Markets Have De-Valued Oil Prices: How Long Will It Last?

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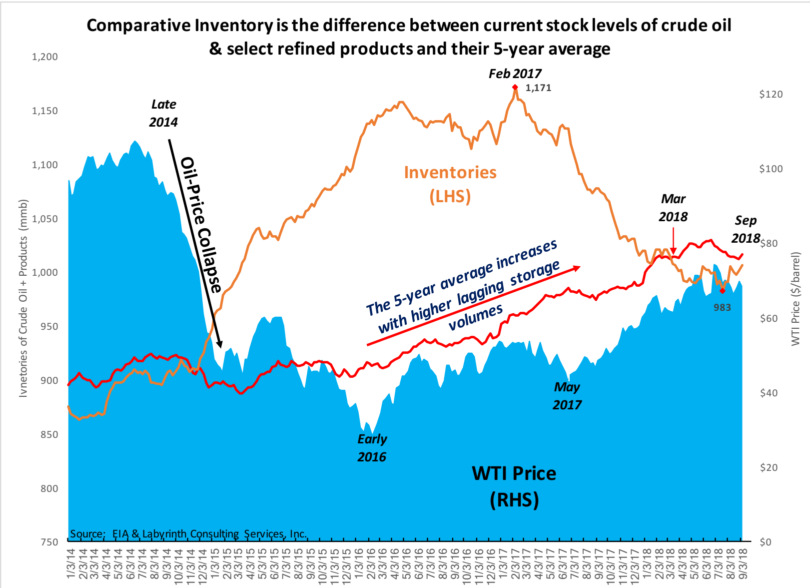
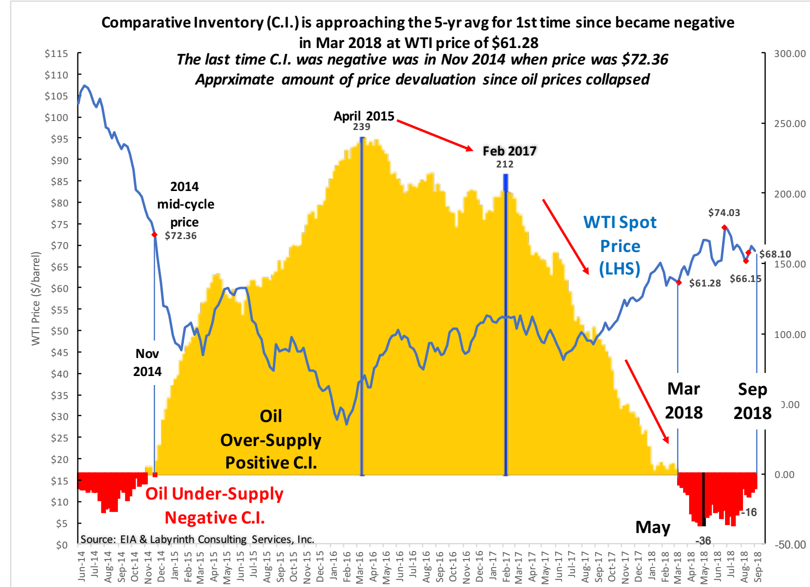
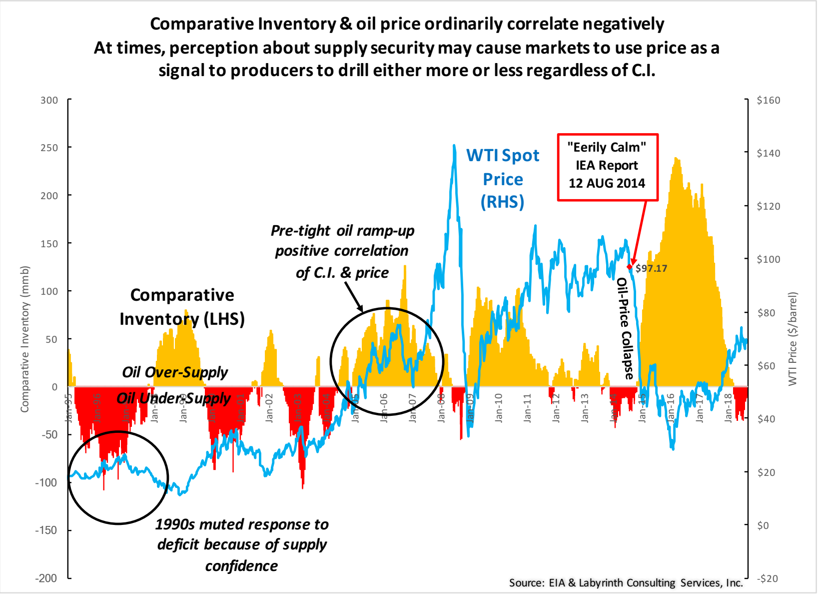
Comparative inventory: The most important approach to oil & gas price formation

