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# 2009 Agricultural Outlook Forum

## Commodity Funds: Impact on Price Discovery

**Dave Lehman, Director**  
**Commodity Research and Product Development**  
**CME Group**

**February 26, 2009**

# Outline

- 1. Informa Study Results**
- 2. Other Study Results**
- 3. Speculative Position Limits**

# Purpose/Timeline

- In May 2008 the CME Group, Kansas City Board of Trade, Minneapolis Grain Exchange, New York Mercantile Exchange, and the Intercontinental Exchange engaged Informa Economics to conduct a study on how different trader groups affect price discovery, volatility, liquidity, and convergence in the following physical commodity markets:
  - CBOT Corn, Wheat, and Soybeans
  - KCBT and MGEX Wheat
  - NYMEX Crude Oil (WTI) and Natural Gas
  - ICE US Cotton
- CFTC provided aggregate large trader data for commercial hedgers, managed money traders (trend following funds), commodity index traders (passive investors) non-reportable traders. This data is similar to the data published in the CFTC's Commitments of Traders Reports, however, it was provided daily and for all individual contract months for period January 1, 2005 through June 30, 2008.

# Sections

**Part 1: Participation Levels**

**Part 2: Liquidity**

**Part 3: Volatility**

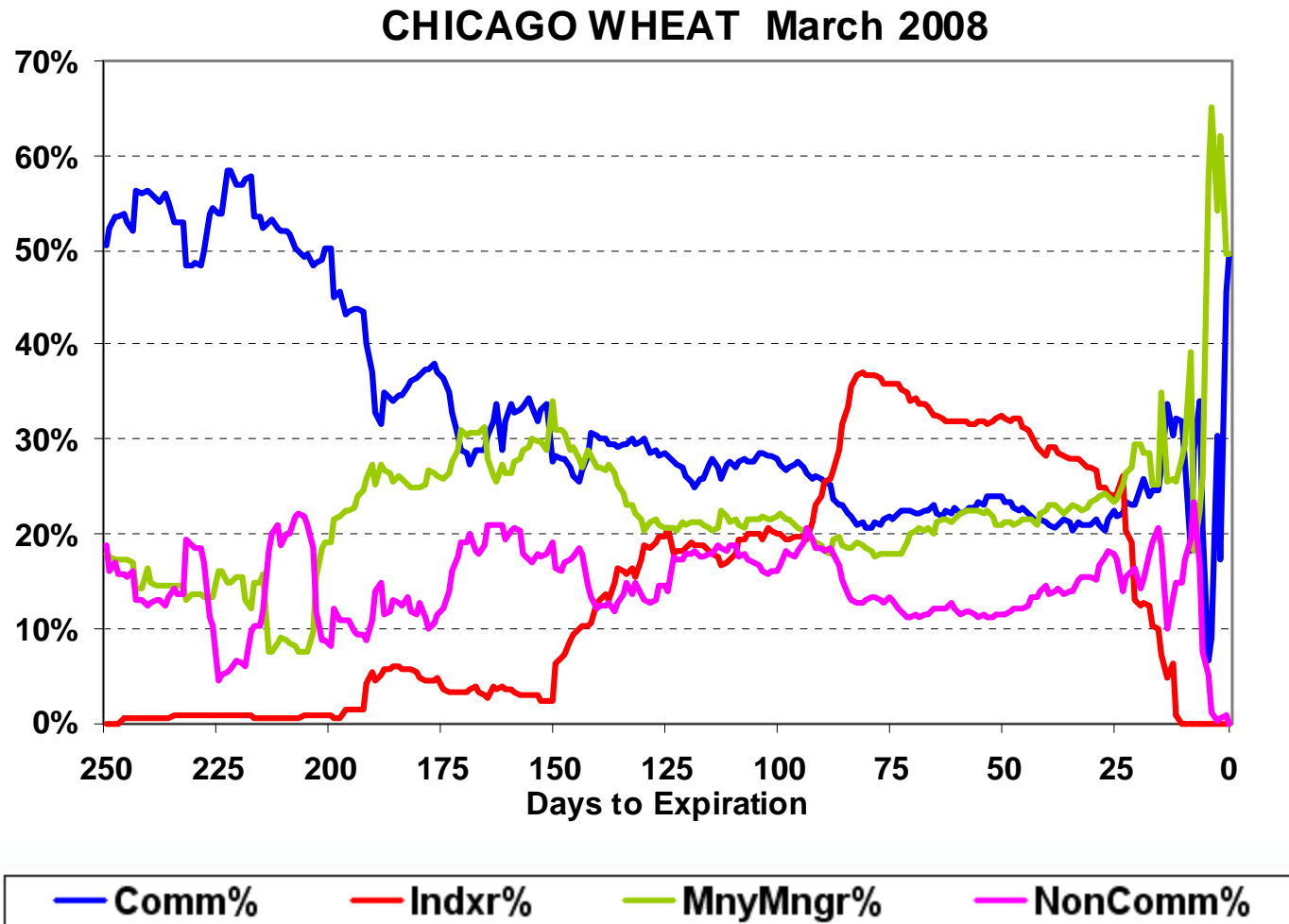
**Part 4: Price Discovery**

**Part 5: Convergence**

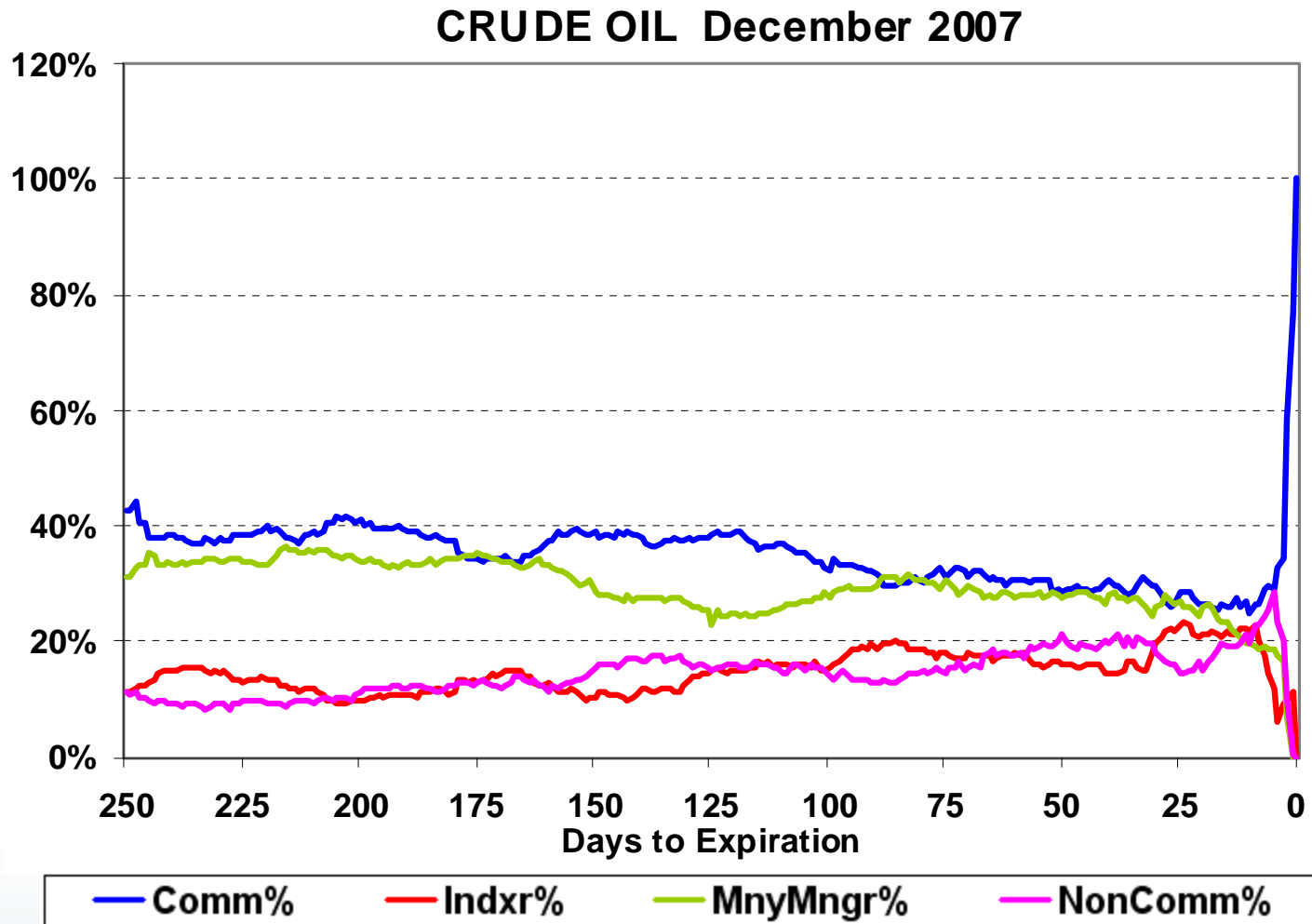
# Part 1: Participation Levels

- **Index traders had the most consistent trading pattern in the markets that were studied. Generally, index traders would enter a position approximately 75 days before expiration of the contract and would exit the position approximately 25 days prior to the contract expiration. This would be consistent with what is known as the “index roll”.**
- **Money manager presence was the most erratic of all trade groups. This is attributed to the groups primary focus of making a profit for the pool of money that is being managed.**
- **Commercial traders usually entered the market early and maintained their positions. This would be consistent with most commercial risk hedging strategies. In addition to this, commercial traders usually maintained the largest positions.**

