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**PERMANENT SUBCOMMITTEE ON INVESTIGATIONS**

*Committee on Homeland Security and Governmental Affairs*

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*Carl Levin, Chairman*

*Tom Coburn, Acting Ranking Minority Member*

**EXCESSIVE SPECULATION  
IN THE WHEAT MARKET**

**MAJORITY AND MINORITY  
STAFF REPORT**

**PERMANENT SUBCOMMITTEE  
ON INVESTIGATIONS**

**UNITED STATES SENATE**



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# **EXCESSIVE SPECULATION IN THE WHEAT MARKET**

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# EXCESSIVE SPECULATION IN THE WHEAT MARKET

## I. EXECUTIVE SUMMARY

For several years, the U.S. Senate Permanent Subcommittee on Investigations has been examining the role of speculation in the commodity markets and failures of the federal regulatory structure to prevent excessive speculation from causing unwarranted changes in commodity prices and an undue burden on interstate commerce.

In 2006, the Subcommittee released a report showing how the injection of billions of dollars from speculation into the commodity futures markets had contributed to rising energy prices.<sup>1</sup> In 2007, the Subcommittee released a report and held a hearing showing how excessive speculation by a single hedge fund named Amaranth had distorted natural gas prices and contributed to higher costs for natural gas consumers.<sup>2</sup> These and other reports offered a number of recommendations for legislative and regulatory actions to enable the Commodity Futures Trading Commission (CFTC) to fulfill its mission under the Commodity Exchange Act to prevent excessive speculation from “causing unreasonable or unwarranted fluctuations in the price of commodities in interstate commerce.”

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<sup>1</sup>In its 2006 report, “*The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat*,” S.Prt. 109-65 (June 27, 2006), the Subcommittee investigation found that influx of billions of dollars into the U.S. energy markets through commodity index funds had contributed to the rise in energy prices, and that the large influx of speculative investments in these markets had altered the traditional relationships between futures prices and supplies of energy commodities, particularly crude oil. The Report recommended that Congress enact legislation to “close the Enron loophole,” the provision in the Commodity Futures Modernization Act of 2000 (CFMA), which exempted from regulation the trading of futures contracts and swaps for energy and metals commodities on electronic exchanges. It also recommended legislation to ensure the CFTC had sufficient authority to monitor U.S. traders trading in U.S. commodities on foreign exchanges. See the 2006 Subcommittee report at [http://hsgac.senate.gov/public/\\_files/SenatePrint10965MarketSpecReportFINAL.pdf](http://hsgac.senate.gov/public/_files/SenatePrint10965MarketSpecReportFINAL.pdf).

<sup>2</sup> In its 2007 report, “*Excessive Speculation in the Natural Gas Market*,” reprinted in S.Hrg. 110-235 (June 25 and July 9, 2007), at pp. 196-710, the Subcommittee investigation found that Amaranth had distorted the price of natural gas futures contracts as a result of its large purchases of contracts on the regulated New York Mercantile Exchange (NYMEX) and “look-alike” swap contracts on the then-unregulated Intercontinental Exchange (ICE). As a result of several provisions in the CFMA, the CFTC did not have authority to limit the positions of traders using ICE rather than NYMEX. Based on this finding, the Report recommended that Congress enact legislation to close the Enron loophole in order to fully regulate electronic exchanges, like ICE, that are the functional equivalent of futures markets. In the 2008 Farm Bill, Congress enacted legislation to close the Enron loophole by providing that commodity contracts traded on over-the-counter electronic exchanges that perform a significant price discovery function be regulated in the same manner as futures contracts. As a result of this legislation, the CFTC now has the authority – and responsibility – to regulate and monitor these electronic markets to prevent excessive speculation. See the 2007 Subcommittee report at [http://hsgac.senate.gov/public/\\_files/REPORTExcessiveSpeculationintheNaturalGasMarket.pdf](http://hsgac.senate.gov/public/_files/REPORTExcessiveSpeculationintheNaturalGasMarket.pdf).

In the Amaranth investigation, the Subcommittee examined how the activities of a single trader making large trades on both a regulated futures exchange and an unregulated electronic energy exchange constituted excessive speculation in the natural gas market. To prevent this type of excessive speculation, the Subcommittee report recommended that limits on the number of contracts that a trader can hold at one time, known as position limits, be applied consistently to both markets in which the same type of natural gas contracts are traded.

In the current investigation, the Subcommittee has examined how the activities of many traders, in the aggregate, have constituted excessive speculation in the wheat market. To prevent this type of excessive speculation, this Report recommends that the CFTC phase out waivers and exemptions from position limits that were granted to commodity index traders purchasing wheat contracts to help offset their sales of speculative financial instruments tied to commodity indexes.

A commodity index, like an index for the stock market, such as the Dow Jones Industrial Average or the S&P 500, is calculated according to the prices of selected commodity futures contracts which make up the index. Commodity index traders sell financial instruments whose values rise and fall in tune with the value of the commodity index upon which they are based. Index traders sell these index instruments to hedge funds, pension funds, other large institutions, and wealthy individuals who want to invest or speculate in the commodity market without actually buying any commodities. To offset their financial exposure to changes in commodity prices that make up the index and the value of the index-related instruments they sell, index traders typically buy the futures contracts on which the index-related instruments are based. It is through the purchase of these futures contracts that commodity index traders directly affect the futures markets.

The Subcommittee investigation examined in detail how commodity index traders affected the price of wheat contracts traded on the Chicago Mercantile Exchange. CFTC data shows that, over the past three years, between one-third and one-half of all of the outstanding wheat futures contracts purchased (“long open interest”) on the Chicago exchange are the result of purchases by index traders offsetting part of their exposure to commodity index instruments sold to third parties. The Subcommittee investigation evaluated the impact that the many purchases made by index traders had on prices in the Chicago wheat futures market. This Report finds that there is significant and persuasive evidence to conclude that these commodity index traders, in the aggregate, 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 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.

The futures market for a commodity provides potential buyers and sellers of the commodity with prices for the delivery of that commodity at specified times in the future. In contrast, the cash market provides potential buyers and sellers with the price for that

commodity if it is delivered immediately. Normally, the prices in the futures market follow a predictable pattern with respect to the cash price for a commodity. Typically, as a contract for future delivery of a commodity gets closer to the time when the commodity is to be delivered under the contract (the expiration of the contract), the price of the futures contract gets closer to the price of the commodity in the cash market. The prices are said to “converge.” In recent years in the wheat market, however, the futures prices for wheat have remained abnormally high compared to the cash prices for wheat, and the relationship between the futures and cash prices for wheat has become unpredictable. Oftentimes the price of wheat in the Chicago futures market has failed to converge with the cash price as the futures contract neared expiration.

The result has been turmoil in the wheat markets. At a time when wheat farmers were already being hit by soaring energy and fertilizer costs, the relatively high price of wheat futures contracts compared to the cash price, together with the breakdown in the relationship between the two prices and their failure to converge at contract expiration, have severely impaired the ability of farmers and others in the grain business to use the futures markets as a reliable guide to wheat prices and to manage price risks over time.

Participants in the grain industry have complained loudly about the soaring prices and breakdowns in the market. “Anyone who tells you they’ve seen something like this is a liar,” said an official of the Farmers Trading Company of South Dakota. An official at cereal-maker Kellogg observed, “The costs for commodities including grains and energy used to manufacture and distribute our products continues to increase dramatically.” “I can’t honestly sit here and tell who is determining the price of grain,” said one Illinois farmer, “I’ve lost confidence in the Chicago Board of Trade.” “I don’t know how anyone goes about hedging in markets as volatile as this,” said the president of MGP Ingredients which provides flour, wheat protein, and other grain products to food producers. “These markets are behaving in ways we have never seen,” said a senior official from Sara Lee. A grain elevator manager warned, “Eventually, those costs are going to come out of the pockets of the American consumer.”

The inability of farmers, grain elevators, grain merchants, grain processors, grain consumers, and others to use the futures market as a reliable guide to wheat prices and manage their price risks over time has significantly aggravated their economic difficulties and placed an undue burden on the grain industry as a whole.

This Report concludes there is significant and persuasive evidence that one of the major reasons for the recent market problems is the unusually high level of speculation in the Chicago wheat futures market due to purchases of futures contracts by index traders offsetting sales of commodity index instruments. To diminish and prevent this type of excessive speculation in the Chicago wheat futures market, the Report recommends that the CFTC phase out existing exemptions and waivers that allow some index traders to operate outside of the trading limits designed to prevent excessive speculation.

## **A. Subcommittee Investigation**

To prepare this Report, the Subcommittee conducted a year-long, bipartisan investigation. As a first step, the Subcommittee obtained and analyzed price and trading

data from a variety of agricultural futures and cash markets. The Subcommittee obtained, for example, daily and monthly wheat futures and cash price data from the CFTC, U.S. Department of Agriculture, Chicago Mercantile Exchange, Kansas City Board of Trade, and Minneapolis Grain Exchange. The Subcommittee also examined numerous historical materials on the operations and performance of the grain futures markets, and on the development and application of relevant statutes, regulations, and guidance. The CFTC provided extensive data on index trading, as well as information on the application of position limits and the granting of exemptions. The Subcommittee appreciates the cooperation and responsiveness of the exchanges and federal agencies.

To understand the issues, the Subcommittee interviewed numerous experts and persons familiar with the wheat markets, agricultural commodity markets as a whole, and commodity indexes. The interviews included persons familiar with grain trading and actual traders from a wide range of organizations in the grain industry: farm organizations, grain elevator operators, grain merchants, grain processors, food manufacturers, and agricultural trade groups. The Subcommittee also interviewed farmers, market analysts, agricultural economists, academic experts, financial institutions, and exchange officials. The Subcommittee also benefitted from a number of meetings and presentations provided by the CFTC. The Subcommittee appreciates the cooperation and assistance of these individuals, organizations, and agencies.

## **B. The Cash and Futures Markets for Wheat**

Wheat crops change hands primarily through cash transactions. There is no centralized cash market for wheat or other grains; the cash market exists wherever a grain elevator, grain merchant, grain consumer, or other participant in the grain industry posts a price to purchase or sell grain. Cash transactions take place all over the country, at all times of the day, either with or without the use of standardized contracts. In a common transaction, a grain elevator purchases wheat from a farmer for cash and then stores the wheat for sales throughout the year to grain processors.

Wheat futures are sold on three regulated exchanges: the Chicago Mercantile Exchange (CME), the Kansas City Board of Trade (KCBOT), and the Minneapolis Grain Exchange (MGEX). Wheat traded on the Chicago exchange, known as “soft red winter” wheat, is used mainly for crackers, pie crusts, cakes, and biscuits. Wheat traded in Kansas City, known as “hard red winter” wheat, is primarily used to make flour for bread. The Minneapolis exchange trades “hard red spring” wheat, which also is used to make bread, biscuits, and rolls.

All three of these futures exchanges offer standardized contracts to buy or sell standard amounts and types of wheat for which the only negotiated variable is the price. In the vast majority of cases, traders of wheat futures contracts do not take physical delivery of the wheat being bought or sold on the futures market. Rather, the primary purpose of the futures market is to enable market participants to “discover” the price of wheat for delivery at specified times in the future, to purchase or sell such contracts for future delivery at such prices, and thereby to enable wheat market participants to protect their business activities against the risk of future price changes.

### C. Increasing Commodity Index Speculation

A commodity index is calculated using the prices of the futures contracts for the commodities that make up the index. Each commodity within a commodity index is assigned a “weight,” and the contribution of each commodity toward the value of the index is calculated by multiplying the current price of the specified futures contract for that commodity by the assigned weight. All of the major, broad-based commodity indexes include soft red winter wheat futures contracts traded on the Chicago exchange as one of their component commodities.

The purchase of a financial instrument whose value is linked to a commodity index offers the buyer the potential opportunity to profit from the price changes in futures contracts for a broad spectrum of commodities, without having to actually purchase the referenced commodities. Typically, hedge funds, pension funds, and other large institutions purchase these financial instruments with the aim of diversifying their portfolios, obtaining some protection against inflation, and profiting when commodity prices are rising. Since they are not involved in selling or buying actual commodities, and do not use these instruments to hedge or offset price risks regarding the actual use of the underlying commodities, the purchasers of commodity index instruments are making a speculative investment.

The large growth in commodity index speculation is a recent phenomenon. It is only over the past six years that financial institutions have heavily marketed commodity index instruments as a way to diversify portfolios and profit from rising commodity prices. The total value of the speculative investments in commodity indexes has increased an estimated tenfold in five years, from an estimated \$15 billion in 2003, to around \$200 billion by mid-2008.<sup>3</sup>

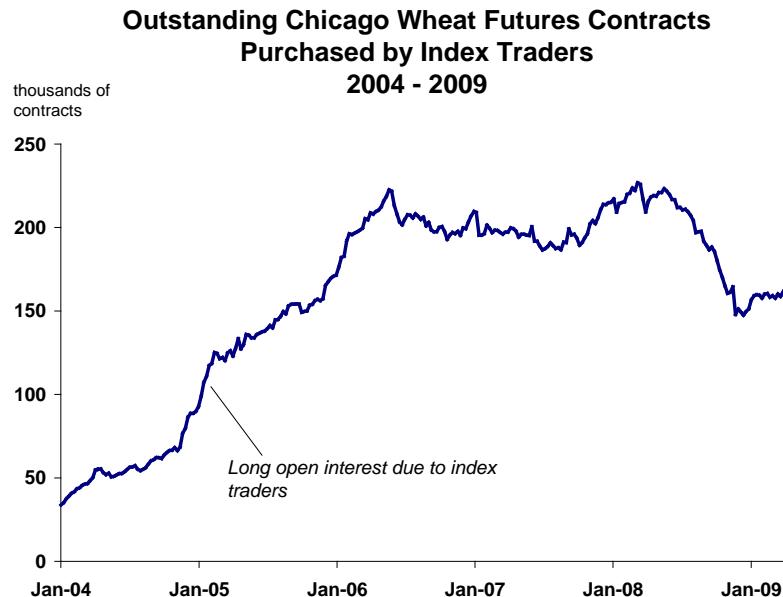
The amount of speculation in the wheat market due to sales of commodity index instruments has, correspondingly, grown significantly over the past five years. CFTC data indicates that purchases by index traders in the largest wheat futures market, the Chicago Mercantile Exchange, grew sevenfold from about 30,000 daily outstanding contracts in early 2004, to a peak of about 220,000 contracts in mid-2008, before dropping off at year’s end to about 150,000 contracts. (Figure ES-1). The data shows that, during the period from 2006 through 2008, index traders held between 35 and 50% of the outstanding wheat contracts (open long interest) on the Chicago exchange and between 20 and 30% of the outstanding wheat contracts on the smaller Kansas City Board of Trade.

The presence of index traders is greatest on the Chicago exchange compared to the other two wheat exchanges, and is among the highest in all agriculture markets. In addition, neither of the other two wheat markets, nor any other grain market, has experienced the same degree of breakdown in the relationship between the futures and cash markets as has occurred in the Chicago wheat market. Accordingly, the

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<sup>3</sup> This estimate reflects both the actual amounts invested in commodity index related instruments and the appreciation in value of those investments due to increasing commodity prices.

Subcommittee focused its investigation on the role of index trading on the Chicago exchange and the breakdown in the relationship between Chicago wheat futures and cash prices.



**Figure ES-1.** Growth in index fund purchases of Chicago wheat futures contracts. Chart prepared by Permanent Subcommittee on Investigations. Data source: CFTC.

#### D. Impact of Index Instruments on the Wheat Futures Market

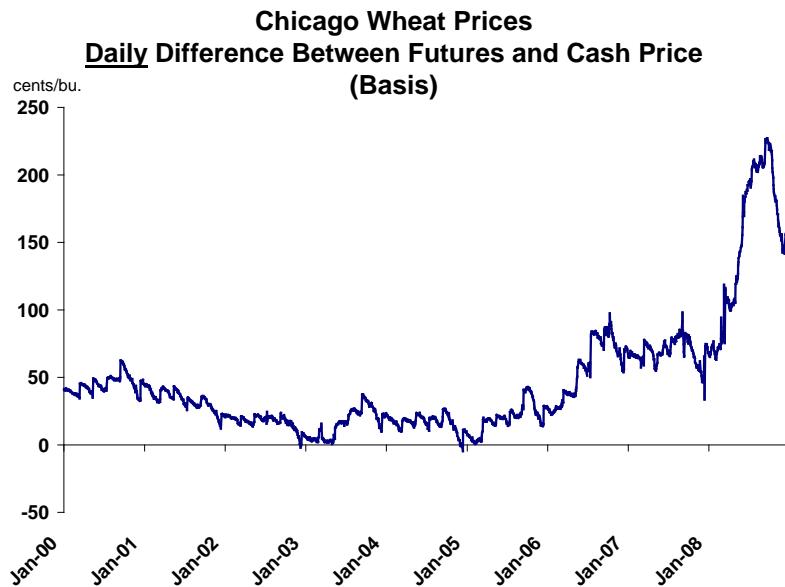
Commodity indexes have an indirect but significant impact on futures markets. A commodity index standing alone is a computational device unsupported by any actual assets such as futures or commodity holdings. Financial institutions that sell index investments, however, have created three basic types of financial instruments tied to commodity indexes: commodity index swaps, exchange traded funds (ETFs), and exchange traded notes (ETNs). Commodity index swaps are sold by swap dealers and are the most common index instrument; ETFs and ETNs offer index-related shares for sale on a stock exchange. The value of commodity index swaps, index-related ETFs, and index-related ETNs rises and falls with the value of the commodity index upon which each is based.

Speculators who buy index instruments do not themselves purchase futures contracts. But the financial institutions who sell them the index instruments typically do. In the case of commodity index swaps, for example, swap dealers typically purchase futures contracts for all commodities on which an index is based to offset their financial exposure from selling swaps linked to those futures contracts. CFTC data shows that,

over the past five years, financial institutions selling commodity index instruments have together purchased billions of dollars worth of futures contracts on the Chicago Mercantile Exchange.

The Subcommittee investigation has found that the large number of wheat futures contracts purchased by swap dealers and other index traders is a prime reason for higher prices in the wheat futures market relative to the cash market. Commodity traders call the difference between the futures prices and the cash price “the basis.” Index traders typically do not operate in the cash market, since they have no interest in taking delivery or making use of a wheat crop. Instead, index traders operate in the futures markets, where they buy futures contracts to offset the index instruments they have sold. The additional demand for wheat futures resulting from these index traders is unrelated to the supply of and demand for wheat in the cash market.

In the Chicago wheat market, the result has been wheat futures prices that are increasingly disconnected from wheat cash prices. Data compiled by the Subcommittee shows that, since 2006, the daily gap between Chicago wheat futures prices and wheat cash prices (the basis) has been unusually large and persistent. Figure ES-2 presents this data for the last eight years.

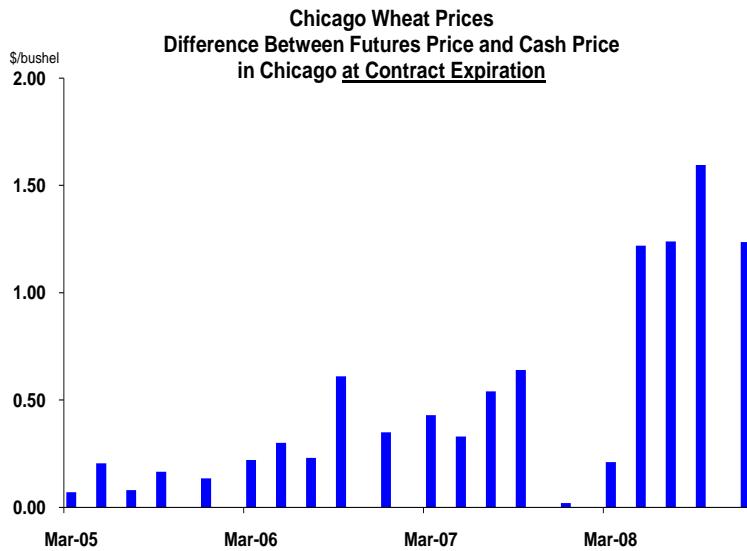


**Figure ES-2.** Increase in daily difference between futures and cash prices for Chicago wheat. Chart prepared by Permanent Subcommittee on Investigations. Data sources: CME (daily futures prices); MGEX (average daily cash prices).

From 2000 through 2005, the average daily difference between the average cash and the futures price for soft red winter wheat traded on the Chicago exchange was about 25 cents. During the second half of 2008, in contrast, the price of the nearest wheat futures contract on the Chicago exchange was between \$1.50 and \$2.00 per bushel higher

than the average cash price, an unprecedented price gap (basis).<sup>4</sup> During that period, the average cash price for soft red winter wheat ranged from \$3.12 to \$7.31 per bushel, while the futures price ranged from \$4.57 to \$9.24. The fundamentals of supply and demand in the cash market alone cannot explain this unprecedented disparity in pricing between the futures and cash markets for the same commodity at the same time.

In addition, increasingly, the wheat futures prices on the Chicago exchange have not converged with the cash prices at the expiration of the futures contracts. Figure ES-3 shows the extent of this price gap (basis).



**Figure ES-3.** Increase in difference between futures and cash prices for Chicago wheat at futures contract expiration. Chart prepared by Permanent Subcommittee on Investigations. Data sources: CME (daily futures prices) and USDA (cash prices at Chicago).

The data underlying this chart shows that the average difference between the cash and futures price at contract expiration at the delivery location in Chicago for the Chicago wheat futures contract rose from an average of about 13 cents per bushel in 2005 to 34 cents in 2006, to 60 cents in 2007, to \$1.53 in 2008, a tenfold increase in four years.

In the same period during which these pricing disparities occurred, CFTC data shows a very large presence of index traders in the Chicago wheat market. Since 2006, index traders have held between one-third and one-half of all of the outstanding purchased futures contracts (“long open interest”) for wheat on the Chicago exchange. For most of 2008, the demand for Chicago wheat futures contracts from these index investors was greater than the supply of wheat futures contracts from commercial firms

<sup>4</sup> Typically, traders define basis as the difference between the cash and futures price (basis = cash – futures). In this report, the basis is defined as the difference between the futures and cash price (basis = futures – cash) in order to give a positive value to the basis when the futures price is higher than the cash price, as it typically is in the wheat market.

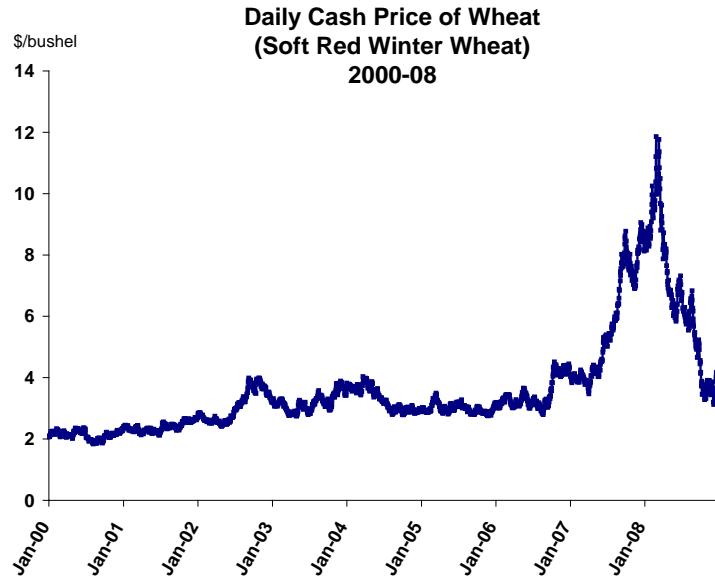
selling grain for future delivery. During July 2008, for instance, index traders buying wheat futures contracts held, in total, futures contracts calling for the delivery of over 1 billion bushels of wheat, while farmers, grain elevators, grain merchants, and other commercial sellers of wheat had outstanding futures contracts providing for the delivery of a total of only about 800 million bushels of wheat. Under these circumstances, the additional demand from index traders for contracts for future delivery of wheat bid up the futures prices until prices were high enough to attract additional speculators willing to sell the desired futures contracts at the higher prices.

The investigation found that, in 2008, the greater demand for Chicago wheat futures contracts generated by index traders was a significant factor in the relative increase in the wheat futures price compared to the cash price (the basis) during that period. In addition, a significant cause of the resulting price disparity between the futures and cash markets, which was far greater than the normal gap between futures and cash prices, was the purchases of Chicago wheat futures by index traders.

#### **E. Undue Burden on Interstate Commerce**

The ongoing pricing discrepancy between wheat futures and cash market prices has exacerbated many of the recent economic difficulties facing farmers, grain elevators, grain merchants, and grain end-users.

Over the past few years, the prices of many agricultural commodities—like the prices of commodities in general—experienced an unprecedented spike and subsequent collapse. For example, the cash price of wheat rose from just over \$3 per bushel in mid-2006, to over \$11 per bushel in early 2008, before collapsing to about \$3.50 per bushel at the end of 2008. Figure ES-4 shows the average daily cash price of wheat from 2000-08, including the spike in the price of wheat during 2007-08.



**Figure ES-4.** The average daily cash price of soft red winter wheat, the type of wheat traded on the Chicago Mercantile Exchange. Chart prepared by Permanent Subcommittee on Investigations. Data source: MGEX (daily cash index price).

A wide variety of factors contributed to the price volatility in the cash market for wheat, including poor weather, changes in agricultural productivity, an increasing demand for commodities in developing countries, changing dietary habits, increasing energy prices, and changes in the value of the dollar compared to other currencies.

Wheat prices in the cash market rose steadily from 2004 to 2008, in part due to steep increases in the price of energy, particularly oil, gasoline, natural gas, and diesel fuel, which sharply increased the costs of farming, transporting grain to markets, and grain processing. Although grain prices in the cash market eventually rose to record highs, farmers and grain merchants often were unable to realize the benefits of those higher prices due to the higher costs. In March 2009, for example, USDA reported that although wheat was selling for very high prices by historical standards, the increase in fuel and fertilizer costs had “offset this unprecedented runup in wheat prices for producers.”

During this same period, futures prices also rose. The steep increases in cash and futures prices severely affected the grain industry in several ways. First, higher futures prices resulted in higher margin calls for wheat farmers, grain elevators, and other sellers of wheat that had hedged in the futures markets, requiring them to make much larger cash outlays than normal. The National Grain and Feed Association estimated, for example, that a typical grain elevator faced a 300% increase in hedging costs in 2008, compared to 2006. It stated that “recent commodity price increases have led to unprecedented borrowing by elevators – and unprecedented lending by their bankers – to finance inventory and maintain hedge margins.” According to the Federal Reserve Bank of Kansas City, in the first quarter of 2008, the Farm Credit System “raised \$10 billion in

funds through the sale of debt securities to meet increasing demand from elevators and other processing and marketing entities.” In April 2008, the Federal Reserve Bank of Kansas City reported that nearly one-quarter of all grain elevators it surveyed were struggling to acquire the cash needed to manage margin calls; about 40% stated they had ‘enough cash to just manage current margin calls.’”

The cash flow problems confronting many grain elevators directly affected farmers, as those elevators began to reduce their cash purchases, pull back on forward contracts offered to farmers, and lower the cash prices offered for crops. Some began to require farmers to pre-pay for seed and fertilizer, causing cash flow problems for farming operations. Farmers participating directly in the futures market also were subject to rising margin calls. One wheat farmer explained, “If you’ve got 50,000 bushels hedged and the market moves up 20 cents, that would be a \$10,000 day. If you only had \$10,000 in your margin account, you’d have to sit down and write a check. You can see \$10,000 disappear overnight. … Everybody has a story about a guy they know getting blown out of his hedge.”

Other problems arose from the unusually large and persistent gap between the futures and cash prices for wheat and the failure of the two prices to converge as futures contracts expired. This persistent pricing difference and lack of convergence meant that farmers, grain elevators, grain merchants, and others who had used the futures market to hedge their future sales found that when they went to sell their wheat, the cash prices were much lower than they had anticipated based upon the futures market. This persistent price gap significantly impaired the ability of farmers and others to protect themselves from declining prices during the dramatic price decreases experienced during the second half of 2008. It also meant that wheat industry participants could no longer rely on the futures markets to reliably price their crops and effectively manage their price risks over time.

In a properly functioning futures market, futures and cash prices converge as futures contracts near expiration. Otherwise, if one price were higher, a trader could buy the commodity in the lesser-priced market and immediately sell it in the higher-priced market for a quick profit. Those types of transactions would soon equalize the two prices. But on many occasions during the last few years in the Chicago wheat market, the two prices have not converged.

One key reason is that the large price disparity between the cash and futures price makes it much more profitable for grain merchants to buy grain in the cash market, hold onto it, and then sell it later—at the price of the higher-priced futures contracts—than engage in the type of transactions described above between the cash and futures market that would make the two prices converge. In addition, the large price disparity means that merchants who already have grain in storage and have hedged that grain by selling futures contracts could suffer a loss if they decided to actually sell their grain in the cash market, because they also would have to buy back the futures contract at a higher price than they could get for selling their grain in the cash market.

Virtually all of the traders interviewed by the Subcommittee, from all perspectives within the grain business, identified the large presence of index traders in the Chicago

market as a major cause of the price convergence problem. This ongoing problem indicates that at a fundamental level the Chicago wheat futures market no longer effectively serves the needs of many wheat growers or commercial wheat users.

Still another set of problems caused by excessive speculation in the wheat market and the disconnect between wheat futures and cash prices affects the federal crop insurance program. Federal crop insurance, which is supported with taxpayer dollars, is available to farmers who want to cover potential financial losses due to bad weather or crop disease. Several types of federal crop insurance use futures prices to determine how much money should be paid to a farmer who has purchased coverage and suffered a loss in crop income. Futures prices are used in the formulas that calculate both the insurance premiums to be paid by farmers and the indemnity payments made to farmers after an insurance claim. Because they are included in the calculations, futures market prices that are significantly higher than actual cash prices impair the accuracy of the insurance formulas and can inflate the final figures. Futures prices that are much higher than the prices in the cash market and that do not closely follow the prices in the cash market can increase both the crop insurance premiums paid in part by farmers and can either increase or decrease the ultimate insurance payout to the farmer—thereby either resulting in too large a payout from a taxpayer-funded program or too small a payout to the farmer who has paid for the insurance. Either scenario undermines the effectiveness of the crop insurance program.

The ongoing large gap between wheat futures prices and cash prices is a problem of intense concern to the wheat industry, the exchanges, and the CFTC. The CFTC has conducted several public hearings and recently formed a special advisory subcommittee to make recommendations on how best to address the problem. The Chicago exchange has amended its wheat contract in several respects—to provide for additional delivery locations, to increase the storage rate for wheat, and to change certain specifications for deliverable wheat—in an effort to improve trading and create a more active cash market that will force cash and futures prices to converge.

These actions to date, however, do not address one of the fundamental causes of the problem—the large presence of index traders in the Chicago wheat market. These index traders, who buy wheat futures contracts and hold them without regard to the fundamentals of supply and demand in the cash market for wheat, have created a significant additional demand for wheat futures contracts that has as much as doubled the overall demand for wheat futures contracts. Because this significant increase in demand in the futures market is unrelated to any corresponding supply or demand in the cash market, the price of wheat futures contracts has risen relative to the price of wheat in the cash market. The very large number of index traders on the Chicago exchange has, thus, contributed to “unwarranted changes” in the prices of wheat futures relative to the price of wheat in the cash market. These “unwarranted changes” have, in turn, significantly impaired the ability of farmers and other grain businesses to price crops and manage price risks over time, thus creating an undue burden on interstate commerce. The activities of these index traders constitute the type of excessive speculation that the CFTC should diminish or prevent through the imposition and enforcement of position limits as intended by the Commodity Exchange Act.

## F. Trading Limits on Index Traders

The Commodity Exchange Act (CEA) directs the CFTC to prevent excessive speculation in the futures markets. Specifically, Section 4a(a) of the CEA requires the CFTC to establish and maintain “position limits” on commodity traders to prevent the undue burden on interstate commerce that results from “sudden or unreasonable fluctuations or unwarranted changes” in the price of a commodity caused by excessive speculation. Pursuant to this statutory mandate, the CFTC has established position limits for the agricultural commodities traded on futures markets such as wheat, corn, oats, and soybeans. These position limits specify the maximum number of outstanding futures contracts that any single trader can hold at any particular time. For example, the CFTC has generally prohibited any single trader from holding more than 6,500 wheat futures contracts at any one time. Prior to 2005, the maximum number of contracts that could be held at any one time was 5,000 contracts.

Over the course of many years, the CFTC has made a number of decisions that have enabled certain index traders to hold more than the current limit of 6,500 wheat futures contracts. The first set of decisions resulted in the CFTC’s granting position limit exemptions to swap dealers selling commodity index swaps. Although the CEA directs the CFTC to impose trading limits to prevent excessive speculation, section 4a(c) of the Act also states that these limits are not to be applied to “transactions or positions which are shown to be bona fide hedging transactions or positions.” The CEA provides the CFTC with the discretion to define the term “bona fide hedging transaction” in order to “permit producers, purchasers, sellers, middlemen, and users of a commodity or a product derived therefrom to hedge their legitimate anticipated business needs for that period of time into the future for which an appropriate futures contract is open and available on an exchange.”

Initially, the CFTC limited the concept of a bona fide hedging transaction to transactions directly linked to the business needs of the producers, marketers, and users of a physical commodity in the cash market. But after Congress directed the CFTC, in 1986, to consider expanding its definition to include persons using the futures markets to manage risks associated with financial investment portfolios, the CFTC issued a series of clarifications and interpretations which, in effect, expanded the definition to include trading strategies to reduce financial risks, regardless of whether a matching transaction ever took place in a cash market for a physical commodity.

In 1991, using this expanded definition, the CFTC granted the first exemption from speculative trading limits to a swap dealer seeking to buy futures contracts to hedge its financial exposure to commodity index swaps it had sold to third parties. According to CFTC data provided to the Subcommittee, since 2005, the CFTC has issued four hedge exemptions to swap dealers seeking to buy wheat futures. Those exemptions permit the swap dealers to exceed the 6,500 position limit and hold up to 10,000, 17,500, 26,000, and 53,000 wheat futures contracts to hedge their exposures to commodity index swaps that reference wheat futures prices. In addition, in 2006, the CFTC staff took another step by issuing two “no-action” letters permitting the manager of one index-related exchange traded fund (ETF) to hold up to 11,000 wheat futures contracts and another fund manager to hold up to 13,000 wheat futures contracts.

Together, these hedge exemptions and no-action letters permit six index traders to hold a total of up to almost 130,000 wheat futures contracts at any one time. Absent these waivers from the position limits, these six index traders would have been limited to a total of about 39,000 wheat futures contracts at a time, or less than one-third of the contracts that they are now permitted to hold.

CFTC data indicates that, from 2006 to mid-2008, the total number of outstanding contracts (long open interest) attributable to commodity index traders in the wheat market was about 200,000 contracts. That means that the six index traders granted waivers from the trading limits may have held up to about 60 percent of all the outstanding wheat contracts held by index traders.

In directing the CFTC to consider granting position limit exemptions to firms using the futures markets to manage price risks associated with financial portfolios, Congress emphasized that the Commission's actions should remain consistent with its mandate to prevent excessive speculation from causing unreasonable or unwarranted changes in the prices of commodities traded on the futures exchanges. Because the large amount of index investments in the Chicago wheat futures market have been one of the major causes of "unreasonable or unwarranted" changes in wheat futures prices relative to cash prices, the granting of exemptions and waivers to index traders is inconsistent with the CFTC's statutory mandate to prevent excessive speculation on futures exchanges. Accordingly, the Report recommends that the CFTC no longer waive position limits for index traders and, in addition, begin an orderly phase-out of the existing waivers.

If the CFTC were to phase out the exemptions and waivers granted to index traders in the wheat market, those traders would become subject to the position limits for wheat futures contracts that generally apply and would be unable to hold more than 6,500 wheat contracts at any one time. The strict enforcement of the 6,500 contract limit should reduce the presence of index traders in the Chicago wheat futures market and help bring the futures market into better alignment with the cash market.

Restoring the 6,500 position limit to index traders may not, however, fully solve the pricing problems in the Chicago wheat futures market and eliminate the problems in the market exacerbated by excessive speculation. CFTC data indicates that at most 60% of the total outstanding wheat contracts (long open interest) which can be attributed to index investors would be affected by restoring the 6,500 limit. If pricing problems persist in the wheat market after the phase-out of these waivers, and after implementation of other actions being taken by the Chicago exchange, the CFTC should consider imposing additional restrictions on index traders to reduce their presence, such as by restoring the pre-2005 position limit of 5,000 wheat contracts per index trader to reduce their aggregate impact on wheat futures prices.

## **G. Other Commodities**

The wheat market illustrates how a large amount of index trading on a futures exchange can significantly impair the ability of the futures market to perform its primary purposes—to enable commercial market participants, including farmers, grain elevators,

grain merchants, and consumers, to efficiently price their commodities and manage their price risks over time. The Subcommittee investigation was made possible in large part by the availability of data compiled by the CFTC on index trading in the wheat market. Comparable data on index trading in non-agricultural markets, including for crude oil, natural gas, and other energy commodities, is not presently available. The data problem is due in part to the complexity of the over-the-counter (OTC) energy market, the associated difficulty in tracing index trading in that market, and the difficulty in assessing the impact of OTC energy trades on regulated energy futures exchanges. To understand the role of index trading in energy and other non-agricultural commodity markets, the CFTC will need to improve its data collection and analysis efforts for both the OTC markets and index trading. Given the importance of this issue, despite the difficulties, the CFTC should undertake this effort to bring additional transparency to the impact of index trading on energy futures markets.

## **H. Findings and Recommendations**

Based upon the Subcommittee's investigation, the Report makes the following findings of fact and recommendations to diminish or prevent excessive speculation in the wheat market.

### **Findings of Fact.**

- (1) **Excessive Speculation in Wheat.** The large number of wheat futures contracts purchased and held by commodity index traders on the Chicago futures exchange over the last five years constituted excessive speculation.
  - (a) **Index Traders Increased Futures Prices Relative to Cash Prices.** The large number of wheat futures contracts purchased by index traders on the Chicago exchange created additional demand for those contracts and was a major contributing factor in the increasing difference between wheat futures prices and cash prices from 2006 to 2008.
  - (b) **Index Traders Impeded Price Convergence.** Over the past few years, the large number of Chicago wheat futures contracts purchased by index investors has been a major cause of the frequent failure of wheat futures and cash prices to converge upon contract expiration.
  - (c) **Unwarranted Price Changes.** The additional demand for Chicago wheat futures contracts attributable to commodity index traders contributed to "unreasonable fluctuations or unwarranted changes" in wheat futures prices, resulting in an abnormally large and persistent gap between wheat futures and cash prices (the basis). Largely as a result of index trading, the average difference between the cash and futures price at contract expiration rose from 13 cents per bushel in 2005, to 34 cents in 2006, to 60 cents in 2007, to \$1.53 in 2008, a tenfold increase in four years.
  - (d) **Undue Burden on Commerce.** The unwarranted changes in wheat prices resulting from the large amount of index trading in the Chicago wheat futures market created an undue burden on interstate commerce.

This undue burden was imposed on farmers, grain elevators, grain merchants, grain processors, and others by impeding useful hedging strategies, imposing significant unanticipated costs, and providing inaccurate indications of expected prices in the wheat markets.

(2) **CFTC Waivers Facilitated Excessive Speculation.** CFTC actions to waive position limits for commodity index traders facilitated excessive speculation in the Chicago wheat futures market. Waiving position limits for these index traders is inconsistent with the CFTC's statutory mandate to maintain position limits to prevent excessive speculation.

(3) **Inflated Futures Prices Affect Crop Insurance.** Because federal crop insurance, which is backed with taxpayer dollars, uses futures prices in its calculations, inflated futures prices can inflate insurance premiums, whose cost is shared by farmers and taxpayers, and impair the accuracy of the formulas used to determine the payouts to farmers, resulting in either overpayments or underpayments.

(4) **Poor Data Impedes Analysis.** There is a lack of adequate data on the number of futures contracts purchased by commodity index traders for non-agricultural commodities like crude oil. Improved data is essential to analyze the extent to which index traders may be contributing to higher futures prices and excessive speculation in crude oil and other markets.

### **Recommendations.**

(1) **Phase Out Existing Wheat Waivers for Index Traders.** The CFTC should phase out existing waivers, granted through exemptions or no-action letters, which permit commodity index traders to exceed the standard limit of 6,500 wheat contracts per trader at any one time, and re-apply the standard position limit designed to prevent excessive speculation in the wheat market.

(2) **Take Further Action If Necessary.** If pricing problems in the Chicago exchange persist after the phase-out of index trader waivers and after implementation of other actions being taken by the Chicago exchange, the CFTC should consider imposing additional restrictions on commodity index traders to reduce excessive speculation, such as by imposing a position limit of 5,000 wheat contracts per index trader.

(3) **Analyze Other Agricultural Commodities.** The CFTC should undertake an analysis of other agricultural commodities to determine whether commodity index traders have increased futures prices compared to cash prices or caused price convergence problems, and whether position limit waivers for index traders should be phased out to eliminate excessive speculation.

(4) **Strengthen Data Collection for Non-Agricultural Commodities.** The CFTC should develop reliable data on the extent to which commodity index traders purchase non-agricultural commodity futures contracts, especially crude oil and other energy commodities. Once this data is collected, the CFTC should

evaluate the impact of index trading in these markets, and whether position limits for index traders should be phased out to eliminate excessive speculation.

The following sections of this Report present detailed information on how, in recent years, the high level of commodity index trading in the wheat market constituted excessive speculation. Section II describes the wheat futures and cash markets, and recent pricing trends that have caused turmoil among wheat producers, merchants, and consumers. Section III provides general information about hedging and speculation in the commodity markets, and why price convergence is important to commercial users of the wheat market. Section IV explains how commodity index trading works, its impact on the futures markets, and how the CFTC has facilitated index trading by waiving position limits for wheat and other agricultural commodities. Section V details the evidence indicating how commodity index trading has been one of the major causes of unwarranted price fluctuations and an undue burden on interstate commerce, and thereby constituted excessive speculation in the wheat market. Section VI describes how inflated futures prices affect the federal crop insurance program.

*“No man qualifies as a statesman who is entirely ignorant of the problems of wheat.”*

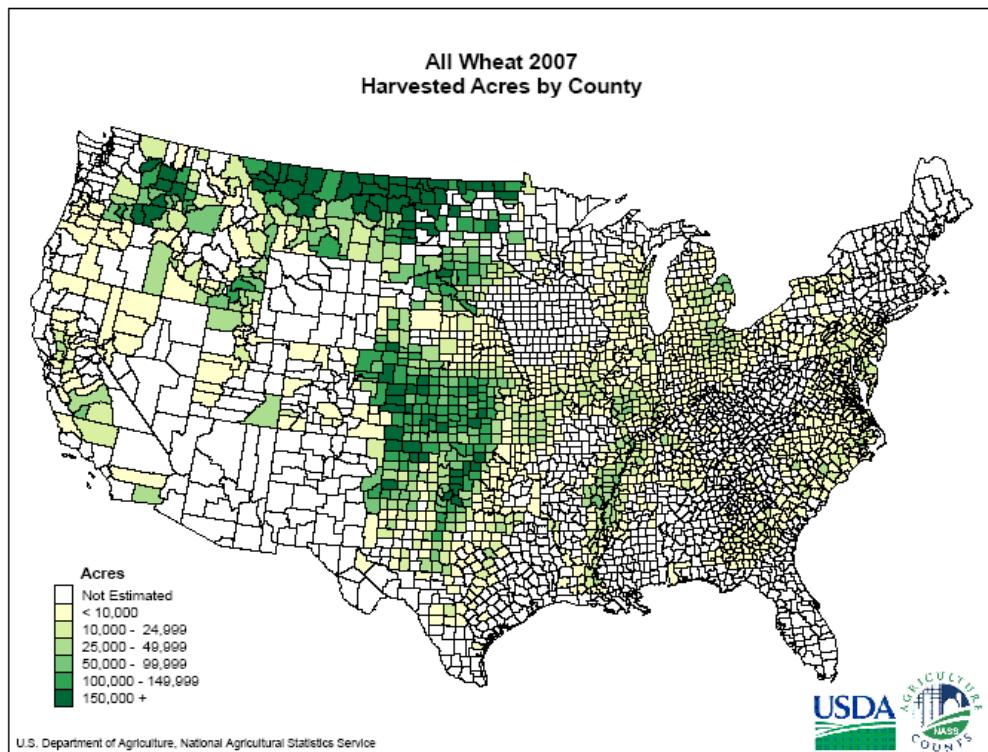
--Socrates (469-399 B.C.E.)

## II. THE U.S.WHEAT MARKET

### A. U.S. Wheat Production

Wheat is a commodity of critical importance to the U.S. and global economy. Wheat provides essential ingredients for the most basic of foods that we eat: breads, cereals, pasta, cakes, cookies, and other baked goods. It is no exaggeration to declare that “grain is the only resource in the world that is even more central to modern civilization than oil.”<sup>5</sup>

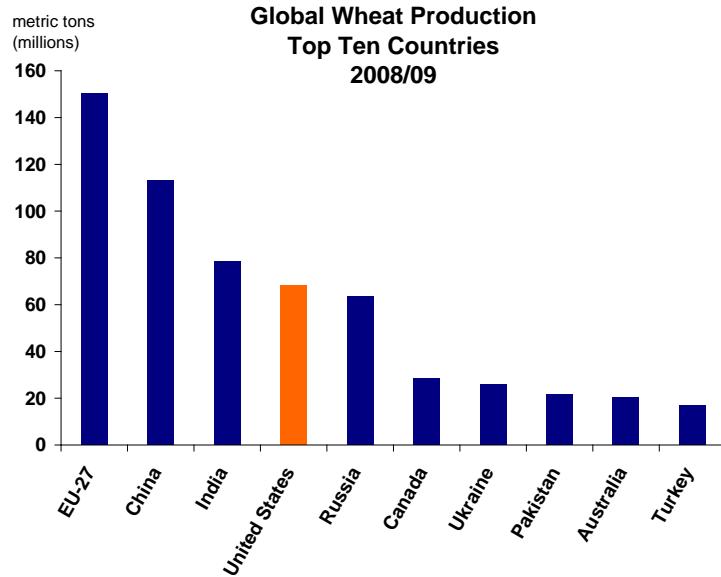
Wheat is grown on approximately 160,000 farms throughout the United States. The largest areas of wheat crops are located in the northern and central plains, the Pacific northwest, and the Midwest. Figure 1 shows the number of harvested acres of wheat in the U.S., by county.



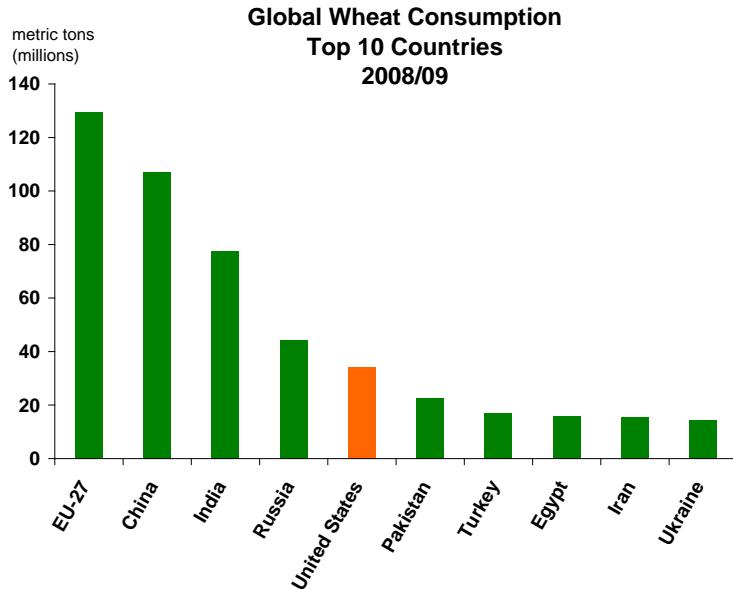
**Figure 1.** Wheat, harvested acres by county. Data source: USDA National Agricultural Statistical Service.

<sup>5</sup> Dan Morgan, *Merchants of Grain*, at p. 13 (Penguin, 1980).

Since the latter part of the 19<sup>th</sup> century, the United States has been one of the leading global producers and consumers of wheat. (Figures 2 and 3).

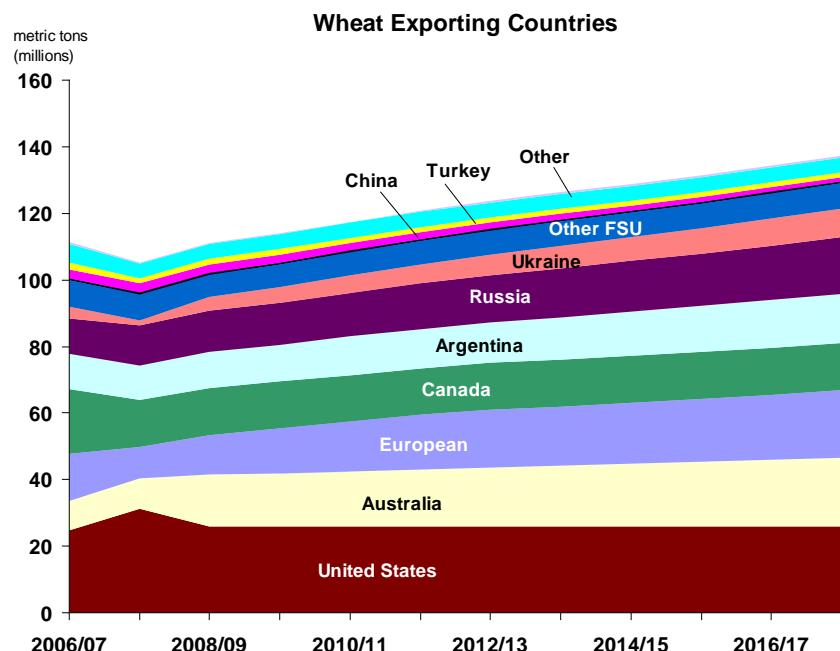


**Figure 2.** Wheat production of top ten wheat-producing countries, 2008-09. Total global production for 2008/09 is estimated to be 683 million metric tons. Data source: USDA Foreign Agricultural Service, World Wheat Production, Consumption, and Stocks, estimate as of 2/10/09.



**Figure 3.** Global Wheat Consumption, 2008-09. Total global consumption for 2008/09 is estimated to be 652 million metric tons. Data source: USDA Foreign Agricultural Service, World Wheat Production, Consumption, and Stocks, estimate as of 2/10/09.

During the 20<sup>th</sup> century, the United States was often the primary supplier of wheat to other countries suffering through war, drought, and famine. “A number of different countries have surpluses of oil or bauxite, or iron ore. But grain surpluses are found in only a handful of nations, and the United States is one of them. In agriculture, there is only one superpower.”<sup>6</sup> The large amount of wheat exported from the United States helps the U.S. trade balance, as well as fosters mutually beneficial relationships with other nations engaged in global trade and commerce. Although in recent times the United States’ market share of global wheat production and consumption has fallen due to increased global consumption and production, the United States remains the leading global exporter of wheat. (Figure 4).



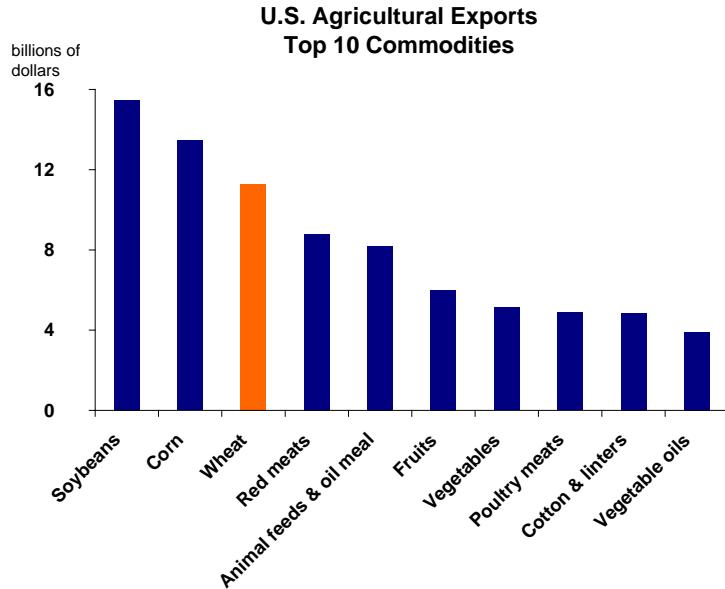
**Figure 4.** Wheat Exporting Countries, current and projected. Data source: USDA Economic Research Service, World Wheat Trade, Table 35.

U.S. agricultural exports make a significant positive contribution to the nation’s balance of trade. In 2007, the value of agricultural commodities exported from the United States totaled approximately \$81 billion, representing about 8 percent of total U.S. exports. In a year when the United States ran a trade deficit totaling over \$900 billion,

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<sup>6</sup> *Id.*, at p. 35.

the net trade of agricultural commodities generated an \$18 billion surplus.<sup>7</sup> Among U.S. agricultural exports, wheat ranks third, following soybeans and corn. (Figure 5).



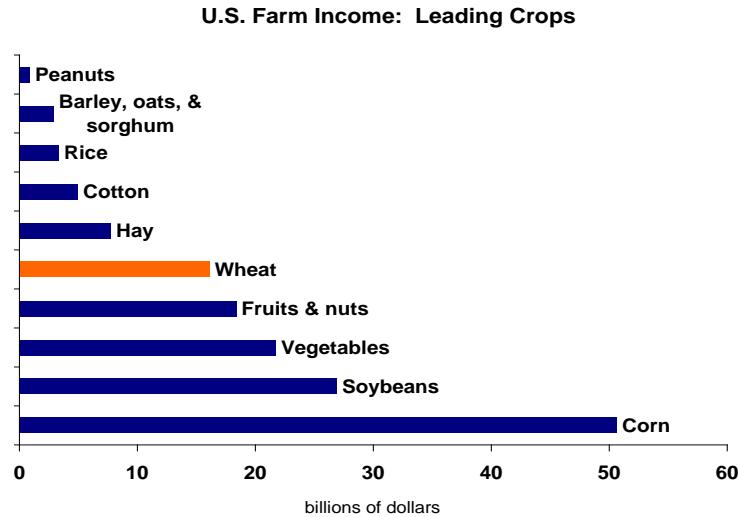
**Figure 5.** Value of top 10 U.S. agricultural exports, 2008. Export values for red meats, fruits, vegetables, and poultry meats include export values of derivative products. Data source: USDA, Economic Research Service, Foreign Agricultural Trade of the U.S., U.S. agricultural exports, year-to-date and current months, <http://www.ers.usda.gov/Data/FATUS/#monthly>.

According to the most recent Census of Agriculture, in 2007, U.S. farms generated a total of nearly \$11 billion in sales of wheat.<sup>8</sup> In 2008, the wheat crop produced over \$16 billion in sales. Corn and soybeans were the only individual crops that produced greater revenue for U.S. farmers. (Figure 6).

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<sup>7</sup> U.S.D.A. Economic Research Service, Foreign Agricultural Trade of the U.S. (FATUS), [Value of U.S. trade—agricultural, nonagricultural, and total—and trade balance, by calendar year](#), last visited 3/9/09.

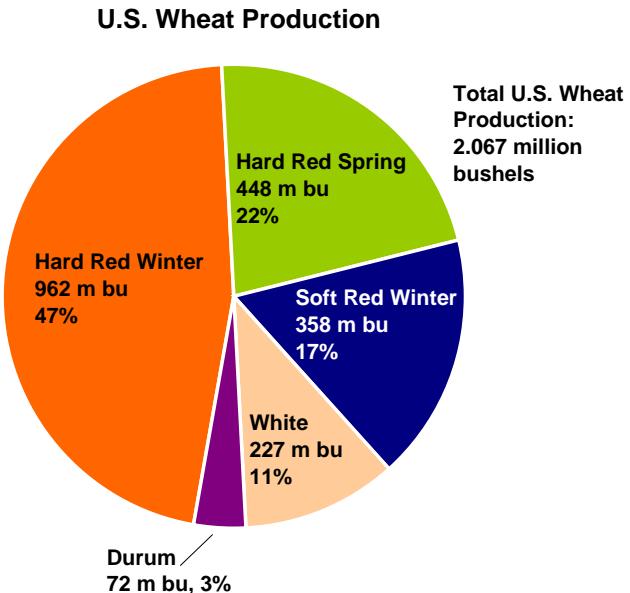
<sup>8</sup> U.S.D.A. Census of Agriculture, 2007, Volume I, Chapter I: U.S. National Level Data, Table 2.



**Figure 6.** U.S. Farm Income, Leading Crops. The USDA estimates that greenhouses and nurseries generated an additional \$17.5 billion in income in 2008. All other crops generated an estimated \$26 billion in farm income. Data source: USDA Economic Research Service, Data Sets, Farm Income: Data Files.