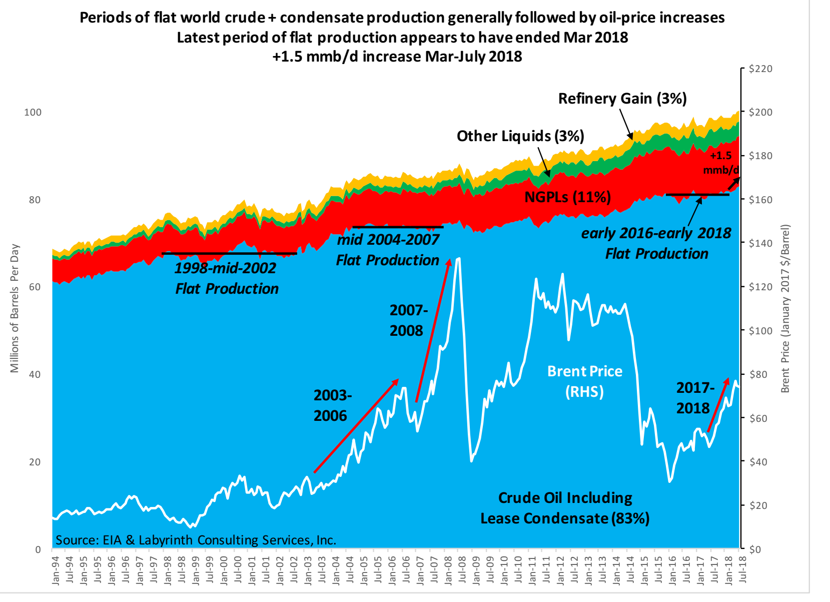




- Comparative Inventory (C.I.) is the difference between current stock levels of crude oil & select refined products, and their 5-year average.
- C.I. has accurately predicted most of the changes in oil pricing since the 1990s when inventory data first became public.
- C.I. explains the 2014 oil-price collapse and subsequent recovery.
- Over-supply and weakening demand for oil led to lower prices and a build up of oil in storage.
- As C.I. fell, prices increased and eventually led to the present C.I. deficit.
- That appears to be ending as C.I. moves back toward the 5-year average.
- This is the context for understanding the near- to medium term direction for supply, demand and prices.

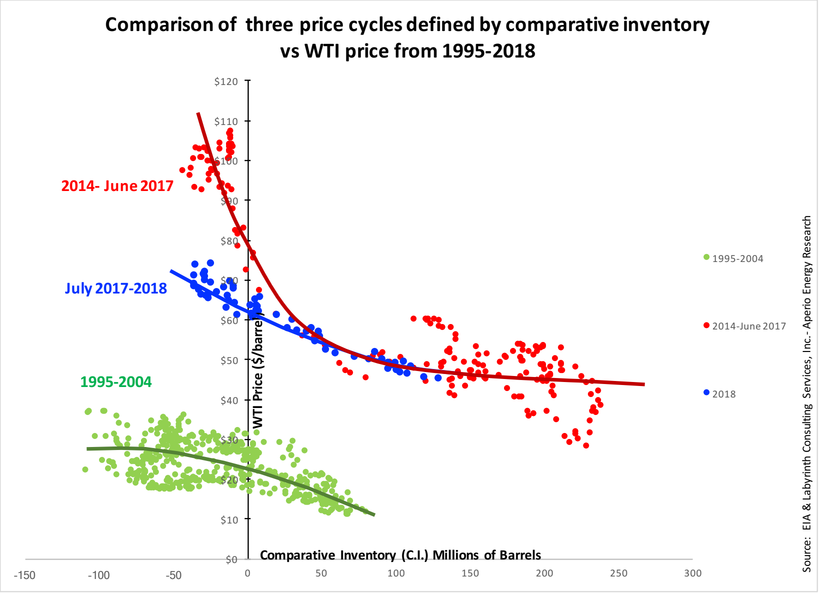
Comparative inventory ordinarily correlates negatively with price

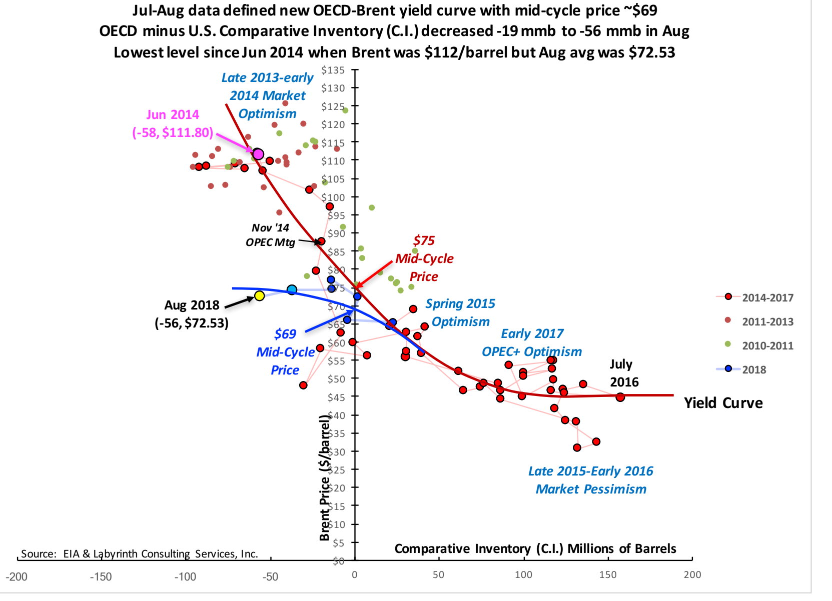




- Comparative Inventory & oil price ordinarily correlate negatively.
- At times, perception about supply security may cause markets to use price as a signal to producers to drill either more or less regardless of C.I.
- Before the ramp up of tight oil production in 2010, markets drove prices higher because of fears about supply security following flat global output 1998-2002 and 2004-2007 despite a C.I. surplus.
- Similarly, price response was muted 1995-1998 despite deep C.I. deficits because markets were confident of adequate supply.
- The recent price rally after July 2017 correlated with a period of flat production early 2016- early 2018.
- March-July 2018 world crude + condensate output increased +1.5 mmb/d leading to market confidence. Preliminary August data suggests flat production with July & may account for recent price rally.

Markets devalued WTI and Brent ~35% during the last year





- The C.I. vs oil-price yield curve intersects the y-axis at the 5-year average & is called mid-cycle price.
- It is the market clearing price of the marginal barrel needed to maintain supply thru the price cycle.
- Mid-cycle price for 2014 to mid-2017 was ~$75-$85 but a new yield curve has developed with mid-cycle price of $60-$70 but more significantly, with a much flatter trajectory than the previous yield curve.
- August OECD C.I. of -56 mmb corresponds to a Brent price of $72.53.
- A similar C.I. for June 2014 of -58 mmb corresponded to a Brent price of $111.80.
- That represents a 35% price devaluation.
- The 1995-2004 price cycle had a flat yield curve trajectory.
- Despite very negative C.I. levels, prices remained correspondingly flat.
- This was based on market sense of supply security.

