

A Closer Look

What Inventories May Tell Us About Oil Prices



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In Brief

- Many factors influence the price of oil in the short term — geopolitical risks, OPEC policy, currency values, financial speculation, energy alternatives, and economic conditions, among others.
- Focusing on inventories and the physical movements of the oil market provides, in our opinion, a reliable method in the analysis of oil prices. We believe that the rapid buildup in inventories over the last two years contributed to the swoon in oil prices.
- Our base case calls for oil inventories to diminish in the next few years, boding positively for oil prices. The biggest risk to our view is a global economic slowdown that could negatively impact demand.

“Stocks [inventories] have no bearing on price. You must realize there is a fundamental change in the market.”

— Ali Al-Naimi

For decades, Ali Al-Naimi, the former Saudi Arabian Minister of Petroleum and Mineral Resources, was arguably the most influential voice in the global oil market.

The long-standing energy representative for the Kingdom of Saudi Arabia, Al-Naimi was responsible for crafting Saudi oil policy, and, considering the dominant role played by Saudi Arabia within the Organization of the Petroleum Exporting Countries (OPEC), he was also the de facto policy setter for the cartel and, in turn, the world. His every public statement was followed and deciphered by journalists, government officials, energy company executives, and traders. Billions of dollars were at stake in the financial markets when he spoke.

To be fair, Al-Naimi made the above statement in 2009 — a very different environment than the global economy and oil market of today. But, regardless of the time period, shouldn't oil inventories always have an influence on oil prices?

In this note, our goal is to establish that inventories — at least in the world of oil — do have a bearing on prices, that the glut of oil held in inventory contributed to the fall in oil

prices, and that our expectation of a drop in inventories in the years to come will lead to higher oil prices. In addition, we compare the two primary weekly oil inventory reports and highlight our preference for monitoring the market.

Oil Prices — A Moving Target

Forecasting oil prices is challenging. The oil market is influenced by an ever-changing variety of factors — including geopolitical risk, OPEC policy, financial speculation, currency values, economic conditions, prospects for alternative energy, and even the price of oil itself. Short term, any of these variables can cause oil prices to fluctuate.

Longer term, however, focusing on the actual physical movements of oil supply and demand provides, in our opinion, the most robust and consistent method for oil price analysis. This is why when Al-Naimi spoke, everyone listened. The thinking was that he might, by chance, provide insight into changes in OPEC or Saudi oil policy, which could have implications for the global supply of oil.

What Inventories May Tell Us About Oil Prices

Inventory data is one of the most important variables in commodity market analysis. It tells us a great deal — about how much stuff we have, if we have too much or too little, and whether prices should be cheap or expensive. Inventory is the by-product of the cumulative amount produced and consumed over time, and represents the total amount of supply that can be used at any given time. In some respects, inventory provides a snapshot of the financial health of a market, and is comparable to the amount of debt on a corporate balance sheet. Like too much debt, high inventories restrain prices from rising, while low inventories facilitate price appreciation.

Oil Inventories Near All-Time Highs

Oil inventories and prices have a well-established connection, which is depicted by the scatter plot below. With oil inventories measured on a days-of-supply basis (inventories divided by consumption) to adjust for seasonality and growing use of oil over time, there is a clear inverse relationship between oil prices and inventories. As inventories shrink, prices tend to rise; as inventories increase, prices face downward pressure (Exhibit 1).

Exhibit 1: Oil Inventory Versus Price

Key Takeaway: Oil inventory levels and oil prices tend to move in opposite directions.

