Not Your Daddy's Oil Market:
Recent Trends In the Financialization of Energy Markets & Why It Matters For Price
Agenda

✔ A little background (the boring stuff).

Ø Myth #1: Forwards are a good indication of where the market is headed. Options trading is a bet on whether prices will go up or down.

Ø Myth #2: History is our best guide, markets never really change (OR history is no help in this market, this is uncharted territory).

Ø Myth #3: Oil prices are determined 100% by physical fundamentals (OR oil prices are determined 100% by speculators).

Ø Myth #4: Speculators don’t know much about commodities, often behave irrationally, and are bad for the general integrity of the market.

✔ Summing Up Market Participation

✔ Key Conclusions

✔ If You’re Not Tired of Derivatives Yet... A Takeaway
In Case You Haven’t Been Paying Attention: The Crude Oil Market

Source: Nymex
Terms of the Trade

- **Spot barrels**: Commodity for immediate delivery. Similar terms include physical, prompt, cash, or short-dated barrels.

- **Paper barrels**: Commodity for future delivery, and/or financially settled. Similar terms include financial, deferred or long-dated barrels, or futures, forwards, or swaps.

- **Long**: A counterparty who owns a commodity who has it available to sell; **Short**: A counterparty who owes or requires a commodity and ultimately needs to buy it.

- **Tenor**: Refers to the duration of a trade, or part of the forward curve. (e.g. Dec’09, or Calendar’10; generically Month 12, Month 24... etc.)

- **Open Interest**: The total number of options and/or futures contracts that are not closed (netted) or delivered on a particular day.

- **Volume**: The number of contracts that traded (changed hands) during a given period of time.

- **Liquidity**: The number of market participants willing and able to participate in a given market at a given time.

- **Bid-Offer Spread**: The difference between the price at which a buyer is willing to buy, and a seller is willing to sell. Bid-offer spreads are wider in illiquid markets.
Futures & Swaps

- Futures and swaps accomplish the same goal -- locking in the price of future volume with certainty today -- in slightly different ways.

- Futures are **exchange traded**. This means that a formal exchange determines and standardizes the terms of a trade (e.g. the expiration calendar, lot sizes, and product qualities). Commodity futures are physically settled.

- Swaps are traded **over-the-counter** (‘OTC’). Terms of trade are not standardized by an exchange, and contracts are settled financially.

**Example:** Dec'09 crude oil is trading for $60/bbl today. It ultimately **settles**, or **expires** at $70/bbl.

Buyer #1 purchases one crude futures contract today for $60 from Seller #1. Money changes hands today; a clearing member of the exchange (or sometimes the exchange itself) clears the trade minimizing counterparty credit risk. If the contract is still held when it expires, the Seller #1 is obligated to physically deliver one 1000 barrels of crude to Buyer #1 in Dec'09 per the terms of the exchange, regardless of the prevailing **spot** price at that time. No further money changes hands in Dec'09. Buyer #1 of the contract is $10 **in the money**. Seller #1 is $10 **out of the money**.

Buyer #2 purchases one crude swap OTC today for $60 from Seller #2. No money changes hands today, but both counterparties enter into a credit agreement. In Dec'09, Buyer #2 purchases the agreed upon volume of crude from the spot market at the prevailing price of the day ($70). Because the spot price in Dec'09 is $10 above the $60 agreed today, Seller #2 is obligated to pay the $10 difference to Buyer #2 in cash.
The Shape of the Forward Curve -- A Traditional Interpretation

**Contango:**
- Upward sloping forward curve
  - $M_1 - M_2 < 0$
- Crude for prompt delivery is cheaper than crude for future delivery
- Perception of plenty / ease of acquisition
  - High inventories
  - Bearish physical fundamentals

**Backwardation:**
- Downward sloping forward curve
  - $M_1 - M_2 > 0$
- Crude for prompt delivery more expensive than crude for future delivery
- Perception of shortage / difficulty of acquisition
  - Low inventories
  - Bullish physical fundamentals

**Arbitrage opportunity:**
- Buy cheap physical crude today --> sell expensive futures today --> store physical crude until futures come due, then deliver it.
- Sell as much inventory on the physical market today as possible --> Buy cheap futures today to replenish storage later.
**A Quick Look at Options**

An option gives its owner the right but not the obligation to buy (in the case of a call) or sell (in the case of a put) at a given price (the strike) on a certain date or during a certain period of time.