## B. Types of Wheat

Five basic types of wheat are grown in the United States: hard red winter (HRW), hard red spring (HRS), soft red winter (SRW), durum, and white. Figure 7 shows the relative amounts of the wheat varieties grown in the United States during the crop year 2007-08.



**Figure 7.** Types and amounts of wheat grown in the U.S. in 2007-08. Source: USDA, Economic Research Service, Wheat Data: Yearbook Tables, Table 6.

The varieties of wheat are differentiated primarily by the hardness, color, and protein content of the grain. Table 1 describes the various types of wheat, their protein content, and most common uses.

### Wheat Varieties, Characteristics, and Uses

Type of Wheat	Physical Characteristics	Protein Content	Uses
Durum	Very hard; translucent, light color	High (14-15%)	Pasta, couscous, Middle Eastern flat breads
Hard Red Spring	Hard; brownish	High (13-14%)	Bread, bagels, hard rolls
Hard Red Winter	Hard; brownish	Medium-High (11-12%)	Bread; bread flours
Soft Red Winter	Soft	Low (9-10.5%)	Cakes, pie crusts, biscuits, crackers
Hard White	Hard; light color, opaque, chalky	Medium-High (similar to HRW)	Bread, brewing, Asian noodles
Soft White	Soft, light-color	Low (10%)	Pie crusts, pastry, noodles, flat breads

**Table 1.** US Wheat Varieties, Characteristics, and Uses.<sup>9</sup>

The protein content of the wheat largely determines its suitability for various products such as breads, cakes, pastries, pastas, noodles, and other foods. Flour milled from wheat with a relatively high content of protein, or gluten, such as hard spring wheat, produces thicker breads that are relatively difficult to tear apart. Flour milled from wheat with a relatively low content of gluten, such as soft winter wheat, is used for products that do not need to stick together well, such as crackers and cookies.<sup>10</sup> Although the protein

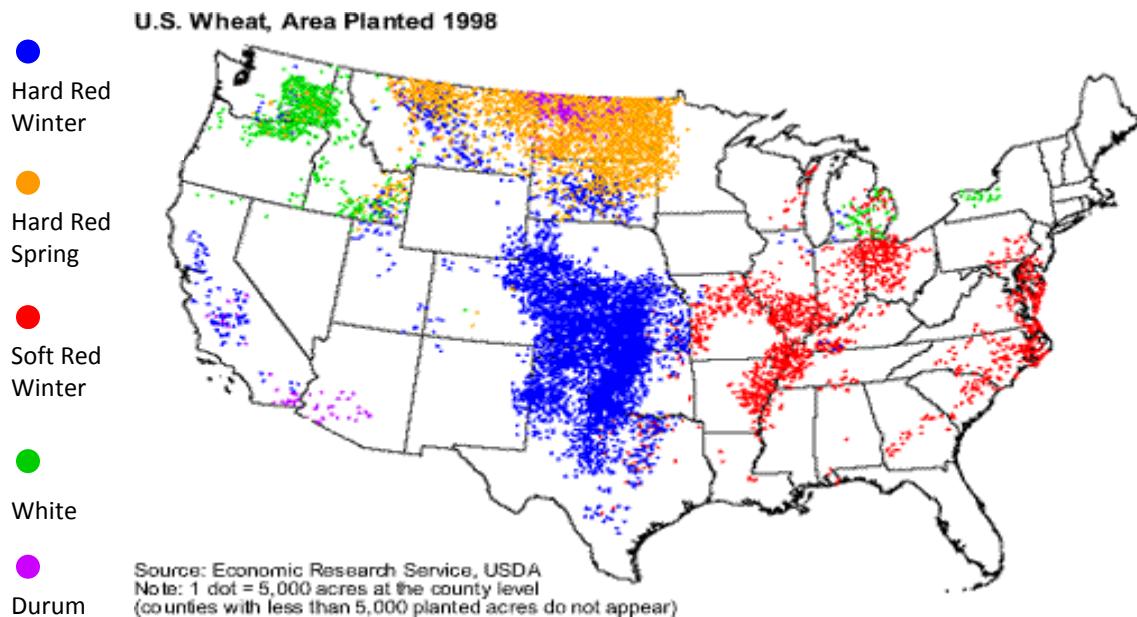
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<sup>9</sup> The data sources for the protein content of the various wheat varieties are: Sally Sologuk, *Durum Wheat 101: An Overview*, Milling Journal, 4<sup>th</sup> Quarter 2004, at p. 48, available at <http://www.northern-crops.com/technical/introdurum.pdf> (durum wheat); Kansas Wheat Commission – Kansas Association of Wheat Growers, Classes of Wheat, at <http://www.kswheat.com/general.asp?id=118>. See also Kyle Stiegert and Brian Balzer, Food System Research Group, Kansas State University, *Evaluating the U.S. Wheat Protein Complex*, at p. 6, available at <http://www.aae.wisc.edu/fsrg/publications/wp2001-5.pdf> (hard red spring and hard red winter wheats); U.S. Wheat Associates, Soft Red Winter Wheat Quality Survey, 2006, available at [http://www.uswheat.org/cropQualityReports/doc/26BC80F1BC58414385257214004695D0/\\$File/SRW2006.pdf?OpenElement](http://www.uswheat.org/cropQualityReports/doc/26BC80F1BC58414385257214004695D0/$File/SRW2006.pdf?OpenElement) (soft red winter wheat).

<sup>10</sup> In *Merchants of Grain*, Dan Morgan describes how Cadwallader Washburn (founder of the company that was the predecessor of General Mills) developed an innovative milling process, powered by the St. Anthony Falls on the Mississippi River, to separate the dark specks of bran that would discolor the white wheat flour during the milling of hard spring wheat. Hard spring wheat is the variety of wheat most suitable for survival in colder, northern climates. Morgan relates the significance of this invention:

content of hard white wheat is similar to that of hard red wheat, its white color and less bitter taste make it a preferable alternative to hard red wheat for certain uses. Because consumers tend to prefer whiter and sweeter tasting breads and pastas, hard white wheat often is a preferred source of flour for these products.<sup>11</sup>

Figure 8 displays the geographic locations where each type of wheat is grown.



**Figure 8.** U.S. Wheat Production, by Variety by County. Data source: USDA, Economic Research Service, Briefing Rooms, Wheat: Maps; at <http://www.ers.usda.gov/Briefing/Wheat/maps.htm>.

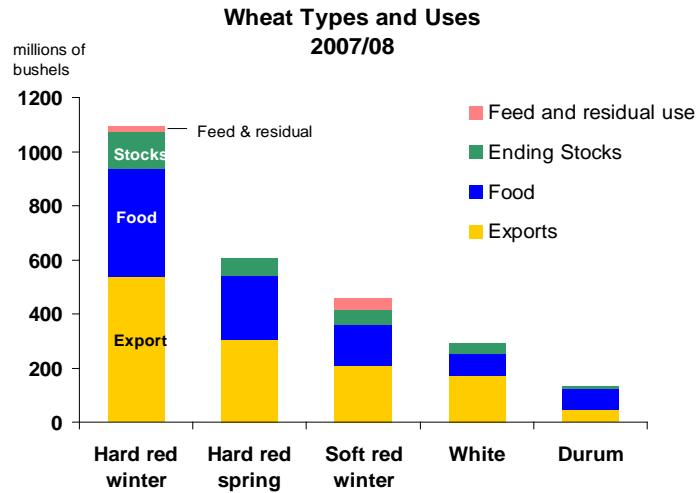
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"The 'new process' milling reversed the economic position of Minnesota flour on the bakers' scale of preferences, not only in the United States but in England as well. Once it could be sold as a whole product free from impurities, Minneapolis flour became the premium flour of the United States. The reason was that the spring planted wheats of Minnesota and the Dakotas, ripened as they were in the dry, sunny climate, contained a higher percentage of protein, or 'gluten,' than soft eastern wheats. This was an advantage of enormous economic significance. Gluten gives flour the capacity to absorb water and, when yeast is added, to rise. To bakers this meant that hard, spring wheat flour produced more loaves per pound. To consumers, the benefit was bread that tended to stay fresh longer."

Washburn's innovation soon "leaked out" and was also adopted by Charles Pillsbury, founder of the company that bears his name. *Merchants of Grain*, at 86.

<sup>11</sup> It also is a preferred choice for Asian noodles. See, e.g., USDA, Economic Research Service, *Hard White Wheat: Changing the Color of U.S. Wheat?*, Agricultural Outlook, August 1998; Whole Grains Council, Whole White Wheat FAQ, at <http://www.wholegrainscouncil.org/whole-grains-101/whole-white-wheat-faq>.

Figure 9 displays the uses of these wheat varieties.

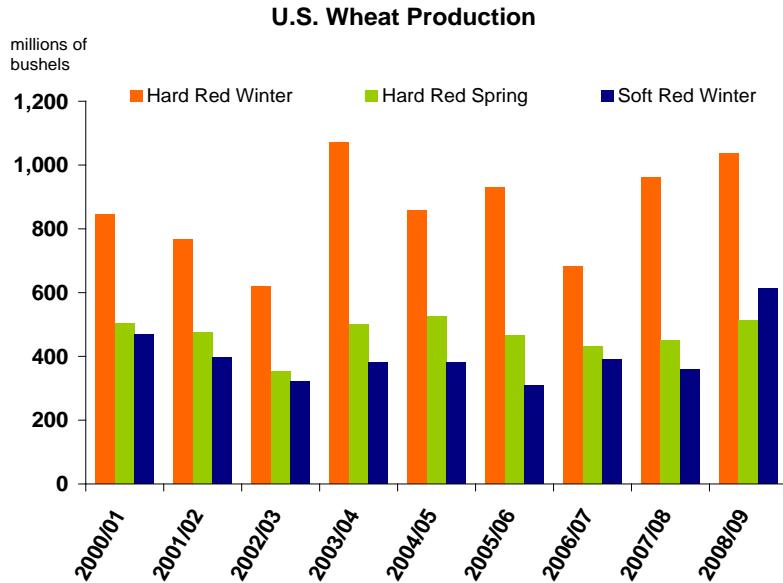


**Figure 9.** Uses of 5 main wheat varieties, 2007-08. Data source: USDA, Economic Research Service, Wheat Data: Yearbook Tables, Table 6: Wheat Classes, Supply and Disappearance.

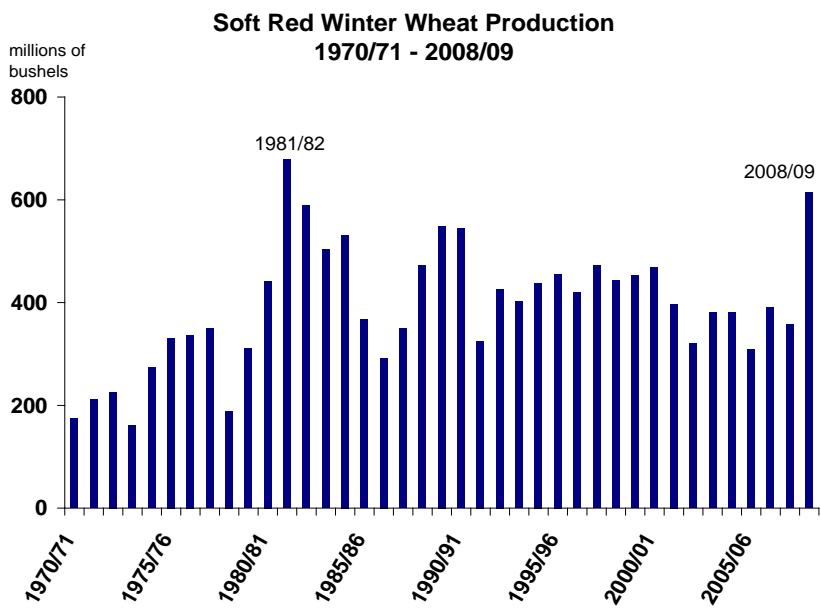
### C. U.S. Wheat Supplies

The amount of a particular crop that is grown is highly sensitive to the price signals in the market for that crop. When the price of a crop such as wheat is relatively high—such that the returns for planting wheat are expected to be higher than the returns from planting other crops—farmers will plant more wheat; when prices are relatively low, farmers will devote fewer acres to wheat than to other crops.

Figure 10 shows the sizes of the three largest U.S. wheat crops—hard red winter, hard red spring, and soft red winter—planted over the past nine crop years. Due to extremely dry conditions in the Great Plains states, the hard red winter wheat crop for 2005/06 was the second-smallest in 30 years. As a result of the record-high wheat prices over the previous two crop years, in late 2007, farmers planted more acres of all types of wheat. A near-record amount of soft red winter was produced for the 2008/09 crop year. (Figure 11).

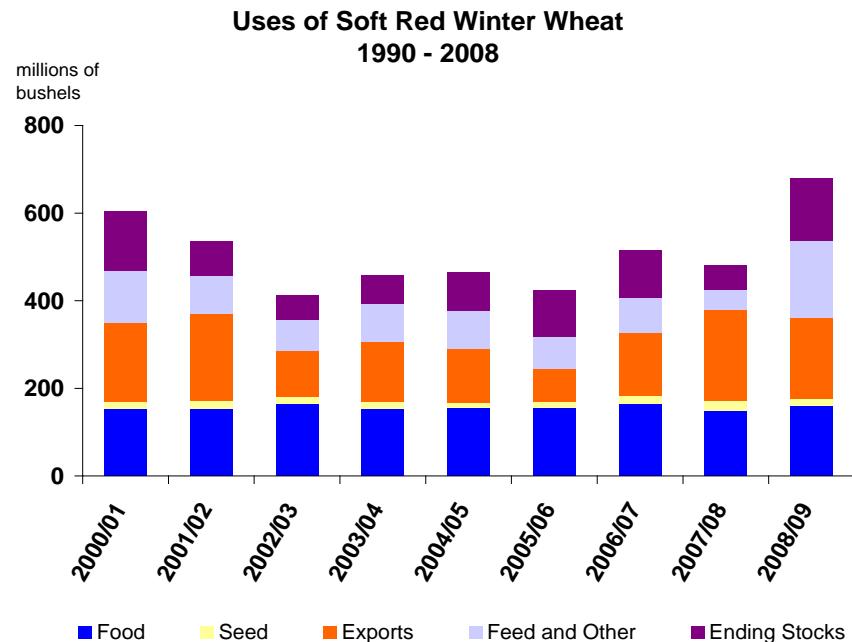


**Figure 10.** U.S. wheat production, 2000-2008. Data source: USDA Economic Research Service, Wheat Data: Yearbook Tables, Table 1.



**Figure 11.** The 2008/09 soft red winter wheat crop is anticipated to be the second largest on record. Data source: USDA Economic Research Service, Wheat Data: Yearbook Tables, Table 1.

The near-record crop of soft red winter wheat harvested in the summer of 2008 helped accelerate the fall of the price of wheat during the latter half of 2008. With such a large harvest, inventories of wheat rose, prices fell, and large amounts of wheat were used as animal feed. (Figure 12).



**Figure 12.** A near-record crop of soft red winter wheat in 2008/09 resulted in additional use of wheat for animal feed and greater-than-normal amounts of wheat placed in storage at the end of the crop year. Data source: USDA Economic Research Service, Wheat Data: Yearbook Tables, Table 9.

#### D. The Cash and Futures Markets for Wheat

The development of the wheat market in the United States has followed the general economic and political development of the nation as a whole. As the frontiers of the nation expanded westward throughout the 19<sup>th</sup> century, settlers in the new territories found the land highly suitable for growing grains such as wheat and corn. As farmlands progressed westward, new canals and railroads were built to carry these crops to the population centers back east, mills were built near those routes to process the wheat into flour, and centralized markets developed in Chicago and elsewhere to facilitate the buying and selling of wheat and wheat products. Much of the basic structure of the U.S. wheat markets today traces its origin to the manner in which these markets evolved during the 19<sup>th</sup> century.

## 1. Cash Markets for Wheat

The primary market for the buying and selling of wheat is the cash market. Virtually all transactions that result in a physical transfer of wheat take place between sellers and buyers exchanging cash for wheat. The futures market is rarely used for the actual buying and selling of wheat, or for the delivery of wheat from a seller to a buyer.

There is no centralized cash market for wheat or other types of grain. Rather, the cash market exists wherever a grain elevator or grain merchant posts a price or makes an offer to purchase grain, wherever a farmer or grain merchant makes an offer to sell, or wherever grain is bought, sold, or stored. These types of transactions take place all over the country, at all times of the day. Transactions in the cash market may or may not be accomplished through standardized contracts, although oftentimes they are.

Typically, country elevators, grain merchants, and millers will post prices on a daily or regular basis for the amounts of grain that they anticipate for their immediate or near-term needs. Elevators and merchants often will post a schedule of prices, depending on when the crop is to be delivered. Cash market prices vary considerably from season to season and from location to location. At any particular time, factors influencing the cash price at a particular location may include local soil and weather conditions as they may affect the quantity or quality of the wheat at that location, local supply and demand factors, such as the availability of alternative or substitute grains at that location, the particular needs of local elevators or processors, and transportation costs to markets or processing facilities.

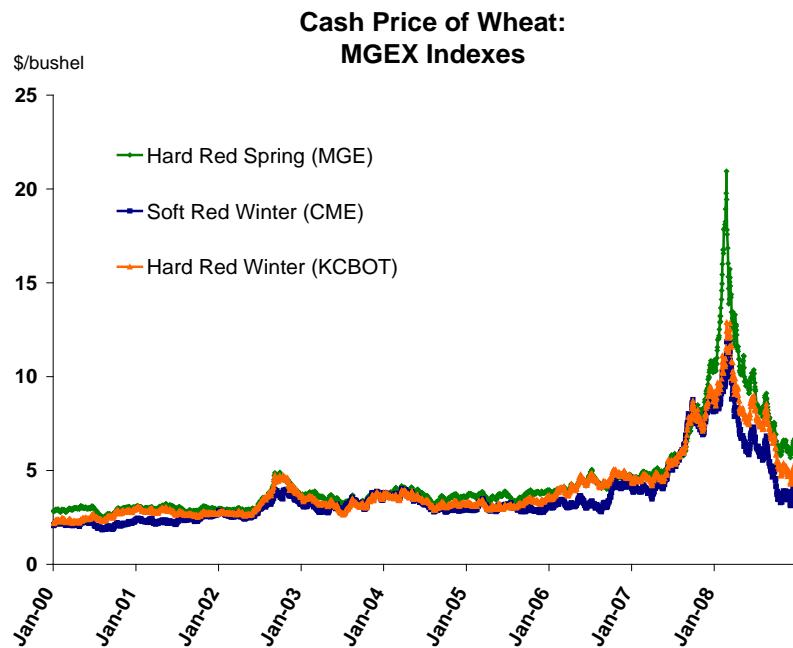
Cash prices may be quoted as an absolute price, particularly if the contract is for immediate delivery of wheat. For example, the cash price for immediate delivery might be \$4 per bushel. A contract for wheat that is to be delivered at a specified time in the future (termed a “forward” contract) often is based upon the current price of the futures contract that is closest in time to the time of delivery. Some forward contracts specify a particular discount or premium to be applied to the futures price; others provide that the discount or premium is to be determined at the time of delivery, based upon prevailing market conditions when the wheat is delivered.

Farmers often have the option of selling their crop in the cash or futures market, according to the current prices in either market, or storing it themselves or at an elevator for later delivery and sale. A farmer’s income depends to a large degree on the farmer’s ability to determine the most profitable option for the sale of his or her crops.

To foster transparent and efficient markets, the U.S. Department of Agriculture publishes daily, weekly, monthly, and annual reports on the price of wheat and numerous other crops in various cash markets. Other organizations also provide pricing reports.

Because of the highly localized nature of the cash market, these types of reports are a valuable source of information about the prevailing prices at or near a particular location.

For hard red winter, hard red spring, and soft red winter wheats, as well as for corn and soybeans, the Minneapolis Grain Exchange (MGEX) offers a daily “cash index” contract for trading as a futures contract. The daily index prices for these commodities is determined by surveying and calculating the average of numerous cash prices for each crop around the region in which it is grown. The Minneapolis exchange explains: “DTN [a large publisher of real-time market data] collects nearly 700 bids each day for hard red winter wheat, 325 bids for hard red spring wheat, 550 bids for soft red winter wheat, 2,450 bids for corn and 2,250 bids for soybeans with representation from elevators around the country.”<sup>12</sup> The MGEX agricultural index contracts can therefore be considered to represent a national average cash price for each of the covered commodities. Figure 13 presents the value of the MGEX index price over the last eight years for each of the three types of wheat traded on futures exchanges: hard red winter, hard red spring, and soft red winter. The data shows, for all three types of wheat, a significant price spike in 2007-08.



**Figure 13.** Average cash prices of wheat traded on futures exchanges, as calculated by the MGE index. Data source: MGEX.

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<sup>12</sup> Minneapolis Grain Exchange, MGEX Agricultural Index Futures and Options, FAQ; at <http://www.mgex.com/documents/2007indexFAQ4.08.pdf>. Although the Minneapolis exchange offers these contracts for trading as futures contracts, there is virtually no trading in any of these futures contracts.

## 2. Futures Markets for Wheat

Following the Civil War, the rapid expansion of the country westward, together with the industrial revolution, transformed the United States into a global agricultural and industrial power, often with wrenching consequences for American farmers, workers, and communities.<sup>13</sup> American farmers no longer produced wheat just for their own sustenance or a local market, but rather became part of a much larger international network for buying and selling grains and other foodstuffs. The price a farmer could get for grain was no longer the result of a simple bargain between the farmer and the local grain dealer, but rather was based on many factors totally out of the farmer's control, such as the latest trends in global supply and demand.

As the U.S. wheat market expanded and U.S. farmers and merchants began to market their wheat globally, futures markets evolved as a means to manage the unpredictable risks merchants faced in buying, storing, and selling wheat in a global market. When it was first established in 1848, the Chicago Board of Trade (CBOT) was primarily a cash market for a wide variety of agricultural commodities, including grains.<sup>14</sup> During the 1850s, increasing supplies of grain and other crops coming into Chicago due to the expansion of farmlands, the building of railroads and canals connecting the new territories to Chicago and other cities, and increasing international demands for U.S. wheat, fostered the increased use of forward contracts to store and market that wheat. A leading professor of agricultural economics, Thomas Hieronymus, explains:

“As commerce developed and required the accumulation of inventories, particularly of seasonally produced crops, merchants and processors found themselves with problems that were best managed by forward contracting. This forward contracting developed into standard procedures that were eventually codified and formalized into futures trading.”<sup>15</sup>

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<sup>13</sup> “Farmers, no longer relatively self-sufficient, were bewildered by the new economic conditions. They were involved now in a world-wide economic network, the impersonal price-and-market system, which they understood only dimly. Slowly and with great difficulty they learned to cope with these new problems, to calculate costs and prices with business-like efficiency, and to join together to deal with powerful market forces.” Samuel P. Hays, *The Response to Industrialism, 1885-1914* (University of Chicago Press, 1957), at p. 31. “Between 1815 and 1860 the character of American agriculture was transformed. The independent yeoman, outside of exceptional or isolated areas, almost disappeared before the relentless advance of commercial agriculture.” Richard Hofstadter, *The Age of Reform* (Alfred A. Knopf, 1955), at p. 38.

<sup>14</sup> William G. Ferris, *The Grain Traders, The Story of the Chicago Board of Trade* (Michigan State University Press, 1988), at p. 9.

<sup>15</sup> Thomas A. Hieronymus, *Economics of Futures Trading* (Commodity Research Bureau, 1977), at p. 93. (available at University of Illinois farmdoc archives, at [http://www.farmdoc.uiuc.edu/irwin/links\\_archive.asp](http://www.farmdoc.uiuc.edu/irwin/links_archive.asp); hereinafter cited as “farmdoc archives”). The CBOT began to trade forward contracts in 1851. In 1859, it received a charter from the State of Illinois to

Once the making of a contract became separated from the delivery of the commodity, as is the case with forward contracts, it became possible for grain merchants and other middlemen to speculate as to the ultimate value of those contracts, and to attempt to profit from the changing value of those contracts. As the amount of forward contracting grew, so did the amount of speculation in the value of those contracts. During the Civil War, speculation became so rampant that the CBOT developed rules to govern the conduct of its members and to ensure the performance of contracts made on the exchange.<sup>16</sup>

The CBOT Annual Report for 1864 reflects how the nature of trading already had shifted from strictly cash transactions to speculative trading:

“It is true that speculation has been too much the order of the day, and buyers and sellers of ‘long,’ ‘short,’ and ‘spot,’ have passed through all the gradations of fortune from the lower to the higher ground, and in many instances have returned to the starting point, if not to a step lower, but it is to be hoped that with the return to peace this fever of speculation will abate and trade will be conducted on a more thoroughly legitimate basis.”<sup>17</sup>

From the beginning of futures trading in the mid-19<sup>th</sup> century until 2008, the CBOT was the leading futures exchange for wheat, other grains, and agricultural commodities, including corn and soybeans.<sup>18</sup> In 2008, the CBOT merged with the Chicago Mercantile Exchange (CME).

establish and enforce grain standards. *Id.* The development of grain standards and grain quality control methods in grain warehouses greatly facilitated the usefulness of standardized contracts. See Ferris, at p. 19.

<sup>16</sup> In 1863, the CBOT adopted a rule to authorize the expulsion of any member who failed to comply with the terms of a contract. In 1865, the CBOT published the “General Rules of the Board of Trade” which included, for the first time, the requirement to post margins, and rules for the standardized delivery and payment procedures for future deliveries under contracts. “By this time all of the essential elements of futures trading were present. . . . We could date the origin of modern commodity futures trading as October 13, 1865 if it is, indeed, desirable to attach a single date to what was actually an evolutionary process.” Hieronymus, at p. 76. In 1883, the CBOT introduced the first clearinghouse to facilitate the offsetting of trades amongst its members. In 1891, the Minneapolis Grain Exchange created the first complete clearinghouse system, by also making the clearinghouse the counterparty to each transaction on the exchange. Anne E. Peck, *The Economic Role of Traditional Commodity Futures Markets* (American Enterprise Institute, 1985), at p. 4-6 (available in [farmdoc](#) archives).

<sup>17</sup> Reprinted in G. Wright Hoffman, *Future Trading Upon Organized Commodity Markets in the United States*, University of Pennsylvania Press (1932), at p. 30.

<sup>18</sup> See, e.g., Ferris, *The Grain Traders, The Story of the Chicago Board of Trade*.

**Three Futures Exchanges.** Today, there are three futures markets for wheat in the United States, each specializing in a particular type of wheat.<sup>19</sup> Soft red winter wheat is traded on the CME, hard red winter wheat is traded on the Kansas City Board of Trade (KCBOT), and hard red spring wheat is traded on the MGEX.

### Wheat Futures Exchanges and Contracts

Exchange:	Chicago Mercantile Exchange (CME)	Kansas City Board of Trade (KCBOT)	Minneapolis Grain Exchange (MGEX)
Type of Wheat Traded:	Soft Red Winter	Hard Red Winter	Hard Red Spring
Contract Size:	5,000 bushels (bu.)	5,000 bu.	5,000 bu.
New Crop Month:	July	July	September
Delivery Months:	Jul, Sep, Dec, Mar, May	Jul, Sep, Dec, Mar, May	Mar, May, Jul, Sep, Dec
Delivery Locations:	Chicago, IL; Toledo, OH; NW Ohio; Ohio River between Cincinnati and Mississippi River; Mississippi River below St. Louis to Memphis. <sup>20</sup>	Kansas City MO-KS; Hutchinson, KS; Wichita, KS; Salina/Abilene KS.	Minn./St. Paul, MN; Red Wing, MN; Duluth MN/Superior WI.
Daily Volume (2/09) <sup>21</sup>	79,439	10,403	2,871
Position Limits:			
Spot month	600	600	600
Single month	5,000	5,000	5,000
All months combined	6,500	6,500	6,500

**Table 2.** Wheat Futures Exchanges and Contracts. Data source: CME, KCBOT, MGEX.

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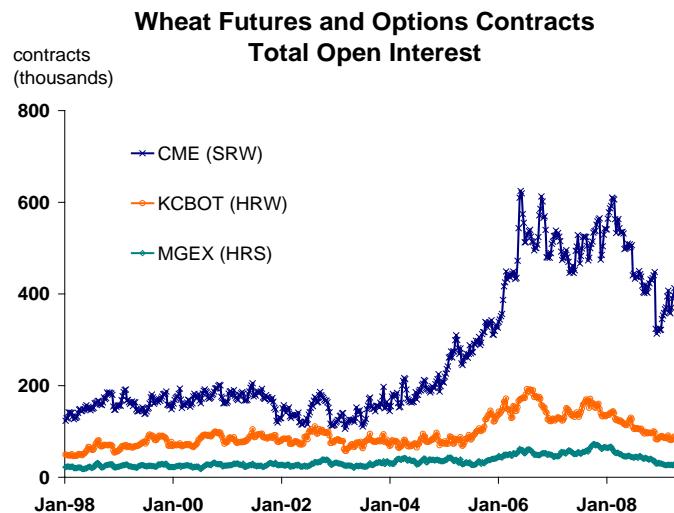
<sup>19</sup> At one time, futures exchanges for the trading of grain were also located in Baltimore, Buffalo, Cincinnati, Duluth, Indianapolis, Milwaukee, New York, Omaha, Peoria, Philadelphia, Portland, Seattle, St. Louis, and Toledo. *Report of the Federal Trade Commission on The Grain Trade, Vol. II, Terminal Grain Markets and Exchanges* (1920), at p. 204. Several exchanges, including the MGEX, have offered futures contracts for durum wheat and white wheat but have been unable to sustain sufficient liquidity to continue trading those types of wheat.

<sup>20</sup> In 2009, a 12-county area of northwest Ohio and the Ohio River and Mississippi River delivery locations were added by the CME as part of the CME's effort to improve the convergence of the CME wheat contract.

<sup>21</sup> CME Group, Monthly Agricultural Update, February 2009; Kansas City Bd. Of Trade, Historical Data, at [http://www.kcbt.com/historical\\_data.asp#kcbt\\_monthly](http://www.kcbt.com/historical_data.asp#kcbt_monthly); Minneapolis Grain Exch., Market Information, Monthly/Weekly Reports, at <http://www.mgex.com/reports.html>.

Table 2 describes key features of each of these futures contracts. As the Table indicates, the structures of the three wheat futures contracts, as well as the rules under which they are traded, are very similar.

Although the amount of soft red winter wheat produced annually is significantly less than the amount of either hard red winter or hard red spring wheat, there is significantly more liquidity—meaning a greater amount of trading—in the wheat futures market in Chicago than on the other wheat futures exchanges. This increased liquidity can be seen in both the daily volume of wheat contracts traded on each exchange, as shown in Table 2, or by comparing the open interest (number of contracts outstanding) on each exchange, as shown in Figure 14.<sup>22</sup>



**Figure 14.** Open interest in the three wheat futures markets. Data source: CFTC.

**Delivery Terms.** Futures contracts are rarely used to provide for the actual delivery of a commodity from a seller to a purchaser. Typically, only one or two percent of all futures contracts result in the delivery of the commodity.<sup>23</sup>

<sup>22</sup> According to traders and grain market analysts interviewed by the Subcommittee, there is no intrinsic reason why any particular wheat contract should be more liquid than the others. However, once a contract becomes highly liquid it tends to stay that way—“liquidity begets liquidity.” Moreover, many traders who trade futures contracts in other agricultural commodities on the CME find it more convenient to use the CME wheat futures contract rather than move to a wheat contract on another exchange.

<sup>23</sup> “In markets that work, delivery is rarely made and taken; futures contracts are entered into for reasons other than exchange of title.” Hieronymus, at p. 340.

Even though actual deliveries under futures contracts are rare, it is nonetheless critical that the delivery terms in the futures contract facilitate such deliveries. In his classic 1977 textbook on futures markets, Professor Hieronymus explained the importance of easy delivery terms:

“The objective in writing a futures contract is to obtain such even balance that only an amount to test the price—to keep it honest—is delivered; to make the contract so readily deliverable and receivable that there is no incentive to make or take delivery. The terms of the contract must be precisely representative of the commercial trading practices of the commodity.”<sup>24</sup>

Experience with futures markets has shown that it is very difficult to maintain trading in a futures contract with delivery terms that do not reflect commercial reality and facilitate delivery. Commercial traders are reluctant to participate in a market where it is difficult to obtain or dispose of the actual commodity.<sup>25</sup>

The three wheat futures contracts specify the type and quality of the wheat to be delivered, the date or time frame for delivery, the possible locations for delivery, and the required price at the time of delivery. The CME soft red winter wheat contract, for example, provides for the delivery of #2 soft red winter wheat, at an approved terminal elevator in Chicago, Toledo, or another approved delivery location (see Table 2). The Kansas City and Minneapolis exchanges have similar rules.<sup>26</sup> The exchange rules specify

<sup>24</sup> “Markets can be destroyed by the wrong delivery terms.” Hieronymus, at p. 340.

<sup>25</sup> *Id.*, at p. 342. The defunct futures market for Maine potatoes provides a good example of how an inadequate delivery process helped cause the demise of the market. The problems in the Maine potato futures market included highly volatile futures prices and a failure of the cash and futures prices to converge at contract expiration. This lack of convergence resulted from the relatively small amount of potatoes that could be delivered under the terms of the contract. “Many people have concluded that the supply of Maine potatoes deliverable on the current NYMEX contract is too small for healthy trading.” Allen E. Paul, Kandice H. Kahl, and William G. Tomek, *Performance of Futures Markets: The Case of Potatoes*, USDA Economics and Statistics Service, Technical Bulletin No. 1636 (1981), at p. viii (available in farmdoc archives). This USDA study warned that traders would stop using the contract unless the performance of the contract was improved, particularly with respect to convergence at contract expiration. It recommended adoption of a cash settlement process (whereby the settlement price at the expiration of a futures contract is set at the price at that time in the cash market) to “sidestep delivery difficulties and ensure that futures price and cash price converge at contract maturity.” *Id.* at ix. The default in the delivery of 50 million pounds of potatoes in 1976, and the failure of deliveries to pass inspection under the March 1979 contract hastened the loss of confidence in this futures market. After years of declining volume, the NYMEX delisted the Maine futures potato contract in 1986.

<sup>26</sup> The Kansas City wheat contract specifies the delivery of #2 hard red winter wheat, or #1 hard red winter wheat at a 1 ½ cent premium over the price for #2 hard red winter wheat. The evolution of the Kansas City futures market into a futures market solely for hard red winter wheat provides another illustration of the importance of the contract delivery mechanism. In 1940, the KCBOT began to allow the delivery of soft winter wheat, at the seller’s option. Prior to this, only hard winter wheat could be delivered. In the 1950s, the price of soft winter wheat dropped relative to the price of hard winter wheat. Given the alternative, sellers preferred to deliver the lower-priced wheat, so that by early 1953, the KCBOT contract became, in

the procedure for the person making delivery to notify the exchange that delivery will be made, and for notifying the person or persons taking delivery.

For grain futures contracts, the rules of the exchanges specify a narrow category of sellers who may make an actual delivery of grain pursuant to those contracts. For wheat, only “warehouses or shipping stations” approved by an exchange may deliver wheat to satisfy a futures contract.<sup>27</sup> Presently, the CME has approved only one warehouse in Chicago (operated by Chicago & Illinois River Marketing, LLC, a subsidiary of Nidera), and three facilities in Toledo (operated by ADM, Cargill, and The Andersons) for delivery of wheat under the CME contract.<sup>28</sup> The requirement that a potential deliverer of wheat under the futures contract first be approved by the board of trade partly stems from the need to ensure that the quality of wheat delivered under the contract meets the contract specifications and partly to ensure that the persons supposed to make or accept delivery are capable of doing so. The fact that there are so few approved warehouses in Chicago and Toledo is due largely to the expense and difficulty of constructing and operating grain warehouses in the current delivery locations, particularly in an urban area like Chicago, and the fact that Chicago and Toledo are no longer major centers for commerce in wheat.

Deliveries under a wheat futures contract follow a multi-step process over several days prior to the expiration of the contract. Wheat futures contracts expire in the middle of the month—on the first business day prior to the 15<sup>th</sup> calendar day of the contract month. Beginning on the second-to-last business day of the month prior to the month in which expiration occurs, an approved firm may give notice of the firm’s intent to make a

effect, a soft winter wheat contract. The contract became a less effective tool for hedging for the producers and users of hard winter wheat, and the millers who used hard winter wheat petitioned the KCBOT to once again restrict deliveries to hard red winter wheat. At first, the proposal was rejected, largely due to the belief that a soft winter wheat contract would result in a larger volume of trading. Once the would-be physical hedgers began to use the KCBOT less frequently as a result of the loss in the ability to hedge hard winter wheat, and overall trading volumes declined significantly, the KCBOT reversed itself and, since 1954, has restricted deliveries to hard winter wheat. Holbrook Working, *Whose Markets? Evidence on Some Aspects of Futures Trading*, reprinted in Selected Writings of Holbrook Working (Chicago Board of Trade, 1985), at pp. 165-176.

<sup>27</sup> The CME Rulebook sets forth the requirements for regular warehouses and shipping facilities. Among other requirements, the facility must be inspected by the Exchange, the USDA, and other governmental agencies; be provided with “modern improvements and appliances for the convenient and expeditious receiving, handling and shipping of product in bulk”; furnish accurate information to the Exchange; permit its books to be inspected; “not engage in unethical or inequitable practices”; and comply with the rules of the Exchange. CME Rulebook, Chap.7.

<sup>28</sup> The CME has received about 40 applications for approval for warehouses as a result of its recent decision to approve delivery locations in northwest Ohio and along the Ohio and Mississippi Rivers beginning with the July 2009 contract. CME Group, Special Executive Report, S-4876, Reminder: Upcoming Approved Changes to the Wheat Futures Contract, May 15, 2009; at <http://www.cmegroup.com/company/membership/membernet/files/20090518S-4876.pdf>.

delivery under the futures contract. The day on which a seller first gives notice is called “position day.” On the day following a position day, the exchange examines the outstanding long open interest (buyers) and selects those positions that have been held for the longest period of time to accept delivery. This second day of the delivery process is called “notice day.” On notice day, the holder of the long position identified by the exchange to accept delivery may either accept the delivery or decide to pass it on to another buyer.<sup>29</sup> The day following notice day is delivery day, when the shipping receipt passes to the purchaser. Once delivery is made, both the long and short open interests are closed. Any contracts still outstanding on the last day of trading are settled through delivery, at the settlement price, on the following day.

Delivery of wheat under the Chicago wheat futures contract (or any of the other wheat futures contracts) from an approved warehouse does not require the physical movement of any grain. Rather, the rights to the grain pass to the buyer in the form of a shipping certificate. Possession of a shipping certificate entitles the holder of the certificate to demand that the warehouse load the wheat upon the mode of transportation provided by the certificate holder (“load-out”), generally barge or rail. Once the holder of a shipping certificate requests load out, the warehouse then must load the grain within a period of time specified by the rules of the exchange. Until the holder of a shipping certificate requests the load out, the holder of the shipping certificate must pay the warehouse storage fees for the amount of grain stored, also at a rate specified by exchange rules.

Through this delivery process, traders may acquire grain through the contract delivery process without actually physically handling any grain. Rather, simply by holding futures contracts until expiration, traders may acquire the rights to grain stored in grain elevators, in the form of shipping certificates. These traders may then hold onto these shipping certificates, pay the storage fees, and then sell the grain later at a higher price.

## **E. Recent Trends in U.S. Wheat Prices**

### **1. Recent Price Increases and Volatility**

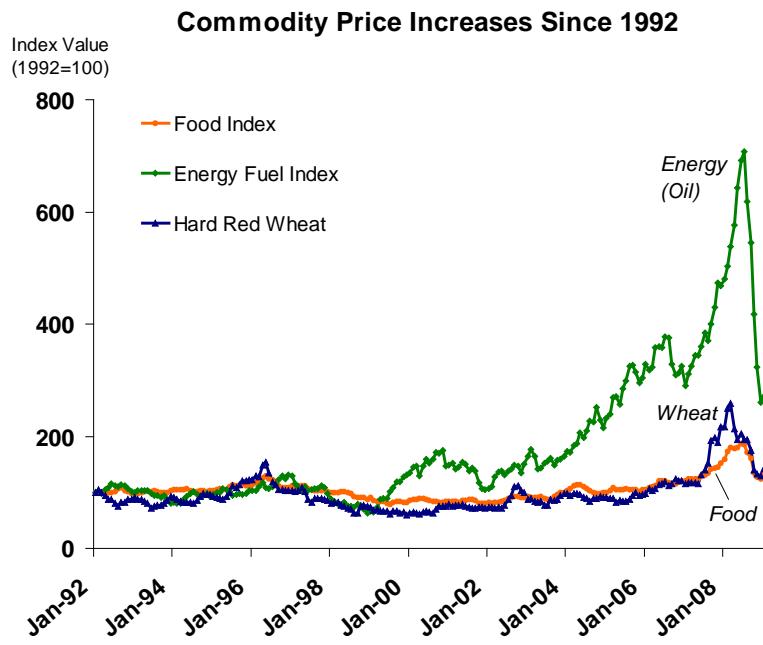
Because the United States is a large exporter of wheat, U.S. wheat prices are strongly influenced by global supply and demand. The price of wheat in Kansas may be influenced just as much by locusts in Australia as by a local drought. Over the past few

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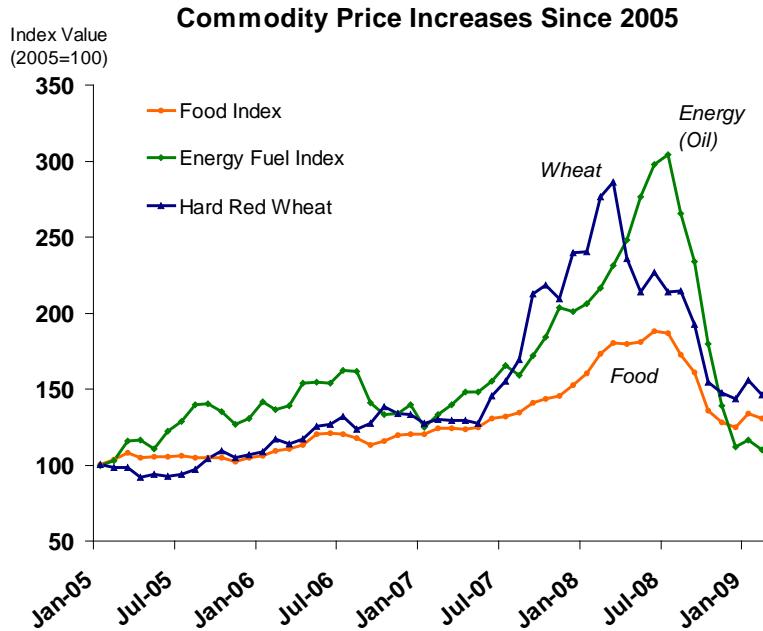
<sup>29</sup> If the holder of the long position identified by the exchange does not want to accept delivery and notifies the exchange of his or her intent to pass it on to another buyer, on the following day the exchange will select and notify the next-oldest holder of a long position to accept delivery. The day the next-in-line holder of a long position is notified becomes the new notice day. This process can continue until the day the contract expires.

years, a wide variety of global and domestic factors have led to unprecedented price increases and volatility in wheat and other agricultural commodities.

Figures 15a and 15b show the climb to record heights by energy, food, and wheat prices over the past several years, peaking in mid-2008, and then falling sharply during the latter half of 2008. As these figures show, over the past 15 years, the price of energy (largely mirroring the price of crude oil) has increased far more than the price of wheat or food in general. Over the past four years, however, the increases in wheat prices were nearly as steep as the increases in the price of oil. (Figure 15b).



**Figure 15a.** Commodity Price Increases since 1992. The energy price index includes the price of crude oil, natural gas, and coal, and closely follows the price of crude oil. Data source for Figures 15a and 15b: International Monetary Fund, Primary Commodity Prices; at <http://www.imf.org/external/np/res/commod/index.asp>.



**Figure 15b.** Relative prices of wheat, energy fuel, and food since 2005.

The large price increase, subsequent collapse, and abnormal price volatility during 2008 caused turmoil in the wheat markets. Media reports conveyed complaints, worries, and warnings from many sectors of the grain industry, from producers to consumers. “Anyone who tells you they’ve seen something like this is a liar,” said an official of the Farmers Trading Company of South Dakota.<sup>30</sup> An official at cereal-maker Kellogg observed, “The costs for commodities, including grains and energy used to manufacture and distribute our products, continues to increase dramatically.”<sup>31</sup> “I can’t honestly sit here and tell who is determining the price of grain,” said one Illinois farmer. “I’ve lost confidence in the Chicago Board of Trade.”<sup>32</sup> “I don’t know how anyone goes about hedging in markets as volatile as this,” said the president of MGP Ingredients which provides flour, wheat protein, and other grain products to food makers.<sup>33</sup> “These markets are behaving in ways we have never seen,” said a senior official from Sara Lee.<sup>34</sup> A

<sup>30</sup> David Streitfeld, *In Price and Supply, Wheat Is the Unstable Staple*, New York Times, February 13, 2008.

<sup>31</sup> Stephanie Antonian Rutherford, *Kellogg shrinks boxes*, Battle Creek Enquirer, June 17, 2008.

<sup>32</sup> Diana B. Henriques, *Price Volatility Adds to Worry on U.S. Farms*, New York Times, April 22, 2008.

<sup>33</sup> Ben Levisohn, *Butcher, Baker—Commodities Trader?*, Business Week, July 14, 2008.

<sup>34</sup> *Id.*

grain elevator manager warned, “Eventually, those costs are going to come out of the pockets of the American consumer.”<sup>35</sup>

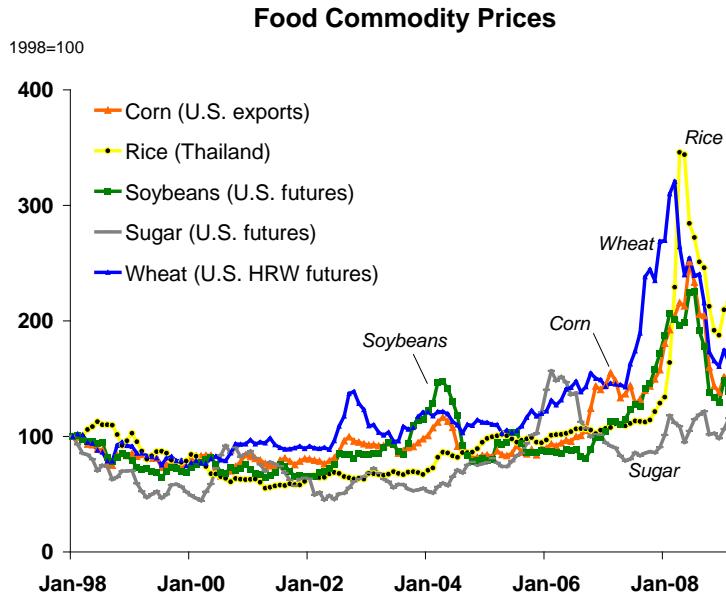
Although the rise in wheat prices to record heights occurred steadily over a span of several years, the subsequent drop in prices took place over a much shorter period, about six months. Despite the sharp drop in the latter half of 2008, prices did not fall all the way back to their pre-spike levels. Many analysts project that the new equilibrium price will be higher than the equilibrium price before the spike. For example, Professors Good and Irwin write: “[U]nfolding evidence suggests that prices are indeed likely establishing a higher average than that experienced in recent history. The factors supporting this conclusion include generally tight world inventories, growing world demand for food and biofuels, and escalating cost of production.” They also state: “[C]urrent market fundamentals center on large amounts of corn used for ethanol production, suggesting that corn prices will continue to be closely tied to energy prices in the immediate future and that the price of the other two crops [wheat and soybeans] will have to be competitive with the price of corn.”<sup>36</sup>

Figure 16 shows how the price of wheat over the past decade has compared to the prices of other agricultural commodities. During this period the prices of wheat, corn, and soybeans all have followed similar patterns.

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<sup>35</sup> Diana B. Henriques, *Price Volatility Adds to Worry on U.S. Farms*, New York Times, April 22, 2008.

<sup>36</sup> Darrel Good and Scott Irwin, *The New Era of Corn, Soybean, and Wheat Prices*, Marketing & Outlook Briefs, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, September 2, 2008. See also Ronald Trostle, *Global Agricultural Supply and Demand: Factors contributing to higher food commodity prices, and prospects for the future*, Economic Research Service, U.S. Department of Agriculture, Presentation to Russian Agricultural Outlook Forum, September 23-24, 2008.



**Figure 16.** Prices of selected food commodities, 1998-2009. Data source: International Monetary Fund, Primary Commodity Prices; at <http://www.imf.org/external/np/res/commod/index.asp>.

The causes of the steep rise in commodity prices in 2008, including the role of increasing speculation in the commodity markets, became the subject of intense public scrutiny and debate.<sup>37</sup> In the first half of 2008 alone, Congress held more than 40

<sup>37</sup> See, e.g., Kevin G Hall, *Speculators' role in crude-oil prices under examination*, The Seattle Times, Sept. 11, 2008; Jeffrey Korzenik, *Energy policy and the speculator*, The Boston Globe, August 21, 2008; Sam Zuckerman, *Spotlight on investors as commodities slide*, The San Francisco Chronicle, August 18, 2008; Katherine Yung, *Causes of Oil Price Swings are Debated: Is it Greedy Speculation or Simply Supply and Demand?*, Detroit Free Press, August 7, 2008; Roger Bootle, *Commodities could be the latest bubble to burst*, The Daily Telegraph, July 28, 2008; Dwight R. Sanders and Scott H. Irwin, *Futures Imperfect*, The New York Times, July 20, 2008; Craig Pirrong, *Restricting Speculators Will Not Reduce Oil Prices*, Wall Street Journal, July 11, 2008; Adam Shell, *Are big bets by speculators driving up oil? Experts disagree on what's behind rising crude prices*, USA Today, July 1, 2008; Paul Krugman, *Fuels on the Hill; Congress Loves to Blame Speculators For the High Price of Oil*, Pittsburgh Post-Gazette, June 28, 2008; Joe Nocera, *Easy Target, But Not the Right One*, The New York Times, June 28, 2008; Ed Wallace, *High Oil Prices: It's All Speculation*, BusinessWeek, June 27, 2008; Jon Birger, *Don't blame the oil speculators*, Fortune, June 27, 2008; Jad Mouawad and Diana B. Henriques, *Why Is Oil So High? Pick a View*, The New York Times, June 21, 2008; Dale Kasler, *CalPERS profits as costs surge; While consumers fume over commodity prices, pension fund makes killing in market*, Sacramento Bee, June 20, 2008; Diana B. Henriques, *A Bill Market Sees the Worst in Speculators*, The New York Times, June 13, 2008; Editorial, *Betting on the bubble*, St. Louis Post-Dispatch, June 9, 2008; *Rising tide becomes a surge that could wreck every boat; Oil prices have nearly doubled over the past two years*, Fort Worth Star-Telegram, June 7, 2008; David Cho, *Investors' Growing Appetite for Oil Evades Market Limits; Trading Loophole for Wall Street Speculators is Driving up Prices, Critics Say*, The Washington Post, June 6, 2008; Alan Bjerga and Matthew Leising, *Tighter Agriculture Investing Rules; Regulator to Watch Futures Markets After Spike in Food Prices*, The Washington Post, June 4, 2008; Margot Habiby and Edward Klump, *Pickens Says CFTC Probe of Oil a 'Waste of Time'*, Bloomberg.com, June 3, 2008; David Nicklaus, *It's simple supply and demand, not a conspiracy*, St. Louis Post-Dispatch, June 1, 2008; David Ivanovich, *Are Speculators*

hearings examining commodity prices, including the impact of increasing levels of speculation, most often with respect to crude oil and energy prices.<sup>38</sup> Some analysts told Congress there was a direct cause-and-effect relationship between increasing speculation in the commodity markets and higher market prices. For example, Michael W. Masters, a hedge fund manager, testified before the Senate that “institutional investors are one of, if not the primary, factors affecting commodities prices today.”<sup>39</sup> Masters noted that “in 2007 Americans consumed 2.22 bushels of wheat per capita,” while the 1.3 billion bushels represented by the 2008 wheat futures contracts stockpiled by “Index Speculators is enough to supply every American citizen with all the bread, pasta and baked goods they can eat for the next two years!”<sup>40</sup> Other analysts categorically denied that speculative investments influenced 2008 prices. For example, one 2008 federal interagency task force stated that “the activity of market participants often described as ‘speculators’ has not resulted in systematic changes in price of the last five and a half years.”<sup>41</sup>

*Fueling Oil Run-Up? Debate centers on investors' rush to cash in on crude*, The Houston Chronicle, May 25, 2008; Steven Mufson, *Skyrocketing Oil Prices Stump Experts*, The Washington Post, May 22, 2008; Lananh Nguyen and Nick Heath, *Crude Logic: Spot-Market Supplies Are Plentiful, But Futures Extend Surge*, The Wall Street Journal, May 21, 2008; Mark Shenk, *Crude Oil Rises Above \$130 as Banks Increase Price Forecasts*, Bloomberg.com, May 21, 2008; Gene Epstein, *Commodities: Who's Behind the Boom?*, Barron's, March 31, 2008.

<sup>38</sup> Diana B. Henriques, *Bills to Rein in Energy Speculators Worry Financial Industry*, The New York Times, July 18, 2008, at p. 1.

<sup>39</sup> Testimony of Michael W. Masters before the Senate Committee on Homeland Security and Governmental Affairs, May 20, 2008, at p. 1 (available at [http://hsgac.senate.gov/public/\\_files/052008Masters.pdf](http://hsgac.senate.gov/public/_files/052008Masters.pdf)). See also Statement of Tom Buis, President, National Farmers Union, Before the House Agriculture Committee, Feb. 3, 2009 (available at [http://nfu.org/wp-content/2-3-09-cftc-regulation-expansion\\_house-ag.pdf](http://nfu.org/wp-content/2-3-09-cftc-regulation-expansion_house-ag.pdf)) (“As speculators created a market bubble and attitude that higher prices were set to stay, crop, livestock and dairy producers locked in higher inputs and feed costs.”).

<sup>40</sup> *Id.*, at p. 2.

<sup>41</sup> Interagency Task Force on Commodity Markets, *Interim Report on Crude Oil*, July 2008, at p. 1. See also, e.g., Merrill Lynch, *Are speculators driving commodity prices higher?*, Global Energy Weekly, June 17, 2008 (“After analyzing the available data in detail, we find no link between spec[ulative] activity and systematic price increases in commodity markets.”).

Still others took a middle position. For example, Professor Christopher L. Gilbert writes, “Because index-based investment is still a relatively recent development, empirical evidence [of price effects] remains sparse.” Gilbert then states:

“The two polar positions on the effects of futures market activity on agricultural prices both appear too simple. On the one hand, the efficient markets view that transactions which do not convey information can have no price impact is contradicted by both market experience and econometric evidence. On the other hand, purely speculative episodes, in which price movements become self-reinforcing, tend to be of short duration. Although discussion tends to focus on speculation, it is investment flows that may have resulted in the most marked effects on food prices. The size of these flows can be large relative to overall market capitalization and liquidity.

In a study that concentrated on agricultural commodities, published just prior to the price collapse near the end of 2008, the U.S. Department of Agriculture's Economic Research Service reported that no single factor, but rather "many factors have contributed to the runup in food commodity prices."<sup>42</sup> USDA provided a long list of those factors, including "increased global demand for biofuels feedstocks"<sup>43</sup> ... adverse weather conditions in 2006 and 2007<sup>44</sup> ... the declining value of the U.S. dollar, rising energy prices, increasing agricultural costs of production, growing foreign exchange holdings by major food-importing countries, and policies adopted recently by some exporting and importing countries to mitigate their own food price inflation."<sup>45</sup> The USDA report also cited a slowdown in growth in agricultural production, the increased difficulty in obtaining water for agricultural uses, rising populations, increased economic growth, and dietary shifts in developing nations, including increased meat consumption resulting in increased demand for grain and protein feeds for livestock, as prime reasons for these price increases.<sup>46</sup>

Since commodity investors tend to look at the likely returns to commodities as a class, and not as likely returns on specific markets, their activities may tend to transmit upward (or downward) movements in one market across the entire range of commodity futures markets. This is likely to have resulted in upward pressure in the less liquid agricultural markets and to increased price correlation across markets. It may also have transmitted upward price movements in energy and metals markets into the agricultural commodities."

Christopher L. Gilbert, Universita Degli Studi Di Trento, Dipartimento Di Economia, *How to Understand High Food Prices*, revision 17 November 2008; available at [http://portale.unitn.it/bpmapp-upload/download/fstore/7f0000016c9f2f72\\_186c6b2\\_11e1bdac6d3\\_765b/23\\_08\\_Gilbert.pdf](http://portale.unitn.it/bpmapp-upload/download/fstore/7f0000016c9f2f72_186c6b2_11e1bdac6d3_765b/23_08_Gilbert.pdf).

