Missing OPEC
The Unwelcome Return of Boom-Bust Oil Price Cycles

Presentation to the Dallas Federal Reserve conference, “Oil and the Economy: Adapting to a New Reality”
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Some Historical Perspective
On Oil Price Volatility
Demand & Supply Inelasticity Means Imbalances = Wild Price Swings
Standard Oil, Texas Railroad Commission, Seven Sisters, OPEC used to manage supply to stabilize prices
Since 2008 the Oil Market Has Been in a Post-OPEC, New Boom-Bust Era

Annual Ranges of Monthly US Crude Oil Prices, 1859-2016

- Average of annual % change between lowest to highest monthly price within the era
- Spread between minimum and maximum prices in a year

Data Sources: The Derrick, API, St. Louis Fed, EIA, The Rapidian Group

No Quotation or Distribution
No Spare Capacity, No Peace

Oil Disruptions, Spare Capacity, and Crude Prices

- Threatened Oil Supply
- Disrupted Oil Supply
- Global Spare Capacity
- US Spare Capacity
- Crude Oil Price (RHS)

Seven Sisters’ Middle East concessions
TX and other US oil states
Suez Canal
Arab Oil Embargo
Iran Revolution
Iran-Iraq War
Threatened by Iran/Iraq, Tanker War
Gulf War I
Gulf War II
After 1972, OPEC

Data: Rapidan Group, EIA, BP, St. Louis Fed, ExxonMobil

VZ ’02 ’03, Iraq ’03, Nigeria ’03 >, Libya ’10 >, Iran ’12 > and others

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Have Crude Oil Prices Bottomed?
Busts Can End Three Ways

1. Blood (military force/social upheaval/geopolitical conflict removes supply)
2. Sweat (sub-lifting cost prices squeeze enough high-cost production out) or
3. Tears (plummeting prices impel policymakers – in recent times OPEC and sometimes some non-OPEC energy ministers - to mandate emergency production cuts)

Crude Oil Prices
Nominal, Source: The Derrick, API, St. Louis Fed, EIA

Mostly sweat, mixed with some tears and blood

Tentatively, blood and sweat, mixed with some tears
Market Eager to Pounce on Bottom Courtesy of Shale or OPEC

WTI Front Month Daily Price

Source: Bloomberg
Anti-Freeze - Iran and Saudi Arabia Added an Eagle Ford Since February

Change in OPEC and Russian Crude Production from January 2016

Source: OPEC, IEA, Rapidan Group
Algiers – OPEC Surprised, But With Enhanced Verbal Intervention Instead of Cuts

Total OPEC Crude Production

Source: OPEC Secretariat, Secondary Sources
The Next Big Surprise?
Every Five Years or So, Major Surprise Develops and Hits the Market

#1
Surprise: Non-OPEC supply fails to rise amid rising prices, soaring Chinese demand, strong GDP
Result: Boom

#2
Shale surprises, offsets disruptions, caps prices

#3
Surprise: Saudi won't swing, shale won't either
Result: Bust

#4
Our surprise candidate: GDP growth more oil intensive than consensus expects

Spot Crude Oil Prices
Source: EIA, Rapidan Group

USD/Barrel


WTI  Brent  Good  Great  Bad  Ugly
Surprise #1 – Non-OPEC Supply Curve Steeper than Believed

Annual Non-OPEC Production Growth and Crude Prices
IEA Projections (’07-’15 exclude Angola) Sources: IEA, EIA,
Surprise #2 – Shale Oil Bursts from Nowhere

Total US Crude Production Forecast, Reference Case
Source: EIA Annual Energy Outlook
Surprise #3 – Saudi Won’t Swing

The big drop: Riyadh’s oil gamble

For years Saudi Arabia acted as a safety net in the market, but as prices fell the game changed, writes Anjli Ramal.

It was October 7, and the price of oil had been falling precipitously since June. Everybody wanted to know when Saudi Arabia would take charge and stem the plunge. “Of course you’re going to cut production,” declared one guest.

“What makes you think we’re going to cut?” the Saudi official replied.

The throwaway remark, recounted by one of the attendees, reverberated across markets. It was the first sign that Saudi Arabia would not come to the oil market’s rescue, shattering long-held assumptions about the kingdom’s oil policy and shaking up a world energy order in place for decades.

Then, the widely shared assumption in the oil market that OPEC would collectively cut production to keep prices high started to look shaky. Saudi Arabia, the world’s biggest oil exporter, has indicated in recent weeks that it is comfortable with a lower oil price, and prices have fallen in response to these signals.

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**OPEC Spare Capacity**

Source: IEA, BP

- **BP 2014 Spare capacity**
- **2014 MTOMR Implied Spare Capacity**
- **2014 MTOMR Effective Spare Capacity**
Surprise #3 – Saudi Won’t Swing

Saudi Share of OPEC Production


Source: TRG, BP, IEA, EIA
**Surprise #4 – “Peak Demand” Predictions Fall Far Short**

Opec: oil demand could peak in just over a decade
Cartel says oil demand could peak in 2029 if signatories of Paris climate deal meet aims

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**Figure 1**
Composition of new sales of passenger cars, 2014 and 2040

World Oil Outlook 2016, OPEC

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**Battery electric vehicles**

BEVs have been talked about for some time, but there remain some major drawbacks that, to a certain extent, will limit the penetration of such vehicles.

To start with, it should be noted that the drastically increased weight of BEVs over conventional ICE-powered cars causes the average power consumed at the

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Global demand for energy will peak in 2030, says World Energy Council

New technology and stricter policies will transform energy industry as renewable growth in solar and wind power continues.