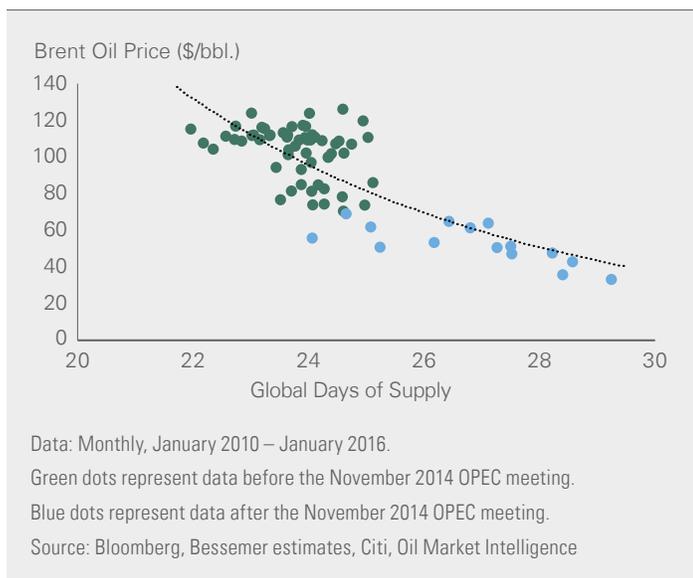
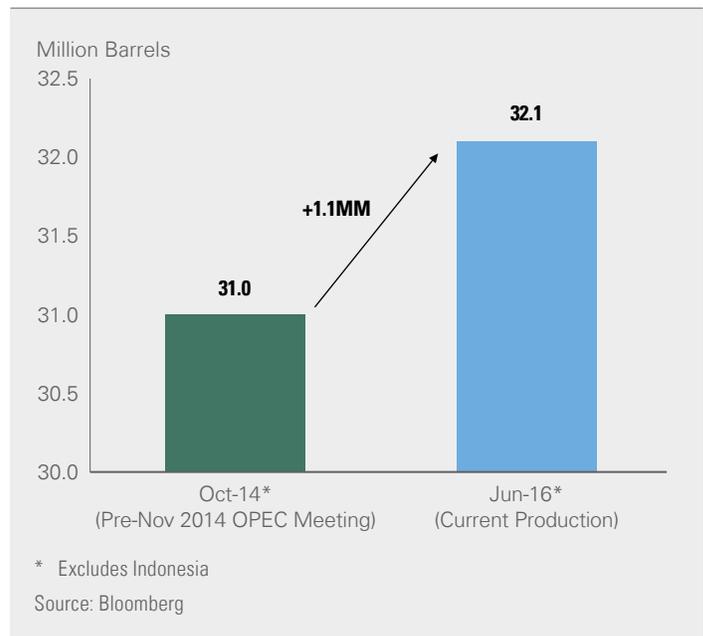


Exhibit 2: OPEC Production Levels

Key Takeaway: OPEC increased oil production levels by 1.1 million barrels per day following its November 2014 meeting.

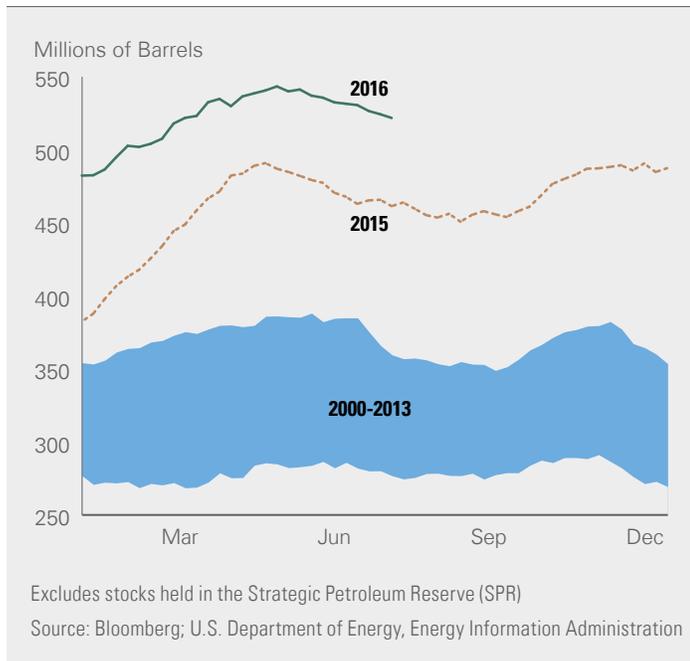


For years, oil inventories remained in a relatively stable range. However, in late November 2014, in one of the more dramatic meetings since the cartel was formed, OPEC chose to relinquish its role as “swing producer” of the global oil market. Instead, it embarked on a new strategy focused on maximizing production and market share of world supply. OPEC’s production growth following this meeting has been very strong. As shown in Exhibit 2, from its November 2014 meeting to present, OPEC has increased production by 1.1 million barrels per day, which has more than offset declines from areas such as the U.S., Mexico, and China that are experiencing price-driven supply challenges.

