Does the CFTC *Commitments of Traders* Report Contain Useful Information?

Dwight R. Sanders

and

Keith Boris*

Paper presented at the NCR-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management

Chicago, Illinois, April 17-18, 2000

* Dwight R. Sanders (sandersdr@aol.com) is the Commodity Risk Manager for Darden Restaurants, Inc., Orlando, Florida. Keith Boris (boristk@ldcorp.com) is a Senior Trading Analyst for Louis Dreyfus Corporation, Wilton, Connecticut.

Does the CFTC *Commitments of Traders* Report Contain Useful Information?

The Commodity Futures Trading Commission's Commitments of Traders data are examined. Non-commercial positions are thought to contain the least amount of measurement error. Although non-commercials comprise a relatively small percent of the tested markets' open interest (10% to 22%), they have the most volatile net positions. The data demonstrates a statistically (positive) negative contemporaneous correlation between net positions held by (non) commercials and market returns. However, traders' net positions do not lead (Granger cause) market returns. In fact, returns lead traders' net positions. Positive returns result in an (increase) decrease in (non) commercials net positions the following week. The findings suggest that prior empirical results, which make assumptions about traders' positions not changing over a reporting interval, may be biased toward reflecting the contemporaneous position-return correlations reported in this research.

Keywords: Commitments of Traders, commercial traders, non-commercial traders, funds

> 'The only real bullish factor in the market is that funds have gotten themselves very short, so inevitably locals will try to push the market higher' (Anonymus Trader, *Wall Street Journal*).
>
> In order for prices to continue higher, there must be strong buying support and according to the latest *Commitments of Traders* report, that may be difficult for at least one segment of the market. According to the CFTC, non-commercials [funds] have increased their net longs…to near record levels (NGI's *Daily Gas* Price Index).

Introduction

The Commodity Futures Trading Commission (CFTC) collects data on the composition of open interest for all futures contracts. A subset of this data is released to the public in the CFTC's *Commitments of Traders* (*COT*) report. The open interest is divided into *reporting* and *non-reporting* traders, where reporting traders hold positions in excess of CFTC reporting levels. Reporting traders are further categorized as *commercials* or *non-commercials*. Commercials are associated with an underlying cash-related business and they are commonly considered to be hedgers. Non-commercials are not involved in an underlying cash business; thus, they are referred to as speculators. Furthermore, reporting level non-commercial activity is generally considered to be that of managed futures or commodity funds. The non-reporting trader classification is typically thought to reflect the activity of small speculators. The *COT* data is broadly discussed in terms of "hedgers" (reporting commercials), "funds" (reporting non-commercials), and "small speculators" (non-reporting traders). The problem addressed in this research is whether or not these categorizations accurately describe the data, based on the CFTC's definitions and collection methodology. For instance, are non-reporting traders "small speculators"? Furthermore, does the *COT* data provide potentially useful information to academics and market analysts?

The CFTC's *COT* report is widely anticipated and closely analyzed by commodity futures traders. The trade's focus tends to be on the positions held by reporting non-commercials or

"funds." On one hand, some analysts suggest that anticipatory purchases in front of commodity funds are a profitable strategy. On the other hand, it is proposed that relatively large fund positions portend market reversals; thus, fund activity is a contrary indicator. Others argue that following the commercial trade is a profitable strategy (Welling). Regardless of the supposition, it is rarely supported by statistical evidence.

The *COT* data is also used by academics to examine the flow-of-funds among trader groups, the forecasting ability of traders (Hartzmark; Leuthold, Garcia, and Lu), and the existence of risk premia (Catrath, Liang, and Song). Yet, the source, reliability, and definitions underlying the data set are rarely scrutinized. Given the widespread use of this data in both academics and industry, it is essential that users have a thorough understanding of how the COT report is compiled and what information it contains. The following research examines these issues. The results are important to academics for correctly interpreting empirical tests of theoretical models and to practitioners who must evaluate the data's importance relative to a much broader information set.

The research is divided into two general parts: 1) an analysis of the data collection procedures used by the CFTC, and 2) an evaluation of the systematic relationship between the data and price behavior. The first issue is addressed by carefully going through the collection procedures utilized by the CFTC to gain a better understanding of the data. In particular, the data pose numerous questions. How have changes in reporting levels, speculative limits, and category definitions impacted it through time? What is the exact definition of a "trader"? How are option positions incorporated into the data? What precisely defines a commercial versus a non-commercial, and who determines that distinction? It is important that researchers understand these issues, or they risk misinterpreting their empirical results. In this research we begin to address these questions, highlighting the strengths and weaknesses of the *COT* data.

The second part of the research examines the informational content of the data as related to prices. This is not meant to be a test of market efficiency or trading profitability; rather, we are investigating the informational content of the data in a broad sense. How do traders' positions relate to prices? Does the *COT* data contain information about price movement? These objectives are pursued in a general Granger causality framework for a subset of the livestock, grain, and energy markets. The results are particularly important to traders and analysts who must allocate their resources across a large universe of data.

In summary, the CFTC's *COT* data is widely used in both academia and the trade, but it is not always well documented or understood. The broad objective of this research is to further our understanding of this unique data source. In doing so, we will gain a more complete picture of the data's potential applicability and how to interpret empirical results that utilize it.

Literature Review

Academic use of the *COT* data has focused on three closely related veins of research: 1) the level and adequacy of speculation in futures markets; 2) the flow-of-funds or forecasting ability of traders; and 3) the existence of risk premia or hedging pressure in futures markets.