# Graphical Example



# Graphical Example



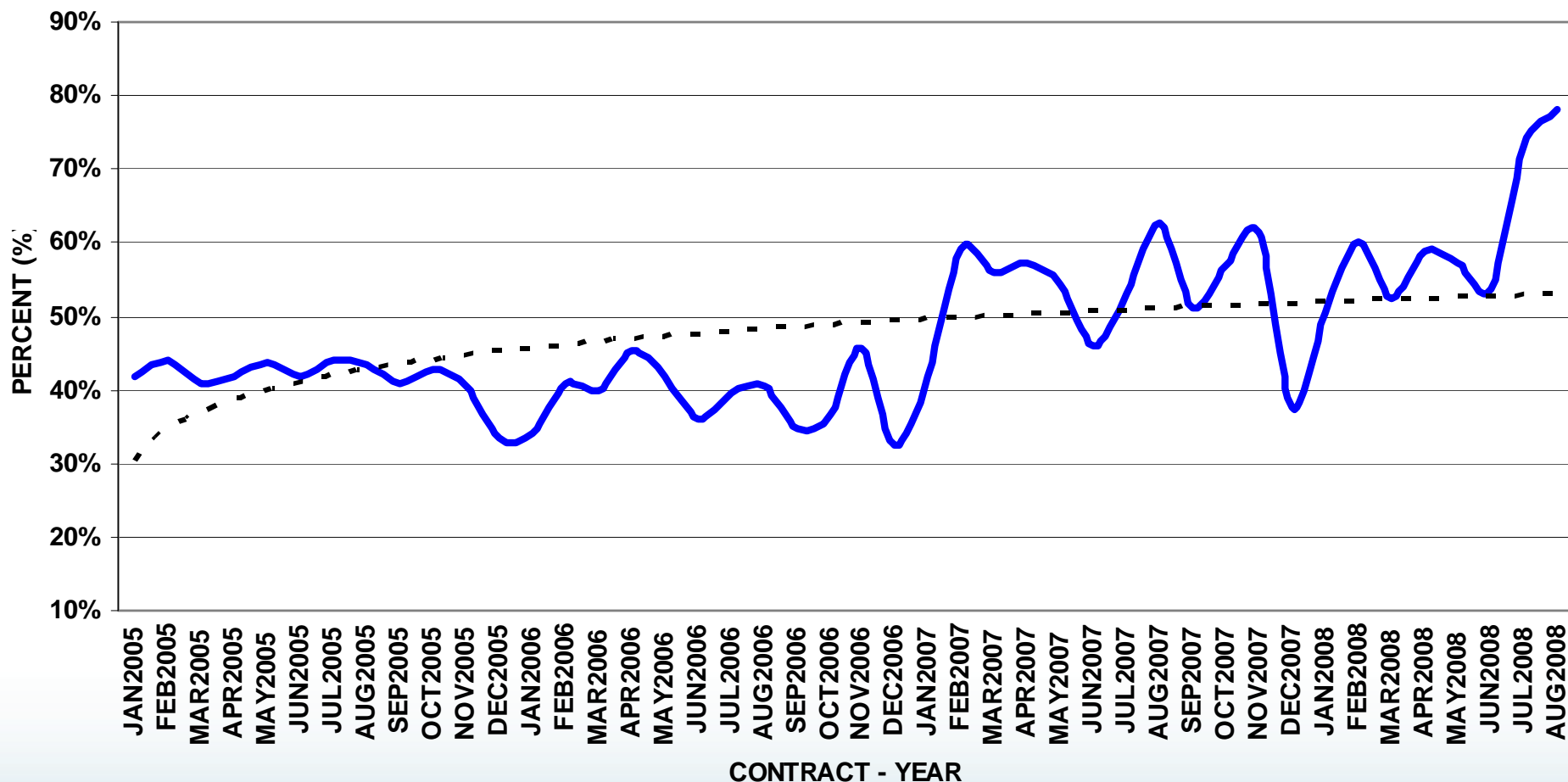


## Part 2: Liquidity

- In this study, since bid/offer spread data was not available, liquidity was measured as the ratio of volume to open interest.
- Liquidity for corn, Chicago wheat, natural gas and crude oil futures all increased during the sample period.
- Liquidity for Kansas City wheat, Minneapolis wheat and cotton futures declined slightly during the sample period.
- There was a weak correlation between index trader participation and liquidity in Kansas City wheat and crude oil.
- However, for most markets there was no link to changes in liquidity and the participation of any trader group.

