The Petroleum Market's New Economics: The Role of Opportunistic Buyer/Sellers

Philip K. Verleger

PKVerleger LLC

Visiting Fellow, Colorado School of Mines

This Is A Different Market

- Petroleum economists have referred to swing producers for years. Today it is demand that swings.
- “Opportunistic Buying for Storage or Selling from Storage” now plays an important role.
  - The success of futures markets facilitates this trading.
  - Paper traders (speculators, investors, others) facilitate the business.
  - Special positions enable large, successful trading firms like Vitol and Glencore to enjoy immense profits from this market.
- Oil-exporting countries cannot force the liquidation of excess inventories.
  - In the old market, OPEC could force stock liquidations by cutting production. OPEC did this in 1981.
  - Today a production cut, if believed, may lead to an inventory increase.
  - The old tools do not work.

The Basis of the New Market Is Demand for Inventories

- In the old model, quantity demanded was a function of price and income:

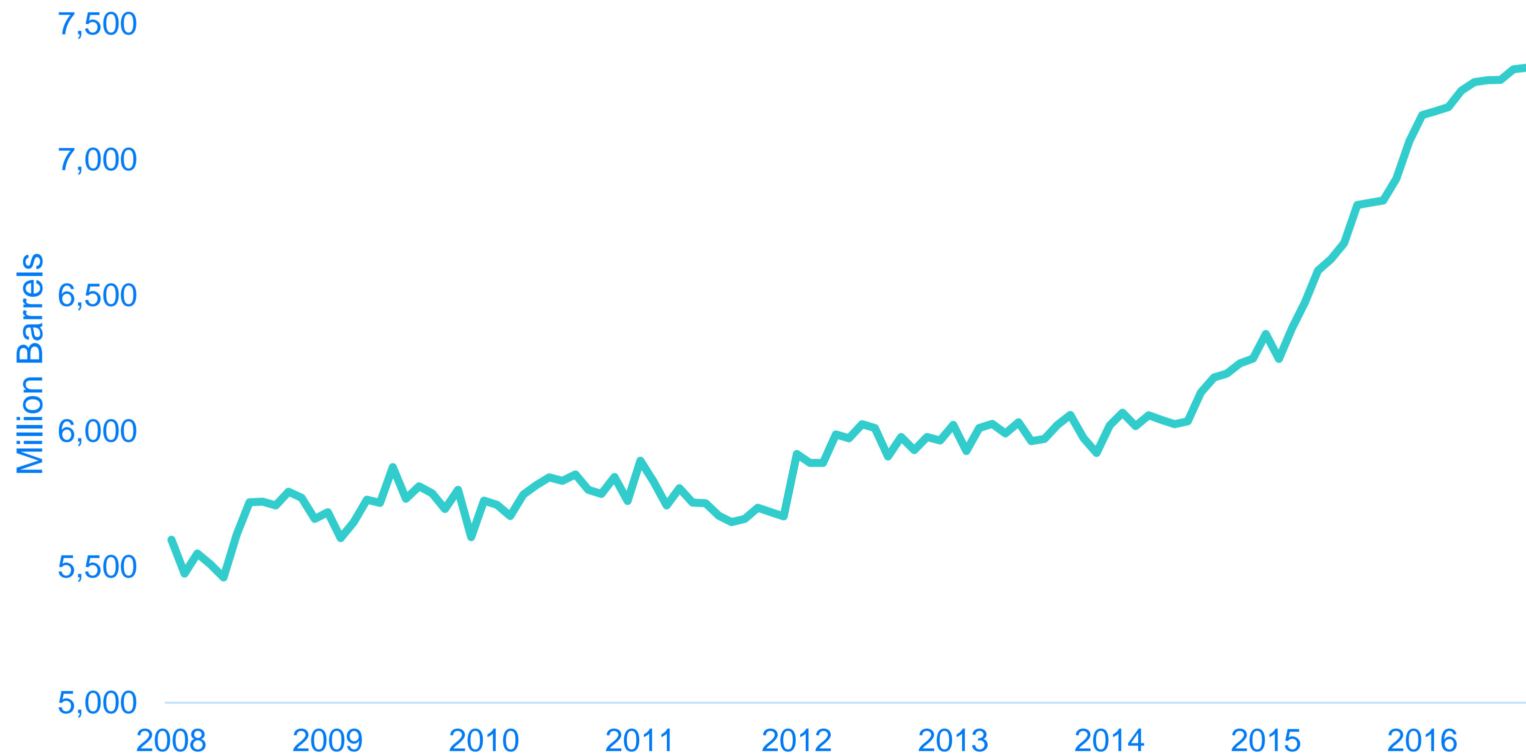
  $$Q^d(t) = F(Y(t), P(t))$$

- In today's world, the quantity demanded must include an item for opportunistic inventory accumulation/liquidation. This might be called the Vitol effect. Opportunistic inventory accumulation depends on expected prices:

  $$Q^d(t) = F(Y(t), P(t)) + H[(\varepsilon(P(t+n)) - P(t))]$$

PkV

Monthly Global Crude Oil Stocks, Including Oil in Transit



Source: Energy Intelligence Group.

Futures and Forwards Facilitate the New Market

- The financial risks of holding unhedged opportunistic inventories is large.
- Firms will hold them if the potential reward is large enough.
  - For example, 12-month contango reached 40 percent in December 1998 when WTI crude prices fell to $10.80 per barrel.
  - The 12-month contango reached 50 percent in December 2008 when Brent prices fell to $37 per barrel.
- Firms will hold inventories if they cannot hedge, but they will demand a huge premium.
  - Given a fixed forward price, cash prices must drop to a low level.
  - The low cash prices will lead to rapid declines in marginal production.

