

SPECULATION AND THE COMMODITY MARKETS

John M. Urbanchuk
Technical Director – Environmental Economics
October 2011

Cardno ENTRIX

10 Corporate Circle
Suite 300
New Castle, DE 19720
USA

Phone 302 395 1919
Toll-free 800 368 7511
Fax 302 395 1920
www.cardno.com

www.cardnoentrix.com

Speculation - “The act of knowingly assuming above-average risks with the hope of gaining above-average returns on a business or financial transaction”.¹

Introduction

Commodity prices have experienced significant boom-bust cycles in recent years with cycles characterized by extreme volatility and price levels that appear to be inconsistent with historic supply-demand fundamentals. Prices of oil and agricultural commodities this year have exhibited a cycle similar to the 2007-2008 boom-bust, as prices surged in the first half of 2011, but have turned downward in recent months. The current cycle has led to concerns about a commodity bubble, and ultimately a bust, like that experienced in 2007-2008. The 2010-2011 increase in crop prices is rooted in fundamental factors but appears to have been exacerbated by a sharp inflow of funds by non-commercial investors including index funds and other financial derivative products. Considerable attention has been paid to the role of speculators in the extreme volatility and higher prices in commodity markets. This situation is of considerable interest to the ethanol industry since ethanol producers have a physical requirement for corn and are directly affected by the impact of non-commercial activity and speculation on price volatility and price levels.

A careful examination of activity by non-commercial and index traders (i.e. speculators) in the corn futures market in the context of supply and demand fundamentals strongly

¹ *The McGraw-Hill Dictionary of Modern Economics*. Second Edition. McGraw-Hill Book Company. 1973

suggests that speculation is a major factor behind the sharp increase in both the level and volatility of corn prices this year.

Analysis

The pattern and volatility of commodity prices in recent years is illustrated by the 2007-2008 global commodity price bubble and the current situation. The boom-bust cycles in commodities prices over the past five years are illustrated in Figure 1 and Table 1.

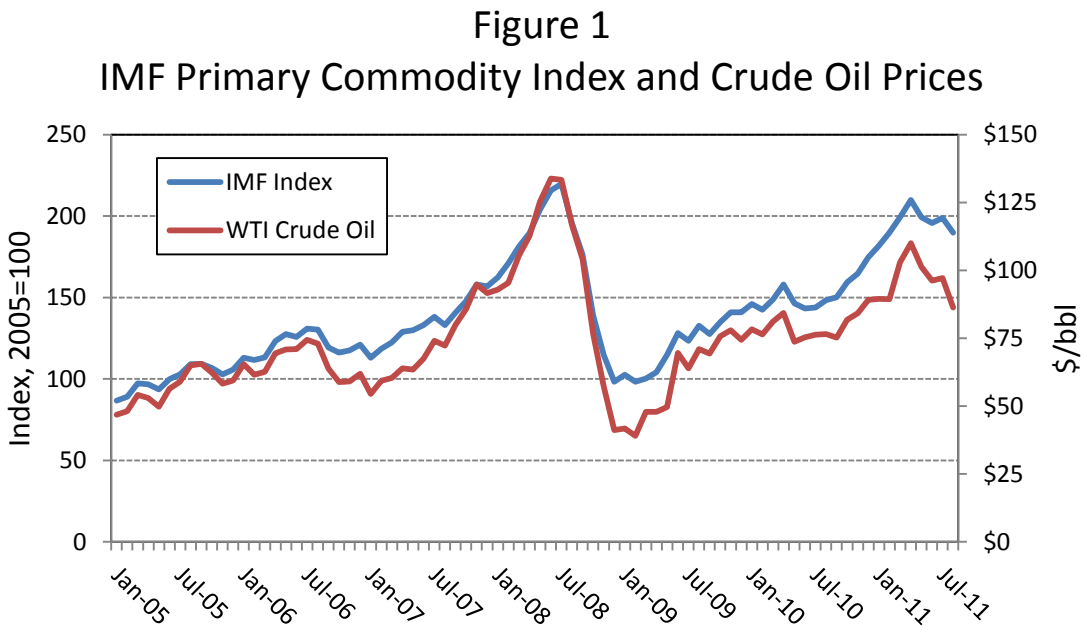


Table 1
Recent Changes in Commodity Prices

	IMF Primary Commodities Index (2005=100)	Crude Oil WTI (\$/bbl)	Corn No. 2 Yel Cent Ill. (\$/bu)
Jan-07	113.1	\$54.51	\$3.66
Jun-08	219.7	\$133.88	\$6.54
Dec-08	98.4	\$41.12	\$3.34
Apr-11	209.9	\$110.04	\$7.35
Aug-11	189.9	\$86.33	\$7.30
Percent Change			
Jan 07-Jun 08	94.2%	145.6%	78.7%
Jun 08-Dec 08	-55.2%	-69.3%	-49.0%
Dec 08-Apr 11	113.3%	167.6%	120.1%
Apr 11-Aug 11	-9.5%	-21.5%	-0.7%