Peck and Leuthold examine the adequacy of futures market speculation using a version of Working's speculative index. The speculative index uses the COT data to quantify speculative levels (non-commercial positions) relative to hedging needs (commercial positions). The forecasting ability of traders is typically examined using a finer version of the CFTC's large-trader data set than that released in the *COT* report. Hartzmark and Leuthold, Garcia, and Lu use detailed end-of-day position data for individual traders to evaluate their forecasting ability. Hartzmark concludes that large traders' returns are generated randomly; whereas, Leuthold, Garcia, and Lu find that select traders in frozen pork bellies can profitably forecast prices. Kahn uses the *COT* report to mimic the positions of reporting non-commercial traders. He finds that following their positions (upon release of the *COT* reports) does not generate statistically significant profits.

Many researchers (e.g., Chang; Bessembinder; Chatrath, Liang, and Song) use the *COT* data to test for hedging pressure or risk premia. Due to changes in the *COT* reporting frequency and availability, researchers often make assumptions about traders' positions. For instance, Chang assumes that traders' commitments are static over a reporting month—the same as they are at the end of the reporting interval. This assumption, while perhaps necessary for a cohesive data set, can potentially bias statistical tests concerning traders' profitability or forecasting ability.

De Roon, Nijman, and Veld use the *COT* data to examine hedging pressure in futures markets. They find strong statistical evidence that hedging pressure impacts futures returns. They define hedging pressure as the difference in commercial short and commercial long positions divided by total commercial positions. In a regression framework, net short hedging by reporting commercials is associated with statistically positive futures returns. In their theoretical model, the authors assume that there is no quantity risk; thus, the regression results reflect a strictly contemporaneous relationship.

Researchers utilizing the *COT* data faithfully take the data at face value: commercials are hedgers and non-commercials are speculators. While this may be a safe assumption, a careful inspection the data collection procedures may aid in its interpretation and use. In addition, academic researchers make numerous assumptions about how traders' positions change or do not change over reporting intervals. Often, these assumptions lead to an implicit overlap between price and position data that may bias conclusions concerning trader profitability, price pressure effects, or hedging pressure. In the following sections, we first examine the collection procedures employed by the CFTC in compiling the *COT* data, and then we explicitly examine the lead-lag nature of the data to help interpret prior research results.

The Large-Trader Reporting System[1]

The CFTC is charged with regulating futures and options trading such that the markets are free from artificial prices. One of the measures used to accomplish this goal is the CFTC's market surveillance program. The market surveillance program is intended to "spot adverse situations in futures markets." To accomplish this "a market surveillance program must determine when a trader's position in a futures market becomes so large relative to other factors that it is capable of causing prices to no longer accurately reflect legitimate supply and demand conditions" (CFTC, Number 5-92). To monitor these situations, the CFTC developed the large-trader reporting system. The large trader reporting system collects daily positions (from futures commission merchants, clearing members, and foreign brokers) for traders that have positions larger than the reportable level. The reportable level is defined by the CFTC for a given future (a single contract month in a commodity market).[2] The reportable level is on a futures-equivalent or delta adjusted basis.[3] So, a trader may hold contracts in excess of the reportable level, but if the position is delta-neutral then it is not a reportable position

Each futures account is identified with an "owner" and a "trader". The "trader" is an entity who makes trading decisions or has material financial interest. For example, a large corporation may have cattle feeding, grain handling, and investor services divisions. The overall corporation is the account "owner," but each division may be considered a separate "trader." A "trader" may have accounts with a number of futures commission merchants (FCMs). Positions are aggregated across accounts controlled by the same entity and those in which the entity has a ten percent or greater financial interest.[4] Thus, within the context of the *COT* reports, a "trader" is any entity that directly controls trading (i.e., is an "authorized trader") or has at least a ten percent financial interest in an account. A trader's position is aggregated across all such accounts.

FCMs file a CFTC Form 102 when an account has a reportable position. Form 102 provides the CFTC with preliminary information concerning financial interests and the commercial nature of the account. The account trader is required to complete a CFTC Form 40 within ten days of acquiring a reportable position. Form 40 collects detailed information on the controlling interest in the account. Also, in Form 40, the trader is asked to self-identify as a commercial or non-commercial. Where, a commercial is "engaged in business activities hedged by use of the futures and option markets…this would include production, merchandising or processing of a cash commodity, asset/liability risk management, security portfolio risk management, etc"

---

[1] The following discussion reflects the procedures for reporting large-trader positions as of January 1, 2000. The information was taken from publications on the CFTC website as well as personal interviews with the CFTC surveillance staff. It is important to note that reporting procedures and requirements have had numerous changes through time. Please see the footnotes provided in this paper and the CFTC's website (www.cftc.gov) for details.

[2] As of January 1, 2000, if a trader holds a reportable position in any future, then all of his positions in all futures are reported. Previously, only those held in that particular future were recorded.

[3] Prior to 1996, traders' futures and options positions were not combined on a delta equivalent basis. There were separate reporting levels for futures and options (CFTC). The respective exchanges provide the CFTC with the deltas for adjusting option positions.

[4] Exceptions to this rule exist for commodity pool operators (CPOs) where it can be demonstrated that the commodity trading advisors (CTAs) act independently.

(CFTC Form 40). In addition to whether the trader is a commercial or non-commercial, more detailed data is collected about the trader's motives. For instance, non-commercials are asked to identify themselves as commodity trading advisors (CTAs), commodity pool operators (CPOs), or floor brokers. Likewise, commercials are asked to identify the cash markets in which they have underlying risk and the nature of their commercial business (e.g., producer, processor, merchandiser, or end-user). Form 40 is updated every two years or upon special calls by the CFTC.

The *Commitments of Traders* Reports

The large-trader reporting system collects detailed daily information on the positions of reportable traders. A subset of this data is released to the public through the CFTC's *COT* reports. Although the CFTC large-trader reporting system contains more detailed information, the *COT* report only discloses positions at the commercial versus non-commercial aggregation level for reporting traders.