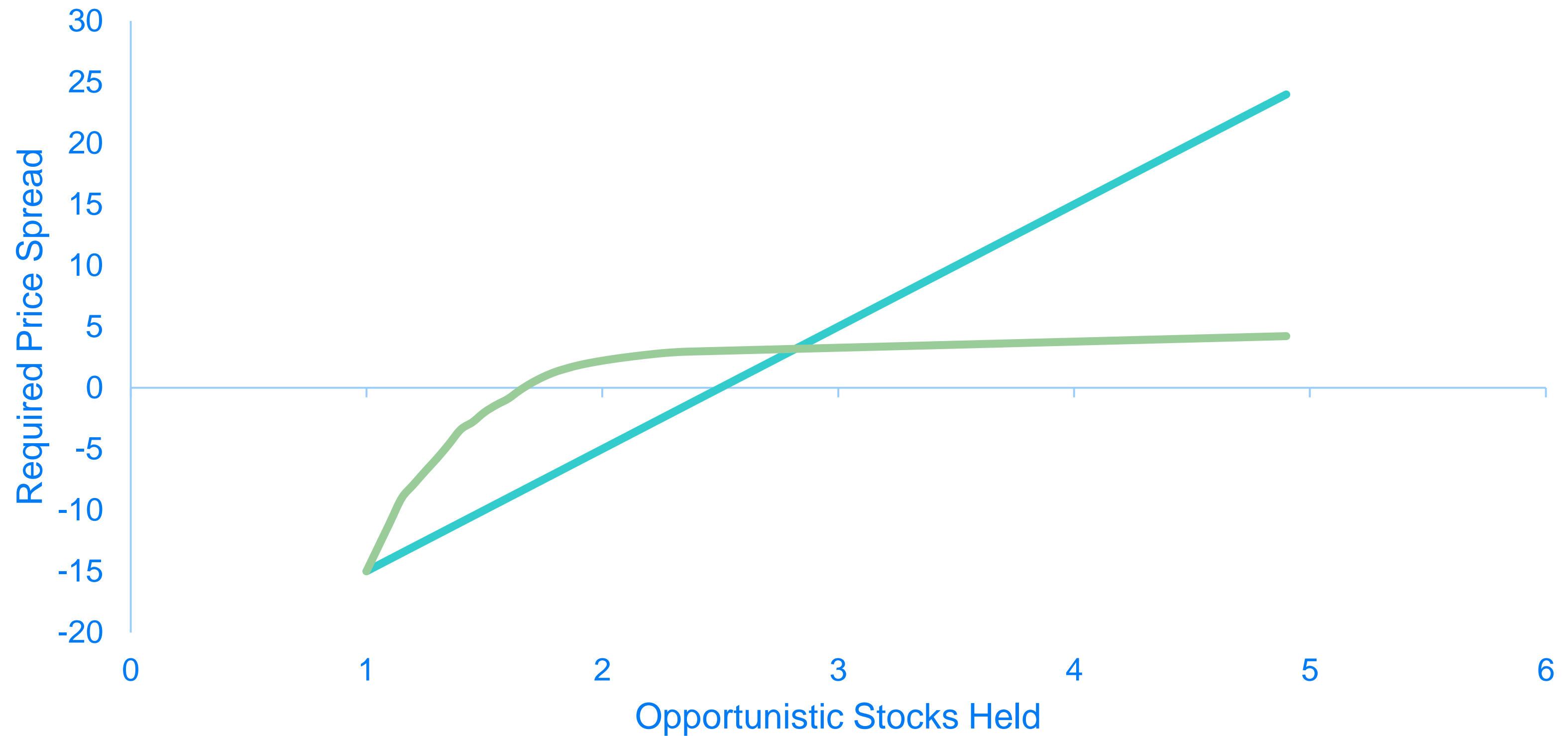
PkV

Futures Can Cut or Eliminate the Risk of Holding Stocks

- Hedging eliminates the risk of holding stocks.
- With futures, firms enjoying unique economies of scale can earn large profits by adding to inventories under certain circumstances, such as having
  - access to very low cost storage,
  - access to specially priced supplies, or
  - the ability to move oil for less than competitors.
- The difference between the old market and the current one can be shown in a curve similar to Holbrook Working's supply-of-storage curve.

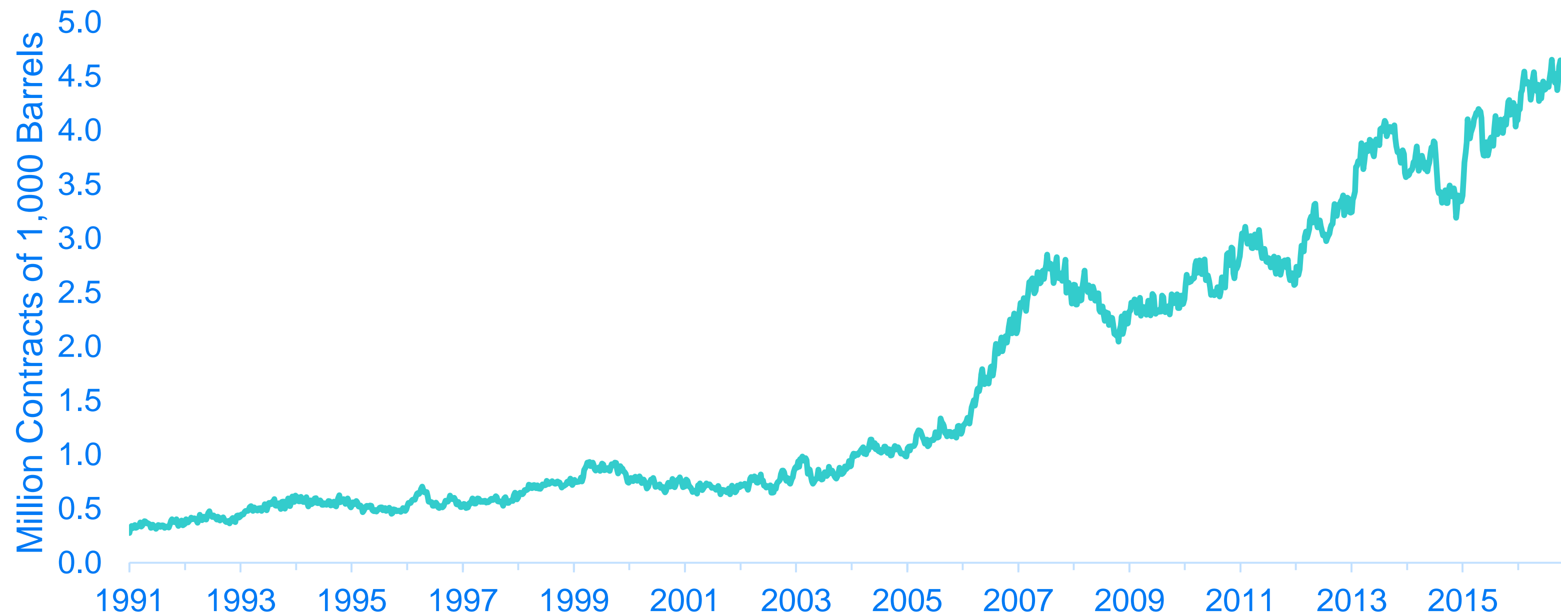
PkV

Hypothetical Illustration of Price Spread Required for a Firm to Hold Incremental Stocks



Source: PKVerleger LLC.

Open Interest in Petroleum Futures Now Totals 4.7 Billion Barrels



Source: CFTC; ICE; IPE.

The Introduction of Opportunistic Buying/Selling Clouds Market Data

- With fixed supply, consumers compete with opportunistic buyers/sellers for oil.
  - Cash prices must rise if the opportunists want to add to stocks, assuming a fixed forward price.
  - Cash prices must fall if the opportunists want to sell given fixed forward prices.
- The presence of opportunistic buyers puts pressure on oil producers to manage expectations.
- The opportunists will add to their positions if producers convince them that markets will be managed.
- They will sell aggressively, however, if they lose confidence.

PkV

The Opportunists Comprise Two Groups

- Paper traders—speculators—buy futures and derivatives, which leads to futures purchases.
- Physical traders, including oil companies, sell futures to the paper traders while adding to inventories.
  - Global commercial stocks have increased 1.7 billion barrels from January 2008, according to EIG.
  - Open interest in crude futures has risen two billion barrels during the same period.
- Is this a random development? Almost certainly not, especially since January 2015.