<sup>42</sup> Ronald Trostle, USDA Economic Research Service, *Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices* (July 2008, Revised).

<sup>43</sup> The Energy Policy Act of 2005 mandated the use of 7.5 billion gallons of renewable fuel by 2012. Sec. 1501, P.L. 109-58, 119 Stat. 594 (109<sup>th</sup> Cong., 1<sup>st</sup> Sess.). In the Energy Independence and Security Act of 2007, Congress increased the requirement for biofuels to 36 billion gallons by 2022, and specified that 21 billion gallons of this total must be derived from non-cornstarch products, such as sugar or cellulose. P.L. 110-140, 121 Stat. 1492 (2007).

<sup>44</sup> The adverse weather conditions in 2006 included droughts in Russia, Ukraine, Australia, and South Africa. In 2007: Northern Europe experienced a dry spring and harvest-time floods; southeast Europe, northwestern Africa, and Turkey experienced drought; the drought in Russia and Ukraine continued for a second year; it was unusually hot and dry during the growing season in Canada; late freezes significantly reduced the yield of U.S. hard red winter wheat crops and the corn and barley crops in Argentina; and Australia experienced a third year of its worst drought in a century. Trostle, at pp. 20-21.

<sup>45</sup> *Id.*

<sup>46</sup> A recent study by the Farm Foundation identified similar factors. "The real and much more complex answer involves economic growth, international trade, currency markets, oil prices, government policies, and bad weather." Farm Foundation, Issue Report, *What's Driving Food Prices?* (by Philip C. Abbott, Christopher Hurt, Wallace E. Tyler), July 2008, at p. 5. The Farm Foundation listed the following factors as underlying the price increases: growing food demand and dietary transition to more animal protein in developing countries resulting in global consumption increasing faster than production; lower level of investment in agricultural research leading to lower growth in productivity in commodity production; bad

On the question of speculation, the USDA report noted the presence of increasing investments in agricultural commodity markets by hedge funds, commodity index funds, and others. The report observed that these speculative investments had constituted an increasing share of agricultural futures contracts and might have increased short-term price volatility, but stopped short of reaching any conclusion about the extent to which speculation contributed to the 2008 rise and fall in commodity prices. The USDA report stated:

“The funds held an increasingly large percentage of open interest in the futures market for agricultural commodities, as well as of nonagricultural commodities such as metals and energy. These investors only had a financial interest in the markets and did not intend to take delivery of the agricultural commodities. Indeed, it is likely that in general, neither the investors nor the financial managers that directed the funds’ investments knew much about the fundamentals of agricultural commodity markets. It is unclear to what extent the effect of these new investor interests had on prices and the underlying supply and demand relationships for agricultural products. However, computerized trend-following trading practices employed by many of these funds may have increased the short-term volatility of agricultural prices.”<sup>47</sup>

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weather and crop disease issues in 2006-2007; increasing mandates and subsidies for biofuels; depreciation of the dollar relative to the Euro and other world currencies; increases in the price of crude oil; and other production cost increases. *Id.*, at p. 48-9.

<sup>47</sup> Trostle, at p. 20. Like the USDA, the Farm Foundation identified increased speculation as a possible cause, but declined to draw any conclusions: “There is no doubt that the amount of hedge fund and other new monies in the commodity markets has mushroomed. Price volatility has increased, partly due to increased trading volumes. Based on existing research, it is impossible to say whether price levels have been influenced by speculative activity.” *Id.*, at p. 20. Generally, there have always been substantial analytical challenges using the available market data in attempting to determine the effects of different levels of speculation on commodity prices. In its report, *The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat*, the Subcommittee found that the recent influx of billions of dollars into hedge funds, index funds, and other commodity investments had indeed contributed to rising energy prices, but also “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.” Staff Report by the Permanent Subcommittee on Investigations, S. Prt. No. 109-65, 109<sup>th</sup> Cong., 2<sup>nd</sup> Sess. (June 27, 2006). “It is likely that economists will continue to search for direct links between imbalances in hedging needs, speculative positions, and speculative returns. The intuitive appeal of the connection is almost inviolate although the empirical evidence is at best mixed.” Peck, *Futures Markets: Their Economic Role*, at p. 28. In 1941, G. Wright Hoffman, consulting economist to the USDA’s Commodity Exchange Authority (predecessor to the CFTC), wrote of the difficulty in measuring the effect of speculation on grain prices: “It is extremely difficult to measure with accuracy the relative importance of underlying trade facts as price determinants; because of this fact, it is equally difficult to measure precisely the importance of those forces which are generated largely within the market.” G. Wright Hoffman, U.S. Department of Agriculture, Technical Bulletin No. 747, *Grain Prices and the Futures Market: A 15-year Survey, 1923-1938* (January 1941), at p. 9.

In September 2008, in response to mounting concerns that speculators were pushing up commodity prices to levels that had no relationship to supply or demand for the commodities involved, the U.S. House of Representatives passed legislation to impose more stringent limits on speculation in the commodity markets.<sup>48</sup> Among other provisions, the bill directed the CFTC to establish position limits for all commodities traded on CFTC-regulated futures exchanges, and authorized the CFTC to impose such limits on over-the-counter commodity transactions. While the House-passed bill was not taken up in the Senate, ten other bills were introduced by more than 30 Senators to stop excessive speculation in the commodity markets.<sup>49</sup>

## **2. Effects of Commodity Price Spikes on Farmers and Grain Elevators**

Much of the reason for Congressional attention to the commodity markets is the dramatic impact that commodity price increases have on the U.S. economy. The steep rise and sudden collapse in grain prices, for example, severely strained farmers and other participants in the grain industry. In particular, the increase in crude oil prices, which peaked at a record-high of \$147 per barrel in July 2008, pushed up the price of other refined products like gasoline and diesel fuel to record highs, and contributed to increased prices for natural gas and fertilizer. Record-high fuel and fertilizer prices significantly increased the costs of farmers growing grain, the farmers and grain merchants transporting grain crops to markets, the processors of these crops, and, ultimately, the consumers of those crops and the foods produced from them.

At some points during 2008, grain prices rose to record highs, but farmers and grain merchants often were unable to realize the benefits of those higher prices. In March 2009, for example, the USDA reported that although U.S. wheat prices had remained high by historical standards, high farming costs, particularly for energy and fertilizer, had “offset this unprecedented runup in wheat prices for producers.”<sup>50</sup> Moreover, in some instances prices fell sharply before the affected crops could be sold or hedges locked in. In other instances, rising prices led to higher margin calls and cash outlays for farmers, grain elevators, and grain merchants who had sold futures to hedge their cash crops.

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<sup>48</sup> H.R. 6604 (Sept. 22, 2008).

<sup>49</sup> S. 3122 (Cantwell, Snowe); S. 3130 (Durbin, Reid, Levin, Bingaman, Dorgan, Feinstein, Klobuchar, Menendez, Brown, Casey, Kerry, Leahy, Murray, Mikulski, Obama, Reed); S. 3131 (Feinstein, Stevens); S. 3134 (Nelson-FL); S. 3183 (Dorgan, Nelson-FL, Carper); S. 3185 (Cantwell, Whitehouse, Sanders, Kerry, Wyden, Nelson-FL); S. 3248 (Lieberman, Collins, Cantwell); S. 3255 (Levin, Feinstein); S. 3268 (Reid, Durbin, Dorgan, Murray, Schumer, Casey, Mikulski, Carper, Klobuchar, Brown, Cardin, Leahy, Menendez, Reid, Lautenberg, Wyden, Johnson, Dodd); S. 3577 (Levin, Bingaman, Harkin).

<sup>50</sup> Mir Ali and Gary Vocke, *Consequences of Higher Input Costs and Wheat Prices for U.S. Wheat Producers*, USDA Economic Research Service, March 2009, at p. 2.

The National Farmers Union described the financial impact upon many farmers:

“As speculators created a market bubble and attitude that higher prices were set to stay, crop, livestock and dairy producers locked in higher inputs and feed costs. The false signals were not reserved for agricultural producers, but extended beyond production agriculture to the ethanol and biodiesel industries and input suppliers, all locking in higher feedstocks and supplies. The 2008 economic collapse and bursting of [the] bubble have jeopardized the economic livelihoods of all these players, which will ripple throughout our rural communities. . . .

“As you can imagine, it was very frustrating for farmers who were paying record amounts for inputs, but could not implement effective marketing plans or strategies to take advantage of the higher prices for their crops.”<sup>51</sup>

The general increase in commodity prices also severely impaired the ability of many grain elevators to buy and sell grain. Elevators are a critical link in the marketing chain for wheat and other grains. A publication by the Federal Reserve Bank of Kansas City explains:

“Since their emergence in the mid-1800s, grain elevators have earned income by collecting, storing, and readying grain for transportation. Smaller, country grain elevators collect grain from farmers, hold it in storage, and coordinate transportation to final end users or larger terminal elevators, which coordinate larger shipments to other domestic or international users. The grain held in storage is either owned by the elevator or by the farmers, who pay storage fees.”<sup>52</sup>

Grain elevators usually purchase grain from farmers with cash purchases or forward contracts which set a specified date in the future for the delivery of the commodity.

“In a forward contract, an elevator agrees to purchase a quantity of grain from a farmer at a specified quality or grade to be delivered on a future date at an agreed-on price. Forward contracts are typically consummated pre-harvest, allowing farmers to guarantee a crop price and eliminate the risk of falling crop prices as harvest approaches.”<sup>53</sup>

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<sup>51</sup> Testimony of Tom Buis, National Farmers Union, Before the U.S. House of Representatives Agriculture Committee, Feb. 3, 2009.

<sup>52</sup> Jason Henderson & Nancy Fitzgerald, *Can Grain Elevators Survive Record Crop Prices?*, The Main Street Economist, Federal Reserve Bank of Kansas City, Vol. iii, Issue III (2008). “According to the 2002 Economic Census, grain elevators operated in almost 6,000 locations and employed over 61,000 workers. Grain elevators generated almost \$90 billion in sales and revenue.” *Id.*

<sup>53</sup> *Id.*

Many grain elevators, particularly co-operatives owned by farmers, also sell seed, fertilizer and other items that farmers need.

In order to protect themselves from the risk of falling crop prices, elevators usually hedge their cash or forward purchases by entering into futures contracts on the futures exchanges to sell the grain at a price they expect will cover their expenses. Grain elevators that possess grain in storage are said to be “long” in the cash market; when they enter into futures contracts to sell that grain in a future month, they are said to be “short” in the futures market. Once the purchase of a cash crop is hedged with a futures contract, any decline in the value of the crop in the cash market should be offset with a gain in the futures market.<sup>54</sup>

Even if an elevator is completely hedged—so that the elevator will have “locked in” a gain regardless of the direction of the market—a steeply rising market can impose significant additional costs upon the elevator operator. In a rising market, grain elevators and merchants that have hedged by selling futures may be subject to margin calls from the exchanges to cover the loss in value of their “short” positions. These margin calls, which are made at the end of each trading day, require payments by the grain elevator or other party to the futures exchanges into a margin account. The amounts in the margin account are not recovered by the elevator until the short position is closed out—in this case, until the elevator sells its grain and terminates the hedge. If a grain elevator cannot make the requisite margin payments, the exchange will close out its position at the current market price, possibly causing further losses.

In 2008, rising grain prices in the cash markets, together with rising margin calls, required many grain elevators to make much larger cash outlays than normal. The National Grain and Feed Association estimated that a typical grain elevator faced a 300% increase in hedging costs in 2008, compared to 2006.<sup>55</sup> It stated that “recent commodity price increases have led to unprecedented borrowing by elevators—and unprecedented lending by their bankers—to finance inventory and maintain hedge margins.”<sup>56</sup>

According to the Federal Reserve Bank of Kansas City, in the first quarter of 2008, the Farm Credit System “raised \$10 billion in funds through the sale of debt

<sup>54</sup> At the same time, any gain in the cash market due to an appreciation in the price of the commodity in the cash market should be offset by a loss in the futures market. That is why a hedging strategy prevents gains as well as losses due to changes in the value of the commodity and should leave the hedged party indifferent to price changes. Hedging is more fully described in Section III of this Report.

<sup>55</sup> National Grain and Feed Association, *Effects of a Changed Marketplace on Elevators, Producers* (document provided to the Subcommittee).

<sup>56</sup> *Id.*

securities to meet increasing demand from elevators and other processing and marketing entities.”<sup>57</sup> In April 2008, the Federal Reserve Bank of Kansas City reported that nearly one-quarter of all grain elevators it surveyed were struggling to acquire the cash needed to manage margin calls; about 40 percent stated they had “enough cash to just manage current margin calls.”<sup>58</sup>

Another factor compounding the financial difficulties of farmers, grain elevators, grain merchants, and producers during much of 2008 was the large difference between the price of wheat on the futures market and the price of wheat in the cash market. For much of the year, futures prices for wheat were significantly higher than prices in the cash market—up to \$2 per bushel more. During the seven-month period from May through December when the price of wheat in the cash market ranged from \$3.12 to \$7.31 per bushel, the price of wheat ranged from \$4.57 to \$9.24 in the futures market.<sup>59</sup> Hence, when farmers and elevators actually sold their wheat in the cash market, they actually received up to \$2 per bushel less than they had initially expected based upon the prices in the futures market.<sup>60</sup> As explained in the following sections of this Report, the persistence of this large price difference between the futures price and the cash price has seriously impaired the basic function and purpose of the futures markets, which is to provide a means for commodity producers, marketers, and consumers to manage their price risks.

In January 2008, the National Grain and Feed Association reported on the dire consequences throughout the grain marketing system from the failure of the futures markets to provide reliable hedging of future crop prices:

“As banks have begun to question hedging performance in futures positions, borrowing lines have been stretched to the limit or beyond. Banks are beginning to restrict financing to some companies. Elevators and other grain buyers have been forced by market conditions to liquidate inventories. Cash basis levels [the difference between the futures and cash prices] are widening in reflection of much higher financing costs that now are being forced into the system—if, indeed, financing remains available

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<sup>57</sup> *Can Grain Elevators Survive Record Crop Prices?*, at p. 4.

<sup>58</sup> Esther George, Senior Vice President, Supervision and Risk Management, Federal Reserve Bank of Kansas City, *Remarks for CFTC Public Meeting on April 22, 2008*. One bank reported to the Federal Reserve that the line of credit to one elevator had risen from \$7 million to \$57 million and required the participation of three banks. *Can Grain Elevators Survive Record Crop Prices?*, at p. 3.

<sup>59</sup> Cash market prices are based upon the MGEX index price.

<sup>60</sup> As explained in the Section III, this loss to the farmers and elevators was due to the large difference between the futures and cash prices (basis) together with the lack of convergence between the cash and futures prices as the futures contracts expired.

at all. In some cases companies have eliminated deferred cash bids altogether.”<sup>61</sup>

The National Grain and Feed Association attributed the large differences between the futures prices and the cash prices for grain, in part, to the influx of futures purchases being made by commodity index investors and other speculators. “We also believe that the poor market performance we are experiencing is influenced by new investors targeting agriculture with the aid of the hedge exemption.”<sup>62</sup> Similarly, the American Bakers Association informed the CFTC of its concern that, as a result of increasing commodity index trading, “the commodity exchanges have moved away from their original intent—to allow producers to sell their product in a transparent, regulated manner to physical users of the commodity.”<sup>63</sup> One grain market analyst likened commodity index trading to a “900-pound gorilla” in the commodity futures markets: “A 900-pound gorilla doesn’t intend to level things in its path, but that may be the result simply due to its sheer size.”<sup>64</sup>

The cash flow problems of many grain elevators directly affected many farmers. As grain elevators struggled to find cash to meet margin calls, they began to reduce their cash purchases, pull back on the forward contracts offered to farmers, and lower the prices offered to farmers for their crops. The National Association of Wheat Growers reported in April 2008:

“The result of financial pressure on country elevators can be withdrawal of bids (no local market for cash grain), withdrawal of forward pricing opportunities (because the elevators can’t hedge those forward prices) and wider basis levels. Basis levels have increased by more than 50 cents in recent weeks because of the increased cost and risk being borne by grain merchants as well as a perception that the futures price was in some cases overinflated.”<sup>65</sup>

The Federal Reserve Bank reported that as a result of increased margin calls and constrained credit lines, “some grain elevators have limited (and in some cases eliminated) their offerings of forward, basis and other contracts to limit further strains on

<sup>61</sup> Letter from Rod Clark, Chair, Risk Management Committee, to Mr. David Stawick, Secretary, Commodity Futures Trading Commission, January 21, 2008.

<sup>62</sup> *Id.*

<sup>63</sup> Letter from American Bakers Association to The Honorable Walt Lukken, Chair, Commodity Futures Trading Commission, May 7, 2008.

<sup>64</sup> Diana Klemme, *When Gorillas Migrate*, feedandgrain.com, July 8, 2008, at <http://www.feedandgrain.com>.

<sup>65</sup> National Association of Wheat Growers, NAWG Comments on Futures Markets, Prepared for Commodity Markets Council forum, April 3, 2008 and CFTC forum, April 22, 2008.

cash flows.”<sup>66</sup> The Federal Reserve Bank also reported that some elevators had begun to require farmers to pre-pay for seed and fertilizer.<sup>67</sup>

Farmers who used the futures markets themselves to hedge the sales of their crops were subject to the same financial stresses as the elevators.<sup>68</sup> “If you’ve got 50,000 bushels hedged and the market moves up 20 cents, that would be a \$10,000 day,” one farmer observed. “If you only had \$10,000 in your margin account, you’d have to sit down and write a check. You can see \$10,000 disappear overnight. . . . Everybody has a story about a guy they know getting blown out of his hedge.”<sup>69</sup> “This is something the farmer didn’t have to worry about before,” a broker noted. “It’s a cruel and unforgiving system.”<sup>70</sup>

The following sections of this Report examine the interaction of the cash and futures markets that contributed to this financial turmoil, the role of speculation through commodity index trading that has helped disrupt the functioning of these markets, and how regulatory actions to date have contributed to these market problems.

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<sup>66</sup> *Id.*

<sup>67</sup> *Can Grain Elevators Survive Record Crop Prices?*, at p. 3.

<sup>68</sup> Several recent estimates indicate that a relatively small percentage of farmers directly use the futures markets for hedging. Instead, most farmers rely upon grain elevators and other grain buyers to obtain forward contracts for their crops. The National Corn Growers Association recently stated: “By one estimate, probably less than 10 percent of farmers are directly using the futures market for risk management.” Statement of Garry Niemeyer, National Corn Growers Association, Agricultural Markets Roundtable, Commodity Futures Trading Commission, April 22, 2008. Another article reported: “in a sample of Kansas producers . . . only 11% hedged any of their grain using futures. [Several studies] consistently showed that more producers used forward contracts than used futures hedges. These studies showed that 42-74% of producers used forward contracts to price any of their grain.” Darrell R. Mark, B. Wade Brorsen, Kim B. Anderson and Rebecca M. Small, *Price Risk Management Alternatives for Farmers in the Absence of Forward Contracts with Grain Merchants*, Choices, 2<sup>nd</sup> Quarter 2008. Grain industry participants interviewed by the Subcommittee generally concurred with these statistics. The Mark-Brorsen article, written in mid-2008, also stated: “At the same time when farmers have a greater demand for cash forward contracts, grain merchants and elevator operators now have limited capacity to offer these contracts. The extra costs associated with margin accounts and extra working capital have been reflected in lower forward basis bids for corn, soybeans, and wheat in many Midwest and Corn Belt states.” *Id.*

<sup>69</sup> Diana B. Henriques, *Price Volatility Adds to Worry on U.S. Farms*, The New York Times, April 22, 2008.

<sup>70</sup> *Id.*

*During the seven years of plenty the land brought forth abundantly. . . . Thus Joseph stored up grain in great abundance like the sand of the sea, until he stopped measuring it, for it was beyond measure.*

--Genesis 41: 47-9

### **III. HEDGING AND SPECULATION IN THE FUTURES MARKETS**

Wheat farmers, grain merchants, millers, commercial wheat users, speculators, and others use a variety of trading strategies in both the cash and futures markets for wheat to deal with changing prices in these markets. To understand some of these basic strategies and the breakdown in the relationship between these two markets over the past several years, this section provides additional information about the purposes of commodity futures markets, the meaning of certain market terms, and the role of CFTC position limits and exemptions. It discusses in particular the risk management and price discovery functions of the commodity markets, the concepts of hedging versus speculation, the importance of price convergence between the cash and futures markets, and key terms such as basis, price spreads, and carry. This section also discusses the development and application of CFTC position limits on agricultural commodity trades and the hedging exemption that allows some market participants to exceed those limits.

#### **A. Purposes of the Futures Market**

U.S. commodity futures markets developed in the mid-nineteenth century to meet the commercial needs of expanding U.S. grain markets. As local grain markets supplied wheat and other grains across the nation and then around the world through improved transportation and technology, grain merchants relied increasingly on forward contracts to manage price risks and sell grain across ever-increasing distances and periods of time.

Forward contracts, like spot or cash transactions, typically call for delivery of a specified quantity and quality of a commodity at a particular time and place, and at an agreed-upon price. Forward contracts can call for any amount or type of grain to be delivered at any time or location. Particularized forward contracts are, however, relatively illiquid, meaning they cannot be easily traded to other parties who may not want delivery at the specified amount, time and place.

Futures contracts developed as essentially standardized forward contracts. A noted expert on commodity markets, Professor Anne Peck, explained: “Futures contracts are standardized forward contracts, and futures markets are organized trading of those contracts.”<sup>71</sup> Futures contracts offer a standard quantity and quality of a commodity for

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<sup>71</sup> Peck, *The Economic Role of Traditional Commodity Futures Markets*, at p. 11.

delivery at a standard time and location. The only variable to be negotiated in a standardized futures contract is price. Standardized futures contracts are therefore of broader utility than forward contracts, and the market for these contracts is more liquid, meaning that it is easier to find a counterparty with which to trade.

The ultimate purpose of commodity markets is to help buyers and sellers price their goods efficiently and manage risks associated with price changes. Professor Hieronymus put it this way:

“The basic impetus for futures markets related to inventory risks, and financing and pricing problems. As commerce developed and required the accumulation of inventories, particularly of seasonally produced crops, merchants and processors found themselves with problems that were best managed by forward contracting. This forward contracting developed into standardized procedures that were eventually codified and formalized into futures trading.”<sup>72</sup>

One key problem in the commodity futures markets is that typically there are an insufficient number of purchasers of a commodity who have the need and ability to trade futures contracts to match the number of sellers of futures contracts in the futures market. The ultimate purchasers of a commodity are often smaller in size, need smaller quantities of the commodity, and have less capital than the producers of the commodity. Smaller end-users often do not have a sufficient need or the resources to participate in the futures markets. For example, while oil companies that refine gasoline trade on the futures markets to hedge their sales of gasoline, it would be prohibitively expensive for the average driver to use the futures market to hedge his or her weekly purchases at the pump.<sup>73</sup>

To make up for the shortage of purchasers, commodity markets rely on other types of participants in the market—namely, speculators—to provide a sufficient number of counterparties to the physical producers, processors, and merchants in the market. The typical definition of a speculator is a market participant who does not produce, use or

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<sup>72</sup> Hieronymus, at p. 93.

<sup>73</sup> The standard futures contract for gasoline calls for delivery of 42,000 gallons of gasoline. For a car that gets 24 miles per gallon, this would be a sufficient amount of gasoline to drive about 1 million miles. Presently, the margin deposit required for a typical consumer to purchase a single futures contract would be about \$9,400.

consume the commodity in its ordinary course of business, but rather enters the futures market solely to profit from changes in commodity prices.<sup>74</sup>

Although buying and selling futures contracts by speculators is often essential to provide sufficient liquidity to a futures market, the participation of these speculators does not change the fundamental nature or purpose of these markets, which is to enable the producers, merchants, and users of the commodity to price the commodity efficiently and manage their price risks over time. The ability and willingness of the physical producers, merchants, and end-users of a commodity to use the futures market to establish prices and manage their price risks is a prerequisite for the participation of speculators.

The history of the commodity futures markets demonstrates that futures markets cannot exist if they do not accomplish their intended purpose of enabling the producers, merchants, and end-users of a commodity to establish prices and effectively manage their price risks. Holbrook Working, one of the pioneers in the field of the economics of the futures markets, observed: “A futures market [can] succeed only to the degree that it [can] attract business from handlers of the commodity.”<sup>75</sup> There are many examples of markets that lost liquidity and went out of existence because the producers and end-users of the commodity lost confidence in the ability of the market to help them price their goods and manage risk.<sup>76</sup> In a 1980 study, commodities expert Professor Peck summarized the contemporary importance of the futures markets to setting prices in the cash markets for agricultural commodities:

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<sup>74</sup> The CFTC defines the term “speculator” as “one who does not produce or use a commodity, but risks his or her own capital trading futures in that commodity in hopes of making a profit on price changes.” CFTC, *The Economic Purpose of Futures Markets and How They Work* (CFTC website).

<sup>75</sup> Holbrook Working, *Economic Functions of Futures Markets*, reprinted in Selected Writings of Holbrook Working (Chicago Board of Trade, 1985), at p. 274.

<sup>76</sup> The demise of the futures market for Maine potatoes is the classic example of this proposition. Another example is the futures market for onions, which Congress prohibited by legislation in 1958, at the request of the onion growers. Following an outcry from onion farmers that the “the gyrations of the futures market” were unreasonably affecting the cash price for onions, the Congress first attempted to subject the onion futures market to regulation under the Commodity Exchange Act. *Prohibiting Futures Trading in Onions*, H.R. Rep. No. 1036, 85<sup>th</sup> Cong., 1<sup>st</sup> Sess (1957). When that failed to stop the price fluctuations, Congress completely prohibited onion futures. The Senate report on the bill to prohibit the trading of onion futures declared: “It now appears that 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.” *Prohibiting Futures Trading in Onions*, S. Rep. No. 1631, 85<sup>th</sup> Cong., 2d Sess. (1958). The futures markets for cured pork, durum wheat, and eggs are additional examples. See Holbrook Working, *Speculation on Hedging Markets*, Food Research Institute Studies, Stanford University, Vol I., No. 2 (May, 1960) (available in [farmdoc](#) archives); Holbrook Working, *Economic Functions of Futures Markets*, reprinted in Selected Writings of Holbrook Working (Chicago Board of Trade, 1985), at pp. 267-9; Diane S. Miracle, *The Egg Futures Market: 1940 to 1966*, Food Research Institute Studies, Stanford University (1972) (available in [farmdoc](#) archives).

“Futures markets in agricultural and metals products have become the primary markets determining underlying values, and all other transactions, spot and forward, are priced in relation to these prices with due allowance for time, place, and quality differences. Both spot and forward market transactions remain important since they are the primary means by which commodity ownership is actually transferred. These transactions are not made independently of market prices, however, and futures positions are often necessary components of the total transactions.”<sup>77</sup>

Professor Peck also described managing price risk as the central function of the futures markets:

“Futures markets are hedging markets. Their use reflects the commercial needs of firms simultaneously operating in the cash markets. Speculation is required on futures markets as a response to commercial needs and can be best understood as offsetting both the long and the short hedging positions of commercials, not their net positions. Measures of minimum speculative needs on a market ought to reflect total hedging requirements of the commercial users of that market.”<sup>78</sup>

In drafting the Commodity Exchange Act, Congress established a regulatory framework which reflects the principle that the primary purposes of a commodities futures market are to enable market participants to manage and assume price risks and to discover and establish prices for commodities traded on the market. Section 3 of the Commodity Exchange Act states:

“The transactions subject to this Act are entered into regularly in interstate and international commerce and are affected with a national public interest by providing a means for managing and assuming price risks, discovering prices, or disseminating pricing information through trading in liquid, fair and financially secure trading facilities.”<sup>79</sup>

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<sup>77</sup> Peck, *The Economic Role of Traditional Futures Markets*, at p. 13.

<sup>78</sup> Peck, *The Influence of Hedging on Futures Markets Activity: Some Further Evidence*, Stanford University (1980), at p. 19 (available in [farmdoc](#) archives). In arriving at this conclusion, Peck referenced similar findings of previous research done by Hoffman, Working, Sandor, and others, and examined more recent data (from 1972-77) from the wheat, corn, soybean, potato, live cattle, pork belly, T-bill, and GNMA markets. Working comments: “One can imagine existence of futures trading purely on the basis of desire of people to speculate; but apparently futures trading cannot long persist except on the basis of conditions that create speculative risks which somebody must carry, and which some people are led to transfer to others by hedging.” Holbrook Working, *Futures Trading and Hedging*, reprinted in *Selected Writings of Holbrook Working* (Chicago Board of Trade, 1985), at p. 140.

<sup>79</sup> 7 U.S.C. §5 (2006).

## B. Use of Hedging to Manage Risks

### 1. Hedging versus Speculation

“Hedging” is the term used to describe the activity of someone who is using the futures market to manage the price risks associated with the sale, purchase, or use of a commodity. Hedging has sometimes been described as an activity undertaken by the producer, merchant, or end-user of a commodity as opposed to a speculator who does not produce, use, or consume the commodity. Since there are numerous strategies and approaches to managing price risks, however, it often is impossible to distinguish, from an economic perspective, whether a particular transaction is, in fact, hedging or speculation.<sup>80</sup> The line between minimizing risks—which is what the term “hedge” connotes—and maximizing profits—which is what the term “speculation” connotes—can be exceedingly difficult to draw.<sup>81</sup>

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<sup>80</sup> In a recent report, the CFTC stated that the term “speculator” means “a trader who does not hedge, but who trades with the objective of achieving profits through the successful anticipation of outright price movements or through relative price movements in the case of spread trades.” CFTC, *Staff Report on Commodity Swap Dealers & Index Traders with Commission Recommendations*, September 2008, at p. 68. A distinction between hedging and speculating based on trader motive or intent is problematic, however, for several reasons. First, producers, merchants, and end-users of a commodity often use the futures market in a manner similar to many speculators “in hopes of making a profit on price changes.” Hedgers often trade with the “objective of achieving profits through the successful anticipation of . . . relative price movements.” Second, it often is impossible to discern a trader’s intent or motive, which in any event does not alter the economic consequences of the trader’s actions.

Another view is that hedging and speculative transactions are inherently similar: “It is sometimes said that hedging is the opposite of speculation. This is not so. They are different kinds of the same thing. The thing that is usually identified as speculation—that is, long or short positions in futures contracts—is speculation in price level. The thing that we identify as hedging—that is, long cash and short futures or vice versa—is speculation in price relationships. . . . Thus hedging and speculation are not opposite; in fact, they are conceptually similar. They are just different kinds of speculation.” Hieronymus, at p. 151.

<sup>81</sup> Whether or not to initiate a hedge may in fact involve speculation about the future course of the market, and may not, in fact, reduce costs. For example, as oil prices rose over \$100 per barrel during the first half of 2008, oil-consuming businesses were faced with the decision of whether to hedge their future fuel purchases and lock-in record-high prices, or not to hedge, thereby facing the risk that oil prices and fuel costs would continue to rise. In light of the subsequent fall in prices in the latter half of the year, a firm that hedged its future fuel purchase with oil futures that were over \$100 per barrel would have fared much worse than a firm that chose not to hedge and was therefore able to purchase their fuel at much lower costs as oil prices fell.

Furthermore, speculation by hedgers regarding anticipated price levels can have the same effect on market prices as outright speculation by speculators. For example, a large increase in the amount of hedging undertaken by commercial firms to “lock in” the purchase price of a commodity in the belief that prices will increase will have the same effect upon absolute price levels as the purchases of the same number of futures contracts by speculators holding that same belief.

One former trader has described how he and other traders exploited the ambiguity between hedging and speculation to disguise the amount of speculative trading they had undertaken:

“The trading desks took more risk: instead of hedging, they took open positions, hoping to profit from movements in market prices. This risk taking was well disguised initially. We all found the

Although a precise definition of hedging is elusive, one accepted definition is “the purchase or sale of a futures contract by a handler of commodities.”<sup>82</sup> Another widely recognized definition of hedging is “the use of futures contracts as a temporary substitute for a merchandising contract that is to be made later.”<sup>83</sup> Both definitions encompass a variety of risk-management strategies. If the futures market is functioning properly, these hedging strategies can help manage price risks and improve the commercial profitability of the market participants employing them. If the futures market is not functioning properly, then these strategies will be ineffective, commodity producers, merchants, and end users will face increased financial risks, and the futures market will not be able to fulfill one of its primary purposes.

## 2. Example of Hedging: The Grain Elevator

To understand how the futures markets help manage risk and why lack of convergence between the futures and cash markets on prices is important, consider a straightforward example of hedging by a grain elevator.<sup>84</sup>

concept of a ‘hedge’ conveniently ambiguous. Traders would put on a ‘heavy’ hedge (we were overhedged) or a ‘light’ hedge (we were underhedged). As time went on, management and controls caught up. In a belated acknowledgment of the verities of the derivatives business, they put trading limits in place, recognizing that we actually needed to speculate to make budgets. ‘Revenue is enhanced by judicious positioning on the back of natural trading flows,’ is how I put it in a more eloquent moment.”

Satyajit Das, *Trader Guns & Money* (FT Prentice Hall, 2006), at p. 42.

<sup>82</sup> Jeffrey Williams, *The Economic Function of Futures Markets* (Cambridge University Press, 1986), at p. 18. Williams also writes: “Hedging operations, which comprise one transaction in a futures market and a simultaneous transaction in the cash market, are central to futures markets. From the very word itself, it can be seen that hedging is commonly associated with risk aversion. That association, however, results from confusion on the part of observers who have failed to understand the nature of hedging as one of two simultaneous transactions. . . . It is by no means obvious that risk aversion motivates dealers’ hedging operations.” *Id.*, at p. 19.

<sup>83</sup> Working, *Whose Markets? Evidence on Some Aspects of Futures Trading*, at p. 252. In another article, Working states: “[T]he general concept of hedging as taking offsetting risks wholly, or even primarily, for the sake of reducing net risks, serves so badly as applied to most hedging on futures markets that we need another concept for that most common sort of hedging. To put it briefly, we may say that hedging in commodity futures involves the *purchase or sale of futures in conjunction with another commitment, usually in the expectation of a favorable change in the relation between spot and futures prices.*” Working, *Futures Trading and Hedging*, at p. 149 (emphasis in original). Peck comments that, “Working’s summary definition is perhaps as all-encompassing as is possible.” Peck, *The Economic Role of Traditional Futures Markets*, at p. 13. Hieronymus defines hedging more narrowly, but is still consistent with Working’s formulation: “To hedge is to take a position in futures equal and opposite to an existing cash position . . . [and] to insulate one’s business activities from price level speculation while retaining the opportunity to speculate in basis variation. This definition takes hedging out of the context of risk shifting and puts it in the business context of trying to make a profit.” Hieronymus, at p. 150.

<sup>84</sup> Other participants that buy and sell unprocessed or processed grain, such as farmers, grain processors, merchants, and commercial end-users often employ similar strategies to manage their price risks. For the

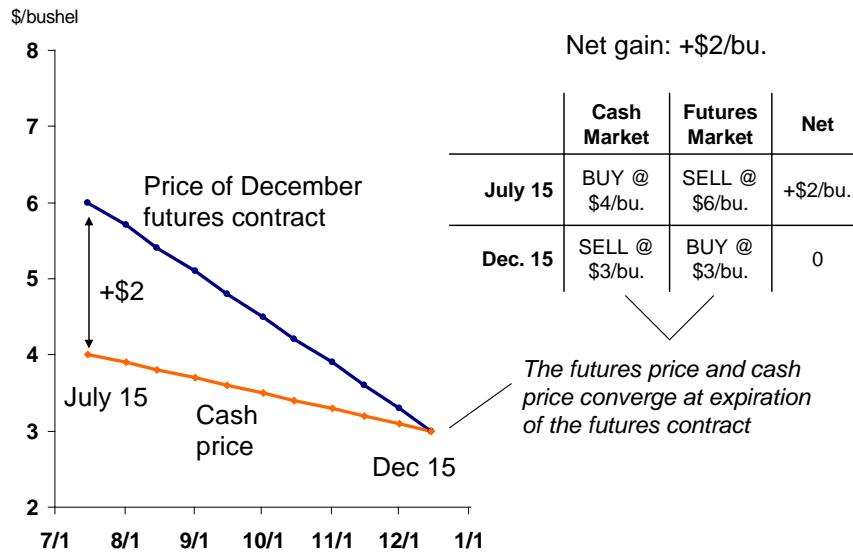
When a grain elevator purchases a crop from a farmer and stores it, that elevator is said to be “long” in that crop in the cash market. Typically, grain elevators are filled shortly after a crop is harvested; the crops in the elevators are then sold throughout the year. Once grain is purchased and loaded into storage in the elevator, the value of the stored grain is fully exposed to the changes in the value of that crop in the cash market. As the price of the crop in the cash market increases, the value of the crop in storage increases, and as the price in the cash market decreases, the value of the crop in storage decreases. In a declining market the elevator could face significant losses.

To protect itself against a potential loss in value of a cash crop in storage prior to the date the crop will actually be sold, the elevator can sell a contract for the future delivery of that commodity on a futures exchange. In determining which futures contract to use, the elevator would typically select the futures contract that calls for delivery of the commodity in the month that is closest to the date on which the elevator anticipates making the actual sale of the stored grain. Rather than waiting for the actual date of sale in the cash market to determine the sales price, by selling a futures contract the elevator would immediately know how much it would receive for the sale of the grain—namely the price of the futures contract it had just sold. By selling a futures contract to deliver the commodity, at a price determined today for delivery at a specified time in the future, the elevator can use the futures market to protect the value of its stored grain. The elevator is then said to be “hedged,” because it has both a long position in the cash market and an equal and opposite “short” position in the futures market.

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sake of simplicity, the example refers solely to a grain elevator and not to other participants in the grain trade.

### Example of a Hedge (With Convergence)



**Figure 17a.** In this example, the futures price and the cash price have converged to exactly the same price.

For example, consider the case of a grain elevator that purchases a crop from a farmer on July 15 for \$4 per bushel, as illustrated in Figure 17a. The grain elevator wants to ensure that the value of its crop in storage will not fall before it sells the wheat in December. The elevator looks up the price of wheat futures on the Chicago exchange and sees there are futures contracts for March, May, September, and December. The price of the December futures contract is currently \$6 per bushel. The grain elevator figures that if it can sell the crop for \$6 per bushel in December, then it will be able to realize a decent profit after subtracting the purchase price of the grain and the costs of storing the grain from July to December. The elevator operator calls a commodities broker (technically, a “futures commission merchant”) and puts in an order to sell December futures at \$6 per bushel. As of July 15, therefore, the elevator has bought grain in the cash market for \$4 per bushel, and sold it in the futures market for \$6 per bushel, for a net gain of \$2 per bushel.

The grain elevator is now hedged, having both a long position in the cash market and a short position in the futures market. Any gain or loss in the elevator’s long position in the cash market from increasing or decreasing prices between July and December should be offset by a loss or gain in the elevator’s short position in the futures market

over that same time period. Thus, the elevator can expect a net gain of \$2 per bushel from its hedging strategy.

Hedging requires two sets of transactions. The first set of transactions is when the commodity is bought and a futures contract is sold. After the first transaction, the elevator's books will reflect that it has acquired grain for \$4 and that it has sold a futures contract for \$6, for a net gain of \$2 per bushel.<sup>85</sup> The second set of transactions is just the opposite of the first set of transactions: the commodity is sold and a futures contract is bought. After these two sets of opposite transactions, the grain elevator will have bought and sold both the grain and the futures contracts used to hedge that grain. The success of the hedging strategy can be determined only after both sets of transactions are completed—the grain has been bought and sold and the elevator no longer has any outstanding futures contracts.

The futures contract that the elevator sold in July requires grain to be delivered to an approved warehouse in December. The elevator, however, would prefer to sell its grain to a local elevator rather than incur the expense of shipping the grain to an approved warehouse. The purpose of its obtaining the futures contract was not to make an actual grain delivery in Chicago or Toledo in December, but to help the elevator manage its price risk. Accordingly, in December, the grain elevator will act to “unwind” the hedge it initiated in July.

To unwind its hedge, the elevator needs to buy a futures contract obligating it to take delivery of the same amount of wheat in December that its earlier futures contract obligated it to deliver in December. The December obligation to take delivery of the wheat would then cancel out its earlier obligation to make delivery of the wheat; since the two obligations would cancel each other out, the elevator would no longer have any obligations in the futures market.

In the example depicted in Figure 17a, the price of a futures contract for December delivery is \$3 per bushel. To unwind the hedge, therefore, the elevator would buy a futures contract for \$3 per bushel. Its delivery obligations to make and take delivery would cancel out, and the elevator would be left with a \$3 gain in the futures market—in July it had sold a December futures contract for \$6 and in December it purchased a December futures contract for \$3.

At the same time, the elevator would sell the grain in the local cash market for \$3 per bushel. Overall, in the cash market the elevator would have lost \$1 per bushel—it

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<sup>85</sup> Although the grain elevator will have to make an immediate outlay of \$4 in the cash market to obtain the grain, it will not receive anything from the sale of its futures contract until it closes out this contract on the futures exchange in December. In the interim, the net gain or loss from the sale of outstanding futures contract, using a daily mark-to-market accounting, remains within the margin account of the elevator on the exchange.

had bought the grain for \$4 in July and then sold it for \$3 in December. Since it gained \$3 in the futures market, however, the grain elevator's hedge resulted in a total gain of \$2 per bushel—the same net gain that it sought to obtain when it initiated the hedge in July.

As this example shows, the convergence of the wheat futures and cash prices in December is critical to the success of the elevator's hedging strategy.<sup>86</sup> Because the cash and futures prices were equal at contract expiration in December, in December it cost the elevator the same amount to "buy back" the futures contract as it received from selling its grain in the cash market. That meant the two transactions in December to unwind the hedge – the \$3 per bushel transaction in the futures market and the \$3 per bushel transaction in the cash market – resulted in no additional gain or loss, leaving the elevator with the same \$2 per bushel gain on its wheat that it had sought to obtain in July when it initiated the hedge. In this manner, the elevator's hedging strategy produced a net gain exactly equal to the amount that the elevator planned for when it initiated the hedge back in July.<sup>87</sup>

By simultaneously taking equal and opposite positions in the cash and futures markets, the grain elevator's aim is to protect itself against fluctuations in the absolute price of wheat in the cash market. Instead of being exposed to the risk of price changes in the cash market, the grain elevator would then be subject only to the relative changes between the price in the cash market and the price in the futures market.<sup>88</sup>

<sup>86</sup> In an actual futures market that is functioning properly, due to transaction costs the cash price usually varies from the futures price by a few cents at contract expiration, which would add to or reduce the return to the hedger by that amount. Additionally, the costs of storing and insuring the grain between the time the crop is purchased in the cash market and it is sold in the cash market would reduce the elevator's total return, as would the foregone interest on the cash used to purchase the crop. To the extent that the cash sale occurred in a different location from the contract delivery point, the difference in the cash price between the point of sale and the delivery point would also either reduce (or enhance) the net return.

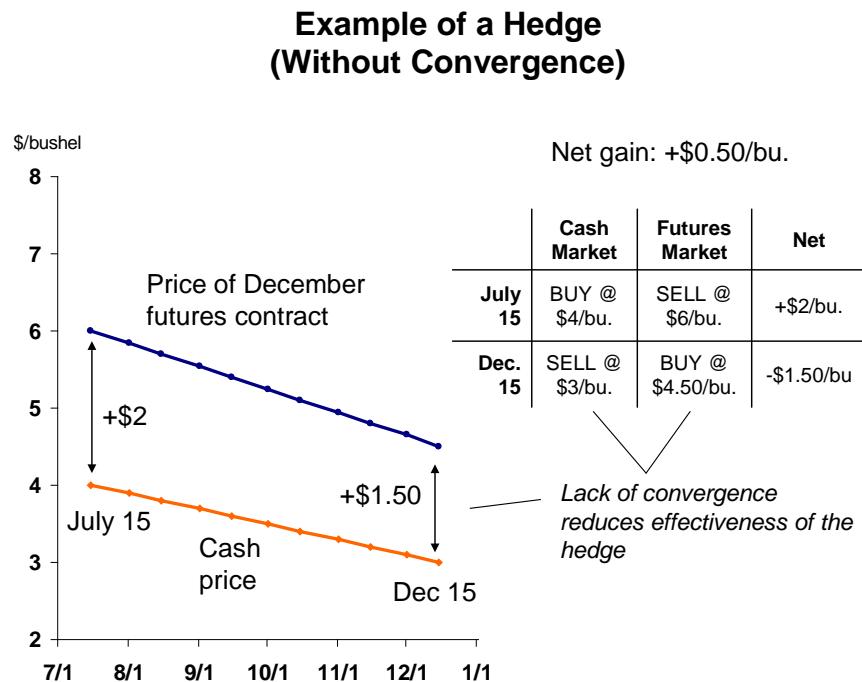
<sup>87</sup> In commercial reality, the dates on which grain elevators actually sell or deliver grain in the cash market rarely match up exactly with the expiration dates of futures contracts. Typically, an elevator sells grain on many dates to merchants or processors who have a continuing need for delivery of grain. These merchants or processors will not want the grain to be delivered at the standard time and place specified in a standardized futures contract, such as a December delivery of 5,000 bushels of soft red winter wheat to an approved warehouse in Chicago. The grain merchant will instead specify a delivery date and location dictated by its commercial needs, such as delivery of the wheat on a specific date to a specific mill. This commercial reality means that a grain elevator typically purchases multiple futures contracts to match its hedging needs, and that it will typically need to unwind one or more of its hedges at some time prior to the actual expiration of the relevant futures contracts.

<sup>88</sup> As explained below, this type exposure to price risk is termed "basis risk." This hedging strategy can be used even if the producer, merchant, or end user of a commodity has not yet acquired the commodity. A producer, merchant, or end user may, for example, initiate a hedge by selling a futures contract in the futures market prior to buying the commodity. In this instance, the sale of the futures contract is called an "anticipatory hedge." "[T]he anticipatory hedge serves as a temporary substitute for a merchandising contract that will be made later. In the one case it serves as a substitute for immediate purchase of the raw material on a merchandising contract; in the other case it serves as a substitute for a forward sale of the

### 3. Importance of Convergence for Hedging

The hedging strategy just described is effective only when the futures price and the cash price converge to approximately the same amount as the futures contract approaches expiration. If the futures price and the cash price are not approximately equal at the time the elevator sells the cash commodity and buys back its futures contract, the elevator's hedging strategy will not be fully effective, and the elevator would still be exposed to some risk. For example, if the futures price is higher than the cash price, the elevator will lose money in the second set of transactions, since it will pay more to buy back the futures contract than it will realize from selling the cash contract.

Figure 17b shows how the lack of price convergence at contract expiration reduces the effectiveness of hedging.



**Figure 17b.** In this example, there is a lack of convergence at contract expiration. A lack of convergence reduces the effectiveness of the hedge.

Figure 17b differs from Figure 17a in that the price of the December futures contract does not converge to the price of the commodity in the cash market. Instead, the

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specific goods that are in course of production.” Working, *New Concepts Concerning Futures Markets and Prices*, at p. 252. See also Peck, *The Economic Role of Traditional Futures Markets*, at pp. 19-21.

futures price remains above the cash price. When the December contract expires, the final futures settlement price is \$4.50, rather than the \$3 in the cash market. As in Figure 17a, when the hedge was initiated in Figure 17b, the grain elevator anticipated receiving a \$2 per bushel gain. However, unlike in Figure 17a, where the cash price and the futures price converged at contract expiration, in Figure 17b it costs the elevator \$4.50 to buy back the futures contract it had sold, while at the same time receiving \$3 in the cash market for the grain it is selling. The result is that, in the second example, the elevator loses \$1.50 per bushel on the second pair of transactions in the cash and futures market to “unwind” the hedge. Subtracting the \$1.50 loss from the \$2 initial gain results in a net gain of only 50 cents for the grain elevator.

In this example, although the futures price and the cash price both fell over the life of the hedge, the hedge failed fully to protect the grain elevator from price risk, failing to do so precisely by the amount of the lack of price convergence. In the real world, the expenses of storage (about 5 cents per bushel per month) and insurance for the grain would have further reduced the elevator’s profits. In this example, the lack of convergence would likely have taken away much of the elevator’s expected profit.

The ability to successfully hedge against price risk, therefore, depends upon the convergence of the cash price and the futures price as a contract approaches expiration. If these two markets converge, then farmers, elevators, and other hedgers can reliably anticipate their net gains (or losses) at the time they initiate a hedge. But if the two markets do not converge in a predictable manner, then hedgers are unable to anticipate their net gains or losses from the hedging strategy and lose the ability to protect themselves from price fluctuations.

In theory, the futures price and cash price should always converge at contract expiration, absent minor variations due to different timing and transaction costs in the two markets. In his classic textbook on commodities, Professor Hieronymus offers an explanation of why cash and futures markets should converge:

“The price of the cash commodity and its futures price must be equal in the delivery month. If the futures price were above the cash price, the cash commodity would be bought, the futures sold, and delivery made. If the cash price were above the futures price, users would buy futures and stand for delivery as the cheapest source of supply. Thus, arbitrage in cash and futures markets forces the two prices to be equal.”<sup>89</sup>

The need to provide a simple mechanism to force the cash and futures prices together near the expiration of a futures contract means that workable delivery mechanisms are critical to a well-functioning futures market. While actual deliveries

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<sup>89</sup> Hieronymus, at pp. 152-3.

may be rare under a futures contract, delivery must be feasible and easily executed if necessary to force convergence between the cash and futures prices—“to keep the market honest.”<sup>90</sup> A futures contract “must be so readily deliverable and so easily takable that neither party has reluctance to make or take and, thus, no desire to make or take delivery. Delivery is made and demanded to test markets and to force price relationships into line but the better the contract, the less this occurs.”<sup>91</sup>

Professor Hieronymus also noted, however, that “even the most casual student is aware that cash prices of storable commodities, particularly grains, are nearly always higher than the futures during delivery month. These differences arise out of technical considerations of delivery, are limited in their possible size, and do not violate the principle.”<sup>92</sup> Limited price differences are to be expected, while large discrepancies between the cash price and futures price—a lack of convergence—indicate that the futures market is not functioning properly. Once the price discrepancies are of such magnitude that it is no longer possible to use the futures market to effectively manage price risks in the cash market, the futures market would no longer be performing its primary function. The increasing lack of price convergence over the past few years in the wheat market has caused a great deal of turmoil within the grain industry and has led to several major efforts to determine the cause of the breakdown and proposals for effective solutions.

### C. Key Market Terms

To understand the reasons for the lack of price convergence in the wheat market in recent years, its impact on commodity trading, and the contributing role of speculation, this section provides additional information on key market terms such as basis, price spreads, and carry.

#### 1. Basis

The difference between the cash price of a commodity and the futures price of that same commodity is defined as the “basis.”<sup>93</sup> The basis is expressed mathematically as:

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<sup>90</sup> Hieronymus, at p. 351.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*, at p. 153. These technical considerations include differences in the price time of delivery under the futures contract, the precise quality (several grades may be deliverable), and differing costs associated with the physical delivery of the commodity under different delivery procedures. *Id.*

<sup>93</sup> For a general description of basis, futures trading, and hedging strategy, see CME Group, *Self-Study Guide to Hedging with Grain and Oilseed Futures and Options*. In the Executive Summary and Section V

### Basis = Cash – Futures

At contract expiration, the basis at the contract delivery location should be zero, or close to zero. In other words, the two prices should converge.

In the previous example of a grain elevator's hedging its cash purchase of wheat through the futures market, Figure 17a showed the cash and futures prices of the wheat held by the elevator over a six month period from July to December. At the time the hedge was initiated in July, the cash price was \$4 and the futures price was \$6 for a resulting basis of -\$2 per bushel. This is commonly referred to as the basis being “2 under.” In this example, when the December futures contract expired, the cash price and futures price had converged at \$3, for a resulting basis of zero.

Because both the cash price and the futures prices of a commodity vary with time, the basis varies with time as well. In addition, at any particular time, there may be multiple different cash prices for a commodity, depending upon the precise grade of the commodity, the location of the commodity, and the costs of transporting the commodity to market. The basis will vary, therefore, according to the commodity's attributes and location. At any given time, the same crop could give rise to a variety of basis calculations, depending upon specific variables in the crop and the market where it is to be sold. A buyer or seller of a crop must take into account each of those variables when computing the basis for a particular sale or purchase.

In addition, many crop sales do not take place at exactly the same time as a futures contract expires—in the case of wheat, for example, there are only five contract expiration dates per year. Timing differences mean that, on the date that a grain elevator actually sells a portion of its grain and lifts its hedge, the basis will not be zero, but rather some other value, either positive or negative. In the previous example of a wheat hedge placed by a grain elevator on July 15, when the basis was 2 under, if the subsequent basis at the time the hedge is lifted is positive—meaning the cash price is greater than the futures price—the grain elevator will receive additional gains because the sale of the cash commodity will produce more money than is needed to buy back the futures contract. If the basis is negative at the time the crop is actually sold—meaning the futures price is greater than the cash price—then the grain elevator will lose money, because the sale of the cash commodity will not generate sufficient money to cover the cost of buying back the futures contract. In short, whether the hedging strategy produces gains or losses

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of this Report, basis is calculated as Basis = Futures – Cash in order to give a positive value to the basis, which makes display and interpretation of the trends in basis easier to follow.

depends how the basis has changed from when the hedge was initiated to when it is lifted.<sup>94</sup>

Although the cash price and the futures price generally can be expected to converge as a contract nears expiration, significant variations can and do occur. Crop shortages in the cash market, for example, may suddenly elevate cash prices and cause the basis to rise sharply. In other instances, such as when a future shortage of wheat is expected, the prices in a futures market can rise more rapidly than in the cash market. Price increases in the futures market relative to the cash market will narrow the basis or even produce a negative value, disrupting price convergence at contract expiration. Price volatility in the futures market may also disrupt the normal relationship between the cash and futures markets, thereby causing the basis to become volatile as well.<sup>95</sup>

Traders often measure the effectiveness of hedging strategies by examining the behavior of the basis. If the futures and cash markets behave as predicted—converging at contract expiration with a basis that approaches zero as the contract ends—a straightforward hedging strategy should result in positive returns. If, contrary to expectations, the basis does not behave as predicted, the hedging strategy may result in a loss. The ability to accurately forecast the relationship of the futures and cash prices—the behavior of the basis—is critical to being able to successfully hedge.<sup>96</sup> Professor Hieronymus emphasizes: “[H]edging is not insurance. Hedging is an intricate activity, requiring substantial knowledge and operational skill. . . . The essence of hedging is speculation in basis.”<sup>97</sup>

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<sup>94</sup> More generally, the profitability of a hedge depends upon whether the hedger is “long” the basis (i.e., buying in the cash market and selling futures) or “short” the basis (i.e., selling in the cash market and buying futures) and the subsequent movement of the basis. If a hedger is long the basis and the basis increases (i.e., the cash price increases relative to the futures price), the hedger will gain the amount of the increase in basis. If the hedger is long the basis and the basis narrows (i.e., the cash price decreases relative to the futures price), then the hedger will lose the amount of the decrease in basis. Conversely, if a hedger is short the basis and the basis increases, then the hedger will lose the amount of the increase in basis, and if the basis decreases the hedger will gain the amount of the decrease. In the previous example, the elevator was “long” the basis (buying in the cash market and selling futures) and the basis increased from 2 under to 0, so the hedger realized \$2 in gains.

<sup>95</sup> “True basis risk is the movement in the basis not attributable to the convergence of spot and futures prices.” Williams, *The Economic Function of Futures Markets*, at p. 107.

<sup>96</sup> Commercial participants who believe that the basis will behave in a predictable way may purchase a commodity and initiate a hedge solely to capture the gains from the expected movement in basis. In this instance, a hedger may actually be speculating in basis. Similarly, a speculator may acquire physical assets in order to be able to capture these types of gains from the more predictable movement in basis rather as compared to the highly speculative changes in absolute prices. Thus, it can be difficult to determine whether a hedger is hedging, a speculator is speculating, a hedger is speculating, or a speculator is hedging. In all instances, the trader is seeking to profit from the relative changes in the futures and cash prices.

<sup>97</sup> Hieronymus, at pp. 150-1.

Even though the basis can be volatile, because convergence does occur in properly functioning markets, the basis is far more predictable than the absolute level of prices for a commodity in either the cash or the futures markets. Put another way, although the futures market and the cash market are each totally unpredictable, the relationship between the two markets is generally predictable because they are closely tied to each other. The two markets should converge as a futures contract nears expiration, with arbitrage trades possible between the two markets to force convergence if necessary.

