Whither Oil Prices and Volatility?

1. The past decade has witnessed unprecedented levels of volatility in oil. The price of a barrel of crude oil has vaulted from $10 in the late 1990s to over $100 in 2008.
2. Not only have current (spot) prices of oil risen far more than other commodities, but market participants expect similar increases over the long term. The term structure of crude oil futures prices has moved up in parallel.
3. As of March 3, 2008, prices were expected to be over $97/bbl through 2013. The BP Royalty Trust (BPT) indicator of expected long-term oil prices has also risen sharply.
4. These indicators suggest that market participants expect most of the dramatic increase in oil prices to be permanent.
Term Structure of Futures Prices Suggests Shocks Expected to be Permanent

Parallel movements in term structure indicate expectations of permanent shocks

Long-Term Market Price also Higher and More Volatile
Market expectations of future volatility have also increased

- The distribution of likely future prices has widened, reflecting increased uncertainty

Why is oil price volatility important?

1. Volatility matters a great deal to world economy
   - Trade flows
   - Investment flows

2. On the exporter side, the boom-and-bust cycle presents economywide challenges
   - Capital inflows
   - Budget cycles
   - Development planning
   - Competitiveness of the non-oil sector
   - Governance and accountability of oil revenues

3. On the importer side, high & volatile oil prices present obstacles
   - Economic growth
   - Investment
   - Trade
   - Development planning
Is Elevated Volatility likely to Continue?

1. A yes answer would have very different implications than a no answer for fiscal management, public- and private-sector investment, current-account stability in oil-exporting and oil-importing developing countries, and many other dimensions of the world economy.

2. Addressing this question requires understanding and assessment of the underlying causes of volatility.

3. To gauge whether oil prices are likely to be volatile in the future, it is necessary to understand why they are volatile today.

FACTORS DRIVING OIL PRICE VOLATILITY

- Market fundamentals. Fluctuations in supply, demand, and market power. Some fundamentals related to expectations of future production, consumption, so not easily observable.

- Trading, especially speculation. Traders can move prices away from fundamental values in some circumstances.

*Speculation is the focus of this presentation*
Speculation Widely Claimed to Drive Volatility

**OPEC** (Press Release, 14 July 2006)

“Geopolitical developments, over which OPEC has no influence, have been behind this sudden rise in volatility, and these have come at a time when the market was already out of line with today’s supply and demand fundamentals, with speculation playing a significant role in driving up prices.” (emphasis added)

**Investment Analysts** (Société Générale Cross-Asset Research, Multi-Asset Portfolio, October 2006)

“Exponential price rises observed since summer 2005 were not consistent with fundamental valuations (for example, 45% overvaluation, still, on current oil price). **Hedge funds have been a massive force amplifying the positive uptrend in commodity prices.** At the peak of the commodity cycle, they held more than 17% of the most liquid of them, the oil market.” (emphasis added)

Speculation Widely Claimed to Drive Volatility, cont’d

**US Senate Permanent Subcommittee on Investigations**

The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat, June 2006

“Based upon its investigation into the role of market speculation in rising oil and gas prices, the Subcommittee staff makes the following findings and recommendations.

**A. Findings**

1. **Rise in Speculation.** Over the past few years speculators have expended tens of billions of dollars in U.S. energy commodity markets.

2. **Speculation Has Increased Prices.** Speculation has contributed to rising U.S. energy prices, but gaps in available market data currently impede analysis of the specific amount of speculation, the commodity trades involved, the markets affected, and the extent of price impacts.”
Some memorable experience consistent with this view

- Gulf Crisis as impetus for concern
- Oil prices spiked, then plummeted
- Little evident change in fundamentals
- Speculators, futures markets claimed responsible for market volatility

CRUDE OIL PRICES, $/barrel


HOWEVER...