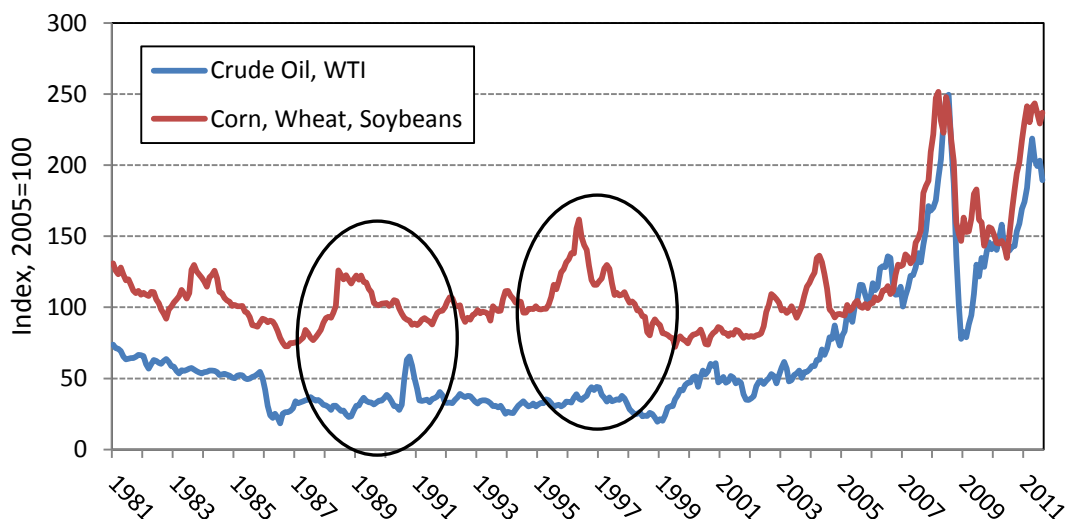
As shown in Figure 1, a significant commodity price bubble -- led by crude oil prices -- developed during early 2007 through mid-2008. This bubble was followed by a bust and subsequent re-emergence of another potential bubble, again led by oil. Between January 2007 and June 2008 the price of West Texas Intermediate crude oil increased 146 percent; and the price of No.2 Yellow Corn, Central Illinois increased 79 percent. Similar increases were experienced by virtually all commodities, as illustrated by a 94 percent increase in the index of primary commodities maintained by the International Monetary Fund (IMF). The commodity bubble eventually burst in mid-2008 and prices of these commodities fell between 49 percent (corn) and 69 percent (crude oil). Prices surged again beginning in December 2008 peaking in April 2011 with crude oil up 168 percent, corn up 120 percent and the IMF Index up 113 percent. Since April, commodity prices have declined, led by a 21.5 percent drop in crude oil prices. Corn prices did not fall as much reflecting a smaller than expected 2011 harvest.

The recent commodity boom-bust cycle is not unique. As shown in Figure 2 which plots the price of crude oil and a weighted average price of corn, wheat and soybeans², similar cycles have occurred in the past four decades. The most notable examples were the 73.3 percent

² Export prices in U.S. dollars weighted by shares of world trade indexed to 2005.

increase in the price of corn, wheat and soybeans between August 1986 and May 1988, and the 68.4 percent in prices between July 1994 and May 1996. The 1986-88 increase in crop prices resulted from three consecutive declines production and the 1994-96 increase resulted from sharp declines in production in the 1993-94 and 1995-96 crop years. Both periods of increase were followed by similar declines as markets adjusted.

Figure 2
IMF Commodity Price Index, 2005=100



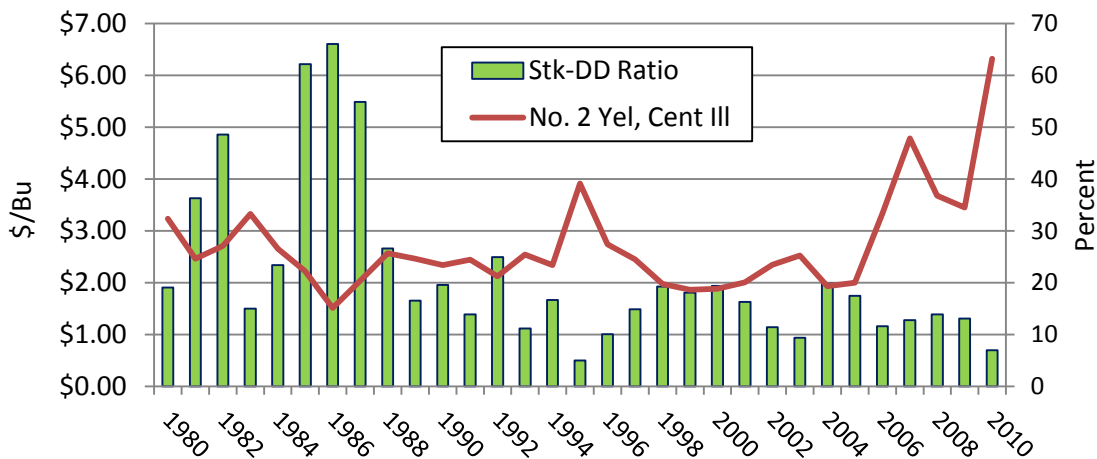
Supply and Demand Fundamentals

Clearly prices respond to changes in supply and demand fundamentals and dramatic changes have fueled increases in speculation. Figure 3 compares the farm and market price for corn to the ratio of corn stocks to demand. Sharp declines in corn stocks in 1983 (-69 percent), 1993 (-55 percent) and 1995 (-70 percent), each caused by substantial declines in average corn yields prompted by drought, resulted in price spikes. Consequently corn prices jumped 23 percent in the 1983 marketing year, nearly 20 percent in 1993 and 67 percent in 1995.

The current situation is somewhat different in that while 2010 and 2011 resulted in the third and fourth largest corn crops on record, demand continued to grow leading to a 47 percent decline in stocks for the 2010-2011 marketing year. The decline in stocks was smaller than experienced

in previous periods of disruption, but prices increased by 83 percent, significantly more than in earlier years.

