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Investment Research
Since 1949

Commodity Revival At Risk

You cannot create experience. You must undergo it.
Albert Camus, Notebooks, 1935 - 1942

March 2018

Robert P. Ryan

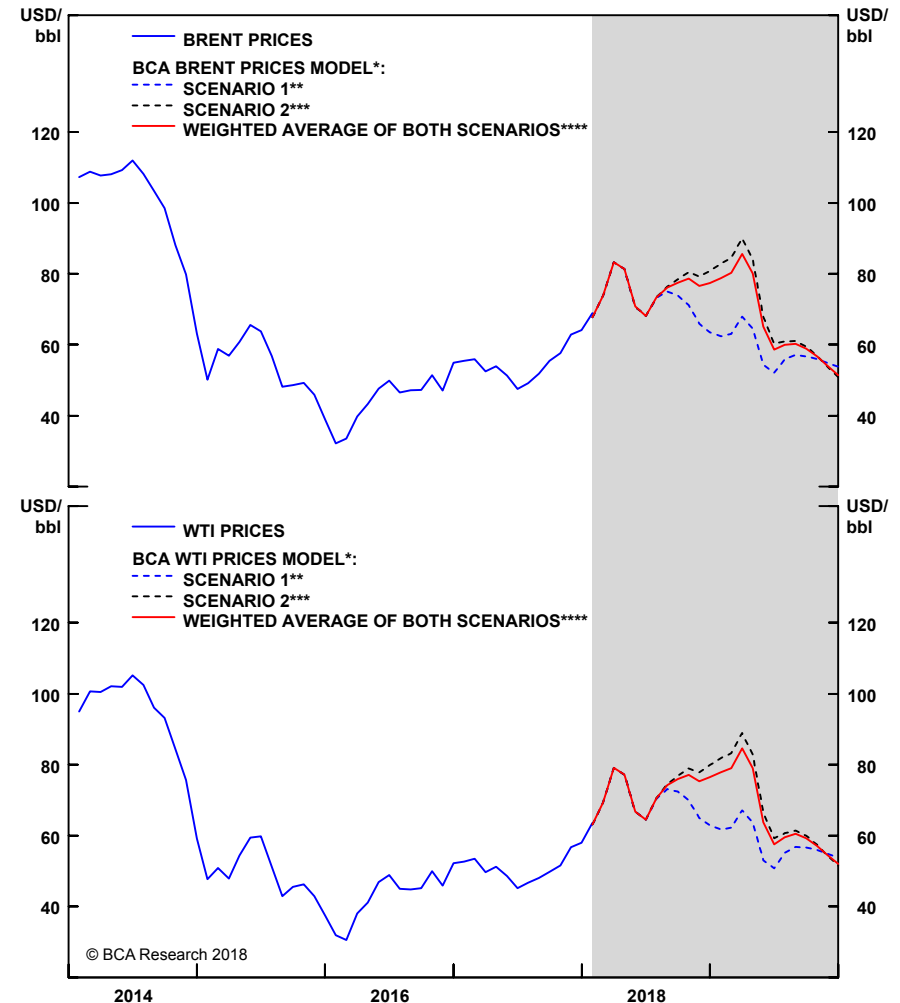
Senior Vice President

Commodity & Energy Strategy

BCA Research's Commodity & Energy Research

- Bottom-up Fundamental analysis
 - Supply
 - Demand
 - Inventories
- Top-down Global-Macro analysis
 - Financial variables (Money supply, interest rates, FX)
 - Global trade volumes, particularly EM
 - Inflation in key economies (U.S., EU, China)
- Trading-market analysis
 - Forward curves
 - Volatility
- CES Leadership
 - Bob Ryan has more than 30 years in commodities
 - NYMEX Senior Economist, Dir. of Options Research
 - ~20 years in sales/trading at BT, GS, DB
 - U.S. EIA Economist, joined BCA as an ME in 2014
 - 2016 calls up 95%; 2017 up 111%

BCA Lifts Oil Price Forecasts



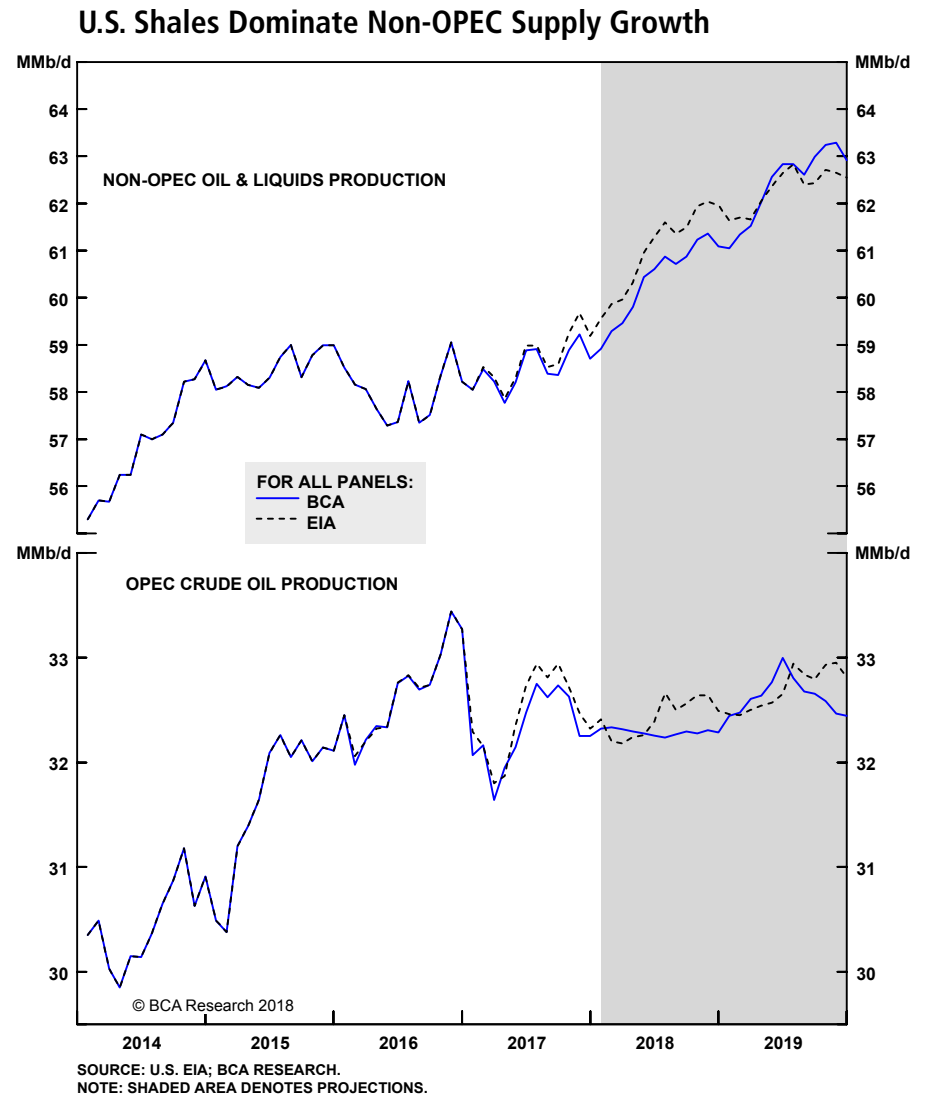
NOTE: SHADED AREA DENOTES PROJECTIONS.
 *PRICES ARE MODELED AS A FUNCTION OF FUNDAMENTAL VARIABLES.
 **OPEC 2.0 INCREASES PRODUCTION STARTING IN JUN/18.
 ***OPEC 2.0 INCREASES PRODUCTION STARTING IN DEC/18.
 ****WE ASSIGN A 20% PROBABILITY TO SCENARIO 1 AND A 80% PROBABILITY TO SCENARIO 2.