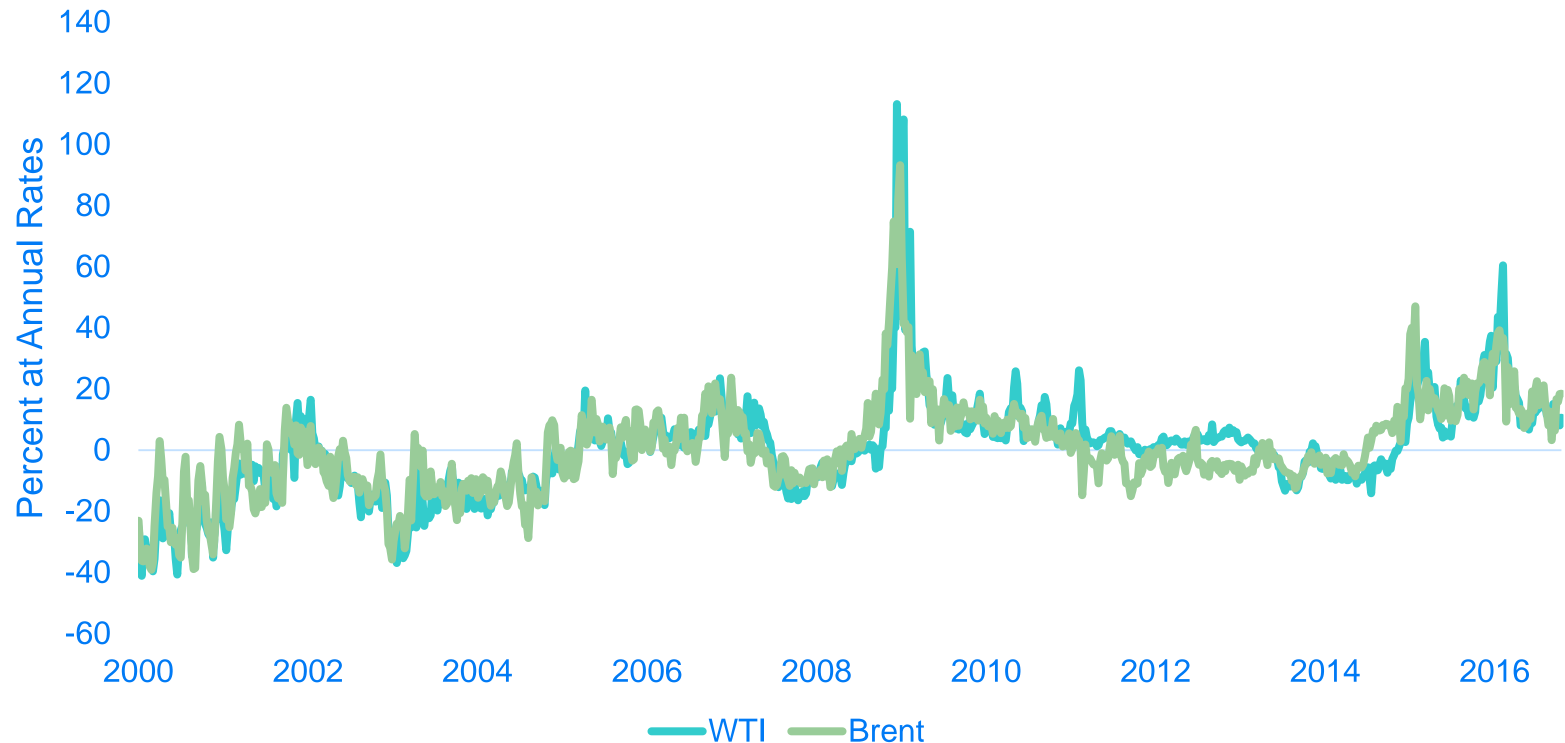
PkV

Opportunists Add to Inventories When the Financial Rewards Are Strong

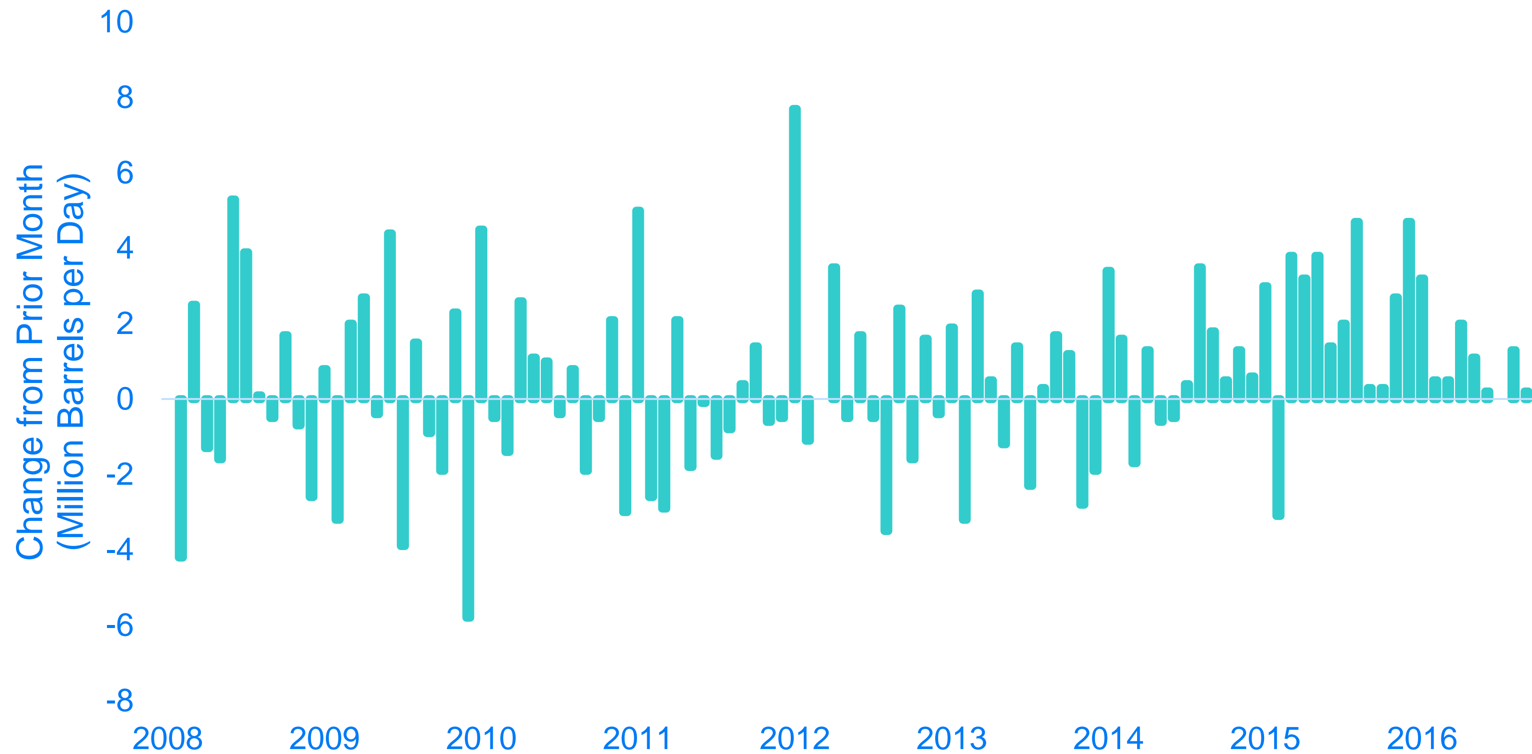
- Excess returns to storage computed from cash and futures prices reveal the financial reward earned by buying oil, hedging, and storing.
- Quantitative easing by central banks has made storage of oil very rewarding for those firms with access to low-cost storage.
- High excess returns are associated with strong demand from opportunistic buyers.
- Announcements by OPEC members of possible agreements lift forward prices and promote increased storage.

