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# The Impact of Speculative Investments on Commodity Price

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# THE IMPACT OF SPECULATIVE INVESTMENTS ON COMMODITY PRICE

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Speculative investments have always been a component of the marketplace. Their existence is vital for providing liquidity and risk transfer, allowing for an efficiently operating market. The futures market was originally used by farmers and grain buyers to reduce risk. There has been an observable increase of noncommercial (speculative) investment since the inception of the futures market. There is a belief that these investors may be adversely affecting the market, considering their primary view of the market is as a financial instrument with no actual interest in the physical underlying commodity. Agencies such as the Commodity Futures Trading Commission have even gone as far as proposing position limits in an attempt to control speculation. This paper attempts to find if there is any significant evidence that speculation may be causing adverse effects to commodities and their related prices. With a better understanding of the market and market participants, agencies may be able to make informed decisions related to speculative policies.

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# CHAPTER 1

## INTRODUCTION

Commodity markets have served an important purpose for all involved in agricultural business for as long as agriculture has been around. The earliest forms of these markets can be traced back as far as 4000 B.C., where Sumerians developed clay tokens to establish a date and time for the delivery of animals (Banerjee 2013). This can be thought of as the earliest form of a futures contract. Through time the commodity market has evolved and expanded. The market exchange first became relevant in the United States by 1864, where commodities such as corn, wheat, pigs, and cattle were traded. This was all possible due to the advent of the Chicago Board of Trade, the world's first established futures and options exchange. This exchange has expanded and ultimately merged with the Chicago Mercantile Exchange to form the CME Group. This exchange now trades over 50 different contracts and has seen volumes of contracts up to 454 million being traded (www.cftc.gov). This type of market structure has become a necessary component for the commodity sector. This is due to the nature of commodities and the time associated with their production. It can weeks up to years for a commodity to go from production to marketplace. This can be attributed to production, refinement, transportation, etc. One problem associated with the lagged period of delivering final goods to market is the adverse price risk. Commodity markets allow producers, end-users, or any participant in between to lock in a price through the process of hedging. This practice has been carried out for hundreds of years by the above mentioned. By definition, for every contract made by producers, end-users, or others involved in the handling of the actual physical commodity, there must also be a counter-party. This is where speculation and other investment agencies emerge.

The objective of this paper is to determine whether these noncommercial traders may be

adversely affecting the market. More specifically, the goal is to determine if these traders have any ability to dictate price movement in an ultimate attempt to profit. It should be clear that if this is in fact true it can be very problematic for the market and those who are involved for commercial reasons.

This paper will use time series data and econometric models in an attempt to quantify the impact of the proposed hypothesis. The data consists of prices of commodities and the net positions held by speculative investors. The main point of this research is to test the effects that speculators (explanatory variable) have on prices (response). Additionally, prices (explanatory) will also be tested to see if they have any effect on speculative positions (response). Granger causality will be used to test this hypothesis. This test will be utilized due to its usefulness in determining whether one time series can significantly predict another time series.

The results of this study will provide benefit to those who are involved in the policy making decisions regarding speculation. There have been proposed position limits for traders who have been characterized as speculators. These limits may have problematic effects on the marketplace, as described above. For position limits to be fairly enforced, there needs to be significant evidence of disruption caused by these speculative traders. This paper may also be beneficial to those who are searching for a better understanding of the intricacies of the commodity marketplace, or new investors in general.

# CHAPTER 2

## REVIEW OF LITERATURE

The period of 2007-2008 was met with major price swings in both energy and agricultural commodities. This period has a dramatic effect on the global economy and caused hardship for consumers. Both food and energy prices were increasing at an alarming rate and were unsustainable for the average consumer. Because of this, many sought out to find a causal link as to what was causing these rapid price movements. Speculation by financial investors was one of the proposed causes of this period of rapid price movements. This hypothesis has since been examined and tested by many individuals and has been met with mixed conclusions. Some believe that speculation has indeed played a part in the movement of prices, while others have concluded that speculation can in no way be used to explain this volatile period.

Michael Masters was one of the first to point at speculation as a causal effect of price movement. He testified before the United States Senate in an attempt to bring light to the situation, and ultimately did this in hopes that an increased awareness of the situation would bring about legislative policy action. His argument was that supply for commodities was adequate in compensating demand, but prices were still rising. This meant that, although prices were observed to be doubling and tripling, demand must have been increasing. His answer to an increased demand despite rapid price upswing was simple. He pointed towards a new group of participants in the commodity market that had not been previously present. This group of institutional investors, which he referred to as “index speculators”, was comprised of Corporate and Government Pension Funds, Sovereign Wealth Funds, University Endowments and other Institutional Investors. Previously, this class of investors had a small relative amount of market participation, roughly $13 billion in 2003. By March of 2008, the same group of “index

speculators" had increased its investment in commodities up to $260 billion. Masters argued and concluded that this increase in investment during the same period where prices were wildly rising was not just a case of mere coincidence, but that this increased investment was itself the cause for the rise (Masters 2008).