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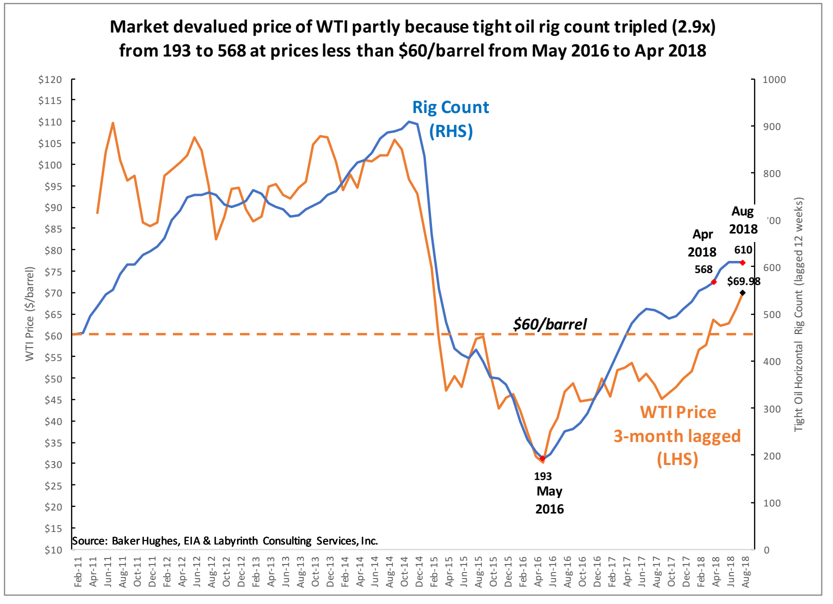
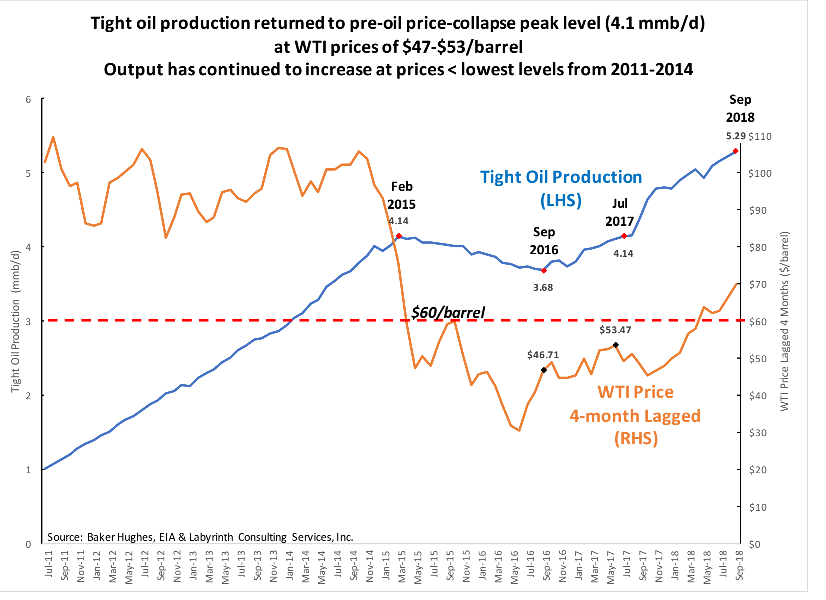
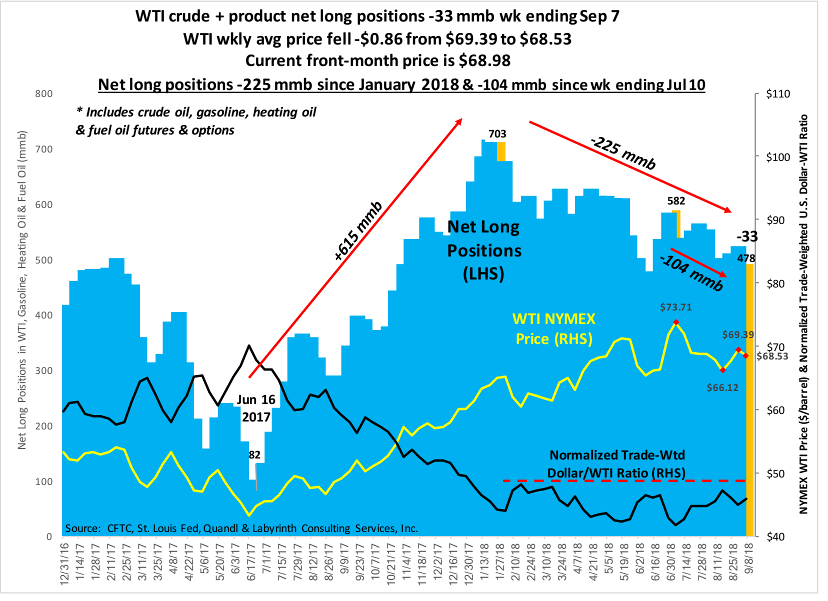
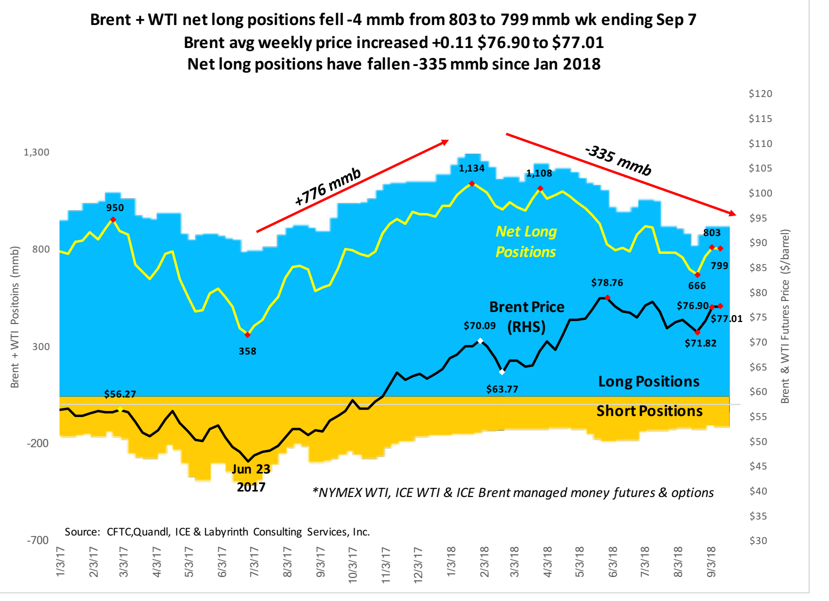




