

**The Adequacy of Speculation in Agricultural Futures Markets:
Too Much of a Good Thing?**

by

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Abstract

The objective of this article is to re-visit the “adequacy of speculation” debate in agricultural futures markets. The Commodity Futures Trading Commission makes available the positions held by index funds and other large traders in their *Commitment of Traders* reports. The results suggest that index fund positions have been a relatively stable percent of total open interest from 2006-2008.

Traditional speculative measures do not show any material changes or shifts over the sample period. In most markets, the increase in long speculative positions was equaled or surpassed by an increase in short hedging. So, even after adjusting speculative indices for index fund positions, values are within the historical ranges reported in prior research. One implication is that long-only index funds may be beneficial in markets traditionally dominated by short hedging. Attempts to curb speculation through regulatory means should be weighed carefully against the potential benefits provided by this class of speculators.

Key Words: Commitment’s of Traders, index funds, commodity futures markets

The Adequacy of Speculation in Agricultural Futures Markets: Too Much of a Good Thing?

Introduction

In a series of classic papers, Working (1953, 1954, 1960, and 1962) argued that agricultural futures markets are primarily hedging markets and that speculation tends to follow hedging volume.

However, the nature and structure of futures markets has changed dramatically since the pioneering research of Working. The days of the dentist-speculator from Dubuque dabbling in the soybean futures market are long gone. Fueled by academic evidence showing that commodity futures portfolios can generate returns comparable to equities (e.g., Gorton and Rouwenhorst, 2006), the investment industry has developed products that allow individuals and institutions to “invest” in commodities through over-the-counter swaps, exchange-traded funds (ETFs), and exchange-traded notes (ETNs) that are linked to popular commodity indices, such as the Goldman Sachs Commodity Index (Acworth, 2005; Engelke and Yuen, 2008). Domanski and Heath (2007) term this the “financialisation” of commodity markets.

The rapid rise of this new class of speculators has led many to argue that today’s speculative trade in agricultural futures markets is the proverbial tail wagging the dog. In other words, speculation is viewed as driving the increase in overall market participation, a reversal of the traditional view that speculation follows hedging volume. Some also claim that these new speculators, especially long-only commodity index funds, create “price distortions” and potentially disrupt traditional cash-futures convergence patterns (Morrison, 2006; Henriques, 2008).

Several previous studies have investigated the role of speculation in agricultural futures markets. The conventional method of monitoring speculative positions in futures markets is

through the Commodity Futures Trading Commission's (CFTC) *Commitments of Traders (COT)* reports. Based on this data, Working (1960) developed a speculative index to measure the adequacy of speculative positions to “balance” the hedging positions held by commercial traders. The index reflects Working's view that the level of speculation is meaningful only when it is considered relative to the level of hedging in the market. Working (1960), Nathan Associates (1967), Labys and Granger (1970), Peck (1980, 1981), and Leuthold (1983) use the speculative index to examine whether speculative activity in grain and livestock futures markets is adequate. Generally, these academic studies concluded that speculation in agricultural futures markets is not excessive. For example, Peck (1980) found that “...wheat, corn, and soybean markets are characterized by very low relative levels of speculation” (p. 1040) and Leuthold (1983) found no “...evidence to indicate that the levels of speculation in livestock have led to increased price variability as often alleged in the popular press” (p. 133). It is interesting to note that a common concern expressed in these studies was the *inadequacy* of speculation on agricultural futures markets relative to hedging pressure.

Given the allegations about the size and impact of speculators in agricultural futures markets that have once again arisen within industry (Sjerven, 2008), government (CHSGA, 2008), and the academy (AFPC, 2008), additional research efforts are needed to better understand the market participation of speculators in general and long-only index funds in particular. The objective of this article is to re-visit the “adequacy of speculation” debate in agricultural futures markets, bringing new data to the task. Specifically, *COT* data—including positions held by long-only index funds as reported in the *Commodity Index Trader (CIT)* report—will be closely examined to better characterize the nature of speculation in grain and livestock futures markets.

Data

Traditional COT Report

The traditional *COT* 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.¹ Two versions of the report are released. The *Futures-Only Commitments of Traders* report includes futures market open interest only. The *Futures-and-Options-Combined Commitments of Traders* report aggregates futures market open interest and "delta-weighted" options market open interest. Open interest for a given market is aggregated across all contract expiration months in both versions of the report.

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:

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

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.

A frequent complaint about the traditional *COT* data is that the trader designations may be somewhat inaccurate (e.g., Peck, 1982; Ederington and Lee, 2002). For speculators, there may be

an incentive to self-classify their activity as commercial hedging to circumvent speculative position limits. In contrast, there is little incentive for traders to desire the non-commercial designation. So, it is often thought that the non-commercial category is a relatively pure subset of reporting speculators (Sanders, Boris, and Manfredo, 2004). The available evidence about the composition of non-reporting traders is dated (Working, 1960; Larson, 1961; Rutledge, 1977-78; Peck, 1982), so little is known about this group other than their position size is less than reporting levels. The data set is further limited because it is purely a classification system and provides no insight as to the motives or complex issues that underlie trading decisions (see Williams, 2001).