Sanders and Irwin set out to test this claim made by Masters. They conducted their tests using time series data of commodity prices (response variable) and net positions (causal variable) held by index traders. They ran multiple tests to determine whether the positions held by index traders had any effect on the prices of commodities. They first tested to see if there was any statistical return to increased net positions. It should be noted that index investors routinely take long only investments and either hold or roll their contract when it comes time. With this in mind, the test would have to show an increase in futures price. Their findings showed that net index positions did not lead to any statistical market returns. They also set out to test whether increased investment by index funds was leading to an increase in volatility, another claim hypothesized about speculative investing. The test results showed that increased investment by index investors actually lowered volatility in commodity prices in subsequent weeks. These results readily contradict the assumption that speculative investment raises volatility. Sanders and Irwin concluded that speculative investment by index fund investors caused no significant disruption to the marketplace. Their implication was that any of the proposed restrictions to limit speculation would be more harmful than good, specifying that speculative investors play an important role in adding liquidity and risk absorption to the market (Sanders and Irwin 2011).

Others like Einloth (2009) came to find that speculative investment behaviors did have some measurable impact on the marketplace. He ran tests based off of marginal convenience yield, which can be derived from the commodity price. Convenience yield refers to the benefit of

holding physical goods, as opposed to holding the underlying contract. For a consumable commodity with non-trivial storage cost, such as oil, the marginal convenience yield should be inversely related to the quantity stored. He states that both quantity stored and demand have influences on price. For commodities that have are highly elastic in storage, speculation has the potential to have a large impact on prices. A producer would be willing to hold inventory now if prices were expected to be higher in the future. To demonstrate inversely, commodities that cannot practically be stored have no room for speculation and storage to impact price. This is because suppliers must take the role of a price taker, due to the nature of the commodity. Einloth also finds that high demand inelasticity allows for speculation to have an impact on prices. Based on his studies he found that speculation was attributed to some of the rapid price upswing, but was not the sole culprit. He concluded that most of the price movement was based on the fact of supply and demand factors, and that the marginal convenience yield caused producers to stagnate supply in an attempt to gain profit in the future. His belief was that speculation did not cause prices of oil to rise to $100/barrel, but that speculation was a present factor when prices rose to $141/barrel. This may have been due to the fact that producers were speculating on futures prices and adding to inventory, thus raising prices. The subsequent collapse, he argued, was from a decline in demand due to a drop in the global economy, not speculators unloading their positions. The successive price recovery in 2009 was from a responsed reduction in supply. Einloth showed that producers were accumulating speculative stores in response to marginal convenience yield. These results show speculation playing a part in price movement, but show that other factors were present.

Gilbert (2009) also conducted studies in an attempt to find if commodities prices experienced bubble like behavior that resulted in their movement away from fundamental prices.

He hypothesized that fundamental factors alone, such as Chinese growth (metals and energy commodities) and biofuels demand (agricultural foods), could not be the only explanation for price movement. The belief was that other market factors could have amplified or distorted commodity price movements. Specifically, trend-following speculation and index-based investment were assessed to determine if they did in fact play a factor. Gilbert used econometric procedures to test if these certain investment strategies employed by groups such as CTA's (Commodity Trade Advisors), combined with short-term reporting horizons, for those such as hedge funds, has the potential to generate explosive behavior in the market. His studies found that this situation indeed created speculative bubbles, most notably in the copper market. His results also point towards bubble behavior in the soybean market. Nickel and crude oil market results may have experienced bubble like behavior and are open to interpretation. The only markets in the study which definitively experienced no bubble behavior were corn, wheat, and aluminum. Looking deeper into the results, Gilbert was able to identify that index-based investments were the main driver of bubble-like increases of non-ferrous metal and energy prices, with a smaller impact on agricultural prices. His estimated impact from index-based investment was 3-10 per cent in the period of 2006-2007, but observed a rise to 20-25 per cent by the first half of 2008. He went further in his study to create a "Corazzolla index", which is simply an aggregate measure of all index positions held in the market. He used this index to granger test the effects of index positions against prices, and vice versa. Through the development of this Corazzolla index he was able to find that index investment accounted for roughly over a third of positions in the market during the observed period. His results show that the Corazzolla index can be used to explain changes in energy, non-ferrous metals, and agricultural futures prices. His conclusions based on his estimates are that index-based

investments were not the sole driver of explosive price changes during the period, but that they played a measurable role in amplifying price movements.

Krugman (2008) offers a more simple explanation to the phenomena. He, along with others previously mentioned, argues that prices cannot be influenced by speculation. He states that there are only two things that can be done with oil: consume it or store it. He shows that if price is above demand level at equilibrium than oil must be being stored, and that there can't be a bubble if oil isn't building inventories. He admits that there is a very low response rate of supply to price, which has been demonstrated to be as low as -.06. Using an example of a price 40% above equilibrium against this elasticity, Krugman shows that 2 million barrels would have to be being stored. He points out that this excess supply would have to be reported on inventory data and is not. Based on this, he concludes that there is no way an oil bubble could ever be present.

