Quarterly Energy Comment

By Bill O'Grady

March 13, 2018

The Market

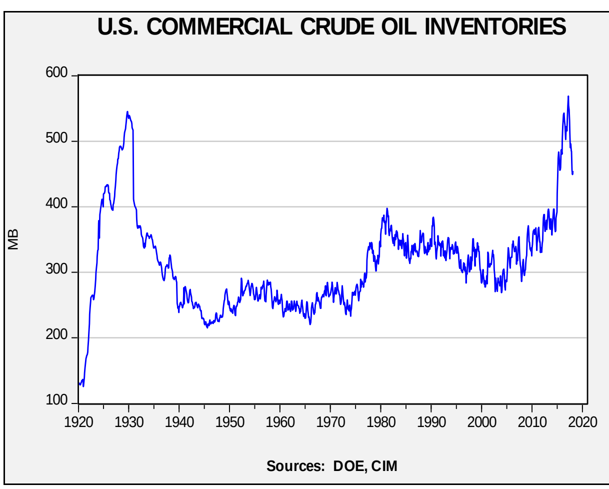
Over the past quarter, oil prices have ranged from a low of around $56 to a high of $66 per barrel.

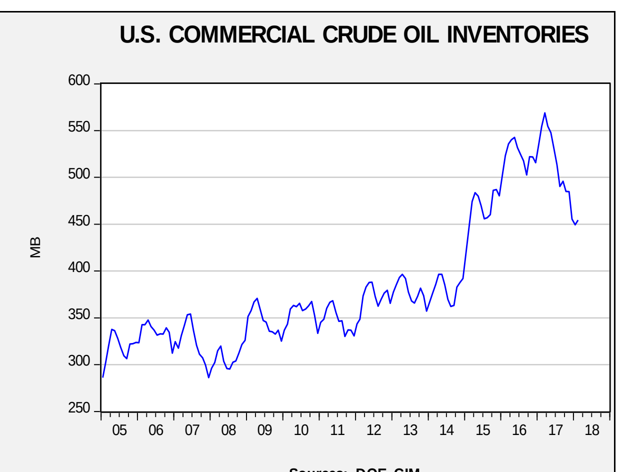
(Source: Barchart.com)

Prices remain elevated, supported by OPEC production discipline and solid global oil demand.

Prices and Inventories

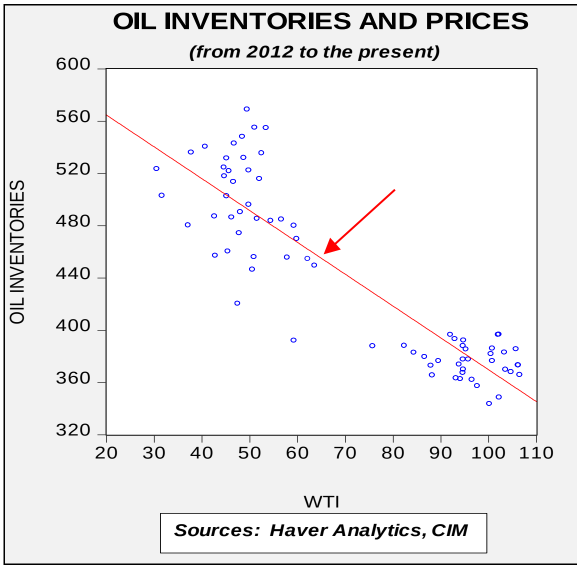
Inventory levels remain elevated but have clearly declined from last year's peak.