- Market devalued price of WTI partly because U.S. tight oil rig count tripled (2.9x) from 193 to 568 rigs at prices less than $60/barrel from May 2016 to Apr 2018.
- Producers have been claiming profits at successively lower break-even prices since the 2014 oil-price collapse.
- Markets hate to overpay.
- Part of price discovery is to see what happens with lower prices.
- Tight oil production returned to pre-oil price-collapse peak level (4.1 mmb/d) at WTI prices of $47-$53/barrel by July 2017.
- Markets take that as confirmation that adequate supply will be available at relatively lower oil prices than before the 2014 collapse.
- Output has continued to increase at prices less than the lowest levels from 2011-2014.

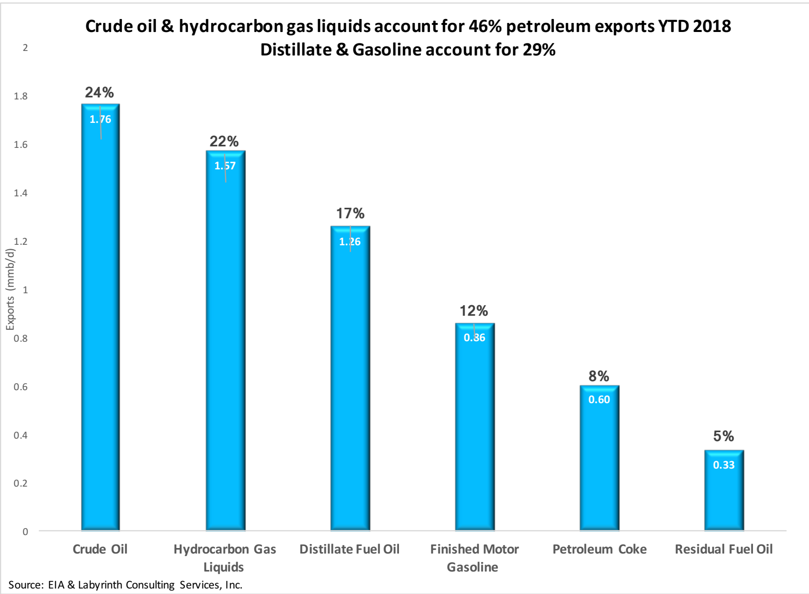
Managed money has been unwinding net long positions

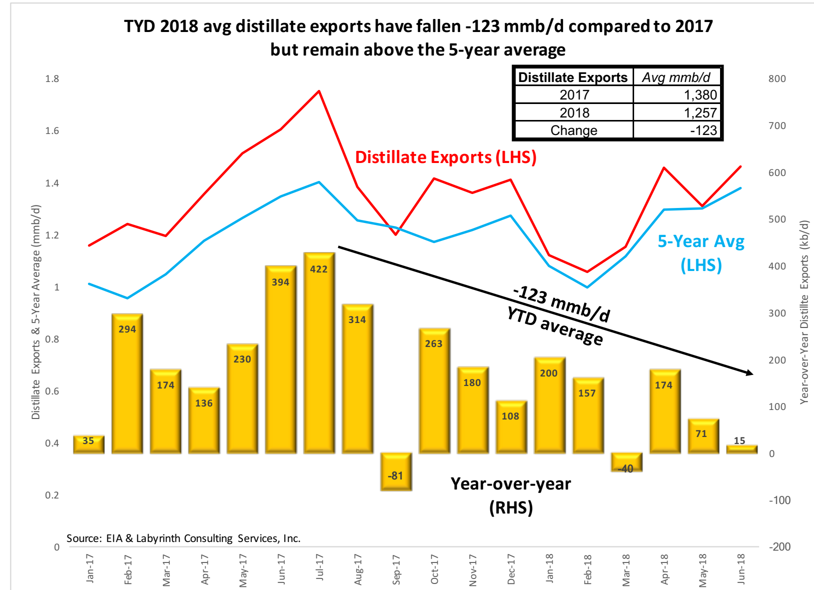




- From mid-June 2017 to Jan 2018, net long positions increased +615 mmb for WTI crude + products, and +776 for WTI + Brent.
- Brent + WTI net long positions have fallen -335 mmb since Jan 2018.
- WTI crude + refined product net long positions have fallen -225 mmb since January 2018 and -104 mmb since the week ending July 10.
- Despite high frequency price fluctuation, the overall trend is down.