Whaley (2010) has conducted studies to test against the claim made by the U.S. Senate subcommittee that excessive speculation by commodity index investors has caused unwarranted increases in the price of wheat futures and has seriously impaired the contract's effectiveness at being an effective risk management tool. Through multiple regression and statistical tests he was able to draw strong evidence against the claims made by the subcommittee. He concluded that commodity index investment should not be characterized as speculation, considering it is passive, fully-collateralized, long-only investment and an effective diversification tool for commodity index traders. His studies also showed that commodity index rolls have little futures price impact, and inflows and outflows from commodity index investment do not cause futures prices to change. The subcommittee report also concluded that commodity index investing is a major cause in the failure of the CBT's wheat futures price to converge in the period 2006- 2009, with the futures price being particularly elevated in late 2008. Whaley argues that this

observation does not undermine the futures contract's effectiveness. The absence of convergence to the cash price does not have any meaningful economic consequences, considering that almost futures contracts are vacated before reaching the delivery month.

# CHAPTER 3

## COMMODITY MARKETPLACE

The commodity marketplace has become a vital component of the agriculture sector. Today's agriculture would not be able to survive without it. This is due to the nature agricultural products. The time it takes to get commodities from production to final destination is what separates agriculture from other sectors. Also the initial investment required for agricultural production is large and is only going to increase. With prices of commodities historically being volatile, it can be difficult for producers to make such a daunting investment. This is where the commodity market serves its essential purpose. It allows those involved in agriculture to lock in their price, despite the constant up and down movement of commodity prices. This is accomplished through a process known as hedging. Producers can essentially pre sell their product by purchasing contracts on the futures market. The contract is set at a specific price and amount for a delivery period in the future. For every contract a producer enters into there must be a counter-party willing to accept the contract. Since final consumers of agricultural goods do not want to pre pay for their goods, financial institutions/speculators take the role of this counter-party. Typically, a large percentage of product is locked in to minimize risk, with the remaining being sold in the cash market for a spot price.

One of the greatest qualities of commodity markets is that they allow for a standardized benchmark price and contract specifications to all market participants. The market is usually comprised of two contracts: the futures and the spot. The futures contract is a uniform price based off of all market information. This includes both public and private information. Public information, such as global supply and demand, is instantly reflected in the futures price. Private information will also be reflected in the futures price when acted upon by the holders of this

information, considering that transactions made by these players will allow the market to adjust to its true fundamental value. Futures contracts are an agreement between a buyer and a seller to exchange a good at a set price at some date in the future. It should be noted that an overwhelming majority of contracts are offset before the delivery period becomes to fruition. This exiting of a position is done by simply purchasing an opposite, equivalent contract of the same commodity. The other type of contract is a spot contract. This contract is simply an immediate exchange between the buyer and the seller on site. The spot price is derived from the futures price through an instrument known as the basis. The basis is simply the difference between the futures and spot price at a given time and location. The basis can have a large range of values across all locations. Some factors that affect basis levels are location, storage availability, storage costs, transportation costs, season, etc.

The tools mentioned above provided by the marketplace allow for one of the most key functions of the futures market. They allow producers to transfer away their risk to counterparties that can absorb this risk. These counterparties are typically investors and speculators. Their existence is critical to ensure proper functioning of the market as they provide liquidity to all participants. Producers purchase contracts in an attempt to lock in their final price received at delivery. This price received is the difference between the futures contract and the basis at the time of delivery. This means a producer can effectively transfer from a price risk to a basis risk, which is generally much less volatile and can be moderately estimated. Being able to easily offset a contract as maturity approaches is possible due to the liquidity. The process explained above is known as hedging and those involved in this process have connections to the actual physical commodity. Speculators and investors, on the other hand, do not deal with or are interested in the commodity at hand. They are willing to participate in the market in an attempt to

profit. This is accomplished by purchasing a contract and speculating on the movement of prices. If speculators/investors are correct, they can sell the contract for a higher value in the future.

# CHAPTER 4

## HISTORY OF PRICE SHOCKS

One of the main events that caused for an investigation into the impact that speculative investment might have on commodities was the oil price crisis of 2007-2008. During this time oil rose and then plummeted at alarmingly rapid rates. To hypothesize that an influx of funds from speculative investors may have caused this, it may be beneficial to first look at previous oil shocks to understand their main causes.

We will look at 4 previous events that have occurred throughout history to identify both what caused them and their impact. The first oil shock occurred in 1973 due to the Yom Kippur War. The shock was a result of the Organization of Arab Petroleum Exporting Countries (OAPEC) placing an embargo on the United States in response to the U.S. support of Israel (www.history.state.gov). This caused the price of oil to rise from $3/barrel up to $12/barrel. The second oil shock occurred in 1979 due to the Iranian revolution. This event caused a decrease in oil output, which subsequently caused the price of oil to double to $39+/barrel. Shortly after this period the Iran-Iraq war had arisen. This event caused oil production to completely stop in Iran to completely halt and also reduced Iraq's production dramatically (Time 1979). This event caused oil prices to stay at an unsustainable level until the mid-1980s. A third oil shock occurred in 1990 in response to Iraq's invasion of Kuwait. With uncertainty about the future of oil supply hanging, prices responded by rising from $17/barrel up to $36/barrel (Hamilton 2009).