Research shows that there is much less uncertainty and risk in attempting to speculate on or predict the relationship between the cash and futures market—the basis—than in speculating on or predicting the absolute level of prices.<sup>98</sup> According to Professor Peck, hedging “is done to profit from the reliably predictable difference in prices in the two markets. … To the extent that the basis is both more stable and more predictable than absolute price levels over relevant storage periods, [hedging] reduces the business risks inherent in commodity storage.”<sup>99</sup>

At the same time, if a once predictable basis relationship becomes unpredictable, then hedging becomes as risky as outright speculation in absolute price levels. “In fact, in those cases where the basis is as volatile as the spot price of the commodity, the hedger moves naturally into holding inventories unhedged, i.e., into ordinary speculation, because there is no risk reduction from hedging.”<sup>100</sup>

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<sup>98</sup> In *Optimal Grain Marketing: Balancing Risks and Revenue* (1999), the National Grain and Feed Foundation advised that seasonal price spread patterns appear “very predictable. In 78 of 89 years, the record shows that the farm price [for corn] at harvest will not be exceeded later in the year by an enormous amount—just the 10 to 15 percent carrying charge.” In the other 11 years, however, “the farm price at harvest could be dramatically exceeded later in the year by as much as 40 to 100 percent,” due to war politics, drought, and wetness, “factors which must surely be deemed unpredictable.” *Id.* at pp. 4-5. See also Kevin C. Dhuyvetter and Terry L. Kastens, *Marketing Grain—Things to Think About*, paper prepared for Risk And Profitability Conference, Kansas State University, August 19-20, 2004 (“While price levels vary considerably from year to year due to supply and demand conditions, the difference between futures prices and cash prices (i.e., basis) tends to be more stable. The important implication of this year-to-year stability in basis is that historical basis levels often are a relatively good indicator of future basis levels and thus a historical average is a reasonable forecast. Research generally has shown that there is little benefit to complex models compared to historical averages.”).

<sup>99</sup> Peck, *The Economic Role of Traditional Commodity Futures Markets*, at p. 15. Professor Peck, like Professor Hieronymus, describes hedging not as insurance but as a form of speculation, but of much less risk and uncertainty than the traditional characterization of speculation as pertaining to absolute price levels. In this instance Professor Peck was describing a hedger that stores a commodity—as opposed to selling it—to take advantage of changing price relationships. Working observed: “Most hedging is done in the expectation of a change in spot-future price relations, the change that is reasonably to be expected being often indicated quite clearly by the current spot-future price relation.” Working, *Futures Trading and Hedging*, at p. 148.

<sup>100</sup> Paul H. Cootner, *Speculation and Hedging*, Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies, Stanford University, Vol.

## 2. Price Spreads and “Carry”

The difference between two commodity prices – such as between a cash price and futures price, or between the prices of two futures contracts – is often called a “price spread.” The basis is one particular type of price spread: it is the difference between the cash price and the nearest futures contract that is about to expire. Just as an understanding of the behavior of the basis helps to evaluate hedging strategies, understanding the behavior of a larger set of relationships between futures prices aids in the understanding of other trading strategies, speculation, and commodity storage patterns.

A key principle behind price spreads in the futures markets is that, in an idealized, properly functioning futures market, the price of one futures contract should not exceed the price of another futures contract by more than the cost of storing the commodity over the period of time between the two contracts. This storage cost, often referred to as the “carrying cost,” encompasses the expenses that a seller would incur to store the commodity for a specified period of time.<sup>101</sup> A futures market is said to be at “full carry” when the price spread between the second and first month futures contracts is large enough to cover the full costs of storing the commodity over the time period between those two futures contracts. If that price spread provides less than the full costs of storing the commodity over that time period—such that it provides only a certain percentage of the full costs of storage—that market is often described as providing that percentage of full carry. Many traders prefer to express price spreads in terms of the percentage of storage costs it provides—the percentage of full carry—rather than in terms of dollars and cents, since it provides a uniform measure of the size of a price spread.

If the price difference between two successive futures contracts were greater than the cost of storing the commodity over the time period involved, then a firm could profit by purchasing the earlier futures contract at the lower price, while simultaneously selling it at the higher price of the later futures contract. Traders would theoretically engage in sales based upon the price spread between the two contracts until the demand for the earlier futures contract pushed up its price and sales of the later futures contract reduced

VII Supp. (1967), at p. 75 (available in [farmdoc](#) archives). “[N]o hedging policy and no future contract maturity can assure a merchant that he will receive the opportunity rate of return on his inventory. . . . In most circumstances, hedging is really a form of speculation—speculation on the basis. It has all the characteristics of speculation even though it is an essential normal aspect of doing business. It differs from the speculation of buying or selling futures only because the variance of the outcome is usually much less.” *Id.* at pp. 74-5.

<sup>101</sup> The true carrying cost consists of not only payments to an elevator to store the grain, but also additional expenses such as the loss of interest that could have been earned on the cash used to purchase the commodity, and insurance to cover the value of the commodity during the period of storage. Hieronymus, at p. 155.

its price, bringing them into a new equilibrium. For this reason, the price of futures contract for the delivery of a commodity in a later month should never exceed the price of a futures contract for an earlier month by more than the full cost of holding the commodity between those months.<sup>102</sup>

The opposite situation, however, is not true. Longer-term futures contracts may sell at a price that is too low to recover the carrying costs for commodities. In the cash market there are significant transaction costs and potential bottlenecks in procuring commodities, and there are severe economic consequences for any firm that runs out of inventory. Many firms therefore keep commodities in inventory even if they cannot fully recover the costs of storing that inventory through the sale of later futures contracts. Professor Williams explains:

“Firms hold stocks of physical commodities for much the same reason they hold money. Because of the great difficulty and expense in moving commodities like wheat and copper quickly to where they are needed, firms will hold commodities despite spreads below full carrying charges.”<sup>103</sup>

In fact, empirical data indicates that futures markets rarely provide for the full carrying costs between futures contracts. Except for instances in which the supplies of the cash commodity are unusually large, and near-term prices are falling relative to later prices as firms seek to unload their inventories, futures spreads have tended to be somewhat less than full carry.<sup>104</sup>

Carrying costs are only one factor in commodity pricing. Price spreads between cash and futures markets should be understood to be a function, not only of the costs of storing a commodity, but also existing prices in the futures market, pricing expectations,

<sup>102</sup> The difference between the cash price and the price of the nearest futures contract (i.e., the basis) is not subject to this constraint. “[T]his upper limit on the carry in futures spreads does not necessarily apply to cash market carry, which includes a local basis. If a harvest is exceptionally large and grain supplies pressure the market to either purchase or find a storage location, cash market spreads can temporarily widen considerably to reward anyone offering grain a ‘home’—either through purchase or storage.”

*Optimal Grain Marketing: Balancing Risks and Revenue*, at p. 3.

<sup>103</sup> Williams, *The economic function of futures markets*, at p. 19. Why firms have held onto stocks of commodities when the futures prices were lower than full carry has puzzled economists for many years. Keynes postulated the theory of “normal backwardation”—that the lower futures price that hedgers were willing to pay to speculators reflected a premium that commodity producers were willing to pay to the speculators to assume the risks that the producer-hedgers desired to transfer. Years of research, however, failed to detect any evidence of “normal backwardation.” Charles S. Rockwell, *Normal Backwardation, Forecasting, and the Returns to Commodity Futures Trading*, Food Research Institute Studies, Stanford University, Supplement to Vol. VII (1967) (available in farmdoc archives). Working was one of the first to develop what is now the prevailing theory that price spread necessarily depend upon the costs of storage of a commodity. See, e.g., Working, *Theory of the Inverse Carrying Charge in Futures Markets*, reprinted in Selected Writings of Holbrook Working, at pp 3-24.

<sup>104</sup> *Optimal Grain Marketing: Balancing Risks and Revenue*, at p. 4.

and the demand for the commodity in the cash market.<sup>105</sup> If the supply of a commodity is plentiful, and no future shortages are foreseen, then the spot price of the commodity in the cash market will likely fall relative to the futures price. The greater the supply of the commodity, the more the spot price and near-term futures prices will fall relative to the price of farther out futures contracts.

### **3. Pricing Trends in Carry and Inversion Markets**

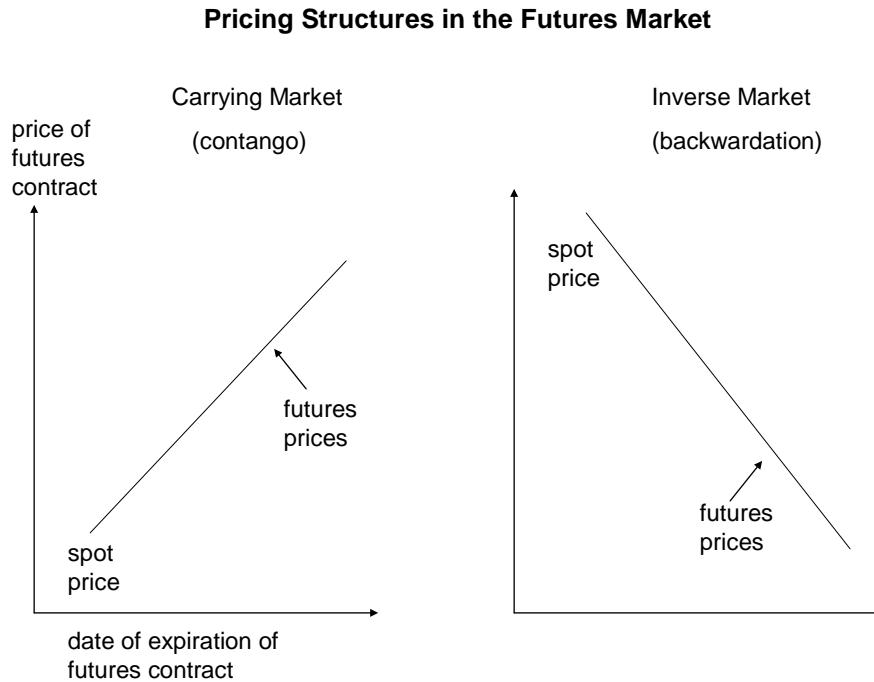
In addition to “basis,” “spreads,” and “carry,” there are several other related concepts and terms that describe the relationships between the prices of various futures contracts.

When the prices of grain futures contracts are higher than the current cash price, the futures market is said to be “a carry market.” In energy markets, this pattern is called “contango.” As explained previously, the price of a later futures contract should not exceed the price of an earlier futures contract by more than the cost of holding the commodity between those two contracts. If the difference in price between successive futures contracts is at this maximum—the cost of holding the commodity between these two contracts—then the market is said to be at “full carry.” When the market is at full carry, a grain producer or merchant that hedges can store grain from the expiration of one futures contract to another and fully recover the costs of storage. In a full carry market, persons holding a commodity are able to recover the full costs of storing the commodity and thus tend to accumulate inventories of the commodity.

When the prices in the grain futures market are lower than the current cash price, the market is said to be an “inverse market.” The corresponding term in the energy markets is “backwardation.” In an inverse or backwardated market, a producer or merchant cannot recover any of the costs of storing a commodity through a hedging strategy. Most producers and merchants reduce inventories during an inverse or backwardated market, choosing to sell the commodity rather than store it at a loss.

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<sup>105</sup> Put another way, “the spot price is determined as the sum of the futures price dependent primarily on expectations, plus a premium dependent on the shortage of currently available supplies.” Working, *New Concepts Concerning Futures Markets and Prices*, at p. 254.



**Figure 18.** Basic relationships between spot and futures prices.

Commercial firms and traders base many of their hedging strategies and inventory management decisions on the relative prices of the various contracts in the futures market. Simply put: “Commodities move into storage when the price of storage is favorable and move out of storage when the price is unfavorable.”<sup>106</sup> The greater the carrying charge provided by the futures market, the more inventory firms will hold in storage and hedge those inventories through additional sales of futures contracts. To the extent that the market will “pay” for a firm’s costs in holding inventory through the price relationships in the futures markets, that firm will attempt to take advantage of such opportunities through hedging. In an inverse (or backwardated) market, firms will reduce their inventories as much as practicable, while still ensuring that they have sufficient inventories to meet anticipated demands.<sup>107</sup>

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<sup>106</sup> Hieronymus, at p. 160.

<sup>107</sup> Professor Peck summarizes the critical importance of futures markets to inventory management as follows:

“[F]utures markets do not determine whether storage will occur but affect the decision to store and the predictability of storage returns.

“In the absence of a futures market, the storage return is speculative and depends entirely on events that occur after the decision to store or not is made. With a futures market, storage returns can largely be determined at the time the decision to store is made if that decision is hedged with a classic, arbitrage hedge. . . . [Futures markets] guide inventory decisions in a rational way. In periods of surplus the market reflects fully carrying charges and thus induces storage. In periods of shortage less

## D. Position Limits and Hedge Exemptions

To understand the nature and extent of hedging, and speculation in the commodity markets, it is also important to understand the statutory and regulatory limits imposed on the amount of speculation in these markets.

Section 4a(a) of the Commodity Exchange Act declares that excessive speculation in the price of a commodity traded on an exchange can create an undue burden on interstate commerce and directs the CFTC to establish limits on the positions held by traders on futures markets in order to prevent “sudden or unreasonable fluctuations or unwarranted changes” in the price of commodities traded on an exchange. The Commodity Exchange Act states:

“Excessive speculation in any commodity under contracts of sale of such commodity for future delivery made on or subject to the rules of contracts markets or derivatives transaction execution facilities causing sudden or unreasonable fluctuations or unwarranted changes in the price of such commodity, is an undue and unnecessary burden on interstate commerce in such commodity. For the purpose of diminishing, eliminating, or preventing such burden, the Commission shall . . . fix such limits on the amounts of trading which may be done or positions which may be held by any person.”<sup>108</sup>

The statute states that these limits shall not be applicable to “bona fide hedging transactions,” and authorizes the CFTC to define the term “bona fide hedge.”

### 1. Position Limits

For many years, to prevent price manipulation and excessive speculation, the CFTC has maintained and enforced position limits for futures contracts related to certain agricultural commodities, including wheat.<sup>109</sup> The CFTC explains: “For several markets (corn, oats, wheat, soybeans, soybean oil, soybean meal, and cotton), the limits are determined by the Commission and set out in Federal regulations (CFTC Regulation 150.2, 17 CFR 150.2). For other markets, the limits are determined by the exchanges.”<sup>110</sup>

than full costs are available, inducing merchants to sell unneeded stocks. . . . That the storage decision can be hedged implies that risks are reduced and more storage is likely at all prices.”

Peck, *The Economic Role of Traditional Commodity Futures Markets*, at pp. 44-5.

<sup>108</sup> 7 U.S.C. §6a(a) (2006).

<sup>109</sup> See CFTC, Notice of Proposed Rulemaking, *Revision of Federal Speculative Position Limits*, 70 Fed. Reg. 12621 (March 15, 2005).

<sup>110</sup> These position limits also apply to options on futures. CFTC, *Speculative Limits*, CFTC website, at <http://www.cftc.gov/industryoversight/marketsurveillance/speculativelimits.html>.

Position limits restrict the number of futures contracts that a commodity trader can hold at a time.<sup>111</sup> These limits restrict the amount of trading that can be conducted by a single person on the regulated futures markets to prevent corners, squeezes, and other trading activities that can artificially inflate or depress commodity prices – so-called unwarranted or undue price fluctuations. The CFTC has established three basic types of position limits: spot month, single-month, and all-months combined, each of which applies to wheat contracts.

**Spot month limit.** Because the potential for price manipulation and market congestion is highest in the month in which a futures contract expires and deliveries may occur (termed either the “spot,” “expiration,” or “delivery” month), the CFTC applies and requires the exchanges to apply more stringent position limits during the spot month than during other months. CFTC regulations pertaining to exchange-set limits state: “For physical delivery contracts, the spot month limit level must be no greater than one-quarter of the estimated spot month deliverable supply.”<sup>112</sup> Under existing CFTC-set position limits for wheat, no trader may hold more than 600 wheat contracts due to expire in the spot month. Table 3 provides the CFTC position limits for four grain commodities.

#### CFTC Position Limits for Wheat, Corn, Soybean, and Oats

Commodity	Spot Month	Single Month	All Months Combined
<b>Wheat</b>	600	5,000	6,500
<b>Corn</b>	600	13,500	22,000
<b>Soybeans</b>	600	6,500	10,000
<b>Oats</b>	600	1,400	2,000

**Table 3.** CFTC position limits for selected agricultural commodities. Data source: CFTC.

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<sup>111</sup> To calculate a particular trader’s position for purposes of applying these limits, the CFTC and the exchanges aggregate multiple positions subject to common ownership as if they were held by a single trader, and combine futures and option positions on those futures to obtain an aggregate future-equivalent position in a futures contract. 17 C.F.R. §§150.4, 150.5 (2008).

<sup>112</sup> 17 C.F.R. §150.5(b)(1) (2008). For the spot month in cash-settled contracts, an exchange must establish speculative position limits “no greater than necessary to minimize the potential for manipulation or distortion of the contract’s or the underlying commodity’s price.” *Id.*

**Single month limit.** The CFTC applies less stringent position limits in months other than the spot month because the potential for congestion, price distortion, and disruption of the cash market is lower than in the spot month. Nonetheless, single month limits are necessary to prevent individual traders from acquiring large positions that could distort the price of a particular futures contract.<sup>113</sup> Under existing CFTC position limits, for example, no trader may own more than 5,000 wheat contracts that expire in the same month.

**All-months combined.** The CFTC also imposes and requires the exchanges to impose an all-months combined position limit for agricultural commodities, which is a limit on the total number of contracts across all months that a trader may hold. CFTC regulations state that the all months-combined levels must be no greater than 10% of the average total open interest (outstanding contracts) in futures and options, up to an open interest of 25,000 contracts, with a marginal increase of up to 2.5% of the total open interest thereafter. The CFTC's regulations also allow the exchanges to establish all-months combined position limits based on other factors related to the customary size of speculative positions in the particular market, provided that such totals do not have significant potential for market distortion.<sup>114</sup> Under existing CFTC position limits for wheat, no trader may hold a total of more than 6,500 wheat contracts for all months combined.

## 2. Hedge Exemptions

The purpose of position limits is to diminish or prevent the burdens on interstate commerce that result from excessive speculation in the commodity futures markets. The Congress has made it clear, however, that position limits should not apply to the legitimate use of the futures markets by commodity producers, merchants, or end-users to price their goods efficiently or to manage their price risks. The Commodity Exchange Act directs the CFTC to grant an exemption from established commodity position limits for “bona fide hedging transactions or positions.” Section 4a(c) of the Commodity Exchange Act states:

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<sup>113</sup> That unusually large positions in a single month can distort futures prices, even when the month is other than the spot month, was demonstrated in the Subcommittee's investigation into the trading practices of Amaranth, a hedge fund active in the natural gas market. See PSI, *Excessive Speculation in the Natural Gas Market*, (2007).

<sup>114</sup> CFTC regulations state that such positions “shall not be extraordinarily large relative to total open positions in the contract, the breadth and liquidity of the cash market underlying each delivery month and the opportunity for arbitrage between the futures market and the cash market in the commodity underlying the futures contract.” 17 C.F.R. §150.5(c)(2)(2008).

“No rule, regulation, or order issued under subsection (a) of this section shall apply to transactions or positions which are shown to be bona fide hedging transactions or positions.”<sup>115</sup>

The Commodity Exchange Act provides the CFTC with the discretion to define the term bona fide hedging transaction, “consistent with the purposes” of the CEA, in order to “permit producers, purchasers, sellers, middlemen, and users of a commodity or a product derived therefrom to hedge their legitimate anticipated business needs for that period of time into the future for which an appropriate futures contract is open and available on an exchange.”<sup>116</sup>

The purpose of this exemption is to allow commodity producers, merchants, and end-users to hedge their crops in the futures markets to protect against price risks arising from their commercial activities involving that commodity. The objective is to allow them to enter into a sufficient number of futures contracts to meet the legitimate needs of their commercial operations. One of the rationales underlying the exemption is that since hedgers are price neutral—because they are hedged they will neither gain nor lose money as the prices in the futures market change—they would have no motive to attempt to manipulate prices through large trades.

The CFTC first issued a regulation defining a bona fide hedging transaction in 1936, immediately following passage of the Commodity Exchange Act. The original definition essentially defined hedging as a sale or purchase of a contract for future delivery of a commodity if the sale or purchase was offset, in terms of quantity, by ownership or fixed-price purchases or sales of the same commodity in the cash market.<sup>117</sup> Since that time, the types of transaction that qualify for the bona fide hedge exemption have been expanded both by Congress and by CFTC administrative action.<sup>118</sup>

The current CFTC regulation states that the term “bona fide hedging transactions and positions” means transactions or positions in a futures contract or option:

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<sup>115</sup> 7 U.S.C. §6a(c) (2006).

<sup>116</sup> *Id.* In recognition of the concern that large hedgers can affect prices in the same manner as large speculators, to help determine whether the CFTC has adequate authority and regulations to “prevent unwarranted price pressures by large hedgers,” in this section of the CEA, Congress also directed the CFTC “to monitor and analyze the trading activities of the largest hedgers . . . operating in the cattle, hog, or pork belly markets,” and report its findings to Congress. *Id.*

<sup>117</sup> Allen B. Paul, *Treatment of Hedging in Commodity Market Regulation*, USDA Economic Research Service, Technical Bulletin No. 1538 (April 1976), at p. 2 (available in [farmdoc](#) archives).

<sup>118</sup> For example, in 1956, Congress amended the Commodity Exchange Act to include the “anticipatory hedge” as a bona fide hedging transaction, meaning that at the time of the purchase or sale of a futures contract the trader did not actually have to own, purchase, or sell a physical commodity, but rather only anticipate doing so. *Id.*

“where such transactions or positions normally represent a substitute for transactions to be made or positions to be taken at a later time in a physical marketing channel, and where they are economically appropriate to the reduction of risks in the conduct and management of a commercial enterprise . . .”<sup>119</sup>

The CFTC regulation also requires that a bona fide hedging transaction arise from either: (1) a potential change in the value of an asset that a person owns, produces, processes, or sells or anticipates owning, producing, processing, or selling; (2) the potential change in value of liabilities that the person owes or anticipates incurring; or (3) the potential change in the value of services that the person provides or purchases, or anticipates providing or purchasing.<sup>120</sup> In addition, the CFTC regulation includes another overall qualification that:

“no transactions or positions shall be classified as bona fide hedging for purposes of section 4a of the Act unless their purpose is to offset price risks incidental to commercial cash or spot operations and such positions are established and liquidated in an orderly manner in accordance with sound commercial practices [and the additional requirements pertaining to anticipatory hedging or exemptions from spot month limits] ....”<sup>121</sup>

While there has been longstanding, broad consensus on the need to grant hedge exemptions for commodity producers, merchants, and end users to manage their price risks, granting similar exemptions to financial firms seeking to use the futures market to manage their financial risks has been the subject of longstanding debate and controversy.

In 1986, Congress urged the CFTC to consider expanding the hedge exemption to include financial firms using the futures markets to manage various types of financial risks. The committee report by the House Committee on Agriculture on the Futures Trading Act of 1986, stated:

“The Committee wishes the Commission to consider giving certain concepts, uses, and strategies ‘non-speculative’ treatment under the Act and relevant Commission regulations, whether under the hedging definition or, if appropriate, as a separate category similar to the treatment given certain spread, straddle, or arbitrage positions: one, the concept of ‘risk management’ by portfolio managers as an alternative to the concept

<sup>119</sup> 17 C.F.R. §1.3(z) (2008).

<sup>120</sup> *Id.*

<sup>121</sup> *Id.* The regulation allows hedges of the actual amount of the sale or purchase or an anticipatory hedge (a hedge placed in advance of the actual sale or purchase of the commodity) up to the amount of the commodity typically bought or sold over a 12 month period. The CFTC permits these bona fide hedgers to apply for exemptions from the spot month limits. *Id.* at §§1.47, 1.48.

of ‘risk reduction’; two, futures positions taken as alternatives rather than temporary substitutes for cash market positions; three, other trading strategies involving the use of financial futures.”<sup>122</sup>

The report of the Senate Committee on Agriculture, Nutrition and Forestry emphasized that any actions taken by the CFTC in this regard should be consistent with its fundamental mission to prevent excessive speculation which causes unreasonable or unwarranted changes in commodity prices.<sup>123</sup>

In 1991, a firm asked the CFTC to grant it an exemption from the position limits in order to purchase and hold futures contracts to hedge its exposure to commodity futures prices from certain financial instruments, called swaps, which it planned to sell to pension funds and other institutional investors. The value of these swaps was to be linked to an index calculated from the prices of specified commodity futures contracts and so would fluctuate with the values of the underlying futures contracts. Because of this exposure to the price of specified futures contracts, the firm requested a hedge exemption so that it could purchase a sufficient number of futures contracts to hedge its swaps exposure. Based on its interpretation of the direction provided by Congress in the Futures Trading Act of 1986, the CFTC granted this request, even though the firm’s trading on the futures market was not in connection with the production, sale, or use of any physical commodity.

According to the records provided to the Subcommittee by the CFTC, four swap dealers selling index-related swaps currently operate with hedge exemptions that allow them to hold much larger positions on the Chicago wheat futures market than would otherwise apply under the CFTC’s speculative position limits. Two other firms that market index-related instruments have received permission from the CFTC to exceed the position limits by a specified amount under formal decisions by the CFTC to not enforce the standard limits with respect to the futures contracts held by these firms.

The next two sections of the Report trace the rise of commodity index trading, how the exemptions from position limits have facilitated index trading in the wheat market, and how index trading, in the aggregate, has contributed to unreasonable and unwarranted changes in the futures prices for wheat and constituted excessive speculation.

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<sup>122</sup> H.R. Rep. No. 624, 99<sup>th</sup> Cong., 2d Sess., at pp. 45-6 (1986).

<sup>123</sup> S. Rep. No. 291, 99<sup>th</sup> Cong., 2d Sess., at pp. 21-2 (1986).

*“If you can look into the seeds of time,  
And say which grain will grow and which will not,  
Speak then to me . . .”*

--MacBeth, Act I, Scene III

#### IV. COMMODITY INDEXES

One of the most significant developments in commodity markets in recent years has been the increasing amount of trading in financial instruments whose value is linked to the value of a commodity index. Commodity indexes are typically calculated using a wide range of commodity futures contracts, such as futures contracts for agriculture, energy, and metal commodities. Although instruments linked to a broad-based commodity index have existed for several decades, it is only within the past few years that these index instruments have become a popular vehicle to speculate in commodity prices. Since 2000, a number of academic publications, financial trade journals, and marketing presentations by swap dealers have touted the alleged benefits of index instruments. As a result, the total value of index instruments—purchased mainly by financial institutions, insurance companies, pension funds, foundations, hedge funds, and wealthy individuals—has grown more than tenfold in five years, from an estimated \$15 billion in 2003, to at least \$200 billion in mid-2008.<sup>124</sup> The purchases of these index instruments have resulted in the injection of billions of dollars in passive, long investments into the agricultural, energy, and metals futures markets.

This section explains how commodity indexes work; how persons commonly make investments based upon a commodity index using swaps, exchange traded funds, or exchange traded notes; how speculative purchases of index instruments affect the futures markets; and how the standard commodity trading limits have been waived for swap dealers and other index traders through hedge exemptions and no-action letters issued by the CFTC. This section also discusses recent CFTC actions pertaining to index trading.

Section V of this Report presents evidence indicating that the large amount of index trading in the Chicago wheat futures market is one of the major reasons for the increasing gap between the futures prices and cash prices (the basis), and for the frequent failure of wheat futures prices and cash prices to converge as the futures contracts expire. These pricing distortions and breakdowns have imposed significant additional costs upon farmers, grain elevators, grain merchants, and wheat users, thereby resulting in an undue burden on commerce which necessitates regulatory action to alleviate.

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<sup>124</sup> CFTC, *Staff Report on Commodity Swap Dealers & Index Traders with Commission Recommendations*, at p. 3 (preliminary data). This estimate reflects both the actual amounts invested in commodity index related instruments and the appreciation in value of those investments due to increasing commodity prices.

## A. Commodity Index Trading in Agricultural Markets

The full extent of the explosive growth of commodity index trading has only recently become apparent, since it is only within the last few years that the CFTC has collected and publicly reported data on the extent of index traders purchasing commodity futures. Prior to 2007, index-related trades were included in the overall data reported by commercial and non-commercial traders in the CFTC's traditional Commitment of Traders Report, its key compilation of information on the extent and nature of the participation on regulated commodity futures exchanges.<sup>125</sup> In January 2007, in response to requests from Congress, the agriculture industry, and others, the CFTC began to publish weekly data on the total or aggregate positions of index traders in agricultural futures contracts traded on those exchanges.<sup>126</sup>

This data appears in the CFTC's "Supplemental Commodity Index Trader Report." That CFTC report now provides the total positions in agricultural futures contracts of managed funds, pension funds, and "other institutional investors that generally seek exposure to commodity prices as an asset class in an unleveraged and passively-managed manner using a standardized commodity index." In addition, it includes the aggregated positions of swap dealers "holding long futures positions to hedge short OTC commodity index exposure opposite institutional traders such as pension funds."<sup>127</sup> Together, this data provides the best available information on the volume of commodity index trading in U.S. agricultural futures markets.

When it began publishing this weekly data in 2007, the CFTC also released data on index trading that it had acquired for the calendar year 2006. This older data enabled the CFTC weekly data series on index trader positions in commodity futures markets to extend back to January 2006. The CFTC staff then took another step by extrapolating its data on index positions held by swap dealers back to January 2004. Although the CFTC has not included this extrapolated data

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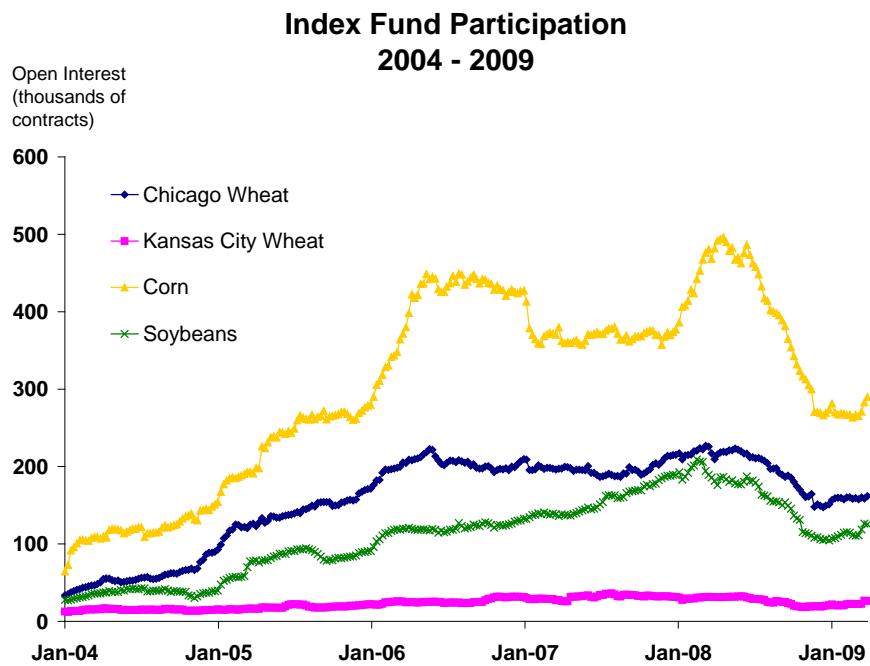
<sup>125</sup> For the CFTC's explanation and description of its Commitment of Traders Report, see <http://www.cftc.gov/marketreports/commitmentsoftraders/index.htm>.

<sup>126</sup> Commodity Futures Trading Commission, *Commission Action in Response to the 'Comprehensive Review of the Commitments of Traders Reporting Program'* (June 21, 2006), December 5, 2006. The CFTC concluded it was able to calculate the aggregate positions of index traders in agriculture futures markets, because: "A careful review of swap dealer positions shows that, with respect to agricultural commodities, swap dealers' OTC trading activities are generally limited to taking short OTC positions opposite pension funds or other index-based traders seeking to diversify portfolios by adding long commodities exposure. Thus, the swap dealers' futures positions are generally limited to long futures hedges offsetting their short OTC exposure to those pension funds or other index-based traders." *Id.*, at p. 11. At the same time, the CFTC concluded it could not perform a similar analysis with respect to index trading in the energy or metals markets. For energy and metal commodities, the CFTC found that the swap dealers' positions on the futures exchanges resulted from the netting of a variety of OTC exposures, many of which were not due to purchases or sales of commodity indexes. The CFTC found it was "difficult, if not impossible, to link these residual futures positions with any part of the underlying activity that makes up the book of the swap dealer. The Commission has concluded, therefore, that at present, including the energy and metal markets in the [Commitment of Traders-Supplemental] report would seriously mislead the public as to the actual amount of index trading and the amount of commercial trading that was present in those market." *Id.*, at pp. 11-12.

<sup>127</sup> *Id.*

for the years 2004 to 2005 in its formal Supplemental Commodity Index Trader Report, the Commission has presented select portions of it to the public. At the Subcommittee's request, the CFTC provided the complete extrapolated data series to the Subcommittee for use in this investigation.

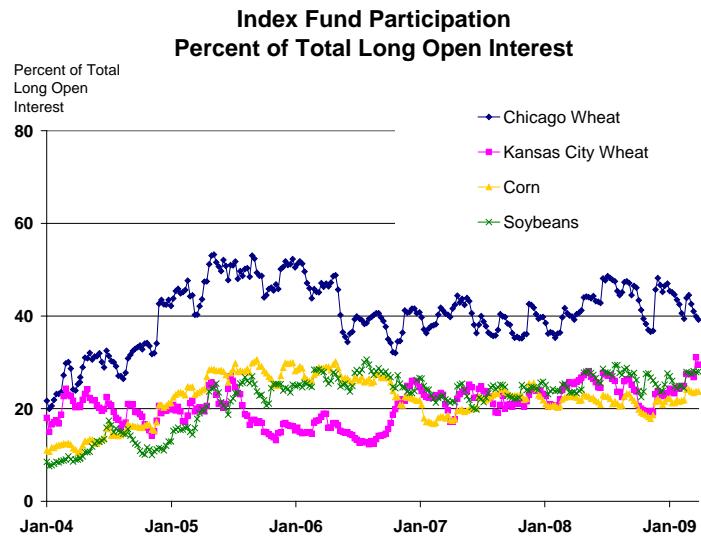
The CFTC data provides useful information on the extent and history of commodity index trading in agricultural futures markets. Figure 19 presents, for example, CFTC data on the number of outstanding purchased futures contracts (long open interest) held by commodity index traders in the wheat, corn, and soybean markets over the past five years. The data shows a substantial volume of contracts in the corn futures market, with about half as many contracts in the wheat and soybean futures markets. Index trading in the corn market, for example, grew sevenfold from about 70,000 corn contracts in 2004, to a peak of almost 500,000 corn contracts in early 2008, before sharply dropping by half to about 270,000 contracts at year's end. Index trading in the Chicago wheat market was smaller on an absolute level, but just as steep, growing sevenfold from about 30,000 contracts in early 2004, to a maximum of about 220,000 contracts in mid-2008, before dropping off at the end of the year to about 150,000 contracts. The amount of index trading in the Kansas City wheat market was substantially less, varying from about 15,000 contracts to 35,000 contracts.



**Figure 19.** Open interest due to index investments. Data source: CFTC.

Figure 20 breaks the data down a different way, showing the percentage of outstanding purchased contracts (total long open interest) held by index traders in the wheat, corn, and soybean markets. This data indicates that although there is a greater overall number of index fund contracts in the corn market, index traders have a relatively greater presence in the Chicago

wheat market. In addition, the data shows that index trading constitutes a significantly larger share of the Chicago wheat futures market than the Kansas City futures market. It shows, for example, that in 2008, index traders held a significant share of the outstanding futures contracts—between 40 and 45% of the long open interest in the Chicago wheat futures market, and between 20 and 30% of the long open interest in the Kansas City wheat futures market.



**Figure 20.** Percent of long open interest held by index traders. Data source: CFTC.

## B. Components of a Commodity Index

Speculation in commodity index instruments has grown over the past five years, as they have become a popular investment strategy for large institutional investors, including hedge funds, pension funds, and university endowments, seeking to diversify their portfolios and profit from rising commodity prices. Purchasing a financial instrument whose value is linked to a commodity index enables an investor to get broad exposure to commodities without having to actually purchase quantities of each commodity or manage a portfolio of commodity investments. One investment consulting firm explains: “Commodity indices attempt to replicate the returns available to holding long positions in agricultural, metal, energy, or livestock investment, without the investor having to actively manage the positions.”<sup>128</sup>

A commodity index functions like an equities index such as the S&P 500 or the Dow Jones industrial average, in that it is computed on the basis of the value of its components. The value of a commodity index is derived from calculating the total value of a specified “basket” of

<sup>128</sup> See, e.g., Alternative Investment Analytics, *Comparing Commodity Indices: Multiple Approaches to Return*, AIA Research Report, updated June 18, 2008.

commodities. Each commodity within the basket is assigned a specified weight, or percentage, and the value of each commodity within the index is obtained by multiplying the current price of a specified futures contract for the commodity by the assigned weight for that commodity. The value of the index varies daily, along with the values of its component commodity futures.

There are a variety of commodity indexes, which are sometimes divided into “first-generation” and “second-generation” commodity indexes. The first-generation indexes have been around the longest, and differ from later indexes primarily in the manner and frequency with which the futures contracts are replaced (“rolled”) as they approach expiration.

The second-generation indexes were developed within the last few years to improve upon the performance of the first-generation indexes. The second-generation commodity indexes have more complex strategies for selecting the particular futures contracts used to calculate the index, and typically select futures contracts that expire later in time than the futures contracts used in the first generation indexes.<sup>129</sup> Because the second-generation index futures contracts are farther from maturity, they need to be replaced (“rolled”) less frequently than in the first-generation indexes.

Table 4 identifies a few key commodity indexes and the commodities and weights used to calculate them.<sup>130</sup> As the Table shows, index funds are generally weighted most heavily toward energy commodities, particularly crude oil. In both the S&P Goldman Sachs Commodity Index (GSCI) and the Deutsche Bank Liquid Commodity Index (DBLCI), crude oil constitutes about one-third of the index. Agricultural commodities, grains in particular, are usually the second most heavily weighted commodity sector in indexes. The more heavily weighted an index is in any particular commodity sector, the more that index’s overall performance will depend upon the performance of that commodity sector.

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<sup>129</sup> See, e.g., *Comparing Commodity Indices: Multiple Approaches to Return*, AIA Research Report, updated June 18, 2008.

<sup>130</sup> The commodity index compositions are presented as of March 2009, and are found at the following web pages, last visited on March 26, 2009:

[http://www2.standardandpoors.com/portal/site/sp/en/us/page.topic/indices\\_gsci/2,3,4,0,0,0,0,0,0,2,1,0,0,0,0,0.html](http://www2.standardandpoors.com/portal/site/sp/en/us/page.topic/indices_gsci/2,3,4,0,0,0,0,0,0,2,1,0,0,0,0,0.html) (S&P GSCI); <http://www.djindexes.com/aig/index.cfm?go=about> (DJ-AIG); <http://dbfunds.db.com/dbc/index.aspx> (DBLCI); [http://www.jefferies.com/pdfs/RJCRB\\_Index\\_Materials.pdf](http://www.jefferies.com/pdfs/RJCRB_Index_Materials.pdf) (Reuters/Jefferies CRB); <http://www.rogersrawmaterials.com/page1.html> (Rogers International Index). The Rogers Index also includes the following commodities with percentage weights of 1 or less: rice, azuki beans, greasy wool, rubber, lumber, barley, canola, oats, palladium, and soybean meal.

**Commodity Index Composition and Weights (%) (as of March 2009)**

Commodity	S&P GSCI	Dow Jones-AIG (DJAIG)	DBLCI	Reuters/Jefferies CRB	Rogers Int'l Commodity Index
WTI crude oil	31.98	13.8	33.57	23	21
Brent crude oil	12.69				14
Unleaded gasoline	3.39	3.7		5	3
Heating oil	4.82	3.6	17	5	1.8
GasOil	4.44				1.2
Natural Gas	7.85	11.9		6	3
<b>Total Energy</b>	<b>65.18</b>	<b>33.0</b>	<b>50.57</b>	<b>39</b>	<b>44</b>
Aluminum	2.58	7.0	10.22	6	4
Copper	2.29	7.3		6	4
Lead	0.33				2
Nickel	0.68	2.9		1	1
Zinc	0.56	3.1			2
<b>Tot. Industrial Metals</b>	<b>6.43</b>	<b>20.3</b>	<b>10.22</b>	<b>13</b>	<b>13</b>
Gold	3.49	7.9	14.73	6	3
Silver	0.33	2.9		1	2
<b>Tot. Precious Metals</b>	<b>3.82</b>	<b>10.8</b>	<b>14.73</b>	<b>7</b>	<b>5</b>
Wheat, CME	5.2	4.8	12.15	1	7
Wheat, KCBOT	1.23				
Corn	4.93	5.7	12.33	6	4.75
Soybeans	1.84	7.6		6	3.35
Soybean oil		2.9			2.17
<b>Total Grains</b>	<b>13.20</b>	<b>20.7</b>	<b>24.48</b>	<b>13</b>	<b>17.27</b>
Cotton	1.06	2.3		5	4.2
Sugar	1.84	3.0		5	2
Coffee	0.90	3.0		5	2
Cocoa	0.45			5	1
Orange Juice				1	0.66
<b>Total "Softs"</b>	<b>5.65</b>	<b>8.3</b>	<b>---</b>	<b>21</b>	<b>9.86</b>
Feeder Cattle	0.83				
Live Cattle	3.36	4.3		6	2
Lean Hogs	1.79	2.4		1	1
<b>Total Livestock</b>	<b>5.78</b>	<b>6.7</b>	<b>---</b>	<b>7</b>	<b>3</b>

**Table 4.** Prepared by U.S. Senate Permanent Subcommittee on Investigations, March 2009

“Sub-indexes” consist of commodities in one particular sector. For each index, there may be five or six sub-indexes, such as an energy sub-index, an agricultural sub-index, or an industrial metal sub-index. Investors seeking exposure to a particular commodity sector rather than exposure to a broad set of commodities may prefer to invest in a sub-index rather than a broad index.

**The “Roll.”** The value of a commodity index depends upon the values of the futures contracts within the index that are within a specified amount of time away from expiration. As time goes forward, however, these futures contracts move closer toward expiration and eventually have to be replaced with futures contracts that are once again within the specified time from expiration. Most first-generation commodity indexes use the price of the second month futures contract to compute the value of the index. The first month futures contract is the futures contract that is nearest expiration; the second month contract is the next one after that. After a certain amount of time, the first month futures contract will expire and the futures contract that had been the second-month futures contract now becomes the first-month futures contract. At that point, the managers of the index must replace the first month contracts with a new set of contracts which, at the time of their selection, serve as second month contracts. This replacement process, which takes place on a periodic basis, is called the “roll.”<sup>131</sup>

The roll by the index fund manager does not actually result in the purchase or sale of any futures contracts—it is only a computational undertaking—since the index itself has no underlying assets. However, as explained below, the computational roll by an index manager will typically result in a large number of actual futures transactions by swap dealers and others who have hedged their exposure to the value of the index and need to match the composition of the readjusted index with actual holdings of futures contracts. In this way, an index roll has a direct and sometimes significant impact on the futures markets by leading to a large number of similar trades within a short period of time.<sup>132</sup>

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<sup>131</sup> The various indexes have established similar procedures for accomplishing the periodic roll. The indexes all have identified a series of dates, typically from the 4<sup>th</sup> or 5<sup>th</sup> day of a month, during which they will replace what have just become first-month futures contracts with a new set of later-month futures contracts. The roll is accomplished at an equal rate over this series of trading days until 100 percent of the value of the first-month futures contracts is replaced with an equivalent value of later-month futures contracts.

Standard & Poor’s describes the roll process as follows: “The simplest way to think of the process is as rolling from one basket of nearby futures (the first nearby basket) to a basket of futures contracts that are further from expiration (the second nearby basket). . . . Taking the first day of the roll as an example, just before the roll takes place at the end of the day, the S&P GSCI consists of the first nearby basket. That portfolio, constructed the night before and held throughout the 5<sup>th</sup> business day, has a dollar value. For the roll, that dollar value is distributed across the first and second nearby baskets such that the number of contracts or the quantity of the first nearby basket is 80% of the total and the quantity held of the second nearby basket is 20% of the total.” Standard & Poor’s, S&P GSCI, FAQ; at [http://www2.standardandpoors.com/spf/pdf/index/SP\\_GSCI\\_FAQ\\_Web.pdf](http://www2.standardandpoors.com/spf/pdf/index/SP_GSCI_FAQ_Web.pdf).

<sup>132</sup> To ensure that the futures contracts they have purchased to offset their exposures to the futures prices in the index-related swaps they have sold, index traders will roll their index-related futures contracts during the same roll period that the index manager rolls the contracts used to calculate the index. Some commodity traders told the

### C. Three Types of Commodity Index Instruments

Investors cannot invest directly in a commodity index, since the index itself, like the S&P 500 or the Dow Jones Industrial Average, is just a mathematically calculated value based upon the relative weights and prices of the commodity futures contracts within the index. Financial institutions have devised several types of financial instruments to enable investors to gain exposure to the value of a commodity index. Presently, there are three types of financial instruments that investors can purchase to provide a financial return based upon the value of a commodity index: commodity index swaps, exchange-traded funds, and exchange-traded notes.

**Commodity Index Swaps.** The most common type of commodity index instrument is a financial instrument known as a “swap” whose return is based upon the performance of a specified commodity index.

A commodity index swap is, in essence, a financial instrument that pays a return based on the value of a specified index. A “swap dealer,” such as a bank or broker-dealer, typically offers a qualified investor the opportunity to purchase, for a fixed price, a swap whose value is linked, on any given date, to the value of a specified commodity index on that date.<sup>133</sup> The purchase price of the swap will be the value of the index on the purchase date. If the value of the commodity index increases, the value of the swap to the purchaser will increase by a corresponding amount. On the other hand, if the value of the commodity index falls, the value of the swap will also fall. Typically, although these swaps often may be sold back to the swap dealer at any time, the large institutions that purchase these types of swaps hold onto them for long periods of time.

Commodity index swaps are not traded on regulated futures exchanges. Instead they are sold “over the counter,” outside of the statutory and regulatory framework that applies to futures exchanges. Because these swaps are traded outside of the exchanges and because current law prohibits CFTC regulation of swaps,<sup>134</sup> the CFTC has virtually no direct data on who purchases them, how many are sold over what time period, or the prices charged.

Subcommittee that they reduce their trading during the time when index traders are rolling their futures contracts; other traders apparently try to anticipate or respond to the rolls. Because of the many possible trading responses to commodity index rolls, it is difficult to determine exactly how such rolls affect futures prices. Depending on the trading strategies adopted by the other traders in the market at the time, the impact of the roll may vary from roll to roll.

<sup>133</sup> Swap dealers are typically large diversified financial institutions. Among the leading swap dealers operating in the United States are Bank of America, Citibank, Goldman Sachs, HSBC Bank, and J.P.Morgan Chase. See, e.g., *OCC's Quarterly Report on Bank Trading and Derivatives Activities: Fourth Quarter 2008*, Table 1: “Notional Amount of Derivative Contracts: Top 25 Commercial Banks and Trust Companies in Derivatives,” U.S. Comptroller of the Currency, December 31, 2008.

<sup>134</sup> The Commodity Futures Modernization Act of 2000, enacted into law as part of the Consolidated Appropriations Act of 2001, P.L. 106-554, contains several provisions which prohibit CFTC regulation of any type of swap.

The CFTC does possess indirect data on these swaps, because the swap dealers who sell them typically hedge their exposure by purchasing the referenced futures contracts on a futures exchange. For example, if a swap dealer has sold a swap whose value is linked to an index consisting of 50 percent oil and 50 percent wheat, the swap dealer will owe the investor a greater amount if the prices of oil and wheat increase. To avoid this financial exposure, the swap dealer typically purchases an equivalent amount of the specified futures contracts in oil and wheat on a futures exchange. If the swap increases in value due to increases in the oil and wheat futures prices – which means the swap dealer owes the swap purchaser more money – the swap dealer’s financial exposure is offset by the fact that the swap dealer also owns the referenced futures contracts whose prices rose. The swap dealer is then said to be “short” oil and wheat in the over-the-counter swap market, but “long” oil and wheat on the futures exchange, for a net exposure of zero. The swap dealer, who charges a fee for selling the swap, then becomes indifferent to any subsequent change in the value of the commodity index.

While the net exposure of swap dealers who sell commodity index swaps may be minimal as a result of this hedging, the hedging process itself has, in effect, transmitted the commodity index swap purchases into purchases of contracts on the futures markets. In this manner, even though commodity index investors typically do not purchase future contracts directly, their swap purchases often result in the purchase of futures contracts on an exchange by their swap dealers. Those purchases, in turn, can affect prices on the exchange by creating an additional demand for the futures contracts referenced in the commodity indexes.

Although it may be possible for swap dealers to hedge some of their commodity index swap exposures by entering into over-the-counter transactions that offset these exposures (i.e., “internal netting”), the CFTC indicates that swap dealers frequently use the futures markets for the purpose of obtaining these hedges or offsets. The CFTC states: “As a result of the growth of the swap market and the dealers who support the market, there has been an associated growth in the open interest of the futures markets related to the commodities for which swaps are offered, as these swap dealers attempt to lay off the residual risk of their swap book.”<sup>135</sup>

**Exchange Traded Funds.** In the past few years, banks and other financial institutions have devised another type of instrument, known as exchange-traded funds (ETFs), to mirror the performance of specified commodity indexes. Unlike the purchase of a commodity index swap from a swap dealer, which is a bilateral transaction between the investor and the swap dealer, ETFs are constructed in such a way that retail investors can buy and sell ETF shares on a stock exchange, in the same way investors buy and sell shares of stock on a stock exchange. The ETF is structured so that the value of the ETF shares should reflect the value of the commodity index upon which they are based.

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<sup>135</sup> CFTC, *Staff Report on Commodity Swap Dealers & Index Traders with Commission Recommendations*, at p. 12.

Purchasers of ETF shares, who can monitor the shares' value in the same manner as the value of stocks traded on a stock exchange, can sell their ETF shares to any other buyer through the stock exchange on which the shares are offered.<sup>136</sup> Although the mechanism by which investors in ETFs gain exposure to a particular commodity index is different from the purchase of a commodity index swap from a swap dealer, the end result is the same — the purchaser of an ETF gains exposure to the value of the commodity index upon which it is based.<sup>137</sup>

A key advantage of ETF shares is that they can be bought and sold as easily as individual stocks. ETFs provide a way for smaller investors who are not large enough to establish an account and purchase and sell swaps with a swap dealer to invest in commodity indexes. One investment analyst explains:

“At the most basic level, ETFs are just what their name implies: baskets of securities that are traded, like individual stocks, on an exchange. ... Unlike regulated open-end mutual funds, ETFs can be bought and sold throughout the trading day. They can also be sold short and bought on margin—in brief, anything you might do with a stock, you can do with an ETF.”<sup>138</sup>

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<sup>136</sup> Due to the arbitrage mechanism used to ensure that ETF values track commodity index values, the net asset value of the ETF may not always equal the value of the ETF trading on the exchange. Only large, authorized institutions—usually termed “Authorized Participants”—are permitted to purchase blocks of shares directly from an ETF issuer. Authorized Participants that redeem blocks of shares from the ETF must obtain the actual underlying assets—either futures contracts or, in some cases, securities – and deposit them with the ETF. Authorized Participants then offer their shares to retail investors through a stock exchange. Unlike the Authorized Participants, retail investors cannot obtain or sell the underlying assets, but can only buy or sell their shares in the fund through a broker in the secondary market on a stock exchange.

The Prospectus for a Deutsche Bank commodity ETF describes how this process works:

“The Shares of the Fund trade on the Amex like any other equity security.

“Baskets of Shares may be created or redeemed only by Authorized Participants. It is expected that Baskets will be created when there is sufficient demand for Shares that the market price per Share is at a premium to the net asset value per Share. Authorized Participants will then sell such Shares, which are listed on the Amex, to the public at prices that are expected to reflect, among other factors, the trading price of the Shares on the Amex and the supply of and demand for Shares at the time of sale and are expected to reflect, among other factors, the trading prices of the Shares on the Amex and the supply of and demand for Shares at the time of sale and are expected to fall between net asset value and the trading price of the Shares on the Amex at the time of sale. Similarly, it is expected that Baskets will be redeemed when the market price per Share is at a discount to the net asset value per Share. Retail investors seeking to purchase or sell Shares on any day are expected to effect such transactions in the secondary market, on the Amex, at the market price per Share, rather than in connection with the creation or redemption of Baskets.”

PowerShares DB Commodity Index Tracking Fund, Prospectus dated May 1, 2008, at p. 1.

<sup>137</sup> For a summary of the advantages and disadvantages of ETFs, see Christopher J. Traubsen, Exchange-Traded Funds: What You Should Know, Morningstar Commentary, at [http://news.morningstar.com/article.aspx?id=3503&\\_QSBPA=Y&dType=etf](http://news.morningstar.com/article.aspx?id=3503&_QSBPA=Y&dType=etf).

<sup>138</sup> Christopher J. Traubsen, Exchange-Traded Funds: What You Should Know, Morningstar Commentary, at [http://news.morningstar.com/article.aspx?id=3503&\\_QSBPA=Y&dType=etf](http://news.morningstar.com/article.aspx?id=3503&_QSBPA=Y&dType=etf).

To provide value to their shares, commodity-based ETFs hold the various futures contracts whose values are used to compute the index value. These ETFs typically hold a basket of futures contracts of commodities in proportion to the weighting of the commodities- in the calculation of the index. As investments in the fund increase, the ETF typically will obtain additional commodity future contracts to support the investments; as investments in the fund decrease, the number of commodity futures contracts held in the ETF typically decrease.<sup>139</sup>

The first ETF based on a commodity index was offered in 2006.<sup>140</sup> Since then many types of commodity ETFs have been created and marketed. “‘Whatever opinion you have about anything, there’s an E.T.F. for it,’ said Michael Metz, chief investment strategist at Oppenheimer & Company. ‘Everything is subject to gambling and speculation.’”<sup>141</sup> Several commodity ETFs track the broadly used commodity indexes, others track the sub-indexes, and some are even based upon the value of futures contracts for a single commodity. Single-commodity ETFs risk much more volatility than an ETF based on a broad basket of commodities.<sup>142</sup>

**Exchange Traded Notes.** A third commodity-based instrument involves exchange-traded notes (ETNs). Commodity-based ETNs are designed and sold by banks and other financial institutions to permit retail investors to purchase shares of a debt security whose price is linked to that of a commodity index. Upon maturation of the note, the issuer of the ETN promises to pay the holder of each share of the note the value of a specified commodity index.

Retail investors can buy and sell shares in ETN notes on secondary markets, in the same manner as stocks traded on a stock exchange. Most commodity ETNs are traded on the NYSE Alternext exchange (formerly the American Stock Exchange).

ETNs offer certain advantages over ETFs. ETN share values exactly track the value of the underlying commodity index, and there may be tax advantages to these instruments compared to swaps or ETF shares.<sup>143</sup> On the other hand, there also are disadvantages. Most

<sup>139</sup> An Authorized Participant that wishes to create a basket of shares for sale to retail investors must purchase the appropriate number of commodity futures contracts and deposit them with the ETF in return for the additional basket of shares. In theory, the purchase of these futures contracts will cause the price of the commodity index to rise, while the sale of additional shares will cause the value of the shares on the exchange to fall, until they are once again in equilibrium. This arbitrage process theoretically works in a similar manner when investors want to sell their shares of the ETF on the exchange.

<sup>140</sup> John Spence, *Commodities ETF breaks new ground, Use of derivatives signals major shift for industry*, MarketWatch, February 6, 2006.

<sup>141</sup> J. Alex Tarquino, *Many Roads to Commodities, Through E.T.F.’s*, New York Times, October 7, 2007.

<sup>142</sup> “Unless you think that we’re going back to the 16th-century spice trade, you should not be speculating on individual commodities.” J. Alex Tarquino, *A New Way to Play in Commodities*, New York Times, July 13, 2008 (remarks of Gary Schatsky).

<sup>143</sup> See, e.g., Seeking Alpha, *The ETN Market Heats Up With Goldman Launch; More On the Way*, August 6, 2007, at <http://seekingalpha.com/article/43585-the-etn-market-heats-up-with-goldman-launch-more-on-the-way>.

prominently, ETNs expose investors to the credit risk of the ETN issuer. If the issuer of the note goes bankrupt, then the ETN shares held by institutional and retail investors could lose all their value.<sup>144</sup>

The issuer of an ETN typically uses proceeds from the sale of shares to investors to make actual purchases of the futures contracts whose values are used to compute the index value to which the note is linked. As with exchange traded funds, the ETN issuer typically constructs a basket of futures contracts to reflect the weighting of the commodities in the index. The issuer then relies on this commodity basket to hedge its exposure to the ETN shareholders for the value of the index. ETN issuers who purchase futures contracts, like swap dealers, create additional demand for the futures contracts in the relevant index and so may affect futures prices.