Figure 3
Corn Stock-Demand Ratio and Price



Source: USDA/ERS

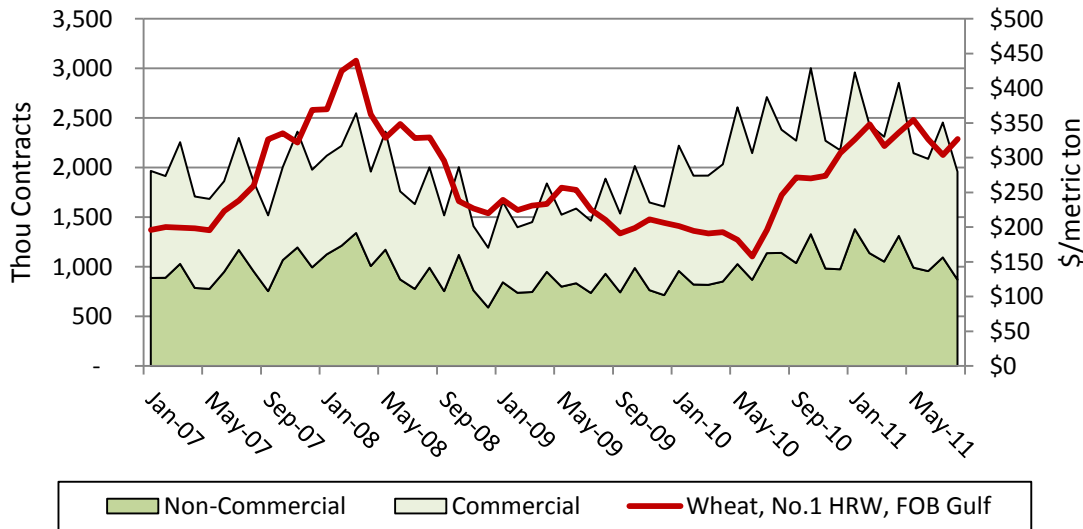
An example of the relationship between changes in supply and demand fundamentals, speculative activity, and prices is provided by the 2010 Russian wheat crop failure. As a consequence of the worst drought on record, wheat yields in Russia, Ukraine and Kazakhstan (the three largest producers in the Former Soviet Union [FSU]) fell nearly 28 percent in 2010. Reflecting these yield declines, Russian wheat production fell 32.8 percent in 2010, Ukrainian output fell 19.3 percent, and wheat production in Kazakhstan dropped 43 percent. The supply situation in Russia became so severe that Prime Minister Vladimir Putin banned all exports of grain in August 2010.³

While together these three countries account for about 13 percent of total world wheat output, world wheat production fell only 5.3 percent in 2010 and the global ratio of stocks to demand fell slightly from 25.4 percent in 2009 to 24.6 percent in 2010.

³ Kramer, Andrew E. "Russia, Crippled by Drought, Bans Grain Exports". New York Times. August 5, 2010

Notwithstanding the small change in the total world wheat supply demand balance, world wheat prices increased nearly 39 percent for the 2010 marketing year. As shown in Figure 4, the apparent reason for the sharp increase in wheat prices was a significant increase in futures market activity. As the drought situation in Russia and other FSU countries became more severe in late 2009 and 2010 the number of wheat futures contracts on the Chicago Board of Trade (CBOT) increased sharply as commercial buyers sought to reduce risk. During this same period investment by index traders in wheat futures also increased peaking at \$8.9 billion in December 2010. Wheat prices continued to fall through 2009 as prospects for total world wheat prospects appeared to improve. However when the full extent of the Russia situation became realized, wheat prices nearly doubled reaching a peak of \$350 per metric ton in May 2011.

Figure 4
Wheat CBOT Futures Positions and Price



Commodity Futures Market

Futures contracts for agricultural commodities have been traded in the United States for more than 150 years. The Chicago Board of Trade (CBOT) was founded in 1848 and the Kansas City Board of Trade (KCBT) in 1856, each established to facilitate the trading of grain. Futures trading of grain began in Kansas City in 1876. Markets for other commodities were established in subsequent years in Chicago, Minneapolis and New York. Commodities trading has been

under federal regulation since the 1920s. The primary federal agency with oversight of commodities is the Commodity Futures Trading Commission (CFTC) which was created by the Commodity Futures Trading Commission Act of 1974.⁴

Commodity futures markets perform three major functions:⁵

- price discovery,
- resource allocation
- risk-management for commodity producers (farmers) and users

Price Discovery

Price discovery is the process of buyers and sellers arriving at a transaction price for a given quality and quantity of a commodity or product at a given time and place. The futures market provides a mechanism for this process.

Resource Allocation

Prices provide an important signal to producers and consumers for allocating resources. Farmers rely on price signals to help them decide what and how much crop to grow, and to purchase and use resources required to grow and market the crop. Consumers rely on prices to help them effectively determine what and how much of a commodity or product to buy. When market prices reflect supply and demand conditions and operate in a free and unencumbered manner, the signals they provide generally are accurate. However, when markets do not work properly and prices are distorted, they send inaccurate signals that can lead to a misallocation of resources for all parties.

Risk Management

Risk management is widely considered one of the most important aspects of futures markets. Producers and consumers can manage the risk of loss caused by price fluctuations by utilizing

⁴ CFTC. <http://www.cftc.gov/About/HistoryoftheCFTC/index.htm>

⁵ Robert Wisner. "Index Funds: Their Role & Impact on Oil and Other Commodity Prices" AgMRC Renewable Energy Newsletter. August 2008. Iowa State University

the futures markets to hedge sales and purchases. Hedging consists of the purchase or sale of equal quantities of a commodity in two different markets at approximately the same time, with the expectation that a future change in price in one market will be offset by an opposite change in the other market. For example, an ethanol producer may agree to buy a futures contract for corn for future delivery and at the same time sell a futures contract for the same quantity of corn. As the contract delivery date approaches, he sells the second futures contract. If the corn price has increased, he can sell the futures contract for more than he paid, thereby locking in, or protecting, the price of his principal input.