From the collection and identification process described above, it seems that the basic classification of reporting versus non-reporting is relatively clean across traders. It is unlikely that there are large measurement errors with respect to position size. However, this delineation tells us nothing about the motives of non-reporting traders. They may be hedgers, speculators, or market makers.

The disaggregation of reporting traders into commercial versus non-commercial market participants has potential sources of error. In particular, "commercial traders" may not always be hedgers, and hedgers may not always be hedging. For instance, because of the speculative position limits placed on non-commercials, there is some incentive for traders to classify themselves as commercials. Also, since cash positions for true commercials are unknown, their positions may be speculative in nature. Therefore, true hedging positions are some subset of the commercial traders' positions. In total, commercial positions are likely to reflect very diverse motives.

In contrast, there are no obvious incentives to self-classify as a speculator. So, reporting non-commercials most likely represent a relatively pure subset of total speculative positions. It would seem particularly difficult for a commodity trading advisor (CTA) to describe themselves as a commercial; thus, it is likely that reporting non-commercial positions largely reflect those held by managed funds.

In summary, the trade's labels of "funds," "hedgers," and "small speculators" placed on the CFTC trader classifications of reporting non-commercials, reporting commercials, and non-reporting traders, respectively, are at best tenuous. First, there is no information about the motives of non-reporting traders. We only know that they do not hold positions in excess of CFTC reporting levels. Second, pure hedge positions are a subset of the reporting commercial classification, and reporting commercial positions likely reflect a diverse set of motives in aggregate. Finally, the "funds" or reporting non-commercials is probably the most precise

classification, effectively capturing the positions of a sub-set of speculators (i.e., managed funds).

Position Measurement

Non-commercial open interest is divided into long, short, and spreading; whereas, commercial and non-reporting open interest is simply divided into long or short. The following relation explains how the market's total open interest (TOI) is disaggregated:

$$(1) \qquad \underbrace{[NCL + NCS + 2(NCSP)] + [CL + CS]}_{\text{Reporting}} + \underbrace{[NRL + NRS]}_{\text{Non-Reporting}} = 2(TOI)$$

where, NCL, NCS, and NCSP are non-commercial long, short, and spreading positions, respectively. CL (CS) represents commercial long (short) positions, and NRL (NRS) are long (short) positions held by non-reporting traders. Reporting and non-reporting positions must sum to the market's total open interest (TOI), and the number of longs must equal the number of short positions.

In this research we focus on two relative measures of position size. The first is simply the percent of the total open interest held by each CFTC trader classification. This measure is the sum of the long and short positions held by the trader class divided by twice the market's total open interest.[5] For instance, the percent of the total market held by commercial traders is calculated as follows:

$$(2) \qquad \text{Reporting Commercials' Percent of TOI}_t = \frac{CL_t + CS_t}{2(TOI_t)}.$$

The second measure captures the net position of the average trader in a CFTC classification.[6] The percent net long position (PNL) is calculated as the long minus the short positions divided by their sum. For instance, the percent net long for the reporting commercials is defined as follows:

$$(3) \qquad \text{Commercial } PNL_t = \frac{CL_t - CS_t}{CL_t + CS_t}.$$

The PNL for each CFTC classification represents the net position held by the group normalized by their total size. De Roon, Nijman, and Veld calculate the PNL for reporting commercials and

[5] This is seen by multiplying through Equation (1) by 1/(2*TOI). For example, reporting non-commercials' percent of total open interest is calculated as [NCL + NCS+2*(NCSP)]/(2*TOI).

[6] All of the results in this paper apply to the average trader in each group. Certainly, there are individual exceptions.

refer to it as "hedging pressure."[7] Furthermore, they distinguish between "hedging pressure" (PNL_t) and "price pressure" (ΔPNL_t). Here, we follow Roon, Nijman, and Veld and examine the behavior and impact of traders' net positions in both levels and first differences.

Data, Empirical Methods, and Results

Since October of 1992, the *COT* reports have been issued every other Friday and contain traders' positions on the previous two Tuesdays.[8] Thus, from October 1992 to present, there is a continuous weekly (Tuesday-to-Tuesday) time series of traders' futures positions. The *COT* data is collected on four relatively independent markets: live cattle, corn, natural gas, and crude oil.[9,10] The data is collected weekly from October 6, 1992 through December 28, 1999 for futures only positions.[11] The *COT* data reflects traders' positions as of Tuesday's close (although it is not released until Friday). A matching set of futures returns, $R_t = \ln(p_t/p_{t-1})$, are calculated for nearby futures using Tuesday-to-Tuesday closing prices. We make no assumptions about how or why traders' positions might change over the course of a week, and there is no overlap between the return series (R_t) and a one lag of the position series PNL_{t-1}.

The first position measure examined is the percent of total open interest held by each CFTC group as shown in Equation 2. The summary statistics are presented in Table 1, and Figures 1 and 2 illustrate the measures for live cattle and natural gas.

From Table 1, it is clear that reporting commercial traders are the largest position holders in these markets. This is especially true in the natural gas and crude oil markets, where commercials comprise 70.9% and 67.2% of the total open interest, respectively. The next largest group is non-reporting traders. The smallest group is the reporting non-commercials or "funds." As shown in Figures 1 and 2 the relative size of each trader category changes through time. In live cattle (Figure 1), the relative proportion of reporting non-commercials has trended higher, while the proportion of non-reporting traders has declined. This is also true in natural gas

---

[7] Following the naming device presented by De Roon, Nijman, and Veld, the percent net long position held by non-commercials, $\frac{NCL_t - NCS_t}{NCL_t + NCS_t + 2(NCSP_t)}$, would be referred to as "speculative pressure" and that held by non-reporting traders, $\frac{NRL_t - NRS_t}{NRL_t + NRS_t}$, as "small trader pressure." Note that the PNL for each CFTC classification, when weighted by their percent of the total market open interest, will sum to zero.