- Tremendous growth in trading across commodities, securities, foreign exchange, etc. in recent years
- Conventional wisdom: trading → volatility. Based on intuition, not facts or systematic analysis
- Economic theory → speculators cannot affect price levels, but could affect price volatility
- A couple of studies using aggregate data do not find support for any effect (CFTC 2005, IMF 2006)
- Speculators make convenient targets
SPECULATORS SERVE AS SCAPEGOATS FOR BOTH PRICES AND VOLATILITY

“... among the causes of low [crude-oil] prices [are] the manipulation of [inventory] stocks by speculators and buyers to depress price to suit their purposes, which are always adverse to the interests of producers” (Petroleum Producers’ Union, 1878; emphasis added)

“NYMEX is the cheapest gambling house in America” (Leon Hess, 1996)

“Derivatives are ‘financial weapons of mass destruction’” (Warren Buffett, 2003)

“...The growing influx of money has led some to believe a commodity price bubble is forming as investor enthusiasm detaches itself from the fundamentals.” (PIW, 28 Feb 2005, Pension Funds Help Inflate Price Bubble, emphasis added)

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Crude-Oil Futures Open Interest up Sharply

Source: IMF

Percentage of open contracts held by non-commercial traders increasing
VOLATILITY HIGH BUT NO CLEAR TREND
Annualized standard deviation of daily crude-oil price changes

APSP Avg. Producer Spot Price, Implied volatility imputed from Brent options
Source: IMF World Economic Outlook

ANALYTICAL PERSPECTIVE
How can speculation influence price volatility?

► Only two theoretical possibilities – dominant player or herding
► First unrealistic – the market is too large and entry barriers too low
► Second has long history in financial markets

“...I explained to you the instability of [stock] prices and the reasons therefore...and discussed the frenzy and foolishness of speculation. ...As there are so many people who cannot wait to follow the prevailing trend of opinion, ...they think only of doing what others do and following their examples” (de la Vega, Confusion de Confusiones, 1688)
What is Herding, and is it Rational?

- Easier to recognize than define
- Broadly, making decisions by observing others and copying them, rather than by assessing fundamentals
- Can be rational if others are better informed. Widespread phenomenon: buying books on best-seller lists, choosing restaurants because they are crowded
- In financial markets, fixed asset supply can only take place among a subset of participants, e.g. speculators. "Flocking"
- Herding can move prices away from fundamentals and exacerbate volatility. Possibility of "stampede" as speculators try to buy or sell simultaneously

Summary of Analysis

1. **Problem** Actions of speculators difficult to monitor
2. **Approach** Use of CFTC microdata to measure parallel trading parallel trading in petroleum futures markets
3. **Methodology** Count number of speculators buying and selling each day, and test if most are on same side of the market
Summary of Findings

1. No evidence of parallel trading among commercial participants -- petroleum companies or financial institutions -- in crude-oil or heating-oil futures

2. No evidence of parallel trading among speculators (noncommercial participants) *as a group* in the crude-oil or heating-oil futures markets

3. Strong statistical evidence of flocking among fund managers in these markets, but levels moderate

4. Interpretation: Roughly half the active speculators buying, rest selling on any day → effect of trading on pieces limited

Implications and Conclusions

**Oil Prices Reflect Fundamentals, not Speculation**

1. Oil prices determined by current supply and demand, and expectations of future supply and demand

2. Widely heard claim that speculation is adding $X to oil price incorrect. $X=0

3. Futures reasonable basis for oil-price forecasts. Forecasts that diverge from futures prices subject to scrutiny

4. Futures prices reasonable basis for hedging programs
Implications and Conclusions (cont’d)

Oil Prices Reflect Fundamentals, not Speculation

1. Volatility unlikely to decrease unless factors driving fundamentals stabilize

2. Continuing increases in demand, and limited success in establishing new supply sources $\rightarrow$ low spare capacity

3. Continuing geopolitical uncertainty + low spare capacity $\rightarrow$ continued price fluctuations

For gory details, check out the paper on the web:

www.rff.org/rff/News/Features/Do-Birds-of-a-Feather-Flock-Together.cfm