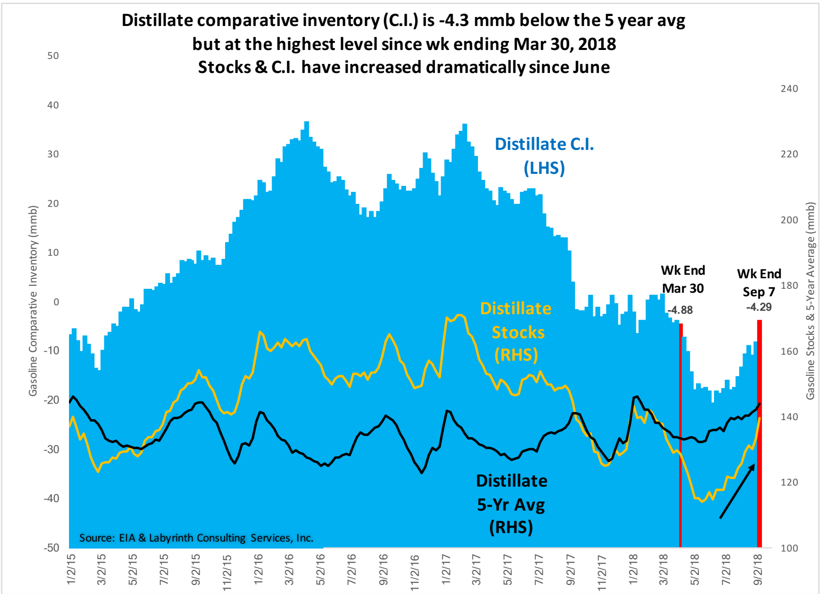
The U.S. export party seems to be losing momentum

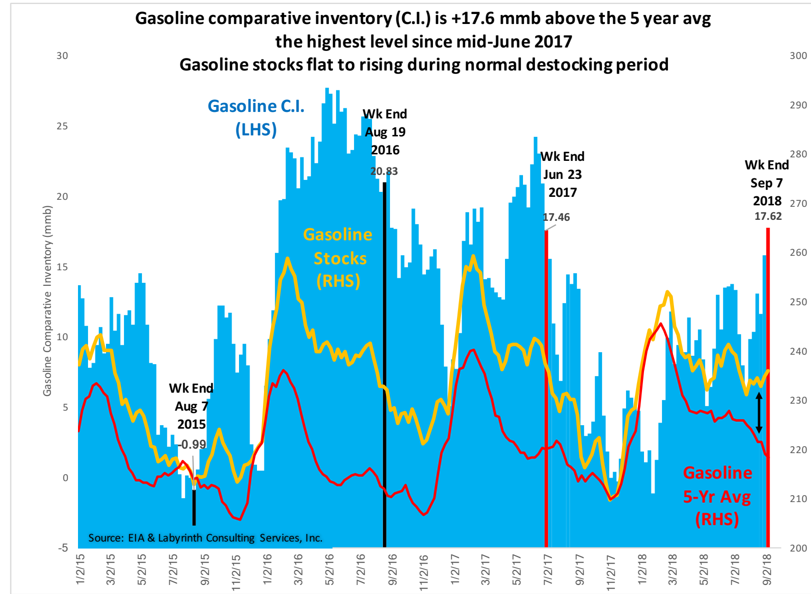




- Distillate exports have been the cash cow driving U.S. refined product exports.
- Distillates comprise ~17% of product exports
- Distillate exports remain strong and above the 5-year average but have declined compared with record levels in 2017.
- Big drop off in exports to Mexico and Brazil where refinery expansions have occurred.
- Exports may increased again when Latin American refineries begin maintenance toward the end of the year.

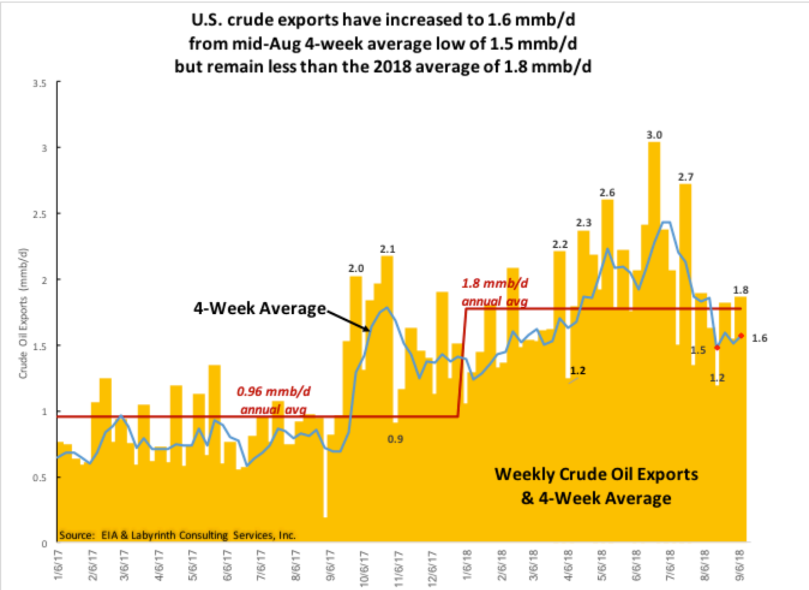
Distillate and gasoline inventories have been building

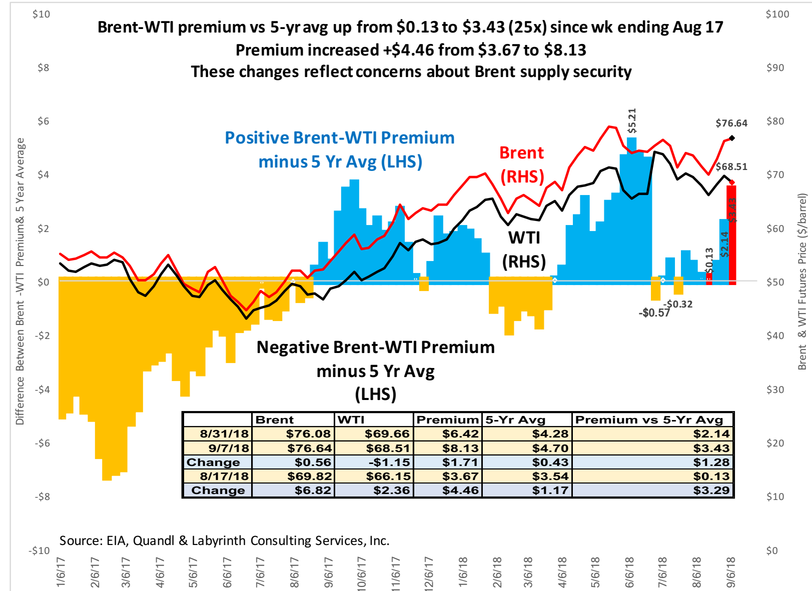




- U.S. storage reports in recent weeks have featured substantial crude oil withdrawals but sizeable distillate, gasoline and other products builds that have led to disappointing overall outcomes.
- Distillate comparative inventory (C.I.) is -4.3 mmb below the 5 year avg but at the highest level since the week ending Mar 30, 2018.
- Stocks & C.I. have increased dramatically since June.
- Gasoline comparative inventory (C.I.) is +17.6 mmb above the 5 year average and at the highest level since mid-June 2017.
- Gasoline stocks have been flat-to-rising during the normal destocking period.