While there may be some incentive for reporting traders to desire the commercial designation, the CFTC implements a fairly rigorous process—including statements of cash positions in the underlying commodity—to ensure that commercial traders have an underlying risk associated with their futures positions. However, in recent years industry participants began to suspect that these data were “contaminated” because the underlying risk for many reporting commercials were not positions in the actual physical commodity (CFTC, 2006a,b). Rather, the reporting commercials were banks and other swap dealers hedging risk associated with over-the-counter (OTC) derivative positions.

For example, a commercial bank may take the opposite side of a long commodity swap position desired by a customer (Hull, 2000, p. 121). The commercial bank, not wanting the market risk, will then buy commodity futures contracts to mitigate their market exposure associated with the swap position. Technically, the bank’s position is a *bona fide* hedge against an underlying risk in the swap market. Yet, the bank clearly is not a traditional commercial hedger who deals with the underlying physical commodity; rather, the bank has paper or swap risk that may or may not emanate from the physical market. Indeed, the third party or bank customer who initiated the

position may be hedging or speculating; their motives are not necessarily known even to the swap dealer. However, the OTC swap positions that can be easily identified are those “...seeking exposure to a broad index of commodity prices as an asset class in an unleveraged and passively-managed manner” (CFTC, 2008a). In this instance, the bank customer is essentially long a commodity index such as the Goldman Sachs Commodity Index (GSCI) via a swap with the bank. The bank then mitigates their long GSCI exposure by hedging each commodity component (e.g., crude oil, corn, and live cattle) in the respective individual futures markets. Because the banks and swap dealers can easily identify swaps associated with commodity indices, it allows the CFTC to further segregate the reporting trader categories to include “index traders.”

Commodity Index Traders (CIT) Report

Starting in 2007—in response to complaints by traditional traders about the rapid increase in long-only index money flowing into the markets—the CFTC released supplemental reports which break out the positions of index traders for 12 agricultural markets. According to the CFTC, the index trader positions reflect both pension funds that would have previously been classified as non-commercials as well as swap dealers who would have previously been classified as commercials hedging OTC transactions involving commodity indices.

The CFTC readily admits that this classification procedure has flaws and that “...some traders assigned to the Index Traders category are engaged in other futures activity that could not be disaggregated....Likewise, the Index Traders category will not include some traders who are engaged in index trading, but for whom it does not represent a substantial part of their overall trading activity” (CFTC, 2008a). Regardless, the data are an improvement over the more heavily aggregated traditional *COT* classifications, and they should provide some new insights as to trader activity.

Summary Statistics and Trends

In this section summary statistics and trends are presented for various measures of market participation and activity. Data for the traditional *COT* trader positions are available for each week from March 21, 1995 through April 15, 2008 (683 observations). *CIT* data are only available for the period covering January 3, 2006 through April 15, 2008 (120 observations). Both reports reflect combined futures and options positions, where options are adjusted to the delta-equivalent futures position. The reports show traders' holdings as of Tuesday's market close. Wherever possible, the entire data set from 1995 forward is used. However, in some instances, the focus is on the period for which the *CIT* data are available—January 2006 through April 2008. Markets included in the analysis are as follows: corn, soybeans, soybean oil, CBOT wheat, KCBOT wheat, cotton, live cattle, feeder cattle, and lean hogs.²

Changes in Market Activity

Agricultural futures markets experienced rapid growth starting in late 2004. For example, open interest for CBOT wheat futures increased 275% from June 2004 to June 2006 (see discussion in Sanders, Irwin, Merrin, 2008). The increase in open interest may be attributed to easier market access and lower trading costs associated with electronic trading, an inflationary environment for many commodity markets, and, potentially, an increase in the use of commodity futures as an investment tool and inflation hedge. The motives that drive the level of trading activity are varied and complex and it is difficult to attribute activity in commodity futures to any single element (Williams, 2001).

Using the data from the traditional *COT* report, the positions of the trader groups—as measured by their percent of total open interest—are examined for the 1995-2005 and 2006-2008 periods. As shown in table 1, uniformly across all markets, the relative size of non-reporting traders

has declined. For example, non-reporting traders in CBOT wheat comprised, on average, 22% of the open interest from 1995-2005, but only 10% of the open interest from 2006-2008. On the flipside, non-commercials increased their share of open interest in every market, and the commercials' share of the open interest increased in all but three markets (KCBOT wheat, soybeans, and cotton).