**Premium** for the option is paid up front and depends on the distance (delta) of the strike from today’s price and the tenor of the option.
Myth #1: Futures, or forwards are a good indication of where the market is headed. Options trading is a bet on whether prices will go up or down.
Futures/forwards are not a prediction of price

- Forwards tell us where a buyer of tomorrow’s crude can find a seller of tomorrow’s crude in the market today.
- Forwards are particularly bad at predicting inflection points, or trend changes. But this doesn’t mean that the futures market is ‘wrong’.
- Forwards/options are not necessarily a commentary on what market participants believe about the future. Market participants have many other reasons for buying or selling deferred price and optionality, other than their beliefs about the future.

Source: Nymex
Myth #2: History is our best guide, markets never really change (OR history is no help in this market, this is uncharted territory).
Physical supply/demand fundamentals still matter in the long run.

We still look at supply, demand, inventories, refinery activity, and pipeline and shipping flows in broadly the same way we always have.

The oil industry cycles through periods of over- and under-investment -- and typically overshoots in both directions. Refining and distribution (e.g. pipelines, tankers, terminals) are particularly pronounced examples of how years of under-investment due to poor margins can lead to capacity constraints down the road.

While under-investment across the supply chain is not a permanent market feature, it is also not a driver that can be reversed overnight. Ultimately though, the market does its job.
And A Few Things Are *Really* Different… The Hairy Chart

Historical long-term average crude price (mean reversion level)

In bear markets, the crude curve sloped up towards $20 (contango)

In bull markets, the crude curve sloped down towards $20 (backwardation)

Since 2003, deferred crude has dislodged from the $20 level

Source: Nymex
A new paradigm for price and curve shape

WTI Price Versus Forward Spread

Source: Nymex
Myth #3: Oil prices are determined 100% by physical fundamentals (OR oil prices are determined 100% by the behavior of speculators).
So What Is a Speculator Anyway?

Trade for any reason other than the acquisition of physical oil for consumption or the sale of physical oil production (or the use of derivatives to hedge that consumption or production) could be considered speculation.

Types of speculation?

- Attempts to price risks that could, but have not yet impacted physical supply or demand (e.g. geopolitical, weather) outside of corporate risk management.
- Attempts to arbitrage market inefficiencies and mispricings.
- Injections or withdrawals of capital into or out of commodities in response to performance of other asset classes or macro credit conditions.
Not very easily!

- A **physical** supply/demand balance can be thought of in three dimensions:
  - Volume
  - Over time
  - In geographic regions

- A **paper** supply/demand balance also has three dimensions:
  - Volume
  - Over time
  - In different tenors, or parts of the forward curve

- Data on paper supply/demand is very limited, especially for OTC activity
Who trades energy derivatives and why?

- **Macroeconomic Hedge Funds**: Employ a variety of strategies usually including relative value trading.
- **Institutional Investors**: e.g., pension funds, mutual funds, retail investors.

**Investors**

- **Model Traders**: e.g., Commodity Trading Advisors (CTAs).

**Trading Houses / Merchants**: Market makers and proprietary traders.

**Banks**: Market makers (liquidity providers) and proprietary traders.

**Brokers**: Market makers (liquidity providers). No warehousing of risk.

**Corporates**: Risk managers.

- **Consumers**: Buyers of producers, e.g., airlines.
- **Refiners**: Buyers of crude, sellers of products.
- **Producers**: Sellers of crude, e.g., E&P companies.

**Institutional Investors**: e.g., pension funds, mutual funds, retail investors.
Different Participants Focus On Different Tenors

- **Corporate Consumers**
- **Hedge Funds / Index Hedging**
- **Corporate Producers**

Tenor:
- M1
- M12
- M24
- M36
- M48
- Y5
- Y10
- Y15
- Y20
### Risk Exposure and Management Strategies For Corporates

