging their positions against all potential risks, attributing almost no difference between downside or upside risks.

Since December, the implied volatility shape remained a reverse or negative skew pattern. Out-the-money puts (lower option strikes) have a higher implied volatility than out-the-money calls (higher options strikes), meaning that more investors are seeking protection against downside risk.

The oil market volatility level is reverting to lower values, suggesting a more balanced and less stressed oil market.

Figure 21



Source Bloomberg

## Derivatives Market Signals

### Options Open Interest

#### Option Open Interest and Call/Put Ratio

Overall, options open interest has decreased significantly since October. Generally, declining open interest combined with rising prices is considered a bearish sign. Price increase is driven by short sellers covering their positions rather than new investment being placed into the marketplace.

CL1 Comdty	Jan-17	Nov-16	Oct-16
Call Options	321,906	494,182	828,367
Put Options	367,452	341,996	596,210
Put/Call ratio	114%	69%	72%

CO1 Comdty	Jan-17	Nov-16	Oct-16
Call Options	190,034	103,948	455,295
Put Options	179,594	113,647	394,597
Put/Call ratio	95%	109%	87%

Source Bloomberg



# CFTC Trader Commitment Reports

## Futures Open Interest

### Open Interest

The CFTC conducts a market surveillance program that consists of collecting confidential data from traders. The CFTC groups the traders into four different categories: “Producers” (which also includes “Merchant,” “Processor” or “Users” of a commodity), “Swap Dealers,” “Money Managers” and “Other Reportable.”

Where CFTC classifies Trader in the four categories mentioned above, we wanted to highlight producers’ exposure; hence, the three other categories have been aggregated into “Others.”

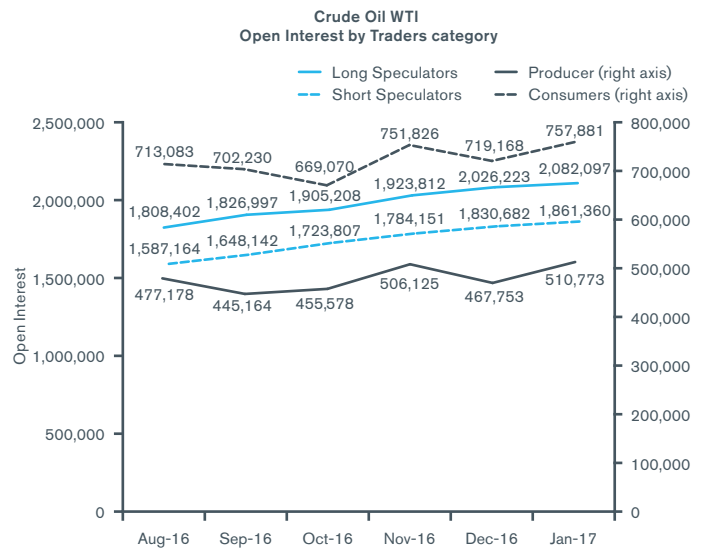
CFTC defines “Producers” as “entities that predominantly engage in the production, processing, packing or handling of a physical commodity and use the futures markets to manage or hedge risks associated with those activities.”

In Figure 22, we aggregated Open Interest in WTI Crude Oil exchanged on the ICE exchange and NYMEX Exchange.

Data show a steady increase in Open Interest up to December, the Total Open Interest (including Futures and Options) of WTI Crude on NYMEX reached the highest open interest since August 2011. As illustrated in Figure 9, this is consistent with the higher level of volatility in November amid the election of Donald Trump and the negotiation within OPEC for a production cut deal.

This increase has been fuelled by a sharp increase among producers +65,000 since September; the prospect of an increase in prices following the OPEC agreement could explain that movement.

Figure 22: Crude Oil WTI



Source: CFTC

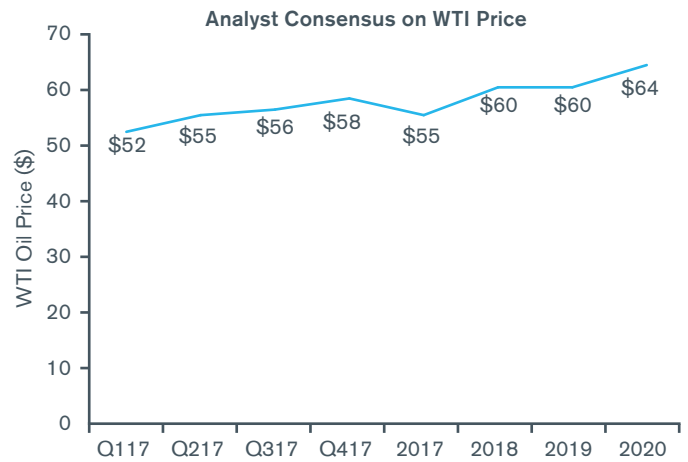
## Analyst Consensus

### Oil Price Consensus

The Bloomberg analyst consensus is slightly bullish, with an oil price reaching \$63 by 2020. Analysts are expecting the global oil surplus to reduce, but they remain reserved and cautious as the upward trend appears to be rather timid.

There are still concerns that the production cut target from OPEC or Russia won't be met and that U.S. shale production will increase if oil prices remain around current levels, putting some downside pressure on the prices. On the other hand, a stronger-than-expected recovery in Europe and the potential fiscal stimulus in the United States might increase oil demand and, as a result, push up oil prices.

Figure 23: Analyst Consensus on WTI Price



Source Bloomberg

Using the individual data from Bloomberg with a focus on last month's analysis, the overall market forecast remains the same. The table below provides more details. No analyst predicts an oil price below \$45 on average for the next 4 years.

	Q1 17	Q2 17	Q3 17	Q4 17	Q1 18	2017	2018	2019	2020	2021
Average	52.9	53.7	55.2	56.3	56.6	50.5	54.0	58.0	58.0	58.0
Median	53.0	53.0	54.0	56.0	56.5	50.5	54.0	58.0	58.0	58.0
Std	1.8	3.1	4.4	5.5	6.3	0.0	0.0	0.0	0.0	0.0
Max	57.0	60.0	62.0	65.0	68.0	50.5	54.0	58.0	58.0	58.0
Min	49.0	48.6	47.5	45.5	45.5	50.5	54.0	58.0	58.0	58.0
Number of Analysts	19	19	19	19	16	20	18	12	10	7

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