Index Trader Activity Based on CIT Data

The sample period from January 2006 through April 2008 is available for analyzing the *CIT* data. The *CIT* data are first compared to the original *COT* classifications to determine from which traditional *COT* category the index positions are extracted. As expected, index trader positions are primarily aggregated within the commercial long positions. Across markets, roughly 85% of the index trader positions were previously contained in the long commercial category of the traditional *COT* reports. The other 15% is primarily from the long non-commercial category. This suggests that the majority of long-only commodity index positions are initially established in the OTC markets, then the underlying position is transmitted to the futures market by the swap dealers (including both commercial and investment banks) hedging OTC exposure.

A detailed view of position size as a percent of total open interest is provided in table 2, panel A. Over the sample period, index traders do make up a fairly large portion of certain markets. In particular, index traders are over 20% of the open interest in live cattle, lean hogs and CBOT wheat. In all other markets, index trader positions tend to be between 10% and 15%. While this is not an insignificant share of the open interest, in no market is the index share larger than either the non-commercial or commercial categories. Rather, the index share of open interest tends to be closer to that of the non-reporting traders.

Importantly, the data show that the percent of total open interest attributable to index traders has been relatively stable over the sample period. For instance, wheat index traders' share of the market has fluctuated in a fairly narrow range between 17% and 26%. Similarly, index funds percent of open interest in corn and soybeans have been stable in the 11%-13% range for most of 2007-2008 and have not exceeded 15% since mid-2006.

An additional criticism of index funds is their disproportionate presence on the long side of the market, stemming from the fact they are "long-only." To examine this idea more closely, we first examine the percent net long position held by each trader category in the *CIT* data. The percent net long position is simply defined by trader category as the net position (long positions minus the short positions) divided by the total positions held (Sanders, Manfredo, and Boris, 2004).

The percent net long for each trader group is calculated over the sample period and presented in table 2 (panel B). As expected, index traders are 90% to 98% net long in each market. Likewise, the commercial category is 20% to 65% net short reflecting the traditional short hedging of producers, first handlers, and warehouses. Interestingly, for two of the markets with high levels of index participation—CBOT wheat and lean hogs—index funds are the only category that held a net long position over the sample period.

To more closely examine each side of the market, the relative size of the long and short side of the markets is presented in panels C and D (table 2) for each trader category. Since index funds are almost exclusively long, their percent of the market roughly doubles when only considering the long side of the market as opposed to total positions (long + short positions). For example, index funds are 21% of the total positions in CBOT wheat, but they are 40% of the long positions in CBOT wheat. Across markets, index funds range from 20% (KCBOT wheat) to 44% (lean hogs) of the long positions in the market. In both CBOT wheat and lean hogs, index funds held a larger

portion of long positions than any other trader group. While this attests to the sheer size of their market participation, it alone does not necessarily imply that the positions are excessive.

Traders and Position Size Based on CIT Data

The *CIT* data (as well as the *COT* data) include information on the number of reporting traders in each category. From this, we can determine the number of reporting index traders in each market as well as the average trader's position size relative to the other trader categories.

Table 3, panel A shows the average number of reporting traders over the sample period from January, 2006 to April, 2008. It is apparent that there are relatively few reporting index traders. The corn, CBOT wheat, and soybean futures markets have 24 long index traders with reportable positions, while the KCBOT wheat futures market has 15 reporting long index traders. There are a few index traders with short positions, but these most likely reflect some of the positions held by long index traders that the CFTC could not disaggregate. Across most of the markets, the number of reporting commercial and non-commercial traders is of similar magnitude.

The average reporting trader's position size by category over the sample period is displayed in panel B (table 3). The average position size is simply calculated as the positions held by that category divided by the number of reporting traders in that category. Because a trader may appear in more than one category, the calculated average position size is likely lower than the actual. Still, index trader positions are relatively large. For example, in the corn futures market, the average long index trader has a position of 16,805, contracts which is more than 10 times the size of the average long position held by either commercials or non-commercials. In fact, index traders in CBOT wheat have an average position size larger than the CFTC position limit (6,500), which provides some indirect evidence that speculators or investors are able to use OTC instruments and

commercial hedge exemptions to surpass speculative position limits. However, since index funds are long-only and not known for rapid-fire trading, it is not clear that this presents a problem.

Speculative Index

As noted in the introduction, Working (1953, 1954, 1960, and 1962) argued that futures markets are primarily hedging markets and that speculation tends to follow hedging volume. Therefore, speculation can only be considered ‘excessive’ or ‘inadequate’ relative to the level of hedging activity in the market. Peck (1979-80, p. 339) provides a succinct re-statement of the arguments found in Working’s papers,

“Taken together, these analyses reaffirm the fundamental importance of hedging to futures markets and dependence of total activity upon hedging needs. The results also lend support to the Working definition of an appropriate measure of hedger demands upon a market. Net hedging is not the most useful view of the demands commercial users make on a market. Speculation is needed to offset both long hedging and short hedging. Only coincidentally are long and short hedgers sufficiently alike in date and amount to be offsetting, although increased balance increases the probability of such correspondence and differences in seasonal needs between long and short hedgers decreases this probability. The appropriate measure of minimum required speculation must at least begin with total hedging demand.”