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Risk Management Strategy</th>
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<tbody>
<tr>
<td>Price of crude</td>
<td>Producer hedging: swaps or put options</td>
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<tr>
<td>Cost of transportation, insurance, duty/tariff</td>
<td>Freight hedging</td>
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<td>Cost of carry (time value of money), time spread</td>
<td>Hedging with time spreads</td>
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<tr>
<td>Refinery margins</td>
<td>Hedging cracks (spread between crude and refined products) or full margins</td>
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<tr>
<td>Refined product price</td>
<td>Consumer hedging: swaps or call options</td>
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<tr>
<td>Locational/basis risk</td>
<td>Hedging product — product risk, or regional risk</td>
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<td>Retail margins</td>
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Myth #4: Speculators don’t know much about commodities, often behave irrationally, and are bad for the general integrity of the market.
Focus on Investors -- Not a Homogenous Bunch

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<th>Participant</th>
<th>Active or Passive? Buyers or Sellers? New or Old?</th>
<th>Activity Versus 5 Years Ago?</th>
<th>Recent Trends</th>
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| Trend Players (Commodity Trading Advisors) | **Buyers or sellers** — Depending on market trend.  
**Active** — Fast moving, directional, tend to enter and exit positions quickly. Most successful in trending market.  
**Old** — CTAs have traded energy for years.                                      | **Up** — Generally more dollars in energy                                                 | • General reduction of activity.                                                                                                                     |
| Macro Hedge Funds                 | **Buyers or sellers** — Depending on view of the market. On average in recent years, hedge funds more long than short given price trend. Funds may participate in any part of the curve and have shown particular interest in owning deferred price and volatility, adding liquidity and price clarity to that part of the curve.  
**Active** — Take proprietary risk daily. May have long or short term views, and take directional or relative value positions in the full range of energy products.  
**Old and new** — Not new to energy per se but more professional and putting more money towards this space in the last ~3 years. | **Up** — Generally more dollars in energy, but also more sophisticated and varied involvement in full range of energy products. | • General reduction of risk. Trading focuses of very short-term ‘day trading’ with very little risk taking.  
• Mixed strategies and results in 2008.                                                                                                           |
| Institutional Investors (Pension funds, mutual funds, retail investors) | **Buyers** — Institutionals enter the market almost exclusively from the long side via products like Commodities Indices and oil-linked notes.  
**Passive** — Take long-term, generally directional views. Tend not to enter or exit positions on short-term price fluctuations.  
**New** — Institutional investors have really only started to participate in the energy space in the past ~3 years. | **Up significantly** — Major inflow of money and interest in commodities as an asset class that really did not exist in a meaningful way 5-7 years ago. | • General reduction of exposure, similar to other asset classes.  
• So far, apparent commitment to commodities as an asset class in the long term.                                                                 |
New participants view commodities as an asset class

**WHY?**

- The dot.com bust, weak dollar, and low interest rates encouraged investors to seek other opportunities. The significant amount of money searching for yield (until recently...) has meant a boom for ‘alternative’ asset classes such as commodities, emerging markets, and real estate.

- Commodities are good for portfolio diversification, and viewed as a good hedge for inflation and ‘event risk’.

**HOW?**

- Commodity equities – buying/selling shares of publicly traded companies where profits are directly tied to commodity prices. e.g. commodity producers or refiners, companies that service those primary industries, companies that transport commodities. Old news.

- Commodity assets – direct ownership or private equity in commodity production, processing, storage or transport. Lots of hassle.

- Commodity ETFs/commodity-linked notes/commodity indices – structured products that allow for direct participation in underlying commodity price moves. Even your grandmother can do it. Where there is demand there is a bank to fill it with product!
Summing Up Market Participation... Then & Now-ish

Pre-2003

Natural Longs
Producer Hedgers

Natural Shorts
Consumer Hedgers

Long or Short

Market Makers / Speculators

Post-2003

Natural Longs
Producer Hedgers

Natural Shorts
Consumer Hedgers

Long or Short

Market Makers / Speculators
Supply/demand determine price in the long run, but increased participation in the financial energy markets increasingly influences the path we take to get there.

Increased participation has increased liquidity, but has also changed the way that the market responds to bullish fundamentals.

One result is that certain market paradigms are no longer applicable to energy markets. One is that idea that oil prices are mean reverting to a long-term average price of about $20.

In the short-term, we see dislocations and exaggerations as a new mix of players compete for deferred price.

As a result, it is now important to analyze not only the physical supply/demand balance, but the paper supply/demand balance as well.
A Takeaway: Options Volatility, a Proxy For Market Participation

WTI Volatility Skew (Average of 12 Mo. Strip)

Calls more expensive

Puts more expensive

10 Delta (Put - Call)  25 Delta (Put - Call)