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Energy Markets

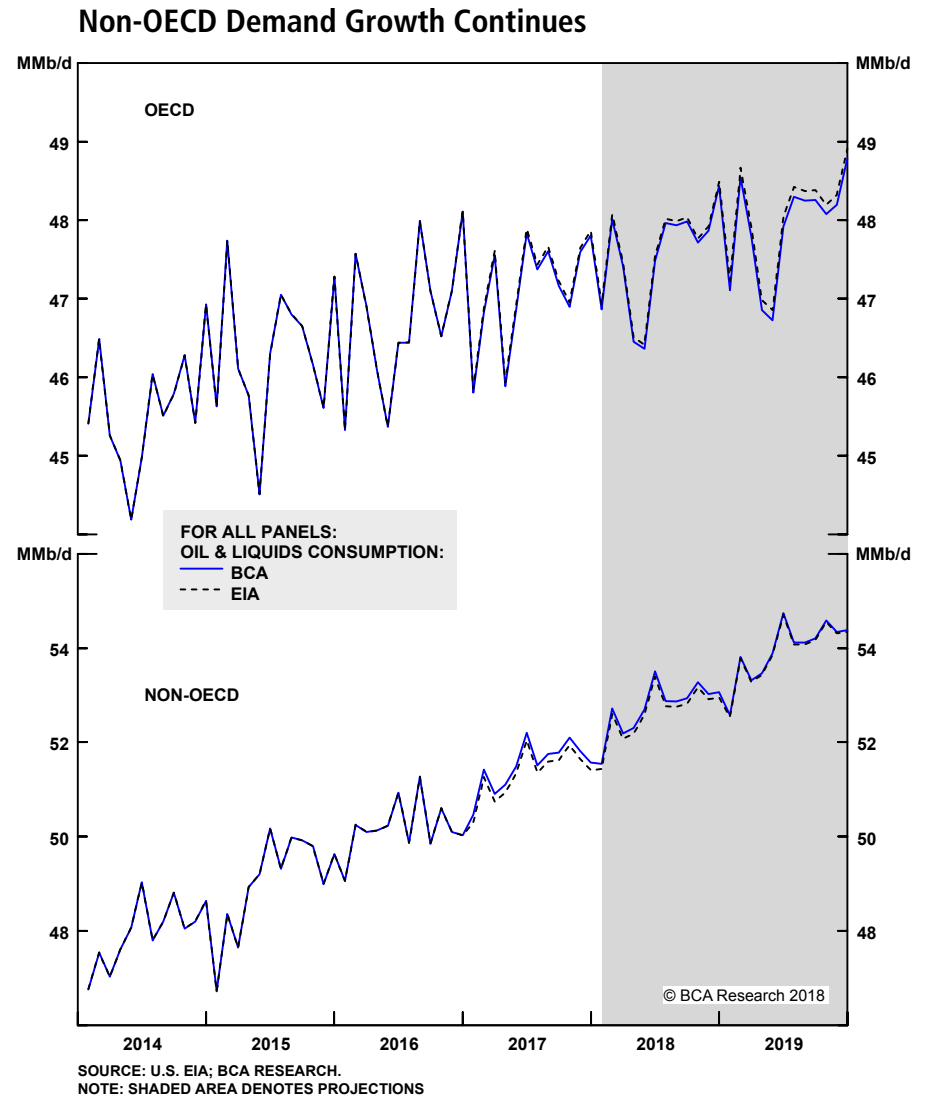
OPEC 2.0 Production Discipline Holds

- OPEC 2.0 – the producer coalition led by the Kingdom of Saudi Arabia (KSA) and Russia – will maintain its production discipline throughout 2018.
- We expect global crude and liquids supply to average 99.64mm b/d in 2018 (+1.98mm b/d). U.S. shale-oil production rises 1.15mm b/d, leading global growth.
- In 2019, global crude and liquids supply will average 102.22mm b/d (+2.58mm b/d), led again by surging U.S. shale-oil production (+1.39mm b/d).
- OPEC production in February 2018 was 270k b/d below the group's OPEC 2.0 quota of 32.73mm b/d, according to Platts.
- Beyond 2018, we believe OPEC 2.0 will endure as a coalition. It will manage production and provide forward guidance consistent with a strategy to keep WTI and Brent forward curves backwardated.



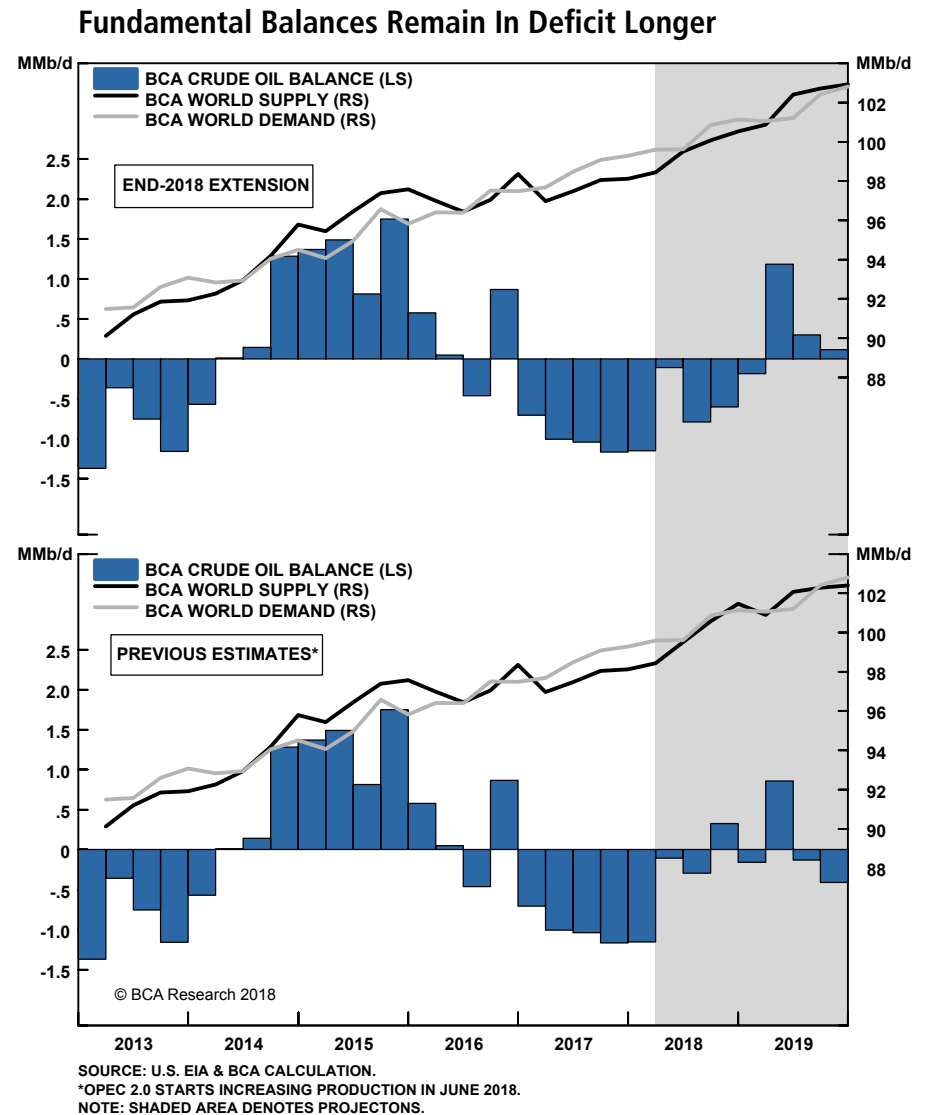
BCA's Bullish Demand Estimates

- Driven by the synchronized global recovery and lower oil prices, BCA expects EM oil demand to have grown in 2017 by ~160k b/d more than the EIA.
- With GDP growth accelerating in ~ 75% of countries monitored by the IMF, we expect commodity demand - particularly for crude oil and refined products - to remain strong in 2018 and 2019.
- The EIA has historically underestimated demand and retroactively revised its net demand estimates by an average 470k b/d per year since 2010. For 4Q17, EIA revised global demand up 450k b/d.
- China and India continue to dominate EM demand growth. Most of the slowdown in consumption since 2014 came from the economic contraction in petro states (Middle East, Russia and Brazil).
- In 2018, global demand crosses 100mm b/d; in 2019 it grows to close to 102mm b/d.



Global Oil Market Tightening

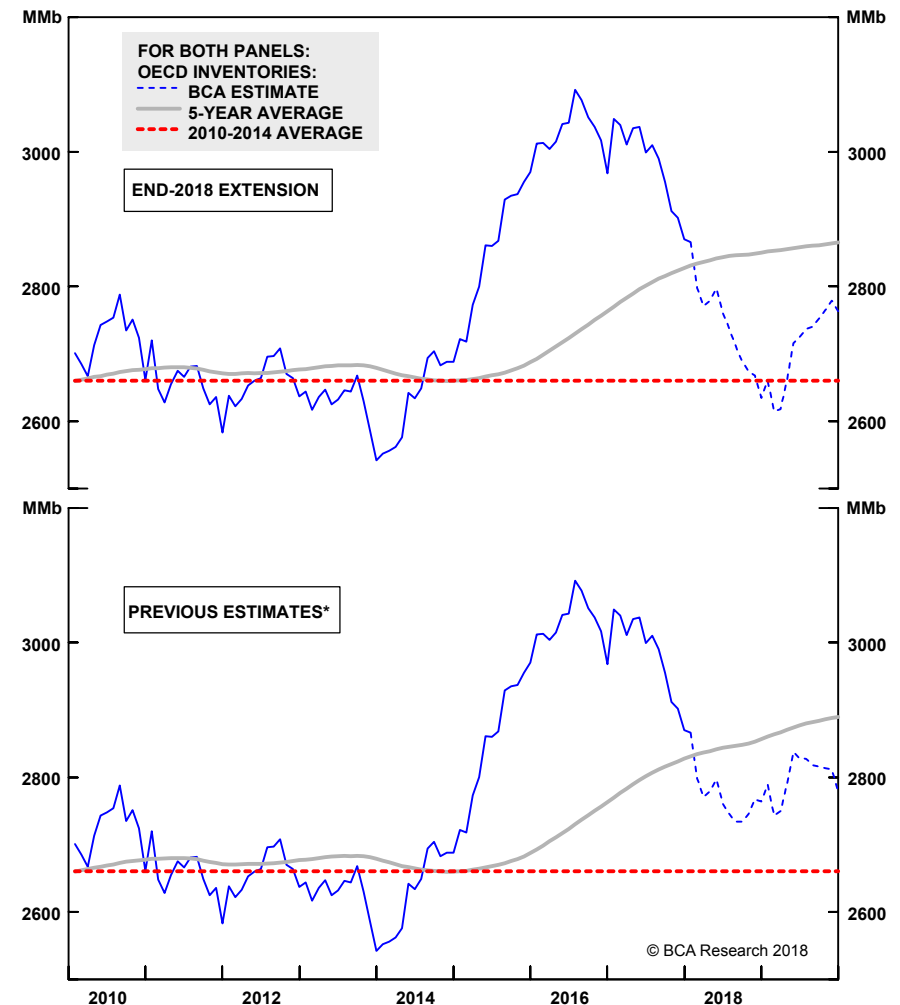
- Our monthly World Supply-Demand balances points toward a tightening of the global oil market in 2018. This will increase the impact of supply-demand shocks, particularly the impact of unplanned supply disruptions.
- The past two years have been remarkably benign (i.e. bearish for oil prices) regarding unplanned production outages, with Iran, Libya, and Nigeria all returning production to near full potential, adding over 1.5 MMb/d of constrained supply back to the world market.
- We believe the risk of future unplanned outages within OPEC are elevated – particularly in Venezuela.
- The odds OPEC 2.0's production cuts are extended to end-2018 are 80% in our modeling. This will lift average Brent and WTI crude oil prices to \$74 and \$70/bbl, respectively. The remaining 20% reflects our previous expectation that cuts would cease at end-June. Resolving this in favor of the former expectation would lift our expectations to \$76 and \$73/bbl for Brent and WTI this year, and \$70 and \$68/bbl next year.