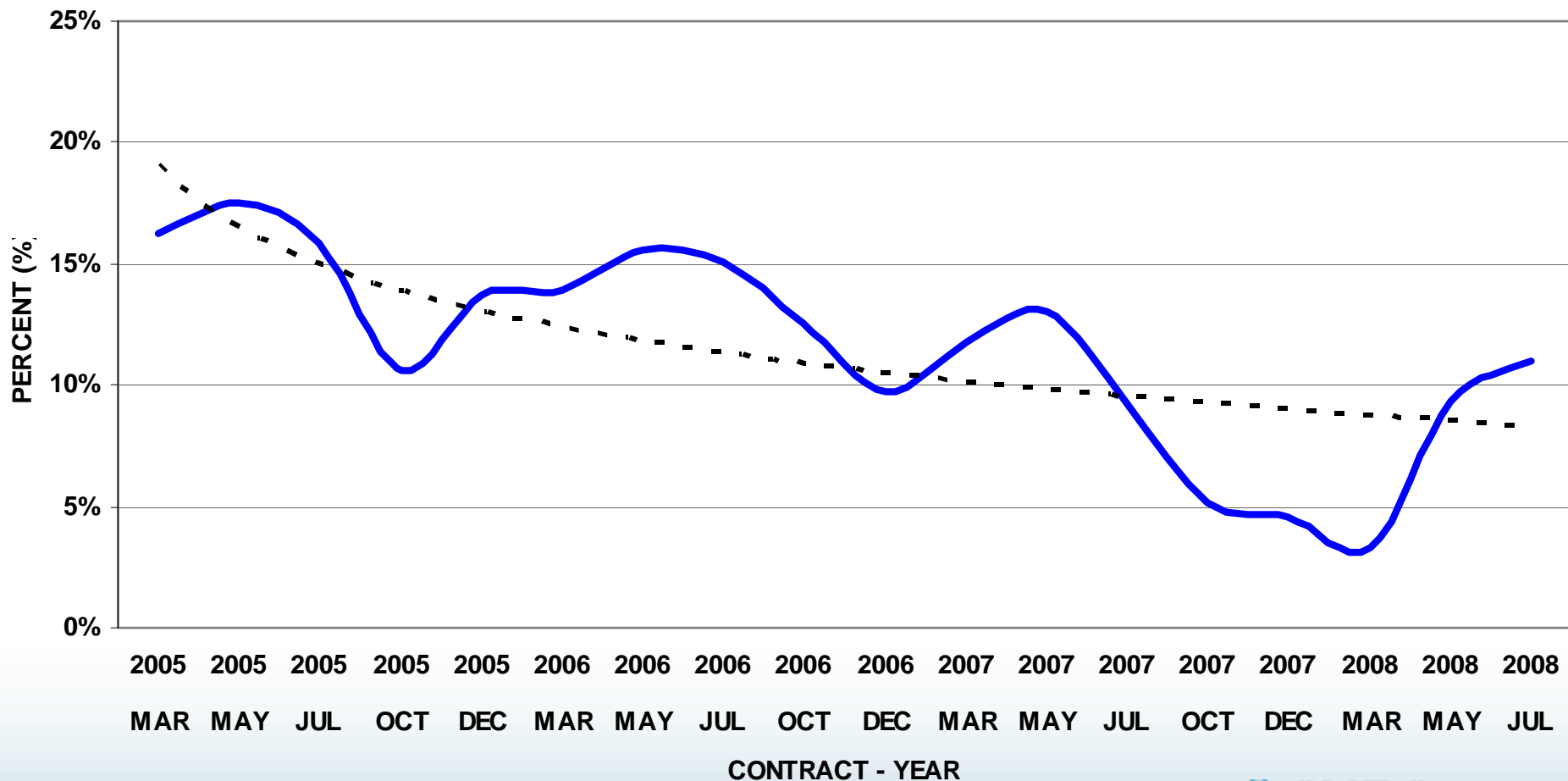
# Graphical Example – Increasing Liquidity Crude Oil

