

**NRRI Teleseminar, with Support from the NARUC Working  
Group on Speculation**

**Speculation in the Natural Gas Market: Bad or Good?**

**January 22, 2009, 1:00-2:30 EST**

**Overview**

This teleseminar will discuss fundamental questions and basic concepts relating to speculation in commodity markets, focusing on the natural gas sector. Policymakers, analysts, and other market observers have expressed opinions on what effect increased financial speculation has had on commodity prices. These opinions vary widely with different implications for appropriate public policy and other actions the government might take. Those who see speculation as almost always benign or beneficial to markets and society in general tend to advocate light-handed regulation of this market activity. Skeptics of speculation, who have become more prominent in view of our country's financial crisis, support more stringent regulations, particularly in limiting speculative positions to mitigate manipulation and a "bubble" phenomenon.

Natural gas prices have exhibited wide fluctuations since the beginning of this century, with particularly pronounced price variability during 2008. Partially because of the weak short-run response of gas supply and demand to price changes, even moderate changes in market conditions can produce large fluctuations in price. This tendency was evident during 2008, when prices rose sharply early in the year and then fell almost as sharply starting around early summer. A number of industry observers blame financial speculation by noncommercial market participants (e.g., hedge funds, pension funds, and other institutional investors) for the volatility and rise in natural gas prices. Industry, regulatory, and other analysts disagree, however, on whether, and to what extent, speculation has affected energy prices. In response to the erratic movement in natural gas prices during 2008, NARUC formed a Working Group of state commissioners to examine various questions relating to speculation in natural gas markets.

In this 90-minute teleseminar, Ken Costello, NRRI's Principal, Natural Gas Research and Policy, will discuss his recent paper on speculation. Commenting on Mr. Costello's presentation, as well as on speculation in general, will be a panel representing different perspectives. The seminar will conclude with participant questions and final comments.

## **Presentation by Ken Costello of NRRI**

### **I. Tutorial on speculation in commodity markets: truths, myths and unknowns**

#### **A. Definition of speculation**

1. Economic activity where an individual or entity attempts to profit from price movements.
2. Specifically, the individual or entity tries to buy an economic good or asset at a price lower than what the good or asset expects to sell at in some future period.
3. Speculation represents a basic economic function in markets with high price volatility and opportunities for profit-making from price movements.

#### **B. Examples of speculation**

1. Physical speculation with assets such as land, houses and stored commodities
2. Financial speculation with assets such as futures contracts, swaps and options

#### **C. The social benefits of good speculation**

1. Good speculation means no market manipulation and, arguably, no “bubble” phenomenon.
2. Good speculation (whether physical or financial in nature) serves a valuable market function.
  - a. It provides liquidity to the market.
  - b. It helps local gas distribution companies and other large gas consumers to hedge against rising prices, and so to reduce risk—a significant benefit amid highly volatile gas prices.
  - c. Good speculation helps to efficiently allocate a commodity such as natural gas across different periods.
    - (1) Today’s decisions depend not only on present supply and demand but also on the expectations for future market conditions.

- (2) Good speculation could moderate future prices, for example, by storing more of a commodity presently to release in a future period when the market expects supply reductions or the possibility of a tight market.
3. The natural gas industry, since around 1990, has relied heavily on financial hedging and speculation as important risk-shifting and profit activities.

**D. Players in financial derivative markets**

1. Both commercial and noncommercial entities participate in financial derivative markets.
2. A commercial entity is involved in the production, processing, or merchandising of a commodity.
  - a. In the natural gas sector, commercial entities would include producers, marketers, local distribution companies, and retail consumers.
  - b. These entities usually purchase or sell financial derivatives such as futures contracts, options, and swaps for hedging. A local gas distributor, for example, may purchase a futures contract to set a price cap on the gas it buys for some future period.
  - c. Commercial entities also rely on financial derivative markets for price discovery.
    - (1) Price discovery involves determining the price level for a commodity, either in the spot or futures market, based on market conditions.
    - (2) Both hedgers and speculators look to the futures exchanges for information that reflects market expectations of supply, demand and prices.
3. Noncommercial entities, by definition, do not take any physical positions on the commodity in question.
  - a. They include short-term speculative traders in addition to other traders with different market strategies and longer time horizons.
  - b. Their motivation is solely to make money in financial derivatives from price movements.

- c. These derivatives can form part of a portfolio containing different financial assets for a selected group of commodities. Some analysts call investors in these portfolios “index speculators.” One example of a commodity index trader is a pension fund. The fund may include financial commodity assets as well as bonds and stocks.