BCA's Bullish Demand Estimates

- Supported by OPEC 2.0's strong compliance level to the agreement, we estimated OECD commercial inventories fell by 183mm bbls since January 2017.
- Extending OPEC 2.0's production cuts to end-2018 would result in an additional 130mm bbls reduction to OECD inventories versus our prior modeling. This means Brent and WTI forward curves will be more backwardated than they would have been had the barrels taken off the market at the beginning of 2017 been slowly restored starting in July of this year, as we earlier expected.
- Once OECD inventories are finally drained to below their five-year average level, the real work for OPEC 2.0 begins.
- We expect U.S. shale production increases by 1.15mm b/d from December 2017 to December 2018, and another 1.3-1.4mm b/d during calendar 2019. This dominates non-OPEC production growth this year and next. Due to the supply response of the shales to higher prices in 2018, global production levels would see a net increase from March 2019 and beyond.

Maintaining Production Cuts Depletes Inventories Even More



SOURCE: U.S. EIA; BCA RESEARCH.
*OPEC 2.0 STARTS INCREASING PRODUCTION IN JUNE 2018.

Balances Tighten

- Oil ministers from the Kingdom of Saudi Arabia (KSA) and Russia - OPEC 2.0's putative leaders - separately indicated increased comfort with higher prices over the next year or so.
- This suggests they are converging on a strategy that accommodates KSA's need for higher prices over the short term to support the IPO of Saudi Aramco, and Russia's longer-term desire to avoid price levels that overly incentivize growth in the U.S. shales.
- We believe OPEC 2.0's production cuts will be extended to year-end.
- This drives our expectation Brent and WTI crude oil prices will average \$74 and \$70/bbl this year, respectively.
- For next year, the extended cuts lift Brent and WTI to \$67 and \$64/bbl.

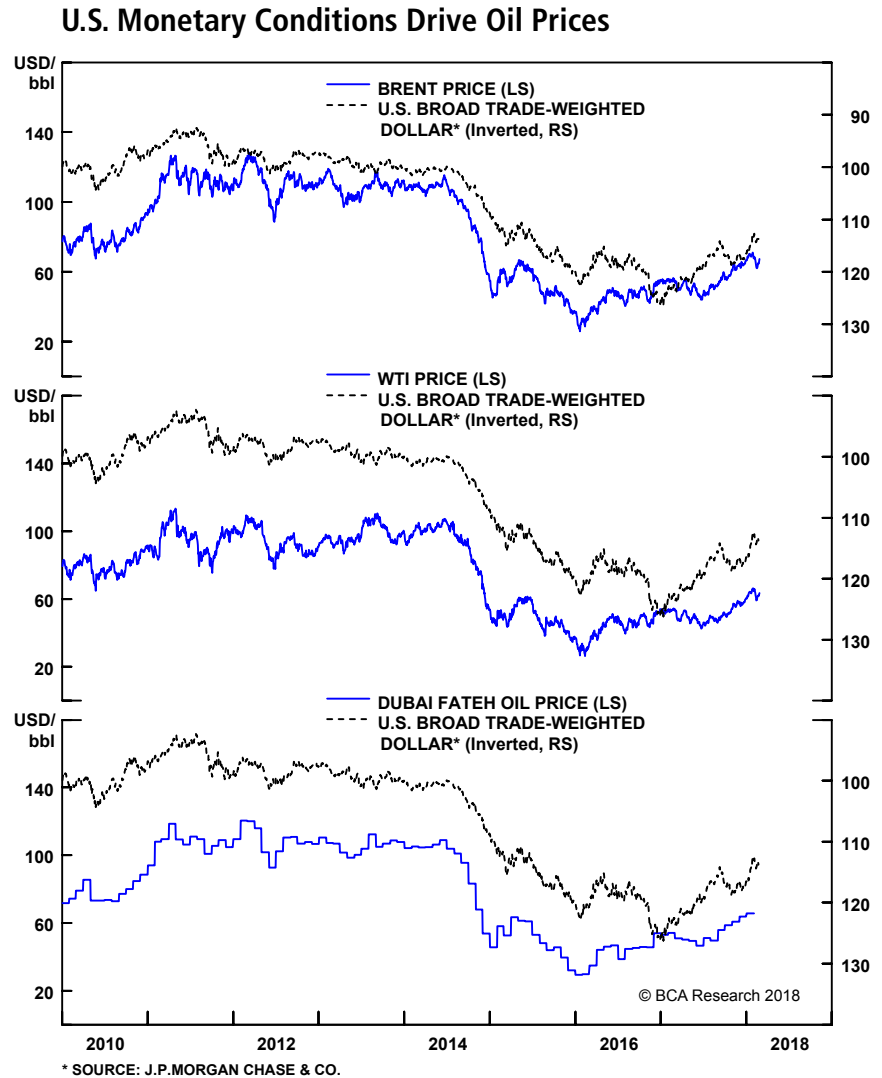
BCA Global Oil Supply - Demand Balances (mm b/d)

	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19
OPEC PRODUCTION OF CRUDE OIL AND LIQUIDS								
OPEC CRUDE OIL PRODUCTION	32.32	32.28	32.27	32.29	32.51	32.80	32.71	32.50
OF WHICH								
ALGERIA	1.04	1.02	1.01	0.99	0.98	0.96	0.95	0.93
ANGOLA	1.61	1.59	1.58	1.56	1.55	1.53	1.52	1.50
ECUADOR	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
EQUATORIAL GUINEA	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
GABON	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
IRAN	3.85	3.86	3.88	3.89	3.91	3.92	3.94	3.95
IRAQ	4.47	4.50	4.55	4.63	4.65	4.65	4.65	4.65
KUWAIT	2.71	2.71	2.71	2.71	2.77	2.83	2.80	2.80
LIBYA	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.90
NIGERIA	1.75	1.74	1.72	1.71	1.69	1.68	1.66	1.65
QATAR	0.61	0.61	0.61	0.61	0.64	0.67	0.68	0.68
SAUDI ARABIA	10.00	10.00	10.00	10.00	10.13	10.33	10.29	10.13
UAE	2.91	2.91	2.91	2.91	2.95	3.01	3.05	3.05
VENEZUELA	1.59	1.56	1.53	1.50	1.47	1.44	1.41	1.38
OPEC NON-CRUDE LIQUIDS	6.90	6.94	6.98	7.02	7.05	7.12	7.19	7.27
TOTAL OPEC PETROLEUM SUPPLY	39.22	39.22	39.25	39.31	39.56	39.92	39.90	39.77
NON-OPEC PRODUCTION OF CRUDE OIL AND LIQUIDS								
N. AMERICA	23.48	24.15	24.62	25.25	25.55	26.18	26.48	26.86
OF WHICH								
U.S. ONSHORE	7.82	8.04	8.33	8.69	9.08	9.46	9.80	10.08
CENTRAL AND S. AMERICA	5.01	5.50	5.83	5.50	5.12	5.63	5.96	5.63
EUROPEAN	4.35	4.28	4.09	4.31	4.30	4.22	4.10	4.29
FSU AND EASTERN EUROPE	14.46	14.44	14.37	14.41	14.48	14.43	14.49	14.49
OF WHICH								
RUSSIA	11.18	11.16	11.10	11.10	11.17	11.33	11.22	11.43
MIDDLE EAST (EX OPEC)	1.11	1.09	1.07	1.05	1.05	1.03	1.02	1.00
AFRICA	1.78	1.78	1.78	1.78	1.80	1.80	1.80	1.80
ASIA AND OCEANIA	9.25	9.27	9.29	9.33	9.30	9.30	9.29	9.30
TOTAL NON-OPEC PETROLEUM SUPPLY	59.22	60.28	60.82	61.23	61.30	62.47	62.81	63.15
TOTAL WORLD SUPPLY	98.45	99.50	100.07	100.53	100.87	102.39	102.71	102.92
GLOBAL LIQUID FUELS CONSUMPTION								
TOTAL NON-OECD	52.15	52.84	52.89	53.12	53.23	54.03	54.14	54.44
TOTAL OECD	47.43	46.77	47.96	48.00	47.81	47.17	48.27	48.35
OF WHICH								
N. AMERICA	22.29	22.48	23.09	22.85	22.60	22.89	23.38	23.13
CNTL. AND S. AMERICA	8.83	9.00	9.10	9.14	8.95	9.14	9.24	9.28
EUROPE	14.91	14.96	15.40	15.13	14.96	14.94	15.41	15.22
EURASIA	4.81	4.85	5.12	5.00	4.86	4.90	5.17	5.05
MIDDLE EAST	8.35	8.90	9.32	8.73	8.48	9.06	9.48	8.89
AFRICA	4.47	4.46	4.37	4.48	4.61	4.59	4.51	4.62
ASIA AND OCEANIA	35.94	34.96	34.46	35.81	36.59	35.69	35.21	36.61
TOTAL WORLD DEMAND	99.59	99.61	100.86	101.14	101.05	101.21	102.41	102.80

SOURCE: BCA RESEARCH; U.S. EIA.