ETNs have gained in popularity over the past few years, but still hold a relatively small share of the market as compared to ETFs. One financial analyst reports: “As of 2008, there were close to 100 ETNs available to investors. Assets under management were more than \$6 billion, compared to \$600 billion for ETFs.”<sup>145</sup>

Table 6 lists the largest commodity-based ETFs and ETNs, based on total assets. Each of these funds had at least \$100 million in assets as of April 2009. Although the largest commodity ETFs have substantial assets, the aggregate amount of investments in commodity-based ETFs and ETNs represents a small fraction of the total investments in index-related instruments, which continue to be made primarily through commodity index swaps.

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<sup>144</sup> Following the bankruptcy of Lehman Brothers in September 2008, for example, the NYSE Alternext exchange removed all of the ETNs issued by Lehman Brothers from listing on the exchange. NYSE Euronext News Release, October 21, 2008, at <http://www.nyse.com/press/1223288675336.html>.

<sup>145</sup> These figures represent the total value of investments in equity-based and commodity-based ETFs and ETNs. Larry MacDonald, ETN Credit Risk May Outweigh Benefits For Some, Investopedia.com, at <http://investopedia.com/printable.asp?a=/articles/bonds/08/credit-risk-exchange-traded-note.asp>.

### Largest Commodity ETFs and ETNs (as of April 30, 2009)

Name	Symbol	Incep. Date	Assets (millions)	Returns (%)		
				2007	2008	Total
United States Oil	USO	4/10/06	2,929.40	46.82	-56.31	-27.33
DB Commodity Index	DBC	2/3/06	1,924.60	31.50	-31.73	-5.28
PowerShares DB Agriculture	DBA	1/5/07	1,748.80	N/A	-19.24	-1.22
United States Natural Gas	UNG	4/18/07	1,140.50	N/A	-36.08	-43.78
iPath DJ-AIG Commodity	DJP	6/6/06	929.00	14.90	-37.42	-15.21
iShares GSCI Commodity Id	GSG	7/10/06	782.80	31.62	-45.75	-23.75
iPath GS CrOil TR Idx ETN	OIL	8/15/06	664.10	47.53	-58.56	-33.73
PowerShares DB Oil Fund	DBO	12/06/07	194.90	N/A	-44.06	-11.00
ELEMENTS Rogers Agric ETN	RJA	10/17/07	193.80	N/A	-31.66	-25.53
ELEMENTS Rogers TR ETN	RJI	10/17/07	175.80	N/A	-42.43	-33.97
United States 12 Month Oil Fd	USL	12/06/07	162.00	N/A	-44.68	-39.82

**Table 6.** Prepared by U.S. Senate Permanent Subcommittee on Investigations, April 2009

Data Source: Indexuniverse.com, Data, at

<http://www.indexuniverse.com/sections/data.html?task=showResults>.

#### D. Types of Commodity Index Returns

In general, financial instruments linked to a commodity index can offer an investor up to three possible sources of return: the spot return, the roll return, and the collateral return.<sup>146</sup> Commodity index swaps, ETFs, and ETNs typically offer investors either a spot return plus a roll return (termed the “Excess Return”), or all three returns—the spot return plus the roll return plus the collateral return (termed the “Total Return”).<sup>147</sup>

**Spot Return.** The spot return is the most straightforward. This return is derived from changes in the spot market prices of the commodities included in an index.

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<sup>146</sup> See, e.g., Claude R. Erb and Campbell R. Harvey, *The Tactical and Strategic Value of Commodity Futures*, January 12, 2006.

<sup>147</sup> See, e.g., Standard & Poor’s, *S&P GSCI, Highlights and Definitions*, May 2007.

**Roll Return.** The roll return is derived from the periodic sale of futures contracts nearing expiration and the simultaneous purchase of futures contracts bearing more distant expiration dates (the roll). The return is the difference between the price of the futures contract being sold and the price of the futures contract being purchased. When the price of the futures contract being sold is less than the price of the futures contract being purchased (i.e., when the futures market is a carry market or in contango), the roll return will be negative. When the price of the futures contract being sold is greater than the price of the futures contract being purchased (an inverse or backwardated market), the roll return will be positive.

**Collateral Return.** The collateral return is the amount of interest earned on the amount of any collateral required for the purchase of a commodity index swap, ETF, or ETN. With respect to commodity index swaps, swap dealers usually require investors to fully collateralize their purchase. The investor purchasing a swap typically must deposit the full purchase price of

the underlying commodity futures with the swap dealer. The swap dealer then invests this collateral, which essentially functions as a margin deposit. Swap dealers typically invest the collateral funds in low-risk Treasury bills or bonds, which earn interest. When the swap is terminated, the swap dealer pays the amount of interest earned to the investor as part of the return payment on the swap. The interest payment arising from the investment of the collateral is termed the “collateral yield” or “collateral return.”<sup>148</sup>

Some ETNs and ETFs also provide a collateral return, since they may also require the purchasers of their shares to provide a deposit equal to the price of the commodity futures contracts included in the index and

reflected in their shares.

As discussed below, over the past several decades the spot returns from commodity indexes have been relatively small. Because a “Spot Return” index will pay the investor a return solely based upon the change in the spot price of the commodity, there is not much interest in investing in an index that pays only a spot return. All of the major commodity index instruments today provide either Excess Returns (spot return plus roll return) or Total Returns (spot return, plus roll return, plus collateral return).

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<sup>148</sup> See, e.g., Standard & Poor’s, *Investing with the S&P GSCI Commodity Indices*, June 21, 2007 (powerpoint presentation).

## E. Commodity Index Rationale and Marketing

*“More importantly, we believe commodities offer an inherent or natural return that is not conditioned on skill.”*

--Ibbotson Associates, 2006.<sup>149</sup>

*“Bottom line, forward looking expected returns for commodity futures (as well as for stocks, bonds, hedge funds, anything) are just bets.”*

--Claude Erb and Campell Harvey, 2006.<sup>150</sup>

### 1. The Marketing of Commodity Index Instruments

Beginning about ten years ago, a number of influential articles in financial journals asserted that there were significant benefits to investing in commodity indexes. A number of financial institutions also began to aggressively market these types of instruments. These articles and marketing presentations claimed commodity index instruments would help diversify a traditional portfolio of stocks and bonds, and that commodities offered protection against unexpected increases in the rate of inflation, a benefit that is not typically provided by stocks and bonds.<sup>151</sup> Additional arguments were that the price of commodities would rise as the global economy expanded and the demand for commodities increased.

In 2000, Robert J. Greer, one of the early proponents of investing in commodity indexes, wrote: “In addition to providing exposure to unexpected changes in inflation, commodity indexes may provide exposure to long-term growth in world demand that may also result in an increasing demand and prices for certain commodity products.”<sup>152</sup> Greer also identified the negative correlation between commodity index returns and the returns from stocks and bonds as a key benefit of adding a diversified commodity index to a diversified portfolio.

In 2004, Professors Gary Gorton of the University of Pennsylvania and K. Geert Rouwenhorst of the Yale School of Management published what would become an oft-cited analysis showing how an investment in a broadly diversified commodity index would have

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<sup>149</sup> Ibbotson Associates (commissioned by PIMCO), *Strategic Asset Allocation and Commodities*, March 27, 2006, at p. 4.

<sup>150</sup> Claude R. Erb and Campbell R. Harvey, *The Tactical and Strategic Value of Commodity Futures*, January 12, 2006, at p. 46.

<sup>151</sup> See, e.g., Greer, *The Nature of Commodity Index Returns*, The Journal of Alternative Investments, Summer 2000, at pp. 45-53; Ibbotson Associates (Commissioned by PIMCO), *Strategic Asset Allocation and Commodities*, March 27, 2006; Vanguard, *Understanding Alternative Investments: The Role of Commodities in a Portfolio*, Vanguard Investment Counseling & Research, August 2007; Goldman Sachs, *The Case for Commodities as an Asset Class* (powerpoint presentation), June 2004.

<sup>152</sup> Greer, at p. 45.

brought positive returns over the 45-year period from 1959 to 2004. Gorton and Rouwenhorst found:

“Fully-collateralized commodity futures have historically offered the same return [for the same level of risk] as equities. While the risk premium on commodity futures is essentially the same as equities, commodity futures returns are negatively correlated with equity returns and bond returns. ... In addition, commodity futures are positively correlated with inflation, unexpected inflation, and changes in expected inflation.”<sup>153</sup>

Gorton and Rouwenhorst pointed out that the returns from an investment in a basket of commodity futures would not result from an increase in the spot prices of the commodities, but rather from the structure of the futures market and the benefits of diversification.<sup>154</sup> Discussing the benefits of diversification provided by adding commodity index instruments to a portfolio of stocks and bonds, Gorton and Rouwenhorst wrote: “It seems that the diversification benefits of Commodity Futures work well when they are needed most. Consistent with a negative correlation, Commodity Futures earn above average returns when stocks earn below average returns.”<sup>155</sup>

Gorton and Rouwenhorst analyzed how a number of individual commodities included in the Goldman Sachs Commodity Index (GSCI) performed between 1959 and 2004.<sup>156</sup> Figure 19 presents this data, in order of descending return. Wheat and corn provided the lowest returns of all the commodities studied.

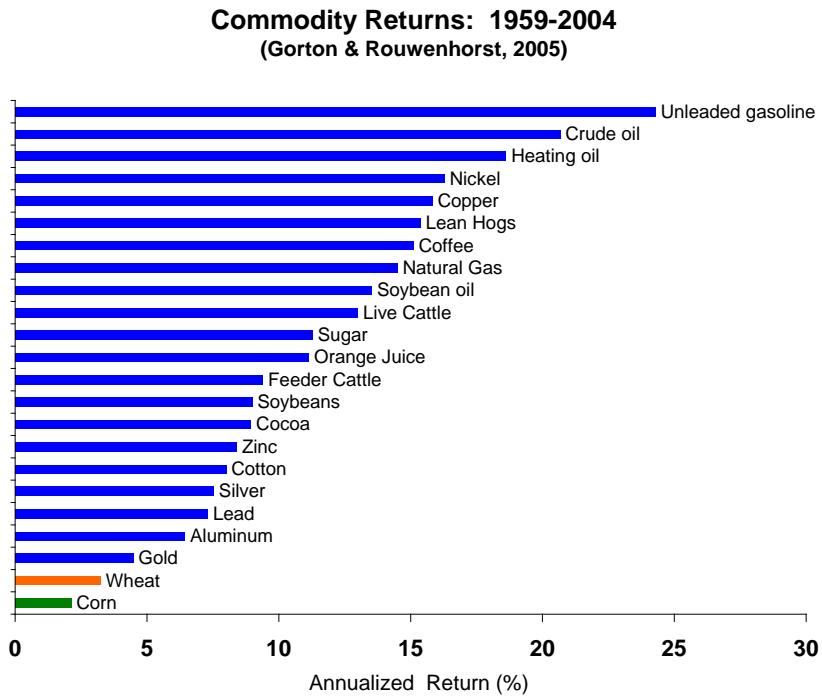
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<sup>153</sup> Gary Gorton & K. Geert Rouwenhorst, *Facts and Fantasies About Commodity Futures*, Yale International Center for Finance, Yale ICF Working Paper No. 04-20, February 28, 2005, at p. 1.

<sup>154</sup> The authors contended that because the futures market reflected expectations about future spot prices, “expected movements in the spot price are not a source of return to an investor in futures. ... Unexpected deviations from the expected future spot price are by definition unpredictable, and should average out to zero over time for an investor in futures, unless the investor has an ability to time the market.” *Id.*, at p. 3. The returns from an investment in futures, they stated, comes from an inherent “risk premium” that exists in the futures market that hedgers must pay to speculators in order for speculators to assume price risks from the hedgers. They cite Keynes’s theory of “normal backwardation,” despite the acknowledged “lack of success” in finding empirical evidence for any such inherent risk premium in the futures market. *Id.*, at p. 4.

<sup>155</sup> *Id.*, at p. 14.

<sup>156</sup> For commodities that were not traded during the entire period, data was used for as long as it was available.



**Figure 21.** Gorton & Rouwenhorst's calculations of annualized monthly arithmetic commodity returns for commodities in the GSCI. Data source: *Facts and Fantasies About Commodity Futures*, Appendix 3.

Although commodity indexes had been in existence for a number of years, prior to the early 2000s, there was a relatively small amount of speculation tied to these indexes.<sup>157</sup> In the early 2000s, however, after the collapse of the internet bubble in the stock market and as the price of oil and other energy commodities began a steep rise, investors began to look to commodities as an alternative investment. The Gorton and Rouwenhorst paper was influential in establishing commodity indexes as an additional way for hedge funds, pension funds, and other institutional investors to diversify their portfolios and benefit from the rising prices of oil and other commodities.

During the mid-2000s, a number of financial institutions—many of whom had created indexes or sold products related to those indexes—made strong recommendations for investors to purchase commodity index instruments. For example, Goldman Sachs, creator of the GSCI, stated: “GS recommends a permanent strategic holding in commodities as a ‘separate asset class’ to hedge macroeconomic risk, decrease expected portfolio risk and increase expected portfolio returns.”<sup>158</sup> Goldman Sachs listed the following benefits of investing in GSCI:

<sup>157</sup> Goldman Sachs, *The Case for Commodities as an Asset Class*, at p. 2.

<sup>158</sup> Goldman Sachs, *The Case for Commodities as an Asset Class*, at p. 10.

- “Commodities are significantly negatively correlated with both Bonds and Equities. ...”
- The GSCI historically has had high equity-like returns (12.24% per annum since 1970 as of May 31, 2004).
- Commodities perform best when other assets perform worst. ...”
- The GSCI provides a hedge against rising inflation. ...”<sup>159</sup>

Alternative Investment Analytics, a consultant to Prudential Bache Commodities which constructed and publishes the Bache Commodity Index (BCI), made similar claims for purchasing commodity indexes:

- “Certain real assets, such as the BCI commodity index, may serve as a hedge against inflation risk.
- Exposure to commodities adds meaningful risk reduction and return enhancement. For the real asset portfolios considered, the BCI typically demanded a 10-25% allocation.
- Commodities exposure via a passive futures based index has the additional virtue that is perhaps the most liquid of real assets, with the possible exception of TIPS [Treasury Inflation-Protected Securities].”<sup>160</sup>

In 2006, a study commissioned by PIMCO on the performance of commodity indexes stated: “Our historical analysis supports the claims that commodities have low correlations to traditional stocks and bonds, produce high returns, hedge against inflation, and provide diversification through superior returns when they are needed most.”<sup>161</sup> The PIMCO study was extremely enthusiastic about these types of investments, going so far to suggest it required absolutely no skill to benefit from commodity indexes:

“More importantly, we believe commodities offer an inherent or natural return that is not conditioned on skill. Coupling this with the fact that commodities are the basic ingredients that build society, we believe commodities are a unique asset class and should be treated as such.”<sup>162</sup>

As a result of these articles, presentations, and soaring commodity prices, the total value of commodity index funds grew exponentially. One market analyst estimated that the total value of investments in commodity index funds “jumped from \$15 billion in 2003 to \$56 billion in

<sup>159</sup> Goldman Sachs, *The Case for Commodities as an Asset Class*, at p. 10.

<sup>160</sup> Alternative Investment Analytics, Real Assets in Institutional Portfolios: The Role of Commodities, Current Update: December 10, 2007, at p. 11.

<sup>161</sup> PIMCO study, at p. ii.

<sup>162</sup> PIMCO study, at p. 4.

2004 and on to \$80 billion” in 2006.<sup>163</sup> As of mid-2008, the CFTC has estimated that the total value of commodity index investments had reached \$200 billion.

## **2. Critical Analyses of Index Instruments**

Not all market analysts were so enthusiastic. In 2006, a number of articles appeared that took issue with the assertion that buying and holding commodity index instruments provided superior returns and benefits. These articles indicated that purchases of commodity index instruments were, in essence, speculative bets on the structure of the commodities futures markets rather than a risk-free technique for portfolio diversification.

The issues raised in these analyses, along with declines in the performance of many commodity indexes in 2005 and 2006, led a number of financial institutions to devise new indexes. Whereas earlier, or first-generation, commodity indexes typically relied on the second month futures contract to calculate the index, these later indexes generally began to use longer dated futures contracts.

Since 2006, these second-generation commodity indexes have become increasingly popular. Although there is no publicly available data on the relative amounts held in instruments linked to second-generation and first-generation indexes, persons interviewed by the Subcommittee estimated that virtually all new commodity index investments are now placed in second-generation index instruments, and that, in the aggregate, investments in second generation indexes now represent more than half of all commodity index investments.

The shift into second-generation indexes is significant for the futures markets for several reasons. First, it means that instead of hedging their swap exposures with purchases of second month futures contracts, many swap dealers now need to hedge their commodity index swap sales with purchases of futures contracts whose expiration dates are more distant in time. Secondly, commodity index rolls now require sales and purchases of futures contracts that are farther apart in time, as opposed to just between the first and second month contracts used in most first-generation indexes. These changes mean that the effect of commodity index trading on the futures markets is not limited to the first two futures contracts, but now extends months longer to futures contracts that are much farther from expiration.

One of the first major analyses challenging the rosy view of the performance of commodity indexes was published in January 2006, by Claude Erb and Campbell Harvey. Erb and Harvey analyzed the returns from the commodities used to support the 2004 Gorton and

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<sup>163</sup> Philip Verleger, *Commodity Investors: A Stabilizing Force?*, The Petroleum Economics Monthly, March, 2006. This and other estimates of a similar magnitude reflect both the growth in actual amounts invested in commodity indexes and the appreciation in value of those investments due to increasing commodity prices.

Rouwenhorst analysis.<sup>164</sup> Erb and Harvey found that an investment in any of these commodity futures did not provide a return greater than the rate of inflation. They wrote: “[T]he average return of the average commodity futures was not statistically different from zero.”<sup>165</sup> Erb and Harvey concluded that although the large returns cited by Gorton and Rouwenhorst were real, they did not result from any significant appreciation in the price of the commodities within the index, but rather the returns resulted from the periodic rebalancing of the commodity futures within the index and from the fact that the performance of these individual commodity futures contracts were uncorrelated with each other.<sup>166</sup>

The Erb and Harvey analysis found that, from 1982 to 2004, agricultural commodities and precious metals were the worst performing commodity sectors, while energy was the best performing sector. Wheat, corn, gold, and silver all had negative returns.<sup>167</sup> The returns computed by Erb and Harvey are shown in Figure 22.

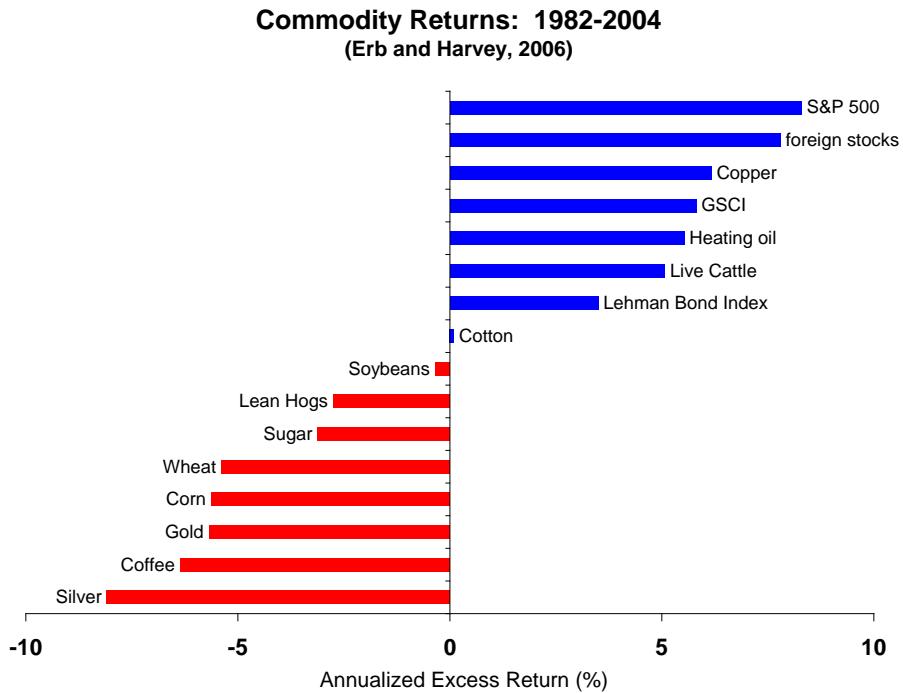
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<sup>164</sup> Claude R. Erb and Campbell R. Harvey, The Tactical and Strategic Value of Commodity Futures, January 12, 2006. Erb and Harvey’s paper referenced and expanded upon previous research into the nature of commodity index and commodity futures returns. See, e.g., Hilary Till, *Two Types of Systematic Returns Available in the Commodity Futures Markets*, Commodities Now, September 2000, and references cited therein.

<sup>165</sup> *Id.*, at p. 4.

<sup>166</sup> Having uncorrelated commodity futures provides a so-called “diversification return” that does not boost the return of an individual commodity, but rather the portfolio as a whole. “Campbell (2000) calls portfolio diversification the one ‘free lunch’ in finance because it allows an investor to reduce a portfolio’s standard deviation of return without reducing the portfolio’s arithmetic return.” *Id.*, at p. 36.

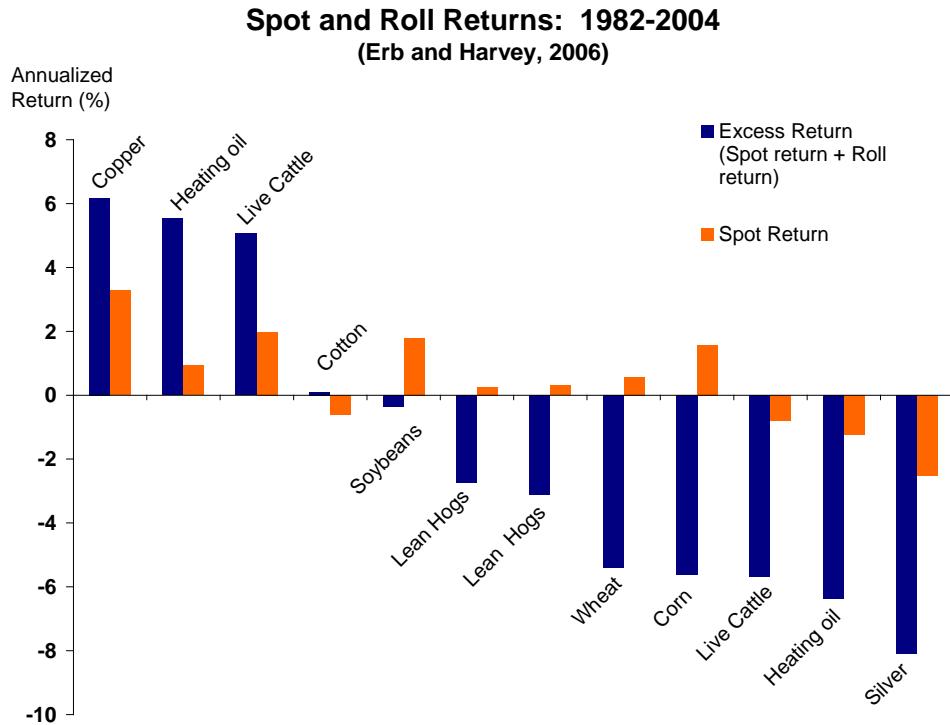
<sup>167</sup> Erb and Harvey represented returns in terms of the excess returns, i.e., the returns over the risk-free rate of return.



**Figure 22.** Annualized excess returns (geometric mean) for selected commodities in the GSCI and various benchmarks. Data source: Erb and Harvey, at p. 15.

After examining why these commodities performed differently over the time period studied, Erb and Harvey found that one of the key factors determining the performance of a commodity within the index was the structure of the market—specifically, whether the futures contracts further from expiration were priced higher than the futures prices nearer expiration (a carry market or contango) or lower than the futures prices nearer expiration (an inverse market or backwardation). As previously explained, the roll return from an index-related investment will be negative in a carry or contango market and will be positive in an inverse or backwardated market.

Figure 23 shows how both the roll return and spot return contributed to the performance of the commodities studied by Erb and Harvey. The data shows that the roll return was the primary determinant of returns, or lack of returns, for all of the commodities studied. For grains in particular—wheat and corn—the small positive spot returns were swamped by large negative roll returns. In other words, despite gains in the price of these commodities, investments in these commodities produced significant losses due to the need to regularly sell the expiring first month futures contracts and purchase more expensive second month futures contracts. This data demonstrates the significance of the roll return and structure of the commodity futures market for long-term investments in commodity futures contracts or index-related instruments.



**Figure 23.** Spot and roll returns for selected commodities. Returns reflect annualized returns (geometric mean). Data source: Erb and Harvey, p. 15.

Erb and Harvey cautioned that commodity prices in the past could not be relied upon to predict future price trends. “In reality, investors do not know what the average term structure of prices will look like in the future. As a result, knowing that roll returns have been an important driver of past returns provides no insight as to the future level of roll returns.”<sup>168</sup> This view stands in direct contrast to other analyses, such as the PIMCO study, that contend commodity indexes offer “an inherent or natural return that is not conditioned on skill.” “Bottom line,” Erb and Harvey wrote, “forward looking expected returns for commodity futures (as well as for stocks, bonds, hedge funds, anything) are just bets. The commodity futures bet has one really high confidence element, the diversification return, and two very uncertain elements, spot and roll returns.”<sup>169</sup>

Independently, another study released in early 2006, by economists Barry Feldman and Hilary Till, arrived at a similar conclusion. Feldman and Till examined how an instrument linked to a commodity index based on wheat, corn, and soybeans futures contracts would have

<sup>168</sup> Erb and Harvey, p. 25.

<sup>169</sup> *Id.*, at p. 46.

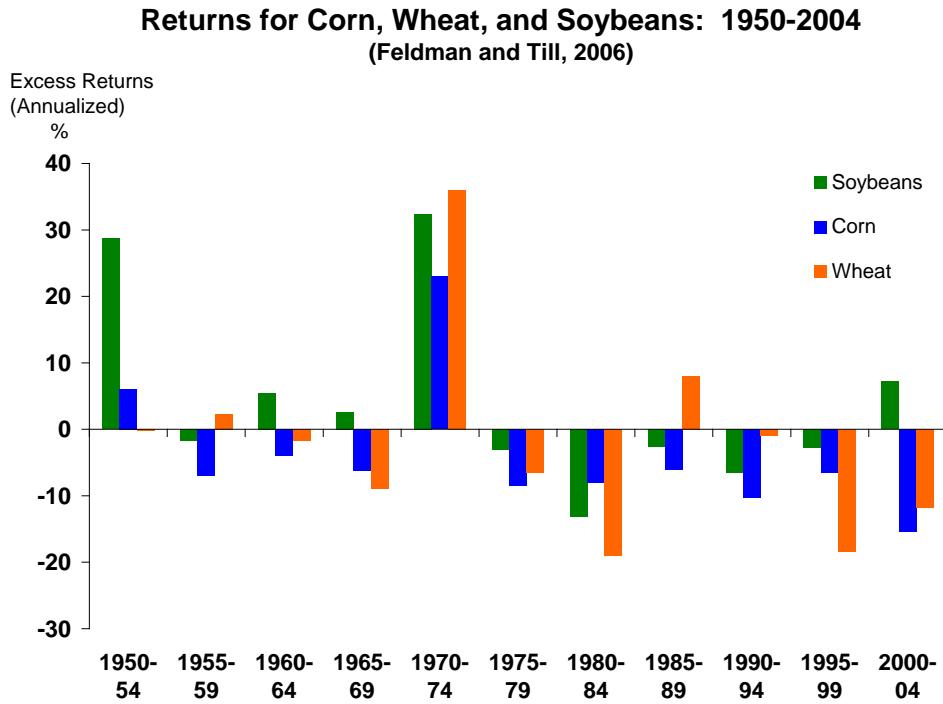
fared over a much longer period of time, from 1950 to 2004.<sup>170</sup> Figure 24 presents this data on the commodity index returns in each 5-year window within this 54-year period. The majority of returns for these commodities during the 5-year intervals within this period were negative.<sup>171</sup> Only during one five-year period from 1970-74, a time when many agriculture commodity prices spiked higher due to a confluence of extraordinary geopolitical and market conditions, did all three commodities provide large positive returns.<sup>172</sup> Like Erb and Harvey, Feldman and Till found that, for most of the 54 years, the negative roll returns overwhelmed the positive appreciation in wheat and corn prices.

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<sup>170</sup> Barry Feldman and Hilary Till, *Separating the Wheat from the Chaff: Backwardation as the Long-Term Driver of Commodity Futures Performance; Evidence from Soy, Corn and Wheat Futures from 1950 to 2004*, EDHEC Risk and Asset Management Research Centre, March 2006.

<sup>171</sup> For the entire period, the annualized excess return for corn was -4.35% and for wheat was -2.91%, compared to a positive annualized return for the S&P 500 of 6.80%. Soybeans managed to show an overall return of 3.41%, largely due to the returns for soybeans provided from just two of these five-year periods, 1950-54 and 1970-74. *Id.*, at p. 11.

<sup>172</sup> A number of factors led to the rapid and general increase in agricultural commodity prices in the early 1970s. Adverse weather conditions reduced the yields in major grain-producing countries, including the United States, Australia, Canada, and the Soviet Union. In 1972 the Soviet Union turned to the U.S. and other world markets to make up for a significant decline in their domestic wheat production. Increased demand for grain by the Soviets and other communist countries resulted in a 29 percent increase in global exports of grain between 1971 and 1972. The U.S. abandoned the gold standard in 1971 and the subsequent depreciation of the value of the U.S. dollar also boosted the demand for exports. Demand for soybean meal as a source of high-protein feedstock soared after the failure of the Peruvian anchovy catch, and soybean prices skyrocketed in 1973 and 1974. The stocks of surplus grain in the U.S. and other grain-producing countries had fallen due to the phase-out of various subsidies in the late 1960s. After this period prices did not return to their previous levels. See May Peters, Suchada Langley, Paul Westcott, *Agricultural Commodity Price Spikes in the 1970s and 1990s, Valuable Lessons for Today*, USDA Economic Research Service, Amber Waves, March 2009.

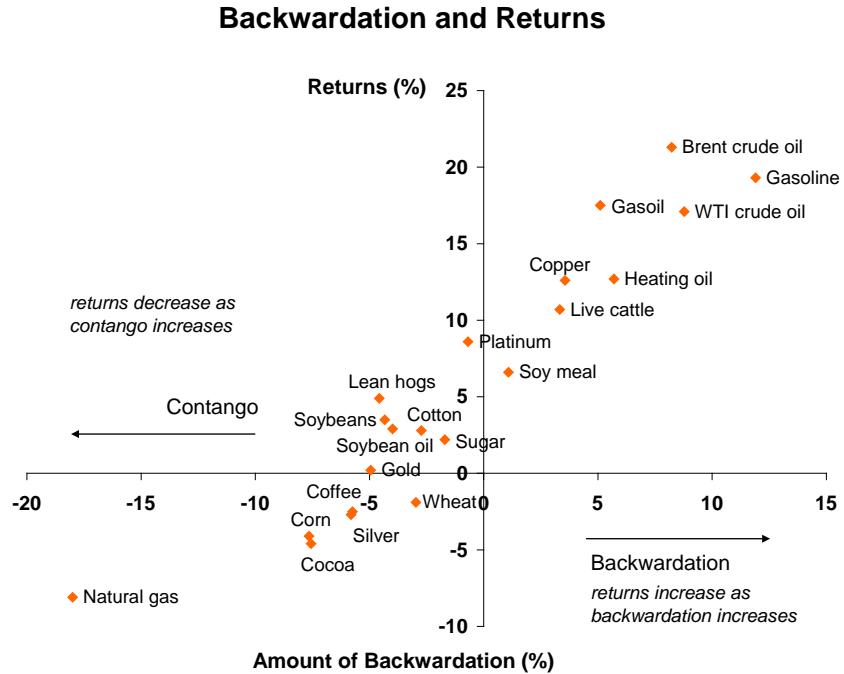


**Figure 24.** Excess returns (spot + roll) for wheat, corn, and soybeans over 5-year periods from 1950-2004. Data source: Feldman and Till (2006), at pp. 33-34.

The negative roll returns, Feldman and Till wrote, were primarily due to the structure of the agriculture futures markets over the 54-year period—specifically, that successive futures contracts tend to increase in price (contango) in order to provide a financial incentive to store the commodity over time. Wheat and corn, Feldman and Till found, “are consistently in contango,” and therefore provided negative returns over the period.<sup>173</sup>

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<sup>173</sup> With respect to the length of time required for the roll return to predominate, Till found the roll yield explained 25% of the variation in futures returns over 1-year time horizons, 40% of the variation over 2-year time horizons, 67% of the variation over a 5-year time horizon, and 73% of the variation over an 8-year horizon. *Id.*, at p. 15. See also, Barry Feldman and Hilary Till, *Backwardation and Commodity Futures Performance: Evidence from Evolving Agricultural Markets*, The Journal of Alternative Investment, Winter 2000; Hilary Till, *Trading strategies, commodity risk*, May 2007.



**Figure 25.** The degree of backwardation is the most important factor determining returns over long time periods. Source: Morgan Stanley, 2005.

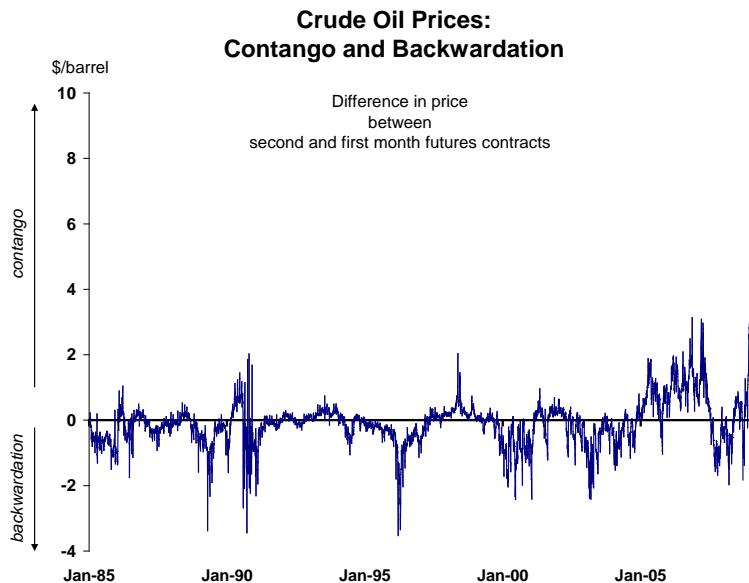
In a related study released in April 2006, Till extended these findings to all commodities. “Over very long timeframes a number of authors have shown how the term structure of a commodity futures curve has been the dominant driver of returns in futures investing. In other words, trends in the spot price of a commodity generally have *not* been a meaningful driver of returns over long periods of time.”<sup>174</sup> These results are shown in Figure 25, which reflects data from Till’s paper.<sup>175</sup> A recent commentary by Standard & Poor’s sums up this body of research

<sup>174</sup> Hilary Till, *Structural Sources of Return and Risk in Commodity Futures Investments*, EDHEC Risk and Asset Management Research Centre, April 2006, at p. 7 (emphasis in original).

<sup>175</sup> The data used in Figure 25 is from a presentation by Nash and Strayer of Morgan Stanley, which was also reproduced in Till’s paper. Morgan Stanley, IQPC, Investing in Commodities, May 2005, at p. 2, 4. Morgan Stanley analyzed the performance of these commodities over two different time periods, a 10-year period from 1994 to 2004, and a 21-year period from 1984 to 2004. The results were similar, finding that spot price changes over both time frames had “very little effect” on the overall performance of the commodities in the index. The Morgan Stanley analysis also concluded that the extent to which prices fell over time (backwardation) in the futures market was the main factor that determined the amount of returns: “The persistence of backwardation is a driver for commodity returns.” For the period from April 1984 to September 2004, they found the correlation between backwardation and returns was 0.94 ( $R^2=0.88$ ), demonstrating a strong statistical relationship.

succinctly: “In commodity indexing, it is important to remember two key things, contango is bad and backwardation is good.”<sup>176</sup>

The importance of the structure of the futures market on commodity index returns became apparent to many in late 2006. In 2004, the structure of the futures market for crude oil—the most heavily weighted commodity in most indexes—changed. The price of longer-term futures contracts rose from below the price of shorter-term futures contracts (backwardation) to where they were now above the price of the shorter-term futures contracts (contango). By 2006, the price of the second month futures contract was consistently more than \$1 per barrel greater than the price of the first month futures contract, which was an unprecedented degree of contango.<sup>177</sup> (Figure 26).



**Figure 26.** A high degree of contango has characterized the crude oil futures market since 2004. Data source: Energy Information Administration.

This change in the structure of the oil futures market had a devastating effect on the returns of the broad-based commodity indexes during 2006. The return on the DJ-AIG energy sub-index, for example, fell from a positive 42% in 2005, to a negative 41% in 2006, and helped

<sup>176</sup> Standard & Poor’s, Commodity Perspective, S&P GSCI, February 2009, at p. 2.

<sup>177</sup> At the same time prices were rising, inventories were full. The Subcommittee released a 2006 report, *The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat*, which concluded that the anomalous situation of high prices despite high inventories was the result of the large influx of index-related investments into the futures markets, which increased the price of more distant contracts relative to the nearer ones. “The large influx of speculative investment into oil futures has led to a situation where we have high crude oil prices despite high levels of oil in inventory.” *Id.*, at p. 3.

drag down the overall performance of the broad-based DJ-AIG commodity index from a positive 21% in 2005, to a paltry 2% in 2006, despite overall rising oil prices.<sup>178</sup>

The large losses caused by increasing oil futures prices led some analysts to openly ridicule commodity index investments. For example, in a 2006 posting on his “Efficient Frontier” website, analyst William J. Bernstein observed that the huge popularity of commodity index investments as protection against inflation had, in effect, undermined the ability of the market to provide that protection.<sup>179</sup> Bernstein argued that the commodity markets were no longer dominated by hedgers, but rather by speculators. He contended that, in such a market, it was unrealistic to expect to earn a premium from long-term futures when everyone was trying to do the same: “Nothing makes a premium disappear faster than tout le monde chasing after it.”<sup>180</sup> Bernstein left his readers with the following advice: “The next time someone tries to sell you a commodities fund based on the Goldman Sachs Commodities Index, smile and say, ‘Sorry, but I’m from Earth, and you’re from planet *I Love Lucy*. Let’s revisit this discussion in an alternate universe.’”<sup>181</sup>

To counteract the losses from the monthly roll of contracts that result from a futures market that is in contango, various financial institutions developed second-generation commodity indexes and strategies to minimize the potential losses from the roll. Generally, these second-generation indexes and strategies replaced the second month futures contracts used to compute the value of the index with more distant futures contracts so that they would have to roll them less frequently. Some index providers also constructed a roll methodology that selected the futures contract to be included based upon a mathematical calculation as to which futures contract would provide the best roll return.

Deutsche Bank was one of the first institutions to offer a second-generation commodity index.<sup>182</sup> It explained that the negative roll return from the oil market was the primary reason for the new index:

<sup>178</sup> The natural gas, livestock, and metals sub-indexes also had negative returns in 2006. Dow Jones-AIG Commodity Indexes, Periodic table of returns, at [http://www.djindexes.com/mdsidx/downloads/aig/AIG\\_Comm\\_Per\\_table.pdf](http://www.djindexes.com/mdsidx/downloads/aig/AIG_Comm_Per_table.pdf).

<sup>179</sup> William J. Bernstein, On Stuff, Efficient Frontier, September 2006, at <http://www.efficientfrontier.com/ef/0adhoc/stuff.htm>.

<sup>180</sup> *Id.*

<sup>181</sup> Bernstein criticized Gorton and Rouwenhorst for relying on a model of the market in which hedgers outnumbered speculators. According to Bernstein, this model may have reflected the composition of the market several decades ago, but no longer accurately depicted the modern commodities markets, in which the largest traders were hedge funds, institutional investors, and swap dealers. *Id.*

<sup>182</sup> Deutsche Bank, *DBLCI-OY: Technology To Tackle Term Structure Dynamics*, June 2, 2006; *DB Commodity Index Tracking Fund Announces Plans to Fight Contango*, Business Wire, May 24, 2006; Deutsche Bank, DBIQ Index Guide, DBLCI Optimum Yield Commodity Indices, March 6, 2008.

“We have noted for some time that the engine room of performance in a commodity index has traditionally derived from the positive roll yield generated in the energy sector due to the tendency of forward curves in this part of the commodity complex to be downward sloping. However, the appearance of contango in the crude oil term structure over the past two years has meant the benefits of rolling down the curve and a positive roll yield have disappeared and have been replaced by a rolling up the curve and picking up a negative roll yield.”<sup>183</sup>

Deutsche Bank announced that the new index was designed to maximize roll return: “Rather than select the new future based on a pre-defined schedule . . . the index rolls to that future which generates the maximum implied roll yield from the list of tradable futures which expire in the next thirteen months.”

Other financial firms, including Goldman Sachs, Morningstar, Prudential Bache, and UBS-Bloomberg, also developed second-generation commodity indexes designed to avoid potentially negative roll returns. Although they differ in specific roll and contract selection methodologies, they all select longer-dated futures contracts for inclusion within the index, and they all roll less frequently than the traditional indexes.<sup>184</sup>

The increasing amount of speculative investments in second-generation index instruments, which some traders estimate now constitutes more than half of all commodity index investments, has significant implications for the futures markets. Unlike first-generation indexes

<sup>183</sup> DBLCI-OY: Technology To Tackle Term Structure Dynamics.

<sup>184</sup> The Goldman Sachs Enhanced Commodity strategy, for example, rolls into more distant futures contracts for crude oil when oil futures prices climb more quickly (move into a steeper contango). For other commodities, such as natural gas, Chicago wheat, and corn, the strategy claims to target futures contracts for only a few specified months to take advantage of historical and structural futures curves for those commodities. Goldman, Sachs & Co., Prospectus Supplement dated July 27, 2007, GS Connect S&P GSCI Enhanced Commodity Total Return Strategy Index ETN. The Bache Commodity Index (BCI) also holds futures contracts that are of longer maturity than in the traditional indexes. Alternative Investment Analytics, *The Bache Commodity Index; A Factor-Based Approach to Commodity Investment*, AIA Research Report, revised August 2008. The Morningstar Long/Short Commodity Index employs a “momentum based” strategy to select commodity futures based on the recent performance of the commodity, including its futures curve (i.e., the degree of market contango or backwardation). Paul D. Kaplan, *Beyond Beta—Passive Alternatives to Active Commodities Strategies*, Morningstar, 2007. The UBS Bloomberg Constant Maturity Commodity Index (CMCI) allows investors to select the particular commodity sectors and specific maturities of the futures contracts they wish to hold—such as contracts with expiration dates 3 months, 6 months, and between 1 and 3 years into the future. It also promises continuous rolling of these contracts on a daily basis to maintain contracts of these maturities within the portfolio. UBS Bloomberg CMCI Commodity Investments, Presentation of Index, at <http://www.ubs.com/4/investch/cmci/ubs-cmci-i-en.html>.

From the limited performance data of these second-generation index funds that is publicly available, it appears that, like their first generation counterparts, their returns are driven primarily by the energy and metals sectors. At best, agricultural commodities contribute only small additional returns. For grains like wheat and corn, where storage is readily available and increasing futures prices (contango) are persistent, the net spot and roll returns will most likely be negative, even with more complex roll strategies. As long as futures prices are increasing (in contango), the roll return will likely be negative, no matter which futures contracts are selected and no matter which roll strategy is employed.

which generally track the price of second month futures contracts for a commodity, second-generation indexes track more distant futures contracts. Traditionally, there has been a significantly lesser amount of trading in longer-dated contracts than in second month contracts. The impact of speculative investments in second-generation index instruments on the prices of these longer-dated futures contracts is likely to be at least as significant as the impact of first-generation index investments on the prices of second month futures contracts.<sup>185</sup> This impact can be seen in the analysis in Section V, which shows that spreads between longer-dated futures contracts for Chicago wheat have increased.

### **E. Exemptions from Speculative Position Limits for Commodity Index Trading**

The ability of index traders to purchase futures contracts for agricultural commodities has been facilitated by the CFTC's decision not to apply the standard position limits on how many futures contracts that a single trader may hold for agricultural commodities to swap dealers, ETF managers, and ETN issuers.<sup>186</sup> If each swap dealer, ETF manager, and ETN issuer had been restricted to holding no more than the standard limit of 6,500 wheat futures contracts at any given time under the CFTC's existing wheat position limit, for example, it is likely that, together, they would have purchased and held fewer wheat contracts (open interest) on the futures exchanges than they actually did.<sup>187</sup>

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<sup>185</sup> The CFTC Supplemental Commitment of Index Traders Report provides only the total amount of open interest across all futures contracts for a particular commodity from index trading; it does not provide data on which particular future contracts are held. Such a breakdown would provide valuable data to assist in the evaluation of the impact of index trading on the futures markets.

<sup>186</sup> The leading commodity indexes reference futures contracts in the agricultural, energy, and metals sectors. Agricultural position limits are established by the CFTC and enforced by the regulated commodity exchanges. In contrast, position limits for non-agricultural commodities such as energy and metals are established by the exchanges themselves under guidance issued by the CFTC. The exchanges may also be required to establish accountability levels which do not restrict the number of contracts that a trader may hold, but trigger additional review of contracts that exceed the specified levels. For more information on accountability levels, see the Subcommittee's report, *Excessive Speculation in the Natural Gas Market* (2007), at pp. 51-52. Because the exchanges establish and apply non-agricultural position limits, swap dealers, ETF managers, and ETN issuers do not need to apply to the CFTC for exemptions related to those commodities.

<sup>187</sup> The information available to the Subcommittee indicates the maximum number of wheat futures contracts that these dealers and funds may hold; it does not indicate how many futures contracts they actually do hold. If each swap dealer were restricted to holding no more than 6,500 wheat futures contracts at any given time, these swap dealers would have had to find another way to offset their financial exposure to the commodity index swaps they sold, or to assume the outright price risks from those swaps. Due to the high volatility in the commodity markets, it is unlikely that swap dealers would have been willing to assume the outright price risks. In addition, since the over-the-counter market (OTC) for swaps in agricultural commodities is less extensive than the OTC market for energy commodities, it would have been difficult for swap dealers to find the requisite offsets in the OTC market. The most likely scenario is that, absent exemption from limits restricting the number of contracts they could hold, swap dealers would have been unlikely to offer the volume of swaps that were offered over the past few years. On the other hand, it is possible that the OTC market for agricultural swaps is larger and has more liquidity than current data suggests, since available data is limited. Traders have told the Subcommittee that the OTC market for agricultural swaps has recently begun expanding.

As explained earlier, the fundamental purpose of position limits is to prevent excessive speculation from causing “sudden or unreasonable fluctuations or unwarranted changes” in the prices of commodities traded on futures exchanges. The Commodity Exchange Act requires the CFTC to impose such position limits to prevent excessive speculation, but also states that the position limits are not to be applied to activities determined by the CFTC to constitute “bona fide hedging transactions or positions.” For many years, the CFTC interpreted the term “bona fide hedging” to require that the transactions sought to be hedged were in the cash market for the commodity. In 1986, the Congress encouraged the CFTC to expand the exemption to allow other types of risk-management transactions, so long as the expansion was consistent with the CFTC’s basic mission to prevent excessive speculation from causing price distortions on the futures exchanges.

The key issue for the CFTC then became whether, and if so how, to extend the hedge exemption, which had traditionally been applied to commercial firms hedging to physical holdings of a commodity, to traders such as swap dealers who were using the futures market to hedge their exposure to financial instruments rather than actual physical commodities.

**Exemptions Granted to Date.** According to data provided by the CFTC to the Subcommittee, since 2005, the CFTC has issued hedge exemptions to four swap dealers for their holdings of wheat futures contracts on the CME. Those exemptions permit the swap dealers to hold up to 10,000, 17,500, 26,000, and 53,000 wheat futures contracts, respectively, to hedge their exposures to wheat swaps tied to commodity indexes.<sup>188</sup> In addition, in 2006, the CFTC staff issued two “no-action” letters permitting two ETF managers to hold up to 11,000 wheat futures contracts each in a single month and, in the case of one of the ETFs, to hold a total of 13,000 wheat futures contracts in all months combined.<sup>189</sup> Together, these no-action letters and the hedge exemptions granted by the CFTC permit six index traders to hold a total of up to almost 130,000 wheat futures contracts in any single month and in all months combined. Absent the hedge exemptions and no-action relief, these six index traders would have been limited to a total of 39,000 wheat futures contracts at a time, or less than one-third of the contracts that they are now permitted to hold.

CFTC data indicates that, from 2006 to mid-2008, the total number of outstanding contracts (long open interest) attributable to commodity index traders was about 200,000

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<sup>188</sup> See Exhibits 1-4. In Exhibit 4, which provides the hedge exemption for up to 17,500 contracts, the CFTC states that the granting of the request for the exemption reflects an increase from a previously granted hedge exemption. Exhibit 5 contains an exemption for an index trader on the Kansas City Board of Trade. Each of the exemptions and no-action letters described in this portion of the Report allowed purchases of wheat futures contracts on the Chicago Mercantile Exchange; in some instances, the CFTC also authorized additional, though much smaller, purchases of wheat futures contracts on the Kansas City Board of Trade.

<sup>189</sup> See Exhibits 6 and 7.

contracts. That means that the six traders using the hedge exemptions and no-action letters issued by the CFTC may have held as much as 60 percent of the long open interest in Chicago wheat futures contracts attributable to index traders.<sup>190</sup>

**Hedge Exemption.** As explained earlier, the hedge exemption is tied by statute to “bona fide hedging transactions or positions.” It was designed to permit producers, merchants, and end users of commodities to hedge their legitimate anticipated business needs by purchasing futures contracts on commodity exchanges.

Longstanding CFTC regulations define bona fide hedges as transactions that “normally represent a substitute for transactions to be made or position to be taken at a later time in a physical marketing channel, and where they are economically appropriate to the reduction of risks in the conduct and management of a commercial enterprise.”

In 1986, Congress encouraged the CFTC to consider expanding the hedge exemption to include firms that were using the futures market to manage risks arising from a portfolio of financial investments. The next year, in 1987, the CFTC issued a statement that expanded its definition of bona fide hedge transactions as requested. The CFTC stated that “various users and potential users of financial futures” had expressed concern that the link to transactions in the physical commodity markets is “overly restrictive and precludes the classification as hedging of numerous strategies that are otherwise risk reducing.”<sup>191</sup> The CFTC then explained that the definition should not be construed to apply only to firms using futures contracts to reduce their exposure to risks in the cash market. It stated that the Commission’s original intent in promulgating the definition of a bona fide hedge was “to provide a general definition ‘to describe the broad scope of risk-shifting transactions which may be possible in the diverse types of futures contracts now under regulation.’”<sup>192</sup> The CFTC concluded that to qualify as a bona fide hedge, a transaction in the futures market did not need to be a temporary substitute for a later transaction in the cash market, but also included “all balance sheet and other trading strategies that are risk reducing and otherwise consistent with this interpretation.”<sup>193</sup>

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<sup>190</sup> Additional research is needed to determine who holds the remaining 70,000 futures contracts linked to commodity indexes, how many of those contracts are attributable to each such trader, and what role, if any, is being played by CFTC position limits, exemptions, and no-action letters.

<sup>191</sup> CFTC, *Clarification of Certain Aspects of the Hedging Definition*, 52 Fed. Reg. 27195 (July 20, 1987). During the consideration of the Futures Trading Act of 1986, both the House and Senate Agriculture Committees had directed the CFTC to review the definition of bona fide hedge to ensure that it reflected the new and evolving use of financial futures. CFTC, *Risk Management Exemptions From Speculative Position Limits Approved Under Commission Regulation 1.61*, 52 Fed. Reg. 34633 (September 14, 1987). For additional background on this issue, see also CFTC Staff Report on Commodity Swap Dealers & Index Traders with Commission Recommendations, at pp. 13-15.

<sup>192</sup> *Id.*

<sup>193</sup> *Id.*

Several months later, the CFTC issued a new “interpretation” of its definition of bona fide hedge transactions to permit exchanges to grant hedge exemptions for various risk management transactions. The CFTC stated that “the exemption of certain risk-management positions from exchange speculative limits would be consistent with the objectives” of the hedge exemption. The CFTC explained that it adopted this broader view of the hedge exemption so that “any futures or option positions involved in such risk reducing strategies currently would be eligible for exemption from exchange speculative limits pursuant to exchange rules.”<sup>194</sup>

The CFTC specified that such exemptions be granted on a case-by-case basis, subject to a demonstrated request and showing by the applicant of the need for the exemption. The CFTC also required that applicants for such “risk management exemptions” be “typically engaged in buying, selling or holding cash market instruments.” Additionally, the CFTC required the exchanges to monitor the exemptions it granted to ensure that any positions held under the exemption did not result in any large futures or options position that could disrupt the relevant futures market.

In 1991, the CFTC granted the first exemption from its speculative position limits to a swap dealer seeking to hedge its exposure to a commodity index swap which it had sold to a pension fund.<sup>195</sup> The CFTC later described the swap and resulting hedge exemption as follows:

“The swap transaction allowed the pension fund to add commodities exposure to its portfolio indirectly, through the OTC trade with the swap dealer – something it could have done directly, but only in a limited fashion.

“The pension fund would have been limited in its ability to take on this commodities exposure directly, by putting on the long futures position itself, because the pension fund—having no offsetting price risk incidental to commercial cash or spot operations—would not have qualified for a hedge exemption with respect to the position.”<sup>196</sup>

Since setting this precedent, the CFTC has granted three additional hedge exemptions to swap dealers seeking to offset their exposures to individual commodities or commodity indexes. The CFTC has stated that these hedge exemptions “were all subject to specific limitations to protect the marketplace from potential ill effects.”<sup>197</sup> Those limitations included that: (1) the futures positions must offset specific price risks; (2) the dollar value of the futures positions must

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<sup>194</sup> CFTC, *Risk Management Exemptions From Speculative Position Limits Approved Under Commission Regulation 1.61*, 52 Fed. Reg. 34633 (September 14, 1987).

<sup>195</sup> CFTC Staff Report on Commodity Swap Dealers, at p. 14. In this instance, the commodities constituting the index included wheat, corn, and soybeans.

<sup>196</sup> *Id.*, at p. 15.

<sup>197</sup> *Id.*

be no greater than the dollar value of the underlying risk; and (3) futures positions could not be held into the month of contract expiration.

**“No-Action” Letter Exemptions.** Although the CFTC has granted several hedge exemptions to swap dealers, it has determined that it is not appropriate to grant such exemptions to exchange-traded funds (ETFs) for the commodity futures held by the ETFs. As described previously, the manager of an ETF does not hold futures to offset price risks, but rather holds futures contracts to ensure that the value of the fund matches the value of the shares in the fund that are traded on a stock exchange. Strictly speaking, therefore, the ETF manager is not holding these futures to offset a price risk or for risk management purposes.

Although the CFTC determined that the hedge exemption was unavailable to ETF managers, on two occasions the CFTC staff nevertheless determined it was appropriate to provide relief to ETFs from the position limits for agricultural commodities. In 2006, the CFTC staff issued a letter stating that it would not enforce the standard position limits with respect to Deutsche Bank’s operation of a commodity-related ETF. Later that year it provided similar relief to another firm, publicly identified by the CFTC only as “X,” managing what appears to be another ETF.<sup>198</sup>

In a “No-Action” letter dated May 5, 2006, the CFTC staff granted Deutsche Bank’s request that the CFTC refrain from taking enforcement action against the bank for violating the speculative position limits on wheat and corn futures, provided the bank held no more than 11,000 wheat contracts and 17,500 corn contracts in any one month.<sup>199</sup> In explaining why it granted the bank’s request, the CFTC noted five factors: “The futures trading activity passively tracks a widely recognized commodity index”; the trading was leveraged; the fund itself did not have price exposure (the price exposure was passed onto the shareholders); the index and the fund were transparent; and the positions would not be carried into the spot month.

Several months later, the CFTC granted similar relief to “X.” It described X’s investment strategy, designated by the letter “P,” to be “a long-only, fully collateralized trading strategy.” Despite requiring Deutsche Bank to provide an index and investor fund that was “highly transparent,” the CFTC staff allowed X to operate without similar transparency, noting only X’s assertion that “X’s clients are provided with at least the level of disclosure and transparency described in your letter.” Despite the lack of transparency to other market participants, the CFTC staff allowed X to exceed the speculative position limits by an even greater amount than for Deutsche Bank’s transparent strategy.