[8] The *COT* reports were issued monthly prior to 1991 and bimonthly from January 1991 to November 1992. From 1975 through 1991, the data is available monthly. Prior to 1975, the reports were issued semi-monthly.

[9] The only statistically significant correlation among futures returns is between natural gas and crude oil. The simple correlation coefficient between these two markets is 0.20.

[10] The CFTC reporting level for these markets are 150, 100, 100, and 300 contracts (futures-equivalent), respectively.

[11] The "optionized" or futures-equivalent data are available weekly from March of 1995 through December of 1999 (250 observations). Over this interval, the correlation between futures only and the futures-equivalent positions were all greater than 0.90 except in natural gas where one was 0.83. In fact, most of the correlations are greater than 0.95; so, it is unlikely that the combined futures and options data set would produce empirical results markedly different from those presented for futures only.

(Figure 2), where reporting non-commercials have tended to become a greater portion of the market. The reason for these trends could stem from increases in speculative limits during the late 1990's (CFTC) and the general growth in managed futures (see Irwin and Yoshimaru).

The remainder of the analysis focuses on net market positions as measured by the percent net long (PNL) in Equation 3. The summary statistics for PNL are presented in Table 2. Across all the markets, reporting non-commercials hold net long positions. Reporting commercials hold net short positions in each market except corn. The net position held by non-reporting traders is mixed.[12]

In all instances, the PNL is volatile with each group swinging from net long to net short (except non-reporting traders in natural gas). The most volatile group is the reporting non-commercials where the PNL can reach extremes greater than 50%, either long or short. The volatility of the non-commercials' net positions is clearly illustrated for live cattle and natural gas in Figures 3 and 4. From this data it is clear that non-commercials, although not a large percent of the total market, must be active traders who will change from long to short over the course of a week. The volatility of each category's net position indirectly reveals information about the diversity of motives within each group. It would appear that the least diverse set of motives exist for non-commercial traders. In fact, the data suggest that this group largely acts in concert relative to the other trader groups. Thus, it is not surprising that they are thought to influence the market. The next set of tests will help determine whether or not the net position held by any of the trader categories contain information concerning the future direction of prices.

Before explicitly examining the lead-lag relationships between traders' positions and market returns, it is worthwhile to examine the contemporaneous relationships between PNL_t and R_t. The simple correlation coefficients are presented in Table 3, with the upper panel using levels of PNL_t and the lower using first differences, ΔPNL_t. All of the correlation coefficients in Table 3 are statistically different from zero at the 5% level except for live cattle reporting commercials (top panel). The results clearly indicate a strong positive contemporaneous correlation between the PNL for non-commercials and returns and a strong negative relationship between reporting commercials and returns. That is, reporting non-commercials (commercials) increase their long positions in rising (falling) markets. This characteristic of the data can support numerous theoretical results, including hedging pressure by commercials (Roon, Nijman, and Veld) to positive feedback trading by non-commercials (De Long, Shleifer, and Summers). Certainly, it is no surprise that the correlations are opposite since the market on whole must retain a neutral net position. Next, we explicitly consider the lead-lag relationship between net positions and returns.

[12]The position held by non-reporting traders is a residual measure. It must be the opposite of that held by reporting traders, which itself is a weighted average of reporting commercial and non-commercial positions.

Hamilton suggests the direct or bivariate Granger test for examining the lead-lag relationship between two series. In Equation (4), the series PNL_t is said to lead futures returns, R_t, if they are useful in predicting R_t. The null hypothesis that PNL_t does not lead R_t, H_O: $\beta_j=0\ \forall j$, is tested with a Wald chi-squared test.[13]

$$R_t = \alpha + \gamma_i R_{t-i} + \beta_j PNL_{t-j} + \varepsilon_t \tag{4}$$

The results (p-values) for testing the null that PNL_t does not lead R_t are presented in Table 4. In the upper panel, percent net long positions (PNL) is measured in levels and in the lower panel it is measure in first differences. Looking at the first row in each panel, there is little evidence that reporting non-commercial or "fund" positions contain any information about futures returns. That is, we cannot reject the null that positions do not lead returns. Although the impact is mostly positive, it is not statistically significant at the 5% level for any market. One interpretation of the results in levels is that non-commercials do not establish large long (short) positions prior to rising (falling) futures prices. Likewise, the results in first differences suggest that an increase (decrease) in "funds" net long position does not proceed a market rally (break).

In Table 4, the impact of reporting commercials' positions is mostly negative across the markets. But, again, statistical significance is weak. Only in crude oil can the null hypothesis that net positions do not lead returns be rejected at the 5% level. The results for non-reporting traders have more statistical rejections of the null, but the directional impact is mixed. For instance, the null is rejected in corn at the 5% level. However, in levels the impact is positive; whereas, it is negative when using ΔPNL. Collectively, the results in Table 4 do not suggest that there is a systematic tendency for any of the trader groups' positions to lead futures returns.

The null hypothesis that futures returns do not lead trader positions is tested in a Granger causality framework by estimating Equation (5) and testing the null hypothesis that $\theta_j=0$ for all j.

$$PNL_t = \phi + \lambda_i PNL_{t-i} + \theta_j R_{t-j} + \omega_t \tag{5}$$

The p-values from the Wald chi-squared test are presented in Table 5. Again, the upper (lower) panel presents the result using PNL in levels (first differences). Here, the results for reporting non-commercials are consistent. The null hypothesis is rejected at conventional levels in all cases, and the impact is uniformly positive. That is, positive futures returns result in reporting non-commercials increasing their net long position. This could be indicative of a class of positive feedback traders or trend-followers.

