Quarterly Oil Price Outlook: 2016-2018

Stratas Webinar

June 28, 2016
Webinar Agenda

- Overview of Short Term Outlook Service
- Recent Happenings
- Highlights of Changes
- Market Fundamentals Outlook
- Price Outlook
- Methodology
Short Term Service Overview
Short Term Outlook – Product Overview

- Global, integrated view, covering oil, oil products, petrochemicals, natural gas and NGLs
- Robust, analytical methodology
- Fully interactive data visualization and data downloads
- Quarterly forecast release with daily and weekly market commentary
Short Term Outlook – Product Coverage

- Global coverage
  - U.S.
  - Europe
  - Middle East
  - Asia
- Forecasts for 8 quarters
  - Monthly prices
  - Updated quarterly
- Price set covers the entire spectrum
  - Crude oils
  - NGLs and feedstock
  - Refined products
  - Base petrochemicals
  - Biofuels
- Forecasted margins
  - Refinery
- Weekly analysis and commentary

- Crude oils
  - Marker crudes
  - Regional crudes
  - API and sulfur ranges
- NGLs & Feedstock
  - Ethane
  - Propane
  - Butane
  - Naphtha
- Refined Products
  - LPG
  - Gasoline
  - Jet fuel
  - Diesel
  - HFO
- Base Petrochemicals
  - Olefins (Ethylene, Propylene)
  - Aromatics (Benzene, Xylenes, Toluene)
Quarterly Review

What has happened since our last forecast?

- Demand growth stronger than anticipated, driven by US and India
- Recession fears in China and US have all but evaporated
- Supply disruptions have tightened the global market to being balanced
- Prices have almost doubled since February
- Brexit strengthened the dollar substantially, killing upward price momentum and reducing likelihood of a rate hike this year
- US Shale is seeing resurgence but only in specific plays – STACK, Permian; focus on cost reduction
- Iran came back aggressively but hit operational challenges
- OPEC remains fragmented
What’s Driving Recent Changes in Crude Prices?

US Dollar driving more than 28% of recent price changes

- Brexit vote, rate hike anticipation primary drivers of recent price volatility
- Decision of UK to leave EU is likely to keep the dollar as a primary driver

Brent Price Forecast Factors

- △ US Dollar 28.3%
- △ Non-OPEC Crude Production 15.6%
- △ Non-OECD Demand 12.6%
- △ OPEC Crude Prod. 12.4%
- △ World GDP 11.8%
- Unplanned Prod Disrupt. 10.2%
Market Sentiment Continues to Rise

NYMEX (WTI) and Brent (ICE) combined

Source: Reuters, CFTC, NYMEX, ICE
Demand Outlook

Upward revision from 0.8 mmb/d to 1.2 mmb/d for 2016

Quarterly growth index (100 = 1Q2016)

Forecast

Non-OECD
Annualized Growth (2016-2018): 1.6%

OECD
Annualized Growth (2016-2018): -0.2%
Supply Outlook

1.3 mmb/d of incremental crude and NGL supply
Inventory Levels Beginning to Draw - Slowly

Supply disruptions balancing market faster than expected
Pricing Outlook
Brent Price Outlook

How have previous Stratas price outlooks held up for the last 12 months?

![Brent Price Outlook Graph](image_url)

Source: Bloomberg, Stratas Advisors
Brent / WTI Diff Higher Than Previous Forecast

Higher volatility combined with higher US production likely to drive diff
Global Product Price Outlook

US prices remain strong with rising demand

Forecast

USD/BBL

- Asia Diesel
- Asia Gasoline
- Asia Fuel Oil
- USGC Diesel
- USGC Gasoline
- USGC Fuel Oil
Wildcards and Risk Factors
Wildcards

What are the key markers for disruption?

- **Nigeria production comes back online; Venezuela comes off; Iranian ramp-up**

- **Dollar/GBP/Euro relationship will continue to drive much higher volatility than forecast**

- **Speed, pace and break-evens of shale production across plays**
Key Brent Price Sensitivities

How will wildcards affect price outcomes?
Market Balance Sensitivity

Nigeria remains at 1.35 mmb/d

Draws 600 mmb from inventories
Market Balance Sensitivity

Nigeria returns fully to 2.2 mmb/d

Draws 259 mmb from inventories

Forecast

M/b/d


Supply Demand

Million Barrels
Shale’s diversity driving uncertainty

Even with technology advances, breakeven prices range widely

Brexit Impacts

$\text{$/Bbl Breakeven}$ vs. $365 \text{ IP Rate (Boe/d)}$

- Bakken
- Eagle Ford
- Permian
Key Price Drivers

Base case assumptions for key uncertainties

- Nigeria comes back on slowly but struggles to return to full production

- Venezuela undergoes (mostly) peaceful regime change with some supply minor disruption

- UK negotiates new trade deals with EU; Sterling and Euro rebound

- U.S. shale’s return remains confined to Permian, SCOOP/STACK and core acreage of other plays; puts downward pressure on prices

- Iran supply struggles to clear 4 mmb/d within the next two years

- Market is tight, but inventories will dampen price increases
Modeling Methodology
Methodology
Framework of the Short-term Price Forecast Modeling

Step 1:
Select Key Drivers & Data Transformation

Crude Oil Price/Differential and Fundamental Drivers (Time Series)

Unit Root Test / Data Transformation

Non-stationary

Step 2:
Diagnostic Tests

Optimal Lag Selection Test

Granger-causality Test

Cointegration Test

Optimal Lag Selection Test

Input Different Assumptions and “What if” Scenarios

Stationary

Step 3:
Apply Forecasting Model

Cointegration Vectors

No Cointegration Vectors

VECM Model (Vector Error Correction Model)

VAR Model (Vector Autoregression)

BVAR Model (Bayesian Vector Autoregression)

Step 4:
Evaluate Outcomes

Out-of-Sample Forecasting

Evaluate Model Accuracy based on MAPE (Mean Absolute Percentage Error)