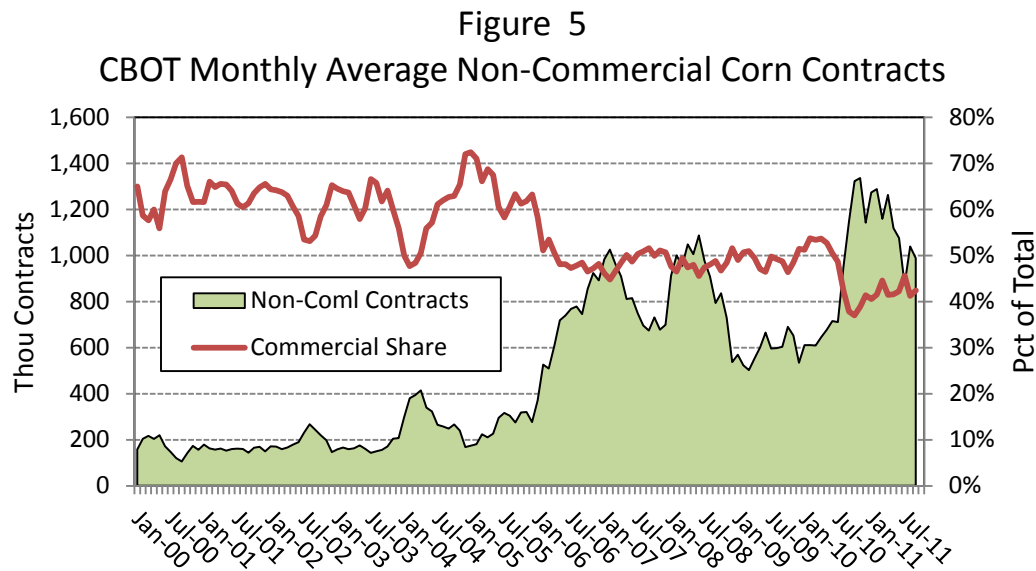
The Role of Speculation

Traditionally, producers or users of a commodity who need to protect profit margins by locking-in prices for their product or input through hedging have been the primary users of futures markets. These market participants typically are commercial entities where buyers are protected against sudden price increases and sellers are protected against sudden price falls. As such, hedging is used as a form of price insurance.

Trading by non-commercial entities, or speculators, takes place not to protect against or “hedge” price risk, but to benefit by anticipating and capitalizing on movements in the markets. Speculators can take “long” positions by buying a contract when they expect prices to go up in hopes of selling the contract at a higher price, or take a “short” position by selling a contract for future delivery if they expect prices to fall and profit by buying an offsetting contract at a lower price and pocketing the difference. Typically non-commercial speculators do not have a use for the commodity they are trading and have no intention of taking physical delivery.

The growth in non-commercial investment in corn futures is illustrated in Figures 5 and 6. The investment in long corn futures and options contracts by non-commercial traders has increased nearly five-fold since 2004 with the most significant increases in the 2007-2008 and early 2011 periods. Over this same time, the share of corn futures held by commercial traders – those who typically have a need for the physical commodity – has fallen from a peak of more than 70 percent in January 2005 to about 40 percent in August 2011.

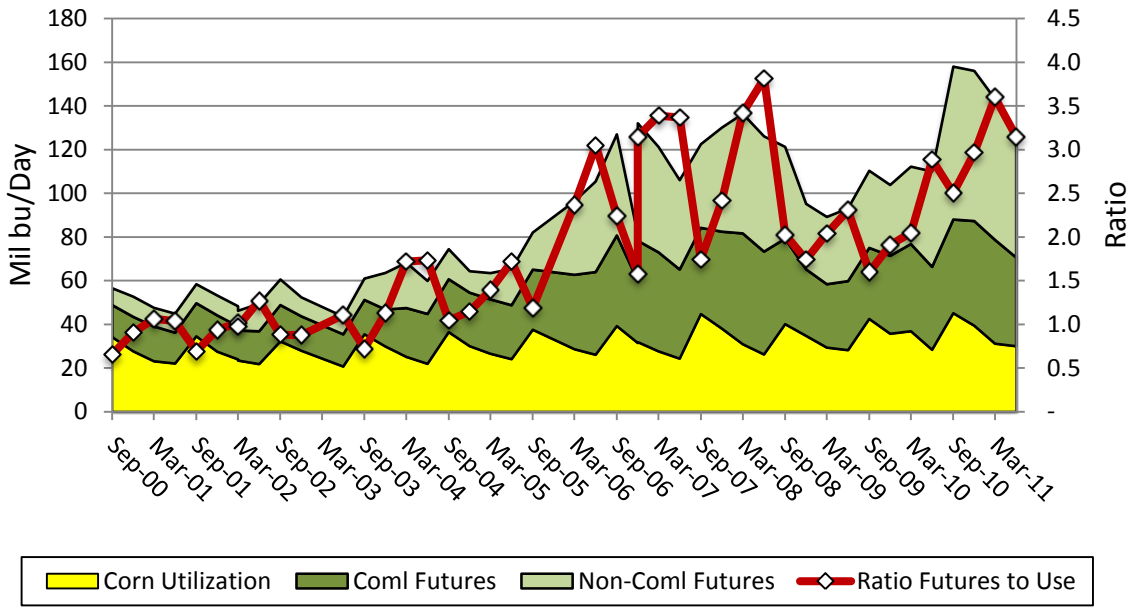
The extension of technology to the investment community and commodities trading in recent years has facilitated the expansion of non-commercial futures trading. Two examples include the introduction of electronic trading by CME Globex that offers trading on global markets virtually 24 hours a day, and the introduction of platforms aimed at smaller investors such as the Eminis commodity futures and options service offered through the CME Globex platform. Eminis provides entry for smaller investors who can trade 1,000 bushel contracts instead of the standard 5,000 bushel contract.



Source: CFTC. Commercial long futures and options

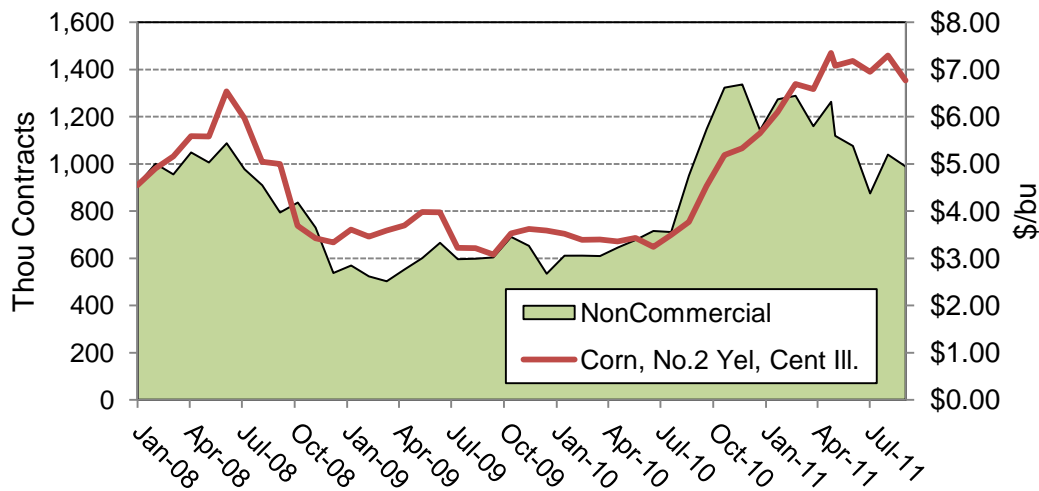
As can be seen in Figure 6, the volume of actual corn utilization is vastly overshadowed by trading in corn futures. While trading by commercials has increased, non-commercial trading volume has grown faster. The creation of “paper bushels” reflected by futures trading is 3 to 4 times the number of physical bushels of corn being used. Since trading volume represents a measure of intensity or pressure behind a price trend, the significant increase in both the level of futures contracts and the ratio of futures trading to physical corn use – which use has increased significantly over the past decade – further illustrates the impact of the futures market on corn prices.