PkV

Excess Returns to Storage for Brent and WTI, Sixth Futures Contract, 2000 to 2016



No Accident: Month-to-Month Change in Global Crude Oil Stocks Including Oil at Sea

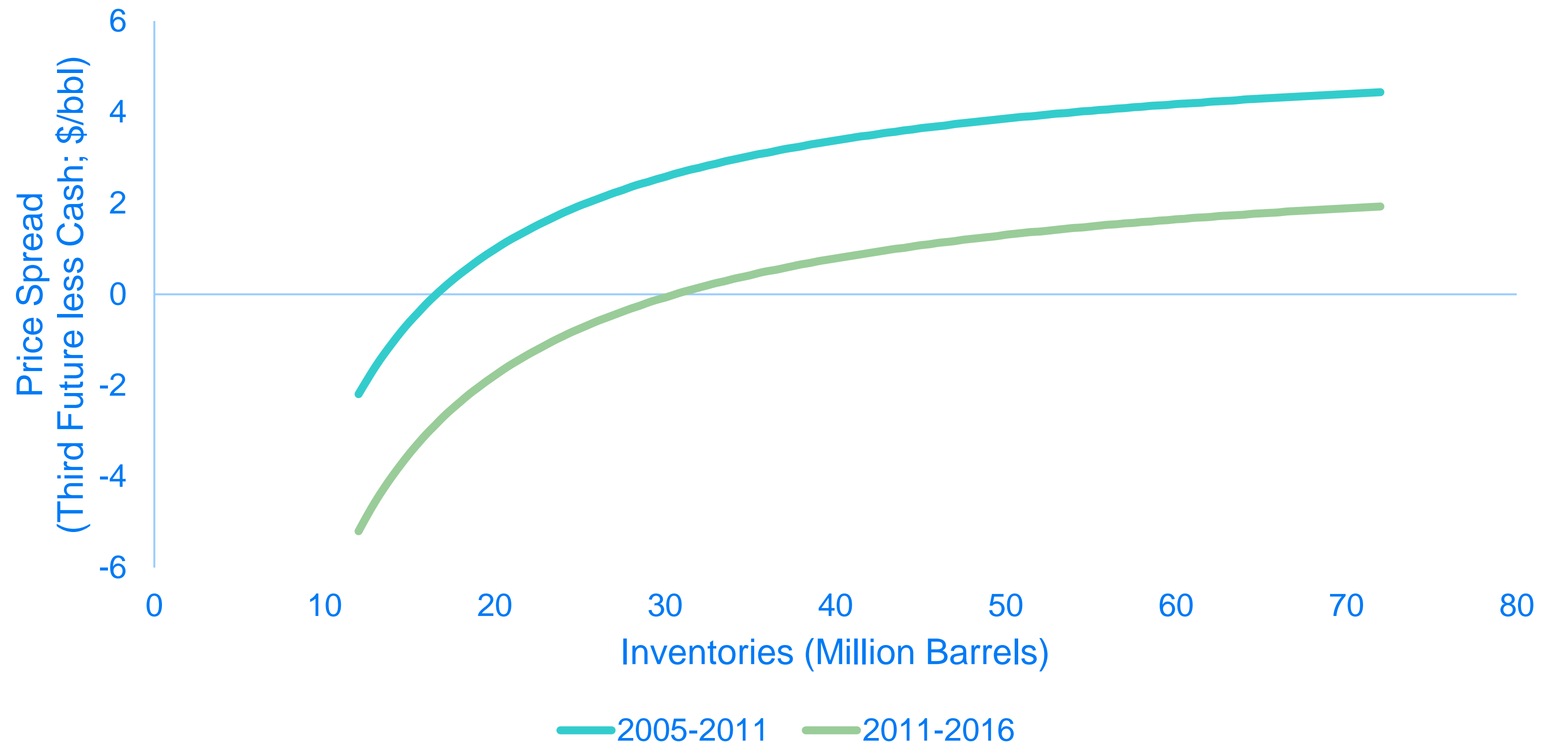


Source: PKVerleger LLC.

Strong Evidence Exists for Opportunistic Traders Affecting Markets

- Researchers have generally failed to find a relationship between paper trader buying and selling and oil prices.
  - Studies have generally examined the link between paper trader positions and outright prices.
  - With all due respect, excellent researchers have been, to borrow from songwriter Johnny Lee and *Urban Cowboy*, "looking for relationships in all the wrong places."
- Where the relationship is to be found is in the supply-of-storage curve for crude oil.
  - Increased activity by paper traders reduces the risk of holding stocks.
  - The curve shifts downward.

Supply-of-Storage Curves for Cushing Crude, January 2005 to October 2011 and November 2011 to August 2016