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<sup>198</sup> Letter from Richard A. Shilts, Director, Division of Market Oversight, to Mr. Michael Sackheim, Esq., Sidley Austin LLP, May 5, 2006 (CFTC letter No. 06-09), No-Action, Division of Market Oversight. Letter from Richard A. Shilts, Director, Division of Market Oversight, to [redacted], September 6, 2006 (CFTC letter No. 06-19), No-Action, Division of Market Oversight. The CFTC did not state why it granted confidentiality to “X.”

<sup>199</sup> CFTC No-Action Letter No. 06-09.

Table 7 compares the levels of No-Action relief granted by the CFTC staff with the regulatory position limits applicable to other market participants.

#### No-Action Relief Granted from Speculative Position Limits

<b>WHEAT</b>	<b>CFTC Speculative Position Limit</b>	<b>Limit for Deutsche Bank ETF</b>	<b>Limit on X for P Strategy</b>
Spot Month	600	0	0
Single Month	3,000	11,000	11,000
All Months	6,500	11,000	13,000

<b>CORN</b>	<b>CFTC Speculative Position Limit</b>	<b>Limit for Deutsche Bank ETF</b>	<b>Limit on X for P Strategy</b>
Spot Month	600	0	0
Single Month	5,500	17,500	17,500
All Months	9,000	17,500	27,000

**Table 7.** Data source: CFTC.

**Proposed Risk Management Exemption.** In November 2007, the CFTC proposed to amend its regulations to create a new type of exemption from the standard position limits. Called a “risk management exemption,” it would permit ETF managers to apply for permission to exceed established speculative position limits, rather than have to continue to rely upon No-Action letters.<sup>200</sup> The CFTC noted that the last substantive changes to its speculation position limits had been made in 1991, and “the intervening 16 years have seen significant changes in trading patterns and practices in derivatives markets.”<sup>201</sup>

The CFTC cited the emergence of commodity index trading, in particular, as a reason for creating the new exemption. In its proposal, the CFTC stated: “To the extent that a type of trading activity can be identified that is unlikely to cause sudden or unreasonable fluctuations or unwarranted changes in prices, it is a good candidate to qualify for an exemption from position limits.” The CFTC stated that commodity index trading had “characteristics that recommend it

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<sup>200</sup> CFTC, Notice of proposed rulemaking, Risk Management Exemption From Federal Speculative Position Limits, 72 Fed. Reg. 66097 (November 27, 2007).

<sup>201</sup> *Id.*

on that score,” including that index trading was passively managed, unleveraged, and diversified across many commodities.<sup>202</sup>

The CFTC notice reiterated the CFTC staff’s previous determination that ETF managers could not qualify for the hedge exemption as currently drafted, but also affirmed its belief that ETF managers should be able to qualify for exemptions from the speculative position limits:

“In the index fund positions described in the no-action letters, the price exposure results from a promise or obligation to track an index, rather than from holding an OTC swap position whose value is directly linked to the price of the index. The [CFTC staff] believed that this difference was significant enough that the index fund positions would not qualify for a hedge exemption. Nevertheless, because the index fund positions represented a legitimate and potentially useful investment strategy the Division granted the index funds no-action relief, subject to certain conditions, described below, that were intended to protect the futures markets from potential ill effects.”

The proposed risk management exemption would have allowed an exemption from speculative position limits for: (1) “intermediaries, such as index funds, who pass price risks on to their customers; and (2) pension funds and other institutional investors seeking to diversify risks in portfolios by including an allocation to commodity exposure.”<sup>203</sup>

The proposed exemption was not finalized. In April 2008, largely in response to public outcry over rising prices for oil, natural gas, and other basic commodities, the CFTC suspended this rulemaking. CFTC Acting Chairman Walt Lukken announced that in light of “current market conditions and the uncertainty surrounding additional speculative money in these markets,” the Commission would be “very cautious” about proceeding with the rulemaking and requested additional comments.<sup>204</sup> The Acting Chairman stated: “I believe that before acting, this agency must be certain that additional speculative pressures will not exacerbate the anomalies we are experiencing in these markets.”

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<sup>202</sup> The CFTC did not provide any empirical evidence or factual basis for this assertion. It is unclear why the CFTC believed passive investments could not cause unreasonable fluctuations or unwarranted changes in price, or why the fact of diversification across commodities lessened the impact upon any single commodity.

<sup>203</sup> 72 Fed. Reg. at p. 66099. The proposed rule would have imposed a number of conditions that an applicant had to satisfy to be granted a risk management exemption: (1) the positions had to be established and liquidated in an orderly manner; (2) the positions had to be part of a broadly diversified portfolio of either long-only or short-only futures based upon either (a) a fiduciary duty to match or track the results of a broadly diversified index that includes such commodities, or (b) a portfolio diversification plan that has exposure to a broadly diversified index that includes such commodity markets; (3) the exemption had to be passively managed; (4) the futures trading must be unleveraged; and (5) the positions could not be carried into the spot month. *Id.*, at p. 66100.

<sup>204</sup> Opening Statement of Acting Chairman Walt Lukken, Agricultural Markets Roundtable, Commodity Futures Trading Commission Headquarters, April 22, 2008.

A few months later, the CFTC staff recommended that the CFTC consider a more limited risk management exemption than the one outlined in the suspended rulemaking. In its *Report on Commodity Swap Dealers and Index Traders*, issued in September 2008, the CFTC staff recommended that the Commission:

“develop an advance notice of proposed rulemaking that would address whether to eliminate the *bona fide* hedge exemption for swap dealers and replace it with a limited risk management exemption that is conditioned upon, among other things: (1) an obligation to report to the CFTC and applicable self regulatory organizations when certain noncommercial swap clients reach certain position levels in related exchange traded contracts, and/or (2) a certification that none of a swap dealer’s noncommercial swap clients exceed specified position limits in related exchange-traded contracts.”<sup>205</sup>

In response to the staff recommendation, on March 24, 2009, the CFTC issued a “concept release” seeking public comment on whether to create a new “risk management” exemption to existing commodity position limits, and, if so, what terms and conditions should apply.<sup>206</sup> The concept release traced the history of the CFTC’s application of the bona fide hedge exemption to swap dealers and others for index fund investments, as well as the staff’s recommendation in the September 2008 Report to address this issue. It described the proposed “conditional limited risk management exemption” as “essentially look[ing] through the swap dealer to its counterparty traders.” The CFTC stated that creating this new exemption would have “the potential to bring greater transparency and accountability to the marketplace and to guard against possible manipulation.” It requested comment on a number of specific questions, including whether the CFTC should continue to allow swap dealers to qualify for exemption under the current definition of a bona fide hedge; whether the CFTC should develop a new “limited risk management exemption” for swap dealers; which transactions could qualify for the new exemption; what conditions should apply to the exemption; whether there should be an overall limit to the size of the exemption; and how to ensure that the exemption was not being used to circumvent position limits by individual traders.

The CFTC proposal invites public comment on the issue of how commodity index trading affects the futures markets and whether—and if so, to what extent—the CFTC should continue to grant exemptions from position limits for index traders. As the next section shows, the large presence of commodity index traders in the Chicago wheat futures market has increased

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<sup>205</sup> The CFTC staff explained that these conditions were designed to ensure that noncommercial counterparties are not purposefully evading the oversight and limits of the CFTC and exchanges, and that manipulation is not occurring outside of regulatory view. *CFTC Staff Report on Commodity Swap Dealers*, at p. 34. If implemented, the recommended certification condition for a swap dealer’s clients would represent a key new limitation.

<sup>206</sup> CFTC, *Concept Release on Whether To Eliminate the Bona Fide Hedge Exemption for Certain Swap Dealers and Create a New Limited Risk Management Exemption From Speculative Position Limits*, 74 Fed. Reg. 12282 (March 24, 2009).

the difference between futures and cash prices (basis) and impeded price convergence at contract expiration. Under these circumstances, the CFTC should not grant any type of exemption from position limits to commodity index traders in the wheat market, and should instead phase out the exemptions already provided.

*“A futures market is not a scholarly seminar in which learned men debate what is, and arrive at, an equilibrium price, it is a game in which businessmen compete, with money at hazard, to establish a market price that works.”*

--Professor Thomas Hieronymus<sup>207</sup>

## V. IMPACT OF INDEX TRADING ON THE WHEAT MARKET

Over the past several years, the traditional relationship between the prices of soft red winter wheat in the Chicago futures market and the price of wheat in the cash market has broken down. Increasingly, the price of wheat futures on the Chicago exchange has been significantly higher than the price of wheat in the cash market, resulting in an unprecedented large difference (basis) between the two. In addition, the two prices have failed to converge as the nearest futures contract reaches expiration. The increasing gap between the futures and cash prices (basis), together with the failure of convergence, have seriously impaired the ability of farmers, grain elevators, grain merchants, grain processors, and others in the agriculture industry to use the Chicago wheat futures market to manage and reduce the price risks arising from their operations in the wheat market.

The Subcommittee investigation finds there is substantial and persuasive evidence that the large presence of commodity index traders in the Chicago wheat futures market is a major reason for the breakdown in the relationship between the Chicago futures market and the cash prices for wheat. This evidence indicates that the large number of futures contracts purchased and held (long open interest) by index traders has created a significant additional demand for wheat futures contracts on the Chicago exchange that is unrelated to the supply of and demand for wheat in the cash market. As a result of this significant additional demand—which has increased the demand for wheat futures contracts by between 30 and 100% during the course of the past three years—wheat futures prices have increased relative to wheat cash prices. The increase in futures prices relative to the cash prices has created a substantial incentive for grain elevators to place more wheat in storage, hold it, and sell it at the higher prices in the futures market, rather than sell the wheat immediately in the cash market. Because it has been so profitable to store the grain in this manner, grain elevators and other traders no longer have a sufficient financial incentive to engage in the type of arbitrage transactions that normally occur when a futures contract expires, in which buyers and sellers play the futures and cash markets against each other until the prices in the two markets converge. The result is an abnormal, large, and persistent difference between wheat futures and cash prices and a frequent failure of convergence at contract expiration.

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<sup>207</sup> Hieronymus, at p. 327.

This section of the Report presents evidence on the extent of the breakdown in the relationship between the Chicago wheat futures and cash prices, and the contributing role of the large amount of commodity index trading on the Chicago exchange.

### **A. Pricing Breakdown in the Wheat Futures Market**

The traditional relationship between the Chicago wheat futures market and the cash market for wheat has broken down in three distinct ways. First, since 2006, market data shows that the price of wheat in the Chicago futures market frequently has been significantly higher than the price of wheat in the cash market. Second, during this same period, the market data shows that the wheat futures and cash prices have often failed to converge at the expiration of the Chicago wheat futures contracts. Third, during most of 2008, the market data shows that wheat futures prices were not just higher than the cash price, but were at a level unrelated to the fundamentals of supply and demand in the cash market at the time. This set of pricing problems indicates that the underlying problem in the Chicago wheat futures market is not merely a lack of convergence at contract expiration, as is often stated, but a problem of consistently elevated futures prices relative to the cash market.

**Increasing Futures and Cash Price Gap -- Daily Basis.** Market data obtained and analyzed by the Subcommittee shows that, since 2006, the difference between Chicago wheat futures prices and cash prices has steadily increased. Figure 26 presents data showing the daily difference between the price of the Chicago and Kansas City wheat futures contracts and the average cash price for each type of wheat.<sup>208</sup> As explained earlier, the three U.S. exchanges that trade wheat futures contracts are in Chicago, Kansas City, and Minneapolis; the Chicago exchange has significantly more trading volume in wheat and a substantially greater proportion of index trading in wheat contracts than the other two exchanges.<sup>209</sup>

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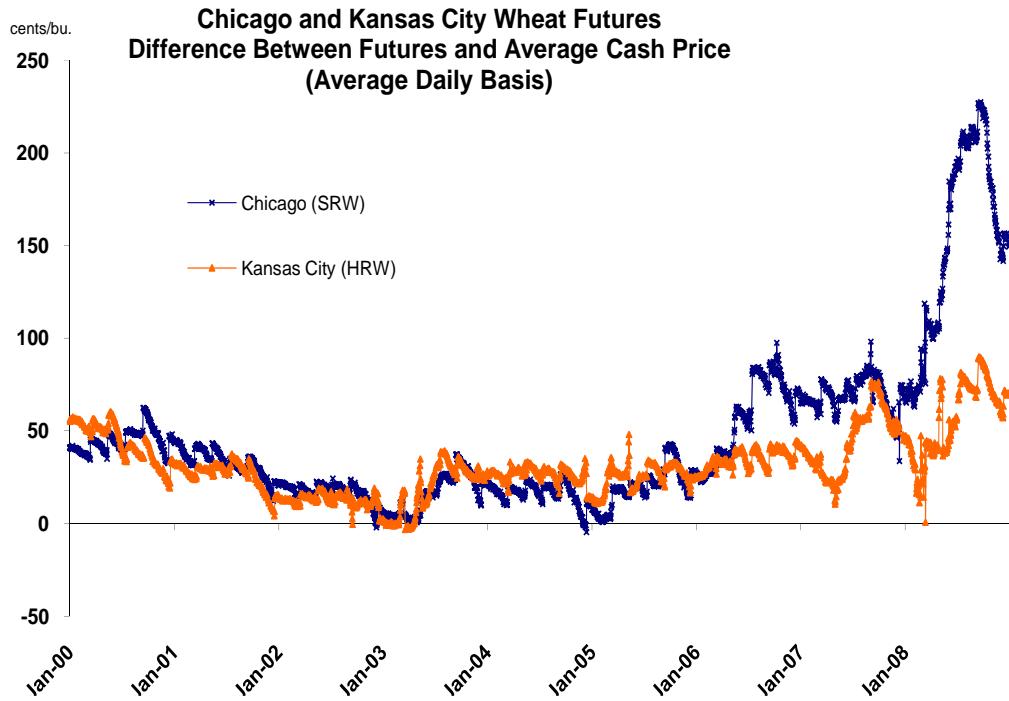
<sup>208</sup> The Subcommittee calculated the daily basis by using the daily average cash price for each type of wheat provided by the MGEX daily cash index, and then subtracting this cash price from the futures price as shown on the relevant exchange for the first-month futures contract price on the same day for the same type of wheat. Using a daily basis computed from the MGEX cash index is useful, because it provides the average price calculated from multiple locations and provides data on the behavior of the basis that is comparable to the basis data from individual markets or delivery locations for the wheat. The “average” basis derived from the MGEX cash index is directly related to the basis at the delivery locations—typically the basis at any particular location will differ from the basis at the contract delivery location by a constant value, namely the cost of transporting the commodity from the particular location to the contract delivery location. The average basis, therefore, should differ from the basis at the delivery location only by the average cost of transportation to the delivery location. A change in the basis at the delivery locations over time should be reflected in a corresponding change in the average basis over that same period of time. Traders interviewed by the Subcommittee stated that when hedging they preferred to use the basis at the delivery locations rather than a basis computed from the MGEX cash index basis, because the MGEX cash index was based upon bids rather than actual reported transaction prices and because they were more familiar with the delivery location basis. The Subcommittee’s analysis of the relationship between the daily basis calculated in this manner from the MGEX index and the daily basis calculated from USDA data at specific delivery points indicates that the MGEX data is as reliable as the USDA data for the purposes of these calculations and this analysis.

<sup>209</sup> As shown in the prior section, as much as 50% of the outstanding wheat contracts (long open interest) on the Chicago exchange is held by index traders and up to 30% is held by index traders on the Kansas City Exchange.

Figure 26 indicates that, prior to 2005, the average daily basis in the Chicago and Kansas City wheat futures markets behaved similarly. From 2000 to 2005, the average daily difference between the futures price for soft red winter wheat traded on the Chicago exchange and the average cash price for that type of wheat was about 25 cents per bushel. Over that same time period, the average daily difference between the futures price for hard red winter wheat traded on the Kansas City exchange and the cash price for that type of wheat was about 26 cents per bushel. In 2006, the basis in the Kansas City futures market remained about the same, but the basis in the Chicago futures market began to climb. From 2007 through 2008, the average daily basis for wheat traded on the Chicago exchange jumped to \$1.10 per bushel; on the Kansas City exchange during this period the average daily basis rose to nearly half that amount, about 51 cents per bushel. During 2008, on the Chicago exchange, the average daily basis reached a maximum of about \$2.25 per bushel, whereas on the Kansas City exchange the maximum basis reached about 90 cents per bushel. The average daily basis increased on both exchanges, but the increase in Chicago was more dramatic and sustained.<sup>210</sup>

According to CFTC data, there is no index trading on the Minneapolis exchange. The following charts do not include basis data from the Minneapolis exchange, however, because Minneapolis wheat prices experienced unusual extremes over the last two years, resulting in unusual and extreme swings in the basis. Prior to late 2007, the average basis on expiration for the Minneapolis wheat contract was relatively stable. Starting in late 2007, however, the average basis on expiration started to increase substantially, reaching an extraordinarily high level of around \$2.50 in March and May of 2008. These high basis levels were not due to a general lack of price convergence in the Minneapolis wheat market. Rather, they reflected the dramatic volatility in Minneapolis wheat prices in late 2007 due to record low levels of wheat in storage and high global demand. See, e.g., Anthony Faiola, *The New Economics of Hunger*, Washington Post, April 27, 2008; Joshua Boak, *Short wheat stocks yield price storm*, Chicago Tribune, February 28, 2008 ("We have never seen anything like this before," [KCBOT Chairman Jeff] Voge said. "Prices are going up more in one day than they have during entire years in the past."); Lauren Etter, *Markets on Tear; Wheat, Oil, Euro—Grain Trading Explodes in the Minneapolis Pits Speculators Flood In*, Wall Street Journal, February 27, 2008 ("Minneapolis has become ground-zero for global wheat following Agriculture Dept.'s January statement that winter-wheat plantings were less than expected"); David Streitfeld, *In Price and Supply, Wheat is the Unstable Staple*, New York Times, February 13, 2008 ("Prices have been gyrating in recent days as traders tried to figure out what to make of the situation. On Tuesday, prices for a sought-after variety, spring wheat, jumped to \$16.73 a bushel on the Minneapolis Grain Exchange, the latest of several records."). Once the grain shortage was alleviated in early 2008, the average basis for hard spring wheat fell back to levels well within historical norms. The extreme price volatility in the Minneapolis wheat market from late 2007 to early 2008, with the resulting basis changes, renders the Minneapolis basis data an unreliable benchmark for analyzing the Minneapolis wheat market, which has virtually no index traders, and for understanding how that data compares to the basis data from Chicago and Kansas City, both of which have substantial index trading.

<sup>210</sup> The Subcommittee investigation does not attribute the increasing daily basis depicted in Figure 26 solely to index trading. Other factors also contributed to the increase. During this period, for example, rising oil, gasoline, and diesel fuel prices increased the cost of transporting wheat by rail, truck, or barge, and could have contributed to the increase in the basis in both markets. Increases in the cost of transportation alone, however, cannot account for the much higher increase in the daily basis for Chicago wheat as compared to Kansas City wheat.

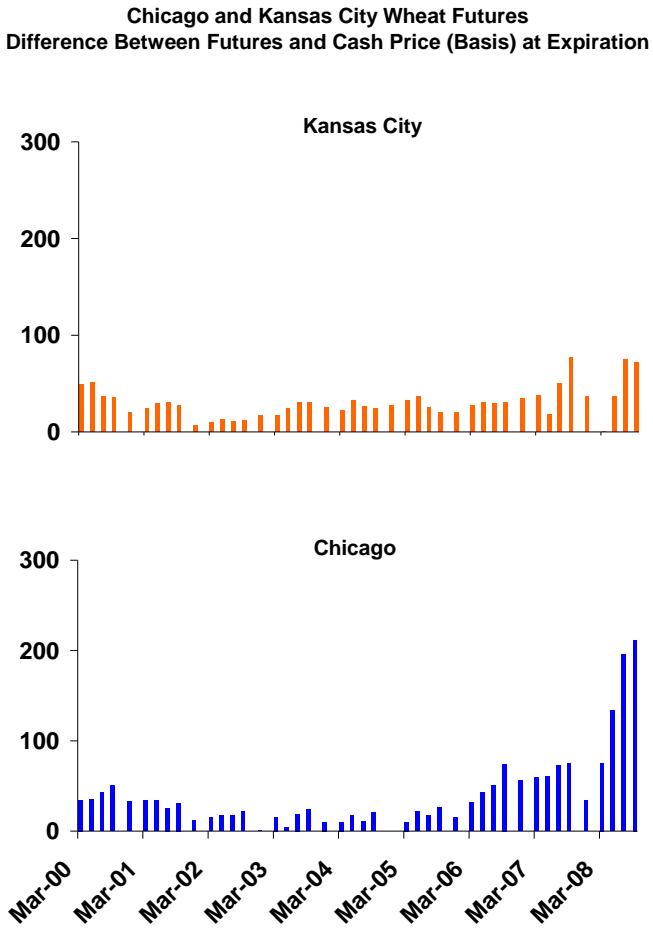


**Figure 26.** Daily basis, computed from MGEX cash index prices for HRW and SRW. Data source: MGEX, KCBOT, CME.

**Increasing Basis at Contract Expiration.** In addition to the unusually high daily difference between the futures and cash prices for wheat on the Chicago exchange, market data shows that, since 2006, there has also been an increasing failure of the wheat futures and cash prices to converge at contract expiration. Figure 27 presents data showing that the difference between the price of the expiring Chicago soft red winter wheat futures contract and the average cash price for soft red winter wheat rose from an average of about 21 cents during the five-year period 2000-2005, to about 56 cents over a two-year period from 2006 to 2007, to \$1.53 in 2008.<sup>211</sup> In comparison, over the same time periods, the average basis at contract expiration for the Kansas City hard red winter wheat futures contract rose from an average of 26 cents from 2000 to 2005, to about 37 cents from 2006 to 2007, to about 50 cents in 2008, a much narrower increase in the basis.<sup>212</sup> This data shows that, over the past few years, the Chicago wheat market has experienced a dramatic and sustained lack of price convergence.

<sup>211</sup> The Subcommittee compiled the basis data in Figure 27, again using the MGEX daily cash index to determine the average daily cash price for wheat. The data in Figure 27 is consistent with the basis data at the delivery locations for the Chicago and Kansas City contracts.

<sup>212</sup> The average basis at contract expiration for the Kansas City wheat contract generally remained below 36 cents throughout this period. However, in three months—September 2007, July 2008, and September 2008—the basis increased to over 70 cents.



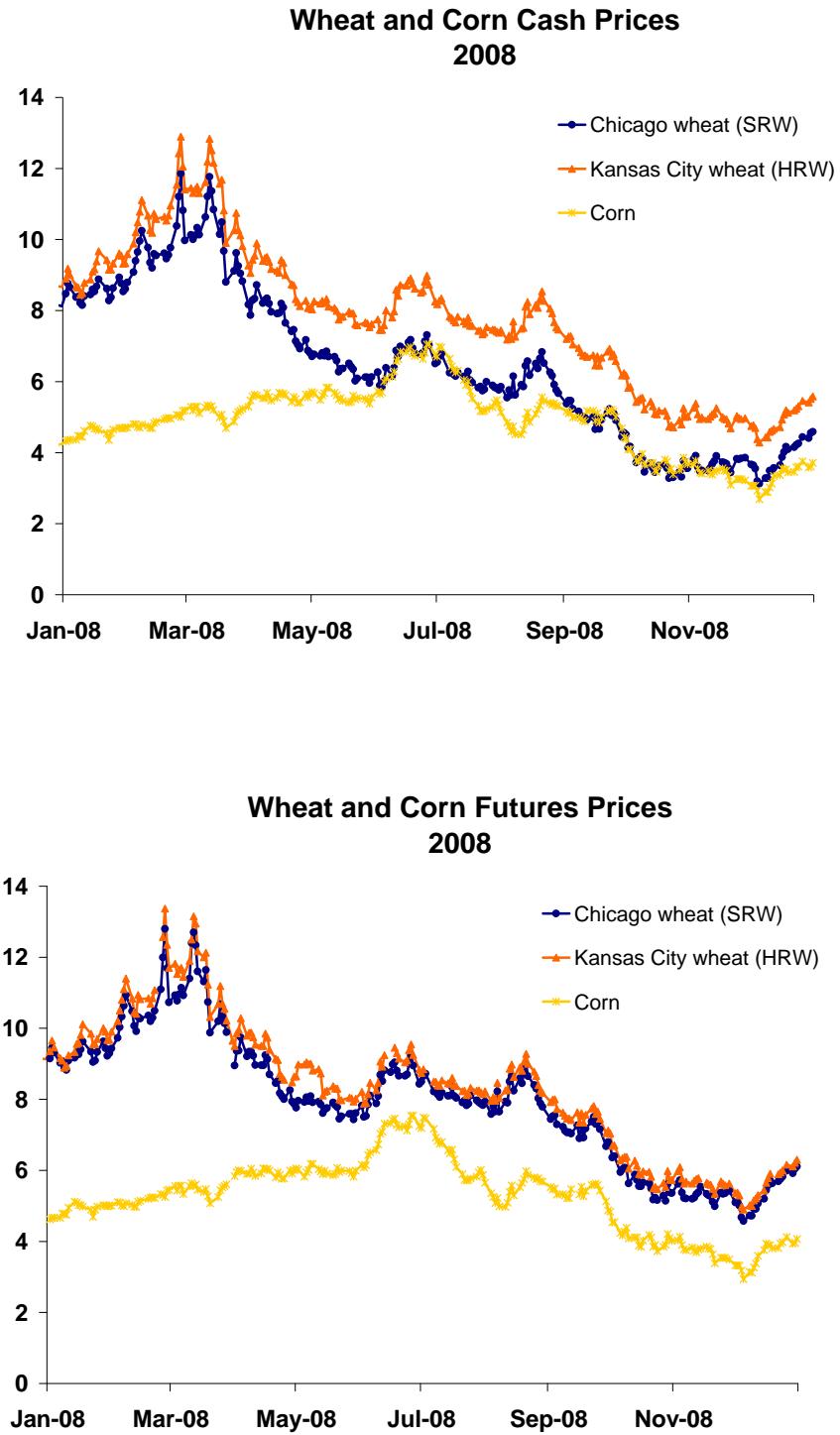
**Figure 27.** Increasing lack of convergence between the CME SRW wheat futures contract and the cash price of SRW wheat. Data sources: CME, KCBOT, MGEX.

**Futures Prices Inconsistent With Cash Market Fundamentals.** The daily basis data and contract basis expiration data analyzed by the Subcommittee provides some quantification of the extent of the pricing problems in the Chicago wheat market. The market data also shows how severely disconnected the price of Chicago wheat futures became in relation to the actual cash market for soft red winter wheat throughout the latter half of 2008.

Figure 28 presents data showing that, beginning in the spring of 2008, soft red winter wheat prices in the cash market fell from a peak of about \$12 per bushel to a low of about \$3 per bushel by December 2008. This drop in the price was due in part to a large wheat harvest in the summer of 2008, planted as a result of the high wheat prices that prevailed during most of 2007. The resulting 2008 soft red winter wheat surplus depressed the price of this wheat in the cash market. Soft red winter wheat was so plentiful that it began to be used for animal feed. That is part of the reason why the soft red winter wheat cash price fell all the way down to the price of corn, which is also used at times for animal feed. In the Chicago futures market, however, it was

a different story. The soft red winter wheat futures price declined during 2008, but remained substantially above the price in the cash market, often by as much as \$1.50 to \$2 per bushel, an unprecedented price difference. In fact, during this period the soft red winter wheat futures price remained close to the price of futures contracts for higher-quality hard red winter wheat. In short, for much of 2008, at the same time soft red winter wheat was selling in the cash market for the price of lower-quality corn, it was selling for a much higher price on the Chicago futures exchange, very close to the price of higher-quality, higher-protein wheat. This pricing data shows that, during 2008, Chicago wheat futures prices were plainly inconsistent with wheat cash prices.

In sum, the market data analyzed by the Subcommittee shows that, over the last few years, the difference in price between Chicago wheat futures contracts and the cash price of wheat (basis) has increased significantly, that the two prices have frequently failed to converge at contract expiration by a large amount, and that in 2008, the Chicago futures price for soft red winter wheat became severely disconnected from the fundamentals of supply and demand in the cash market.



**Figure 28.** During 2008, SRW was selling in the cash market for the same price as a lower-quality commodity, while in the futures market it was selling for the same price as a higher-quality commodity. Data source: CME, KCBOT, MGEX.

## B. The Role of Index Trading in Wheat Pricing Problems

The Subcommittee investigation found significant and persuasive evidence that the large number of wheat futures contracts (long open interest) held by commodity index traders is a primary reason for the pricing problems in the wheat market just described, including the increasing difference between wheat futures prices and cash prices (basis), the increasing lack of price convergence at contract expiration, and the disconnect between wheat futures prices and cash market fundamentals in Chicago during 2008. This evidence consists of the following:

- Index trading and pricing trends in the wheat market;
- Subcommittee interviews with market participants;
- Testimony presented by market participants to the CFTC;
- Financial and academic analyses; and
- Commodity market theory on how futures prices are established.

Each of these factors is discussed below.

### **1. Index Trading and Pricing Trends in the Wheat Market**

#### **a. Volume of Index Trading in the Wheat Market**

The percentage of outstanding wheat contracts (long open interest) held by index traders in the Chicago wheat futures market is significantly greater than the percentage held by index traders in any other agricultural commodity market.<sup>213</sup> As shown in the prior section, since 2006, commodity index traders have held between 35 and 50% of the outstanding wheat contracts purchased (long open interest) on the Chicago exchange, and between about 20 and 30% of the outstanding wheat contracts purchased (long open interest) on the Kansas City exchange.<sup>214</sup>

These percentages alone, however, do not present a full measure of the presence or influence of index-related instruments in these markets. In several respects, expressing the size of index trading as a simple percentage of the total long open interest held by index traders

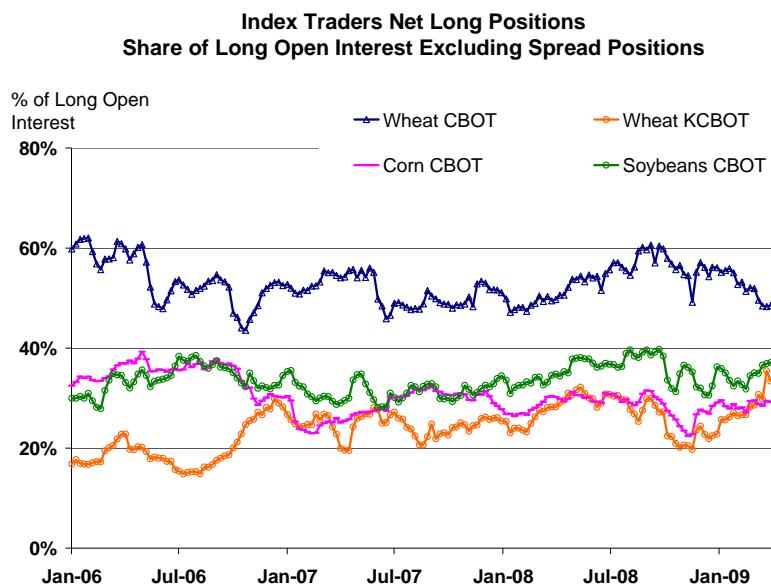
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<sup>213</sup> Index traders also participate in the futures markets for corn, soybeans, soybean oil, cotton, lean hogs, live cattle, feeder cattle, cocoa, sugar, and coffee. Aside from wheat, the other commodity markets in which index traders hold a substantial share of the long open interest are the futures markets for two livestock commodities, lean hogs and live cattle. Lean hog futures contracts are financially settled, meaning that the price of the expiring futures contract is set at the price of the commodity in the cash market at contract expiration. By definition, therefore, lean hog futures and cash prices will be equal at settlement, so there is no problem with convergence. Live cattle, unlike grain, cannot be placed in storage from one contract expiration to another. That constraint means there is always an active cash market for live cattle at contract expiration that helps to force convergence.

<sup>214</sup> See Figures 19 and 20.

understates their presence. First, except for the period just prior to the periodic roll of the near-term contracts into longer-term contracts, all of the open interest due to index traders is held in futures contracts other than the first month contract nearest expiration. The share of long open interest held by index traders in the months other than the first month is certainly larger than the share of long open interest held by these index traders in all of the months.<sup>215</sup>

Second, a significant share of the long and short open interest is held by spread traders. Spread traders do not go either long or short; they hold equal positions in two different contracts, buying one and selling the other. Index traders, on the other hand, are purely directional traders. They buy contracts and hold onto them for long periods of time. Comparing the level of index traders to the total number of directional traders provides a better indication of the relative contribution of index traders to the direction of the market than if non-directional spread traders are included in the comparison. Roughly speaking, it indicates how much of the “push” upwards in the market is due to index traders. Figure 29 indicates that index traders constitute a much larger share of the directional traders than of all traders.



**Figure 29.** The net long open interest due to index instruments represents up to 60% of the long open interest (excluding spread positions) in the Chicago wheat futures market.  
Data source: CFTC.

<sup>215</sup> The CFTC commitment of traders data does not break out any trader positions by contract months. Based on the Subcommittee's review of publicly available open interest data from the Chicago exchange, the open interest in the first month represents, on average in recent years, an estimated 10-20% of the total open interest at the time the roll of commodity index funds is completed under the S&P GSCI roll methodology. Assuming index traders represent 35-50% of the total long open interest at the time the standard roll is completed, it follows that at the time the standard roll is completed index traders could represent anywhere from about 38% (35%/0.9) to about 62% (50%/0.8) of the open interest in the second and following months.

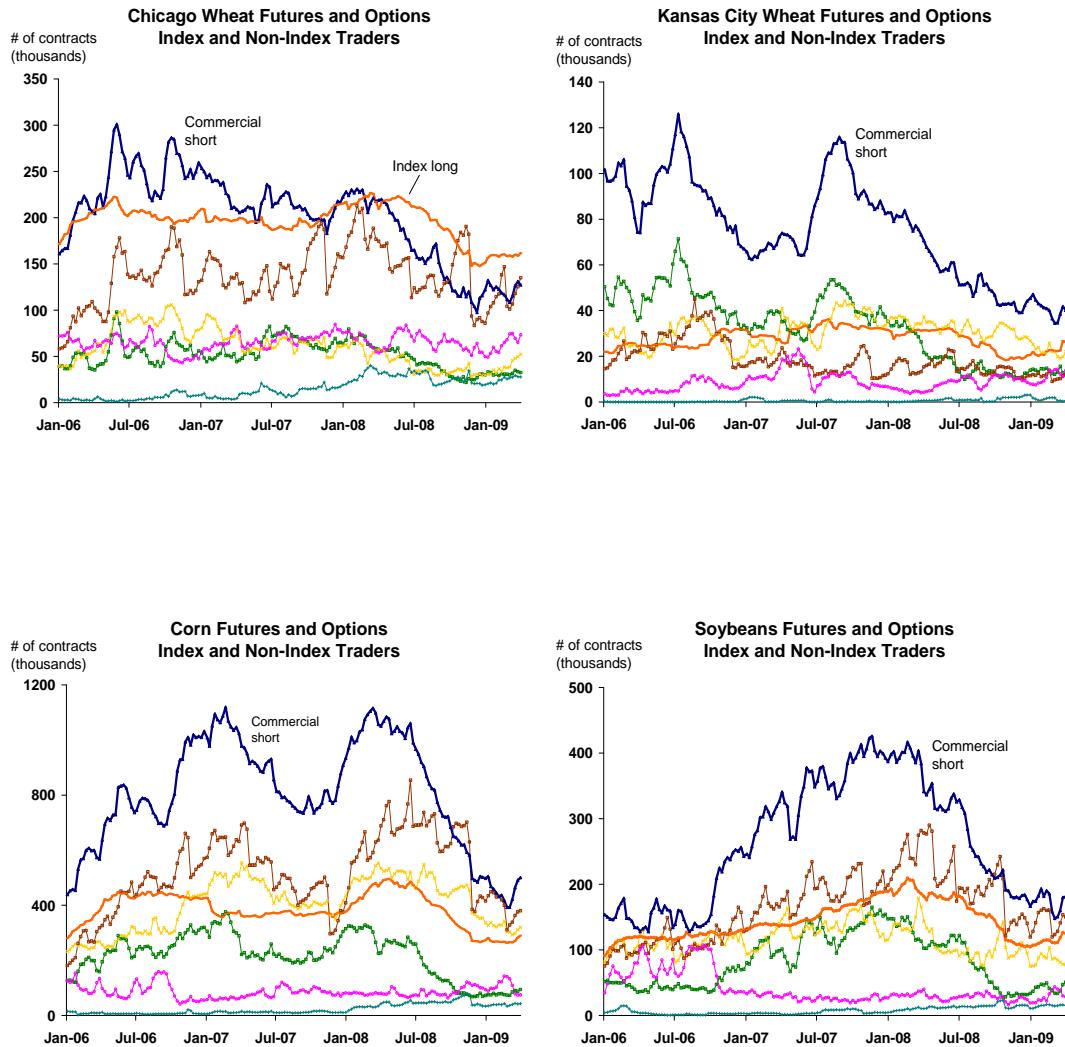
Third, another measure of the extent of index trading in the futures market is to examine the long open interest held by index traders compared to the short open interest held by traders classified by the CFTC as “commercial” traders. The data indicates that the long open interest held by index traders in the Chicago wheat market is relatively high compared to the short open interest held by these commercial traders. In some instances, the data indicates that there have been more index traders who want to buy futures contracts than there are short commercial traders willing to sell them. In these instances, when the demand exceeds the supply, index traders looking to buy must bid up the price in order to attract additional sellers.

Over the past few years, the relative balance between index traders and short commercial traders in the Chicago futures market has been very different from the balance in the other markets in which index traders are present, including the Kansas City wheat market and the Chicago corn and soybean markets as well. In these other markets the open interest due to short commercial traders has generally significantly exceeded the open interest from long index traders. (See Figure 30). In contrast, in the Chicago wheat market during the period in which data is available, the number of long index traders generally has been roughly equal to the number of short commercial traders. On several occasions, the latest being an extended period in 2008, the open interest due to index traders exceeded that of short commercial traders.

For example, on July 1, 2008, index traders held 212,012 contracts for the future delivery of Chicago wheat. On the same date, short commercial traders had 165,044 contracts outstanding for the future delivery of Chicago wheat. Since each contract represents 5,000 bushels of wheat, as of July 1, 2008, index traders had bought 1,060,060,000 bushels of wheat for futures delivery, while commercial sellers had supplied only 825,220,000 million bushels to meet that demand. In short, on that date, demand for soft red winter wheat futures from index traders exceeded the supply provided by commercial sellers by roughly 20%. When demand substantially exceeds supply, the price of wheat futures must rise to attract more sellers.<sup>216</sup>

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<sup>216</sup> One noted futures market scholar described how additional purchases of futures contracts by speculators increase the price of futures contracts as follows: “Assume there is an exogenous increase in net speculative purchases of futures. This tends to drive up the futures price relative to the spot price, and by increasing the return to short hedgers induces a larger amount. Similarly, an exogenous increase in speculative sales of futures lowers the futures price which increases the return to and therefore the amount of long hedging..” Lester G. Telser, *The Supply of Speculative Services in Wheat, Corn, and Soybeans*, Food Research Institute Studies, Supplement to Vol. VII, 1967, at p. 163 (available in farmdoc archives).



**Figure 30.** Relative share of index trading in grain futures markets. Data source: CFTC.

#### Legend

- Non-Commercial Long, No Index
- Commercial Long, No Index
- Non-Commercial Spread Positions, No Index
- Non-Commercial Short, No Index
- Commercial Short
- Index Long

The result is that the Chicago wheat futures price rose higher than the price in the cash market and did so, not in response to normal supply and demand factors related to the commercial delivery of wheat in the cash market, but in response to the additional demand generated by index traders seeking to offset their sales of commodity index instruments. Overall, from 2006-2008, index traders increased the demand for wheat futures contracts by a significant amount—from between 33% to 100%.<sup>217</sup>

The demand for futures contracts from index trading directly affects futures prices only, since index traders do not operate in the cash market, and they have no interest in taking delivery or making use of a wheat crop. They are not buying futures contracts to hedge any actual purchases of wheat in the cash market. Instead, index traders are buying futures contracts to offset the index instruments they have sold to third parties. They purchase futures contracts to offset this financial exposure, regardless of the price of those contracts or the underlying fundamentals of supply and demand in the cash market. The demand for wheat futures created by index traders is unrelated to the demand for wheat in the cash market and unrelated to the type of price changes in the cash market that typically affect decisions by market participants to buy or sell. In light of all of these factors, it is not surprising that, in recent years as index trading grew significantly, the price of Chicago wheat futures have become increasingly disconnected from the price of wheat in the cash market.

### **b. Impact of Index Trading on Short-Term Futures Price Spreads**

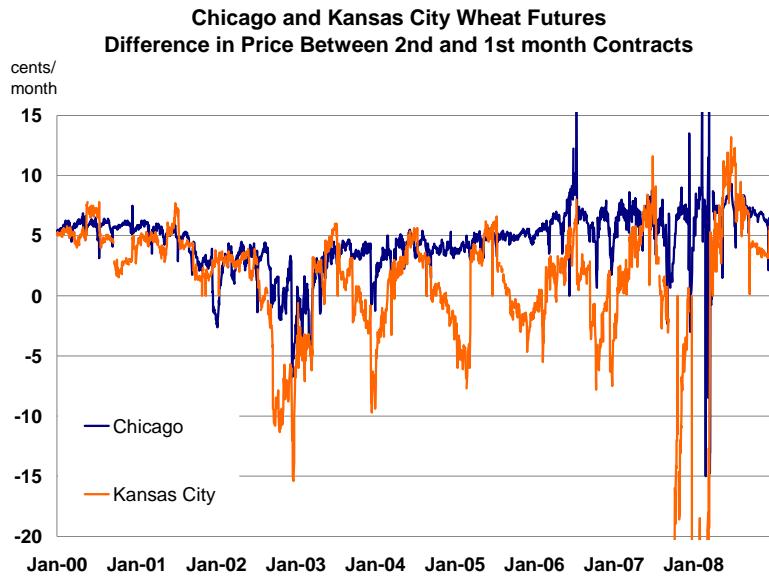
The impact of index trading on the Chicago wheat market can be seen by observing the change in price relationships between various futures contracts on the Chicago exchange as compared to the corresponding contracts on the Kansas City and Minneapolis exchanges. In particular, a number of Chicago wheat price spreads (the difference in price between two different futures contracts) increased significantly over the same time period that the number of wheat contracts held by index traders on the Chicago exchange rose significantly as well. In contrast, the same price spreads on the Kansas City and Minneapolis exchanges did not increase by a similar amount during the same time period. Supply and demand fundamentals in the cash market alone cannot account for the greater price spreads in the Chicago market. The most significant factor differentiating the Chicago wheat futures market from the other wheat futures markets is the large number of wheat contracts purchased and held by index traders.

Figure 31 shows the difference in price – the price spread -- between the first and second month futures wheat contracts on both the Chicago and Kansas City exchanges between 2000 and 2008. The data shows futures prices for soft red winter wheat traded on the Chicago exchange and for hard red winter wheat traded on the Kansas City exchange. The difference in prices between a second month futures contract and a first month futures contract is called the “2-1” spread. The data shows that, before 2004, the 2-1 spread for Chicago wheat futures

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<sup>217</sup> During this period index traders constituted between about 25 and 50% of the total long open interest. This means that these index traders increased the long open interest by 33% (25/75) to 100% (50/50).

contracts generally tracked the 2-1 spread for Kansas City wheat; the price difference in both markets was generally less than 6 cents, meaning the second month prices were generally higher than the first month prices. Beginning in the fall of 2004, however, the 2-1 spread for Chicago wheat futures increased significantly relative to the spread for Kansas City wheat futures, frequently exceeding 7 cents, while the Kansas City spread typically was well below that amount. The greater price spread on the Chicago exchange as compared to the Kansas City exchange has generally persisted since 2004, with only a few limited exceptions.

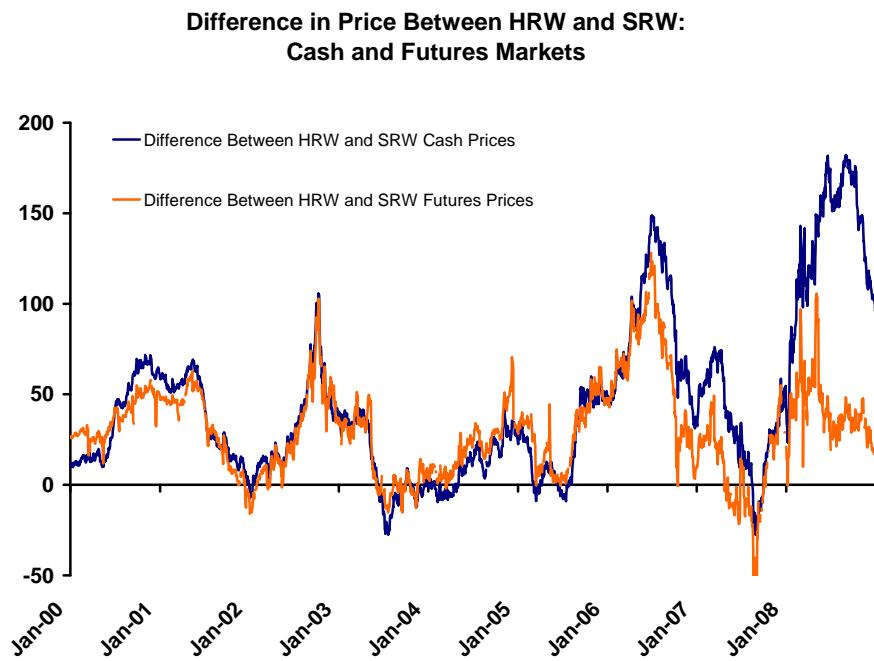


**Figure 31.** Beginning in 2004, the 2-1 spread for Chicago wheat grew much larger than for Kansas City wheat. Data source: CME, KCBOT.

The increase in the spreads and the generally higher futures prices in the Chicago wheat futures market compared to the Kansas City wheat futures market cannot be fully explained using traditional considerations of supply and demand in the cash markets for soft red winter and hard red winter wheat. The soft red wheat crop, harvested in the summer of 2005 and marketed from 2005 to 2006, was smaller than average, at 309 bushels. On the other hand, the hard red winter wheat crop marketed from 2005 to 2006, was larger than average, at 930 bushels. The smaller than average soft winter wheat crop should have resulted in a smaller 2-1 spread, since a reduction in supply normally results in higher near-term prices relative to the longer-term price. Instead, the 2-1 price spread increased. Professor Irwin and his colleagues have concluded that wheat futures prices from mid-2006 until mid-2007 were not supported by the supply and demand conditions in the cash market. They wrote: “Futures prices of SRW wheat were higher than could be supported by fundamentals of supply and demand, and therefore, higher than could

be supported by the cash market.”<sup>218</sup> The large increase in the 2-1 spread in the Chicago wheat futures market from 2005-2007 indicates the strong influence of an additional factor, unrelated to supply and demand, such as index trading, in the Chicago futures market.

The divergence of the Chicago wheat futures market from the fundamentals of supply and demand in the cash market can also be observed by comparing the spreads between futures and cash prices in the various wheat markets. Figure 32 displays the difference in price between the cash price of soft red winter wheat and the cash price of hard red winter wheat, and the difference in price between the first month futures contracts for soft red winter wheat on the Chicago exchange and the first month futures contract for hard red winter wheat on the Kansas City exchange.



**Figure 32.** In 2006, the price of Chicago wheat futures became artificially elevated relative to the cash market. Data source: CME, KCBOT, MGEX.

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<sup>218</sup> Professor Irwin and his colleagues state that soft red winter wheat futures prices during this period were driven higher “by the overall increase in wheat prices and the preference of many market participants to trade in the more liquid Chicago market rather than at other exchanges.” Irwin et al. (May 2007), at p. 14. It is unclear how greater liquidity – meaning a greater trading volume and open interest -- in the Chicago market would lead to an increase in the price of wheat. Generally, greater liquidity should lead to prices that are more aligned with market fundamentals. Moreover, most of the additional liquidity that entered the Chicago wheat futures market during the period in which the convergence problem dramatically worsened resulted from index trading. If the source of the pricing problems in the Chicago market is due to additional liquidity in that market, and index traders have been the greatest source of additional liquidity during the period in which those problems worsened, it is then logical to conclude that the increase in index trading is the source of these pricing problems.

Figure 32 shows that prior to 2006, the difference between the price of the first month futures contract for wheat on the Chicago exchange and the first month contract for wheat on the Kansas City exchange generally followed the difference in price between the cash prices for the two types of wheat. Beginning in the spring of 2006, the difference in price between these two types of wheat in the Chicago and Kansas City futures markets became significantly less than the difference in price between these two types of wheat in the cash market. This pricing disparity indicates that, beginning in 2006, the Chicago wheat futures price was increasingly elevated with respect to the price of wheat in the cash market. As the price of soft red winter wheat on the Chicago exchange increased relative to the price of soft red winter wheat in the cash market, the difference in price between Chicago wheat futures and Kansas City wheat futures became much less than the difference in price between the two types of wheat in the cash market.<sup>219</sup>

The most straightforward explanation for the disconnect between the price of soft red winter wheat in the cash and futures markets is the increasing presence of price-insensitive commodity index traders buying and holding Chicago wheat futures contracts. Index traders buy and hold futures contracts without regard to the fundamentals of supply and demand in the cash market. Since 2006, index traders have constituted between 35 and 50% of the total outstanding long open interest in the Chicago wheat market. It is to be expected that if nearly half of the holders of long open interest are pursuing a trading strategy for the buying and holding of wheat futures that is insensitive to the fundamentals of supply and demand in the cash market, then the wheat futures market will become increasingly reflective of that price-insensitive strategy and less reflective of the fundamentals of supply and demand in the cash market.<sup>220</sup> In effect, the large presence of commodity index traders, who do not buy or sell in relation to the fundamentals in the cash market, have created an additional supply-demand dynamic in the Chicago wheat futures market that is not related to the supply-demand dynamic in the cash market. The result are prices which not only fail to converge at contract expiration, but are the product of a fundamental disconnect between the futures and cash markets for wheat.

Because the purchaser of an intermonth spread such as the 2-1 spread depicted in Figure 31 is, in effect, helping to pay for the cost of storing the commodity over the length of the spread, it is useful to express a spread as the percentage of the total carrying costs for the commodity

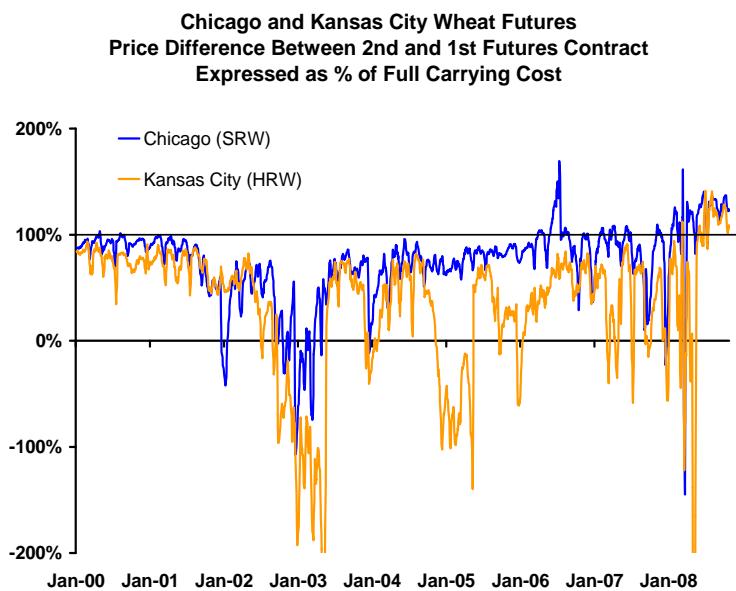
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<sup>219</sup> The extent to which the gap between the intermarket (i.e., between two different wheat markets) cash and futures price spreads increased since 2005 can be seen in Figure 26. The difference between the intermarket cash and futures price spreads equals the difference in intermarket basis:  $(\text{HRW cash} - \text{SRW cash}) - (\text{HRW futures} - \text{SRW futures}) = (\text{HRW cash} - \text{HRW futures}) - (\text{SRW cash} - \text{SRW futures}) = \text{HRW basis} - \text{SRW basis}$ . Thus, the extent to which the two lines in Figure 32 begin to diverge in 2006 is shown in Figure 26, which displays the average or “index” basis for the Chicago SRW and Kansas City HRW wheat markets.

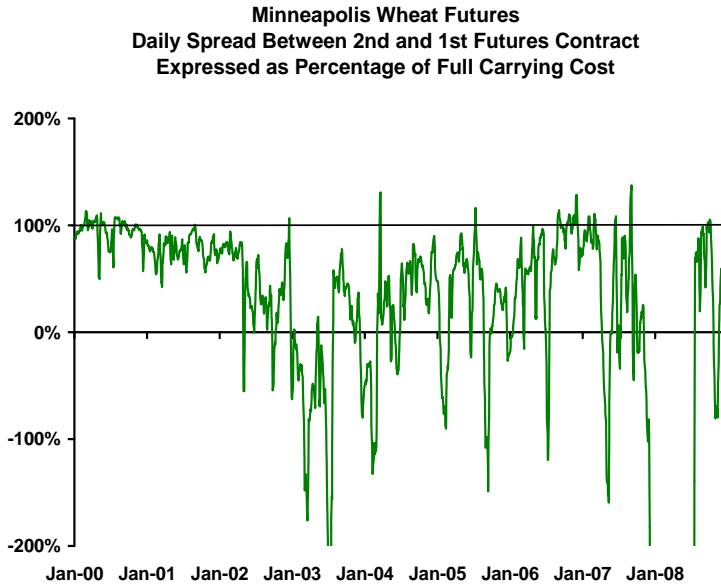
<sup>220</sup> If a market is constituted half and half between price-sensitive traders and price-insensitive traders who only buy and hold, it is difficult to imagine how the half of the market that is price-sensitive, which both buys and sells according to the various traders’ perceptions and expectations regarding supply and demand, can have a greater upward effect on price than the other half that only buys and holds.

over that time period (expressed as percentage of “full carry”). Figure 33 presents the same data as in Figure 31, but expressed in terms of percentage of full carry rather than cents per month.

In March 2006, the 2-1 price spread in the Chicago wheat futures market reached full carry and, afterwards, regularly exceeded full carry. About 18 months later, after the 2007-2008 winter wheat crop was harvested amid high demand in the cash market, near term wheat prices increased and the Chicago market receded from full carry status. During 2008, both the Chicago and Kansas City futures exchanges returned to a full carry status for extended periods of time. In contrast, the Minneapolis market for hard red spring wheat only briefly reached full carry in the fall of 2008, following the harvest of the relatively plentiful 2008/09 crop. (Figure 34).



**Figure 33.** The 2-1 spread for Chicago and Kansas City wheat futures expressed as a percentage of full carry. Interest rates based upon 3-month Treasury bills. Storage costs are considered to be 0.165 cents per day (approx. 5 cents/month). Displayed values represent 5-day moving averages. Data source: CME, KCBOT, US Treasury Dept.

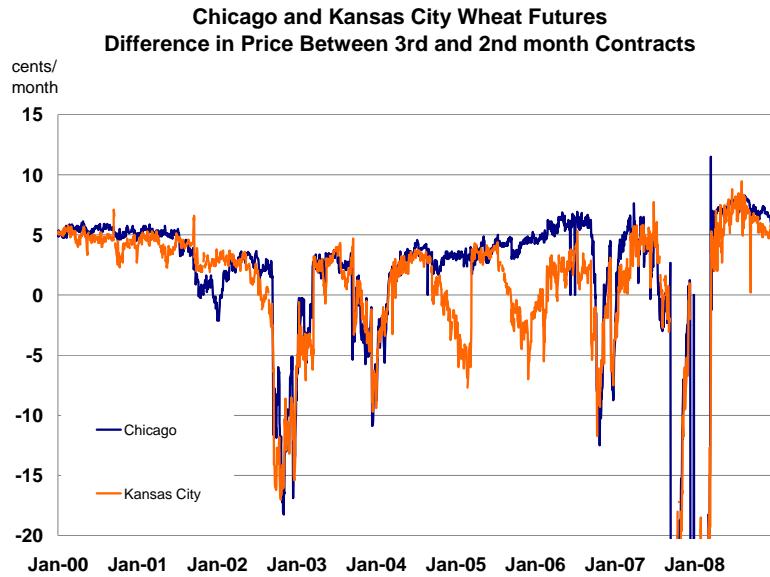


**Figure 34.** The 2-1 spread for Minneapolis wheat expressed as a percentage of full carry. Interest rates based upon 3-month Treasury bills. Displayed values represent 5-day moving averages. Data source: CFTC, US Treasury Dept.