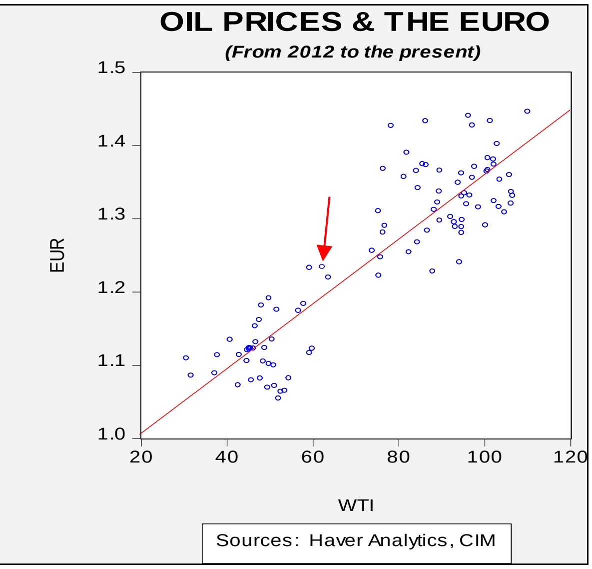




In the above charts, the one on the left shows the long-term inventory situation, while the chart on the right shows a 13-year history. Normal inventories would be below 400 mb, so stockpiles remain elevated.

Since 2012, oil prices have closely tracked the dollar and U.S. commercial crude oil inventories.

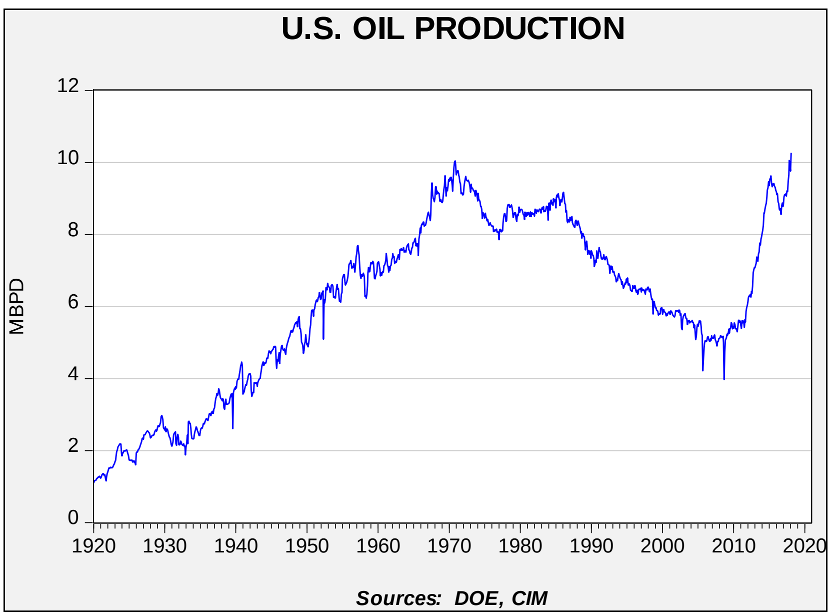




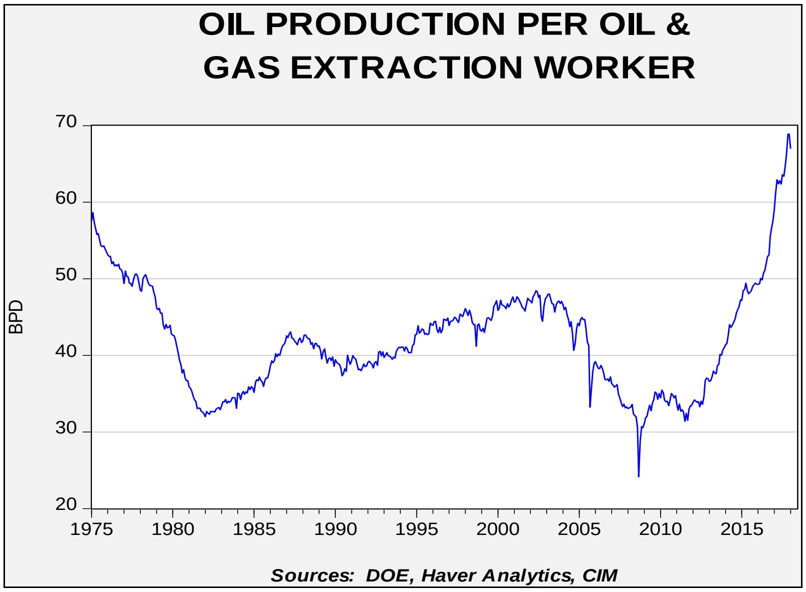
Our model that evaluates oil prices based on the euro and oil inventories suggests a fair value of $72.49. Oil prices remain undervalued relative to inventories and the dollar.