[13] The lag structure (i, j) in equations (3) and (4) are determined by estimating the models for all values of i = 1,2,…8 and j=1,2,…8, and then choosing the model that minimizes Akaike's information criteria (Beveridge and Oickle). The model is tested for serial correlation with a Lagrange multiplier test and heteroskedasticity with White's test. If there is serial correlation, then additional lags of the independent variable are added until it is eliminated. If the model is heteroskedastic, then we utilize White's heteroskedastic consistent covariance estimator.

The results for reporting commercials (second row of each panel) are also fairly consistent. In levels, the returns statistically lead net positions and the impact is uniformly negative (commercials increase long positions as prices fall). This could characterized "value hedgers" or negative feedback traders who buy (sell) in falling (rising) markets. Alternatively, this could be a manifestation of the data constraint that longs must equal shorts. Where, commercials take the opposite position of positive feedback non-commercial traders. The presented results allow for a wide range of interpretations.

The results are mixed for non-reporting traders in Table 5. Of the eight tests with the non-reporting traders, the null is rejected in four tests at the 5% level and the impact is mixed across the markets.

In summary, the Granger causality tests suggest the following. First, there is no pervasive evidence that traders' percent net long positions (PNL) contain any predictive information about market returns (equation 4 and Table 4). Second, there is consistent evidence that positive (negative) futures returns cause the net long positions held by non-commercial traders to increase (decrease). In particular, positive returns in week t-1 result in an increase in the net long positions held by non-commercials the following week. Similarly, commercial traders show a tendency to be net sellers of futures positions the week following an increase in prices. The results for non-reporting traders are mixed. These findings support a wide variety of theoretical models and interpretations.

Summary and Conclusions

The CFTC collects detailed daily information on the positions held by reporting traders. A subset of that information is released to the public in the biweekly *COT* reports. A futures market's open interest is disaggregated into positions held by reporting and non-reporting traders, and reporting traders are further identified as commercials or non-commercials. These groups are commonly referred to as large speculators (reporting non-commercials), hedgers (reporting commercials), and small speculators (non-reporting traders).

The collection methodology underlying the *COT* data leads to the following conclusions. First, the data provides no information about non-reporting traders other than they do not hold positions in excess of reporting levels. Second, the trading motives in the reporting commercial classification is likely to extend beyond just hedgers. That is, pure hedging positions are a subset of those represented by reporting commercials. Finally, reporting non-commercials are the trader category least prone to reporting error. Since there are no incentives to self-classify as a speculator, the reporting non-commercial positions likely reflect a pure subset of true speculative positions.

The empirical analysis focused on traders' positions in live cattle, corn, natural gas, and crude oil from 1992 through 1999 (378 weekly observations). The empirical analysis shows that the largest positions are held by reporting commercials and the smallest by reporting non-commercials. Although a relatively small percent of the total market (between 10 and 23 percent

for the tested markets), the non-commercials are active traders who may change from extreme net long positions to extreme net short positions over the course of a week.

The contemporaneous relationship between the percent net long (PNL) for each CFTC trader class and market returns (R_t) is analyzed. The results strongly indicate that reporting non-commercials (commercials) increase their long positions in rising (falling) markets. The fact that the non-commercials and commercials show inverse changes in their positions is not surprising, since longs and shorts must balance. Importantly, this contemporaneous relationship can support a number of competing theoretical models (e.g., hedging pressure, positive feedback trading).

The lead-lag relationship between net positions and market returns is analyzed in a Granger causality framework. There is no consistent evidence that traders' percent net long positions (PNL) contain any predictive information about market returns. However, the results clearly indicate that positive futures returns precede increases in the net long positions held by reporting non-commercial traders. Commercials are net sellers following price increases.

The above findings are important for accurately interpreting prior empirical results. First, any research that assumes positions at the end of a time period are the same as those held during the time period must be carefully evaluated (see Chang; Bessembinder; Catrath, Liang, and Song; De Roon, Nijman, and Veld). The contemporaneous correlation between returns and positions will bias results to suggest that that commercial traders create hedging pressure which results in a risk premium flowing to non-commercials. Or, it will appear that non-commercials are profitable traders and commercials are not. The lead-lag relationships presented in this research shows that neither group's positions are systematically useful in predicting returns. In fact, for both groups, returns lead positions. That is, (non-) commercials are net (buyers) sellers the week following an increase in prices. It is not clear that the *COT* data provides any information concerning the profitability of trader groups

The finding that traders' positions are not useful in predicting returns is important to practitioners. In this analysis, it is assumed that the *COT* data is available immediately (on Tuesday). However, the data is not publicly released until Friday afternoon. In the interim, traders' positions can change dramatically, especially those held by non-commercials. Thus, it is even more unlikely that the public release of the data is useful in predicting returns. However, our tests certainly do not rule out the possibility that this data can be used in conjunction with other information to forecast prices.

References

Beveridge, S., and C. Oickle. "A Comparison of Box-Jenkins and Objective Methods for Determining the Order of a Non-seasonal ARMA Model." *Journal of Forecasting*. 13(1994):419-434.

Chatrath, A., Y. Liang, and F. Song. "Commitment of Traders, Basis Behavior, and the Issue of Risk Premia in Futures Markets." *Journal of Futures Markets*. 17(1997): 707-731.

Commodity Futures Trading Commission. "The CFTC Market Surveillance Program." Number: 5-92, http://www.cftc.gov, April 1, 2000.

Commodity Futures Trading Commission. "The Commitments of Traders Report." Number: 4-91, http://www.cftc.gov, April 1, 2000.