Elevated FX Risks In 2H18

- From our modelling, we find the USD to be an important explanatory variable for oil prices.
- In line with our House view, we are expecting some USD strengthening on the back of as many as four interest-rate hikes by the Federal Reserve in the U.S. As we've noted in the past, we expect these effects to be felt more in 2H18.
- A steeper backwardation in oil forward curves - i.e., the front of the curve trades premium to the deferred contracts - reduces the USD's effect on oil prices, all else equal.
- In other words, supply-demand fundamentals dominate the evolution of oil prices when forward curves are more backwardated, and the influence of financial variables -the USD in particular - is muted.



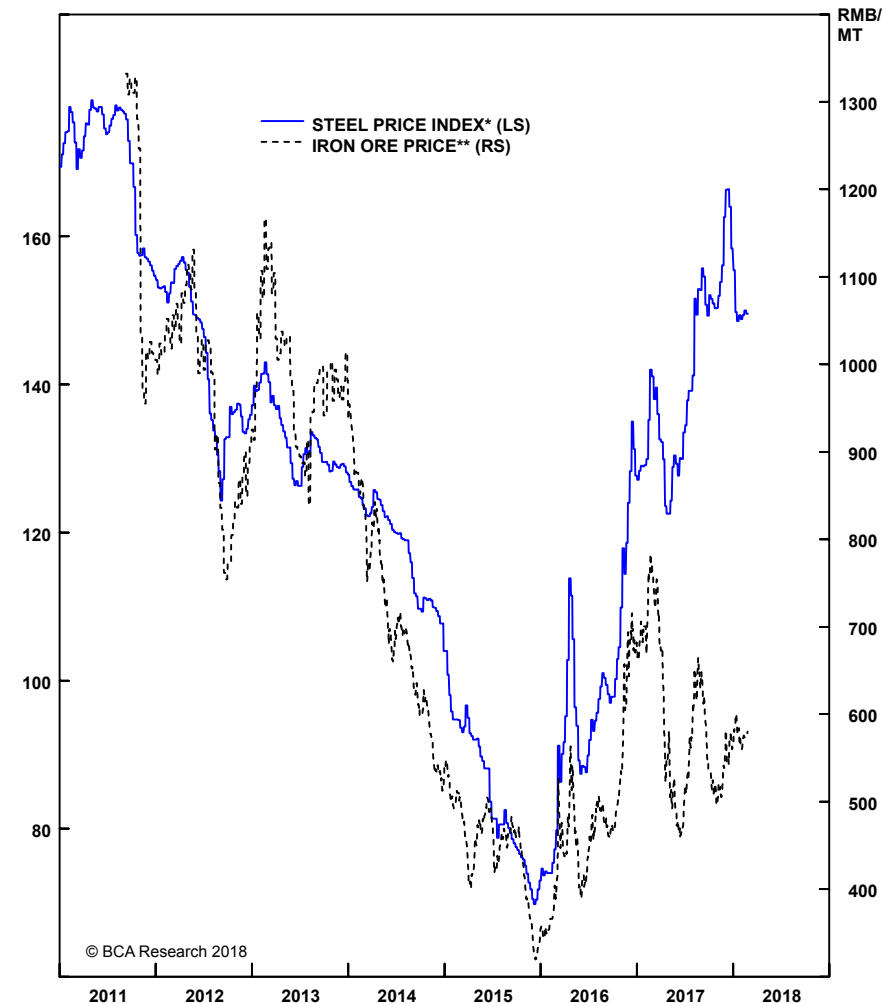
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Bulks + Base Metals Markets

China's Environmental Reforms Drive Steel & Iron Ore

- China's environmental policy actions reduced world steel-making capacity by ~115mm MT between 1H16 and 1H18.
- The total gain in steel prices since the start of Beijing's focus on steel-market reforms is a resounding 108%.
- Iron ore prices posted similar gains to steel in 2016 but diverged sharply in 2017
 - Prices slumped more than 40% between mid-March and mid-June
 - Iron ore prices ended last year 15% lower yoy, and have since rebounded by 3.5%.

Steel, Iron Ore Prices Diverge



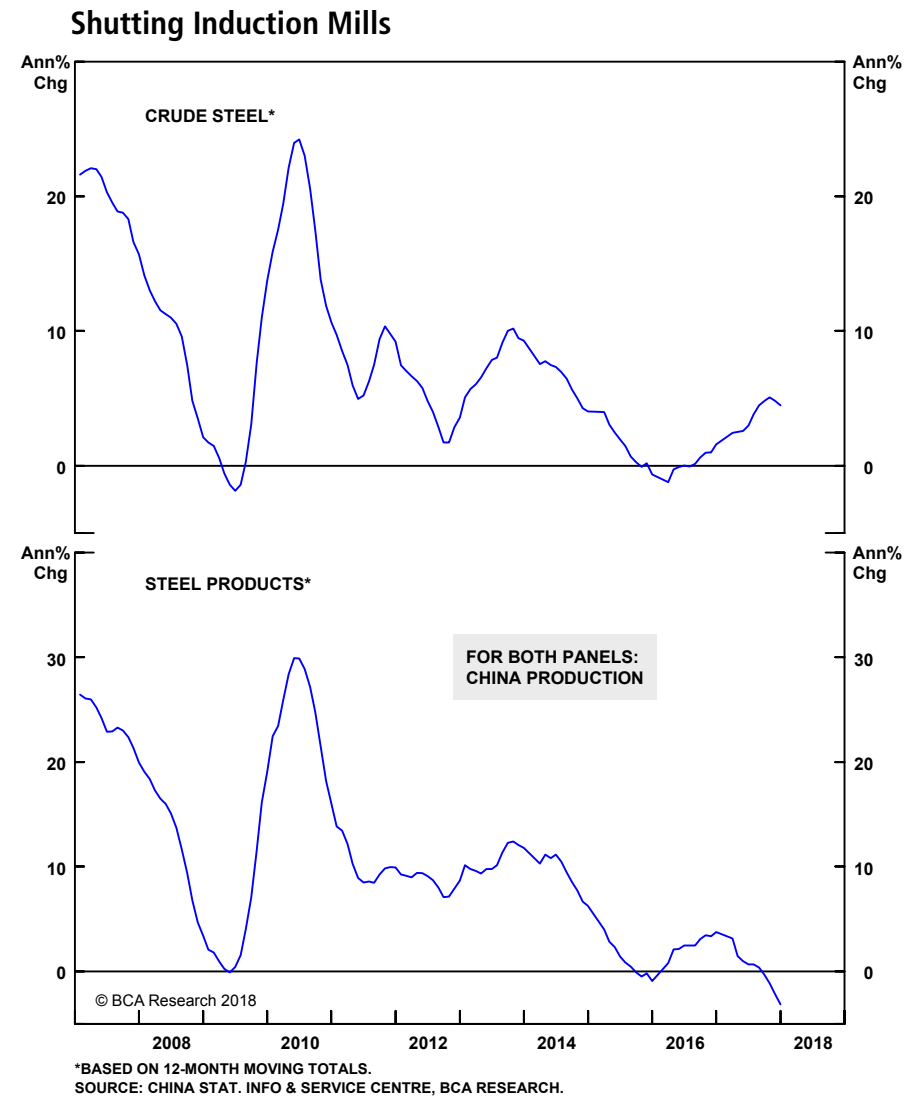
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*MYSPI STEEL COMPOSITE PRICE INDEX FROM MYSTEEL.COM.; 2005=100.

**SOURCE: CHINA IRON & STEEL ASSOCIATION, AVERAGE CHINA IMPORT PRICE 62% GRADE.

China's Steel Paradox: Record Crude Output Amid Falling Products Output

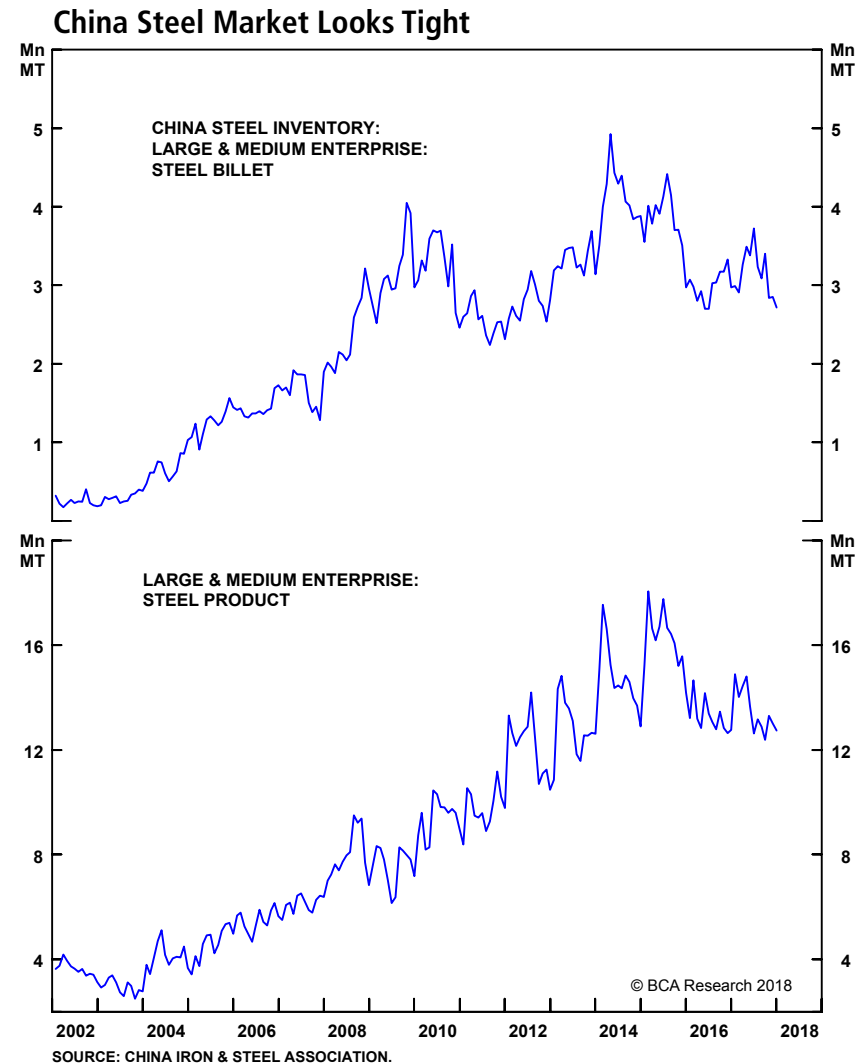
- In addition to eliminating 100-150mm MT of outdated steel capacity over the 2016-2020 period, Beijing pledged to eliminate smaller induction furnaces in China by 2H17.
- These induction furnaces account for ~ 80-120mm MT worth of annual capacity. Actual output was ~ 30-50mm MT in 2016.
- The production cuts from induction mills are not evident in official data – China's crude steel production figures have continued to rise amid these cuts.
- This production paradox is because Chinese induction furnaces are illegal. As a result, their output is not accounted for in official production data.