**E. Differences between good and bad speculation**

- 1. From a societal perspective speculation can produce either positive or negative results; thus, speculation is inherently neither good nor bad.
- 2. We previously talked about the benefits of good speculation -- for example, efficient allocation of market risk, provision of market liquidity, provision of information for price discovery.
- 3. Speculation carried to an extreme (“excessive speculation”) or tainted with manipulative intent can cause harm and adversely affect markets.
  - a. The Commodity Futures Trading Commission (CFTC) defines manipulation as: “Any planned operation, transaction, or practice that causes or maintains an artificial price.” It defines artificial price as a price “higher or lower than it would have been if it reflected the forces of supply and demand.”
    - (1) Manipulation occurs when speculators attempt to distort prices with the goal of earning higher profits from the sale or purchase of a financial asset.
    - (2) The harm done can carry over to the physical commodity market when it relies on futures prices and the prices of other financial derivatives for determining the price of physical gas.
  - b. “Excessive speculation” is problematic to some market analysts when associated with the concept of “speculative bubble.”
    - (1) The CFTC defines a speculative bubble as “a rapid run-up in prices caused by excessive buying that is unrelated to any of the basic, underlying factors affecting the supply or demand for a commodity or other asset. Speculative bubbles are usually

associated with a ‘herd or bandwagon’ effect in which speculators rush to buy the commodity . . . before the price trend ends, and an even greater rush to sell the commodity . . . when prices reverse.”

- (2) A speculative bubble inflates the price of a commodity beyond (sometimes far beyond) the level that would reflect only physical supply-and-demand conditions.
  - (3) Experience has shown that a bubble can develop when speculators’ domination of a market evolves into a “herd” mentality
  - (4) A speculative bubble results in high price volatility, with likely consequential effects (both positive and negative) on market participants. When prices move quickly upward, speculators benefit while consumers of a commodity would pay more and become worse off.
- c. While almost unanimous agreement exists as to the justification for regulation to combat manipulative speculation, less consensus occurs as to whether and how to regulate speculative bubbles. (Recent events in credit markets, however, have pushed the argument in favor of mitigating speculative bubbles.)
  - d. The CFTC sets limits on speculation only to prevent manipulation by an *individual speculator* or a *group of colluding speculators*. These limits arguably do not address the total amount of speculation in a commodity market. That is, the CFTC’s actions may not include limiting or preventing speculative bubbles.

## **F. Federal regulation of speculation**

1. Why regulation?
  - a. The rationale for regulating futures markets and other financial derivatives lies with the potential for speculators to manipulate markets to their economic advantage and at a cost to other market participants and the economy as a whole.
  - b. Early regulation of the futures markets for agricultural products resulted from the general perception that those

markets were vulnerable to manipulation and misinformation by traders. These malicious actions had the intent of moving prices in a direction favoring those traders who had a dominant position.

2. The regulatory structure: CFTC, FERC, NYMEX, and Congress
  - a. Both the CFTC and the Federal Energy Regulatory Commission (FERC) have regulatory authority over market manipulation in natural gas markets.
  - b. The New York Mercantile Exchange (NYMEX) self-regulates futures and options activities, with CFTC oversight and guidance, in order to ensure market transparency and to prevent manipulation, abuse, and other market problems.
  - c. Congress enacted the Commodity Exchange Act in 1936, originally giving authority over the oversight of futures markets to the U.S. Department of Agriculture. The driving force behind the Commodity Exchange Act was:
    - (1) To protect the price discovery function;
    - (2) To prevent the manipulation of commodities through corners, squeezes and similar schemes; and
    - (3) To ensure an effective vehicle for risk shifting.

#### **G. Theoretical arguments on the price effect of speculation**

1. Distinction between *short- and long-term effects*: suppose that speculators store more natural gas today because of news that potentially could increase the future price. (This is an example of physical speculation.)
  - a. This news would add to the inventory of stored gas, which, in turn, would tend to increase the current price, as less natural gas supplies would be available for current consumption.
  - b. Looking longer term, the increased storage should reduce future prices below what they otherwise would be: additional natural gas would be available in the future from the release of more gas stored today.

- c. The overall effect from an increase in storage today is to increase the current price but to lower future prices (during periods when the speculator releases additional stored gas).
  - (1) From a multi-period perspective, this physical speculation would produce more stable prices (i.e., a lower spread between current and future prices).
  - (2) From the consumer's perspective, this speculation would require trading off higher prices today for lower prices tomorrow.
  
