Devil or Angel? The Role of Speculation in the Recent Commodity Price Boom

Scott H. Irwin
Monthly Average Price of Crude Oil, Cushing, OK, Jan 2000 - Oct 2008
Monthly RJ/CRB Commodity Price Index, Jan 2000 - Oct 2008

Index (Jan. 1982 = 100)

Jan-00 Jan-01 Jan-02 Jan-03 Jan-04 Jan-05 Jan-06 Jan-07 Jan-08

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A Bull Market Sees the Worst in Speculators

By DIANA B. HENRIQUES
Published: June 13, 2008

As Oil Rises, More Speculating About Speculators
JUNE 30, 2008, 10:25 AM

MARKET MAKER
Energy Speculators Draw the Heat

Are Pension Funds Fueling High Oil?
A Senate hearing weighs charges that speculation by big investors and sovereign wealth funds is behind the rise in commodities and energy prices

The Role of Speculators in the Global Food Crisis

By Beat Balzli and Frank Hornig

Vast amounts of money are flooding the world's commodities markets, driving up prices of staple foods like wheat and rice. Biofuels and droughts can't fully explain the recent food crisis -- hedge funds and small investors bear some responsibility for global hunger.
When you have enough speculators betting on the rising price of oil, that itself can cause oil prices to keep on rising. And while a few reckless speculators are counting their paper profits, most Americans are coming up on the short end — using more and more of their hard-earned paychecks to buy gas for the truck, tractor, or family car. Investigation is underway to root out this kind of reckless wagering, unrelated to any kind of productive commerce, because it can distort the market, drive prices beyond rational limits, and put the investments and pensions of millions of Americans at risk. Where we find such abuses, they need to be swiftly punished.

---U.S. Senator John McCain, June 18, 2008
"For the past years, our energy policy in this country has been simply to let the special interests have their way -- opening up loopholes for the oil companies and speculators so that they could reap record profits while the rest of us pay $4 a gallon,"

---U.S. Senator Barack Obama, June 22, 2008
"For the past years, our energy policy in this country has been simply to let the special interests have their way -- opening up loopholes for the oil companies and speculators so that they could reap record profits while the rest of us pay $4 a gallon,"

---U.S. Senator Barack Obama, June 22, 2008

President-elect

\[ \text{Republican} + \text{Democrat} = \text{Trouble} \]
Fadel Gheit, left, Roger Diwan, Michael Masters and Edward Krapels appear before a House subcommittee investigating the energy speculation and the high cost of crude oil.
Feeling Powerless, India Blames Oil Speculation

By HEATHER TIMMONS
Published: July 23, 2008

Oil prices driven by speculation not demand: Italy

Fri Jun 13, 2008 1:49pm BST

[-] Text [+]

Japan blames speculators for oil hike

Peter Alford, Tokyo correspondent | May 26, 2008

FINANCIAL speculation and other non-supply/demand factors may have increased crude oil prices by more than a third recently, according to a new Japanese Government white paper.
Outline

- New commodity speculators
- Bubble logic
- Conceptual errors
- Inconsistent facts
- Direct evidence
- Lessons from history
A New Type of Commodity Speculator

- Commodity Index Investors
  - Desire portfolio exposure to returns from a basket of commodities
  - Long-only
- Popular Indexes
  - GSCI
  - Dow Jones-AIG
  - Reuters/Jeffries-CRB
- Investment Types
  - OTC index funds
  - Exchange-traded funds
  - Exchange-traded notes

Diagram:
- Investors
  - $\pi$
- Swap Dealer
  - Long Futures Positions
  - $\pi$
- Index
Notional Value of Commodity Index Trading on U.S. Futures Exchanges (CFTC)

Investment (bil.$)

Dec-07: 118
Mar-08: 133
Jun-08: 161
All Futures Jun-08: 946
Proportion of Open Interest Held by Index Traders in Grain and Livestock Futures Markets, Jan 2006-Jun 2008

Source: Sanders, Irwin, and Merrin (2008a)

“Perma-Longs”
# Index Trading in NYMEX Crude Oil Futures

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Notional Value (bil. $)</td>
<td>39.1</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td>Net Long Position (# contracts)</td>
<td>408,000</td>
<td>398,000</td>
<td>363,000</td>
</tr>
<tr>
<td>Total Futures Equivalent Open Interest (# contracts)</td>
<td>2,508,971</td>
<td>2,885,101</td>
<td>2,837,447</td>
</tr>
<tr>
<td>Index Position/Total Open Interest</td>
<td>16%</td>
<td>14%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: CFTC Staff Report on Commodity Swap Dealers and Index Traders (2008)
It Has to be a Bubble!