Production

U.S. oil production continues to recover.

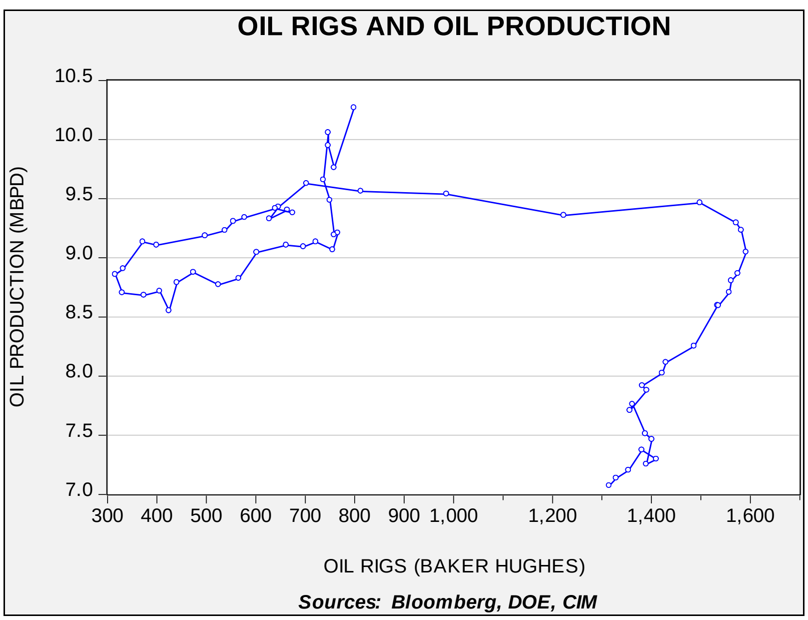


The chart above shows oil production since the 1920s. U.S. production has reached a new high, exceeding the previous peak hit in the early 1970s. Productivity has been remarkable as well.



The number of barrels produced by each worker per day has been rising sharply since 2013. There is growing concern that this pace cannot be maintained. After all, we suspect some of this rising output relative to workers is due to the exploitation of superior properties. The law of diminishing returns will likely become an issue at some point. If productivity does begin to stall, oil prices will likely move higher, especially given that prices are undervalued relative to stockpiles and the dollar.

Another way of examining this productivity spike is to compare production to active oil rigs.



The above is a scatter chart of rig counts and production. The first entry is for January 2013 at 1,300 rigs and near 7.0 mbpd of production. By the end of 2014, production had reached 9.5 mbpd of production with 1,500 rigs. What is remarkable is that production stayed steady for several months, even as rig counts fell by more than 50%. And, after production declined about 1.0 mbpd – from 9.5 mbpd to 8.5 mbpd – from April 2015 to September 2016, output and rigs rose until July 2017. Since then, despite a mostly steady rig count, production has increased from 9.0 mbpd to 10.3 mbpd. We are not sure how long production can be maintained at current levels without an increase in rig activity, but it is clear that productivity has changed.

Oil Summary

We view the current market as undervalued. Seasonally, oil inventories tend to rise into April and this will act as a bearish influence on prices. However, once refinery activity recovers in the late spring, oil inventories should decline and prices are expected to move toward $70 per barrel.