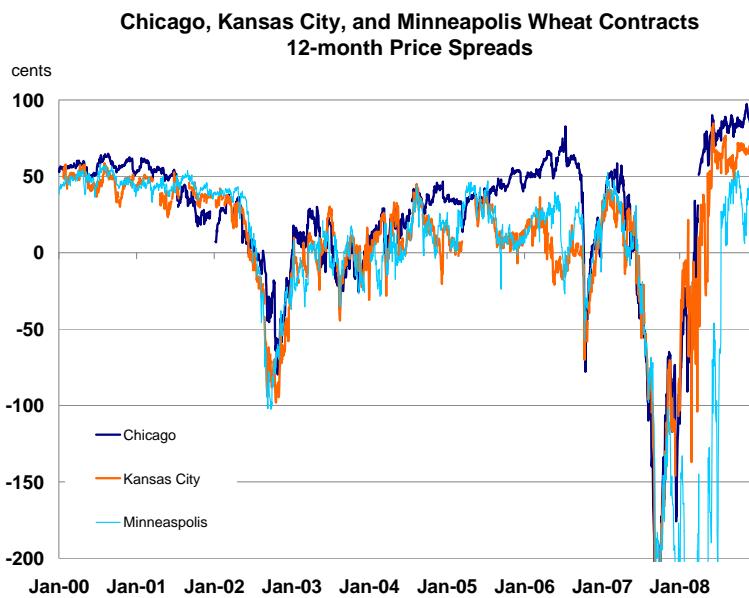
The extent to which the 2-1 spreads in the three wheat markets has been able to provide or exceed full carry is fully consistent with the evidence that, assuming all other market conditions are equal, the substantial presence of index traders tend to increase the 2-1 spread in that market. The Chicago wheat market, with a high level of index traders, exhibits a substantial increase in the 2-1 spreads to levels consistently at and above full carry. The Kansas City wheat market, with a moderate level of index traders, exhibits a more moderate but nonetheless visible increase in the 2-1 spreads to a level at or above full carry. The Minneapolis wheat market, with no index traders, continues to exhibit virtually no tendency to exceed full carry for any extended period of time.

### c. Impact of Index Trading on Longer-Term Price Spreads

During the same time period from 2000 to 2008, the data shows the same pattern for price spreads between more distant wheat futures contracts on the three exchanges. Again, the data shows an increase in the wheat price spreads on the Chicago exchange compared to the comparable price spreads on the Kansas City and Minneapolis exchanges. Figure 35 shows the price spread between the third and second month futures contracts for both the Chicago and Kansas City wheat futures contracts. This price spread is called the “3-2” spread. The data for the 3-2 spread presents a very similar picture as the data on the 2-1 spread in Figure 31 with respect to second and first month wheat futures contracts.



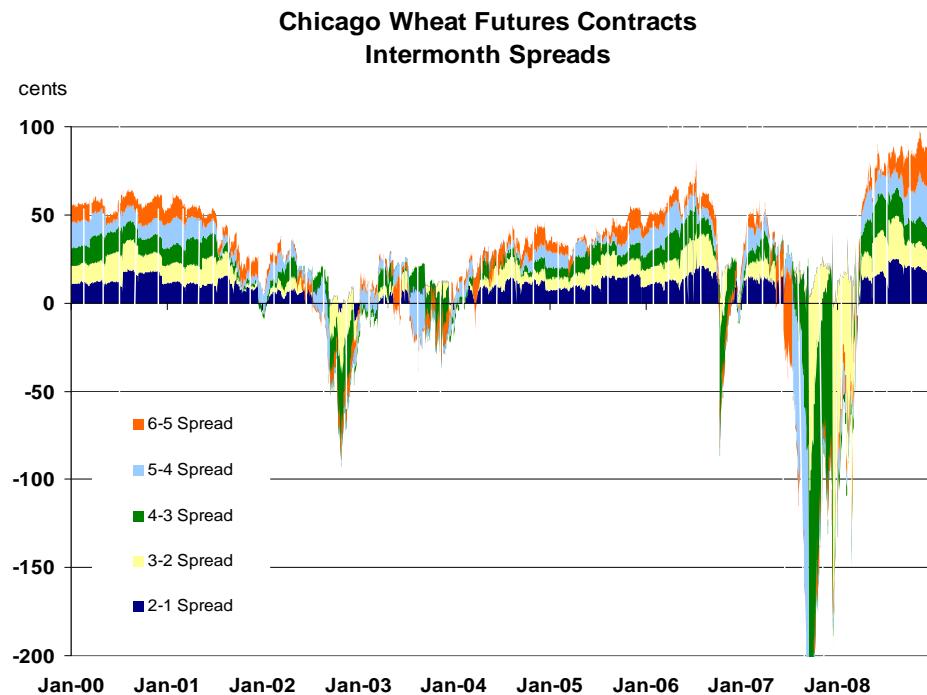
**Figure 35.** Beginning in 2004, the difference in price between the third-month and the second-month futures contracts grew much larger in the Chicago wheat futures market than in the Kansas City wheat futures market. Data source: CME, KCBOT.



**Figure 36.** Beginning in 2004, 12-month price spread for Chicago wheat futures grew much larger than the same spread for Kansas City and Minneapolis wheat futures. Data source: CME, KCBOT, CFTC.

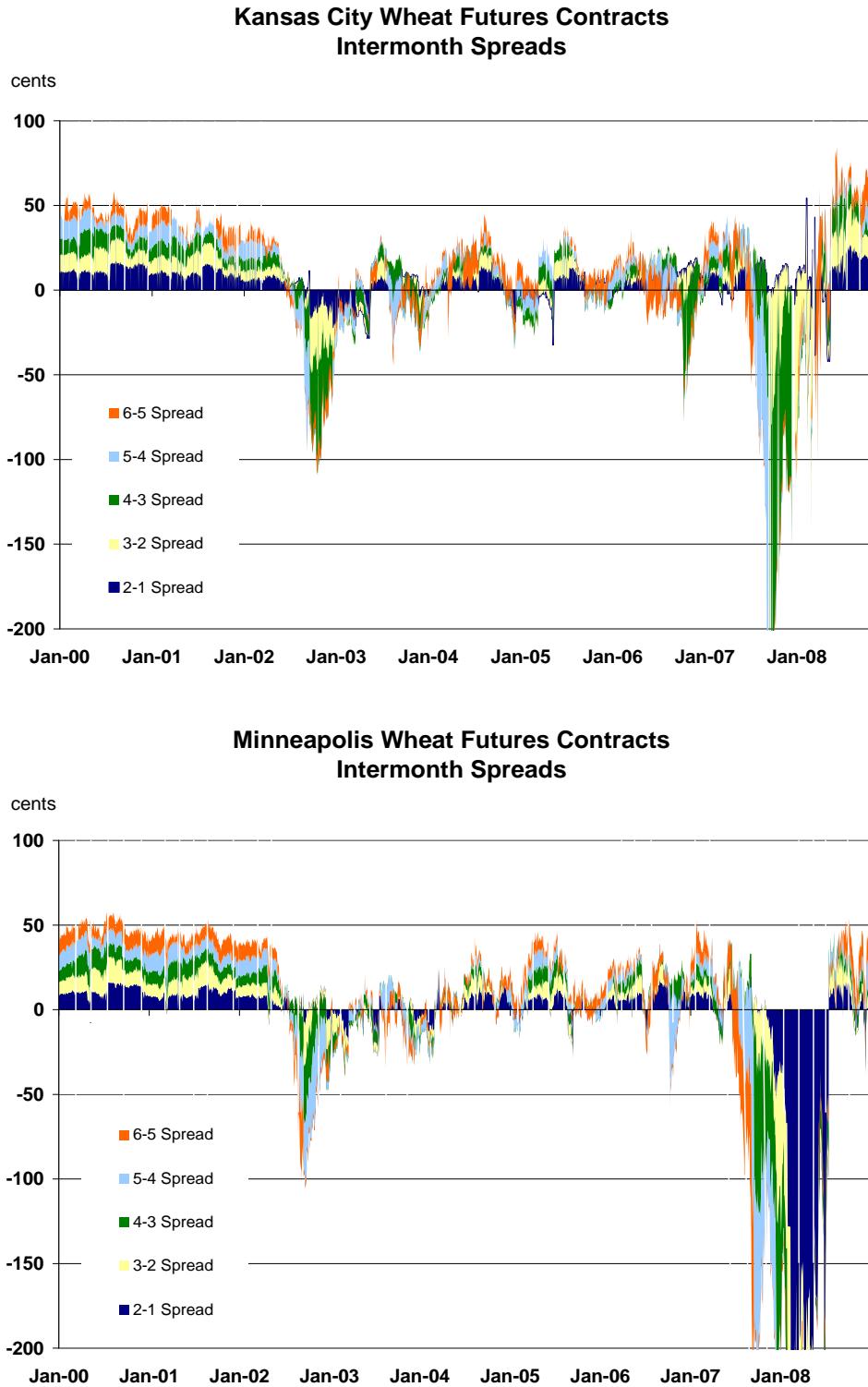
The pattern appears yet again when examining very long-term price spreads between wheat futures contracts that are 12 months apart. Again, the price spreads grew significantly larger in the Chicago futures market than in the Kansas City and Minneapolis futures markets. Figure 36 shows the 12-month price spreads in the three wheat futures markets. The data shows that, prior to mid-2004, these long-term price spreads behaved similarly in all three wheat markets. Beginning in September 2004, the long-term price spreads in the Chicago wheat market again began to diverge from those in the Kansas City and Minneapolis markets. Additionally, both the long-term spreads and the shorter-term spreads in the Chicago market reached historically high levels in late 2006.

The next Figure (Figure 37) presents data from five different intermonth price spreads for wheat futures contracts in each of the wheat futures markets to show the contribution of each monthly spread to the overall increase in the price spreads in the Chicago market compared to the other two markets.<sup>221</sup> The vertical white lines on the data indicate the expiration dates for the futures contracts.




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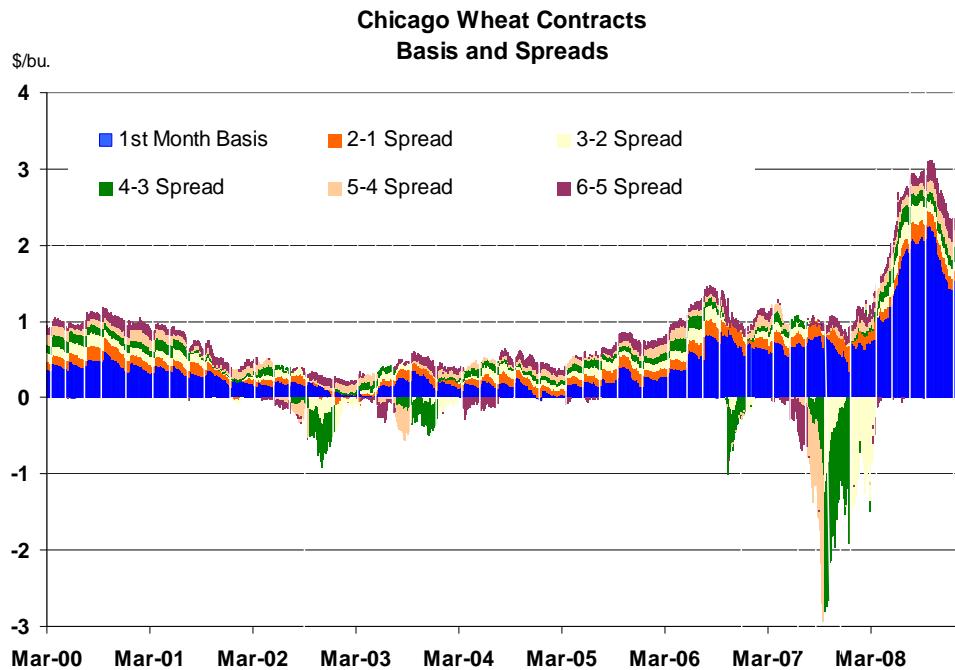
<sup>221</sup> Full-page versions of these charts are included in the Appendix.

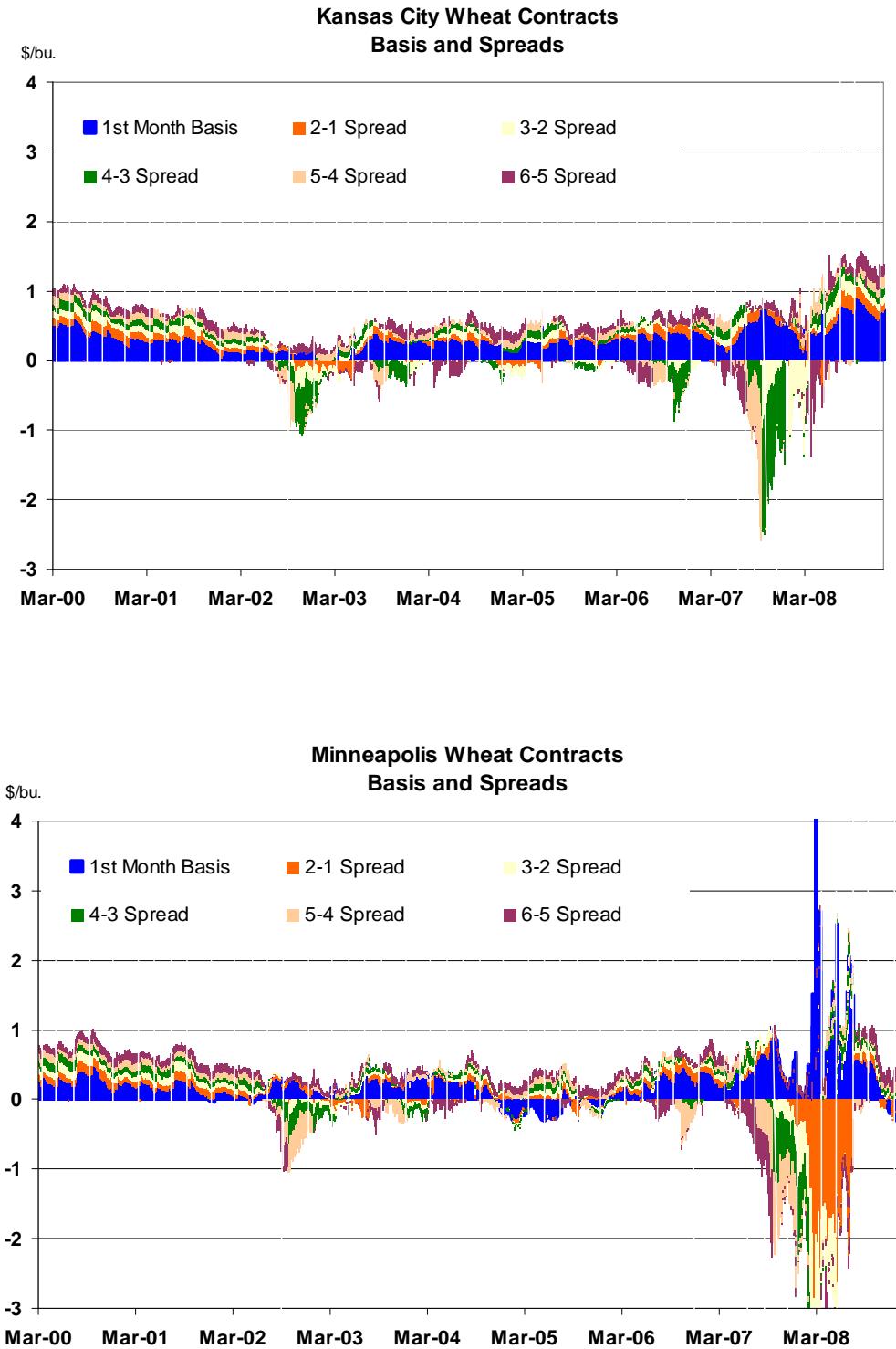


**Figure 37.** Price spreads in the three wheat futures markets. Data source: CME, KCBOT, CFTC.

The three charts in Figure 37 indicate that, since 2004, there has been a major structural change in the Chicago futures market compared to the other two futures markets. The data shows a significant increase in Chicago wheat price spreads between a number of successive futures contracts, increasing both the short-term and long-term spreads in the Chicago futures market. These increased price spreads produce thick price bands (i.e., large price spreads) on the Chicago data that are not present in the Kansas City or Minneapolis data. The data shows that these substantial increases in price spreads in the Chicago market have occurred over several years and with respect to different size wheat crops; they cannot be explained solely by the fundamentals of supply and demand in the cash market. Rather, they are consistent with the presence of a significant number of index traders who are continuously bidding up both near-term and longer-term futures prices on the Chicago exchange.

The next three charts (Figure 38) present the same intermonth price spread data as the prior three charts in Figure 37, but adds data showing the daily basis (difference between the price of the first month futures contract on the exchange and the average cash price using the MGEX cash index) in each market. This additional data shows how increases in the price spreads in the Chicago wheat futures contracts relate to the lack of convergence at the expiration of those contracts.

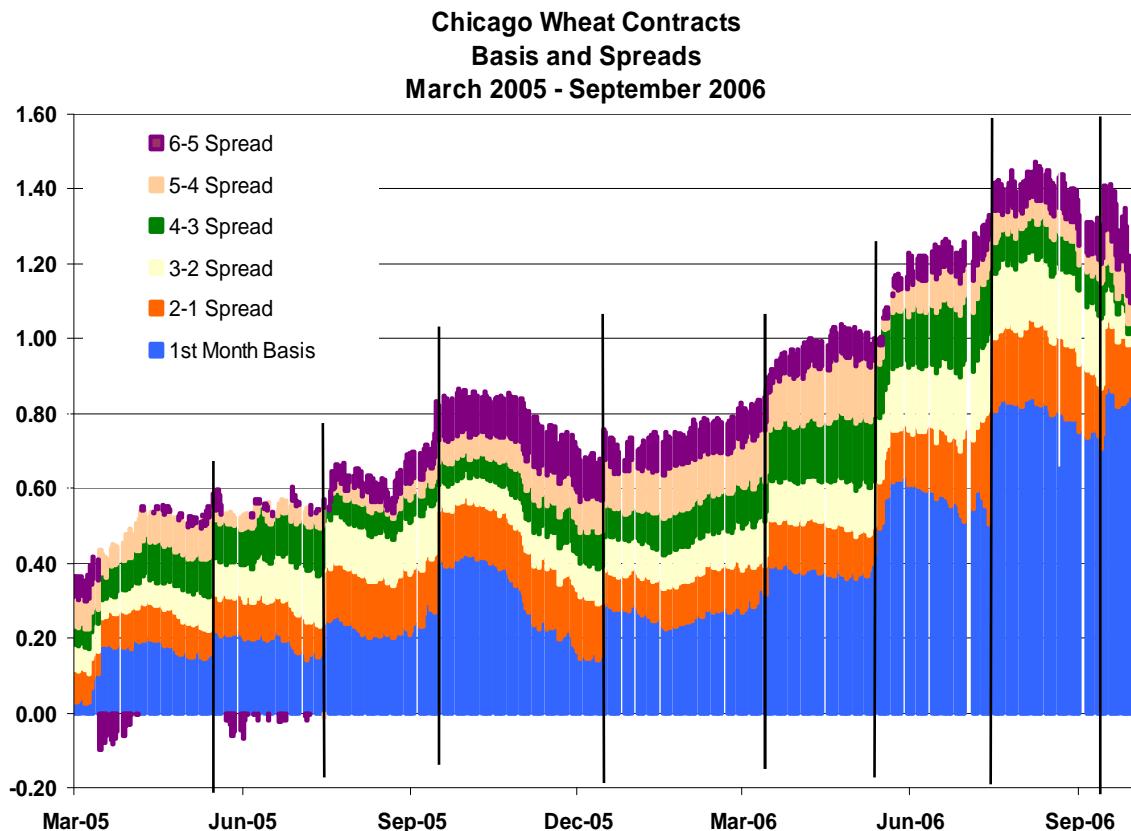




**Figure 38.** Price spreads and daily average basis in the three wheat futures markets.  
Data source: CME, KCBOT, CFTC, MGEX.

An examination of these three charts reveals how the increase in longer-term price spreads has contributed to the increasing basis and the lack of convergence in the Chicago wheat market, magnifying the pricing problems.

Figure 39 presents the same basis and spread information as in the first chart in Figure 38 for the Chicago exchange, but focuses solely on the period from January 2005 to December 2007, so that the data can be seen in more detail.<sup>222</sup>



**Figure 39.** Price spreads and daily average basis in the Chicago wheat futures market, March 2005-September 2006 . Data source: CME, MGEX.

Figure 39 illustrates how even when the basis is decreasing between contract expiration dates, the basis can nevertheless increase from one contract to another over multiple contracts. Figure 39 also displays how the basis is related to the intermonth spreads. Specifically, the new basis after a contract expires equals the “old” basis (i.e., the basis just prior to contract expiration) plus the “old” price spread between the first and second months (i.e., the spread just prior to contract expiration).

<sup>222</sup> A full-page reproduction of Figure 39 is found in the Appendix.

$$\text{New Basis} = \text{Old basis} + 2-1 \text{ spread}$$

At the same time, the “new” 2-1 spread at the expiration of a contract will be equal to the “old” 3-2 spread. When the first month contract expires, the value of this “new” 2-1 spread will then become the “new” basis. In this manner, even distant intermonth spreads may eventually influence the spread between the cash and the first month futures contract.

Indeed, Figure 39 shows how the increase in the basis resulting from the addition of the 2-1 spread to the old basis can be greater than the decrease in the basis during the period in which the previous first month contract moved towards expiration. When intermonth spreads are large, as they were in the summer of 2006 and again in the summer of 2008 for the Chicago wheat contract, and there is a weak cash market, the basis exhibits a tendency to increasingly diverge rather than converge. Not only do the large intermonth spreads provide a full carry, thereby inhibiting arbitrage transactions in the cash market at the terminal elevators, but they continue to increase the basis at the expiration of each contract.

It also becomes apparent from Figures 38 and 39 that it is a strong demand for wheat in the cash market that best promotes and eventually causes convergence. This data pattern is fully consistent with the conclusion that the large number of futures contracts held by index traders in the Chicago futures market are a major factor causing the lack of convergence. When demand for wheat in the cash market is strong, the cash price moves closer to the first month futures price and the intermonth spreads are reduced as well. When demand in the cash market is weak, the cash and futures prices do not converge and intermonth spreads expand. Thus, it can be seen from Figure 38 that when the spreads collapsed in both the Kansas City or Chicago due to strong demand in the cash market, there was much better convergence.

These pricing patterns are consistent with classical models on how futures markets work. According to these models, the intermonth spreads in the grain markets are strongly influenced by the level of speculative purchases of futures contracts from hedgers who are selling futures contracts. Because it costs money to store grain, the price of grain in the future is typically higher than the price of grain today. Speculators purchasing grain for more distant delivery therefore must pay a higher price for those futures than the prevailing cash price of grain. In effect, the speculators buying from the hedgers are paying for part or all of the costs of storing the grain until it is delivered. When the demand for grain is strong, such as in times of a grain shortage, immediate purchases of grain on the cash market can push up cash prices and significantly reduce the spread between the nearer and farther futures contracts. The intermonth price spreads therefore reflect the balance between the immediate demand for grain by merchants and processors and the more distant demand for grain by speculators and others.

In the Chicago wheat market, the substantial purchases of wheat futures by index traders have created a significant demand for futures contracts and increased the futures prices in more distant months. These higher prices have increased the price spreads between the more distant

months and the nearer months, particularly between the second and first months. The monthly roll of futures contracts tied to commodity indexes has also contributed to the increase in these price spreads. On occasion these spreads have increased above full carry.<sup>223</sup> These index traders have therefore provided a significant financial incentive for firms to store grain. As a result, the difference between the futures price and the cash price for Chicago wheat has on a number of occasions risen to record levels, thereby preventing convergence at contract expiration.

At other times, during periods in which there is a strong demand for wheat in the cash market, the cash price of wheat has risen relative to the futures price. The cash price increase directly reduces the basis. In addition, the strong demand in the cash market has reduced the intermonth spreads, thereby allowing the basis to continue falling across several contracts. Thus, convergence is promoted during times of strong demand in the cash market and inhibited during times of weak demand in the cash market.<sup>224</sup> The influence of index trading on price convergence, therefore, has depended in part upon the relative demand for Chicago wheat in the cash market. Ever since index-based traders have become a large presence in the Chicago wheat futures market, when demand in the cash market for wheat has been normal or weak, there has been poor convergence, but when demand in the cash market for wheat has been strong, convergence has returned. This trend can be expected to continue as long as index traders constitute a significant share of the Chicago wheat futures market.

## **2. Subcommittee Interviews with Market Participants**

At the same time that the Subcommittee was compiling and analyzing market data from the three exchanges that offer wheat futures contracts, the Subcommittee contacted a wide variety of individuals and firms with expertise in the wheat and grain markets to obtain their views on the severity and nature of the pricing problems, the cause of those problems, and the role of index trading. The Subcommittee interviewed market participants encompassing the entire spectrum of the wheat industry, from farms to grain elevators to grain merchants to grain processors. The Subcommittee spoke to persons who bought and sold wheat futures on the exchanges and who bought and sold actual wheat in the cash markets. In addition, the

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<sup>223</sup> A number of traders interviewed by the Subcommittee stated that a lack of confidence in price convergence for Chicago wheat contracts has itself contributed to the lack of convergence. In a properly functioning market, traders will engage in arbitrage transactions when they believe one market is overpriced relative to the other, and the pricing difference will eventually disappear. If traders believe that one market is overpriced relative to the other, but that the price differences will not disappear over time, they will not engage in arbitrage transactions because they do not have confidence that the transactions will, in fact, produce the expected result. Arbitrage only works when a sufficient number of traders believe it will work. The lack of confidence by many traders that Chicago futures and cash prices will converge, while impossible to quantify, should be considered as another factor contributing to the lack of price convergence.

<sup>224</sup> In more technical terminology, convergence is promoted when the demand for accessibility is strong relative to the supply of storage, and impeded when the demand for accessibility is weak relative to the supply of storage.

Subcommittee interviewed a number of grain market analysts, all of whom had many years of experience in the grain industry and expertise in the Chicago, Kansas City, and Minneapolis markets.

Virtually all of the grain traders and many of the market analysts provided the Subcommittee with the same explanation for the large, persistent difference in Chicago wheat futures and cash prices (basis), and for the failure of those prices to converge as the futures contracts near expiration. These grain traders and analysts stated that the most significant factor contributing to the increasing basis and the lack of price convergence was the large presence of commodity index traders in the Chicago wheat futures market. Many traders stated that index traders had created an additional demand for futures contracts that was not related to or matched by any corresponding demand in the cash market, and that the futures prices had responded to this added demand by rising to a higher level than the prices in the cash market.

In previous investigations conducted by the Subcommittee into the operation of the commodity markets, there usually has been a range of views on the causes of particular price movements. Typically, different traders with different market perspectives have had differing views on the behavior of the market. In contrast, during this investigation, there has been a striking unanimity of perspective. Virtually all of the traders and analysts contacted by the Subcommittee stated that the large presence of commodity index traders in the Chicago market was the primary factor contributing to the pricing problems in the wheat market.

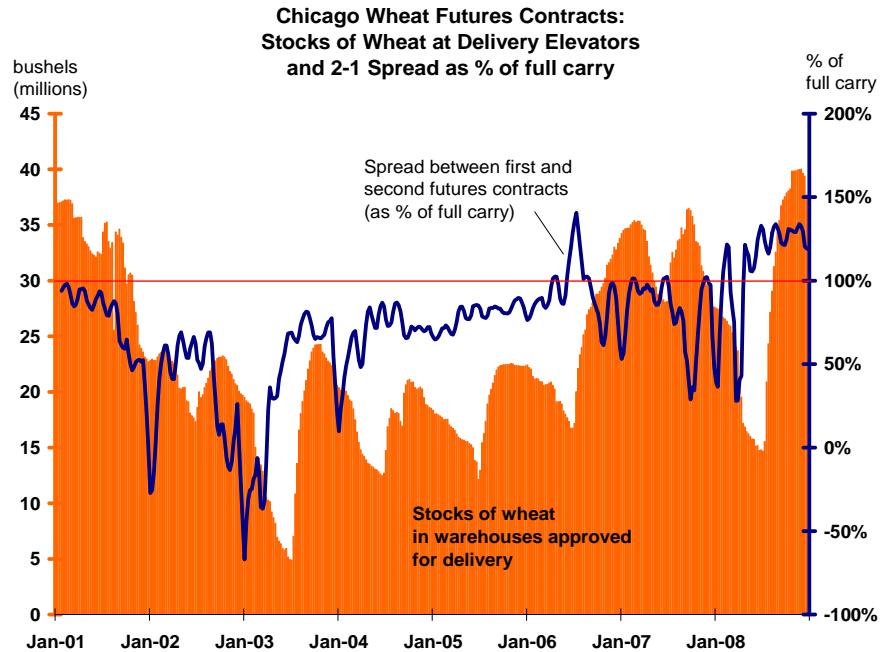
Many traders and analysts explained that the higher futures prices made it more profitable for grain elevator operators to purchase grain in the cash market, place it into storage, and then hedge those grain purchases with the sale of relatively high-priced futures contracts than to engage in arbitrage transactions (buying wheat in the cash market, selling futures contracts, and then delivering the wheat) at contract expiration. When price spreads are near or above full carry, a grain elevator can recover more than the full cost of storing the grain. Elevator operators and other grain market participants told the Subcommittee that, in recent years, because the futures and cash price difference has been so great, this approach—often termed “cash and carry”—was more profitable than any other type of prudent investment strategy.<sup>225</sup>

Storage data for wheat, when compared to contract price differences, illustrates the point. Figure 40 combines two sets of data for the period, 2001 to 2008: the daily price spreads between the second and first month wheat futures contracts expressed as a percentage of full carry on the Chicago exchange during these eight years, and the amount of wheat stored in the

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<sup>225</sup> Because only approved warehouses can make delivery under the futures contract, only these approved warehouses can directly engage in the type of arbitrage transactions that will help force convergence (i.e., buy wheat in the cash market, sell a futures contract, and deliver the wheat under the futures contract). For approved warehouses, it can be particularly profitable to engage in cash and carry transactions rather than arbitrage transactions because the cost of storage is so low.

grain warehouses at the Chicago wheat futures contract delivery locations.<sup>226</sup> As Figure 40 illustrates, the amount of grain in storage at these elevators generally increased over time after futures prices rose and provided a greater financial incentive to store grain, and generally decreased when futures prices fell and provided less of a financial incentive to store grain.



**Figure 40.** The amount of grain in storage at the terminal elevators for delivery of the Chicago wheat futures contract depends upon the incentive to store grain provided in the futures market, represented here by the percentage of full carry provided by the difference in price between the second- and first-month futures contracts. Values for the 2-1 spread reflect the 20-day moving average of the daily difference between the second- and first-month futures contracts on the CME. Full carry is computed from the 3-month Treasury bill and a daily storage fee of 0.165 cents (4.95 cents per month). Data source: CME.

Because most traders interviewed by the Subcommittee considered the large presence of index traders in the Chicago wheat market as a major underlying cause of the pricing problems in that market, these traders and market analysts were skeptical that the changes in the Chicago wheat futures contract recently adopted by the Chicago exchange and approved by the CFTC—providing additional delivery locations, higher storage fees, and revised quality specifications—would be sufficient to cure the pricing problems. These traders and analysts believed that as long as the high price spreads persisted, more storage facilities at the new delivery locations would most likely result in more grain being placed into storage at the new delivery warehouses rather than a sufficient number of cash transactions at contract expiration to force convergence.

<sup>226</sup> For a description of the term “full carry,” see Section III.

They also viewed the likely result of the increased storage fees to be an increase in the price spreads to reflect the higher costs of storage.

The traders and analysts contacted by the Subcommittee did have a range of views on what should be done to remedy the pricing problems in the Chicago wheat market. Most traders and analysts supported revoking the exemptions and other waivers that have enabled commodity index traders to hold many more contracts than the standard position limit of 6,500 wheat contracts at a time. They thought that limiting the purchases by index traders would help relieve the demand for futures contracts that is increasing the price of wheat futures contracts relative to the cash market. Some were concerned that imposing restrictions on index traders who use the regulated exchanges might cause them to offset their financial exposures in the less transparent and unregulated over-the-counter market, and therefore would result in a loss of liquidity and transparency. Still others said that regulatory action was unnecessary, because commodity index trading would diminish over time as it became apparent that index instruments were highly speculative investments that would not necessarily generate superior returns or less risk.

### **3. Testimony Presented to the CFTC**

In addition to the data analysis and interviews conducted by the Subcommittee, public testimony presented to the Commodity Futures Trading Commission by a number of grain market participants and analysts have identified the large amount of index trading in the Chicago wheat market as a major underlying cause of the market's pricing problems.

On April 22, 2008, the CFTC sponsored a public "Agricultural Forum" to discuss the pricing problems affecting the Chicago wheat futures market. The CFTC invited a wide range of commodity market participants to attend. A significant number of the grain market participants in this Forum pointed to the large presence of index traders in the Chicago wheat market as a major factor underlying the large and persistent increase in futures prices compared to cash prices and the lack of price convergence at contract expiration.

**National Grain and Feed Association.** The National Grain and Feed Association, for example, wrote to the CFTC:

"[The] previously reliable relationship between cash and futures has deteriorated to a point where many commercial grain hedgers are questioning the effectiveness of hedging using exchange-traded futures. Genuine convergence occurs less often and only for short periods of time. The band, or range, of convergence has widened due to several factors, including: 1) higher and more volatile transportation costs; 2) demand for storage created by biofuels growth; and 3) the futures market running ahead of cash values due to passively managed, long-only investment capital."<sup>227</sup>

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<sup>227</sup> Statement of the National Grain and Feed Association to the Commodity Futures Trading Commission, April 22, 2008. (Exhibit 8).

The National Grain and Feed Association stated that although many factors typically affect price levels and basis, “we believe that one new factor—the entry of large amounts of long-only, passively managed investment capital into agricultural futures markets—is causing a disruption in markets.”<sup>228</sup>

**American Bakers Association.** The American Bakers Association (ABA), whose members produce approximately 85% of all baked goods consumed in the United States, also identified the index traders in the wheat market as the primary cause of the disruption in the market: “Overall, we believe that the root cause of the current dilemma is a lack of regulation upon the largest single participant in the futures markets—the long only commodity index.” The ABA wrote to the CFTC:

“[T]he commodity exchanges have moved away from their original intent—to allow producers to sell their product in a transparent, regulated manner to physical users of the commodity. ABA is concerned that traditional market participants are being pushed out of the market—in favor of more non-traditional, new market participants that are essentially using the commodities market as a financial instrument.”<sup>229</sup>

**National Corn Growers Association.** The National Corn Growers Association (NCGA) also participated in the 2008 CFTC forum. The corn market has also experienced an increase in basis and a number of recent occasions when there has been a lack of convergence, although not as frequent or severe as in the wheat markets.<sup>230</sup> The NCGA also believes that the significant presence of commodity index traders in the grain markets has contributed to the problems of increasing basis and lack of convergence in these markets:

“It is NCGA’s opinion that the large funds are having an overwhelming influence on the futures markets and are ‘non-commercial traders.’ Frequently, we see dramatic shifts in the futures market that have no substantiated fundamental drivers. While we do not want to drive the index and hedge funds from the market, they should be treated for what they are, ‘speculators.’ I realize this flies in the face of some CFTC decisions, but I believe to truly be classified as a hedge, an entity must have a cash commodity position. NCGA realizes that the large Index Funds are selling a commodity index and then going long in each of their market basket commodities which could be construed as a hedge. But, they are

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<sup>228</sup> *Id.*

<sup>229</sup> Letter from American Bakers Association to The Honorable Walt Lukken, Commodity Futures Trading Commission, May 7, 2008. (Exhibit 9).

<sup>230</sup> Since 2005, index traders have held between 20 and 30% of the total long open interest in the corn futures market.

selling a market basket of futures prices, not a market basket of physical commodities.”<sup>231</sup>

**American Cotton Shippers Association.** The American Cotton Shippers Association (ACSA) provided a similar diagnosis of a number of pricing problems in the cotton futures market.<sup>232</sup> The ACSA stated:

“We simply cannot function in a market with unrestrained volatility unrelated to supply-demand conditions or weather events. The ICE Number 2 Contract is no longer a rational market for price discovery and hedging—its use to the commercial trade has been minimized. It is now an investment vehicle for huge speculative funds that have created havoc in the market unimpeded by fundamentals or regulation. It is a market overrun by cash precluding convergence of cash and futures prices, hedging, and forward contracting—a market lacking an economic purpose—a market not contemplated by the Congress when it authorized futures trading of agricultural commodities.”<sup>233</sup>

**American Farm Bureau Federation.** The American Farm Bureau Federation, “the national’s largest general farm organization and the representative of millions of farmers and ranchers in every state in the nation,” expressed the same views regarding the cause of the recent lack of convergence in the grain markets:

“Trading activity by funds is certainly one of the contributing factors generating high futures prices for commodities. Ordinarily, this would appear to be positive for agriculture. But if the futures markets do not converge with cash markets, there is little information on what real price levels should be either for producers or consumers of the commodity in question. With convergence, even if futures market prices fall precipitously in the delivery month, there are still economic signals being sent that producers can respond to. Without convergence, these trades become just so much froth.

“In mid-March [2008], index funds represented approximately 42 percent of the open interest in Chicago wheat, meaning that roughly two out of every five outstanding contracts were held by funds with limited need to trade on supply and demand fundamentals—they simply buy and hold. The result was a disconnect of the cash price (traditionally based on futures as a means of price discovery) from the high of the futures market. Forward contracting virtually ceased.”<sup>234</sup>

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<sup>231</sup> Statement of Garry Niemeyer, National Corn Growers Association, Commodity Futures Trading Commission Agricultural Markets Roundtable, April 22, 2008. (Exhibit 10).

<sup>232</sup> Since 2005, index traders have held between 25 and 40% of the total long open interest in the cotton futures market.

<sup>233</sup> Comments of American Cotton Shippers Association to Commodity Futures Trading Commission on Speculative Disruption In Cotton Futures Contract, April 22, 2008. (Exhibit 11).

<sup>234</sup> Statement of the American Farm Bureau Federation to the Commodity Futures Trading Commission, Public Meeting to Discuss Recent Events Affecting The Agriculture Commodity Markets, April 22, 2008. (Exhibit 12).

**Bunge North America.** In its comments to the CFTC on its 2006 proposal to create what is now the Commitment of Index Traders Report, Bunge North America, Inc. (“Bunge”), one of the largest grain processors and marketers globally, provided the CFTC with several observations about the effect of index trading in the Chicago wheat futures market. Bunge described the issue for the CFTC as follows:

“The growth in commodity funds and the corresponding growth in financial hedge positions has created in some physical commodity futures markets an investment class that is large and non-responsive to economic conditions in the underlying cash market. This phenomenon perhaps is most readily apparent in trading in the nearby December futures for soft red wheat at the Chicago Board of Trade, where traditional basis relationships have eroded and the price discovery and risk management utility of the wheat futures contract is in question. ...”

“The most noteworthy market from a negative consequences perspective is in the CBOT soft red wheat futures market. It is increasingly the view among traditional commercial market participants that the index fund position are not necessarily market liquidity providers, but are rather takers of liquidity, as they generally do not trade on cash market fundamentals.”<sup>235</sup>

#### 4. Recent Market Analyses

Several recent articles by market analysts, investment advisors, and academic scholars have also examined the impact of the increasing presence of index trading in a number of commodity markets on futures and cash prices for those commodities.

**Vanguard Investment Counseling & Research.** A 2007 paper prepared by Vanguard Investment Counseling & Research reported that the swell of money into commodity index instruments had diminished the returns for index traders holding commodity futures tied to those indexes.<sup>236</sup> The Vanguard analysis contended that the increasing number of index-linked trades in the commodity futures markets had actually changed the structure of those markets:

“Another recent influence on term structure in the commodities markets is money flowing into long-only commodity index-linked products. These passive investments are consistently rolling out of expiring nearby contracts into the

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<sup>235</sup> Letter from Thomas J. Erickson, Vice President Government & Industry Affairs, Bunge North America, Inc., to CFTC, Re: Comprehensive Review of the Commitment of Traders Reporting Program (71 F.R. 119 (June 21, 2006)). (Exhibit 13).

Although all of these commenters identified commodity index traders as a major disruptive force in the grain market, they provided a variety of suggestions as to the best way to address this problem. Some recommended that the CFTC not grant any additional exemptions from position limits. Other recommended that the CFTC not only stop granting new exemptions, but also impose stricter position limits on all index traders. Some recommended increasing the margin requirements for index traders. Some recommended additional transparency and study.

<sup>236</sup> Vanguard, *Understanding Alternative Investments: The Role of Commodities in a Portfolio*, Vanguard Investment Counseling & Research, August 2007.

second-month contract. The resulting strong demand for second-month contracts pushes up prices. If strong enough, such demand could influence the term structure, as longer-term contract prices increase relative to short-term (nearby) contract prices.”<sup>237</sup>

Vanguard also advised that it expected returns from commodity indexes to be lower in the future:

“A large contributor to *differences* in commodity futures returns is the return derived from rolling futures contracts before they expire. This roll return is positive when futures markets are backwardated and negative when markets are in contango. Many markets (such as those for energy contracts) have been consistently backwardated in the past. However, probably in part because of large-only investor inflows, these markets were in contango beginning in 2004. Consequently, over the next few years, we do not expect average returns from a long-only passive commodity investment to be as high as they have been in the past. . . . We caution against making an allocation [to commodities] on the basis of an extrapolation of historical commodity returns.”<sup>238</sup>

**Mellon Capital Management.** A 2008 paper issued by Mellon Capital Management (MCM) presented a similar analysis.<sup>239</sup> MCM also found that the increasing amount of commodity index trading likely had shifted the structure of the futures markets. Noting that the total amount of index trading in futures markets had ballooned from “less than \$10 billion in 2001 to well over \$200 billion in 2008,” MCM observed that these investors “are almost entirely long and will tend to bid up the price of futures, potentially contributing to contango.”<sup>240</sup> MCM presented data (this data is displayed in slightly different format in Figure 41) showing the increase in contango over the past ten years in a number of commodities that are included in index funds.

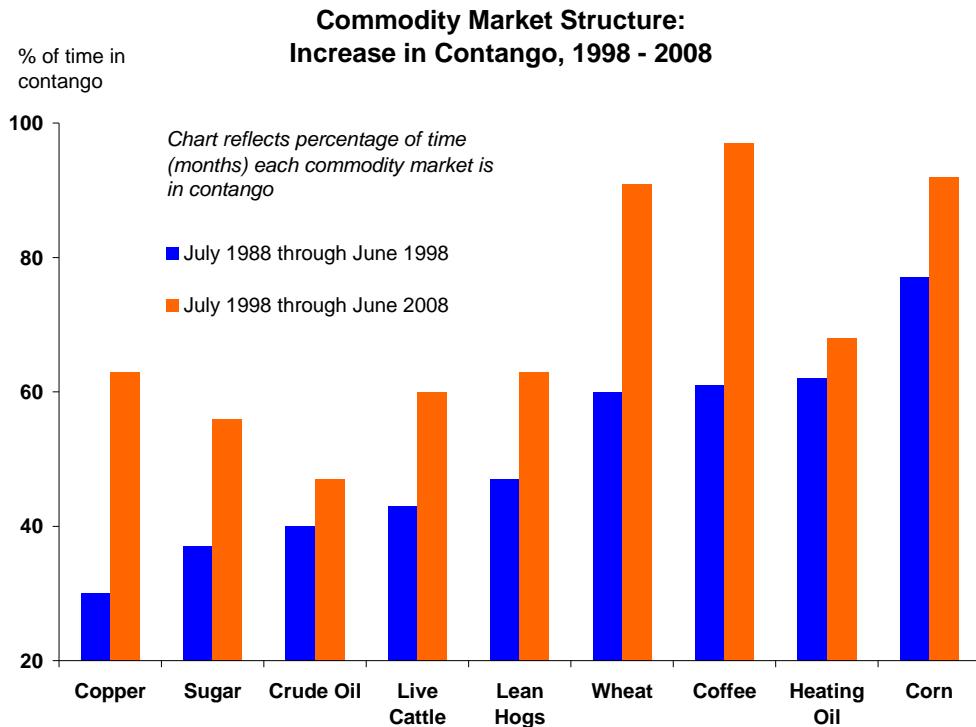
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<sup>237</sup> *Id.*, at p. 13. Vanguard reported that returns from commodity indexes over the period, 1970 to 2006, had largely been driven by the rise in energy prices, and that the indexes most heavily weighted towards energy had therefore performed better. “Since the introduction of energy futures contracts in 1983, total returns have been driven not by a general rise in commodity prices but by the strong performance of the energy sector.” *Id.*, at p. 4. Vanguard warned not to expect a continuation of these returns, because the structure of the energy markets had been shifting away from backwardation and into contango, which most likely would result in a negative return. “Unfortunately, there is evidence that the roll return is declining or even disappearing in markets where it traditionally has been strongest (such as energy futures markets).” *Id.*, at pp. 11-12. See also, PSI, *The Role of Market Speculation in Rising Oil and Gas Prices*, June 2006, at pp. 13-4.

<sup>238</sup> *Id.*, at p. 13. (emphasis in original).

<sup>239</sup> Maria Riddle, *The Role of Commodities in a Modern, Diversified Portfolio*, Mellon Capital Management, November 2008.

<sup>240</sup> *Id.*



**Figure 41.** The market structure for many commodities included in index funds has changed significantly over the past ten years. Data source: MCM.

MCM concluded that the resulting increase in futures prices was not likely to produce attractive returns: “Given the historical track record of commodities as a volatile ‘path to nowhere,’ there is little reason to expect a return in excess of cash over the long term. The increasing prevalence of contango markets (upward sloping forward price curves) reinforces this view for today’s futures investor.”<sup>241</sup>

**The Petroleum Economics Monthly.** In the March 2009 edition of *The Petroleum Economics Monthly*, Philip Verleger, a noted oil economist, found the increase of investments in commodity index instruments had a significant effect on price spreads in the crude oil futures market.<sup>242</sup> His explanation of the effects of purchases of large amounts futures contracts by

<sup>241</sup> *Id.*, at p. 5. MCM also stated: “Nothing in the long-term history of commodity prices—up to and including recent experience—suggests that, as a group, they will produce equity-like returns going forward.” *Id.*, at p. 8. With respect to spot returns, MCM noted that commodity spot prices, in real terms, “are pretty close to where they were in 1900.” For corn, crude oil, copper, silver, and cattle, MCM found that “as recently as 1999, the cumulative inflation-adjusted returns for all five commodities were negative when measured over the previous century.” *Id.*, at p. 2. MCM nonetheless concluded that it could be worthwhile for an investor to purchase commodity indexes to diversify a portfolio and provide a hedge against inflation.

<sup>242</sup> Philip K. Verleger, Jr., *The Great Glut: The Influence of Passive Investors*, The Petroleum Economics Monthly, Volume XXVI, No. 3, March 2009. Mr. Verleger also found there was no correlation between the weekly flow of

index traders and other speculators on the price spreads in the crude oil futures market matches the explanations provided to the Subcommittee by grain traders and grain market analysts on the effect of commodity index trading on the price spreads in the wheat futures market.

“[T]here is very, very convincing evidence that firms in the oil industry respond to financial incentives to hold inventories. Inventories increase when markets are in contango. Inventories are liquidated when markets are in backwardation. The rate of acquisition or liquidation depends on the magnitude of the contango or backwardation. The degree of contango or backwardation is measured by the returns to storage.

“These findings describe the market’s current dynamic. The market cycle starts with investment in futures by speculators, *peakies*, and those seeking to diversify portfolios. Buying by these individuals tends to lift forward prices, reducing backwardation or increasing contango.”<sup>243</sup>

Mr. Verleger warned that when passive investments become large enough—such as when they constitute one-half of the open interest in a market, as he believes they did in the crude oil market at the time of his analysis—the size of these positions can “overwhelm the market” or “invite a squeeze.”<sup>244</sup> He recommended that the CFTC and the exchanges enforce position limits to prevent this type of disruption to the markets resulting from index traders. “We suggest that

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money into or out of energy and agricultural futures contracts due to commodity index traders and the weekly changes in the spot price of those commodities.

<sup>243</sup> *Id.*, at p. 25. Mr. Verleger uses the term “peakies” to refer to persons who believe that the global annual production of crude oil has peaked or will soon reach a peak. In testimony before the Congress in 2006, former Chairman of the Federal Reserve Alan Greenspan offered a similar analysis regarding the effects of increasing investments from hedge funds and other institutional investors on commodity prices:

“[I]ncreasing numbers of hedge funds and other institutional investors began bidding for oil [and] accumulated it in substantial net long positions in crude oil futures, largely in the over-the-counter market. These net long futures contracts, in effect, constituted a bet that oil prices would rise. ... With the demand from the investment community, oil prices have moved up sooner than they would have otherwise. In addition, there has been a large increase in oil inventories.”

Statement of Alan Greenspan, *Oil Depends Upon Economic Risks*, Hearing before the Senate Committee on Foreign Relations, June 7, 2006. See also Staff Report of the 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 27, 2006, at pp. 7, 13 (“[T]he large purchases of crude oil futures by speculators have, in effect, created an additional demand for oil, driving up the price of oil for futures delivery in the same manner that additional demand for contracts for the delivery of a physical barrel today drives up the price for oil on the spot market. ... [T]he influx of speculative dollars appears to have altered the historical relationship between price and inventory, leading the current oil market to be characterized by both large inventories and high prices.”)

<sup>244</sup> Philip K. Verleger, Jr., *Passive Investors Are “Roiling” Markets*, The Petroleum Economics Monthly, Volume XXVI, No. 2, February 2009, at p. 25. Mr. Verleger also found that purchases of futures contracts by commodity index traders can be beneficial if they result in an increase in the amount of oil in storage and do not distort the market. “Price volatility tends to decline as inventories rise. Higher stock levels also tend to moderate upward pressure on prices. Thus the increase in inventories almost certainly augers a period of lower prices, quite possibly much lower prices.” Philip K. Verleger, Jr., *Giving Credit Where Credit is Due: The Stabilizing Influence of Passive Investors*, Notes at the Margin, Volume XIII, No. 16, April 20, 2009, at p. 1.

regulators and the exchanges might need to intervene in trading activity, perhaps by enforcing rigid position limits in some contracts. Failure to do so could make one or more contracts irrelevant to the world market.”<sup>245</sup>

**Institute for Agriculture and Trade Policy.** In 2008, the Institute for Agriculture and Trade Policy (IATP), a farm-oriented research organization based in Minneapolis, issued a paper which examined the role of index trading in the runup of agricultural commodity prices from 2006 and 2008.<sup>246</sup> The Institute described the problem in part as follows:

“As prices have become more volatile and convergence less predictable since 2006, the futures market has lost its price discovery and risk management functions for many market participants. According to the FAO [Food and Agriculture Organization of the United Nations], as of March 2008, volatility in wheat prices reached 60 percent beyond what could be explained by supply and demand factors.”<sup>247</sup>

In addition to the problems that higher futures prices, price volatility, and poor price convergence cause for farmers and agricultural businesses, IATP noted that these pricing problems have global implications: “The Agribusiness Accountability Initiative (AAI) stated that ‘massive

<sup>245</sup> *Id.*, at p. 14. Mr. Verleger has discussed the impact of commodity index trading upon the commodity markets in several of his weekly and monthly newsletters going back to January 2005. Although he has typically found a variety of other factors primarily responsible for the behavior of crude oil spot prices during this period, Mr. Verleger has also consistently found that index traders have increased the price of crude oil futures contracts. See, e.g., Philip K. Verleger, Jr., *The Influence of Index Traders on Oil Prices*, The Petroleum Economics Monthly, Volume XXV, No. 3, March 2008, at p. 24 (“The results . . . suggest that buying by index funds has promoted additional forward sales by noncommercial and commercial market participants. Although we cannot produce the results of statistical causality tests to confirm this view, our hypothesis is that buying by index fund traders has lifted forward prices. The rise in forward prices has then been seen as an increasingly good opportunity for commercial traders to hedge by selling forward.”); Philip K. Verleger, Jr., *Commodity Investors: Trying to Squeeze a Barrel into A Pint Jar*, The Petroleum Economics Monthly, Volume XXIII, No. 10, October 2006, at p. 15 (“The evidence presented below suggest that much, if not all, of futures purchases by commodity investors has been offset by inventory accumulation. . . . What happens if investors seeking to put money into commodities cannot find counterparties? The obvious answer is the forward price will be bid up until the investors give up or a counterparty sells. We suggest the forward price curves for gasoline and heating oil have been distorted by this process. Furthermore, this bidding has influenced forward ‘cracks’ (the difference between the future price of products and the future price of light sweet crude.”); Philip K. Verleger, Jr., *Commodity Investors: A Stabilizing Force*:, The Petroleum Economics Monthly, Volume XXIII, No. 3, March 2006, at p. 14 (“In summary, the introduction of investors in physical commodities has altered the economics for holding crude oil. It is now profitable to build and hold crude oil inventories.”); Philip K. Verleger, Jr., *Are Oil Markets Entering Yet Another “New Era”?*, The Petroleum Economics Monthly, Volume XXII, No. 7, July 2005, at p. 1 (“The current new era is marked by the entry of long-term investors, who have pushed forward crude prices to record levels.”); Philip K. Verleger, Jr., *Inflating the Commodity Bubble: Impact of Pension Fund Investment on Oil Prices*, The Petroleum Economics Monthly, Volume XXII, No. 1, January 2005.

<sup>246</sup> Institute for Agriculture and Trade Policy, *commodities Market Speculation: The Risk to Food Security and Agriculture*, November 2008, available at [www.iatp.org](http://www.iatp.org).

<sup>247</sup> *Id.*, at p. 5.

commodity market speculation ... has pushed the prices of wheat, maize, rice and other basic foods out of the reach of hundreds of millions of people around the world.”<sup>248</sup>

IATP called commodity index funds “the elephant in the room” due to the “huge amount of money invested through them and the price volatility that results from index fund ‘bets.’”<sup>249</sup> IATP explained how these funds have a major impact on futures markets:

“Perhaps the most crucial loophole is the one that exempts financial speculators from the speculation position limits of commercial hedgers, provided that the speculator ‘swap’ the futures contract through a middleman ... which would then itself seek to sell the contract it had just bought to spread its risk. ... The [commodity index] funds are legally bound by their prospectus to trade to maintain this fund composition balance, regardless of the supply and demand fundamentals in agricultural markets. ... The underlying fundamental for these funds is not the supply and demand of physical commodities ... but the prospectus formula and profit target. ... While it is generally agreed that some speculative capital is necessary for the effective operation of commodities futures and options markets, it does not follow that the amount of capital must be unbounded for futures and options trading to carry out its price discovery and risk management functions.”<sup>250</sup>

Among other steps to rein in excessive speculation in the commodity markets, IATP recommended establishing position limits on U.S. exchanges and banning foreign commodity exchanges from operating in the United States unless they also establish and enforce position limits for “financial speculation.”<sup>251</sup>

**University of Illinois Analyses.** In a series of papers published over the past two years, Professor Scott Irwin and colleagues at the University of Illinois thoroughly documented and analyzed the recent convergence problems in the wheat, corn, and soybean markets, but did not find that index trading played a major role.<sup>252</sup>

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<sup>248</sup> *Id.*, at p. 3.

<sup>249</sup> *Id.*, at p. 7.

<sup>250</sup> *Id.*, at pp. 7-8.

<sup>251</sup> *Id.*, at p. 11.

<sup>252</sup> Scott H. Irwin, Philip Garcia, Darrel L. Good, and Eugene L. Kunda, *Poor Convergence Performance of CBOT Corn, Soybean and Wheat Futures Contracts: Causes and Solutions*, Marketing and Research Report 2009-02, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, March 2009; Scott H. Irwin, Dwight R. Sanders, and Robert P. Merrin, *Devil or Angel? The Role of Speculation in the Recent Commodity Price Boom (and Bust)*, February 2009; Dwight R. Sanders, Scott H. Irwin, and Robert P. Merrin, *The Adequacy of Speculation in Agricultural Futures Markets: Too Much of a Good Thing?*, Marketing and Research Report 2008-02, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 2008; Scott H. Irwin, Philip Garcia, and Darrel L. Good, *The Performance of Chicago Board of Trade Corn, Soybean, and Wheat Futures Contracts After Recent Changes in Speculative Limits*, July 2007. In addition to extensively documenting the nature and extent of the recent convergence problems in the grain markets, these papers

In a 2007 paper, Professors Irwin, Garcia and Good found that the several instances in which the corn and soybean markets experienced a lack of price convergence represented “[a] picture . . . of weakness, but not failure.”<sup>253</sup> They believed these price convergence failures resulted from “a unique situation” involving extraordinarily high barge rates along the Illinois River, futures prices that failed to reflect fundamental values in the cash market, and “a large carry in the futures market that influenced delivery and load-out decisions.”<sup>254</sup> A large carry, they noted, provides merchants with an incentive to store the commodity for later delivery, when futures prices are higher. They explain that, as more of the commodity is stored and less is marketed, there are fewer transactions to force price convergence.