- 2. *Socially desirable* versus *socially undesirable* price effects
  - a. Socially desirable: when no manipulation or “bubble” condition exists, speculation has the effect of improving price efficiency over a multi-year period. It conveys correct price signals about the scarcity of physical supplies and market expectations of future conditions in commodity markets.
  - b. Socially undesirable: manipulation by speculators produces artificial prices that distort information on the actual scarcity of physical supplies over different time periods or between markets. Manipulation jeopardizes the integrity of a market by providing participants with information that likely would lead to inefficient and socially undesirable outcomes.
  - c. A difficult but important question is how to distinguish between *appropriate and inappropriate prices* for both commodities and financial derivatives. A rapid rise in commodity prices *per se*, for example, should not imply that market conditions warrant governmental intervention. Such a price movement may simply reflect an unexpected rise in demand in a tight market with little producer and consumer short-term response.
  - d. In a highly volatile market, such as natural gas and oil, it is important for producers, consumers and other market participants to have the ability to manage price risks through hedging. Hedging, as we know, requires speculators who are willing to take on price risk with the prospect of earning a profit.

## II. Current issues and concerns about speculation in energy markets

### A. Factors explaining the level and volatility of natural gas prices

1. In 2008, when prices rose rather sharply during the first several months and then fell almost as sharply starting around the early part of summer. As of early summer, spot gas prices were in the \$12-13 per MMBtu range, which were the highest they had ever been for that time of year. The fear was that if prices remained at that level through the upcoming winter or rose even higher, natural gas would become unaffordable for an increasing number of residential customers. But then, around midsummer, rather surprisingly to many analysts, prices started to drop quickly and drastically. According to the U.S. Energy Information Administration (EIA), the decline in price resulted from the combination of a drop in oil prices, mild summer temperatures, and a larger-than-expected increase in domestic gas production.
2. Another explanation comes from reports about the production of abundant supplies of shale gas, in particular in the Barnett Basin, at less than \$7 per Mcf.
3. As of mid-January, the Henry Hub had fallen to less than \$5.50 per MMBtu. Winter NYMEX futures prices were close to \$14 per MMBtu back in early July.
4. Physical factors account for some unknown portion of price volatility:
  - a. Arguably the most important factor being those that affect natural gas supply and demand conditions
  - b. In a tight market, natural gas prices are especially sensitive to market fundamentals, making prices both volatile and susceptible to significant prediction error.
  - c. Market fundamentals include; (1) aggregate storage levels, (2) consumer response to price changes, (3) weather, (4) the cost of gas exploration and production, (5) oil prices, (6) general economic conditions, and (7) regional pipeline capacity relative to demand.
  - d. Fear premium (e.g., prospects of a hurricane or other events disrupting gas supplies or the gas delivery system)
5. Some industry observers blame speculation in financial derivatives particularly by noncommercial market participants (e.g., hedge

funds, pension funds, and other institutional investors) for the volatility and rise in natural gas prices.

- (1) Speculation in energy markets by noncommercial entities, including natural gas, has increased dramatically. With falling interest rates and equity returns along with declining house prices, investors (including hedge funds) looked for new places to put their money. One attractive asset is financial derivatives in commodities, which until recently have had high returns, relative to securities and real estate.
- (2) The large shift of financial assets to energy markets has raised concerns about its effect on oil and natural gas prices.
  - (a) Studies and testimony before Congress present contrasting views and evidence of the relationship between financial speculation and commodity prices.
  - (b) Some analysts contend that financial speculation has at most a transitory and weak effect on prices.
  - (c) Other analysts contend that the effect is longer-term and robust.

## **B. Petitions for congressional action**

1. One problem highlighted by several analysts and policymakers was passage of the Commodity Futures Modernization Act (CFMA) in 2000. Critics of this legislation point out that it reduces the authority of the CFTC to safeguard energy markets from fraud and manipulation.
  - a. This Act placed much of the financial derivative market in energy outside CFTC jurisdiction.
  - b. Under the CFMA, financial derivatives divide into three basic categories: agricultural, excluded, and exempt. The Act considers energy an exempt commodity because it is a physically delivered commodity but not an agricultural commodity.