By reviewing these oil shocks throughout history, we can draw some commonalities between these events. All of these oil shocks could be concluded to have happened due to supply shortages/uncertainty due to geopolitical affairs. However, the case of the 2000's oil crisis may

not be able to be explained by this. For this reason we need to further examine potential causes in order to understand the factors that ultimately contributed to this price shock.

The 2000's were met with their own unique set of geopolitical events such as the North Korean missile tests, Iranian nuclear plans, Hurricane Katrina, etc., which may lead some to point to these events as the cause for dramatic price jumps. These events did indeed have short term effects on prices, but were deemed insignificant in explaining the magnitude of price movements. Another explanation may be the stagnation of production despite a rising world demand. This was the case as Saudi Arabia, one of the major suppliers of oil, actually saw a reduction in their production during the period of 2005-2007. During this same period demand was rising, largely in part to China's rapidly increase of oil consumption. Previous to this, increase in demand by China did not play as significant of a role in price impact due to their relatively small size in the market. But by the mid 2000's China had developed into a significant consumer of oil and had become large enough to have meaningful impact on prices.

Another factor that should be accounted for is the response to changes in the price of oil. The response by people to changes in oil price was not as large as it should have been. This may have been due to the relatively low allocation of income dedicated to energy and transportation. Since the fraction of budget allocated to this was relatively small, people could handle shifting their budget to allow for a larger fraction of energy and transportation to be expensed. This allowed people to continue to consume the convenient levels they were used to despite increasing prices. This shows that the price elasticity of demand for oil was initially low for people as dramatic price spikes occurred.

Masters (2008) proposed that the price shock of the 2000's could be attributed to the large influx of speculative funds into the commodity markets. He argued that commodity index

funds were buying oil as a financial asset instead of the traditional buyer who is purchasing it for use. By the peak of oil prices, commodity index traders were holding a quarter trillion dollars' worth of contracts. He argued that these fund managers were behaving this way in order to drive up the futures prices as well as the spot price connected to it. He referred to it as the financialization of "commodities". His conclusion was that this financialization caused a speculative bubble in the oil price.

For the conclusion that commodity index funds are trying to artificially drive up prices to be true, one important factor must be present. That is that the price elasticity of demand must be very low. Since this actually was the case during this period, one could make the case that financial speculation truly was a decisive factor in the price of oil. Conveniently, the same factor that could potentially make this claim true, low price elasticity of demand, is also one of the main factors that helps explain a price shock due to simple fundamentals.

We can also examine the other factor mentioned above that supply was stagnating despite the fact demand was rising, and try to explain why this was the case. Those who are of the belief that speculation was the disruption causing the market to become inefficient could argue that the speculation itself was the reason why supply was not correctly altered to demand. Producers of oil could have been potentially misled by all of the speculative purchases. The high volume of long contracts being purchased may have signaled to producers of oil that they should halt their current production in order to potentially benefit from an increased price in the future. However, by looking at the futures contracts at the height of oil prices in July 2008, this theory can be disproved. It is true that futures contracts in the short future were higher than the spot price, but far out contracts were moving lower than the spot price. This suggests that producers should not

have based their production on futures alone, and thus speculation driving futures prices may not have been a determining factor in the price shock (Hamilton 2009).

The two factors outline previously; a failure to keep supply constant with demand and a low price elasticity of demand, are two major factors that would be necessary for prices to move far away from their actual values. These fundamental factors could be enough in explaining the sudden price spike of 2007-2008, as demonstrated above. However, considering the speed and magnitude of the subsequent price collapse, one may hypothesize that there was indeed a speculative price bubble which caused prices to rise dramatically (Hamilton 2009).

# CHAPTER 5

## DATA AND METHODS

The research procedures for this time series analysis required data to be collected for both positions held by speculative investors and commodity prices. The data for speculative positions was collected from the Commodity Futures Trading Commission (CFTC). The CFTC releases a weekly report, known as the Commitment of Traders (COT). This report provides a breakdown of each Tuesday's open interest for markets in which 20 or more traders hold positions equal to or above the reporting levels established by the CFTC. This report separates traders into four different classes, which is illustrated in TABLE 2 below. (www.cftc.gov) In this study we will be using the managed money accounts to represent speculation. The net position refers to the difference between the open long and short contracts. The data for commodity prices was collected from the Quandl database. This database has historical prices of almost all tradable commodities. For the sake of this study, we will be using the historical prices concurrent with the COT reports. The data being used ranges from 6/30/2006 - 12/30/2014. This range is used due to the COT report only having data back to 6/13/2006, and the Quandl database only reporting prices up to the end of 2014. This was done in an attempt to keep the data uniform. The commodities being studied are NYMEX Crude Oil (Energy), CBOT Corn (Agricultural), and CBOT SRW (Agricultural).