Crude exports are lower but the Brent-WTI differential sends another message

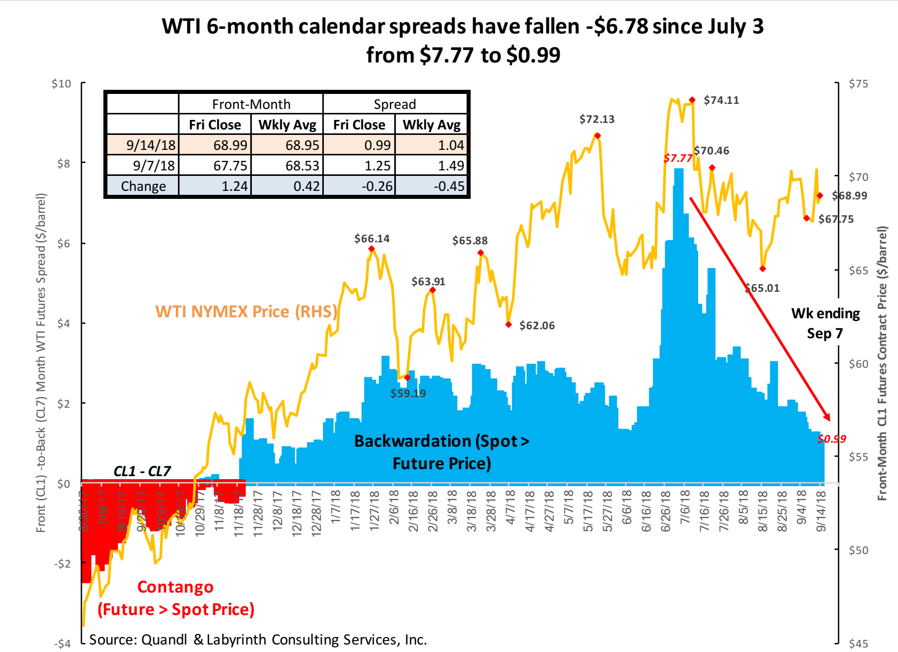


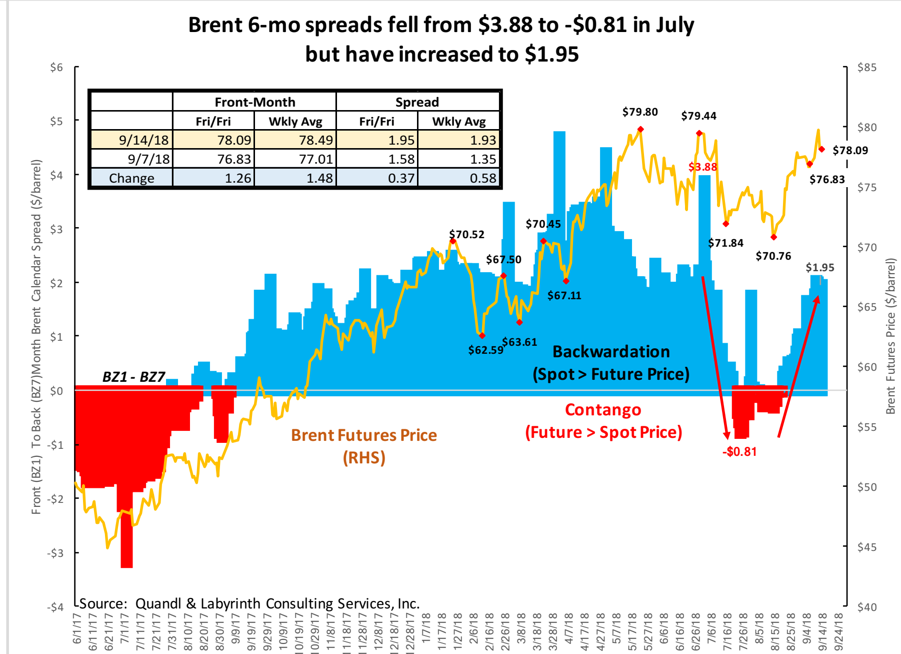


	Brent	WTI	Premium	5-Yr Avg	Premium vs 5-Yr Avg
8/31/18	$76.08	$69.66	$6.42	$4.28	$2.14
9/7/18	$76.64	$68.51	$8.13	$4.70	$3.43
Change	$0.56	-$1.15	$1.71	$0.43	$1.28
8/17/18	$69.82	$66.15	$3.67	$3.54	$0.13
Change	$6.82	$2.36	$4.46	$1.17	$3.29

- Crude oil exports remain strong but have fallen sharply from 2-3 mmb/d levels from April through July.
- Last week's exports were 1.6 mmb/d, 200 kb/d less than the 2018 YTD average of 1.8 mmb/d.
- At the same time, the Brent-WTI premium vs 5-yr average is up from $0.13 to $3.43 (25x) since week ending Aug 17.
- Premium increased +$4.46 from $3.67 to $8.13.
- These changes reflect increased market concerns about supply security.
- This could mean increased U.S. exports on the horizon.
- Yet foreign refiners have begun to understand the limitations of high-gravity U.S. crude.