VOLUME / OPEN INTEREST FROM 200 DAYS TO EXPIRATION



# Graphical Example – Declining Liquidity Cotton

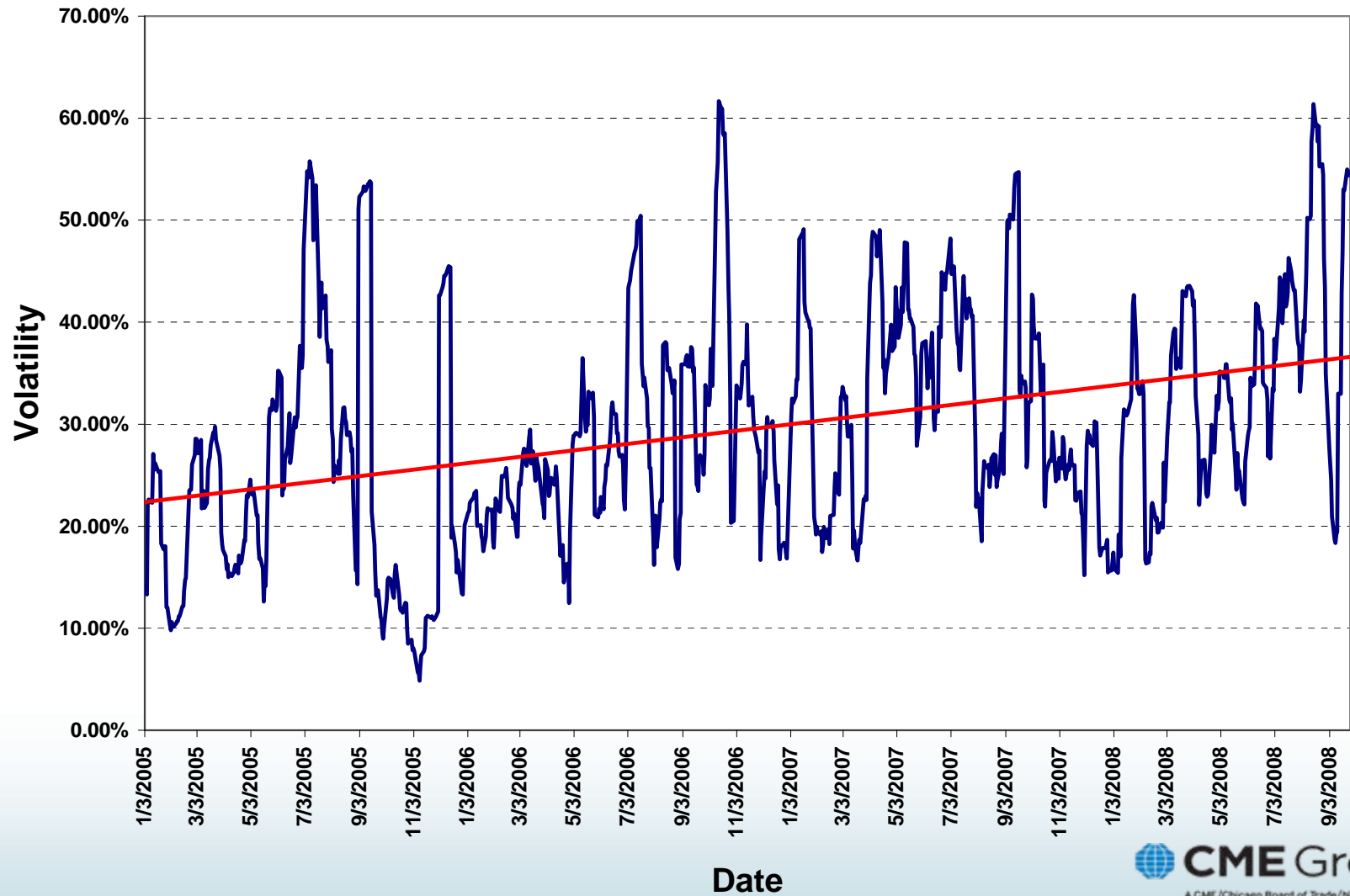
VOLUME / OPEN INTEREST FROM 200 DAYS TO EXPIRATION



## Part 3: Volatility

- There is some positive correlation between index trader and/or money manager participation and increased volatility for corn, wheat and cotton.
- The data wasn't clear on whether or not index trader and/or money manager participation increased volatility in crude oil and natural gas.
- However, there is no substantial evidence that index trader and/or money manager participation caused an increase in volatility.
- If fact, the slight correlation in corn, wheat and cotton could be linked to the long only strategy of index traders and trend following by money managers in a bull market caused by the recent tight supplies and strong world demand.

# Historical Volatility, Corn



## Correlation Matrix, Corn

- Volatility appears positively related to the presence of three of the four large trader groups, but is negatively related to the presence of small traders.
- Index traders and money managers are unique in that their market presence tends to move together.

	Volatility	Commercial Presence	Non-Commercial Presence	Indexer Presence	Money Mgr Presence	Small Trader Presence
Volatility	1.00					
Commercial Presence	0.10	1.00				
Non-Commercial Presence	-0.01	-0.28	1.00			
Indexer Presence	0.26	-0.20	-0.30	1.00		
Money Mgr Presence	0.08	-0.19	-0.35	0.24	1.00	
Small Trader Presence	-0.30	-0.49	-0.06	-0.37	-0.38	1.00

## Part 4: Price Discovery

- **Granger Causality and Vector Autoregression analysis was conducted to determine whether changes in traders' positions cause changes in price and whether changes in price cause changes in traders' positions**
- **The results indicate that changes in futures market positions by any category of trader did not cause changes in price.**
- **However, the results do indicate that changes in price caused many categories of traders to change their positions.**
- **In summary, the results indicate index trader and money manager activity do not drive price changes. However, changes in price did drive index trader and money manager activity.**
- **Additional analysis in the form of a price pressure test appears to largely correspond and solidify the Granger Causality and Vector Autoregression results.**

## Granger Causality Results, Chicago Wheat

	Commercial	Non-Commercial	Indexer	Money Mgr	Small Trader
---- P Values ----					
Position Causes Price	0.257	0.550	0.605	0.716	0.322
Price Causes Position	0.024	0.199	0.357	0.039	0.860
---- Significant at 5% Level ----					
Position Causes Price	N	N	N	N	N
Price Causes Position	Y	N	N	Y	N

P-values are the probability that the sum of squared errors in the unrestricted model is not different from the sum of squared errors in the restricted model.

- Commercials and money managers respond to price by changing positions
- No evidence that position changes influence price.