The additional production from OPEC caused global oil inventories to swell rapidly. In the U.S., oil inventories of 522 million barrels as of early July stand at near-record levels as shown in Exhibit 3 (all-time high inventory levels were reached in October 1929).

Exhibit 3: U.S. Crude Oil Inventories

Key Takeaway: U.S. oil inventories are at near-record levels in 2016.



Oil inventories breaching “tank tops,” or the maximum amount of oil that can be held in storage, was of high concern earlier this year. If tank tops were breached, the price of oil would likely fall to a level that would force producers to stop pumping oil in order to prevent oil from hypothetically spilling out of storage tanks. Oil prices at \$20 or lower was not out of the question. In such a “tank top” scenario, given this risk, we chose, at the time, to take a conservative approach to oil-related investments in our portfolios, despite the relatively attractive prices.

All eyes have been on Cushing, Oklahoma, the logistical nexus for the U.S. oil industry. Cushing is not only where tens of millions of barrels of oil are stored, but its tank farms supply oil to many of the larger refineries along the Gulf Coast and in the mid-continent region of the U.S. Oil inventories at Cushing have been rising steadily since the end of 2014, when OPEC flooded the market with oil.

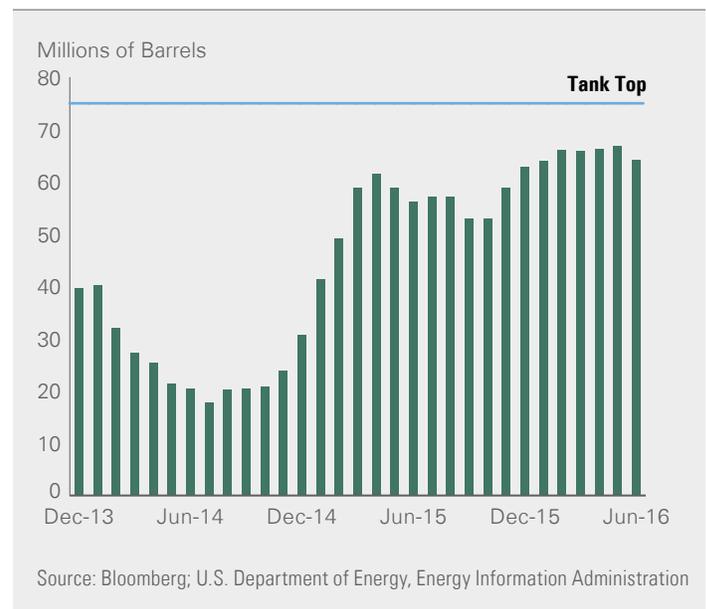
In May of this year, Cushing oil inventories hit an all-time high of 68 million barrels (Exhibit 4). With effective capacity of 75 million barrels, inventories were as close as they ever have been to maximum capacity.

We believe, however, that the imminent threat of oil inventories at Cushing hitting “tank tops” has receded. Already, Cushing inventories have declined by 4 million barrels.

Fortunately, an abundance of research is available that allows us to monitor not only the current inventory situation, but all facets of the oil market. The most commonly analyzed reports for “real time” data are the American Petroleum Institute’s (API) *Weekly Statistical Bulletin* and the Energy Information Administration’s (EIA) *Weekly Petroleum Status Report* (the EIA is an agency of the U.S. Department of Energy, or DOE; in this note, we refer to EIA and DOE data interchangeably).

Exhibit 4: Cushing Oil Inventories

Key Takeaway: Oil inventories at Cushing, Oklahoma, have been steadily rising in recent years, hitting an all-time high of 68 million barrels in May 2016.



The EIA provides the most useful dataset for analysis, in our view.

API Versus DOE Reports

The capabilities of the API and EIA are vastly different. While the API is the largest oil industry trade association and is well funded by 650 corporate members, the EIA, as a department of the U.S. government, has significantly more resources. For fiscal year 2016, the EIA has a budget of \$122 million devoted to research across all aspects of U.S. energy research and policy, not just oil. In addition to the *Weekly Petroleum Status Report*, the EIA publishes comprehensive energy databases (with some datasets going back to the early 1900s), special studies on the energy market, and long-range forecasts for energy consumption and supply.

There are indeed similarities between these two organizations' weekly reports, but there are also some important differences as well. Exhibit 5 provides a side-by-side comparison of the two reports.

