

# PIEDMONT PEAKS

## The Crude Collapse: A Supply/Demand Analysis



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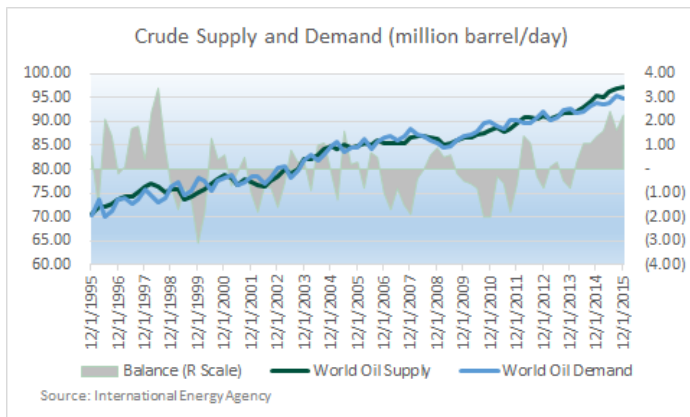


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### Concept Introduction

With crude oil prices experiencing a large drop beginning in 2014 and accelerating in the back half of 2015, we attempt to put a historical context around supply and demand, as well as potential drivers of price change going forward. Various hydrocarbons are all suffering from price pressure, but not all of these are driven by the same market forces. This paper will attempt to give the reader a baseline of understanding surrounding the topic, as we believe the broader discussion about hydrocarbon prices has been lacking in factual context. We will examine global oil supply versus demand as well as our expectations for future supply given the large decrease in US drilling activity and capital expenditures, which should result in reduced domestic supply in 2016 and likely for years to come. We will leave other commodity discussions for a subsequent analysis, but the dynamics of the physical oil markets are fairly well outlined, in our view, and we attempt to share that view in the paragraphs that follow. While we believe our analysis suggests that the balance of supply and demand will “improve” as we move through 2016 and into 2017, oil prices move for many other reasons than economic fundamentals. While we will touch on several of these (hydraulic fracturing technology, global growth concerns) others will largely be left alone (OPEC’s diminishing market share, anti-carbon politics, etc.)

### Oil Background

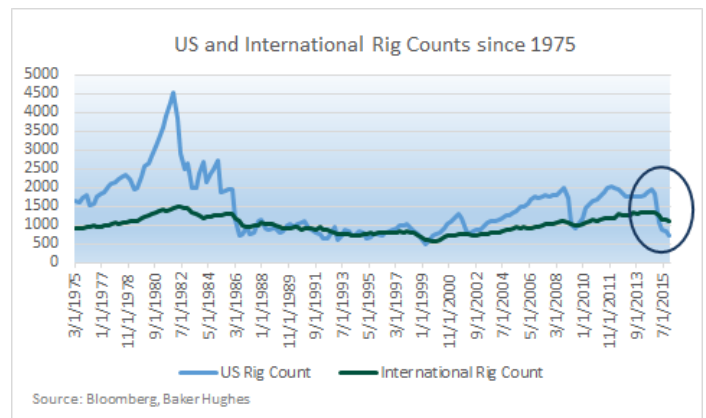


While much has been made of the “supply glut” for crude oil, the current gap between supply and demand is not overly large by historical standards. In fact, we find that the supply demand balance has very little correlation with the price level of crude. Clearly, this would be the case when a cartel is present (and recessions cause their own price dynamics), but many other factors are involved in the current market environment. OPEC currently accounts for about 40% of global oil supply

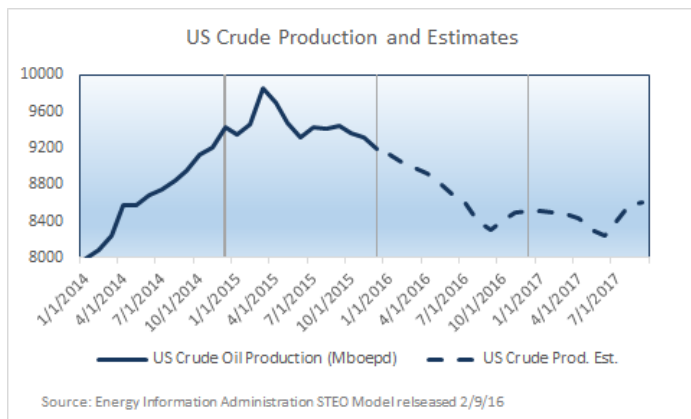
(37.9 million barrels per day (Mboepd), versus a world total of 95.8 million at year-end 2015) according to the International Energy Agency. This percentage has decreased marginally over the past several years, and helps to explain why OPEC has been opposed to cutting supply and conceding market share to non-OPEC countries (including the US), further eroding this percentage. Moreover, sentiment about the global economy has been uniformly bad, which has stoked fears of a global recession and driven the dollar higher. Obviously, a stronger dollar hurts the price of a dollar denominated commodity all else equal. A further slowdown in global growth would slow the pace of demand growth as well, though the US is the largest oil consumer globally, and has an economy in relatively good shape.