Working (1960) developed a mathematical index of speculation based on this view of the functioning of futures markets. His speculative index has been used in several studies to examine grain and livestock futures markets for adequate speculative activity (Working, 1960; Nathan Associates, 1967; Labys and Granger, 1970; Peck 1980, 1981; Leuthold 1983). Nearly all prior research is concerned about a lack of sufficient speculative activity to support hedging demands in the marketplace. While this notion seems at odds with the current market environment, Working’s T still provides an objective measure of speculative activity.

Working’s speculative “T” index is easily calculated using the traditional *COT* trader categories:

$$(2a) \quad T = 1 + SS / (HL + HS) \quad \text{if } (HS \geq HL)$$

or

$$(2b) \quad T = 1 + SL / (HL + HS) \quad \text{if } (HL > HS)$$

where open interest held by speculators (non-commercials) and hedgers (commercials) is denoted as follows,

$$\begin{array}{ll} SS = \text{Speculation, Short} & SL = \text{Speculation, Long} \\ HL = \text{Hedging, Long} & HS = \text{Hedging, Short} \end{array}$$

Peck (1980, p. 1037) notes that the speculative index, "...reflects the extent by which the level of speculation exceeds the minimum necessary to absorb long and short hedging, recognizing that long and short hedging positions could not always be expected to offset each other even in markets where these positions were of comparable magnitudes." Working (1960, p. 197) is careful to point out that what may be "technically an 'excess' of speculation is economically necessary" for a well-functioning market.

As a highly simplified example of the calculation and interpretation of Working's speculative T index, consider the intuitive case where $HL=0$; then, $T= SL/HS = 1+ (SS/HS)$.³ It follows, if long speculation (SL) just equals short hedging (HS), then T equals its minimum value of 1.00, where the level of speculation is just sufficient to off-set hedging needs. Now, consider if $HL=0$, $HS=100$, $SL=110$, and $SS=10$, then T equals 1.10 or there is 10% speculation in excess of that necessary to meet short hedging needs.

As noted by several authors (e.g., Leuthold, 1983), Working's T suffers from the problem of how to classify the non-reporting traders. Non-reporting traders can be classified as speculators, creating an upper bound on the speculative index. Or, they can be classified as hedgers, creating a lower bound on the index. With either of these approaches however, the index will be impacted through time if the proportion of non-reporting traders in a market changes. As shown in table 1,

diminishing levels of non-reporting trader positions is clearly a problem over our sample period. So, we follow the advice of Rutledge (1977-78) and initially allocate the non-reporting traders' positions to the commercial, non-commercial, and index trader categories in the same proportion as that which is observed for reporting traders.

The averages of the weekly values for Working's T are presented in table 4 for a number of sub-periods using the traditional *COT* data. The speculative indices reported do not seem extraordinarily high in any sub-period from 1995 through 2008 using the traditional *COT* data. Corn futures average 1.08 which suggests that there is only 8% more speculation than the minimum needed to offset short and long hedging needs. The highest speculative index within the grains is CBOT wheat at 1.15, and for livestock it is 1.38 recorded for feeder cattle. Average index values across the nine markets range from 1.12 to 1.14 for the different sub-periods, implying that speculation is barely large enough to meet total hedging demands. In addition, there is no discernable trend in the indexes across the different sub-periods.

In the last column of table 4, Working's T is re-calculated for the 2006-2008 sample period by re-classifying index traders as speculators using CIT data. Because commercial hedgers are predominantly net short in each market, they require long speculators to "carry" their hedging. So, by re-categorizing the long-only index funds into the non-commercial category, Working's T essentially is shifted upward in each market. Even with this adjustment, the average speculative index for the nine markets only increases from 1.14 to 1.27. The largest increase, from 1.38 to 1.67, occurs in feeder cattle.

Further perspective is provided by comparing Working's speculative index in recent periods with those reported by other researchers for earlier periods. Table 5 presents the historical estimates from four previous studies (Working, 1960; Labys and Granger, 1970; Peck, 1980; Leuthold, 1983)

along with the upper and lower bounds for the *CIT* adjusted data from 2006-2008.⁴ The upper (lower) range results from assuming that non-reporting traders are speculators (hedgers).⁵ Non-reporting traders are a proportionately smaller part of the market than they have been historically (see table 1), resulting in a smaller range of “T” values than recorded in previous work. Therefore, the calculation of Working’s T in recent years is not particularly sensitive to the speculator or hedger classification imposed on non-reporting traders. The exception is feeder cattle, where non-reporting traders still represent over 30% of the total open interest.