Which Report Is Better?

The EIA provides the most useful dataset for analysis, in our view. Every Friday, the government requires companies to submit inventory data on crude oil and other energy products. The fact that the government mandates compliance with its reporting schedule suggests that its data is as accurate as practically achievable.

Reporting and data collection by the API is not as comprehensive as that from the EIA. API data is based on survey estimates, the validity of which is not enforced. The data is also subject to the participation rate of its member firms; responding to these surveys is voluntary. On occasion, surveys are not sent back to the API or the data is not completed in a timely manner.

Exhibit 5: Comparison of Weekly API and DOE Reports

Characteristics	API Report	DOE Report
Typical release time	Tuesday, 4:30 PM EST	Wednesday, 10:30 AM EST
Report participants	API members	All energy companies
Data collection methodology	Surveys to API members	Actual data
Access to information	Paid subscription	Free
What's Included?		
Oil inventories	Yes	Yes
Product inventories*	Yes	Yes
PADD data**	No	Yes
Oil production	No	Yes

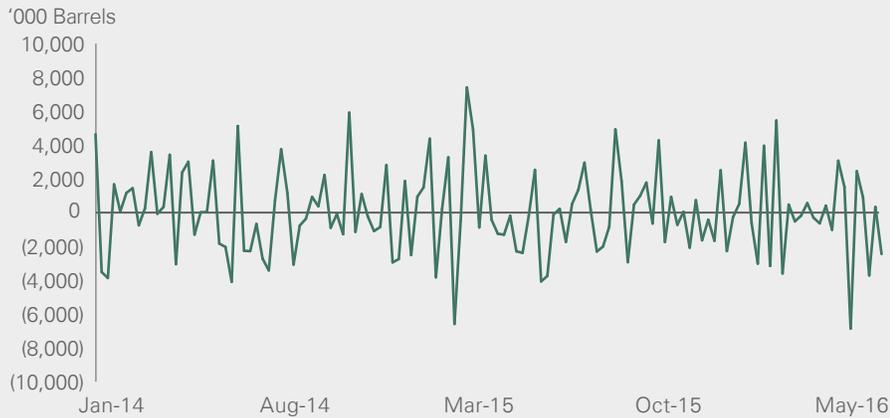
* Gasoline and oil distillates.

** PADD is defined as Petroleum Administration for Defense Districts; there are 5 PADDs, or petroleum regions, in the U.S.

Source: American Petroleum Institute, Department of Energy, Energy Information Administration

Exhibit 6: Weekly Oil Inventory Change – EIA Versus API Variance

Key Takeaway: Oil inventory data often varies between the EIA and API reports; this is a function of how the data is collected and the participation rates of the data providers.



Source: API, Bloomberg, U.S. Department of Energy

It is not uncommon, therefore, that results from the EIA and API differ from week to week. Exhibit 6 highlights the variance of the weekly change in oil inventories between the EIA and API.

Sometimes the two results show markedly different results. In early March 2015, for example, the API reported that oil inventories rose 2.9 million barrels from the week before. The very next day, the EIA reported that stocks increased by a much greater amount — 10.3 million barrels! A 7.4 million barrel variance between the two reports is highly significant and can cause heightened short-term volatility in oil prices.

Is There Information in the APIs?

Yes. API results can be a useful leading indicator for EIA statistics. Because the API report is released on Tuesday, the day before the EIA report, information can be gleaned from it. Often the APIs provide a sneak peak of what the EIA may report. In fact, approximately 80% of the time, the API and DOE data are directionally aligned: that is, both report inventory builds (i.e., increases), or both report inventory draws (i.e., declines).

The cautionary note, however, is not to put too much credence in the API figures.

As highlighted above, inventories reported by the API can be misleading on occasion. The most prudent approach for those taking cues on the direction of oil prices from weekly inventory data is to wait until Wednesday for verification of results from the EIA.

Often the APIs provide a sneak peak of what the EIA may report. In fact, approximately 80% of the time, the API and DOE data are directionally aligned.