Commodity Futures Trading Commission. "CFTC Form 40: Statement of Reporting Trader." OMB No. 3038-009.

Commodity Futures Trading Commission. "17 CFR Part 15, 17, 18, and 19, Final Rulemaking." http://www.cftc.gov, April 1, 2000.

Commodity Futures Trading Commission. "17 CFR Part 15, 17, 18, and 19, Proposed Rulemaking." http://www.cftc.gov, April 1, 2000.

Commodity Futures Trading Commission. "Speculative Limits, Hedging and Aggregation in Agricultural Commodity Futures and Options." Number: 3-92, http://www.cftc.gov, April 1, 2000.

De Long, J.B., A. Shleifer, L.H. Summers, and R.J. Waldmann. "Positive Feedback Investment Strategies and Destabilizing Rational Speculation." *Journal of Finance*. 45(1990):379-395.

De Roon, F.A., T.E. Nijman, and C. Veld. "Hedging Pressure Effects in Futures Markets." *Journal of Finance*, forthcoming, 2000.

Hamilton, J.D. *Time Series Analysis*. Princeton, New Jersey: Princeton University Press, 1994.

Hartzmark, M. "Luck and Forecast Ability: Determinants of Trader Performance in Futures Markets." *Journal of Business*. 64(1991): 49-74.

Hieronymus. T.A. *Economics of Futures Trading for Commercial and Personal Profit*. New York: Commodity Research Bureau, 1971.

Irwin, S.H., and S. Yoshimaru. "Managed Futures, Positive Feedback Trading, and Futures Price Volatility." Journal of Futures Markets. 19(1999):759-776.

Kodres, L.E., and M. Pritsker. "Directionally Similar Position Taking and Herding by Large Futures Market Participants." *Risk Measurement and Systemic Risk: Proceedings of a Joint Central Bank Research Conference*, Board of Governors of the Federal Reserve System: New York, 1995.

Leuthold, R.M. "Commercial Use and Speculative Measures of the Livestock Commodity Futures Markets." *Journal of Futures Markets*. 3(1983):113-135.

Leuthold, R.M., P. Garcia, and R. Lu. "The Returns and Forecasting Ability of Large Traders in the Frozen Pork Bellies Futures Market." *Journal of Business*. 67(1994):459-73.

NGI's Daily Gas Price Index. "Bulls Put Finishing Touches on Volatile Week." Volume 7, No.25. August 16, 1999.

Peck, A.E. "Measures and Price Effects of Changes in Speculation on the Wheat, Corn, and Soybean Futures Markets." *Research on Speculation, Seminar Report*, Chicago Board of Trade, Chicago, 1981, pp.138-149.

Privin, Angela. "Coffee Prices Rally Amid Concerns of Dry Spell." *Wall Street Journal*. September 2, 1999, p. C15.

Table 1. Percent of Total Open Interest Held by CFTC Reporting Categories, October 1992 to December, 1999 (378 weekly observations).

	Live Cattle	Corn	Natural Gas	Crude Oil
Reporting Non-Commercial	22.1[a] (11.8, 30.2)[b]	16.7 (6.4, 26.2)	10.4 (4.4, 23.2)	11.6 (5.8, 19.6)
Reporting Commercial	39.9 (30.5, 49.2)	46.5 (38.7, 55.5)	70.9 (58.8, 84.3)	67.2 (60.1, 78.1)
Non-Reporting	38.0 (26.7, 48.5)	36.8 (24.4, 47.2)	18.7 (7.5, 30.8)	21.2 (10.2, 28.8)

[a]The average percent of the total open interest held by the CFTC trader category.
[b]The minimum and maximum sample values are presented in parentheses (minimum, maximum).

Table 2. Percent Net Long Held by CFTC Reporting Categories, October 1992 to December, 1999 (378 weekly observations).

		Live Cattle	Corn	Natural Gas	Crude Oil
Reporting Non-Commercial	Mean [a]	12.6	20.3	13.4	7.5
	Std. Dev.[b]	24.4	34.4	37.0	25.1
	Range [c]	(-46.0, 63.2)	(-52.9, 78.7)	(-59.7, 85.1)	(-54.5, 72.6)
Reporting Commercial	Mean	-5.8	2.8	-7.4	-1.5
	Std. Dev.	12.2	17.3	6.8	6.7
	Range	(-32.5, 18.0)	(-32.3, 37.2)	(-23.2, 7.9)	(-17.1, 18.2)
Non-Reporting	Mean	-2.3	-13.1	20.3	0.6
	Std. Dev.	10.3	9.6	3.7	7.5
	Range	(-33.9, 18.9)	(-29.7, 17.4)	(3.6, 39.3)	(-18.6, 17.9)

[a]The average percent net long (PNL), calculated as long minus short positions divided by their sum. All of the means are statistically different from zero at the 5% level (two-tailed t-test) except for non-reporting traders in crude oil. The series are stationary at the 10% level (Dickey-Fuller test) except for non-reporting corn positions.
[b]Standard deviation.
[c]The minimum and maximum sample values are presented in parentheses (minimum,maximum).

Table 3. Contemporaneous Correlation Coefficients Between Futures Returns and Percent Net Long Positions, October, 1992 to December, 1999 (378 weekly observations).

Levels[b]		Live Cattle	Corn	Natural Gas	Crude Oil
	Reporting Non-Commercial	0.175[a]	0.221	0.231	0.287
	Reporting Commercial	-0.059	-0.239	-0.252	-0.324
	Non-Reporting	-0.195	0.126	0.149	0.329
Differences					
	Reporting Non-Commercial	0.447	0.537	0.463	0.519
	Reporting Commercial	-0.289	-0.672	-0.494	-0.560
	Non-Reporting	-0.388	0.445	0.280	0.431

[a]Simple correlation coefficients calculated over 378 (377) observations in levels (differences). Using a two-tailed t-test, any correlation greater than 0.10 in absolute value is statistically significant at the 5% level.
[b]The upper panel presents the results with PNL in levels. The lower panel presents results using PNL in first differences.