Comparing the historical estimates in table 5 with our results using the traditional *COT* data in table 4, one is struck by the relatively low levels of speculation throughout 1995-2008. The average values for the speculative indices range from 1.12 to 1.14 across the different sub-periods, about equal to or *smaller* than the averages from the historical estimates spanning the late 1940s to the late 1970s, with the exception of Leuthold’s upper bound estimates in livestock futures markets. As noted earlier, a common concern expressed in previous studies was that speculation on futures markets was *not* large enough to accommodate hedging pressure. The results for 1995-2008 are wholly consistent with this historical concern regarding agricultural futures markets. Peck’s (1980) conclusions are especially relevant in this regard. For example, she was concerned about the *inadequacy* of speculation in CBOT wheat from 1972-1977 after finding a speculative index ranging from 1.094 to 1.323. Peck viewed this level of speculation as inadequate when compared to an index of 1.355 to 1.891 from 1947-1971, a period that “would hardly be characterized as speculative” (p. 1041). Likewise, Peck reports KCBOT wheat had a speculative index ranging from 1.009 to 1.045 which was “manifestly inadequate” (p. 1043). Across the sub-periods over 1995-2008, CBOT wheat had an average speculative index of 1.14 and KCBOT wheat averaged 1.07.

The final column of table 5 shows upper and lower bounds for Working's T over 2006-2008 using the *CIT* adjusted data. Again, there is little evidence that current index levels are deviating from historical norms, even after accounting for index trader positions. For instance, the range reported for live cattle futures (1.13-1.60) is generally lower than those reported by Peck (1.568-2.173) and Leuthold (1.05-2.34). Interestingly, the values reported for cotton (1.27) and soybean oil (1.14) by Working for the 1954-1958 period are generally at the upper end of the recent range reported for 2006-2008. There is no pervasive evidence that current speculative levels, even after accounting for index trader positions, are in excess of those recorded historically for agricultural futures markets.

It is somewhat surprising and counter-intuitive that Working's T has remained at or below historical levels, given the large increase in both non-commercial positions and long-only index participation in the markets. As demonstrated by Working (1960) and carefully explained by Peck (1981), the subtleties of Working's speculative index require close study and the index can be impacted by shifts in any trader category. Consider a base case of equation (2a) where $HL=0$, $HS=100$, $SL=150$, and $SS=50$, then $T = 1 + (50/100) = 1.50$, indicating that there is 50% more speculation than technically necessary to satisfy commercial hedging needs.

Now, consider two alternative cases. First, assume that there is a large increase in long speculation that is accompanied by an equal increase in short hedging positions, such that $HL = 0$, $HS = 200$, $SL = 250$, and $SS = 50$, then $T = 1 + (50/200) = 1.25$. That is, the speculative index actually declines because all of the increase in speculation was met by hedging, and the "excess" speculative positions are now actually a smaller proportion of the total hedging demand. In the second alternative case, assume that the increase in long speculation is met by other short speculators, such that $HL=0$, $HS = 100$, $SL = 250$, and $SS=150$, then $T = 1 + (150/100) = 2.50$.

Here, the “T” index increases quite dramatically because speculators traded with speculators and there is no commercial hedging need for this additional speculation. While there are many other scenarios under which Working’s T can increase or decrease, these two cases are illustrative of what would commonly be considered necessary and excessive speculation, respectively.

In table 6, the hedging and speculative positions used to calculate Working’s T are presented for the first three months of 2006 and 2008 using the CIT adjusted data. With a few exceptions, the data in table 6 suggest that the first alternative case above is fairly descriptive of the changes experienced in the commodity markets over this interval. In the corn market, there was a large increase in long speculative (SL) positions (+233,768), however, this is not enough to absorb the 525,471 contract increase in short hedging; thus, Working’s T declines. A similar story holds for soybeans, soybean oil, and cotton. Feeder cattle provide an excellent example of the second alternative case provided above. In this market, HS and HL decline by very similar amounts, while there are also parallel increases in SL and SS positions—that is, speculators are trading with each other. As a result, Working’s T increases fairly dramatically from 1.374 to 1.917. Live cattle show a similar increase in speculative trade, but the increase in Working’s T (0.200) is of a smaller magnitude than seen in feeder cattle (0.543). In the other markets, there is some combination of these two impacts that result in fairly minor shifts in Working’s T index.

Given the relatively small shifts in Working’s T documented in this research, it is apparent that the much publicized increase in long-only speculative positions is largely accompanied by a comparable increase in short hedging. While the increase in long-only speculation has received the most publicity, the increase in the size of short hedging positions is equally interesting. For example, the average short hedging position during the first quarter of 2008 in corn is slightly less than 6 billion bushels and in soybeans a little over 2 billion bushels. Of course, what is not clear is

the validity of Working's classical paradigm: speculation follows hedging. Did long speculation increase to meet short hedging needs as assumed by Working? Or, is the tail wagging the dog?