The preliminary models used for this study can be expressed as:

$$\text{(1a) Nearby Commodity Price} = \beta_0 + \beta_1(\text{Managed Money Net Position}) + \varepsilon_i$$

$$\text{(1b) } \Delta\text{Nearby Commodity Price} = \beta_0 + \beta_1(\Delta \text{ Managed Money Net Position}) + \varepsilon_i$$

Using the equation (1a) we can test to see if there is a significant relationship between nearby commodity prices and the managed money net positions. Equation (1b) tests for the same relationship, but instead as a percentage change. These equations will be used to test each of the different commodities. The expected sign of the coefficient for both of these equations is positive, meaning that an increase in the net position of managed money accounts will show an increase in price. This is to be expected the case for all three of the commodities in the study.

Next the data will be tested with the incorporation of a time lag. In the first case, managed money net positions will be the lagged variable (causal) and prices will be the response variable. The models used to test this can be expressed as:

(2a) $\text{Nearby Commodity Price} = \beta_0 + \beta_1(\text{Nearby Commodity Price})_{t-1} + \beta_2 (\text{Managed Money Net Position})_{t-1} + \varepsilon_i$

(2b) $\Delta\text{Nearby Commodity Price} = \beta_0 + \beta_1(\Delta\text{Nearby Commodity Price})_{t-1} + \beta_2 (\Delta\text{Managed Money Net Position})_{t-1} + \varepsilon_i$

These models can be used to indicate whether past values of managed money net positions are reliable in predicting values of price. Model (2a) measures the actual change for both variables. Model (2b) is being used to capture the magnitude of change, which may be lost when measuring actual change. In the case for both equations the expected sign of the coefficient is to be positive, indicating that prices will move (respond) in the same direction that the managed money accounts are moving. This assumption holds true for all of the commodities.

Finally, models will be constructed to test the effects of lagged prices on current levels of speculative investment. It can be hypothesized that as prices move in a certain direction, investors will follow the trend. To test this hypothesis, the following models will be used:

(3a) $\text{Managed Money Net Position} = \beta_0 + \beta_1(\text{Managed Money Net Position})_{t-1} + \beta_2 (\text{Nearby Commodity Price})_{t-1}$

$$+\varepsilon_i$$

(3b) $\Delta\text{Managed Money Net Position} = \beta_0 + \beta_1(\Delta\text{Managed Money Net Position})_{t-1} + \beta_2 (\Delta\text{Nearby Commodity Price})_{t-1} + \varepsilon_i$

These models can be used to indicate whether past values of commodity prices can be used to predict future levels of investment. Like the above, the first model (3a) measures the actual change of the variables. The second model (3b) measures percent change from each observation, to capture the magnitude of change. Considering strategies used by investment funds, such as trend following, model (3b) may be the most appropriate in testing this hypothesis. Nonetheless, both models will be used for interpretation. The expected sign of the coefficient for both models is positive, indicating that investors will follow the changes in price.

The hypothesis test for all models is consistent. Several hypothesis tests will be done in this study. A t-test will be done for each independent variable to see whether the estimated beta coefficient is statistically different from zero. Rejection of a null hypothesis will indicate that the estimated coefficients is statistically different from zero. Failure to reject a null hypothesis will mean that the estimated coefficient is statistically no different than zero and therefore will have no significant impact on the dependent variable. The hypothesis tests can be summarized in Table 1 below.

Table 1: Hypothesis Test

1. $H_0$: Managed Money Net Position = 0
2. $H_0$: ΔManaged Money Net Position = 0
3. $H_0$: Managed Money Net Position = 0
4. $H_0$: ΔManaged Money Net Position = 0
5. $H_0$: Nearby Commodity Price = 0
6. $H_0$: ΔNearby Commodity Price = 0

# CHAPTER 6

## RESULTS

The results of the regression analysis are reported in the table below. For all commodities there are significant t-values for the simple regression model (1a). As expected the sign of the coefficient in these tests is positive. This regression model has managed money net position as the independent variable and nearby commodity price as the dependent variable. For crude oil the estimated coefficient is .0000012796, meaning for every 1 contract increase in managed money net position there will be an expected .0000012796 increase in nearby crude oil price. For corn the estimated coefficient is .0000754113, meaning for every 1 contract increase there will be an expected .0000754112 increase in nearby corn price. For wheat the estimated coefficient is .000188348, meaning for every 1 contract increase there will be an expected .000188348 increase in nearby wheat price. The regression models that incorporated time lag all produced similar results. None of the commodities tested were able to reject the null hypothesis that the coefficient explaining change was significantly different from zero. These results are summarized in Table 4. It should be noted in the model using lagged values of change in net position of corn to predict change in corn price, a t-value of 1.78 was produced. Although this value is not high enough to reject the null hypothesis at $\alpha = 0.05$, it does come very close.