Figure 6
Ratio of Volume of Corn Futures to Corn Utilization



The increase in non-commercial speculation has been accompanied by commensurate increase in corn prices. This relationship is illustrated in Figure 7.

Figure 7
CBOT Corn Long Positions and Corn Price



The development of financial derivatives such as commodity index funds has provided a mechanism by which non-commercial entities can increase their participation in the futures markets. A commodity index tracks a basket of commodities to measure their performance in much the same way a mutual fund tracks “baskets” of individual stocks. Commodity indexes are often traded on exchanges, allowing investors to gain easier access to commodities without having to enter the futures market. The value of these indexes fluctuates based on their underlying commodities, and this value can be traded on an exchange in much the same way as stock index futures.⁶ Energy –petroleum in particular– plays a major role in index funds. For example, energy futures account for 65 percent of the S&P GSCI Commodity Index (formerly the Goldman Sachs Commodity Index) while grains account for about 10 percent of the index value.⁷ The S&P GSCI is widely recognized as the leading measure of general commodity price movements in the economy. Since petroleum has such a large relative weight the index is largely driven by the price of oil and petroleum products institutionally mandated ratios sway market activity. In other words, as the price of oil increases, grain prices also increase and more corn must be purchased to maintain mandated index proportions

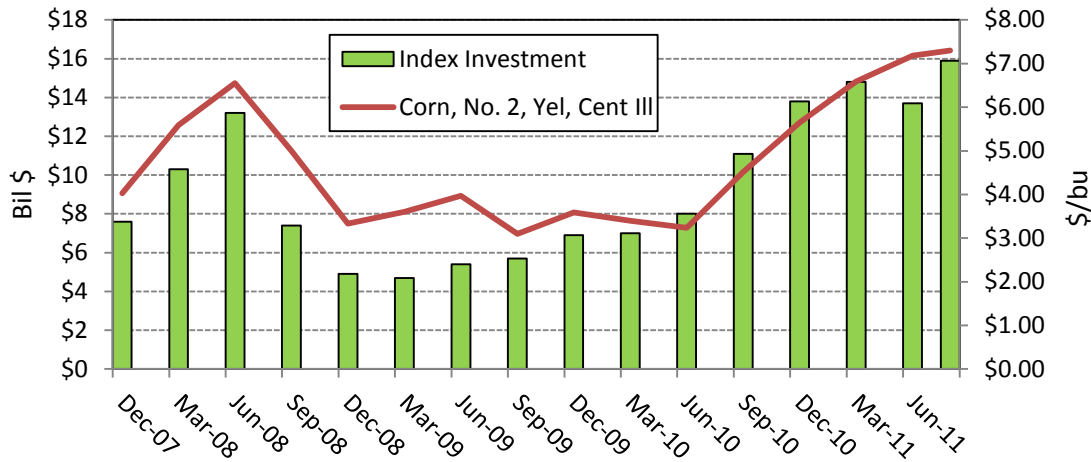
Investors in commodity indexes include index funds, swap dealers, pension funds, hedge funds and mutual funds, exchange traded funds (ETFs), exchange traded notes (ETNs) and similar exchange-traded products. Lehman Brothers reports that total Assets Under Management (AUM) in commodity indices increased from “...a negligible amount in 2002, to \$77 billion in January 2006, to peak at \$297 billion in July 2008. Between July and September 2008 the volume of AUM fell to \$187 billion”.⁸ In 2007 the CFTC began tracking and reporting on index investment in a broad range of commodities. The growth in index investment in corn and the relationship to corn prices is illustrated in Figure 8.

⁶ <http://www.investopedia.com/terms/c/commodityindices.asp>

⁷ Standard & Poors S&P GSCI Factsheet. Available at http://www2.standardandpoors.com/spf/pdf/index/SP_GSCI_Factsheet.pdf

⁸ Daniel Ahn. “Speculation and Commodity Prices: Anatomy of a quasi-bubble from 2006 to 2008” Lehman Brothers January 2009.

Figure 8
Index Investment in Corn and Corn Prices



Sources: CFTC, USDA/ERS

The Lehman analysis of speculation and commodity markets indicates that index investors typically are large in size and have substantial impact on liquidity in the markets. Further they are almost entirely biased toward long positions and generally invest in commodities at idiosyncratic times for broader strategic exposure. Even though index traders rarely hold new information since they are anonymous, traders can misinterpret an index inflow as a bullish statement by a trader with superior information. Consequently index inflows can thus impact both prices and volatility.⁹

The effect of the commodities index funds appears to have created a condition known as “contango” where the futures price is above the expected future spot price. Consequently, the futures price will decline to the spot price before the delivery date. This is known as convergence. Contango results in a vicious circle of upward spiraling prices and a situation where sellers delay sales in anticipation of more price increases; and buyers increase purchases for inventory in fear of even greater future price increases. The Institute for Agriculture and Trade Policy (IATP) points out that “As commodity prices have become more

⁹ Ibid p. 9

volatile and convergence less predictable since 2006, the futures market has lost some of its price discovery and risk management functions for many market participants.”¹⁰

Does Speculation Affect Commodity Prices?