Unlike traditional speculators in Working's day—who were regarded as scalpers, day traders, or position traders and who were responsive to hedging needs in the market—long-only index funds appear to be more mechanical and less responsive to hedging demands. While this does not alter the calculation of the speculative index, it does bring into question Working's maintained assumption about the nature of speculation in today's markets. It is also possible that the commercial category still contains “contamination” both from hedgers who are really speculating and swap dealers who are hedging OTC swaps not used for commodity index investments. The degree of this contamination is unknown plus it is unclear whether it would lead to over- or under-estimation of long or short positions. So, the potential directional impact on Working's T is difficult to discern.

In sum, agricultural futures markets do not have a historically high level of speculative activity based on Working's speculative T index. Working and others strongly maintained that futures markets were hedging markets, where speculators enter the market in response to hedging pressures. For example, Peck (1979-80, p. 329) unequivocally states, “Taken together, the historical evidence is clear: futures markets reflect commercial needs.” The rise of long-only index funds in agricultural futures markets opens this basic tenant to debate and may bring into question the appropriateness of traditional measures of speculative market balance.

Summary and Conclusions

The “adequacy of speculation” debate in agricultural futures markets is revisited, bringing new data to the task. Specifically, this research examines the size and activity of trader categories in the

traditional Commodity Futures Trading Commission (CFTC) *Commitments of Traders (COT)* reports and the *Commodity Index Trader (CIT)* reports.

The data are first closely examined for potential shifts or changes in trader activity. In regards to the relative size of the index funds, they usually comprise 10% to 20% of the total open positions within most markets. However, because they are almost exclusively long, they tend to make up 20% to 40% of the long-side of the market. In some markets (i.e., lean hogs, CBOT wheat), index funds are the predominant long position holder. The agricultural markets averaged fewer than 25 reporting long index traders over the 2006-2008 sample period. However, the long index traders have average positions that are more than 10 times the size of the typical non-commercial trader.

Several notable trends or shifts in market participation are observed in the data. First, agricultural commodity futures markets have experienced a rapid increase in open interest that started in late 2004 and continues into 2008 for many markets. For most markets, the index funds' percent of open interest peaked in 2006 and has since stabilized. Second, traditional speculative measures do not show any material changes or shifts over the sample period. In most markets, the increase in long speculative positions was equaled or surpassed by an increase in short hedging. So, even after adjusting speculative indices for index fund positions, values are within the historical ranges reported in prior research.

While the analysis in this report does not test for directly for price impacts, it does provide some pertinent evidence in this regard. First, the stabilization of the index funds' percent of total open interest may suggest that other traders have adjusted their strategies to better cope with this relatively new market participant. Second, Working's speculative index suggests that long-only index funds may in fact be beneficial in markets dominated by short hedging pressure. That is, they

improve the adequacy of speculation by helping the market to “carry” unbalanced short hedging. The relatively normal level of speculation over the sample period raises some doubt as to whether index funds are behind recent commodity price increases.

Much like in the last major episode of structural change in commodity markets in 1972-1975, some are blaming speculators for the recent increase in commodity prices. Proposals are once again surfacing to curb “harmful” speculation in futures markets. Such policy decisions aimed at curbing speculation may well be counter-productive in terms of price levels or market volatility. In particular, these policy initiatives could severely compromise the ability of futures markets to accommodate hedgers and facilitate the transfer of risk.

There is certainly a need for additional research on several fronts. Early research on futures markets stressed that an understanding of the size and motivation of various market participants was a crucial first step in understanding other, more advanced, market performance issues. For instance, the concept of short hedgers paying a risk premium to speculators may need to be re-visited. The activity of all trader groups, especially index traders, should be investigated using more disaggregated data (e.g., daily by contract maturity). Patterns in index trading—such as the rolling of positions from one contract maturity to another—may have impacts on market liquidity and short-term volatility. The price impact of trader groups also needs to be carefully examined as do the incentives for various market participants. Finally, there is a need to re-examine the fundamental question of whether agricultural futures markets are still hedging markets, as defined by Working.

End Notes

¹ See Hieronymus (1971), McDonald and Freund (1983), and Fenton and Martinaitas (2005) for extensive discussions of the history and evolution of the *COT* Report. CFTC (2008b) contains a detailed explanation of current *COT* reports.

² CBOT denotes Chicago Board of Trade (now CME Group, Inc.), KCBOT denotes Kansas City Board of Trade, and MGEX denotes Minneapolis Grain Exchange.

³ Note that $SS + HS = SL + HL$ must hold in a zero sum futures market if all positions are categorized as speculative or hedging. If $HL = 0$, the identity reduces to $SS + HS = SL$. Dividing through by HS and re-arranging yields $T = SL/HS = 1 + (SS/HS)$.

⁴ The 1967 Nathan Associates study reported speculative indexes in graphical form rather than tabular form, and hence, results from this study are not included in Table 10. The data sample for Peck's 1981 study is a sub-sample of the data from her 1980 study.

⁵ Note that *CIT* adjusted speculative indexes for 2006-2008 in table 5 allocate non-reporting traders' positions to the commercial, non-commercial, and index trader categories in the same proportion as that which is observed for reporting traders. Consequently, the estimates in table 5 fall between the reported ranges in table 6.