## Part 5: Convergence

- The same pressure test used in the price discovery section was used in the analysis of convergence by restricting the data set to the final 20 days of trading for each contract month during the study period.
- This test it was found that no trade group consistently influenced price levels during the last 20 days of trading.
- The convergence trend analysis and six-month comparison indicated that most of the agricultural futures contracts were more likely to be “too cheap” rather than “too rich”.
- Cotton and natural gas are the two commodities that raise concern as prices in these markets do appear to routinely over-estimate their final value (within the study period).
- Confidence in a finding of futures mis-pricing grows as the number of observations increase. It is possible that by altering or expanding the sample, the mis-pricing identified here might be mitigated.

# Numerical Example- Chicago Wheat

Contract	Price at Delivery	Price 120 Days Before Delivery	Difference
May 04	354.00	394.18	-40.18
Jul 04	377.25	322.95	54.30
Sep 04	327.25	396.43	-69.18
Dec 04	285.00	368.40	-83.40
Mar 05	348.00	341.80	6.20
May 05	296.50	326.23	-29.73
Jul 05	338.00	314.95	23.05
Sep 05	311.50	363.33	-51.83
Dec 05	309.50	351.78	-42.28
Mar 06	352.00	338.73	13.28
May 06	394.00	334.23	59.78
Jul 06	366.00	348.80	17.20
Sep 06	377.00	374.40	2.60
Dec 06	477.00	401.23	75.78
Mar 07	446.00	422.33	23.68
May 07	489.00	500.98	-11.98
Jul 07	581.00	490.05	90.95
Sep 07	838.00	484.23	353.78
Dec 07	874.00	489.40	384.60
Mar 08	1160.00	867.15	292.85
May 08	761.00	769.00	-8.00
Jul 08	810.000	840.475	-30.48
Sep 08	703.750	1112.050	-408.30

Number Positive: 13  
Number Negative: 10

Average: 27.07

- Since May of 2004, more contracts have been under-priced than over-priced six months prior to expiration.
- 10 of the last 14 contracts were under-priced six months out.
- Conclusion: No evidence of routine over-pricing in Chicago wheat futures. If anything, the evidence favors a bias to the downside.

# Other Study Results

**March 2009 USDA Amber Waves Volume 7, Issue 1**

## **Agricultural Commodity Price Spikes in the 1970's and 1990's**

### **Valuable Lessons for Today**

- **Even though the 2006 to 2008 increase in crop prices was unprecedented, it was also very similar to the increase in crop prices in 1971 to 1974 and 1994 to 1996.**
- **Each period had a similar combination of factors that resulted in the higher crop prices. The main factors were the depreciation of the U.S. dollar, increased world demand that led to supply shocks and foreign policy changes in response to the higher prices.**
- **In each period the market eventually adjusted bringing prices back down. However, the current adjustments have been happening in a much more volatile environment.**

# Other Study Results

January 30, 2009 United States Government Accountability Office

Request from Representative Collin Peterson to examine commodity index trading and the laws and regulations surrounding that trade group.

- The Commodity Exchange Act does not prohibit this activity.
- Review of 8 empirical studies and 3 qualitative studies.
  - A. The 8 empirical studies found limited statistical evidence that there is a relationship between commodity futures prices and the activity of index traders and/or speculators.
  - B. Two of these studies included CFTC staff and non-public COT data. These studies also found limited evidence that index traders and/or speculative activity adversely affected commodity prices.
- Conclusion: “As result, the fact that the studies generally did not find statistical evidence of such a relationship appears to suggest that such trading is not significantly affecting commodity prices at the weekly or daily frequency.”

# Other Study Results

**November 2006 University of Illinois – Darrel Good, Scott Irwin and Philip Garcia**

## **“The Performance of the Chicago Board of Trade Corn, Soybean, and Wheat Contracts After Changes in Speculative Limits in 2005”**

- **There was a large increase in open interest for corn, soybeans and wheat in the deferred months. The majority of these positions were held by the non-commercial trade group.**
- **However, analysis of price volatility showed no evidence that volatility was affected by the change in speculative limits. This reflects a well developed market that was able to absorb the influx of activity without altering daily volatility.**
- **Study suggested that convergence in corn and soybeans were fairly normal, but should be closely monitored. Also, suggested increasing storage rates.**
- **Convergence patterns in wheat suggested a constraint or bottleneck in the delivery system. Also noted that the contract appeared to be reflecting a “generic” world contract rather than a SRW contract.**
- **The study also pointed out that there was a need for more transparency in the CFTC’s Commitments of Traders report.**

# Speculative Positions Limits

**Speculative position limits are established by the Commodity Futures Trading Commission (CFTC) Regulation § 150.2. It states:**

**No person may hold or control positions, separately or in combination, net long or net short, for the purchase or sale of a commodity for future delivery or, on a futures-equivalent basis, options thereon, in excess of the flowing:**

	SPOT MONTH	SINGLE MONTH	ALL MONTHS
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## AGRICULTURAL

Corn & mini-sized Corn	600	13,500	22,000
Soybeans & mini-sized Soybeans	600	6,500	10,000
Wheat & mini-sized Wheat	600	5,000	6,500
Oats	600	1,400	2,000
Rough Rice	600	1,800	1,800
Soybean Oil	540	5,000	6,500
Soybean Meal	720	5,000	6,500