Table 4. Granger Causality Test that Percent Net Long Positions Lead Futures Returns, October, 1992 to December, 1999 (378 weekly observations).

Levels[d]		Live Cattle	Corn	Natural Gas	Crude Oil
Reporting Non-Commercial	lags (i,j)[a]	2,1	1,1	3,2	1,1
	p-value[b]	0.294	0.161	0.103	0.305
	impact[c]	(+)	(+)	(+)	(+)
Reporting Commercial	lags (i,j)	2,1	1,1	3,1	1,2
	p-value	0.782	0.189	0.406	0.034
	impact	(+)	(-)	(-)	(-)*
Non-Reporting	lags (i,j)	2,1	2,4	3,2	1,2
	p-value	0.033	0.027	0.298	0.003
	impact	(-)*	(+)*	(+)	(+)*
Differences					
Reporting Non-Commercial	lags (i,j)	2,1	1,1	3,1	4,1
	p-value	0.869	0.154	0.062	0.297
	impact	(+)	(+)	(+)	(-)
Reporting Commercial	lags (i,j)	2,1	1,1	3,1	1,1
	p-value	0.554	0.295	0.166	0.058
	impact	(+)	(-)	(-)	(+)
Non-Reporting	lags (i,j)	2,1	2,3	3,1	1,1
	p-value	0.458	0.017	0.128	0.045
	impact	(-)	(-)*	(+)	(-)*

[a]The lag structure (i,j) from the OLS regression, $R_t = \alpha + \gamma_i R_{t-i} + \beta_j PNL_{t-j} + \varepsilon_t$.

[b] The p-value from the Wald chi-squared test of the null, $\beta_j=0\ \forall j$. Rejection of the null implies that the PNL leads futures returns, R.

[c]The cumulative impact of lagged values of PNL. The (+) or (-) is the sign of $\Sigma\beta_j$, and an asterisk (*) denotes a rejection of the null that $\Sigma\beta_j=0$ at the 5% level (Wald chi-squared test).

[d]The upper panel presents the results with PNL in levels. The lower panel presents results using PNL in first differences.

Table 5. Granger Causality Test that Returns Lead Percent Net Long Positions, October, 1992 to December, 1999 (378 weekly observations).

Levels[d]		Live Cattle	Corn	Natural Gas	Crude Oil
Reporting Non-Commercial	lags (i,j)[a]	2,1	7,1	2,3	7,1
	p-value[b]	0.006	0.000	0.000	0.004
	impact[c]	(+)*	(+)*	(+)*	(+)*
Reporting Commercial	lags (i,j)	2,3	7,1	2,1	5,1
	p-value	0.000	0.044	0.010	0.000
	impact	(-)*	(-)*	(-)*	(-)*
Non-Reporting	lags (i,j)	1,1	2,1	3,1	3,7
	p-value	0.800	0.986	0.054	0.000
	impact	(+)	(-)	(+)	(-)
Differences					
Reporting Non-Commercial	lags (i,j)	1,1	6,1	8,1	7,1
	p-value	0.030	0.002	0.014	0.044
	impact	(+)*	(+)*	(+)*	(+)*
Reporting Commercial	lags (i,j)	6,1	6,3	6,1	1,7
	p-value	0.000	0.095	0.014	0.000
	impact	(-)*	(+)	(-)*	(+)*
Non-Reporting	lags (i,j)	3,8	1,7	1,5	2,7
	p-value	0.001	0.184	0.016	0.000
	impact	(+)*	(-)	(-)	(-)*

[a]The lag structure (i,j) from the OLS regression, $PNL_t = \phi + \lambda_i PNL_{t-i} + \theta_j R_{t-j} + \omega_t$. is estimated for percent net long (both PNL and ΔPNL) and returns, R, for each market and trader category.

[b]The p-value from the Wald chi-squared test of the null, $\theta_j=0\ \forall j$. Rejection of the null implies that that returns, R, lead traders' positions, PNL.

[c]The cumulative impact of lagged values of PNL. The (+) or (-) is the sign of $\Sigma\theta_j$, and an asterisk (*) denotes a rejection of the null that $\Sigma\theta\beta_j=0$ at the 5% level (Wald chi-squared test).

[d]The upper panel presents the results with PNL in levels. The lower panel presents results using PNL in first differences.

Figure 1. Live Cattle Futures, Proportion of Total Open Interest Held by CFTC Trader Classification, October, 1992 to December, 1999.