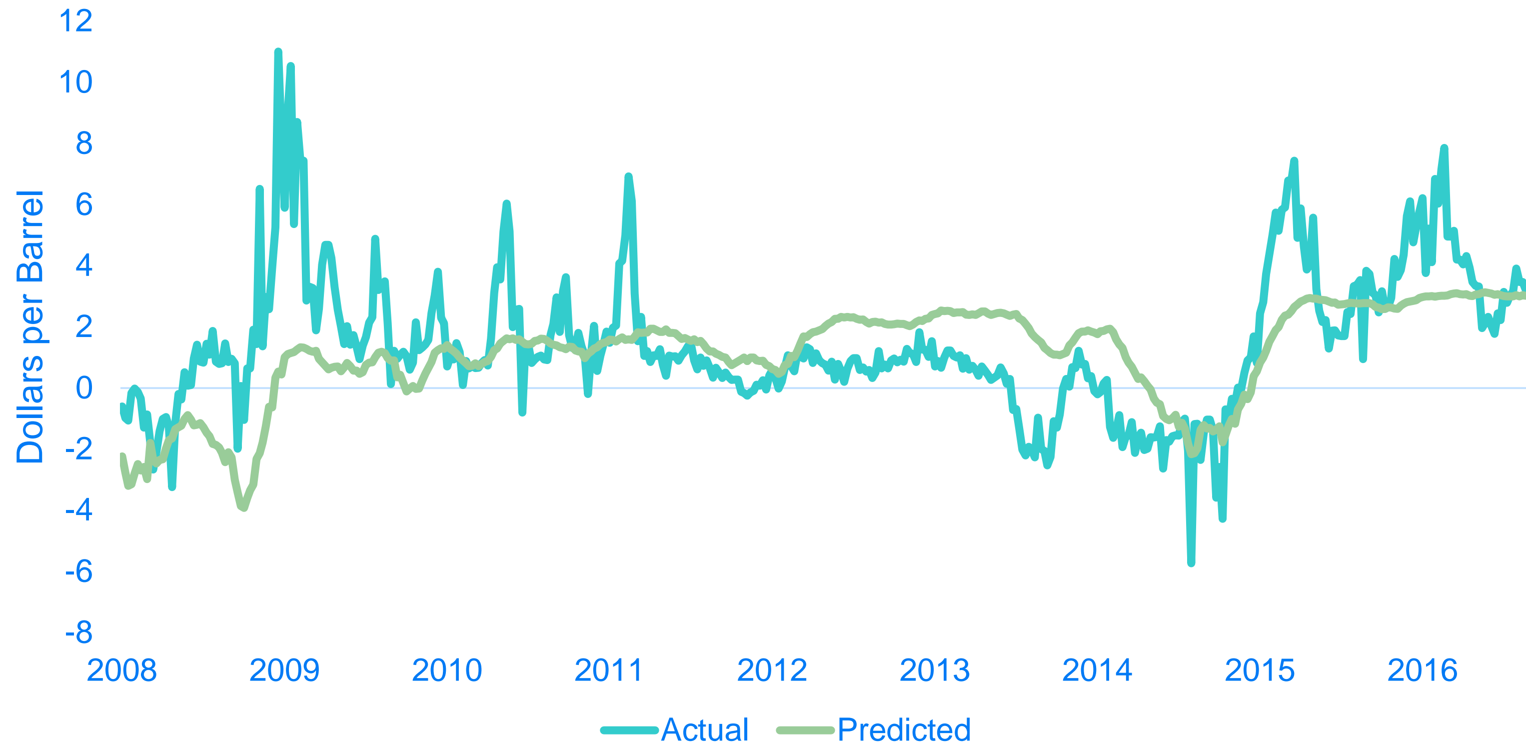
Source: PKVerleger LLC.

It Is Price Spreads, Not Price Levels, that These Activities Explain

- Paper trading reduces the risk of loss from holding stocks.
  - Opportunistic traders can buy more stocks as paper traders add to futures positions.
  - The risk of holding stocks increases as paper traders sell futures positions.
- Logically, then, the position of paper traders should be important in determining price spreads.
- The data support this conclusion.

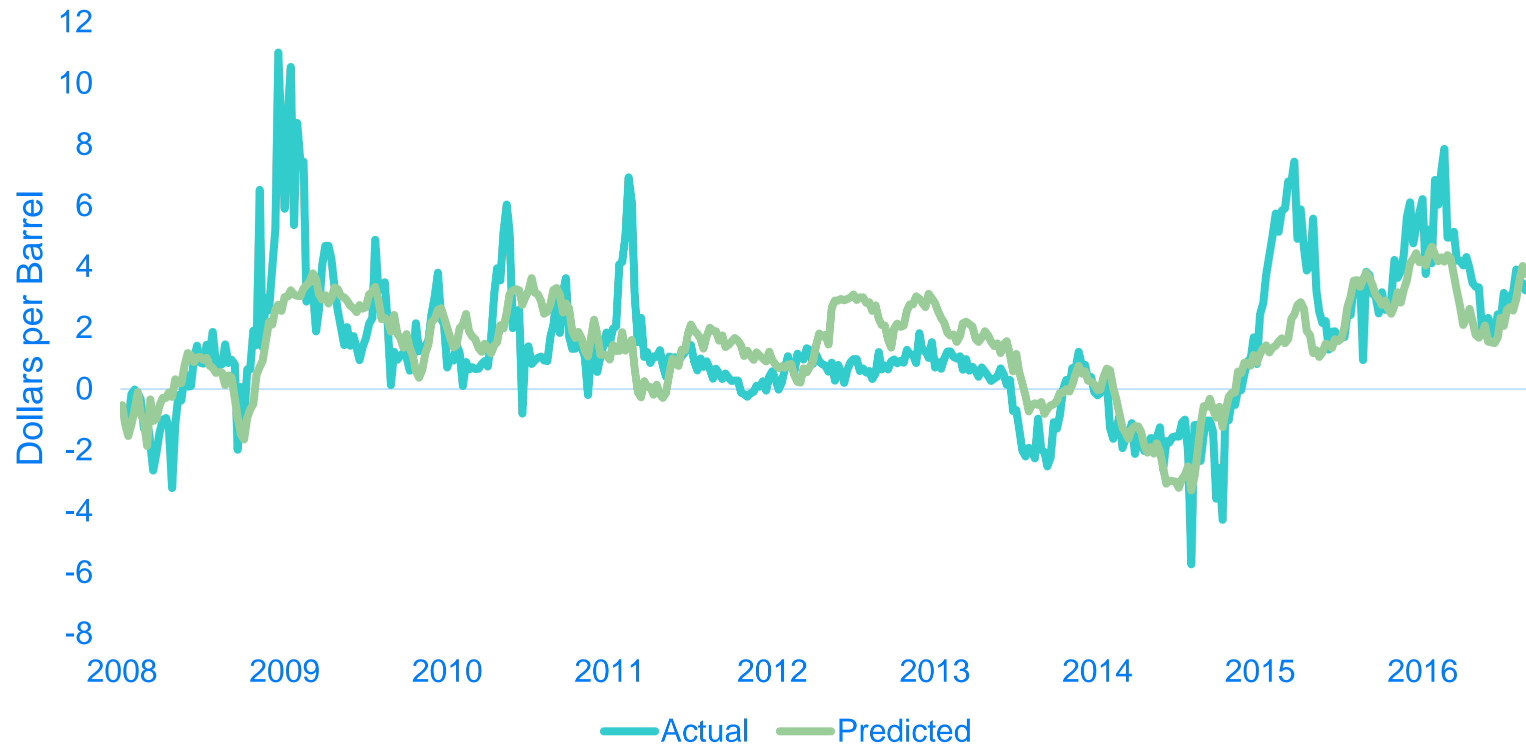
PkV

Actual vs. Predicted Price Spread from Traditional Supply-of-Storage Model for Crude Using Inventories Alone as an Explanatory Variable