Evidence Of A Tight Steel Market In China

➤ Despite record crude steel production in China, the following observations point to a strained steel market:

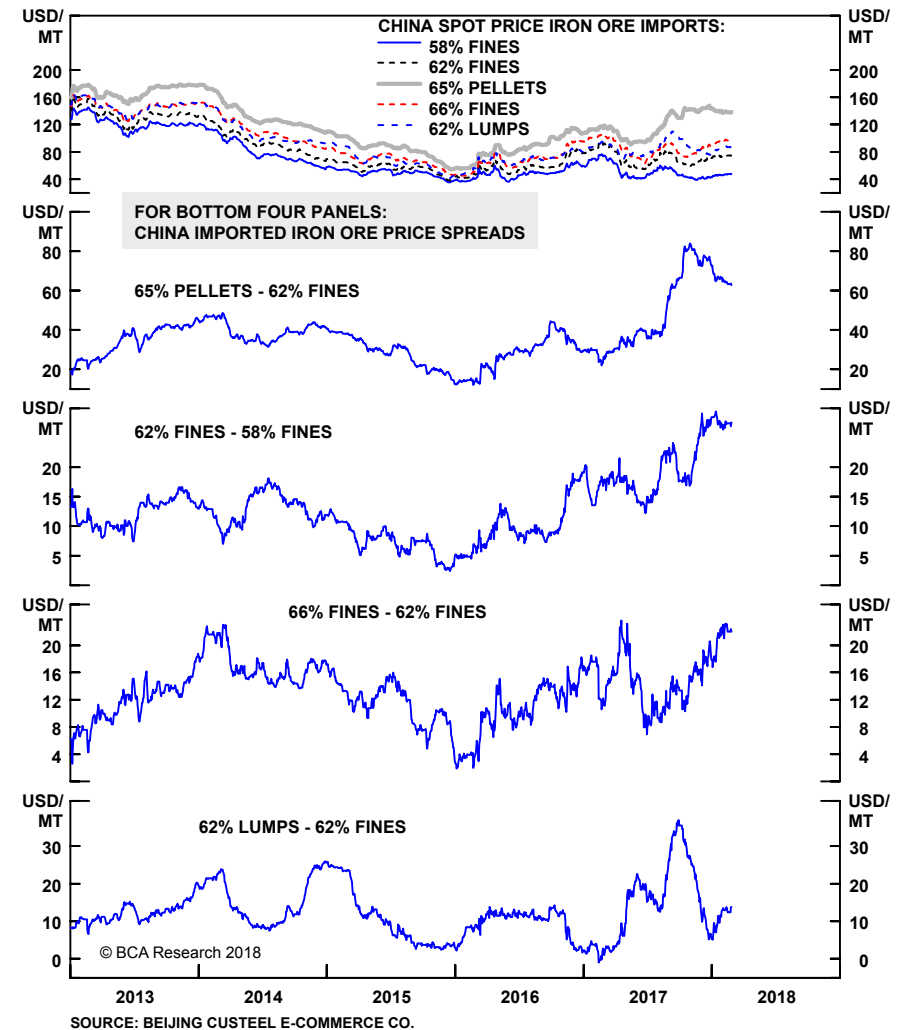
1. Output of steel products have been falling: they came in 3.46% lower yoy for the March to November period – the first yoy decline for that period since 1995.
2. China's steel exports have been on a downtrend.
3. China's scrap steel imports – the main input to illegal induction furnaces – fell in 2H17.



Wider Iron Ore Spreads

- A consequence of the steel winter capacity cuts in China is stronger demand for higher grade raw materials.
- Higher-grade ores are more efficient for blast furnaces, allowing them to produce more steel from each tonne of iron ore.
- Given steelmakers' healthy profit margins, they are able to afford the higher grades and are favoring productive efficiency.
- This widened the discount for lower grade iron ore fines – 58% iron content – as well as the premium for higher grade 65% iron content.
- Premiums for iron ore pellets and lumps – which do not require the highly polluting sintering phase – have also widened.