Projected Inventories Suggest Higher Oil Prices in the Future

Inventories are an important factor in determining oil prices. The rapid buildup of inventories over the past couple of years, in our opinion, contributed to the swoon in oil prices. Unexpected supply disruptions from Canadian wildfires to terrorist attacks on oil infrastructure in Libya and Nigeria have caused oil prices to rally significantly from the lows experienced earlier in the year; however, the magnitude of the oil inventory overhang still present is expected to “cap” the upward trajectory for oil prices over the short term.

Longer term, however, as the demand for oil continues apace due to global population and income growth, and as production growth struggles in the years ahead as a result of lower capital budgets and drilling activity today, inventories are expected to decline from current bloated levels. Our analysis suggests that the fundamentals of the oil market are already becoming more constructive. As shown by the estimates in Exhibit 7, we believe that although the rebalancing process has begun, the oil

market is not likely to balance — where production and consumption are in equilibrium — until sometime in 2017, or even 2018.

By 2019–2020, however, we expect consumption to exceed production, and inventories to decline materially. Oil shortages may be on the horizon as the decade comes to a close.

Apparently, investors do not see it this way. The oil futures curve in Exhibit 8 — which reflects the market’s expectations for future oil prices — suggests that oil prices will remain relatively stable from current levels.

The efficient market hypothesis would conclude that current and future oil prices incorporate all available information, including expectations for production, consumption, and inventories. The “flat” structure of the oil futures curve below, moreover, implies little improvement or change in supply and demand fundamentals. As we have outlined, we believe that oil supplies will diminish, that the oil market will transition from a surplus of inventory to a deficit, and that oil inventories will be lower and prices higher than the market thinks now.

Exhibit 7: World Oil Production and Consumption Balance

Key Takeaway: While the fundamentals of the oil market are becoming more constructive, the market is not likely to balance production and consumption until 2017–2018.

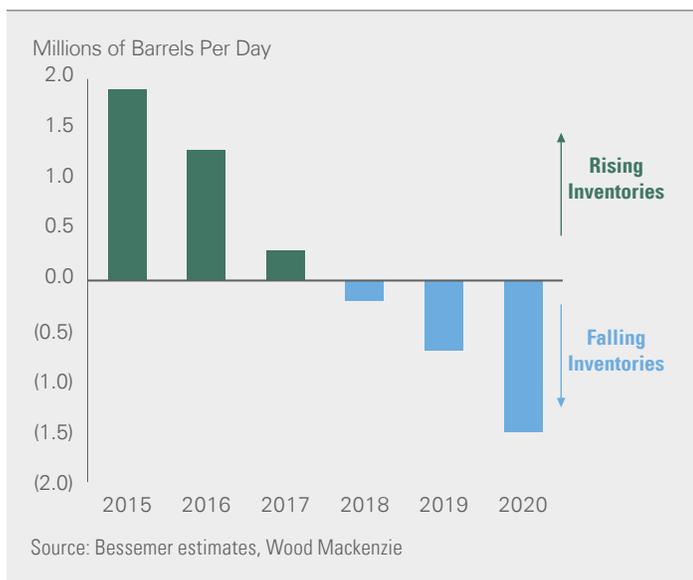


Exhibit 8: Oil Futures Prices (WTI, \$ per barrel)

Key Takeaway: Based on the oil futures curve, investors in the oil market expect relatively stable prices over the next six to seven years.



From an investment perspective, the disconnect between the market's expectations for future oil prices and what our analysis suggests is compelling.

High current oil inventories — which again should prevent oil prices from appreciating much in the short term — afford us a bit of time to continue our due diligence on oil-related investments.

If anything, the short-term outlook for oil prices has deteriorated to some degree. A number of factors — including rising OPEC production, a resumption of Canadian production, and poor global refining margins — suggest a market still grappling with too much supply.

An additional risk for oil prices may be the demand side of the equation. Oil demand is highly sensitive to and correlated with global

GDP growth. As the business cycle matures, odds of an economic recession rise. As a firm, we are becoming more acutely attuned to the potential for an economic slowdown, and are monitoring various leading economic indicators that point to softer economic conditions ahead.

Although we are generally constructive on the oil market, we are vigilant to the risks posed to its outlook. In our opinion, the greatest risk to future oil prices is a global economic slowdown, as opposed to another windfall of oil production. Any hiccup in demand would likely cause us to revisit our thesis on falling inventories. As our confidence on the health of the global economy builds and oil inventories recede, we are more likely than not to add more oil exposure to our portfolios as time passes.

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