- A ‘titanic’ wave of money invested in commodity futures markets
- Overwhelmed ‘normal’ supply and demand fundamentals
- Greatly magnified upward trend in commodity prices
- Final result: A bubble

So it’s becoming increasingly clear that there are very few people left in academia and economics-land that think that commodities were anything but a bubble. In fact it appears the only economists left attacking the bubble theory are the ones being paid by Wall Street to defend their actions.

---Accidental Hunt Brothers Blog, October 15, 2008
Chart 1. S&P GSCI Spot Price Index vs. Index Speculator Assets

The World According to Mr. Masters

Chart 2. Commodities Futures Market Size (Billions) vs. S&P GSCI
Conceptual Error #1: Money Flows are not the Same as Demand

- Futures markets are zero-sum games
- If long positions of index funds are new “demand” then the short positions for the same contracts are new “supply”?
- Simply observing that large investment has flowed into the long side of commodity futures markets at the same time that prices have risen substantially does not necessarily prove anything.

“...for every long there is a short, for everyone who thinks the price is going up there is someone who thinks it is going down, and for everyone who trades with the flow of the market, there is someone trading against it.”

Tom Hieronymus
Conceptual Error #2: Index Futures Positions Distort both Cash and Futures Prices

- Futures contracts are financial transactions that only rarely involve the actual delivery of physical commodities (i.e. “side bets”)
- To impact the equilibrium price of commodities in the cash market, index investors must take delivery and/or buy quantities in the cash market and hold these inventories off the market
- Absolutely no evidence that index fund investors are taking delivery and owning stocks of commodities
Conceptual Error #3: Hedgers are Benign Risk-Avoiders and Speculators are Harmful Risk-Seekers

- Hedging and speculation are best described as a continuum
- Index funds entered a dynamic and ever-changing “game” between commercial firms and speculators with various motivations and strategies
- Commercial firms tend to have an informational advantage
- Index funds add liquidity and may improve competition in commodity futures markets
## Inconsistent Fact #1: Speculation is not Excessive Compared to Hedging (2006:I-2008:I Averages)

<table>
<thead>
<tr>
<th></th>
<th>Long Hedging</th>
<th>Short Hedging</th>
<th>Long Speculation</th>
<th>Short Speculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>328,362</td>
<td>654,461</td>
<td>558,600</td>
<td>208,043</td>
</tr>
<tr>
<td>2008</td>
<td>598,790</td>
<td>1,179,932</td>
<td>792,368</td>
<td>182,291</td>
</tr>
<tr>
<td>Change</td>
<td>270,428</td>
<td>525,471</td>
<td>233,768</td>
<td>-25,752</td>
</tr>
<tr>
<td><strong>Soybeans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>126,832</td>
<td>192,218</td>
<td>183,105</td>
<td>107,221</td>
</tr>
<tr>
<td>2008</td>
<td>175,973</td>
<td>440,793</td>
<td>351,379</td>
<td>74,844</td>
</tr>
<tr>
<td>Change</td>
<td>49,141</td>
<td>248,575</td>
<td>168,274</td>
<td>-32,377</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>57,942</td>
<td>213,278</td>
<td>251,926</td>
<td>92,148</td>
</tr>
<tr>
<td>2008</td>
<td>70,084</td>
<td>240,864</td>
<td>300,880</td>
<td>121,578</td>
</tr>
<tr>
<td>Change</td>
<td>12,141</td>
<td>27,585</td>
<td>48,954</td>
<td>29,430</td>
</tr>
</tbody>
</table>

Source: Sanders, Irwin, and Merrin (2008a)
Inconsistent Fact #2: Price Increases Did not Occur in All Commodity Futures Markets Included in Popular Indexes (January 3, 2006 – April 15, 2008)
Inconsistent Fact #3: Price Increases Occurred in Commodity Futures Markets not Included in Popular Indexes or Markets Without Futures