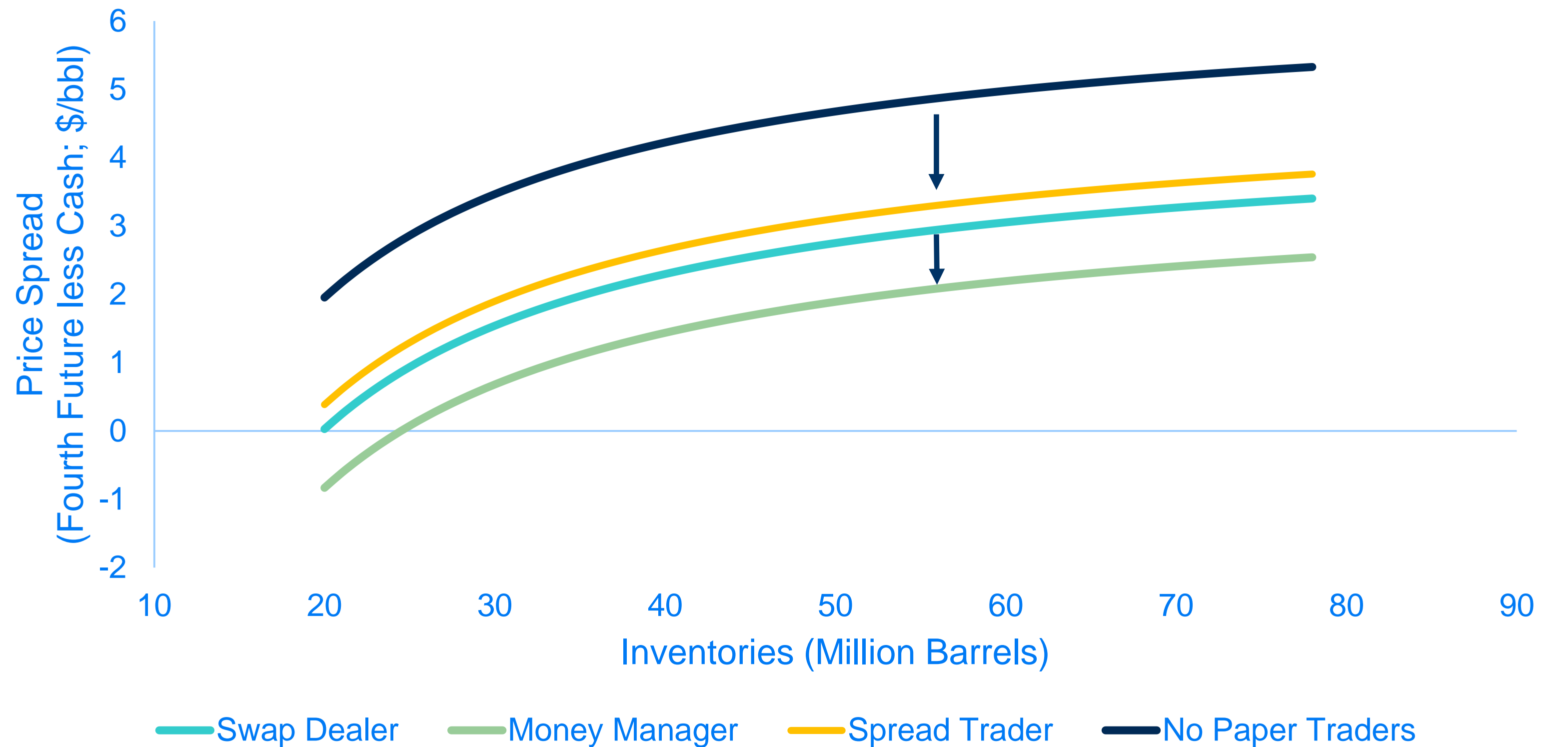
Source: PKVerleger LLC.

Actual vs. Predicted Price Spread from Traditional Supply-of-Storage Model for Crude Using Inventories and Speculative Positions as Explanatory Variables



Source: PKVerleger LLC.

Supply-of-Storage Curve for the WTI Fourth Contract

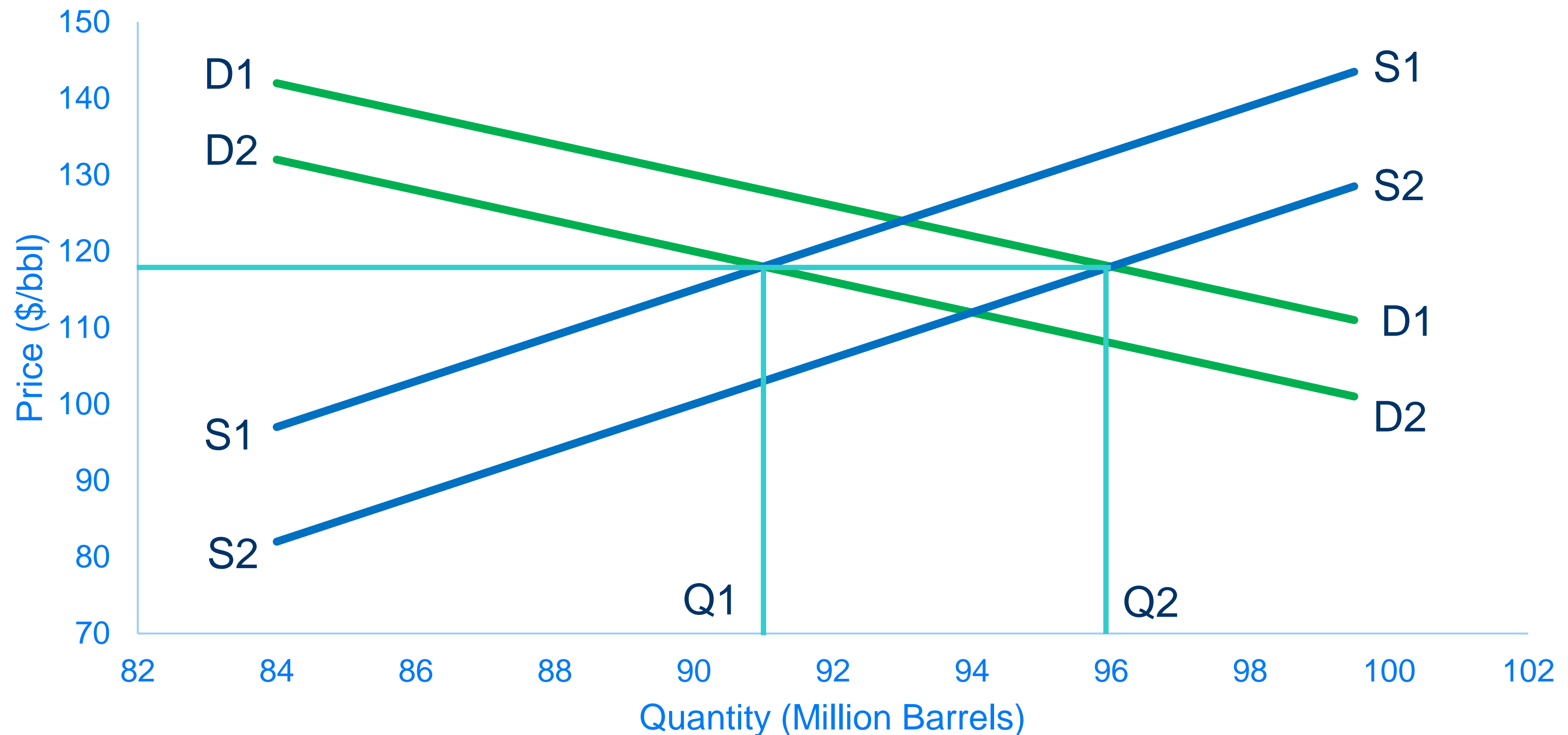


Source: PKVerleger LLC.