## LIVESTOCK

Feeder Cattle	300	1,600	
Frozen Pork Bellies	100	800	1,000
Lean Hogs	950	4,100	
Live Cattle	450	5,400	

# How are Speculative Limits Determined?

## **Spot Month:**

**Based on the deliverable supply of the commodity at the futures delivery points and may be no greater than one-quarter of the estimated deliverable supply at the futures delivery points.**

## **Single Month and All Month\*:**

**Limits are to be no more than 10% of the average combined futures and delta-adjusted option month-end open interest for the most recent calendar year up to 25,000 contracts with a marginal increase of 2.5% of the remaining open interest thereafter.**

\* There are no “All Month” limits for Feeder Cattle, Live Cattle and Lean Hogs.

# Hedge Exemptions

**Regulation § 150.3 lists positions that may be exempted from (and thus exceed) the Federal Limits:**

**Bona Fide Hedge:** Transactions which are defined in CFTC § 1.3(z) as transactions that normally represent a substitute for transactions to be made, or positions to be taken, at a later time in a physical marketing channel and that are economically appropriate to the reduction of risks in the conduct of a commercial enterprises.

**CFTC § 1.47:** Allows the Commission to recognize transactions other than those enumerated in § 1.3(z) as bona fide hedges in such amounts and under such terms as it may specify.

**OTC Index-Based Exposure:** Swap dealers may apply for an exemption in the event that futures positions are used to hedge price exposure to swap positions. Such exemptions do not apply to spot month positions.