<table>
<thead>
<tr>
<th></th>
<th>January 2006</th>
<th>April 2008</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearby Rough Rice Futures</td>
<td>$8.27/lb.</td>
<td>$22.17/lb.</td>
<td>+168%</td>
</tr>
<tr>
<td>Nearby Fluid Milk Futures</td>
<td>$12.65/cwt.</td>
<td>$17.29/cwt.</td>
<td>+37%</td>
</tr>
<tr>
<td>Cash Durum Wheat</td>
<td>$3.18/bu.</td>
<td>$12.99/bu.</td>
<td>+308%</td>
</tr>
<tr>
<td>Cash Edible Beans</td>
<td>$19.30/cwt.</td>
<td>$34.40/cwt.</td>
<td>+78%</td>
</tr>
</tbody>
</table>
Inconsistent Fact #4: Inventories did not Increase for Storable Commodities

Ending Stocks as a Percent of Use, 2001/02-2007/08

“So my challenge to people who say there’s an oil bubble is this: let’s get physical. Tell me where you think the excess supply of crude is going.”
Inconsistent Fact #5: Commodity Index Fund Trading is Predictable

- Index funds do not attempt to hide their current positions or their next move
  - Publish mechanical procedures for rolling to new contract months
  - Indicate desired market weightings when the index is re-balanced
- Theory shows that trading must be unpredictable for any trader group to consistently push prices away from fundamental value
- Highly unlikely that other large traders would allow index funds to push futures prices away from fundamental values for long when trades are so easily anticipated
This Time is Different!

- Facts build a persuasive case against bubble hypothesis
- But, evidence is indirect
- Bubble proponents can argue “this time is different”
- Direct evidence on the relationship between speculator positions and price changes is needed

Solution: Granger causality tests
Granger Causality Test Results for CFTC COT Trader Categories, Positions Do Not Lead Returns, 1995-2006

\[ R_t = \alpha_t + \sum_{i=1}^{m} \gamma_i R_{t-i} + \sum_{j=1}^{n} \beta_j \text{PNL}_{t-j} + \epsilon_t \]

<table>
<thead>
<tr>
<th>P-values for Hypothesis Test: $\beta_j=0$, $\forall j$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercials</strong></td>
</tr>
<tr>
<td>Wheat CBOT</td>
</tr>
<tr>
<td>Wheat KCBOT</td>
</tr>
<tr>
<td>Wheat MGE</td>
</tr>
<tr>
<td>Corn</td>
</tr>
<tr>
<td>Soybeans</td>
</tr>
<tr>
<td>Soybean Oil</td>
</tr>
<tr>
<td>Soybean Meal</td>
</tr>
<tr>
<td>Lean Hogs</td>
</tr>
<tr>
<td>Live Cattle</td>
</tr>
<tr>
<td>Feeder Cattle</td>
</tr>
</tbody>
</table>

Source: Sanders, Irwin, and Merrin (2008b)
Granger Causality Test Results for CFTC COT Trader Categories, Returns Do Not Lead Positions, 1995-2006

\[ PNL_t = \phi_t + \sum_{i=1}^{n} \lambda_i PNL_{t-i} + \sum_{j=1}^{m} \theta_j R_{t-j} + \omega_t \]

P-values for Hypothesis Test: \( \theta_j=0, \ \forall j \)

<table>
<thead>
<tr>
<th></th>
<th>Commercials</th>
<th>Non-Commericals</th>
<th>Non-Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat CBOT</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Wheat KCBOT</td>
<td>0.00</td>
<td>0.00</td>
<td>0.07</td>
</tr>
<tr>
<td>Wheat MGE</td>
<td>0.00</td>
<td>0.00</td>
<td>0.85</td>
</tr>
<tr>
<td>Corn</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Soybeans</td>
<td>0.22</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Soybean Oil</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Soybean Meal</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Lean Hogs</td>
<td>0.00</td>
<td>0.00</td>
<td>0.16</td>
</tr>
<tr>
<td>Live Cattle</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Feeder Cattle</td>
<td>0.03</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Sanders, Irwin, and Merrin (2008b)
### Figure 16: Granger Causality Tests relating Daily Position Changes to Price Changes in the NYMEX WTI Crude Oil Futures Contract from January 2000 to June 2008