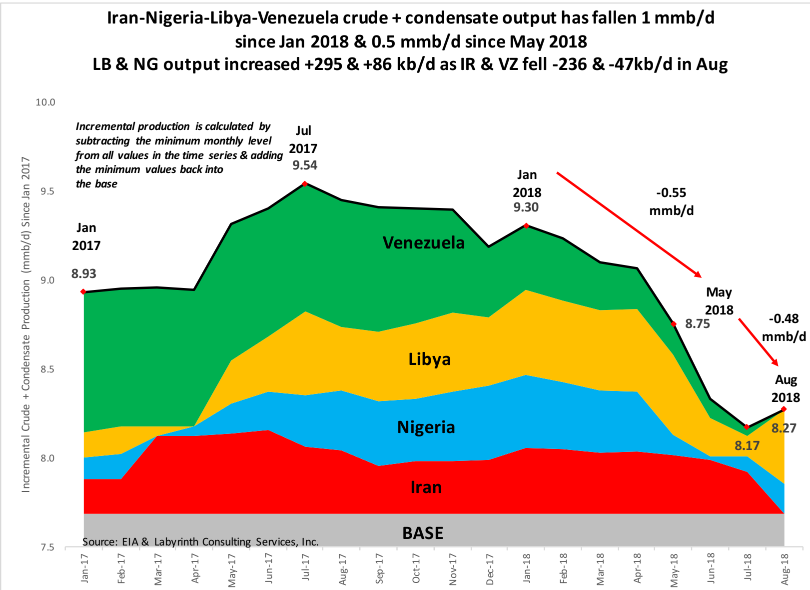
WTI and Brent spreads are moving in opposite directions

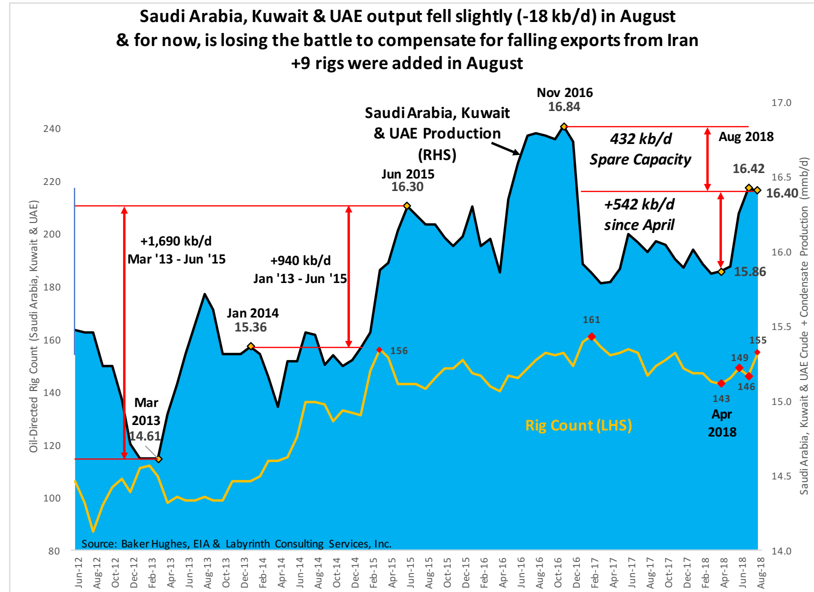




- WTI 6-month calendar spreads and front-month prices are falling.
- Brent spreads and price are generally increasing.
- WTI spreads have fallen -$6.78 since July 8, from $7.77 to $0.99.
- Brent spreads went into contango in July but have increased from -$0.81 to $1.95 in August and early September.
- Increasing Brent backwardation and positive pricing relative to WTI reflects supply security concerns.

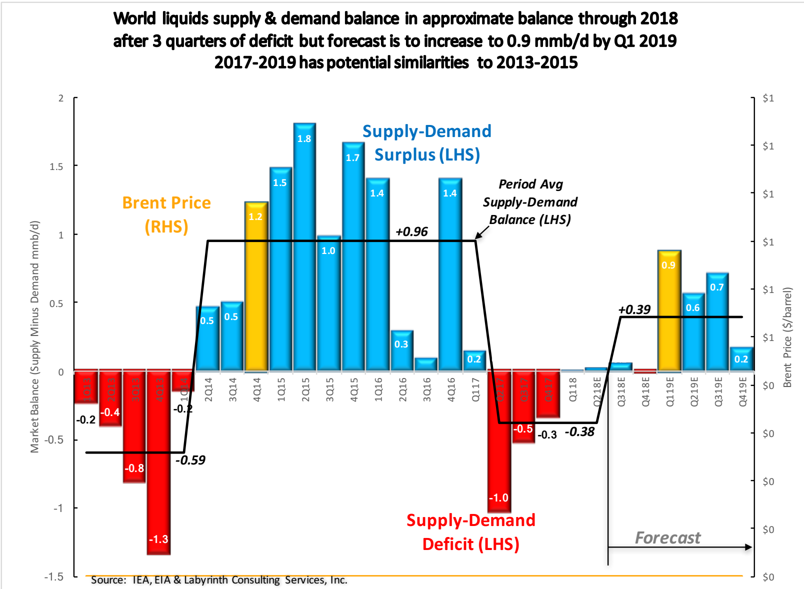
Markets have been sensitive to supply concerns in recent weeks