The debate over the impact of speculation by index funds and other non-commercial traders on commodity prices is lively. On one side of the argument, some academics, hedge fund managers, commodity end-users, and policy-makers claim that speculative buying by index funds creates bubble conditions, with the result that commodity futures prices far exceeded fundamental values during the boom period.

- A 2008 study that examined the activity of index and institutional funds used investment and price data to substantiate the existence of a commodity price bubble over the 2006-2008 period.¹¹ The authors blame the rapid increase in overall commodity prices during this period on institutional investors’ embrace of commodities as an investable asset class.
- In an examination of the performance of the Chicago Board of Trade’s (CBOT) wheat futures contract over essentially the same period, the U.S. Senate Permanent Subcommittee on Investigations concluded that ¹²

“... there is significant and persuasive evidence to conclude that commodity index traders were one of the major causes of “unwarranted changes” — here, increases in the price of wheat futures contracts relative to the price of wheat in the cash market. The resulting unusual, persistent and large disparities between wheat futures and cash prices impaired the ability of participants in the grain market to use the futures market to price their crops and hedge their price risks over time, and therefore constituted an

¹⁰ Institute for Agriculture and Trade Policy. “Commodities Market Speculation: The Risk to Food Security and Agriculture”. Institute for Agriculture and Trade Policy. Minneapolis. November 2008. p.5

¹¹ Masters, M.W. and A.K. White. The Accidental Hunt Brothers: How Institutional Investors are Driving up Food and Energy Prices. 2008

¹² United States Senate, Permanent Subcommittee on Investigations. “Excessive Speculation in the Wheat Market. Majority and Minority Staff Report”. June 24, 2009.

undue burden on interstate commerce. Accordingly, the Report finds that the activities of commodity index traders, in the aggregate, constituted “excessive speculation” in the wheat market under the Commodity Exchange Act.”

Partly in response to concerns over excessive speculation Congress passed the Dodd-Frank financial overhaul bill in July 2010. One of the key provisions of Dodd-Frank was requiring commodity position limits -- caps on the amount of contracts any one trader holds to prevent excessive speculation. Earlier this year the Chicago Mercantile Exchange (CME) proposed an increase in trade limits for its agricultural contracts -- limit levels which had been in place for years -- given a surge in trading volume and open interest. Recent press accounts report that the CFTC has determined to adopt the CME proposal to increase grain position limits by as much as 85 percent.¹³

- A recent study prepared for U.N. Conference on Trade and Development (UNCTAD) examined commodity price behavior over the 2006-2008 time period and attempted to quantify the extent to which high commodity prices resulted from bubble behavior and index-based investment in commodity futures. The study author concludes that “...index-based investment in commodity futures may have been responsible for a significant and bubble-like increase of energy and non-ferrous metals prices, although the estimated impact on agricultural prices is smaller. The estimated price impact of index-based investment on energy and metals prices is of the order of 3–10 per cent in 2006–2007 but rises to 20–25 per cent in the first half of 2008. The impact on grains prices was approximately half that on oil and metals.” The author further concludes that “...it would be incorrect to argue that high oil, metals and grains prices were driven by index-based investment but index investors do appear to have amplified fundamentally-driven price movements.”¹⁴ The report urges greater international oversight, intervention and transparency in response to the increased investment in commodity markets, which has had a significant impact on the prices for a wide range of commodities. “Rising

¹³ Chicago Tribune. “CFTC set to back CME Group on higher grain position limits”. September 22, 2011.

¹⁴ Gilbert, Christopher L. Speculative Influences on Commodity Futures Prices 2006-2008. Discussion Paper No. 197 March 2010. UNCTAD

volumes of financial investments in commodity derivatives markets has encouraged herding behavior through which price determination in commodity markets increasingly follows the logic of financial investment rather than market fundamentals.” According to UNCTAD this highlights the need to deflate bubbles as prices are less and less driven by supply and demand.

- A study conducted by economists at the International Food Policy Research Institute (IFPRI) statistically tested whether speculative activity in the futures market can be identified as a source of the increasing agricultural commodity prices during the 2007–2008 period. Their results indicate “... that speculative activities might have been influential” during this period. The IFPRI analysis also examined the extent to which selected indicators of speculative activity can help forecast spot market price movements. This analysis produced evidence that speculation affects current commodity prices of corn, wheat, soybeans and rice. The study authors conclude that “... excess price surges caused by speculation and possible hoarding could have severe effects on confidence in global grain markets, thereby hampering the market’s performance in responding to fundamental changes in supply, demand, and costs of production”.¹⁵
- A June 2011 study by economists at USDA on food commodity price volatility reports, “The price effects associated with the rapid increase or decrease in noncommercial open interest may be interpreted as a lack of short-term liquidity on the commercial or hedging side of the market resulting in a short-term over-reaction of prices.”¹⁶
- A 2009 Policy Brief by the Peterson Institute for International Economics focused on the speculative bubble in crude oil futures, which broadly influenced prices for other commodities. The brief’s author, Mohsin S. Kahn, found that “While market fundamentals obviously played a role in the general run-up in the oil prices from 2003 on, it is fair to conclude by looking at a variety of indicators that speculation drove an oil price bubble in

¹⁵ Robles, Miguel, Maximo Torero, and Joachim von Braun. “When Speculation Matters”. IFPRI Issue Brief 57. International Food Policy Research Institute. February 2009.

¹⁶ Trostle, Ron et al. “Why Have Food Commodity Prices Risen Again?” USDA WRS-1103. June 2011.

the first half of 2008. Absent speculative activities, the oil price would probably have been in the \$80 to \$90 a barrel range.”¹⁷

- Among other institutions, economists at MIT¹⁸, Rice University¹⁹, Texas A&M University²⁰, the London School of Economics²¹, University of Chicago²², New York University²³, and World Bank²⁴ have also suggested that excessive speculative investment by non-commercials played a role in the 2007-08 commodities bubble.

Is Speculation Good or Bad?

Speculation has both positive and negative aspects. On the benefits side, non-commercial speculators can provide some measure of liquidity that facilitates the ongoing function of the market as commercial traders liquidate contract positions by paying for commodities at delivery or selling contracts to offset the risk of other contract positions they hold.

