Macro Voices: Oil-market madness
April 5, 2020
OPEC++ production agreement is largely irrelevant
Producers will be forced to cut production because of low price and low demand
Oil markets will probably return to balance in 2H 2020

<table>
<thead>
<tr>
<th>Year-over-Year</th>
<th>Q2 2019</th>
<th>Q3 2019</th>
<th>Q4 2019</th>
<th>Q1 2020</th>
<th>Q2 2020</th>
<th>Q3 2020</th>
<th>Q4 2020</th>
<th>2020 AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPPLY GROWTH</td>
<td>0.80</td>
<td>-1.95</td>
<td>-1.59</td>
<td>-0.16</td>
<td>-8.78</td>
<td>-3.18</td>
<td>-3.91</td>
<td>-4.01</td>
</tr>
<tr>
<td>DEMAND GROWTH</td>
<td>0.40</td>
<td>1.10</td>
<td>1.90</td>
<td>-6.97</td>
<td>-17.90</td>
<td>-7.54</td>
<td>-4.10</td>
<td>-9.13</td>
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<tr>
<td>SUPPLY BALANCE</td>
<td>0.80</td>
<td>-1.85</td>
<td>-0.69</td>
<td>7.71</td>
<td>9.92</td>
<td>2.51</td>
<td>-0.49</td>
<td>4.91</td>
</tr>
</tbody>
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Source: OPEC, IEA, EIA, Vitol, Trafigura, Goldman Sachs & Labyrinth Consulting Services
EIA International/EIA Supply & Demand Master
No one saw this coming?
Markets anticipated 2008, 2014 & 2020 collapses months before public awareness
Brent 12-month spreads reached level almost as low as 2008, price was lower

Source: Quandl & Labyrinth Consulting Services, Inc.
Oil & Gas General/Futures & Future Spreads/BZ1-B12 2013-2020
Markets have already priced-in upcoming inventory build with WTI priced in $20 range. That is why price fell so quickly and so far below previous levels.
Oil prices had already found support levels before Trump-OPEC+ discussions. Light Louisiana Sweet (LLS) reached bottom on March 30. Brent spot and futures followed the next day.

Source: EIA & Labyrinth Consulting Services, Inc.
Fears about filling oil storage are exaggerated.
U.S. crude oil storage would not reach capacity until November assuming a constant, never-seen fill rate of 1.5 mmb/d (10.5 mmb/week).

Source: EIA & Labyrinth Consulting Services, Inc.

EIA Current/Weekly Updates/Crude Oil & Refined Products Inventories & CI
-9 mmb/d world liquids y-o-y demand contraction possible in 2020
-7 mmb/d in Q1, -18 mmb/d in Q2 & -8 mmb/d in Q3 and -4 mmb/d in Q4

2008 Financial Collapse

Annual Growth

Positive Demand Growth

Negative Demand Growth

2020 Covid-19 & OPEC+ failure

Source: OPEC, IEA, EIA, Vitol, Trafignura, Rystad, IHS Markit & Labyrinth Consulting Services

EIA International/EIA Supply & Demand Master
WTI is at least $30 under-valued at $19 spot price based on green C.I. yield curve. Price-discovery excursions from the yield curve are normal and necessary. The present excursion is extreme but only one of six since mid-2014.

C.I. is current crude + products stock level minus 5-yr avg

<table>
<thead>
<tr>
<th></th>
<th>C.I.</th>
<th>WTI</th>
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</thead>
<tbody>
<tr>
<td>3/27/20</td>
<td>9.07</td>
<td>$19.44</td>
</tr>
<tr>
<td>3/20/20</td>
<td>-8.55</td>
<td>$24.19</td>
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<tr>
<td>Change</td>
<td>17.61</td>
<td>-4.75</td>
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</table>

Source: EIA, HSNO & Labyrinth Consulting Services, Inc. - Aperio Energy Research - EIA Current/Weekly Updates/Current Oil & Refined Products, Inventories & C.I.
Appendix Slides
Five oil rallies failed from mid-2018 to early 2020. Prices were largely range bound within 1 standard deviation of the mean until coronavirus & OPEC+ failure combined to collapse prices to -4 standard deviations.

WTI Price

- **Iran Waivers**
  - Oct 2018: $76.22

- **End IR waivers, attacks on Gulf shipping**
  - April 2019: $66.18

- **OPEC+ cut extension**
  - July 2019: $60.43

- **Saudi Refinery Attack**
  - Sep 2019: $61.88

- **OPEC+ Cut, Trade Deal & Assassination**
  - Jan 2020: $63.05

- **WTI 12-month Spread**
  - Dec 2018: $42.68

- **Mean & standard deviation from**
  - CL1 Sept 15 2018 - present

Source: Quandl & Labyrinth Consulting Services, Inc."
Happy Days Are Here Again--$28 oil!
WTI front-month price rose +$6.83 (+32%) to $28.34 week ending April 3
12-month spreads increased +$6.96 (+51%) to -$6.72

Source: Quandl & Labyrinth Consulting Services, Inc.
Oil & Gas General/Futures & Future Spreads/CL1&CL12 Futures
Cushing storage would not reach capacity until August assuming a constant fill rate of 285 b/d (2.5 mmb/week) and not including Strategic Petroleum Reserve.
Brent in prompt-month-only super-contango week ending April 3
12-month spreads eased +$8.85 from -$14.19 to -$5.32 since last Friday
Front-month price rose +$9.18 to $34.11 on hope of coordinated global production cut

Source: CME & Labyrinth Consulting Services, Inc.
WTI term structure in super-contango though July contract week ending April 3 but 12-month spread has eased +$8.85 (+62%) since last Friday. Front-month price increased +$9.18 to $34.11.