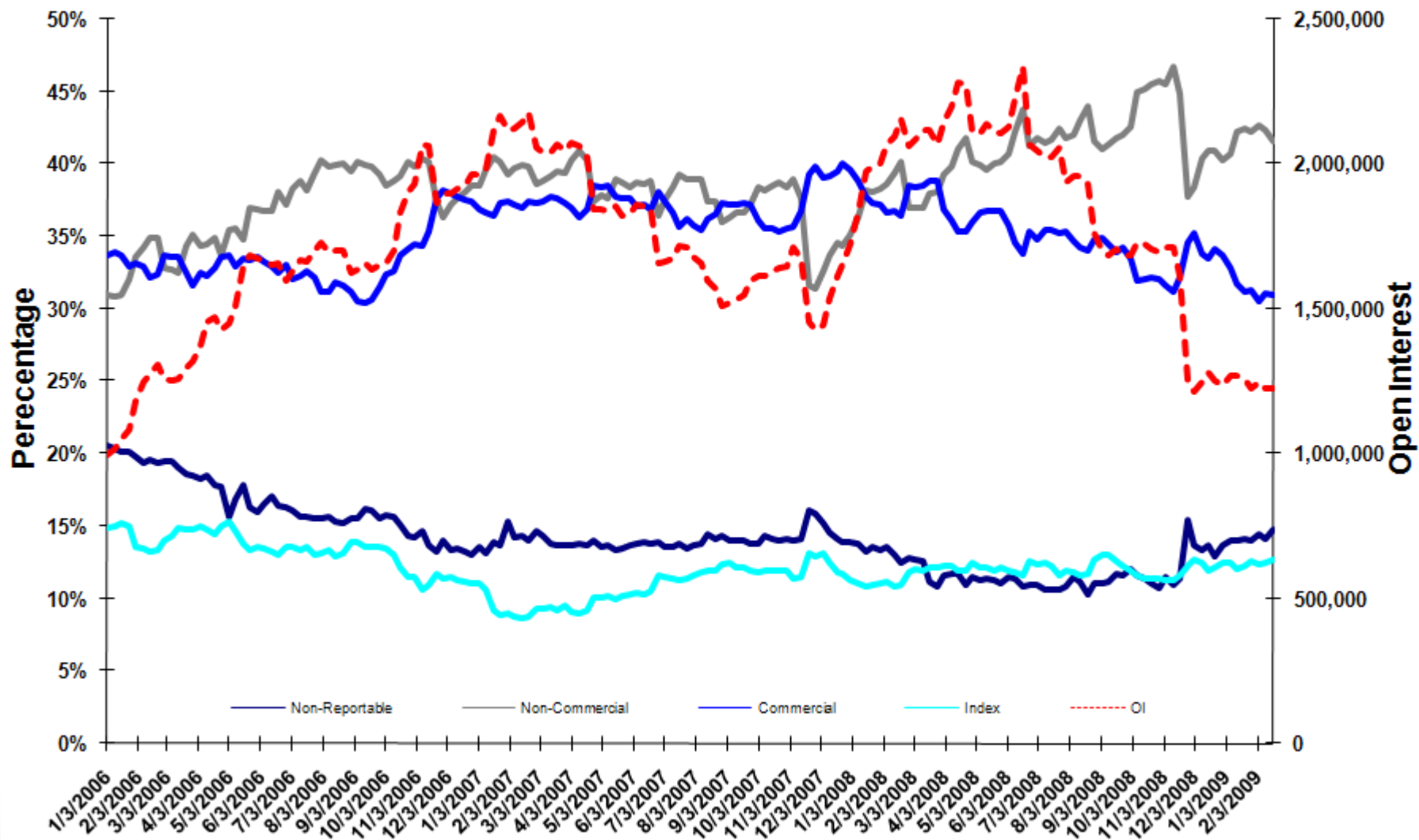
# Aggregation of Positions

**Market Regulation monitors position limits as outlined above.**

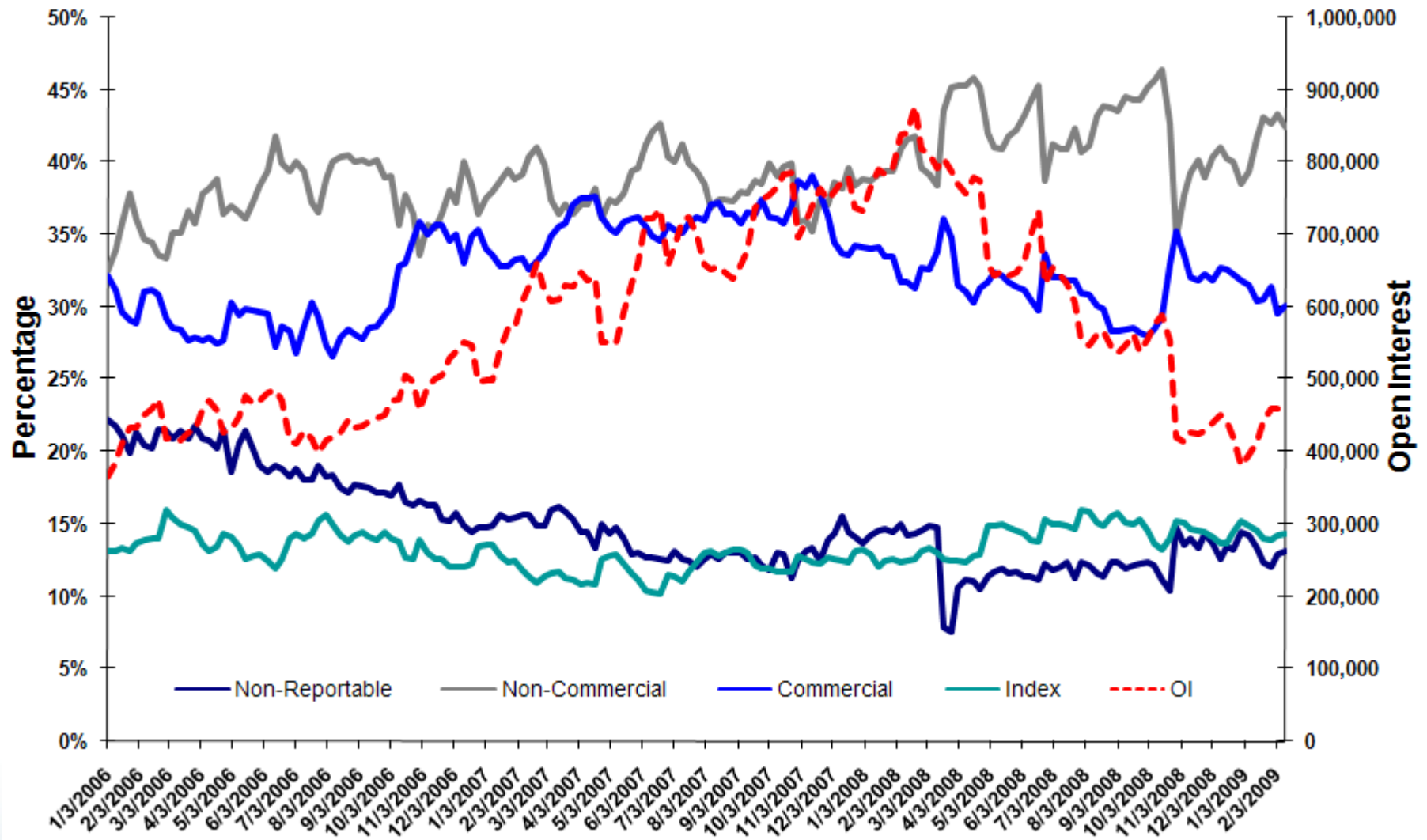
**However, account positions may need to be aggregated depending on who owns the positions and who controls the positions.**

- **Positions in accounts which have a common controller(s) will be aggregated when determining compliance with speculative position limits.**
- **Positions in accounts that share a 10% or more ownership interest will be aggregated when determining compliance with speculative position limits.**
- **Limited exemptions to these requirements are outlined in the CFTC regulations.**

## Percentage of Open Interest by Category Corn



# Percentage of Open Interest by Category Soybeans



# Percentage of Open Interest by Category CBOT Wheat