On the downside, non-commercial speculation is an investment strategy that can cause significant price effects without adding anything of economic value. A speculator, unlike other investors, does not create new capital that can be used to support production.

On the issue of price volatility, several academic researchers have dismissed any causal link between speculation and increased volatility in agricultural commodity markets. However, a

¹⁷ Kahn, Mohsin S. “The 2008 Oil Price Bubble.” Policy Brief No. PB09-19. Peterson Institute for International Economics. August 2009.

¹⁸ Eckaus, R.S. “The Oil Price Really Is a Speculative Bubble.” MIT Center for Energy and Environmental Policy Research. June 13, 2008

¹⁹ Medlock, Kenneth B. and Amy Myers Jaffe. “Who Is In the Oil Futures Market and How Has It Changed?” James A. Baker III Institute for Public Policy, Rice University. August 26, 2009

²⁰ Agriculture and Food Policy Center, Texas A&M University. “The Effects of Ethanol on Texas Food and Feed,” April 10, 2008.

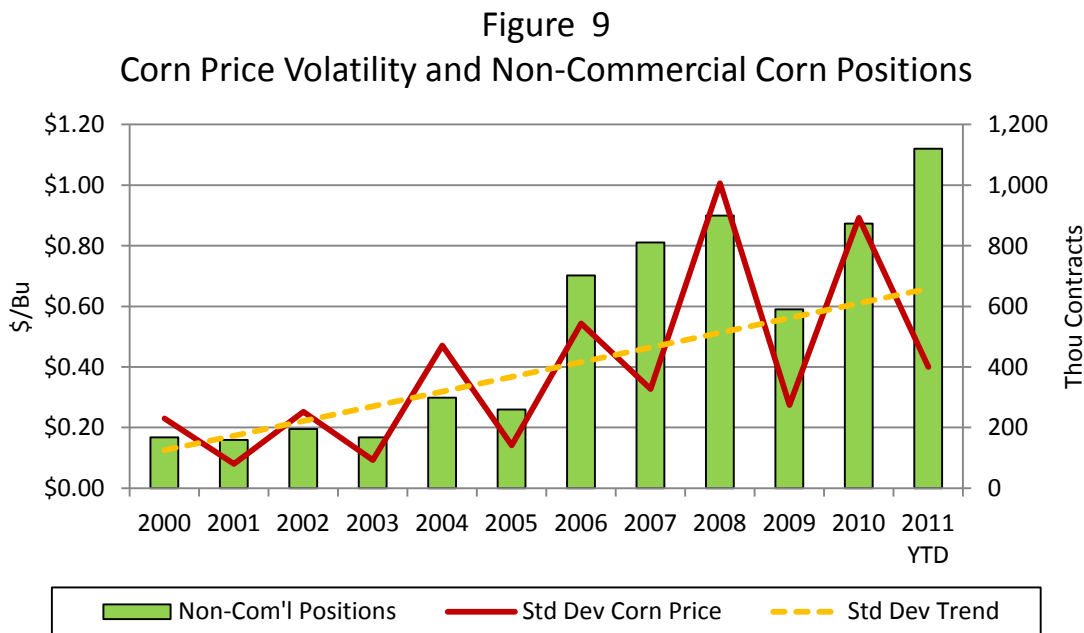
²¹ Krugman, Paul. “Oil speculation.” (New York Times Editorial). July 8, 2009.

²² Patterson, Michael and Elizabeth Stanton. “Oil Rally Topped Dot-Com Craze in Speculators’ Mania.” Bloomberg, June 13, 2008.

²³ Roubini, Nouriel. “The risk of a double-dip recession is rising.” Financial Times Opinion, August 23, 2009

²⁴ Baffes, John and Tassos Haniotis. “Placing the 2006/08 Commodity Price Boom into Perspective.” Policy Research Working Paper 5371. World Bank. July 2010.

comparison between non-commercial futures activity and volatility in corn prices seems to counter this argument. The relationship between non-commercial futures activity and corn price volatility is illustrated in Figure 9. Volatility in cash market corn prices is measured by the standard deviation of corn prices by calendar year.²⁵ The standard deviation shows how much variation there is from the average value of a series, in this case the price of No.2 Yellow Corn, Central Illinois. A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data are spread out over a large range of values. The standard deviation is frequently used as a measure of volatility: the higher the standard deviation, the higher the level of volatility. As can be seen in Figure 9, the standard deviation of corn prices has increased substantially over the past decade with peaks reached in 2008 and 2010. Increasing volatility is illustrated by the positive slope of the trend in the standard deviation. This increase has generally tracked the increase in the average number of non-commercial long futures positions in corn.



A recent study published by the UN concludes that futures contracts and other “commodity derivatives are not capable of mitigating the causes of commodity price volatility,” and that

²⁵ The standard deviation was calculated using the average cash market price for the 12 calendar months of each year.

failure to regulate commodity derivatives adequately has not only contributed to huge increases in food import bills and food insecurity, but also to making futures and options contracts unavailable or too expensive for many farmers and some agribusinesses to use to manage price risk.²⁶

Conclusion

A careful examination of activity by non-commercial and index traders (i.e. speculators) in the corn futures market in the context of supply and demand fundamentals strongly suggests that speculation is a major factor behind the recent sharp increase in both the level and volatility of corn prices.

The commodity futures markets play an important role in assisting market participants manage risk and make well-informed decisions. When markets function properly and efficiently, prices send the appropriate signals to buyers and sellers. However, when markets are distorted and prices belie underlying supply-demand fundamentals, no one is well served. It is undeniable that basic market fundamentals for corn and many other commodities have exerted upward pressure on prices in recent years. However, it also is clear that prices are likely higher than justified purely by fundamentals and the commodity markets have become more volatile as the volume of trading by index funds and other non-commercial traders has increased sharply. This is best illustrated by the imbalance in the level of corn prices relative to the change in stocks in the 2010 marketing year compared to earlier periods of market disruption.