- c. As an exempt commodity, energy is tradable under different institutional arrangements: (1) a Designated Contract Market (DCM), which includes NYMEX; (2) a Bilateral Exempt Market, which includes the Over-the-Counter (OTC) Market; or (3) an Exempt Commercial Market, which includes the Intercontinental Exchange (ICE).
2. The financial markets for energy commodities have two distinct venues -- “futures exchanges” and “over-the-counter” markets:
  - a. Under the Commodity Exchange Act, trading of futures contracts must take place on a futures exchange regulated by the CFTC.
  - b. Financial derivatives falling outside the legal definition of a futures contract trade in what is commonly called the OTC (i.e., over-the-counter) market. This market is subject to much less regulation.
3. NYMEX and ICE are the major organized commodity exchanges that trade standardized contracts for natural gas and other energy commodities.
  - a. NYMEX is a fully self-regulated futures exchange overseen by the CFTC. It must conduct regular surveillance of futures markets, ensure protection against manipulation, and insure their own financial integrity and that of their customers.
  - b. ICE, in contrast, does not regulate itself and operates largely outside CFTC jurisdiction.
4. Recent Congressional activities
  - a. A U.S. Senate investigation in 2007 concluded that the CFTC is not meeting its statutory mandate to prevent market manipulation and excessive speculation from causing “sudden, unreasonable, or unwarranted” energy prices. The investigation listed three new actions that would enable the CFTC to protect energy markets from manipulation, abuses, and excessive speculation. They are:
    - (1) Requiring energy exchanges currently exempt from the CFTC’s regulatory system, such as ICE, to fall under the same statutory and regulatory requirements as the regulated exchanges, such as NYMEX;

- (2) Strictly enforcing the statutory prohibition against excessive speculation (by setting, for example, speculative limits on futures contracts over the life of the contract, rather than just for the month that contracts expire); and
  - (3) Increasing funding for improving CFTC enforcement by allowing the agency to collect user fees from the commodity markets.
- b. Problems with uneven regulation of energy financial derivatives, highlighted by the Enron and Amaranth incidents, led to passage of legislation in 2008. This legislation (namely, the Food, Conservation, and Energy Act, also known as the *2008 Farm Bill*):
- (1) Gave the CFTC authority to oversee electronic energy markets such as ICE.
  - (2) Closed the so-called “Enron loophole,” which allowed ICE and other electronic energy exchanges to avoid regulatory scrutiny of their over-the-counter markets.
  - (3) Still raises the question of the need for additional Congressional or other action
- c. In late 2008, additional legislation, a so-called anti-speculation bill, passed in the House but stalled in the Senate. This legislation has centered on:
- (1) Broadening the oversight responsibilities of the CFTC,
  - (2) Increasing margin requirements,
  - (3) Limiting speculative activity by noncommercial players
  - (4) Formalizing oversight of position limits on regulated exchanges and foreign boards of trade,
  - (5) Regulating over-the-counter markets.

## Appendix

### Ten Questions on Speculation and General Responses

Question	General Response
1. Has financial speculation in commodity markets increased during the past two to three years?	Market investors have shifted their money out of stocks, bonds, and real estate to commodity financial derivatives to maximize their risk-adjusted returns as well as to hedge.
2. Does speculation normally improve market performance and efficiency?	Speculation, when performed without manipulation, can improve market liquidity, efficiently absorb new information into prices, and allow for more hedging. Such speculation also improves price efficiency by accounting for both present and future expectations about physical commodity supply and demand conditions.
3. Would speculators like to manipulate markets if they could?	Just as firms would benefit from having market power, speculators would benefit from artificially moving prices in their favor.
4. Is speculative manipulation difficult, especially in achieving sustainable success for the manipulator?	Manipulation requires restrictive (i.e., inefficient market) conditions, which have a low probability of occurring. But when such conditions exist, manipulation is a real possibility.
5. Do speculators attempt to profit from buying low and selling high?	Profits to speculators correspond to the difference between the price at which they sell a financial derivative and the price they paid for it.
6. Can speculation lead to higher current prices, with a speculative bubble exacerbating price movements?	Speculation can lead to hoarding of current supply for future consumption, or push current spot prices up because of arbitrage with futures prices.
7. Do regulatory gaps presently exist in the oversight of financial derivatives?	Uneven, and in some instances minimal, regulation of financial derivatives—for example, those derivatives traded over-the-counter.
8. Have market promptness and efficiency in absorbing information increased the demand for, and importance of, both hedging and speculation?	Price volatility increases as the market responds more quickly to new information, placing a greater demand on managing price risk.
9. Does hedging require a counterparty (“it takes two to tango”)?	Speculators frequently act as a counterparty in hedging transactions, taking on the risk shifted from the hedger.
10. Do experts agree on the effect of financial speculation on commodity prices?	Analysts and others differ over the interpretation of the high correlation between speculative activity, changes in trading volume, and changes in commodity prices.