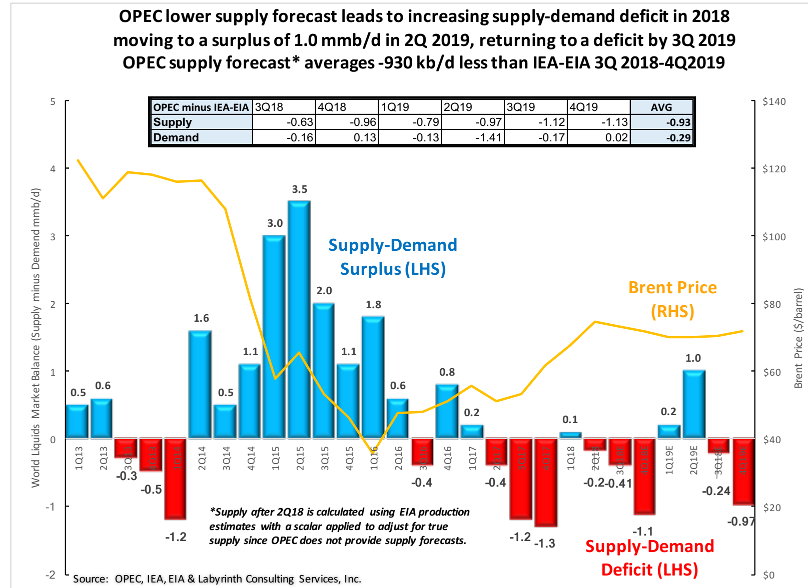




- The price rally that began in mid-August reflected renewed market concerns about tighter world supply.
- This is an artificial problem created by U.S. sanctions on Iran but real nonetheless.
- Iran, Nigeria, Libya & Venezuela production has fallen 1 mmb/d since January & 0.5 mmb/d since May 2018.
- Saudi Arabia, Kuwait & UAE have increased production 542 kb/d since April but there is considerable doubt about true spare capacity.
- Maximum output was 16.84 mmb/d just before the 2016 production cuts.
- If that represents spare capacity then, there is little left to overcome tighter supplies in the future.

Two Different Views of Supply-Demand Balance

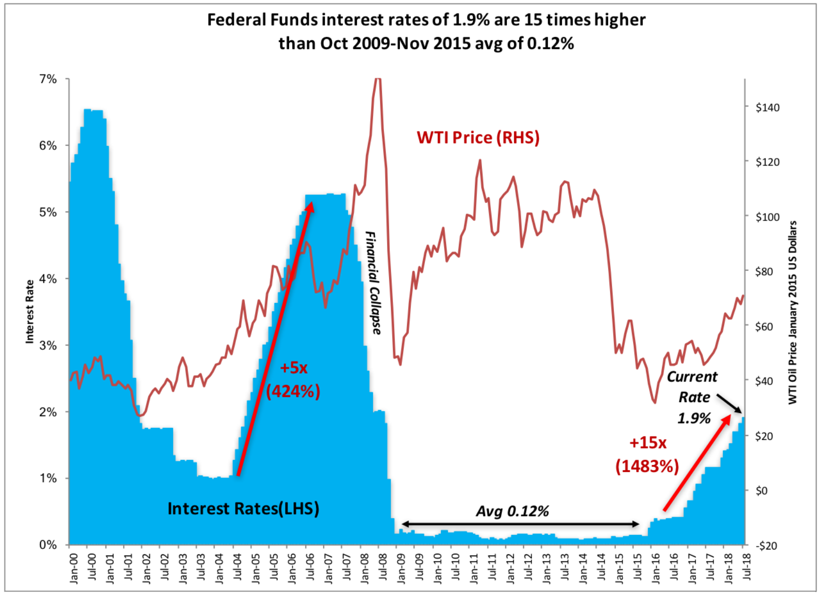


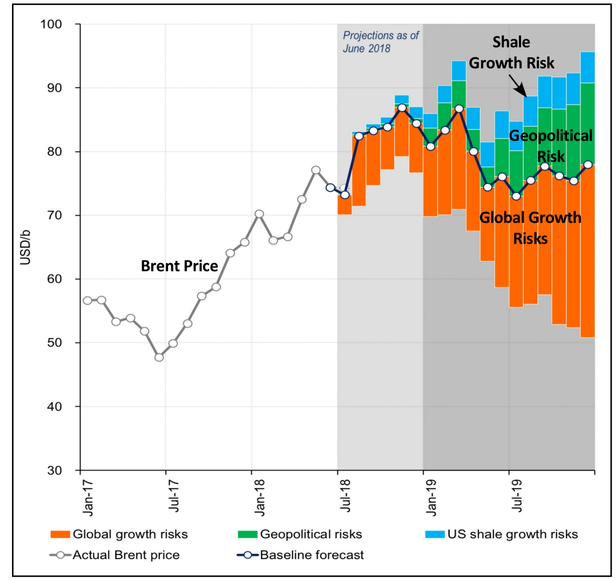


OPEC minus IEA-EIA	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	AVG
Supply	-0.63	-0.96	-0.79	-0.97	-1.12	-1.13	**-0.93**
Demand	-0.16	0.13	-0.13	-1.41	-0.17	0.02	**-0.29**

- IEA and OPEC world supply balance forecasts suggest different potential scenarios for the remainder of 2018 and for 2019.
- IEA suggests that markets have been more-or-less in balance in 2018 and are likely to move into substantial over-supply in 2019.
- OPEC forecasts show 2017 deficits continuing through 2018, and reaching a maximum in Q4.
- OPEC indicates over-supply by mid-2019 returning to deficit for the rest of that year.
- No wonder investors are confused!

Closing thoughts and observations





Source: Modified from Fattouh & Economou (2018) by Labyrinth Consulting Services, Inc.

- Oil fundamentals are only part of the story–the global economy is the main factor going forward.
- Current U.S. interest rates of 1.9% are 15 times higher (1483%) than the average 0.12% from 2009 through 2015.
- Emerging markets are taking the blows for now & a recent study by Oxford Institute for Energy Studies places global economic growth risks above geopolitical risk or shale growth risks for oil price.
- Oil supply threat from Iran probably over-stated: sanction relief likely and Iran will find ways to export crude through Iraq & black market.
- OPEC spare capacity may be greater than assumed.
- Above all, it is critical to recognize that oil markets remain in a period of secular deflation that begain in 2014.
- However things turn out, they are not going to return to the old normal.
- I expect prices to remain range-bound near or below current levels for the near term and will probably fall in 2019 (but nothing would completely surprise me!).