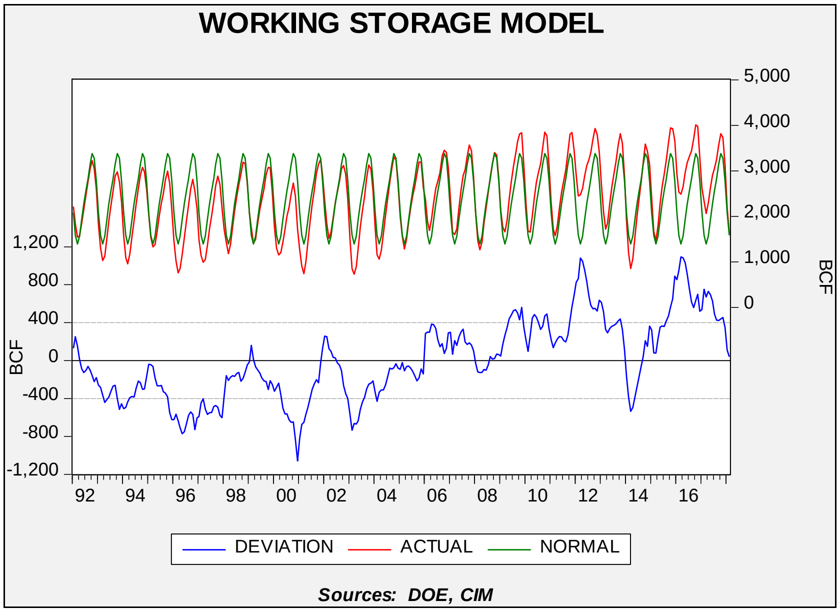
The longer term outlook is mixed. There is a growing possibility that nations will take more aggressive steps to reduce demand through electrification of the transportation sector and tax policy. At the same time, markets are ignoring the potential for a major geopolitical disruption. It's been 27 years since the 1991 Gulf War, when the world faced a supply shock brought by an event in the Middle East. The breakdown in geopolitical order in the region is likely to accelerate and thus the likelihood of a supply disruption is rising. In our estimation, this potential disruption is not currently discounted in the market. We also note that recent developments in Saudi Arabia are significant; although reforms are certainly necessary, the potential for internal unrest in the kingdom is rising. As a result, energy assets should probably be held in diversified portfolios to protect from possible supply disruptions.

Natural Gas

Natural gas prices have been volatile over the past quarter, which isn't unusual during winter.

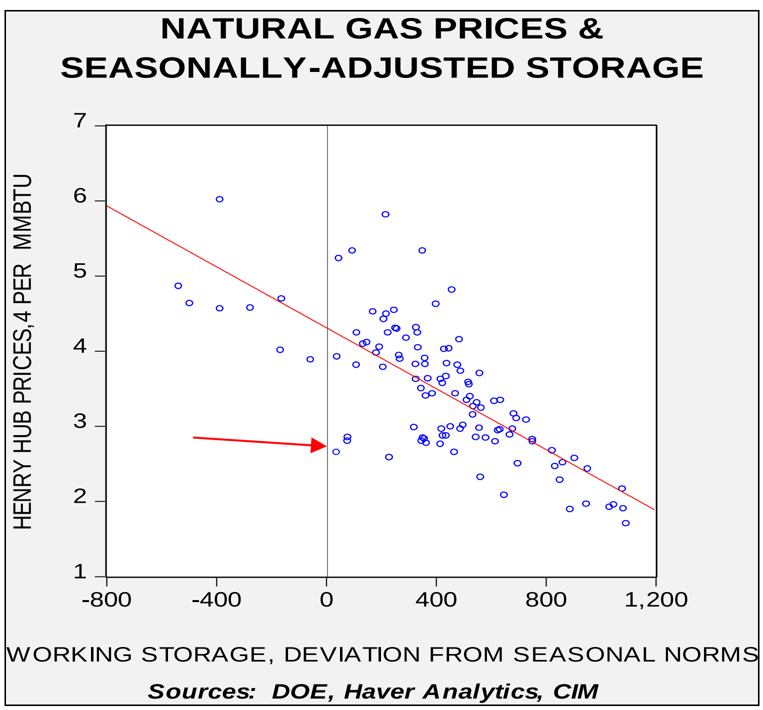
(Source: Barchart.com)

It was a generally cold winter which led to a sharp drop in natural gas stockpiles.