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Forget 'Peak Oil': We could reach 'Peak Demand' for energy before 2030
Anmar Frangoul | Special to CNBC.com
Monday, 10 Oct 2015 | 8:04 AM ET

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Energy Giant Shell Says Oil Demand Could Peak in Just Five Years

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The Guardian, October 10, 2016

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Financial Times, November 9, 2016

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**No Quotation or Distribution**
Peak demand in transport sector includes massive declines in gasoline use.

Other fuels (diesel, jet fuel, electricity, etc.) grow in use while gasoline fades.

Diminished gasoline use is due to efficiency gains in light duty vehicles (see below from AEO 2016), sharp diversion from history.

Transportation sector total delivered energy consumption (excluding pipeline) declines over 2015-40 in the Reference case. This trend differs markedly from history, which saw 1.3% average annual growth over 1973-2007 (2007 was the peak year for consumption).

Petroleum-based gasoline use falls 26.3% over 2015-40, driven by rising light-duty vehicle fuel economy.

Use of all other transportation fuels grows over 2015-40, led by diesel fuel and compressed and liquefied natural gas.

EIA Assumes US Oil Demand Peaks, Then Declines Because Gasoline Implodes

Unrealistic vehicle efficiency gains underpin massive decline in transportation sector gasoline demand.
US Demand Forecasts Show Future Decline – But Where’s the Recession?

Prices rise while demand remains flat in EIA’s base forecast
Big Battle Shaping Up Over Fuel Economy Standards in Washington

Sales-Weighted MPG of New Car Purchases and Pump Prices
University of Michigan, EIA

Carmakers, environmentalists gear up for mpg fight

Keith Lang, Detroit News Washington Bureau - 11:02 p.m. EDT July 28, 2016

Washington - A projection from federal regulators that U.S. automakers probably will miss the 54.5 miles-per-gallon fleetwide average for 2025 is likely to touch off an intense lobbying fight between automakers and environmentalists.

Autowakers have seized upon the projection, which stated they may only be able to achieve a fleet-wide average of between 50 and 52.5 mpg by the deadline that was set by the Obama administration in 2012. They argue that federal regulators should consider scaling back the stringent mileage rates when they come up for a mid-term review in 2016.

Something baby boomers and millennials agree on: SUVs

Published: Dec 5, 2015 12:09 p.m. ET

The Rapidan Group
Global Energy Insight

No Quotation or Distribution
Millennials May Want to Drive as they Start Families and Jobs
Which would disappoint environmental groups

Something baby boomers and millennials agree on: SUVs
Published: Dec 5, 2015 12:09 p.m. ET

Carmakers, environmentalists gear up for mpg fight
Keith Laing, Detroit News Washington Bureau
11:02 p.m. EDT July 29, 2016

Washington — A projection from federal regulators that U.S. automakers probably will miss the 64.5 miles-per-gallon fleetwide average for 2025 is likely to touch off an intense lobbying fight between automakers and environmentalists.

Automakers have seized upon the projection, which stated they may only be able to achieve a fleet-wide average of between 50 and 52.6 mpg by the deadline that was set by the Obama administration in 2012. They argue that federal regulators should consider scaling back the stringent mileage rules when they come up for a mid-term review in 2018.

Ford says Millennials are buying bigger SUVs
Chris Woodyard, USA TODAY
3:59 p.m. EDT March 18, 2016

Ford is finding that Millennials are opting to buy...
History Shows Washington Shirks from *Biting* Fuel Economy Standards

After gas prices drop, DOT reduces car standard

Amidst low pump prices, SUVs proliferate via light truck “loop hole.” Congress freezes CAFE in ’97

Source: EIA, NHTSA
Reality Check: Forecasters Seeing Thirstier Demand Growth

**Total World Per Capita Oil Demand (2010 vs. 2016 Forecasts)**

- 2015: +6%
- 2020: +8%
- 2025: +5%
- 2030: +3%
- 2035: +1%

Source: EIA

**OECD Per Capita Oil Demand (2010 vs. 2016 Forecasts)**

- 2015: -3%
- 2020: -3%
- 2025: -6%

Source: EIA

**Non-OECD Per Capita Oil Demand (2010 vs. 2016 Forecasts)**

- 2015: +14%
- 2020: +18%
- 2025: +15%

Source: EIA
Let’s Not Forget About Frantic Inventory Building
The US built inventory cover in periods of high spare capacity, but China and India will fill in a tight market

- India and China have both announced plans to acquire 90 days of import cover
- We expect China will work aggressively to import an additional 2-400 million barrels of crude in the coming years
- India will be slower to ramp up; 39 million barrels of storage will likely be filled in the next 12-18 months, but plans to fill an additional 91 million barrels by 2020 are ambitious and could be delayed
**Barrels at Risk**

“Base Case” - Moderate GDP (60% odds): Disruptions average 1.2 mb/d through 2021; 2.6 mb/d threatened

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**Geopolitical Disruptions and Spare Capacity**

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- **Saudi Arabia**
- **Angola**
- **S. Iraq**
- **N. Iraq**
- **Venezuela Default**
- **Nigeria**
- **Libya**
- **Sudan**
- **Yemen**
- **Venezuela**
- **Iraq**
- **Nigeria**
- **Libya**

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**Disrupted Barrels**

OPEC Spare Capacity

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**Capacity Loss**

- **Venezuela**
- **Nigeria**

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2016 - 2021
Our Price Scenarios and Probabilities

Boom To Follow Bust
Rapidan Group Five Year Oil Market Outlook
August 2016

Real Global GDP Growth

OECD Commercial Crude and Liquids Inventories: Scenarios and Probabilities

Source: Rapidan Group, IMF

Source: EIA, IMF, Rapidan
Our Price Scenarios and Probabilities

Source: Rapidan Group, Bloomberg

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Thank You

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