FUZZY Demand in the New Market Is Much More Difficult to Manage

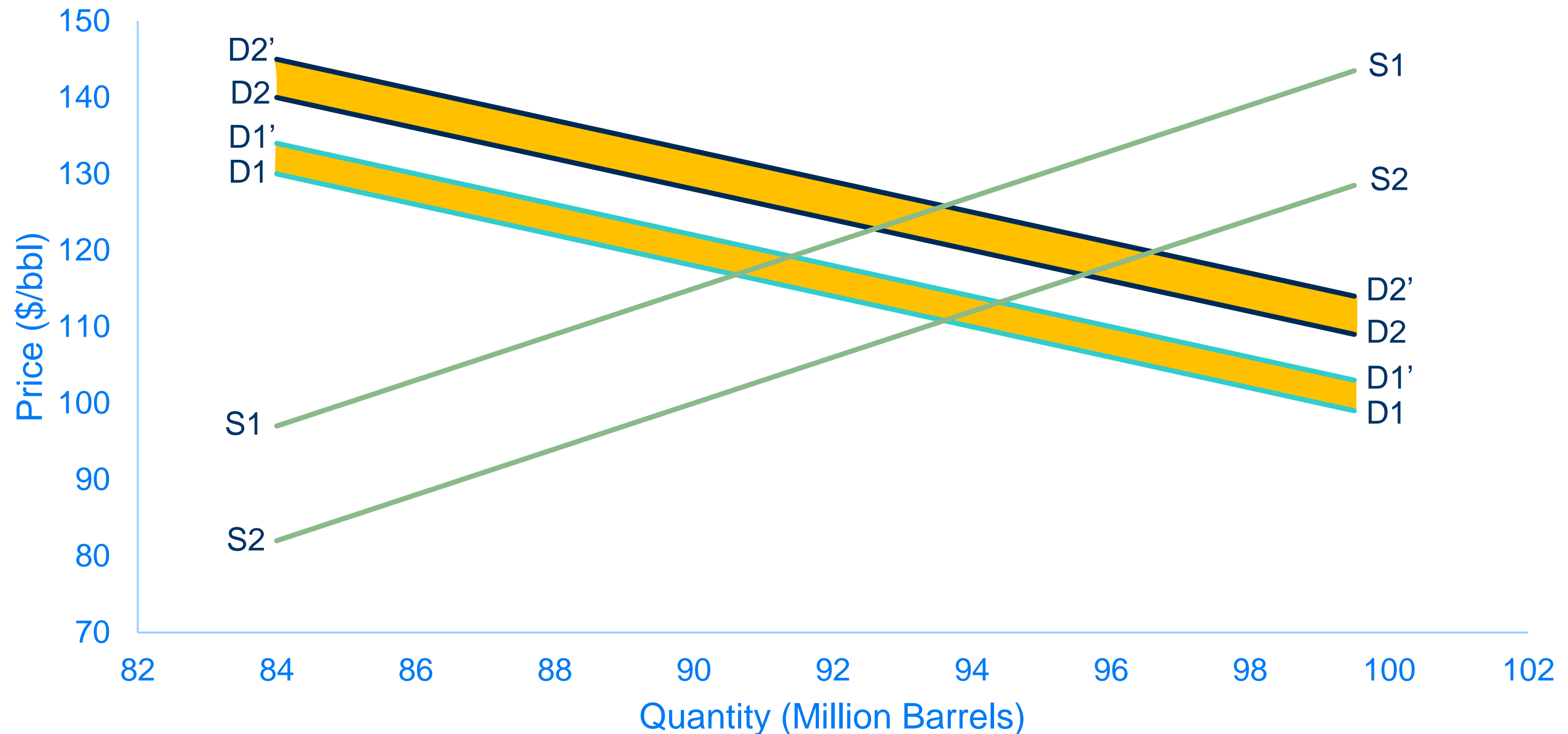
- It is relatively easy to control prices if one can control production in a market with no opportunistic buyers.
- It is much more difficult to manage a market with "fuzzy" demand and supply.
  - There is no way to control the destination of crude. It can go to consumers or it can go into storage.
  - The problem becomes particularly severe when price elasticities of demand are low.
  - Depending on expectations, the demand in Q4 2016 could range from 92 to 100 million barrels per day and prices from $20 to $80 per barrel given the low price elasticity of demand.

Crude Oil Price Determination in a World with No Surplus Stocks as Managed by OPEC



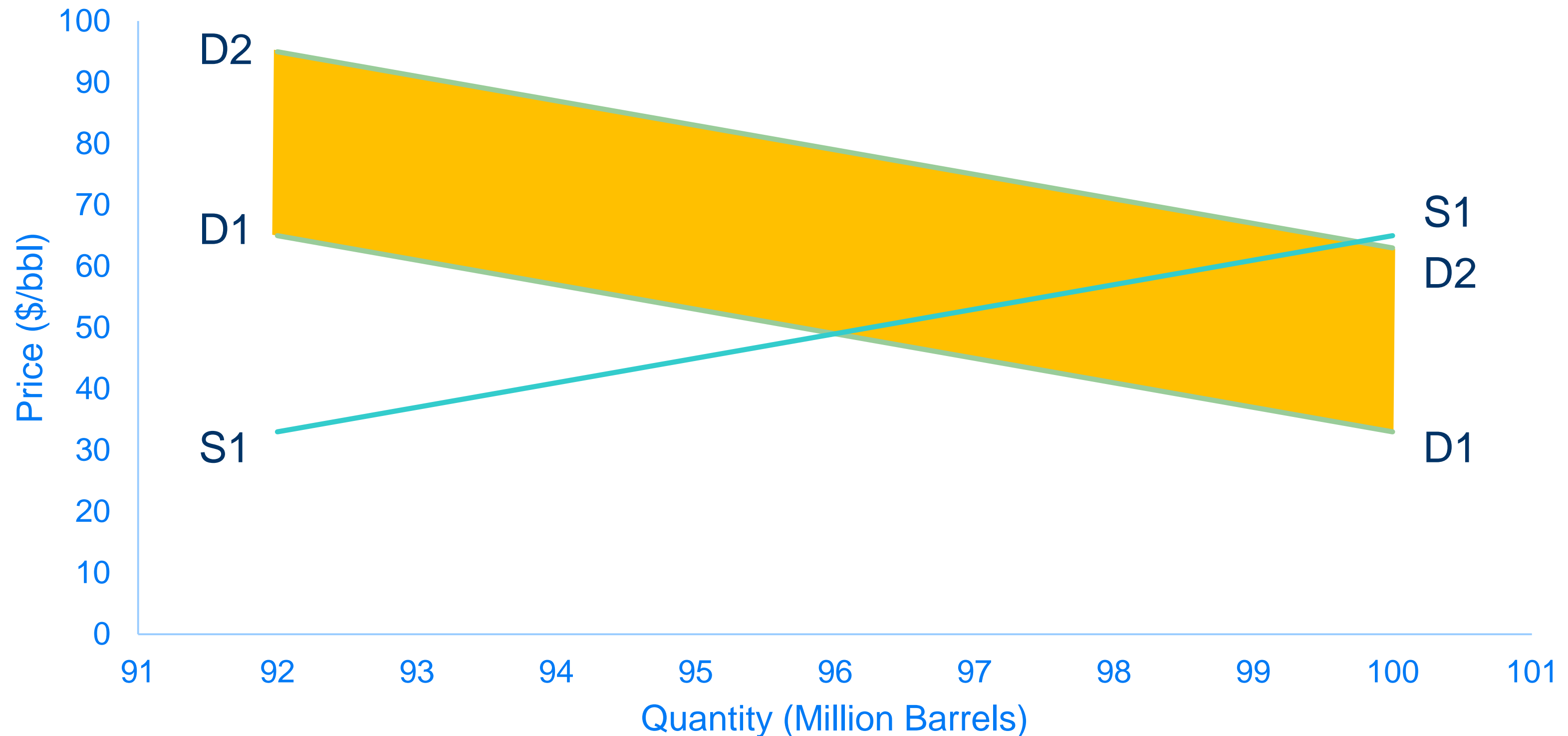
Source: PKVerleger LLC.