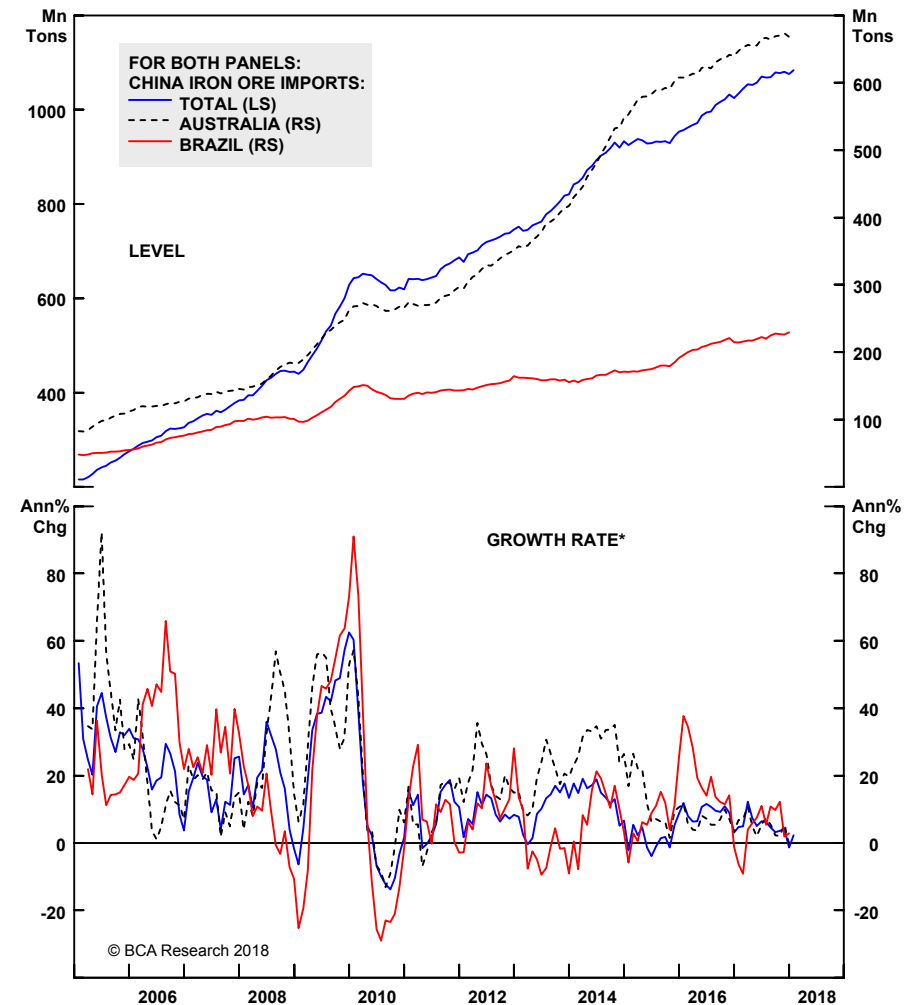
Reform Widens IO Spreads



Demand For High-Grade Iron Ore Will Persist

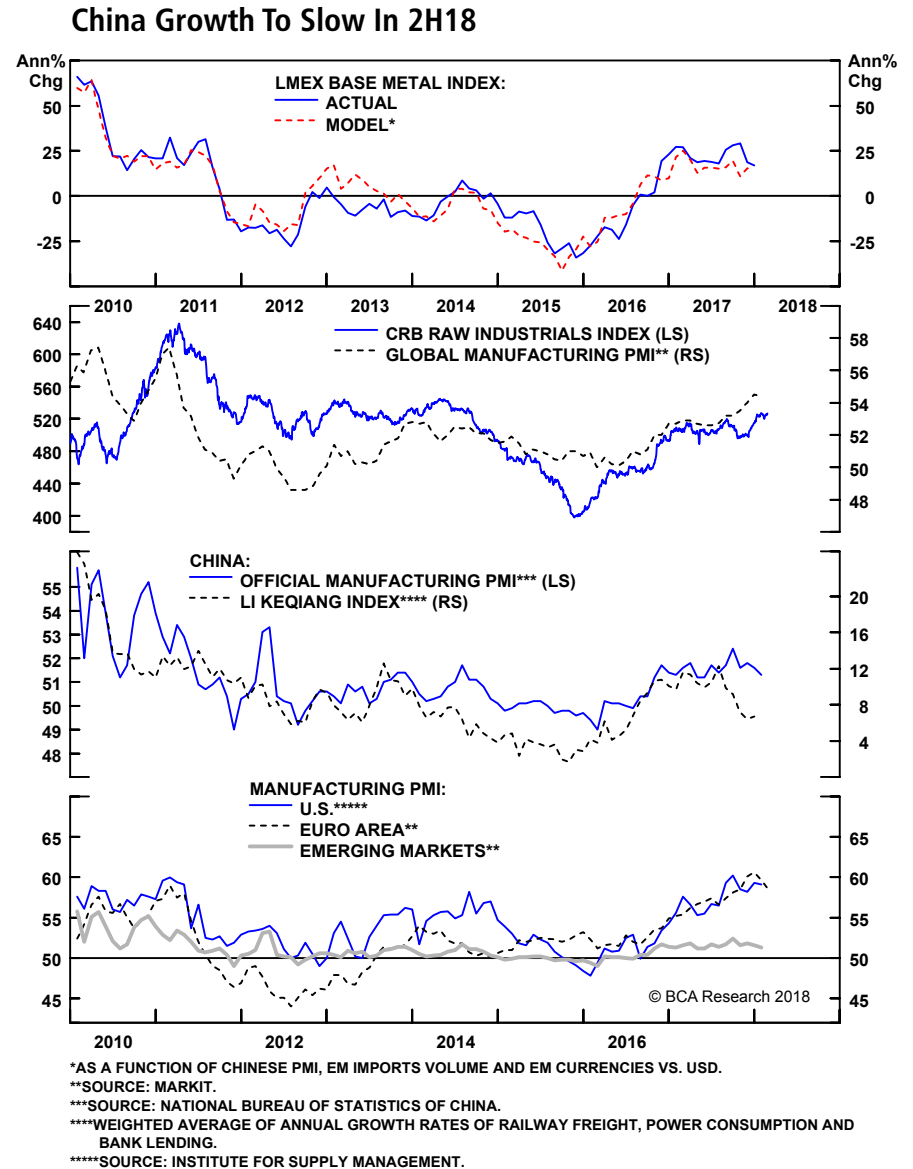
- Higher metallurgical coke prices are also driving up spreads. Higher-grade iron ore requires less met coke to purify the ores.
- China's imports show a decline in iron ore from India – which is of the lower grades.
- On the other hand, high-grade ore imports from Brazil and Australia are expected to remain strong.
- Keeping production going on the back of higher-grade ores will dampen the impact of the winter production cuts.
- China's environmental focus is long-term, and, as a result, we expect these spreads to remain wider than their historical average.

High-Quality IO Favored In China



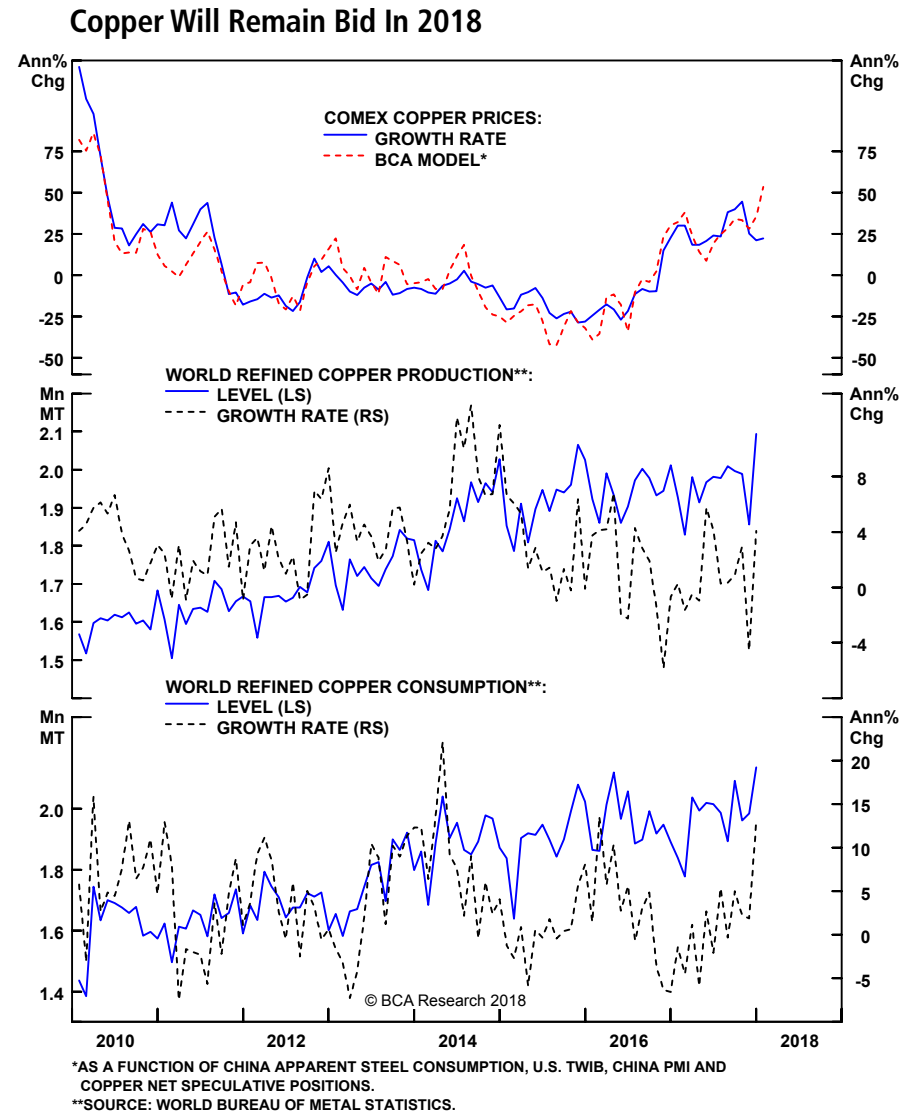
China Growth Slows After 1H18

- While we expect more upside to metal prices in 1H18, slowing growth in China and a stronger USD will prevent a repeat of 2017's stellar performance.
- Xi's reforms will turn into a headwind for metal prices as they begin to impact the real economy later this year.
 - The Li Keqiang index and PMIs are weaker.
 - Real estate sector, a huge consumer of steel, also will weaken in big cities.
- Another bearish risk comes from a stronger USD. We see the Fed as more committed to interest-rate normalization than markets expect, particularly in 2H18.



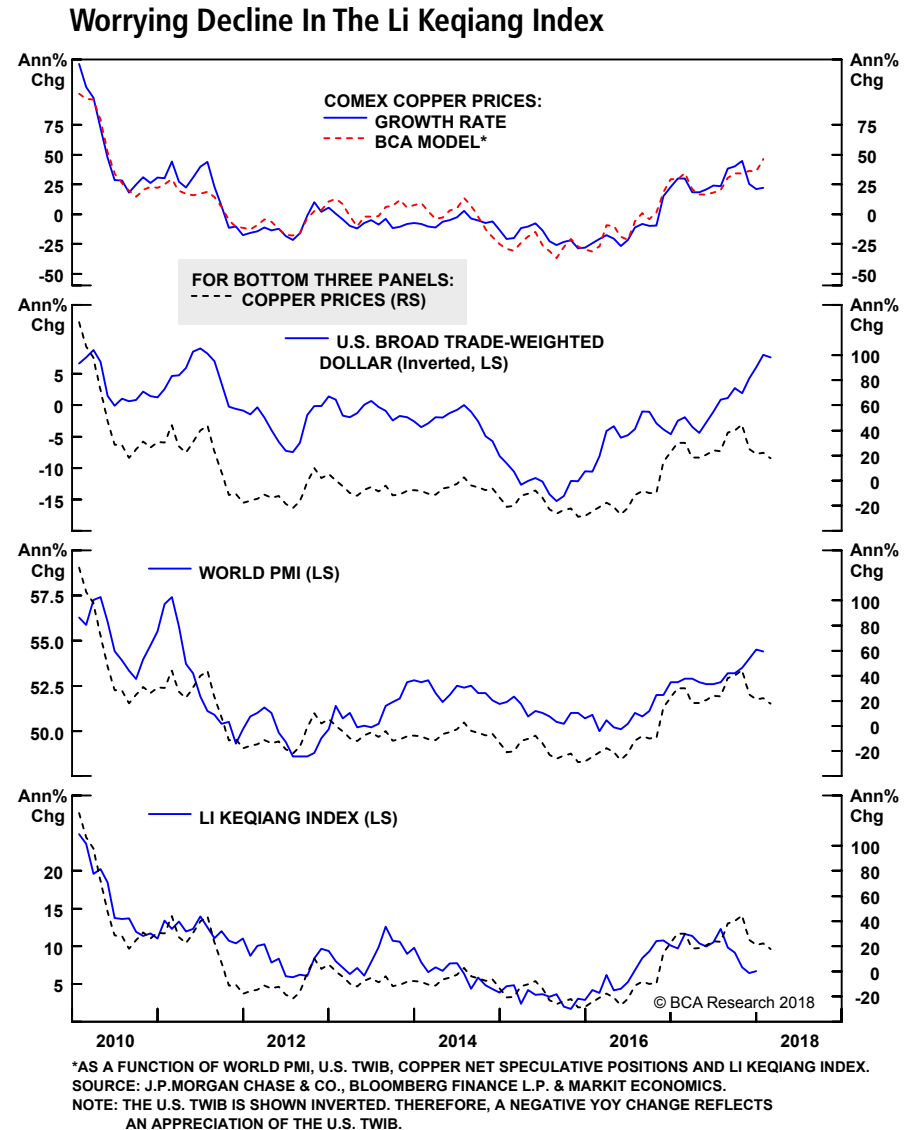
Copper Prices Remain Supported

- In our modelling of copper, we find that China's steel consumption leads copper prices 6 months into the future.
- This is because the construction sector is a huge end user of both materials at different stages in the construction process.
- We do not expect a demand-induced plunge in copper prices over the next 6 months.