With respect to poor price convergence in the wheat market, the professors found that the performance of the Chicago wheat futures contract was so “dismal” that it constituted “failure to accomplish one of the fundamental tasks of a futures market.”<sup>255</sup> “This prolonged period of weak basis,” they elaborated, “suggests that the contract is not providing a hedging mechanism, may not be providing proper price signals to wheat producers and consumers, and may be reducing the effectiveness of crop revenue insurance products based on CBOT wheat futures prices.”<sup>256</sup> They identified the following factors as responsible for the lack of price convergence: (1) soft red winter wheat futures prices that “exceeded fundamental value” in reference to the cash market; (2) a large carry; and (3) insufficient deliveries. As with corn and soybeans, the large carry served to encourage storage rather than deliveries, resulting in fewer transactions to force price convergence.<sup>257</sup>

have helped focus much of the analysis and discussion on this issue. Professor Irwin has made presentations to the CFTC on his findings on several occasions. Many of the people interviewed by the Subcommittee staff during this investigation were familiar with these papers.

<sup>253</sup>Irwin, Garcia and Good (2007), at p. 17.

<sup>254</sup> The referenced increase in the carry (i.e., spread between the second and first month futures contracts) in the corn and soybean markets occurred from late 2005 through August 2006. *Id.*, at pp. 10-17. There was a similar increase in the carry in the Chicago wheat market during this period.

<sup>255</sup> *Id.*, at pp. 10, 17.

<sup>256</sup> *Id.*, at p. 17.

<sup>257</sup> Professors Irwin, Garcia, and Good also believed that the decline of Chicago as a center of commerce in wheat, particularly soft winter wheat, and the use of the Chicago wheat contract as a global benchmark for wheat prices, were partially responsible for the convergence failures. They recommended changing the terms of the Chicago wheat futures contract to encourage and facilitate deliveries of wheat, but also more research “to investigate the need for and development of a new contract that more precisely reflects world supply and demand conditions for wheat.” *Id.*, at p. 18. As they note, however, Chicago has not been a major center of wheat commerce for nearly a century. In 1926, a Federal Trade Commission (FTC) Report on the Grain Trade noted “the tendency toward a loss by Chicago of its primacy as a market for the physical handling of grain, especially as regards wheat, while maintaining its dominant position in futures. An increasing quantity of grain that never goes to Chicago is hedged in Chicago futures.” FTC, *Report on the Grain Trade*, Vol. VII, Effects of Futures Trading, at p. 286 (1926). The FTC Report recommended additional delivery points for the contract: “Outside deliveries might be considered a further logical step in making the national market for future trading, so far as practicable, also national in some sense as regards the

In this paper, Professors Irwin, Garcia, and Good identified increased speculation as one of the key factors responsible for the larger carry in these markets during this period: “The larger carry in the corn and soybeans markets in the past year likely resulted from large crop inventories, increased commercial long hedging in deferred contracts by exporters and ethanol producers, *and the large increase in speculative interest in owning corn and soybean futures.*”<sup>258</sup> The paper identified index traders as one of the factors underlying this increase in speculation in the grain markets. Although it identified “a particular concern” that “the huge inflow of commodities investment has raised prices, at least temporarily, to higher levels that can be justified by economic fundamentals,” it did not evaluate or address this specific concern in more detail.

In a 2009 paper, Professors Irwin, Garcia, Good, and Eugene Kunda found that, from late 2005 to 2009, the wheat, corn, and soybean markets were plagued by “extended periods” in which there was a lack of price convergence, although corn and soybeans had not performed as poorly as wheat. “Performance has been consistently weakest in wheat, with futures prices at times exceeding delivery location cash prices by \$1/bu., a level of disconnect between cash and futures not previously experienced in grain markets.”<sup>259</sup> Again, the 2009 paper identified the large carry in these markets as the root cause of the convergence problem. “In sum,” the paper stated, “[this] analysis pinpoints an unusually large carry in nearby spreads as the main factor driving poor convergence performance of corn, soybean, and wheat futures contracts in recent years. The large carry led to a historically large wedge between futures and cash prices and substantial declines in hedging effectiveness.”<sup>260</sup>

facilities offered for delivery on its futures.” *Id.* A 1953 analysis by Professor Holbrook Working of the effectiveness of hedging techniques in the wheat futures market also referenced the longstanding decline of the cash wheat market in Chicago. Professor Working stated that he used price quotations from the Kansas City markets rather than Chicago “because changes in the major wheat-producing areas and in the normal lines of movement of the commodity have left Chicago with a vestigial spot wheat market that no longer affords a good source of spot price quotations.” Holbrook Working, *Futures Trading and Hedging* (1953), reprinted in Selected Writings of Holbrook Working, (1977), at p. 145. In 1961, Stanford University Professor Roger Gray commented, “It is somewhat misleading to speak of our three major wheat futures markets. Chicago is the major futures market, carrying about three-fourths of all the open contracts on all United States wheat futures markets in the postwar period. Kansas City and Minneapolis have divided nearly all of the remainder in a ratio of about two to one in favor of Kansas City. . . . Yet Chicago is a cash wheat market of only secondary importance . . . .” Roger W. Gray, *The Relationship Among Three Futures Markets*, Food Research Institute Studies, Vol. II, No. 1 (Feb. 1961), at p. 22 (available at farmdoc archives). The issue, therefore, is not whether Chicago has declined as a location for the wheat trade—it clearly has—but what additional factor has arisen within the past few years that, together with weaknesses in the contract, now threatens the very existence of the Chicago wheat contract as a useful hedging instrument.

<sup>258</sup> *Id.*, at p. 13 (emphasis added).

<sup>259</sup> Irwin, Garcia, Good, and Kunda (2009), at p. 1.

<sup>260</sup> *Id.*, at p. 5. Professor Irwin and his colleagues found that all contracts performed poorly whenever the price spread between the second and first futures contracts (i.e., the carry) exceeded 80% of full carry. They explained how a large carry impairs convergence:

Although Professors Irwin and his colleagues again identified the increased carry in the grain markets since 2006 as a major underlying cause of the convergence problems in these markets, they again did not identify the root cause for this increase.<sup>261</sup> Rather, they partially

“Large carry markets contribute to lack of convergence by ‘uncoupling’ cash and futures markets when futures prices are above cash prices. The delivery instrument for corn and soybeans is a shipping certificate, while the delivery instrument for wheat was a warehouse receipt until recently when it was changed to a shipping certificate (starting with the July 2008 contract). Those longs who receive certificates or receipts from shorts in the delivery process are not required to cancel those instruments for shipment. The instruments can be held indefinitely with the holder paying ‘storage’ costs at the official rates specified by the CBOT in contract rules. The taker in delivery (the long) may choose to hold the delivery instrument rather than load out if the spread between the price of the expiring and next-to-expire futures contracts exceeds the cost of owning the delivery instrument. Therefore, as the magnitude of the nearby spread exceeds the full cost of carry for market participants with access to low-cost capital, those participants can (and do) stand for delivery but do not cancel delivery certificates or receipts for load out.

“The lack of load out, then, means that deliveries do not result in cash commodity purchases by the taker that would contribute towards higher cash prices and better convergence. Alternatively, a smaller carry in the market and the absence of an ‘abnormal’ return to certificate ownership would motivate participants with long positions to liquidate prior to delivery, putting downward pressure on nearby futures and contributing to better convergence.”

*Id.*, at p. 2.

<sup>261</sup> Professor Irwin and his colleagues rejected index trading as a possible cause for the increase in the price spreads and resulting carry in the market, because they did not find lasting increases in the price differences between the first and second month futures contracts during the 5-day roll periods for the S&P GSCI commodity index. For a number of reasons, however, the increase in the second-to-first month price spreads resulting from increased index trading would not necessarily be manifested during this small window of time.

First, there is no reason to expect that the increase in the spread between the second and first month contracts resulting from index traders would occur only during the five days when the S&P GSCI is rolling futures contracts from the first to the second months. All of the traders in these markets are well aware of when the various funds roll their contracts, and some may avoid trading during any period in which they believed they would have to compete with index traders for the purchase or sale of specific futures contracts. Thus, to a certain extent the increase in trading by index traders during this period may be directly offset by decreased trading by non-index traders during this period. The net increase in demand for futures contracts resulting from index traders, therefore, could be spread out over a much larger time frame than this 5-day window.

Second, since 2006, the roll window for the S&P GSCI has represented a decreasing proportion of the total time period in which index-related futures contracts are rolled. Since 2006, most new investments in commodity indexes have been placed into the second-generation indexes. The second-generation commodity indexes rely on futures contracts that are more distant than those in the first-generation funds, and roll less frequently in order to avoid or reduce the losses from rolling contracts in contango markets.

Third, as discussed previously, other intermonth spreads—including the spread between the third and second month contracts—have also increased over the past few years. Once a futures contract reaches expiration, what had been the spread between the third and second month futures contracts then becomes the spread between the second- and first-month contracts. Hence, much of the increase in the spread between the second and first months since 2006 is directly related to the prior increase in the spread between the third and second month contracts rather than the rolling of contracts. Hence, much of the increase in the 2-1 spreads has already occurred by the time the S&P GSCI contracts are rolled.

Fourth, investments tied to commodity indexes directly affect the intermonth price spreads through their initial investments as well as through the periodic rolling of contracts. The initial purchase of a futures contract by an index trader, by itself, will increase the difference in price between the second month contract and the first month

attributed the failures of convergence to “structural issues related to the delivery process”—meaning the fact that Chicago is no longer a principal location for commerce in wheat—and recommended that the contract delivery point be moved to New Orleans to increase the number of cash transactions near contract expiration and encourage price convergence.

## **5. Basic Futures Market Theory: Impact of Speculation on Price**

Finally, basic theory about how commodity markets work supports the finding that commodity index trading is a primary cause of the pricing problems in the Chicago wheat market.

All of the traders in commodity futures markets, including speculators, commercial hedgers, and others, affect the price of commodity futures contracts. A bid to purchase or an offer to sell a particular futures contract at a particular price that is made by a speculator has the same effect upon the market as an identical bid or an offer from a commercial hedger. It is the interactions between all of the buyers and sellers which determine market prices, not theoretical models of what the appropriate price should be given the fundamentals of supply and demand. G. Wright Hoffman, one of the first economists to extensively analyze trading on the futures markets, observed, “Fundamental market information determines prices only through the opinions and actions of traders composing the market.”<sup>262</sup> Similarly, Professor Holbrook

contract, and between more distant contracts. Because these index traders are passive, meaning they hold onto the futures contracts for long periods of time and do not subsequently buy or sell on the basis of market supply and demand fundamentals, there is no subsequent selling of these contracts prior to the roll that would lower these spreads. Hence, by the time a roll window arrives, the spread already would have been elevated to a certain degree due to the buy and hold strategy pursued by these index traders. It is not possible to quantitatively determine or estimate the relative contribution of the initial purchase and the subsequent roll to the overall level of the price spread. To the extent that the subsequent roll does not actually increase the price spread, however, it may still serve to maintain that spread and prevent it from falling as firms seek to “sell the spread” in order to recover the costs of storing the commodity over the time period represented by the spread. This type of effect also would not be observable in any correlation between price and position.

The 1967 USDA Economic Research Service study on speculation, margins, and prices emphasized the importance of examining a wide time frame rather than a discrete trading window when analyzing the effect of speculation on price. “If one assumes that the principal, measurable price effect of speculation is not caused by the holding of speculative position over time, but, instead, by the immediate market reaction to the transaction (buying or selling) itself, then no combination of measures which reflect merely the net change in ‘ownership’ of open contracts can adequately explain the real price effect of speculation.” *Margins Speculation and Prices in Grains Futures Markets*, at p. 71. The USDA advised taking a broad approach: “[A]ppropriate examination of speculative activities and related price behavior over a wide sample of market situations would identify circumstances under which speculation quite likely was a measurable price-making factor.” *Id.*, at 73.

<sup>262</sup> G. Wright Hoffman, *Future Trading Upon Organized Commodity Markets in the United States*, (University of Pennsylvania Press, 1932), at p. 259. In 1941, the USDA published Mr. Hoffman’s study of grain prices and the futures markets over a 15-year period beginning in 1923, the year in which data on the positions of traders first

Working writes, “[T]he price of a commodity, of which stocks are held, cannot be determined by an impersonal economic law; it is determined by human judgments, essentially speculative, regarding what those stocks can be sold for at a later time.”<sup>263</sup> Professor Thomas Hieronymus has also observed, “A futures market is not a scholarly seminar in which learned men debate what is, and arrive at, an equilibrium price; it is a game in which businessmen compete, with money at hazard, to establish a market price that works.”<sup>264</sup>

The price of a futures contract reflects the supply of and demand for that contract, as transmitted to the market by the buyers and sellers of the contract. As in any type of market, if there are more buyers than sellers, then the price will rise until there is sufficient incentive for

became available under the Grain Futures Act of 1922. USDA, *Grain Prices and the Futures Market: A 15-year Survey, 1923-1938*, Technical Bulletin No. 747, January 1941 (G. Wright Hoffman, consulting economist). Mr. Hoffman’s USDA study concluded that “when the trading of market leaders results in large purchases or sales within comparatively brief periods of time, it is capable of causing the price to move with the trading—if purchases, upward; if sales, downward.” *Id.*, at p. 49. The USDA found that when the net positions of the 5 largest speculators in the Chicago wheat futures market were “combined and considered as a group their positions as well as their large trades reveal a pronounced price relationship. *They suggest in even stronger terms than for earlier periods that the trading of these leaders caused prices to move with their trading.*” *Id.*, at p. 52 (emphasis added). Moreover, the USDA found that the larger the speculative trades, the more likely those trades were to affect prices. “[T]he larger the daily net trades by leading operators the more certain it becomes that the prices will respond directly to the trading.” *Id.*, at p. 60.

Mr. Hoffman also contributed to the 1926 report prepared by the Grain Futures Administration (the GFA was the predecessor agency to the Commodity Exchange Authority, which was the predecessor agency to the CFTC) at the request of the U.S. Senate on the causes of the price fluctuations in the wheat market in 1925. The 1926 report concluded, “While this investigation did not reveal any concentrated action for the deliberate purpose of manipulating the market, most of the wide and erratic price fluctuations that occurred in wheat futures at Chicago during the early part of 1925 were largely artificial and were caused primarily, either directly or indirectly, by heavy trading on the part of a limited number of professional speculators.” *Fluctuations in Wheat Futures*, Senate Doc. No. 135, 69<sup>th</sup> Cong., 1<sup>st</sup> Sess., June 28, 1926, at p. 1. It found that “large speculative operations” were “a constant hazard in the market, the force of which may move prices far out of line with the normal and, temporarily, at least, destroy completely the hedging value of the futures market.” The report advised that limits on the size of speculative positions and intraday trading were necessary “if the futures market shall best serve hedgers and others who have need of it in the process of moving grain from the farms of this country to the consumers of this and other countries.” *Id.*, at p. 6.

Fifty-five years after the Senate published this report, Professor Todd Petzel published a critique of the GFA’s study of the events of 1925, observing that the use of statistical techniques for the analysis of market data that were not yet developed at the time of the GFA study did not support the GFA’s conclusions. Professor Petzel’s analysis confirmed the correlation between the purchases by speculators and price changes, but he then stated “it is important that causality not be read into [the fact of correlation]. It is impossible to determine whether price increases (or decreases) during the day caused purchases (or sales) by speculators or the converse.” Todd E. Petzel, *A New Look at Some Old Evidence: The Wheat Market Scandal of 1925*, Food Research Institute Studies, Vol. XVIII, No. 1, 1981, at p. 123 (available at farmdoc archives). Professor Petzel found that “without intraday trading data it is impossible to suggest a causal relationship.” *Id.*, at p. 126. Professor Petzel, therefore, did not disprove the GFA’s finding, but rather rejected it because it could not be proved according to a high degree of statistical certainty with the available data. In the absence of good or sufficient data, however, non-statistical methods are often used to demonstrate the truth or falsity of a hypothesis.

<sup>263</sup> *The Economic Functions of Futures, Markets*, at p. 294.

<sup>264</sup> Hieronymus, at p. 327.

additional sellers to enter the market. It follows, therefore, that if in the commodity futures markets there are more traders, such as speculators, who desire to purchase a futures contract than other traders, such as hedgers, who in the normal course of business would sell those contracts, then the price of those futures contracts must rise to attract additional sellers. In this manner an excess of speculative purchases of futures contracts will raise the price of those futures contracts.<sup>265</sup>

It is also well-established that speculative activity is often a major determinant of price spreads. Professor Hieronymus wrote in his classic textbook: “Speculators in futures markets affect prices; they accumulate and liquidate inventory which puts prices above the levels that would otherwise prevail when they are accumulating and puts prices below levels that would otherwise prevail when they are liquidating.”<sup>266</sup>

Professor Hieronymus describes in detail how speculators in the grain markets influence the intermonth price spreads in the grain futures markets and thereby affects the deliveries and storage of grain at terminal elevators. He first explains how a terminal elevator determines whether to hold or deliver grain:

“The elevator management must formulate a judgment of the most favorable spread at which it can move its hedges forward and, at a smaller spread, deliver grain. In making this judgment, it looks at existing supplies, supplies to come, demands for use and shipment, and the amount of available space. It is a complex judgment, and first delivery day is nearly always a time of intense interest.

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<sup>265</sup> A variety of rationales are sometimes offered to support the contrary view that speculation does not affect futures prices. First, it is sometimes asserted that in an efficient market any deviations from “fundamental value” will quickly disappear as other market participants take advantage of the arbitrage opportunities presented by such deviations. This view presumes that “fundamental value” is an objective reality that all market participants can readily discern. As Hoffman, Working, and Hieronymus and many others have stated, “fundamental value” is not an objective value that exists independently from the market—it is what the market says it is. Hence, there is actually no reason to believe the price of a futures contract should be anything other than what the market currently says it is. Second, it is often asserted that “for every buyer there is a seller.” The significance of this fact is unclear; presumably it is intended to mean that the upward pressure placed on the market by the buyers will always be met by an equal and opposite downward pressure placed upon the market by the sellers, thereby implying that price increases cannot be attributed solely to the buyers. This argument is unpersuasive, since it leads to the logical conclusion that prices in any market should be static—in any market there are an equal number of buyers and sellers. Moreover, it is the presence of bids and offers that move prices, not the presence of buyers and sellers; for every bid there is not necessarily a corresponding offer and vice versa. Third, it is often asserted that, because speculators never take delivery, they must eventually engage in a market transaction that is the opposite of the initial transaction—for example, they must eventually sell each futures contract that is purchased—so that there is no net effect from their speculative buying and selling. This analysis ignores the fact that market conditions and prices at the time of the subsequent transaction will be different from the market conditions and prices at the time of the initial transaction, so that the subsequent transaction will not necessarily have an equal and opposite effect upon the market as the initial transaction. Moreover, most hedging does not result in physical delivery. In many commodity futures markets, only 1 or 2% of the transactions result in physical delivery. It cannot be credibly argued that 98-99% of the transactions in a commodity futures market have no effect on price because they do not result in delivery.

<sup>266</sup> Hieronymus, at pp. 145-6.

"The opposite ends of these futures trades by warehousemen are taken by speculators; they buy the hedges. They pay premiums for the deferred deliveries. If they are to make money the cash price must increase by more than the amount of the premium. They pay, indirectly, the storage that the warehouseman receives indirectly. As the spreads are wide, they are paying more storage than when the spreads are narrow."<sup>267</sup>

Professor Hieronymus refers to the interaction between large speculators and the terminal elevators as "the delivery game."<sup>268</sup> Not only do the speculators take the opposite position from the hedgers in the price spreads, but their actions in bidding up the price of the spreads, or conversely, in selling their spread positions, directly affects the amount of the grain stored at the terminal elevators. "Thus, it is the speculators who make the inventory decisions. Inventory is accumulated when speculators are willing to pay enough more for distant contracts than nearby to encourage accumulation and hedging, and inventory is liquidated when speculators will pay little more or even less for the more distant contracts."<sup>269</sup>

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<sup>267</sup> *Id.*, at pp. 159-60. Professor Hieronymus's observation that speculators who are long the spread are in effect paying for the storage costs of the commodity by the warehouse (or other persons holding warehouse receipts) offers another explanation of why investors in commodity index strategies in a contango market fare so poorly. The monthly roll of the underlying futures in an index fund is in essence the purchase of an intermonth spread—it entails selling the nearby futures and purchasing the longer-term futures. The hedger on the other side of this transaction purchases the shorter-term futures and sells the longer-term futures. By buying the spread from the hedger, the index trader is essentially paying that hedger the storage cost of the commodity over the time span of the spread. These index traders are, in effect, paying for the cost of storage of the commodity while hoping that the price will appreciate by more than the storage cost of that commodity. As shown in the previous section, over the past 50 years, that approach has been an extremely poor strategy in the wheat and corn markets.

<sup>268</sup> *Id.*, at p. 172.

<sup>269</sup> *Id.*, at p. 194. Although there is an extensive body of literature on the effect of speculation on price levels, only a fraction of this literature specifically addresses the effect of speculation on intermonth price spreads. One of the few empirical analyses of this issue was published in 1967 by the U.S.D.A. Economic Research Service, as part of a larger study entitled, "Margins, Speculation, and Prices in Grain Futures Markets." USDA Economic Research Service, *Margins, Speculation, and Prices in Grain Futures Markets* (U.S. Government Printing Office, 1967) (available at farmdoc archives). The purpose of the study was "to define and measure speculation and its relation to price fluctuations, and to measure the relation of margin changes to speculation and price movements." The USDA concluded that speculation played a role in price formation, but it was often impossible to quantitatively measure that contribution even using the best available data. "Original, objective analyses show that speculation explained part of short-term price ranges or changes in most the market situations for which estimating procedures were developed. The relative importance attributable to speculation, compared with other explanatory variables, varied widely, as did its absolute price effect." *Id.*, at p. 4. The USDA study also examined of how the relationship between hedgers and speculators can affect prices. In particular, the USDA noted that changes in the balance between the number of speculators and the number of hedgers can influence prices. "We noted that fluctuations in the grain futures markets became marked when long or short aggregate commitments in speculation or hedging became unbalanced, with respect to offsetting positions in the same category. Price stability often occurred when long and short hedging positions were well balanced and when these positions represented approximately an equal share of total open contracts as did holdings by speculators other than spreaders." *Id.*, at p. 3. The report noted that large purchases of futures contracts by speculators can increase the price spreads in the futures market: "[C]ertain (intra-commodity) spread positions are relatively important in influencing changes in price differences between contracts. Changes in aggregate holdings of spreads by large speculators between contracts within different crop

In sum, unless there is an independent increase in the supply of futures contracts by commercial hedgers, increased futures purchases by speculators -- or index traders -- will result in an increase in the price of futures contracts. The basic laws of supply and demand fully apply to the actions of speculators and index traders in the commodity futures market. As speculators or index traders demand additional futures contracts, the price of those futures contracts will increase and the commercial sellers will have an added financial incentive to place their grain into storage. All else equal, therefore, as the demand for futures contracts from index traders increases, the price of those futures contracts can be expected to increase as well.

Whether an increase in demand from index traders will, in fact, result in an increase in futures prices and spreads will depend on additional factors, including the relative balance between the long index investor and short hedgers, and the extent of demand in the cash market. When there is significantly more selling (i.e., short hedging) of futures contracts than speculative buying, the additional purchases of futures contracts by index traders can more readily be absorbed by the market than when the index funds are of comparable size or larger than the short hedgers. When the demand for contracts for future delivery of a commodity from index traders matches or exceeds the supply of the contracts for future delivery, the price of those contracts for future delivery will rise relative to the price of the commodity in the cash market.<sup>270</sup>

The extent of the demand for the commodity in the cash market also will have a significant influence on the price spreads, basis, and convergence. Price spreads, particularly the spread between the cash and futures price (the basis), will increase when demand in the cash market is weak, and decrease when the demand in the cash market is strong. A strong cash market will raise the cash price relative to the futures price and result in smaller spreads between futures contracts, as the near-term demand for the commodity rises relative to the longer-term demand. Thus, when the cash market is strong enough—as it was in the latter part of 2007—convergence may occur even when there is a large presence of index trading in the market. When the cash market is weaker than usual—as it was during the second part of 2008—the

years (e.g., long old crop – short new crop) consistently were closely related to logical, corresponding shifts in price spreads.” *Id.*, at p. 5.

<sup>270</sup> There is no widely accepted way to quantify what an acceptable level or percentage of speculation in a particular market might be. The USDA Economic Research Service’s 1967 study into the effects of speculation on futures prices addressed this point:

“Data limitations precluded our serious consideration of developing or adopting a single benchmark, a ‘speculative statistic’, which could quantify speculation and contribute consistently and rationally to explanations of futures price behavior of an extended period of time. Even if the concept that speculation could be precisely defined by a single statistic is acceptable in theory, such a historical series simply could not have been developed and tested.”

USDA, *Margins Speculation and Prices in Grains Futures Markets*, at p. 67 (available on farmdoc archives). The USDA study concluded that “Price behavior is probably best explained by a number of independent factors acting singly and jointly with one another.” *Id.*, at p. 73.

demand for futures contracts from index traders will cause the spreads to widen significantly, and price convergence will be impeded.

The problem with the large basis levels and lack of convergence in the Chicago wheat futures market is fully explained by this framework. This framework does not rely on any novel concepts or theories of commodity market behavior. It simply integrates the presence of commodity index traders into well-accepted, basic models of how commodity markets work.

The Commodity Exchange Act does not define the term “excessive speculation,” but rather states that excessive speculation that causes “sudden or unreasonable fluctuations or unwarranted changes in the price of such commodity is an undue and unnecessary burden on interstate commerce in such commodity.” The Act then directs the CFTC to establish limits on trading to diminish, eliminate, and prevent this burden on commerce.

This Report finds there is significant and persuasive evidence that the large amount of commodity index trading due to speculative purchases of index instruments has contributed to “unreasonable fluctuations” and “unwarranted changes” in the price of wheat futures contracts, since the change in the relationship between futures and cash prices in the wheat market is, in large part, due to this index trading rather than the fundamentals of supply and demand in the cash market. Additionally, this Report finds there is significant and persuasive evidence that the change in the relationship between the price of wheat futures contracts and the price of wheat in the cash market has significantly impaired the ability of farmers, grain elevators, millers, grain merchants, grain processors, and others in the grain industry to use the futures markets to reliably price wheat and manage their price risks, which has imposed significant, additional costs upon these participants in the grain industry. Because there is substantial and persuasive evidence that this level of speculation in the wheat futures market has been a major cause of these unwarranted changes and unreasonable fluctuations, and has imposed an undue burden on interstate commerce, this Report finds that the high level of index trading in the wheat futures market constitutes “excessive speculation” that the Congress directed the CFTC to prevent through the imposition of limits on trading.

## VI. FUTURES PRICES AND CROP INSURANCE

A final issue involves the federal crop insurance program. The evidence shows that artificially high futures prices can result in increased farmer and taxpayer costs through the federal crop insurance program and in inaccurate insurance payouts.

Federal crop insurance is available to farmers who want to cover potential financial losses due to natural perils such as bad weather and crop disease. The federal crop insurance program uses settlement prices from certain futures contracts to determine how much money should be paid to a farmer who has purchased coverage and to set insurance premiums. Futures prices that are higher than justified by the fundamentals of supply and demand in the cash market increase the costs of purchasing crop insurance for farmers as well as for federal taxpayers who share in the cost of those insurance premiums. Futures prices are also used to set both base and harvest prices for certain types of crop insurance. The base price is then used to set revenue guarantees, and the harvest price is used in the revenue calculation. Both prices are included in formulas used to calculate insurance payments made to farmers. The increasing lack of predictability as to the difference between the futures price and the cash price for wheat (the basis) undermines the reliability and effectiveness of the formulas used to calculate insurance payouts, potentially resulting in underpayments or overpayments by the program to the purchasers of federal crop insurance.

### A. Background

#### 1. Development of the Federal Crop Insurance Program

The United States Department of Agriculture's (USDA) Risk Management Agency oversees the current federal crop insurance program in conjunction with private insurers. The program was first authorized by Congress in the 1930s after the devastation to farmers and the agricultural community from the Great Depression and the Dust Bowl.<sup>271</sup> Farmers faced losses due to inclement conditions such as drought, flooding, hail, freezes, and disease.<sup>272</sup> The crop insurance program was created as a way for the government to help protect farmers from future losses. In 1938, Congress created the Federal Crop Insurance Corporation to help manage the program.<sup>273</sup> Initially, the program was started as an experiment, and crop insurance coverage

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<sup>271</sup> Schlesinger, Arthur M. Jr., *The Crisis of the Old Order 1919-1933* (Houghton Mifflin Company, 1957), at p. 174-175. Net farm income in 1932 was \$1.8 billion -- less than one-third what it had been three years earlier. To put this into real terms, it took 16 bushels of wheat -- more than the average yield of a whole acre -- for a farmer to buy his children a pair of \$4 shoes.

<sup>272</sup> Hurt, Douglas R., *The Dust Bowl: An Agricultural and Social History*, (Nelson-Hall, 1981), at p. 30-31. In 1931, a bumper crop of wheat accompanied by drought brought economic disaster to the southern Great Plains. In the Dust Bowl states, the price of wheat fell from an average of \$.99 per bushel in 1929 to \$.34 in 1931.

<sup>273</sup> The Federal Crop Insurance Corporation was created by Congress in legislation that was passed on February 16, 1938 (7 U.S.C. 1501).

was mostly limited to major crops in the main producing areas. The program was not heavily utilized during its first fifty years. During this time, participation in the program was low, while losses were high.

In 1980, the Federal Crop Insurance Act was passed, expanding the insurance program to more crops and regions of the country.<sup>274</sup> The Act contained a number of provisions that were designed to encourage more farmers to participate in the crop insurance program. For example, Congress eliminated limitations in the Federal Crop Insurance Corporation's ability to offer reinsurance to private companies. While more farmers utilized the program after the new Act was passed, many chose not to participate because they believed that if a disaster were to occur that affected their crops, the federal government would come through with disaster assistance as it had so many times before. The low participation rate in the crop insurance program led to Congress issuing a number of ad hoc disaster assistance bills following major disasters in the 1980s and early 1990s.

In 1994, the crop insurance program was reformed yet again, with enactment of the Crop Insurance Reform Act, which effectively eliminated ad hoc disaster assistance payments.<sup>275</sup> Initially, the 1994 Act made participation in the crop insurance program mandatory for farmers to be eligible for other USDA benefits such as payments under price support programs. This requirement increased program participation. In 1996, Congress repealed the mandatory participation requirements, but farmers who accepted other federal benefits were required to purchase crop insurance or waive their eligibility for any disaster benefits that might be made available during that crop year.

In 2000, in another bid to increase program participation, Congress authorized USDA to start subsidizing the premiums farmers paid to obtain crop insurance. These taxpayer subsidies today cover more than 60% of the premium costs. Currently, farmers pay about 41% of the amount needed to cover insured losses.<sup>276</sup> According to The Center for Agricultural and Rural Development at Iowa State University, this large subsidy means that most farmers will get substantially more back from the program than they pay into it. The Center estimated that the premium subsidy is large enough that the average farmer can expect a rate of return of 143% for the premium paid.<sup>277</sup>

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<sup>274</sup>The Federal Crop Insurance Act of 1980, P.L. 96-365.

<sup>275</sup>The Crop Insurance Reform Act of 1994, P.L. 103-354.

<sup>276</sup>Babcock, Bruce A. and Hart, Chad, E. *Iowa Ag Review*, summer 2006, Volume 12, No. 3.

<sup>277</sup>*Id.*

Today, about 58% of U.S. grain farmers participate in the crop insurance program which has grown to become the largest single source of financial protection to farmers.<sup>278</sup> According to the 2008 USDA Performance and Accountability Report, in 2008, USDA's Risk Management Agency provided more than \$88 billion of Federal crop insurance protection to farmers.<sup>279</sup> The premiums continue to be heavily subsidized. In 2006, the crop insurance program cost taxpayers approximately \$2.5 billion, or \$3.31 for each dollar paid out.<sup>280</sup>

## **2. How the Program Works**

USDA offers crop insurance through its Risk Management Agency (RMA). RMA administers the crop insurance program in partnership with private insurance companies. Farmers purchase crop insurance from an approved private insurance company that is authorized to sell the policy on behalf of USDA. The farmer enters into a contract with the insurance company to insure the eligible acreage of a particular crop planted in a particular county. The farmer pays a premium for the insurance, but part of the cost of the premium is paid for with taxpayer dollars. Insurance is provided on a crop-by-crop and county-by-county basis. RMA acts as a reinsurer for a portion of all federal crop insurance policies, meaning it acts as an insurer for the private insurance companies that provide direct coverage to farmers.

Under the federal crop insurance program, the private insurer agrees to indemnify the farmer for losses that occur during the insured crop year. The insurer has the backing of USDA's RMA and receives reimbursement for a portion of the administrative costs associated with underwriting the policy. Additionally, USDA and the insurer share a percentage of the risk of loss and opportunity for gain associated with each insurance policy written. According to USDA, all eligible acreage must be insured to reduce the potential for adverse selection against the insurance provider.<sup>281</sup>

**Insurance Options.** USDA offers farmers a number of different insurance options for hundreds of crops, including wheat, corn, and soybeans. Options include policies that protect against loss of yield and loss of revenue. Based upon their needs, farmers can choose the policy option that is best for them. Crop coverage availability is determined by county, but coverage is broadly available for most crops in their core growing areas.<sup>282</sup> Coverage availability differs by location and varies by policy type. For example, Crop Revenue Coverage policies for wheat are

<sup>278</sup> According to the 2002 USDA Agricultural Resource Management Survey, nearly 58% of farms that earned most of their income from grains, oilseeds, dry beans, or peas purchased crop insurance.

<sup>279</sup> U.S. Department of Agriculture 2008 Performance and Accountability Report (November 17, 2008) at p. 3.

<sup>280</sup> Babcock, Bruce A. and Hart, Chad, E. *Iowa Ag Review*, summer 2006, Volume 12, No. 3.

<sup>281</sup> Adverse selection could occur if the insured party has better knowledge of the relative risk of a particular situation than the insurance provider does.

<sup>282</sup> For a current list of crops covered, see <http://www.rma.usda.gov/policies/08croplist.html>.

available in 2,354 counties across 40 states, while corn coverage is available in 2,517 counties across 47 states, and soybean coverage is available in 1,986 counties across 32 states. Revenue Assurance wheat coverage is available in 1,181 counties across 17 states, while corn coverage is available in 1,528 counties across 19 states, and soybean coverage is available in 1,388 counties in 19 states.<sup>283</sup>

There are two basic categories of federal crop insurance: “yield based” insurance determined according to a farmer’s actual production history, and “revenue based” insurance determined according to the farmer’s expected crop income. Each category offers a number of different insurance plans for farmers to choose from.

Under yield based plans, the farmer chooses a level of yield to insure, typically from 50% to 75% of the farmers’ average crop yield, but up to 85% in some areas. The farmer also selects the percent of the predicted price he or she wants to insure, typically from 55 to 100% of the crop price as established annually by RMA. If the harvest is less than the insured yield, the farmer can collect an indemnity payment based upon the difference. Indemnity payments are calculated by multiplying the difference between the harvest and the yield by the insured percentage of the established price that was selected when crop insurance was purchased. Yield based plans do not use futures market prices in their calculations.

Under revenue based plans, the farmer insures a level of crop income, based upon the average yield multiplied by the expected price for the crop. If the revenue that the farmer earns is lower than the level the farmer insured, an indemnity payment will be made for the difference. Three key plans under the revenue insurance category, Crop Revenue Coverage (CRC), Revenue Assurance (RA), and Group Risk Income Plan (GRIP), use futures market settlement prices to establish the expected crop prices as well as the harvest price that is used to determine any loss.<sup>284</sup>

### **3. Inadequate Program Oversight**

RMA is responsible for protecting against waste, fraud and abuse in the crop insurance program. Recently, the U.S. Government Accountability Office (GAO) and others have raised concerns regarding the integrity and oversight of the program. In 2005, 2006, and 2007, GAO reports detailed millions of dollars lost to wasteful and incorrect indemnity payments that RMA did not identify, prevent, or correct.<sup>285</sup> GAO found that some farmers allowed crops to fail -- either deliberately or through neglect-- in order to collect insurance.

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<sup>283</sup> This information was provided to the Subcommittee by USDA.

<sup>284</sup> Given similarities in the programs, USDA has proposed a rule that would combine the Crop Revenue Coverage program and the Revenue Assurance program starting in 2011.

<sup>285</sup> See *Crop Insurance: Continuing Efforts Are Needed to Improve Integrity and Ensure Program Costs Are Reasonable*, GAO-07-819T (May 3, 2007). See also *Crop Insurance: More Needs to Be Done to Reduce Program's*

Additionally, GAO found that the insurance companies running the programs did not conduct due diligence in investigating losses and paying claims, and the payments USDA made to companies running the programs were found to be excessive. GAO reported that USDA data showed that an estimated \$62 million in 2006 indemnity payments made under the crop insurance program were the result of waste, such as incorrect payments based on incomplete or missing paperwork. In 2007, this number was \$63 million, and in 2008, it more than doubled to \$165 million.<sup>286</sup> According to GAO, USDA has taken some steps to address these concerns, but in 2007, GAO identified federal crop insurance as a program in need of better oversight to ensure program funds were spent as economically, efficiently, and effectively as possible.<sup>287</sup>

One person interviewed by the Subcommittee stated that some farmers have chosen to plant crops even though futures prices were unusually high relative to cash prices because, under the crop insurance program, the farmer could receive an indemnity payment if prices subsequently fell. Higher futures prices encourage farmers to plant more wheat even if these high futures prices are not justified by the actual conditions of supply and demand for wheat. The person interviewed stated that even though farmers recognized that there would be ample supplies of soft red winter wheat, some planted additional acres of wheat anyway, in the expectation they would nonetheless receive indemnity payments if prices fell as a result of the overplantings. Another person interviewed by the Subcommittee stated that the futures market had become so disconnected from the cash market that he was not aware of any farmers who based any of their planting decisions on the prices in the futures market.

## **B. Impact of Futures Prices on Crop Insurance**

Recent turmoil in the wheat market, including rising prices, increased price volatility, and divergent prices in the cash and futures markets, has led to uncertainty among farmers when making decisions about which crop insurance to buy. In addition, because revenue-based crop insurance relies on base and harvest prices to calculate revenue guarantees and crop revenues, increasing futures prices and the widening gap (basis) between cash and futures prices have led to higher premiums and greater uncertainty as to the eventual level of indemnity payments.

USDA offers farmers three different revenue insurance plans: Crop Revenue Coverage (CRC), Revenue Assurance (RA), and Group Risk Income Plan (GRIP). All three use futures settlement prices to establish crop price guarantees to be paid in the event of a loss.

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*Vulnerability to Fraud, Waste, and Abuse*, GAO-06-878T, (June 15, 2006) and *Crop Insurance: Actions Needed to Reduce Program's Vulnerability to Fraud, Waste, and Abuse*, GAO-05-528 (September 30, 2005).

<sup>286</sup> U.S. Department of Agriculture 2008 Performance and Accountability Report (November 17, 2008) at p.300.

<sup>287</sup> *Crop Insurance: Continuing Efforts are Needed to Improve Program Integrity and Ensure Program Costs are Reasonable*, GAO-07-994T (June 7, 2007).

Futures prices are used to determine a “base price” and “harvest price” for insured crops. For an insured wheat crop, for example, the base price is determined by averaging daily contract settlement prices on the Chicago futures exchange during the one month period, August 15-September 14, for the July futures wheat contract in the following year. The July contract is used, because it is the futures contract that will expire closest to the time when the insured wheat crop will be harvested. Base prices for corn and soybean crops are determined using futures contracts that expire closest in time to when each of those commodities is harvested, as set out in Table 1. Once established, the base price is used to provide revenue guarantees under a formula applicable to the particular type of crop insurance purchased by the farmer.

The harvest price is also determined by using the average daily settlement price for a specified futures contract on the Chicago exchange. For wheat, settlement prices during the month of June for the July futures contract are used; corn and soybean crops use futures contracts in later months, as set out in Table ES-1. Once established, the harvest price is used to calculate a guaranteed amount of revenue from the harvest of the insured crop. The amount is calculated by taking the farmer’s actual production history (APH) yield multiplied by the yield coverage level and the harvest price. The policy’s guaranteed revenue is the larger of a specified minimum guarantee or the harvest guarantee calculated for a specific policyholder. The resulting guaranteed revenue amount is then used in determining whether and how much of an indemnity payment is owed to an insured farmer.

#### **Base and Harvest Price Calculation Information for Wheat, Corn, Soybeans**

	<b>Base Price</b>	<b>Harvest Price</b>
<b>Wheat</b>	Average settlement price from August 15- September 14 for the following July futures contract on Chicago exchange	Average settlement price in June for July futures contract on Chicago exchange
<b>Corn</b>	Average settlement price in February for December futures contract on Chicago exchange	For CRC coverage: average settlement price in October for December futures contract on Chicago exchange  For RA and GRIP coverage: average settlement price in November for December futures contract on Chicago exchange
<b>Soybeans</b>	Average settlement price in February for November futures contract on Chicago exchange	Average settlement price in October for November futures contract on Chicago exchange

**Table 8.** Prepared by Permanent Subcommittee on Investigations, May 2009  
Data source: USDA

Farmers with certain CRC, RA, or GRIP policies can use the larger of the base or harvest price to calculate their guarantee. Farmers with other RA policies use only the base price to calculate their indemnity payment. Typically, if the harvest price is greater than the base price, then an indemnity payment can be made only if there is a yield loss, meaning the actual yield is less than the yield guarantee. If there is a yield loss, then the farmer is paid for the lost bushels (yield guarantee minus actual yield) at the more favorable harvest price.

To understand how the widening gap between futures and cash prices can increase the cost of federal crop insurance premiums and decrease program effectiveness, the following examples explain how base and harvest prices affect premiums and payouts.

### **1. Increased Insurance Premiums**

USDA uses the prices of commodity futures contracts to calculate the premiums due under federal crop insurance policies. As futures prices have increased in recent years, farmers have faced higher premiums for crop insurance coverage. Because the federal government subsidizes these premiums, the higher amounts have also increased taxpayer costs.

Crop insurance premium rates vary by county, crop, type, practice, and plan or insurance, and are based on a combination of historical yield losses for the crop and county as well as a variable known as the price factor or price volatility as measured by options traded on the Chicago exchange. The premiums for CRC, RA, and GRIP policies represent a combination of yield risk and price risk. USDA uses historical yield loss data to determine the “yield risk” associated with a particular crop in a particular county—the risk that the actual yield may be lower than the average yield. Premium rates for revenue products are based on a combination of yield risk and the price risk arising from the volatility of the prices in the futures market.<sup>288</sup> Below are two examples of how premiums are calculated.<sup>289</sup>

#### **Example 1: Futures Prices and CRC Premiums**

A corn farmer has an actual production history (APH) yield of 152 bushels per acre, and chooses to insure the crop under a CRC policy at 65% with a base price of \$5.40 per bushel. The base price is derived from the average settlement prices during February for the following December futures contract traded on the Chicago exchange. The premium rate for the farmer’s county has been determined to be 0.069. This rate is based upon a combination of historical yield losses for the crop and county and the price volatility as measured by options traded on the Chicago exchange. Calculations below are for CRC coverage. RA coverage calculations would be the same, although the premium rate could vary.

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<sup>288</sup> The “price risk” is measured by the price of options on futures for the commodity.

<sup>289</sup> These examples were provided to the Subcommittee by USDA.

Expected Value of Crop: APH Yield x Base Price  
 $= 152 \times \$5.40 = \$821.80$

Yield Guarantee: APH Yield x Coverage Level  
 $= 152 \times .65 = 98.8$

Revenue Guarantee: Yield Guarantee x Base Price  
 $= 98.8 \times \$5.40 = \$533.52$

Total Premium: Revenue Guarantee x Premium Rate  
 $= \$533.62 \times 0.069 = \$36.50$

Premium Subsidy: The federal government pays a portion of the farmer's premium. That portion varies by coverage level and insurance plan. For 65% coverage for CRC insurance in 2009, the federal government pays 59% of the total premium.  
 $= \$36.50 \times .59 = \$21.53$

Farmer Premium: Total Premium-Premium Subsidy  
 $= \$36.50 - \$21.53 = \$14.97$

### **Example 2: Futures Prices and GRIP Premiums**

A corn farmer has an actual production history (APH) yield of 159.4 bushels per acre, and chooses to insure the crop under a GRIP policy at 90% with a base price of \$4.04 per bushel. As above, the base price is derived from the average settlement prices for the December futures corn contract traded on the Chicago exchange. The premium rate for the farmer's county has been determined to be 0.111. This rate is based upon a combination of historical yield data and price volatility.

Expected County Revenue (ECR): Expected County Yield (ECY) x Base Price  
 $= 159.4 \times \$4.04 = \$643.97$

GRIP Liability:  $1.5 \times ECR$   
 $= 1.5 \times \$643.07 = \$965.97$

Yield Guarantee: ECY x Coverage Level  
 $= 159.4 \times .9 = 143.5$

Revenue Guarantee: ECR x Coverage Level  
 $= \$643.98 \times .9 = \$5.79.58$

Total Premium: GRIP Liability x Premium Rate  
 $= \$965.97 \times 0.111 = \$107.22$

Premium Subsidy: The federal government pays a portion of the farmer's premium. That portion varies by coverage level and insurance plan. For 90% coverage for GRIP insurance in 2009, the federal government pays 44% of the total premium.

$=\$107.22 \times .44 = \$47.18$

Farmer Premium: Total Premium-Premium Subsidy  
 $=\$107.22 - \$44.18 = \$63.04$

In the case of both premium calculations, a higher futures price would have boosted the base price and resulted in a higher premium cost to both the federal government and farmer.

## 2. Inaccurate Insurance Payouts

Futures prices also affect insurance payouts, since the level of insurance payouts depends on both the levels of futures prices at the time the crop is planted and the levels of the futures prices at the time of harvest. Higher futures prices at the time of planting can result in a higher level of insurance payments, whereas higher futures prices at the time of harvest can result in either a higher or a lower level of insurance payments, depending on the type of insurance and other factors relating to the size of the harvested crop. Since the federal government provides financial support for the crop insurance program, higher insurance payouts impose additional costs on taxpayers. The following examples demonstrate how futures prices are incorporated into federal crop insurance calculations.

**Crop Revenue Coverage.** Crop Revenue Coverage (CRC) uses both a farmer's average yield and commodity futures prices to set revenue guarantees. CRC insurance protects against reductions in price, yields, or a combination of both. Coverage is based upon a farmer's average yield (or actual production history—"APH") multiplied by the higher of the base price or the harvest price for the commodity (based on the specified futures exchange settlement prices).

A farmer's APH yield is based upon a minimum of four and a maximum of ten consecutive years of crop yield data. A farmer can choose an insurance coverage level of between 50 and 85% of a guaranteed level of revenue. CRC will make payments whenever the farmer's actual revenue is below the guarantee. There is no limit on the amount the harvest price can decrease from the base price; however, the harvest price may not be greater than 200 percent of the expected price. For example, the 2009 expected price for CRC for winter wheat in Missouri is \$8.58. That means that the harvest price for wheat is limited to \$17.16 or lower.

### Example 3: Futures Prices and CRC Insurance

A wheat farmer has an APH yield of 50 bushels per acre, and chooses to insure the crop under a CRC policy at 75% of the APH yield with a base price of \$5.93 per bushel. Assume the harvest price is \$7.93 per bushel, and the harvested yield is 30 bushels per acre. The base price of \$5.93 was derived from the average settlement price from August 15 to September 14 for the July wheat futures contract during the harvest year, as set out in Table 1. The harvest price of \$7.93 was derived from the average daily settlement price during the month of June for the July wheat futures contract, as set out in Table 1.

Minimum Guaranteed Revenue= APH Yield x Yield Coverage Level x Base Price  
 $= 50 \times 75\% \times \$5.93 = \$222.37$  per acre

Harvest Guarantee Revenue= APH Yield x Yield Coverage Level x Harvest Price  
 $= 50 \times 75\% \times \$7.93 = \$297.37$

The Calculated Revenue, used in determining an indemnity payment:  
Calculated Revenue= Harvested Yield x Harvest Price=  $30 \times \$7.93 = \$237.90$

The indemnity payment is the difference between the guaranteed revenue and calculated revenue: Indemnity Payment=  $\$297.37 - \$237.90 = \$59.47$  per acre

This example shows how CRC insurance would provide an indemnity payment due to low yields. Farmers with CRC coverage could also receive indemnity payments if the calculated revenue were lower than the revenue guarantee. In either case, however, a higher futures price would have boosted the base and harvest prices and resulted in larger CRC indemnity payments.

**Revenue Assurance.** Revenue Assurance (RA) is similar to CRC insurance in that the plan guarantees a minimum gross income per acre, but the yield levels used to calculate the guaranteed level of revenue have a narrower range than in the CRC. RA also uses futures prices to establish a set guaranteed level of revenue under its policies. RA policies are written in a manner similar to CRC, but offer farmers two options. The standard RA policy bases coverage on the farmer's average yield multiplied by the base price for the commodity based on the specified futures exchange settlement prices for the commodity. This price does not increase even if the futures price rises by harvest time. The second option is the "harvest price option." If the farmer elects to purchase this option, the revenue guarantee does increase if the harvest price is higher than the base price, just as it does under CRC. The harvest price option carries a higher premium than the base price option. RA will insure a farmer at a coverage level between 65-85%. As with CRC, the harvest price may not be greater than 200 percent of the expected price. Here is an example of how the RA base price option would work.

#### **Example 4: Futures Prices and RA Insurance**

A wheat farmer has an APH of 50 bushels per acre and chooses to insure the crop at 75% of the APH yield with a base price of \$5.93 per bushel. Assume the harvest price is \$7.93 per bushel and the harvested yield is 30 bushels per acre. As above, the base price of \$5.93 and the harvest price of \$7.93 are derived from the average settlement prices for the July futures wheat contract traded on the Chicago exchange.

Revenue Guarantee: APH x Yield Coverage Level x Base Price  
 $= 50 \times 75\% \times \$5.93 = \$222.37$

Actual Harvest: Actual Yield x Harvest Price  
 $= 30 \times \$7.93 = \$237.90$

$$\begin{aligned}\text{Indemnity} &= \text{Revenue Guarantee} - \text{Actual Revenue} \\ &= \$222.37 - \$237.90 = \$0\end{aligned}$$

The revenue guarantee is used in the calculation since under the base price option, the revenue guarantee does not rise even though the harvest price is greater than the base price. In this example, higher futures prices for the July futures contract would have reduced the amount of indemnity, since the price of the July futures contract is used to calculate the actual revenue. If the July futures contract is very high relative to the actual cash price for the crop, the use of this formula will result in less insurance payments than warranted by the actual conditions in the cash market at the time of the harvest.

**Group Risk Income Protection.** Group Risk Income Protection (GRIP) is an insurance plan based on county yields rather than individual yields. The income guarantee level is based upon county expected yield and average futures prices. The actual gross revenue is based upon the actual county yield and the average futures price at harvest. Because GRIP is a group-based product, guarantees and indemnity payments are determined at the county level for all farmers participating in the program. This approach means that if a farmer has a good crop, but the overall county does not, the farmer will still receive an indemnity payment and vice-versa.

GRIP does not require any farm production history so it is an attractive plan to farmers who do not have production records or who have a low APH yield. Unlike the other insurance options, GRIP offers coverage between 70 and 90% of the county yield (at 5% increments), and most farmers choose to insure at the highest level.

Under GRIP, farmers receive payments any time the actual county revenue drops below the trigger revenue that the farmer chooses. The trigger revenue is calculated by multiplying the expected crop price by the expected county yield, and multiplying the result by the elected level of coverage. The amount of payment the farmer receives depends upon the level of protection selected when the farm is enrolled in the program. The maximum liability per insured acre is 150% of the base price, multiplied by the expected county yield. If a farmer elects to increase the liability of the policy, the premium and potential indemnity increase proportionately.

GRIP can also be purchased with a harvest option, which means that if the harvest futures price is higher than the base price, the harvest price is used to calculate the trigger price. GRIP has the same limits as CRC on the degree to which the harvest price can differ from the base price. Below is an example of how GRIP works.

#### **Example 5: Futures Prices and GRIP Insurance**

In 2007, a wheat farmer lives in a county with an expected county yield of 50 bushels per acre, and chooses to insure the crop under a GRIP policy at 90% with a base price of \$4.35 per bushel. Assume a harvest price of \$5.74 and a harvest yield of 30 bushels per acre. The base

price of \$4.35 and the harvest price of \$5.74 are derived from the average settlement prices for the July wheat futures contract traded on the Chicago exchange.

Expected County Revenue (ECR): Expected County Yield (ECY) x Base Price  
 $= 50 \times \$4.35 = \$217.50$

GRIP Liability:  $1.5 \times ECR$  (Growers may elect to increase the liability of their policy up to 150% of the expected county revenue. Most growers select this option.)  
 $= 1.5 \times \$217.50 = \$326.25$

Yield Guarantee: ECY x Coverage Level  
 $= 50 \times .9 = 45$

Revenue Guarantee: ECR x Coverage Level  
 $= \$217.5 \times .9 = \$195.75$

### Indemnity Calculation

Actual County Revenue (ACR): Actual County Yield x Harvest Price  
 $= 30 \times \$5.74 = \$172.20$

Payment Factor for GRIP:  $([Revenue\ Guarantee - ACR] / Revenue\ Guarantee)$  -- This is the percent of a GRIP policy's liability to be paid out as an indemnity payment. The purpose of this payment formula is to create a "disappearing deductible"-- an enhanced payout that helps to cover the deductible portion of the loss.  
 $= [\$195.75 - \$172.20] / \$195.75 = 12.03\%$

Indemnity Payment: Payment Factor x Maximum GRIP Liability  
 $= 12.03\% \times \$326.25 = \$39.24$  per acre

### **3. Impact of Divergent Futures and Cash Prices**

Because key federal crop insurance plans rely on base and harvest prices to set revenue guarantees, and those prices reflect the relevant commodity futures contract prices, the trend in recent years toward large differences (basis) between futures and cash prices and the lack of price convergence at contract expiration signal that the program is less and less reflective of the actual conditions in the wheat market.

Table ES-2 shows the base and harvest prices for the last three years for soft red winter wheat, and adds comparative data on prices from the cash market. This data shows an upward pricing trend as well as an increasing difference between the harvest and cash prices (basis). For example, prior to 2006, the greatest difference between the harvest price and the cash price was 46 cents per bushel. In 2006, the difference between the harvest price and the cash price increased to 80 cents, which was more than 25% of the cash price. In 2008, the difference between the harvest price and the cash price grew to \$1.21 per bushel.

**Base, Harvest, and Cash Prices for Soft Red Winter Wheat  
2001-2009**

Year	Base Price for SRW wheat for RA coverage	Harvest Price for SRW wheat for RA coverage	Average SRW wheat Cash Price in June in Toledo, OH	Difference Between Harvest Price and Cash Price
2001	\$2.97	\$2.63	\$2.17	+\$0.46
2002	\$3.04	\$3.17	\$3.00	+\$0.17
2003	\$3.53	\$3.07	\$3.02	+\$0.05
2004	\$3.36	\$3.35	\$3.36	-\$0.01
2005	\$3.40	\$3.31	\$3.13	+\$0.18
2006	\$3.50	\$3.84	\$3.04	+\$0.80
2007	\$4.35	\$5.94	\$5.23	+\$0.71
2008	\$5.93	\$8.31	\$7.10	+\$1.21
2009	\$8.58	TBD	TBD	TBD

**Table 9.** Prepared by the Permanent Subcommittee on Investigations, June 2009

Data source: USDA, MGEX

The lack of convergence between futures and cash prices in recent years affects the accuracy and effectiveness of the indemnity payments farmers receive from their crop insurance coverage. Given that the indemnity calculation for crop insurance in some of the insurance programs, such as the RA program, use the settlement price of the futures market contract that is closest to the contract that will expire at the time of harvest, and these futures prices have risen relative to the cash harvest prices, the calculation of the revenue received by the farmer under these insurance formulas may be substantially higher than the actual revenue received by the farmer, which would result in a lower insurance payment than justified by the actual conditions in the cash market. Under the CRC Insurance program, however, as shown in Example 3, a higher futures price could result in a higher revenue guarantee and therefore a higher insurance payout.

These examples demonstrate how the increasingly large difference between the futures price and the cash price for wheat, together with the failure of these two prices to converge as a futures contract nears expiration, can lead to higher or lower crop insurance payouts than warranted by the actual market conditions.