Crude Oil Price Determination in a World with Opportunistic Inventory Accumulation/Liquidation by Consuming Sector



Source: PKVerleger LLC.

Crude Oil Price Determination in a World with Opportunistic Buyers and Inelastic Demand



Source: PKVerleger LLC.

This Market Facilitates Large Trading Profits

- Arbitrage should eliminate trading profits, especially the ability to profit by opportunistic buying and selling.
- However, this conclusion holds only in a world where there are no unique competitive advantages.
- Trading companies such as Vitol have many competitive advantages.
  - Better and earlier information
  - Access to very low cost storage facilities
  - Lowest costs for storage
  - Access to very low cost ships
- Quantitative easing has resulted in the expansion of infrastructure and driven down costs.

PkV

OPEC Destabilizes Prices by Operating in the Old Oil Market

- Convincing announcements of meetings intended to limit output actually boost opportunistic demand.
  - The Algiers announcement led to a 250 million barrel increase in open interest (3.5 million barrels per day); prices rose 20 percent.
  - The implied short-run price elasticity is -0.2.
- Failure to follow through on announced intentions has an offsetting negative impact.

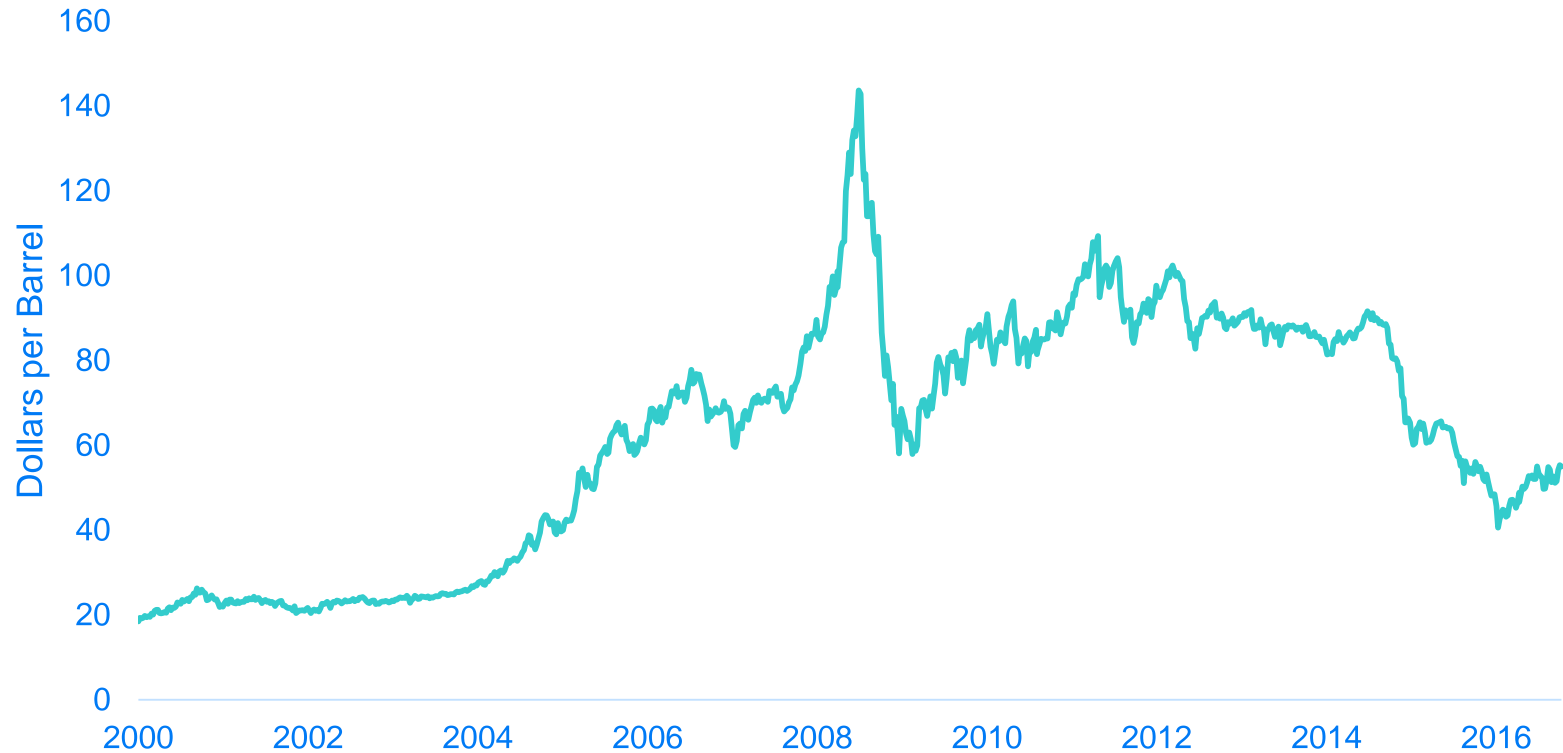
PkV

OPEC and Exporter Hands Are Tied by Expectations of Forward Prices

- Prices have an upper limit as long as opportunistic investors are positive because markets will remain in contango.
- Thus, at best, a successful producer can only lift spot prices to the point where contango is essentially eliminated and stocks begin to be drawn.
- The upper limit is set by forward prices. The current limit seems to be between $50 and $55 per barrel.
- Oil producers have little control over this price range. The market must be convinced that prices will be higher in two years. At this juncture, it has no such confidence.

PkV

Twenty-Four-Month-Forward WTI Price, Weekly Data



Source: NYMEX (CME).