# CHAPTER 7

# DISCUSSION

The results of this study are fairly consistent with those who have done prior research. There is little evidence to show that speculative investments have any measurable impact in causing price movement. The tests show that there is a significant correlation between prices and speculative investments, but correlation does not imply causation. Through the use of Granger causality tests, it was determined that speculation does not granger cause price movements, and price movements do not granger cause speculative investment. As others have concluded, speculation may have the potential to move prices in short horizons, known as bubbles. However, when given time the market will always correct itself so that prices reflect their true fundamental values.

These results show that there is currently not a need to try and control speculation in the marketplace. The proposed position limits do not hold merit. By trying to control speculation without evidence showing that it may be disruptive could be very problematic to the marketplace. An inefficiently operating market may become the subsequent result of implementing such a change. The accounts held by these investors give necessary liquidity to the market. Without them, producers and other users of the physical commodity may have to inherit risk that they might not be able to handle.

The main limitation of this study is the assumption that has to be made about the Commitment of Traders report. The report does the best job it can at classifying the different types of traders. However, some market participants may be able to report in categories other than what their intended purpose of trading is. For example, some large firms that handle the actual physical commodity may also take speculative positions that do not reflect their actual

business operation. This is even acknowledged by the Commodity Futures Trading Commission. Going forward, researchers may have to find a way to work around this limitation. This may be done through the acquisition of data from other sources that may have information on large investment firms.

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# APPENDIX

Table 2: Categories and Description of Trading Classes in CFTC COT Report

| | |
|---|---|
| **Producer/ Merchant/ Processor/ User** | Entities that predominantly engage in the production, processing, packing or handling of a physical commodity and uses the futures markets to manage or hedge risks associated with those activities. |
| **Swap Dealer** | Entities that deal primarily Over-The-Counter in swaps for a commodity and uses the futures markets to manage or hedge the risk associated with those swaps transactions. |
| **Money Manager** | Entities which manage on-exchange futures trading on behalf of their clients. Names of such money managers range from Commodity Trading Advisors (CTAs), registered Commodity Pool Advisors (CPOs), as well as unregistered funds, many Hedge Funds and large Exchange Traded Funds |
| **Other Reportables** | Every other reportable trader that is not placed into one of the other three categories |
| **Non-reporting Traders** | Smaller traders who are not obliged to report their positions |

Table 3: Explanation of Variables

| Variable | Explanation |
|---|---|
| OILP | Nearby NYMEX Crude Oil price |
| CORNP | Nearby CBOT Corn price |
| WHEATP | Nearby CBOT Wheat price |
| OILPCTP | Percentage change of price from weekly observation for NYMEX Crude Oil |
| CORNPCTP | Percentage change of price from weekly observation for CBOT Corn |
| WHEATPCTP | Percentage change of price from weekly observation for CBOT Wheat |
| OILMMN | Managed Money net position for NYMEX Crude Oil |
| CORNMMN | Managed Money net position for CBOT Corn |
| WHEATMMN | Managed Money net position for CBOT Wheat |
| OILPCTMMN | Percentage change of Managed Money net position from weekly observation for NYMEX Crude Oil |
| CORNPCTMMN | Percentage change of Managed Money net position from weekly observation for CBOT Corn |
| WHEATPCTMMN | Percentage change of Managed Money net position from weekly observation for CBOT Wheat |

Table 4: Results of Regression

| Dependent | Independent | Estimated Coefficient | t-statistic | P-value |
|---|---|---|---|---|
| OILP | OILMMN | .127965E-5 | 14.64** | **[0.000]** |
| CORNP | CORNMMN | .754113E-4 | 14.02** | **[0.000]** |
| WHEATP | WHEATMMN | .188348E-3 | 10.36** | **[0.000]** |
| OILPCTP | OILCPTMMN | .638014E-2 | 3.62** | **[0.000]** |
| CORNPCTP | CORNPCTMMN | .504633E-2 | 1.79* | [0.074] |
| WHEATPCTP | WHEATPCTMMN | .201276E-3 | 0.59 | [0.555] |
| OILP | OILMMN(-1) | .289375E-5 | 1.17 | [0.242] |
| CORNP | CORNMMN(-1) | .211133E-4 | 1.78* | [0.075] |
| WHEATP | WHEATMMN(-1) | .481429E-4 | 1 | [0.318] |
| OILMMN | OILP(-1) | -65.1683 | 0.14 | [0.891] |
| CORNMMN | CORNP(-1) | -8.48635 | -0.91 | [0.363] |
| WHEATMMN | WHEATP(-1) | -1.28825 | -0.36 | [0.719] |
| OILPCTP | OILPCTMMN(-1) | .171569E-2 | 0.04 | [0.344] |
| CORNPCTP | CORNPCTMMN(-1) | .261428E-2 | 0.92 | [0.356] |
| WHEATPCTP | WHEATPCTMMN(-1) | .472632E-3 | 1.39 | [0.163] |
| OILPCTMMN | OILPCTP(-1) | .375144E-2 | 0.29 | [0.77] |
| CORNPCTMMN | CORNPCTP(-1) | 1.21772 | 1.54 | 0[.123] |
| WHEATPCTMMN | WHEATPCTP(-1) | -6.95274 | -1.04 | [0.297] |