China Fears Weighing On Copper Prices

- While bullish sentiment for copper remains high, concerns that policymakers' attempts at a managed slowdown in China this year goes too far will weigh on the market.
- Fundamentally, support for copper prices from potential supply shortfalls at both the mining and refining levels will be offset by a stronger USD and slower growth in China this year.

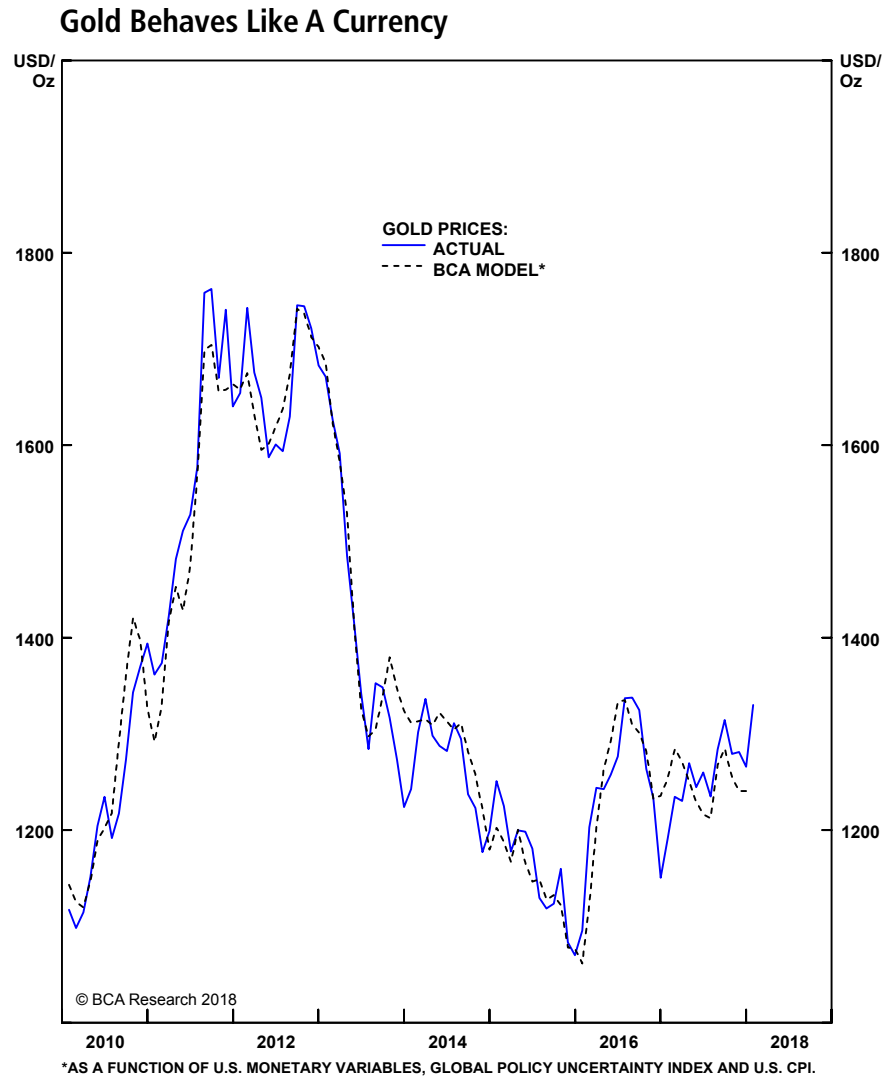


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Precious Metals Markets

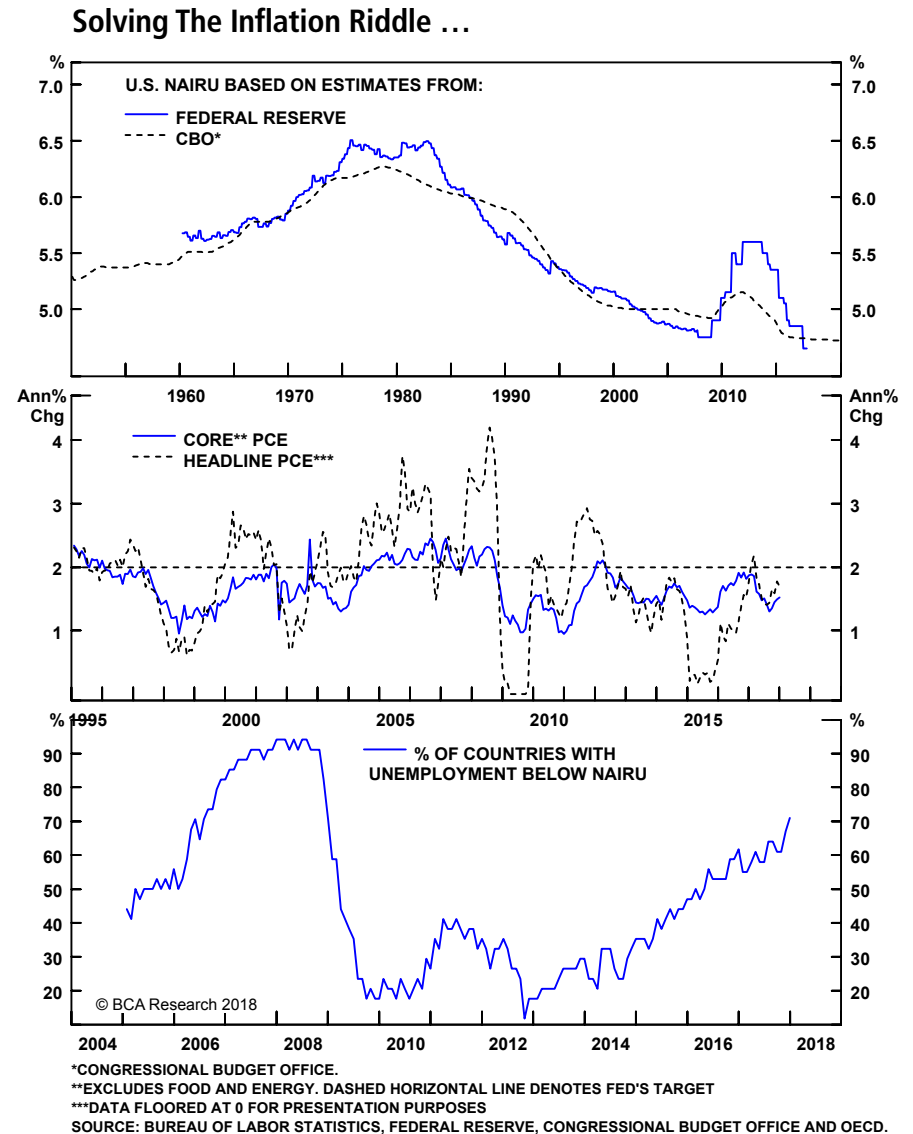
Inflation, U.S. Financial Variables Drive Gold

- Looking into 2018, the major risk factors driving gold will, on balance, continue to incline us to favor gold as a strategic portfolio hedge.
 - Inflation and inflation expectations;
 - Fiscal and monetary policy; and
 - Geopolitical risks argue in favor of gold.
- However, this will be partially mitigated by Fed rate hikes
 - We expect four hikes this year.
 - But if inflation fails to show up again, monetary policy in the U.S. could remain accommodative, which will favor gold.



Monetary Accommodation Fails To Spur Inflation

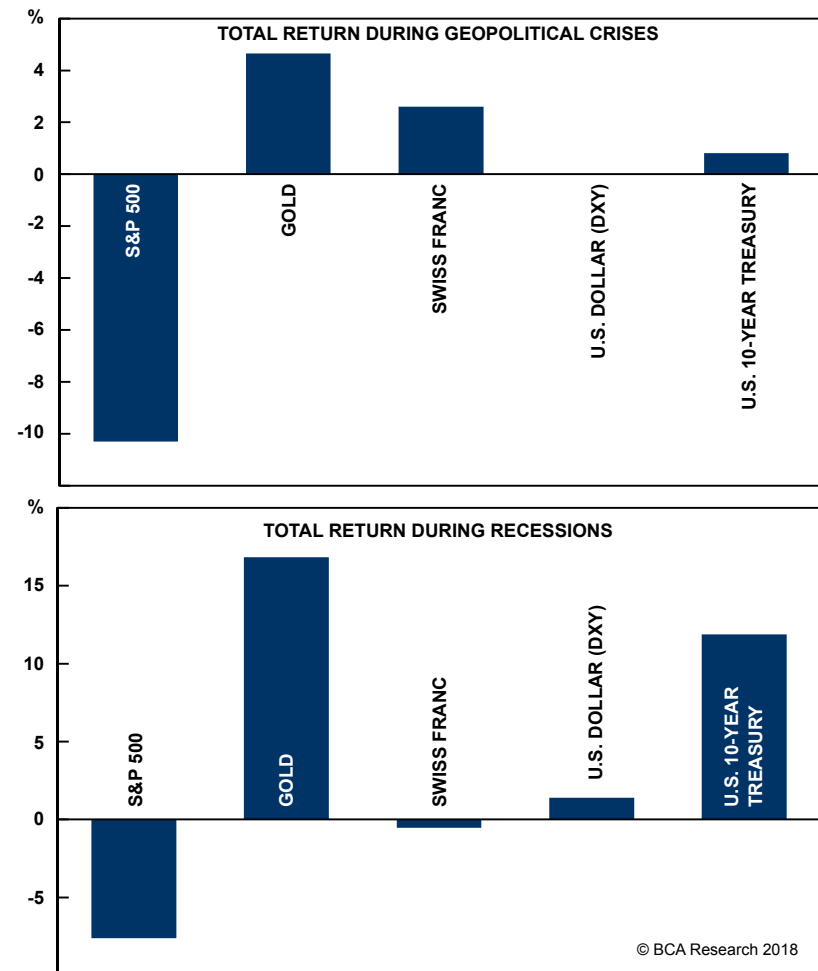
- Inflation failed to emerge in 2017, even as systematically important central banks remained massively accommodative, and most of the OECD economies reported jobless rates below the natural rate of unemployment.
- These fundamentals should be inflationary and supportive of gold. To date, they haven't been.
- Should the Fed proceed with rate hikes while inflation remains quiescent, real interest rates will increase.
 - This would depress gold prices.
 - If, on the other hand, the Fed deliberately stays “behind the curve,” it risks being forced to implement steeper rate hikes later in the cycle.