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Table 1. Percent of open interest held by trader category, *COT* reports, 1995-2008

Market	Non-Commercial	1995-'05		Non-Reporting	2006-'08		Non-Reporting
		Commercial	Commercial		Commercial	Commercial	
Corn	28%	47%	25%	39%	46%	15%	
Soybeans	33%	42%	25%	40%	44%	16%	
Soybean Oil	31%	51%	18%	34%	58%	8%	
CBOT Wheat	35%	42%	22%	42%	48%	10%	
KCBOT Wheat	20%	55%	25%	32%	48%	20%	
Cotton	34%	53%	13%	41%	52%	7%	
Live Cattle	30%	41%	29%	40%	44%	16%	
Feeder Cattle	32%	24%	43%	42%	27%	32%	
Lean Hogs	34%	36%	30%	40%	45%	15%	

Table 2. Positions held by COT groups, 2006-2008**Panel A: Percent of Total Open Interest**

Market	Non-Commercial	Commercial	Index	Non-Reporting
Corn	37%	36%	12%	15%
Soybeans	38%	33%	13%	16%
Soybean Oil	33%	46%	12%	8%
CBOT Wheat	39%	29%	21%	10%
KCBOT Wheat	30%	40%	10%	20%
Cotton	40%	37%	16%	7%
Live Cattle	37%	28%	20%	16%
Feeder Cattle	37%	19%	12%	32%
Lean Hogs	37%	26%	22%	15%

Panel B: Percent net long

Market	Non-Commercial	Commercial	Index	Non-Reporting
Corn	48%	-37%	94%	-19%
Soybeans	28%	-35%	94%	-18%
Soybean Oil	46%	-42%	95%	22%
CBOT Wheat	-6%	-54%	90%	-25%
KCBOT Wheat	66%	-47%	98%	-11%
Cotton	15%	-47%	96%	28%
Live Cattle	21%	-57%	97%	-39%
Feeder Cattle	33%	-20%	98%	-45%
Lean Hogs	-7%	-65%	98%	-24%

Panel C: Percent of long positions

Market	Non-Commercial	Commercial	Index	Non-Reporting
Corn	42%	23%	23%	12%
Soybeans	41%	21%	25%	13%
Soybean Oil	39%	27%	24%	10%
CBOT Wheat	39%	14%	40%	8%
KCBOT Wheat	41%	21%	20%	18%
Cotton	40%	20%	31%	9%
Live Cattle	40%	12%	39%	10%
Feeder Cattle	44%	16%	23%	17%
Lean Hogs	36%	9%	44%	12%

Panel D: Percent of short positions

Market	Non-Commercial	Commercial	Index	Non-Reporting
Corn	33%	49%	1%	18%
Soybeans	36%	45%	1%	19%
Soybean Oil	27%	66%	1%	7%
CBOT Wheat	40%	45%	2%	13%
KCBOT Wheat	19%	58%	0%	22%
Cotton	39%	55%	1%	5%
Live Cattle	34%	44%	0%	22%
Feeder Cattle	31%	23%	0%	46%
Lean Hogs	38%	42%	0%	19%

Table 3. Traders and positions by COT trader category, 2006-2008**Panel A: Average number of traders**

Market	Non-Commercial			Commercial		Index	Index
	Long	Short	Spread	Long	Short	Long	Short
Corn	203	133	234	275	331	24	10
Soybeans	138	111	166	113	152	24	7
Soybean Oil	64	38	55	49	57	16	3
CBOT Wheat	102	118	142	65	101	24	9
KCBOT Wheat	57	24	37	50	72	15	2
Cotton	112	78	87	63	62	21	4
Live Cattle	79	68	87	80	137	23	3
Feeder Cattle	35	29	29	35	51	16	1
Lean Hogs	57	68	80	24	43	21	2

Panel B: Average position size (contracts)

Market	Non-Commercial			Commercial		Index	Index
	Long	Short	Spread	Long	Short	Long	Short
Corn	1,218	644	2,062	1,422	2,542	16,805	1,176
Soybeans	616	398	955	1,081	1,743	6,123	691
Soybean Oil	861	483	1,123	1,647	3,527	4,550	688
CBOT Wheat	573	553	981	1,091	2,297	8,597	1,092
KCBOT Wheat	723	349	549	626	1,223	1,948	180
Cotton	382	393	891	921	2,652	4,104	361
Live Cattle	566	434	722	408	864	4,569	462
Feeder Cattle	267	152	203	153	153	473	62
Lean Hogs	401	394	565	754	1,885	3,853	212