<table>
<thead>
<tr>
<th>Trader Classification</th>
<th>Hypothesized Direction of Causality</th>
<th>Price Changes lead Position Changes</th>
<th>Position Changes lead Price Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direction</td>
<td>Significant?</td>
<td>P Value</td>
</tr>
<tr>
<td>All Commercials (includes Manufacturers, Commercial Dealers, Producers, Other Commercial Traders, and Swap Dealers)</td>
<td>+</td>
<td>Yes</td>
<td>0.028</td>
</tr>
<tr>
<td>Manufacturers</td>
<td>+</td>
<td>Yes</td>
<td>0.048</td>
</tr>
<tr>
<td>Commercial Dealers</td>
<td>+</td>
<td>Yes</td>
<td>0.040</td>
</tr>
<tr>
<td>Producers</td>
<td>+</td>
<td>Yes</td>
<td>0.032</td>
</tr>
<tr>
<td>Other Commercial Traders</td>
<td>.</td>
<td>No</td>
<td>0.918</td>
</tr>
<tr>
<td>Swap Dealer</td>
<td>.</td>
<td>No</td>
<td>0.114</td>
</tr>
<tr>
<td>All Non-Commercials (includes Hedge Funds, Floor Brokers &amp; Traders)</td>
<td>.</td>
<td>No</td>
<td>0.062</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>-</td>
<td>Yes</td>
<td>0.003</td>
</tr>
<tr>
<td>Floor Brokers &amp; Traders</td>
<td>.</td>
<td>No</td>
<td>0.741</td>
</tr>
<tr>
<td>All Non-Commercials combined with Swap Dealers</td>
<td>.</td>
<td>No</td>
<td>0.062</td>
</tr>
</tbody>
</table>

Source: Commodity Futures Trading Commission
What about the Bust?

Relationship between Corn and Ethanol Price at Iowa Plants, 09/07/07-10/31/08

\[ y = 2.762x - 1.1005 \]

\[ R^2 = 0.9102 \]
We Have Been Here Before: Lessons from History

Abraham Lincoln: “For my part, I wish every one of them [speculators] had his devilish head shot off.”

Vladimir Lenin: “For as long as we fail to treat speculators the way they deserve—with a bullet to the head—we will not get anywhere.”

Harry Truman: “...the cost of living in this country must not be a football to be kicked around by grain gamblers.”

U.S. Congress: “Speculative activity in the futures markets causes such severe and unwarranted fluctuations in the price of cash onions as to require complete prohibition of onion futures trading in order to assure the orderly flow of onions in interstate commerce.”
scapegoat

SYLLABICATION: scape-goat

PRONUNCIATION: skæpˈɡoʊt

NOUN: 1. One that is made to bear the blame of others. 2. Bible A live goat over whose head Aaron confessed all the sins of the children of Israel on the Day of Atonement. The goat, symbolically bearing their sins, was then sent into the wilderness.

TRANSITIVE VERB: Inflected forms: scape-goat-ed, scape-goat-ing, scape-goats
To make a scapegoat of.

ETYMOLOGY: scape^2 + goat (translation of Hebrew 'aza 'azazel, goat that escapes, misreading of 'azā 'azel, Azazel).
House passes oil anti-speculation bill

Thu Sep 18, 2008 2:29pm EDT

WASHINGTON (Reuters) - The U.S. House passed a bill intended to prevent excessive speculation in oil and other futures trading on Thursday despite a veto threat from the White House.

The bill requires the Commodity Futures Trading Commission to set position limits on major oil and agricultural futures contracts and to monitor look-alike contracts traded over the counter. It could set limits on those contracts, if need be.

Foreign exchanges would have to adopt reporting standards and trading limits similar to U.S. exchanges to have access to U.S. customers.
Concluding Thought

“For many years the anti-futures trading arguments tended to prevail so that speculation was treated as a necessary evil that accompanied the desirable hedging process. During the last decade the balance appears to have shifted so that a favorable view is more widely held. It is doubtful that the favorable view is yet in the majority but it is generally held by students of futures markets and increasingly held by members of Congress and the CFTC.”

---Hieronymus, 1977, p. 298