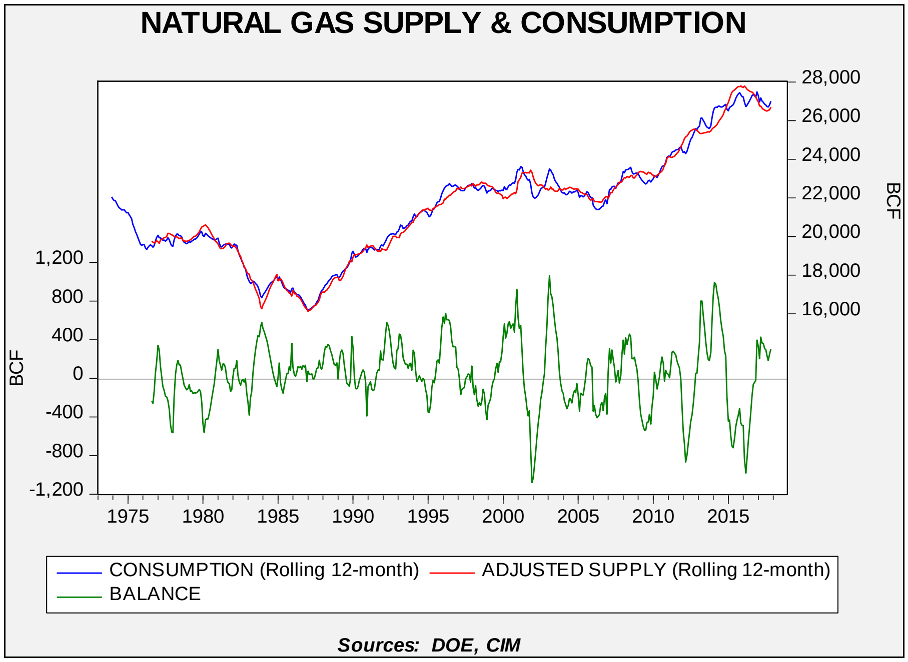


This chart shows a model of seasonally-adjusted inventories. Inventories finally fell to normal levels this month. Since 2008, stockpiles have mostly been above normal, a function of associated gas generated from oil drilling.

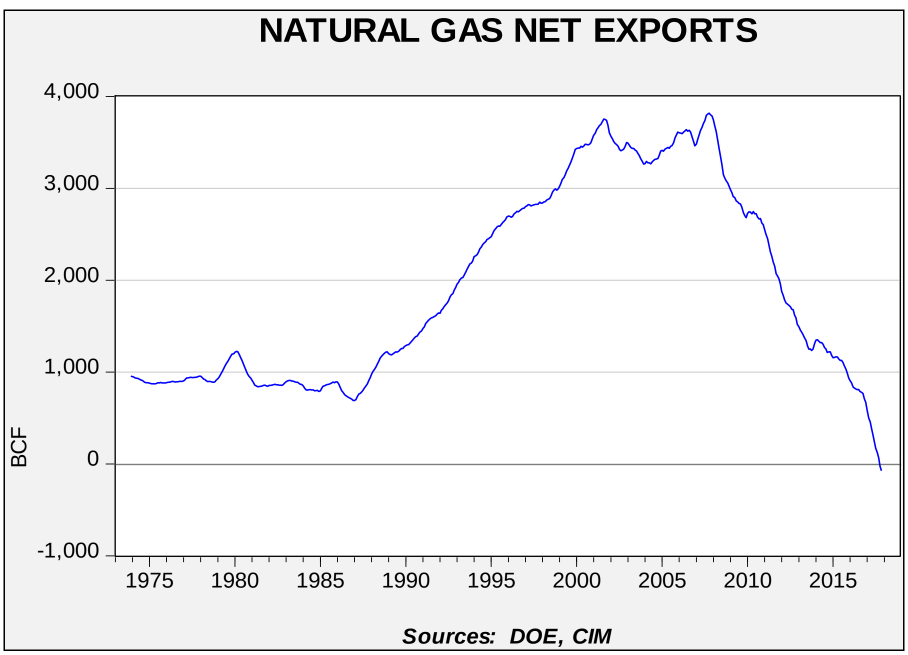
Prices are seriously undervalued at this point.



The key question for prices going forward is the pace of inventory accumulation, which will begin at the end of March. Currently, yearly consumption is outpacing supply; if this pattern continues, with natural gas inventories near normal, natural gas could get a boost in the coming months.



One of the more remarkable developments has been America's import/export balance. The U.S. is now a net exporter of natural gas.



This chart shows net natural gas exports (gross exports less gross imports) on a rolling 12-month basis. For the first time since the DOE began recording the data, the U.S. is a net exporter of natural gas. Although the bulk of these exports are piped gas to Canada and Mexico, liquefied natural gas exports have been rising from zero in 2013 to nearly

500 bcf last year. We look for LNG to grow in the coming years which offers a bullish outlook for natural gas prices.

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