Table 4. Working's speculative index, 1996-2008

Market	<i>COT</i> 1995-'01	<i>COT</i> 2002-'03	<i>COT</i> 2004-'05	<i>COT</i> 2006-'08	<i>CIT</i> Adjusted 2006-'08
Corn	1.06	1.09	1.10	1.07	1.13
Soybeans	1.08	1.08	1.10	1.09	1.21
Soybean Oil	1.07	1.07	1.07	1.06	1.09
CBOT Wheat	1.13	1.15	1.15	1.14	1.31
KCBOT Wheat	1.05	1.05	1.09	1.09	1.14
Cotton	1.05	1.05	1.09	1.10	1.20
Live Cattle	1.12	1.13	1.11	1.15	1.30
Feeder Cattle	1.28	1.31	1.26	1.38	1.67
Lean Hogs	1.23	1.15	1.13	1.16	1.39
Average	1.12	1.12	1.12	1.14	1.27

Table 5. Working's speculative index reported in prior research

Market	Working ^a 1954-1958	Labys & Granger ^b 1950-1965	Peck ^c 1947-1971	Peck ^c 1972-1977	Leuthold ^d 1969-1980	CIT Adjusted ^e 2006-'08
Corn	1.16	1.19	1.263-1.609	1.045-1.204		1.06-1.34
Soybeans	1.28	1.31	1.329-1.946	1.061-1.310		1.10-1.45
Soybean Oil	1.14	1.18				1.07-1.15
CBOT Wheat	1.22	1.19	1.355-1.891	1.094-1.323		1.19-1.49
KCBOT Wheat			1.081-1.264	1.009-1.045		1.05-1.36
Cotton	1.27					1.16-1.27
Live Cattle				1.568-2.173	1.05-2.34	1.13-1.60
Feeder Cattle					1.08-3.80	1.14-2.61
Lean Hogs					1.10-8.69	1.18-1.68
Average	1.21	1.22	1.26-1.68	1.155-1.411	1.08-4.94	1.12-1.55

^aWorking (1960), Table 3, p. 194. Non-reporting traders are allocated to hedging or speculating based on the levels of hedging and speculating in reported positions (see Working's technical appendix 2, p.p. 214-216)

^bLaby's and Ganger (1970), Table 5-6, p. 127. Non-reporting traders are allocated to hedging or speculating based on the levels of hedging and speculating in reported positions following the method of Working (1960).

^cPeck (1980), Table 1, p. 1039 and Table 2, p. 1042. Peck estimates an upper (lower) bound by assuming all non-reporting traders are speculators (hedgers). The date range represents the most inclusive time period over which the index was calculated across the markets.

^dLeuthold (1983), Table VI, p. 131. Leuthold estimates an upper (lower) bound by assuming all non-reporting traders are speculators (hedgers). The date range represents the most inclusive time period over which the index was calculated across the markets.

^eUpper (lower) range results from assuming that non-reporting traders are speculators (hedgers).

Table 6. Speculative and hedging positions for Working's T, first quarter of 2006 and first quarter of 2008

Market		HL	HS	SL	SS	Working's T
Corn						
	2006 ^a	328,362	654,461	558,600	208,043	1.212
	2008	598,790	1,179,932	792,368	182,291	1.102
	Change	270,428	525,471	233,768	-25,752	-0.109
Soybeans						
	2006	126,832	192,218	183,105	107,221	1.336
	2008	175,973	440,793	351,379	74,844	1.121
	Change	49,141	248,575	168,274	-32,377	-0.215
Soybean Oil						
	2006	66,636	124,134	92,515	35,599	1.187
	2008	121,196	228,515	128,546	25,844	1.074
	Change	54,560	104,381	36,032	-9,755	-0.113
CBOT Wheat						
	2006	57,942	213,278	251,926	92,148	1.340
	2008	70,084	240,864	300,880	121,578	1.391
	Change	12,141	27,585	48,954	29,430	0.051
KCBT Wheat						
	2006	43,993	110,601	80,158	13,560	1.088
	2008	46,459	96,556	67,827	15,767	1.110
	Change	2,466	-14,045	-12,330	2,207	0.023
Cotton						
	2006	41,582	108,085	86,777	21,824	1.146
	2008	107,826	296,434	200,773	18,918	1.047
	Change	66,244	188,349	113,995	-2,906	-0.099
Live Cattle						
	2006	54,549	128,951	129,786	45,305	1.247
	2008	34,970	144,549	198,211	80,303	1.447
	Change	-19,579	15,599	68,425	34,998	0.200
Feeder Cattle						
	2006	10,707	17,725	20,769	10,632	1.374
	2008	6,310	13,435	28,284	18,111	1.917
	Change	-4,397	-4,290	7,515	7,479	0.543
Lean Hogs						
	2006	15,949	65,438	93,522	40,036	1.492
	2008	36,825	113,971	149,415	69,055	1.458
	Change	20,876	48,533	55,893	29,019	-0.034

Note: HL = Hedging, Long; HS = Hedging, Short; SL = Speculating, Long; SS = Speculating, Short

^aThe data reflect average positions in the first calendar quarter of 2006 and 2008, respectively.