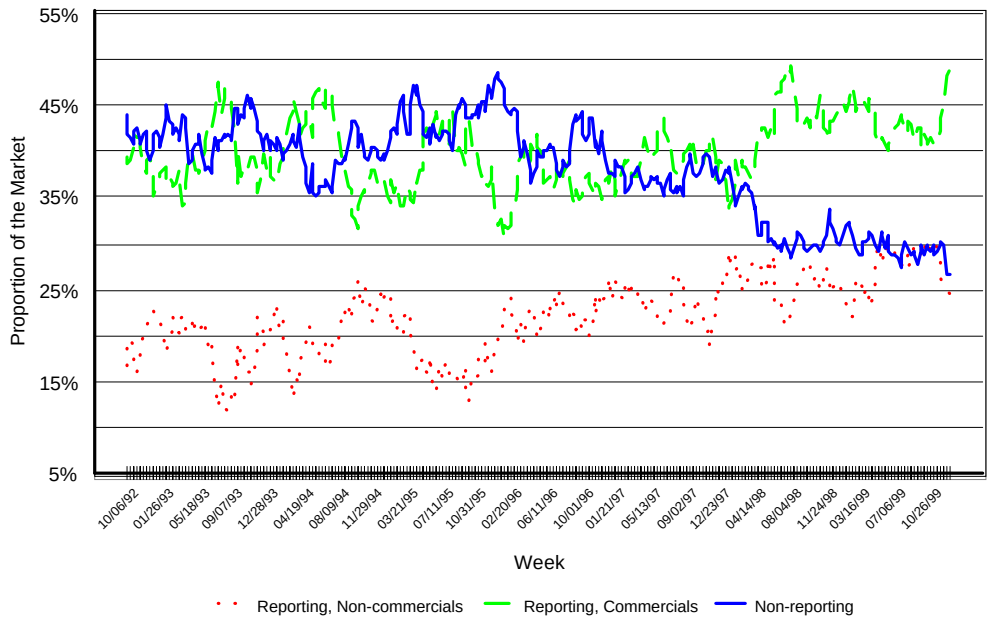

Figure 2. Natural Gas Futures, Proportion of Total Open Interest Held by CFTC Trader Classification, October, 1992 to December, 1999.

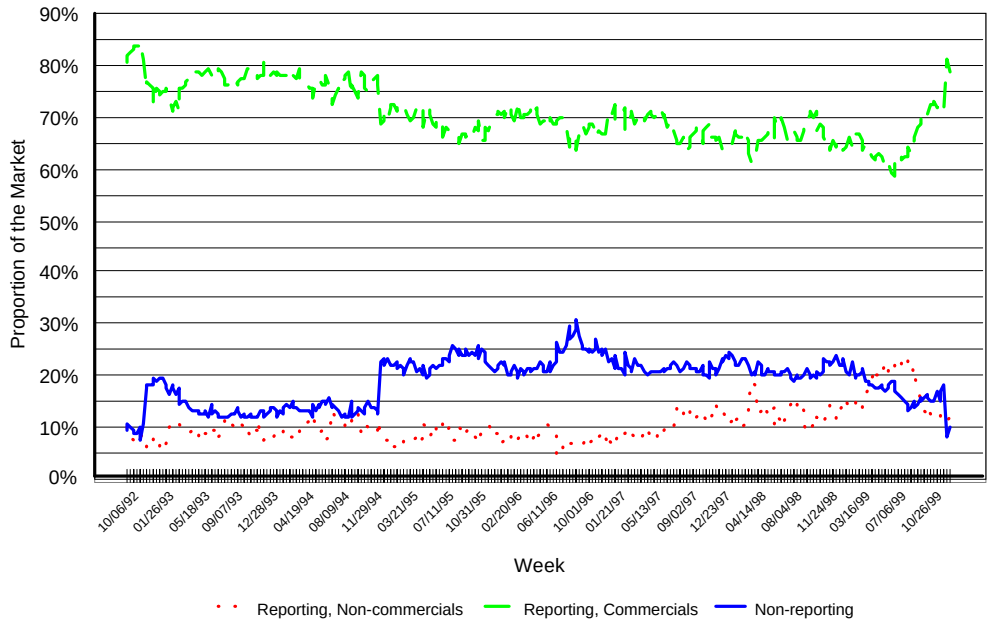

Figure 3. Live Cattle Futures, Percent Net Long by CFTC Trader Classification, October, 1992 to December, 1999.

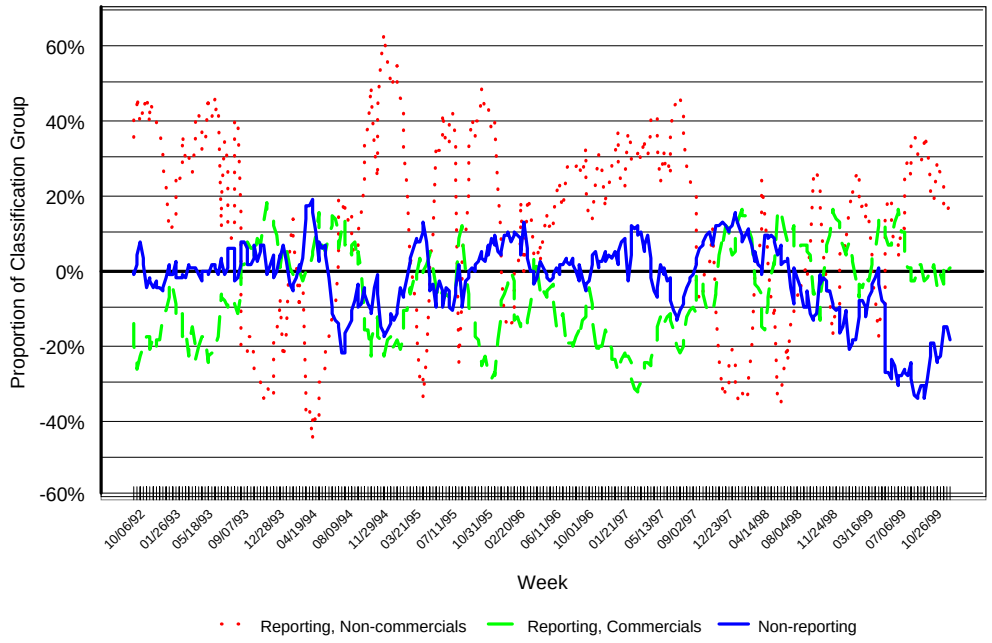

Figure 4. Natural Gas Futures, Percent Net Long by CFTC Trader Classification, October, 1992 to December, 1999.