In Recession & Crises Gold Outperforms

- If – as we expect – the economy goes into recession in 2H19, equities could peak as early as the end of this year.
- Given gold’s role as a global portfolio hedge during bear markets, the metal could enter a bull market as soon as end-2018 when equity markets start pricing in a recession.
- Gold provides the best average returns amongst different “safe-haven” assets following a major geopolitical event.
- Thus elevated political risks in 2018 will further support the gold market. Most notable on our geopolitical strategists’ minds are continued U.S.-China tensions (mostly over N. Korea), Trump’s protectionist policies, and potential conflicts in the Middle East.

Gold Is A Global Portfolio Hedge



NOTE: ECONOMIC EVENTS ARE DEFINED AS NBER DESIGNATED RECESSIONS. THIS TIME FRAME DETERMINES THAT THE MARKET DRAWDOWN IS LESS THAN WHAT IS GENERALLY EXPERIENCED. GEOPOLITICAL EVENTS ARE BASED ON OUR SURVEY OF THE MOST RELEVANT CRISES. FINANCIAL EVENTS ARE LIMITED TO LIQUIDITY, DEBT OR CURRENCY CRISES. SOME EVENTS CAN BE DESIGNATED AS MORE THAN ONE TYPE, BUT THE MOST RELEVANT CATEGORIZATION WAS CHOSEN TO PREVENT OVERLAP IN EVENT TYPES.

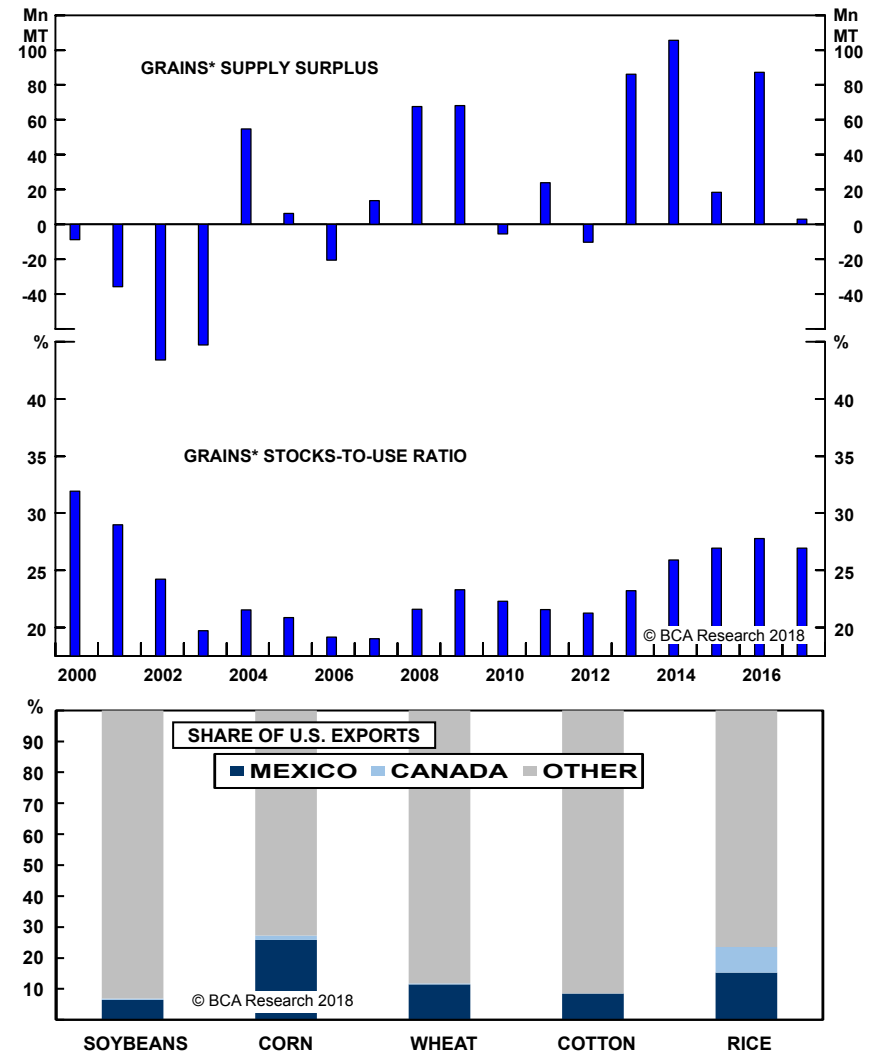
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Ags & Softs Markets

Latest USDA Global Balances Were Bearish

- Global grains stockpiles are already at record highs and were revised up further in the January USDA WASDE.
 - Corn stocks were revised up, largely on back of an upward revision to U.S. ending stocks.
 - U.S. wheat ending stocks were revised up; global inventories were revised down negligibly due to revisions to Australian stocks. China cut its 2018 minimum purchase price for wheat to bring down massive state stockpiles.
 - Rice ending stocks revised up slightly due to revisions to Philippine, Pakistan, and Nigeria ending stocks.
- Despite a marginal upward revision to soybean season-end inventories, markets reacted positively to smaller expected U.S. soybean yields, and a smaller upward revision to ending stocks.
- In addition, the risk that NAFTA is abrogated by the U.S. would weigh on Ag markets, as Canada and Mexico are among the U.S.'s top three ag export destinations.

Bearish Grain Fundamentals



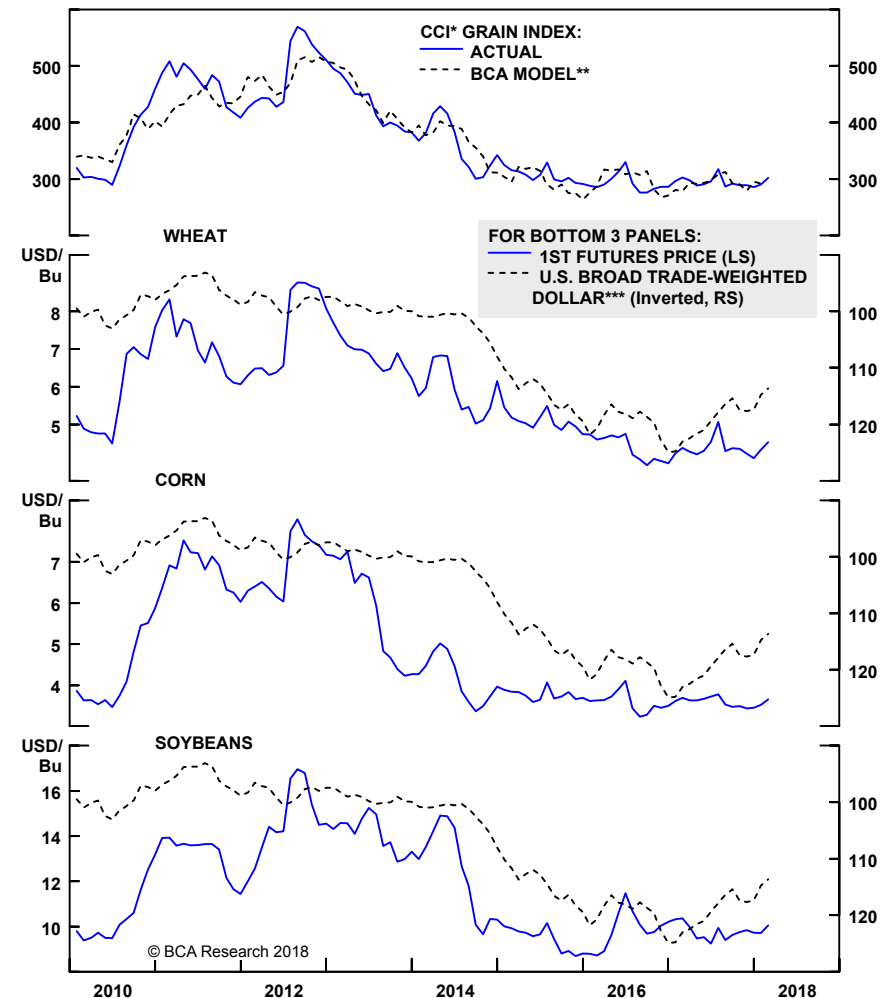
*INCLUDES CORN, SOYBEANS, RICE AND WHEAT.
SOURCE: USDA & BCA RESEARCH.

Fed Policy Drives Ag Markets

➤ U.S. financial factors are important determinants of agriculture commodity price developments. Monetary policy impacts agriculture markets through the following channels:

1. Higher real rates will, all else equal, increase borrowing costs for farmers, and discourage investments in general.
2. Tighter credit also leads to a slowdown in growth – *ceteris paribus*, depressing consumption and demand.
3. Higher U.S. rates entail a strengthening of the U.S. dollar making U.S. exports less competitive. Additionally, the weakening of the domestic currency *vis-à-vis* the dollar increases profitability for farmers selling in international markets, incentivizing them to plant more, despite depressed global ag prices, which increases supply.

USD Will Be Important



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*TOTAL RETURN EQUAL WEIGHT CONTINUOUS COMMODITY INDEX (CCI).
**AS A FUNCTION OF U.S. FINANCIAL VARIABLES.
***SOURCE: J.P. MORGAN & CO.



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