The impact of speculation and non-commercial trading activity is of significant consequence to ethanol producers since they have a physical requirement for corn and are directly affected by increased price volatility and price levels. While some amount of non-commercial speculation is healthy for commodities markets, empirical evidence from the last several years can be interpreted to show that excessive speculation contributed to higher and more volatile corn price than would have otherwise been experienced. The role of non-commercial speculators in commodities markets and mechanisms to mitigate the distorting

²⁶ De Schutter, Olivier. Food Commodities Speculation and Food Price Crises. UN Briefing Note 02-September 2010.

price impacts of excessive speculation deserve the careful consideration of policymakers, regulators and market participants.

BIBLIOGRAPHY

- Ahn, Daniel. "Speculation and Commodity Prices: Anatomy of a quasi-bubble from 2006 to 2008" Lehman Brothers January 2009.
- Agriculture and Food Policy Center, Texas A&M University. "The Effects of Ethanol on Texas Food and Feed", April 10, 2008.
- Baffes, John and Tassos Haniotis. "Placing the 2006/08 Commodity Price Boom into Perspective." Policy Research Working Paper 5371. World Bank. July 2010.
- Buyuksahin, Bahattin, Michael S. Haigh and Michel A. Robe. "Commodity and Equities: A "Market of One"?" CFTC Working Paper Series. July 2008.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1069862
- CME Group. "A Global Trading Summary of Grain, Oilseed and Livestock Markets" Monthly Agricultural Update. April 2011
- De Schutter, Olivier. Food Commodities Speculation and Food Price Crises. UN Briefing Note 02- September 2010.
- Eckaus, R.S. "The Oil Price Really Is a Speculative Bubble." MIT Center for Energy and Environmental Policy Research. June 13, 2008
- Gilbert, Christopher L. Speculative Influences on Commodity Futures Prices 2006-2008. Discussion Paper No. 197 March 2010. UNCTAD
- Institute for Agriculture and Trade Policy. "Commodities Market Speculation: The Risk to Food Security and Agriculture". Institute for Agriculture and Trade Policy. Minneapolis. November 2008.
- Irwin, Scott H., Dwight R. Sanders and Robert P. Merrin. "Devil or Angel? The Role of Speculation in the Recent Commodity Price Boom (and Bust)". Southern Agricultural Economics Association. Atlanta. January 2009
- Irwin, Scott H., Dwight R. Sanders and Robert P. Merrin. "The Adequacy of Speculation in Agricultural Futures Markets: Too Much of a Good Thing?" Marketing and Outlook Research Report 2008-02. Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 2008.
http://www.farmdoc.uiuc.edu/marketing/morr/morr_archive.html
- Irwin, Scott H., Dwight R. Sanders (2010), "The Impact of Index and Swap Funds on Commodity Futures markets: Preliminary Results", *OECD Food, Agriculture and Fisheries Working Papers*, No. 27, OECD Publishing. [doi:10.1787/5kmd40w115f-en](https://doi.org/10.1787/5kmd40w115f-en)

- Irwin, Scott H., Dwight R. Sanders. "Index Funds, Financialization, and Commodity Futures Markets". *Applied Economic Perspectives and Policy* (2011), pp.1-31 February 2, 2011.
- Kahn, Mohsin S. "The 2008 Oil Price Bubble." Policy Brief No. PB09-19. Peterson Institute for International Economics. August 2009.
- Kauffman, Frederick. "How Goldman Sachs Created the Food Crisis". *Foreign Policy*. April 27, 2011.
http://www.foreignpolicy.com/articles/2011/04/27/how_goldman_sachs_created_the_food_crisis
- Kramer, Andrew E. "Russia, Crippled by Drought, Bans Grain Exports". *New York Times*, August 5, 2010.
- Krugman, Paul. "Oil speculation." (New York Times Editorial). July 8, 2009.
- The McGraw-Hill Dictionary of Modern Economics*. Second Edition. McGraw-Hill Book Company. 1973
- Masters, M.W. and A.K. White . "The Accidental Hunt Brothers: How Institutional Investors are Driving up Food and Energy Prices". 2008
- Medlock, Kenneth B. and Amy Myers Jaffe. "Who Is In the Oil Futures Market and How Has It Changed?" James A. Baker III Institute for Public Policy, Rice University. August 26, 2009
- Moledina, Anyaz, Terry L. Roe and Mathew Shane. "Measuring commodity price volatility and the welfare consequences of eliminating volatility". Working Paper. USDA/ERS and the Economic Development Center, University of Minnesota.
- Patterson, Michael and Elizabeth Stanton. "Oil Rally Topped Dot-Com Craze in Speculators' Mania." *Bloomberg*, June 13, 2008.
- Peters, May, Suchada Langley and Paul Westcott. "Agricultural Commodity Price Spikes in the 1970s and 1990s Valuable Lessons for Today". *Amber Waves*. USDA Economic Research Service. March 2009
- Robles, Miguel, Maximo Torero, and Joachim von Braun. *When Speculation Matters*. IFPRI Issue Brief 57. International Food Policy Research Institute. February 2009.
- Roubini, Nouriel. "The risk of a double-dip recession is rising." *Financial Times Opinion*, August 23, 2009
- Suni, Paavo and Emanuele De Meo. "Speculation and Commodity Markets" ETLA Suhdannevuosikirja 2009:1 www.etla.fi/eng/julkaisuhaku.php?type=details&id=1634
- Trostle, Ron et al. "Why Have Food Commodity Prices Risen Again?" USDA WRS-1103. June 2011.

United States Senate, Permanent Subcommittee on Investigations “Excessive Speculation in the Wheat Market: Majority and Minority Staff Report” June 24, 2009. Available online at <http://hsgac.senate.gov/public/index.cfm?FuseAction=Documents.Reports>

Wallace Tyner, Philip Abbot and Christopher Hurt, “What’s Driving Food Prices?” Farm Foundation, July 23, 2008, 6 and 26-27, <http://www.farmfoundation.org/news/articlefiles/404-FI-NAL%20WDFP%20REPORT%207-28-08.pdf>

Wisner, Robert. “Index Funds: Their Role & Impact on Oil and Other Commodity Prices” AgMRC Renewable Energy Newsletter. August 2008. Iowa State University