### The Rise of Shale

When we think about the current oversupply of oil, market observers talk about hydraulic fracturing and the US energy renaissance this technology created. Oil that was previously trapped is able to be extracted at reasonably low prices, especially now that the technology is widespread and recent cost decreases have exacerbated this phenomenon. Additionally, despite an increase in general instability in the Middle East, previous supply disruptions have begun to come back on line. If we look at rig counts since the end of the financial crisis (both in the US and internationally) there was a broad increase, which has led to this supply imbalance and elevated inventories. Given the slowdown in demand growth and increase in global supply, that oil went into inventories, both onshore in producing countries, and offshore on tankers and other vessels. Rig counts have been falling precipitously, however, and production expectations for the US in particular have fallen significantly. The US was the largest contributor to the global glut, with supplies moving from around 8 mboepd to nearly 10 mboepd since 2013. Experts expect US production to give back all the gains of that period, which accounts for nearly the entire imbalance as it stands currently.



One factor that has been cited as a potential negative for oil prices going forward is the relative speed at which shale wells can be drilled and completed. Unlike long-lead time projects like deep-water or oil sands operations, a single shale well can often be drilled and completed in just a few months. This could potentially limit any upside in prices as new production immediately comes back on line. We do not believe this will be significant for several reasons. First, firms that were only profitable with cheap money and high oil prices are being driven out of business at the margin. Additionally, oil workers have been laid off and are likely reintegrating into other industries closer to home. On the oilfield services side, many older rigs are being taken out of service, either semi-permanently (“cold-stacked”) or being fully scrapped at shipyards across the globe. Further, other manufacturers that pivoted toward the oil industry are likely moving away from it and reducing energy related capex and business lines as the industry has contracted. Rig counts are an indication of *new wells* coming on line, but the supply of drilled but uncompleted wells (DUCs) have created “shadow inventory” that has also weighed on prices, and company reports coupled with the decline in rig counts suggest these will be depleting as well. One fact that has not been widely publicized about shale wells is that these tend to deplete very quickly (up to 70% in the first year) so without new wells coming online, production decline curves are very steep, unlike conventional wells. Finally, there is trepidation about Iran’s oil coming back on line, but reduced capex across the global oil patch should result in production decreases more broadly.

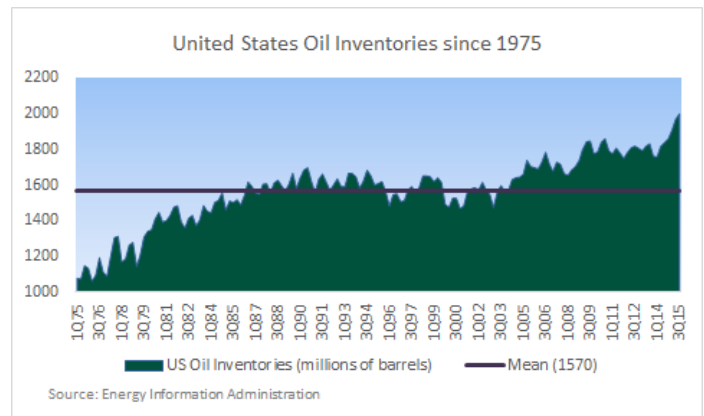


### Global Growth Concerns

For much of the oil price swoon, market observers suggested that the precipitous fall in prices meant that we were in the midst of a global recession or one was imminent. Clearly, global growth has continued to slow, as many emerging markets have been in or close to recession for the better part of the past five years. The rise in the dollar and broad collapse in commodity prices has contributed to this growth dynamic, especially in the case of commodity countries and currencies that are producers of commodities other than oil. As oil prices tend to influence demand creation or destruction, clearly there should be shifts in demand for a given level of GDP growth. We have seen research that attempts to model the price of oil using a classic economic demand curve. Using this model, a higher level of global GDP growth would be required to increase prices much beyond current levels (~\$45/bbl). Nonetheless, prices as seen in January are much lower than these models would imply.

### Inventories

The last piece of the pricing puzzle, given the relatively small mismatch between supply and demand, is inventories. US inventories (and North America more broadly) are at the highest levels seen in data going back to 1975 (and we have heard “80 years” mentioned, but our dataset is not that long). Reliable global inventory data is significantly harder to come by, but anecdotal evidence suggests that significant inventories are held both onshore and in floating storage. Clearly, elevated inventory levels could act as a cushion against any supply disruption resulting from geopolitical concerns in the Middle East. In fact, we would argue that the current state of unrest in many African and Middle Eastern countries would have already resulted in a price spike were inventories not at very elevated levels.



### Conclusion

After a miserable start to the year, oil prices have begun to recover from the mid-\$20s levels reached in January. This has occurred even as inventory numbers have yet to meaningfully decline, but as more awareness of potentially tighter supplies in the future is occurring. While we believe the price improvement is reflective of the fundamental supply dynamics discussed in this paper, we also caution that other factors are at work, including broadly improved market sentiment across asset classes. In fact, 2015 began much the same way, culminating in a peak for oil prices mid-year (WTI was above \$60 in June after beginning 2015 just above the \$52 level). Prices had seemingly stabilized, trading in a tight range between the upper \$50s and very low \$60s in May and throughout June before falling relentlessly for the remainder of the year. Technical indicators also suggest a bottom may have been reached, but we would anticipate continued volatility against a backdrop of very slow global GDP growth. Our point in this paper was not to predict a level for oil prices at the end of 2016 or even 2017, but to elucidate the fundamental factors that would contribute to a firming in prices as time moves forward. In the preceding two pages, we have tried to illuminate the primary issues affecting the oil market today. And in doing so, we are reminded of two quotes that both pertain to the topic at hand: “The most reliable way to forecast the future is to understand the present” by John Naisbitt and “Energy forecasting is easy, it’s getting it right that’s difficult” by Graham Stein. We have hopefully accomplished the former, and realize the futility of the latter.