T-values with ** denotes a significant value and values with * denote a level close to significant. P-values that are **bold** reject the null hypothesis at α =0.05. P=Price. MMN=Managed Money Net. PCT=% Change

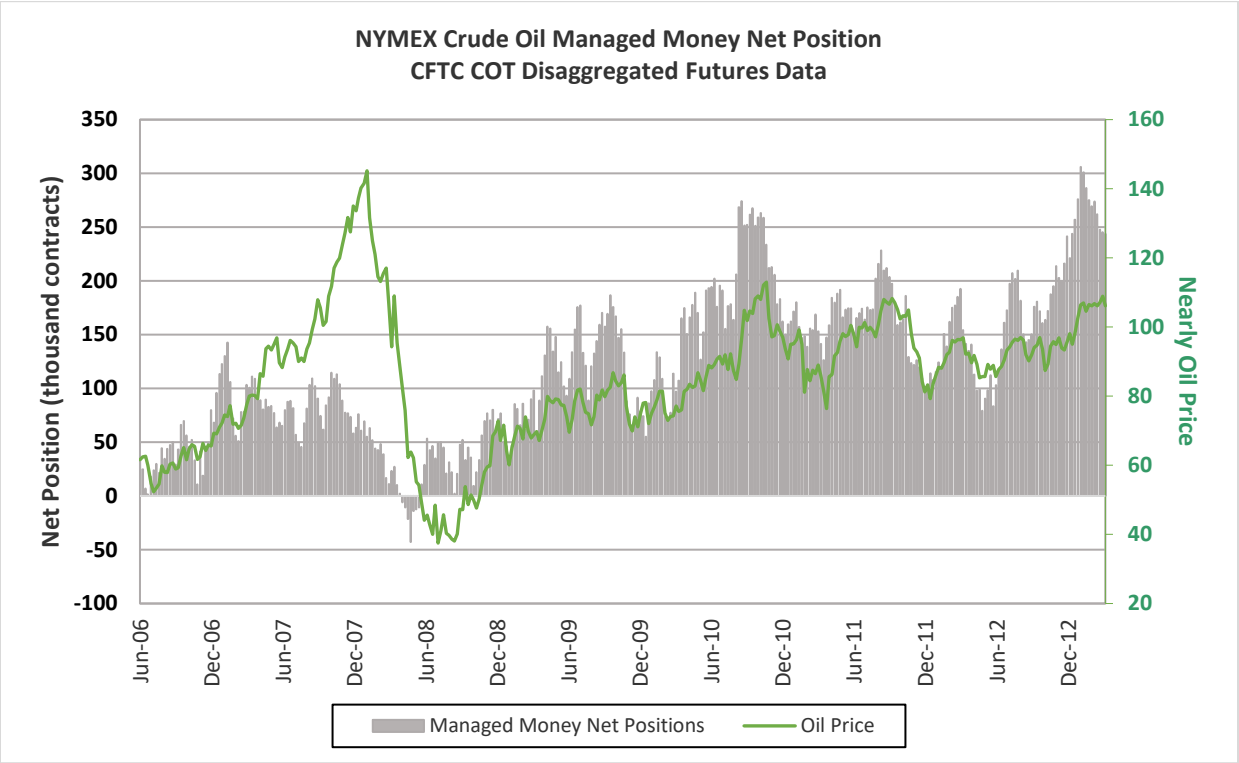


Figure 1: NYMEX Crude Oil Managed Money Net Position and Nearby Price

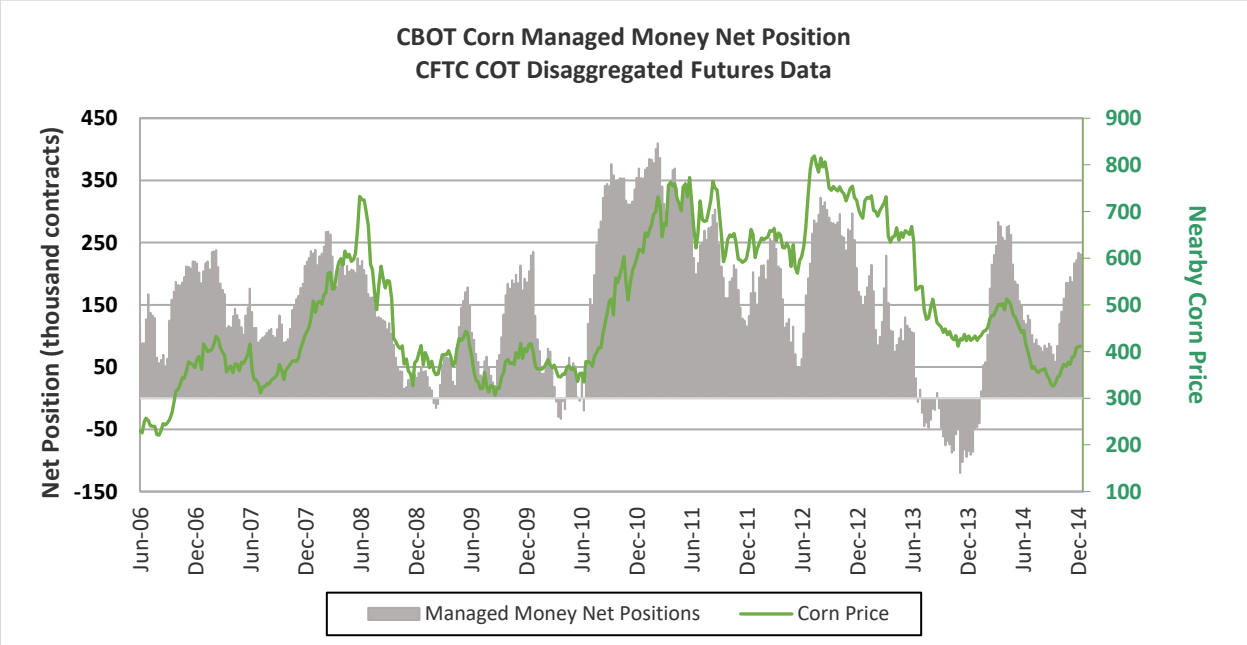


Figure 2: CBOT Corn Managed Money Net Position and Nearby Pric

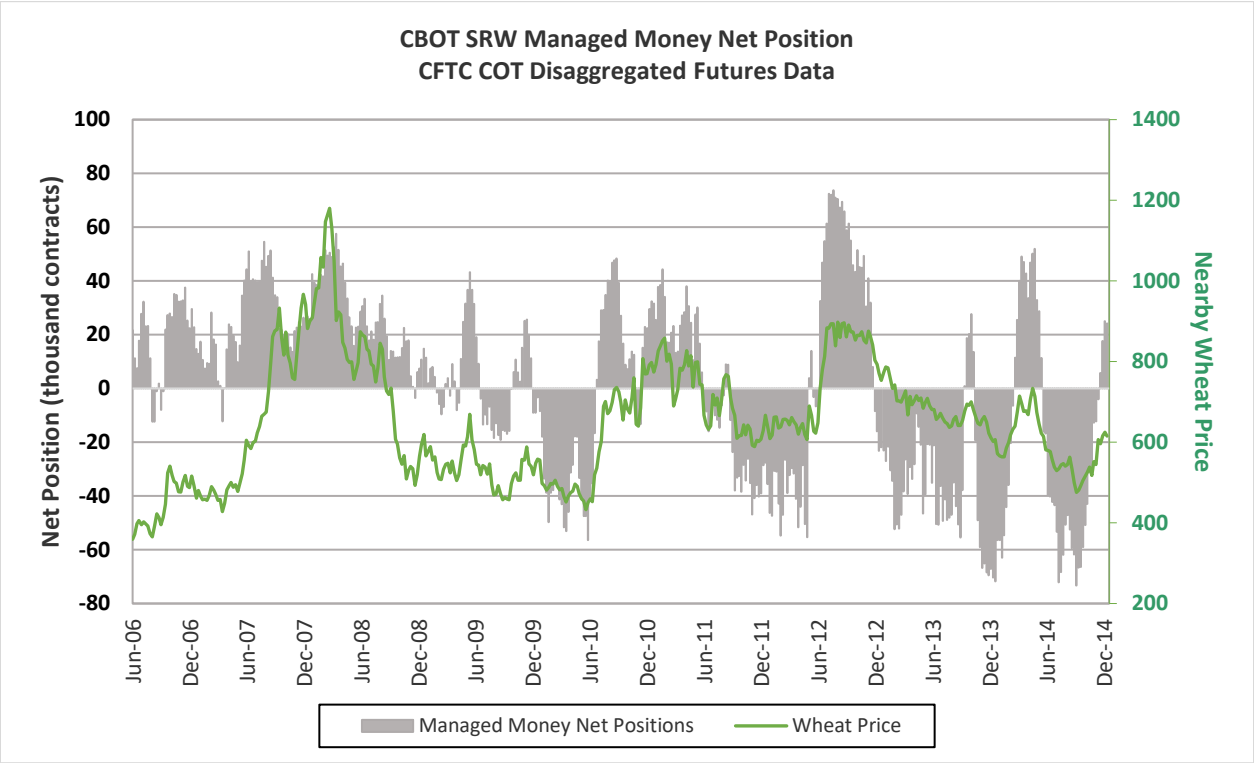


Figure 3: CBOT Wheat Managed Money Net Position and Nearby Price

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Southern Illinois University
Bachelor of Agribusiness Economics, May 2016

Research Paper Title:
The Impact of Speculative Investment on Commodity Price

Major Professor: Dr. Wanki Moon