Comment Regarding Position Limits for Derivatives

In response to U.S. Commodities Futures Trading Commission
1/26/11 Notice of Proposed Rulemaking
RIN #s 3038-AD15; 3038-AD16

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We generally endorse the positions presented by the CFTC in its 1/26/11 notice regarding position limits for all derivative markets. We do also have some differences and alternative proposals that we will describe below. As we read this document, the CFTC includes four central points, including both broad conceptual guidelines for setting position limits as well as specific proposals. In our view, these four central points are as follows:

1. Why Set Position Limits?

The CFTC document presents two key observations here:

A) *"A primary mission of the CFTC is to foster fair, open, and efficient functioning of the commodity derivatives markets. Critical to fulfilling this statutory mandate is protecting market users and the public from undue burdens that may result from 'excessive speculation,'"* p. 4753, third column.

B) *"The Commission is not required to find that an undue burden on interstate commerce resulting from excessive speculation exists or is likely to occur in the future in order to impose position limits. Nor is the Commission required to make an affirmative finding that position limits are necessary to prevent sudden or unreasonable fluctuations or unwarranted changes in prices or otherwise necessary for market protection. Rather, the Commission may impose position limits prophylactically, based on its reasonable judgment that such limits are necessary for the purpose of 'diminishing, eliminating or preventing; such burdens on interstate commerce that the Congress has found result from*

excessive speculation," p. 4754, first column.

We endorse the CFTC's perspective here. To explain our endorsement, we will present arguments from the economics literature as well as recent evidence which explores the primary analytic argument opposed to position limits. This view is that is that position limits on commodities futures markets will diminish market liquidity; and that, by so doing, position limits will, in turn, increase price instability in spot markets.

2. Establishing Uniform Commission-set Position Limits for All Commodities

The CFTC position here is as follows: *"The proliferation of economically equivalent instruments for trading in multiple trading venues, however, warrants extension of the Commission-set position limits beyond agricultural products to metals and energy commodities….Uniform position limits should be established across such venues to prevent regulatory arbitrage and ensure a level playing field for all trading venues*," p. 4755, columns 2-3.

Again, we endorse the CFTC position here. In our review of the literature and recent evidence on liquidity and price movements in commodities markets, we will see that the market for petroleum, in particular, behaves in similar ways to major food commodities. As such, position limits for these markets should operate in uniform ways.

3. Formulas for Setting Position Limits

The CFTC formula for setting position limits is as follows: *"The formula proposed herein is intended to ensure that no single speculator can constitute more than 10 percent of a market, as measured by open interest, up to 25,000 contracts of open interest, and 2.5 percent thereafter*," p. 4759, 1st column.

This appears to be a reasonable formula for setting uniform position limits. However, given that the goal with position limits to prevent any given speculator from acquiring excessive market power, the only way to know whether this formula is effective is through direct observation. Should this approach prove inadequate, we propose an alternative simple formula, working directly from measures of central tendencies in the level of trading.

4. **Exemptions from Position Limit Regulations**

The CFTC endorses the idea of offering exemptions on a limited basis, as follows: "*... the new statutory definition of bona fide hedging recognizes bona fide hedging ... only if such transactions or positions represent cash market transactions and offset cash market risks, as opposed to the acceptance of bona fide hedging transactions and positions as activity which normally, but not necessarily, represents a substitute for cash market transactions or positions*," p. 4671, 1st column.

The aim in offering such exemptions is to prevent the Dodd-Frank regulations from imposing excessive burdens on derivative market participants who are legitimate hedgers, specifically those with an interest in transactions involving the physical commodity, and are thereby not contributing to destabilizing the markets. This may be a desirable goal in principle. But, as we discuss below, in practice, it will be difficult for the CFTC to sort out which market participants truly merit exemptions by the standards established. As such, the effectiveness of the entire regulatory framework around derivative markets will hinge on the CFTC proceeding with great caution in offering exemptions. In our view, the only way to insure that the Dodd-Frank regulations are implemented effectively is to allow no exemptions at all.

In what follows, we discuss the issues raised by the CFTC proposal in three parts: 1) The relationship between liquidity and price stability in asset markets in general and commodity markets in particular; 2) formulas for setting position limits; and 3) difficulties in indentifying which traders should legitimately qualify for exemptions.

THE RELATIONSHIP BETWEEN MARKET LIQUIDITY AND PRICE STABILITY IN COMMODITY MARKETS

We will address this question both through a general overview on the relationship between liquidity and stability in asset markets generally, as well as through considering the case of commodities futures markets in particular. We examine both general analytic issues as well as empirical evidence regarding contemporary commodities markets.

To begin with, liquid asset markets—i.e. markets with a relatively large volume of trading opportunities—clearly provide a benefit to wealth holders through enabling them to buy or sell claims on physical assets without having to make long-term commitments to holding these assets. Thus, because the New York Stock Exchange is thick with millions of traders, it is easy for any of us to buy shares of, say, Microsoft tomorrow if we wish to then sell those same shares two days later. The physical plant, day-to-day operations, and profit prospects of Microsoft will almost certainly not have changed over the course of those two days. But because of the existence of a highly liquid stock market, we have nevertheless been able to become both an owner and former owner of the firm in that short time period because of the presence of a highly liquid stock market. Depending on activity in the market, we may even be able to receive some capital gain through this short-term purchase and sale of Microsoft shares.

The parallel situation also holds with the futures market for commodities. When there is a highly liquid market for food commodities, for example, a farmer can choose when to relinquish her ownership claims on the crops she is cultivating, rather than bear the risk of waiting until the crop is harvested. Without a relatively liquid market for food commodities delivered in the future, farmers would be forced to bear the risk of waiting until the harvest to sell their crops, at a price in the spot market that nobody can know for certain in advance.

These benefits of liquid asset markets, including all commodities futures markets, are not in dispute. However, proponents of the "efficient market" theory of how asset markets operate contend that the benefits of liquid financial markets extend well beyond this basic contribution. Moreover, any full assessment of highly liquid asset markets must consider their costs as well as the benefits we have described.

Efficient market theory of liquid asset markets. According to the efficient market approach, liquid asset markets correctly evaluate firms according to their "fundamentals"—i.e. their potential profitability. Thus, a liquid financial market is engaged in crucial information processing and price discovery activities. The profit potential of firms becomes widely disseminated as a result. Moreover, the fact that information on fundamentals is widely disseminated forces firms to operate more efficiently. It becomes more difficult for firms to hide their deficiencies, and these deficiencies are widely recognized and punished by market participants.

Correspondingly, asset market traders are rewarded for trading at prices that reflect fundamentals, and are punished for trading at prices that misread fundamentals. Over time, in other words, good traders outcompete bad traders, and the most important characteristic of good traders is that they will end up driving prices toward fundamentals. It follows from this perspective that any significant interference with the market that diminishes liquidity, and thereby trading levels, will be harmful. For the specific case of commodities futures markets, the argument would be that any regulations to discourage market trading would diminish the capacity of markets to establish prices that reflect fundamental values. [1]

Critique of Efficient Market Hypothesis and Alternative Perspectives. The efficient market hypothesis—and specifically the argument that increasing the liquidity of markets must be stabilizing—has been heavily criticized, starting with John Maynard Keynes himself in his classic 1936 work, *The General Theory of Employment Interest and Money*. But the critical tradition developed beyond Keynes in various ways, continuing into the present. The range of leading critics has included the late Hyman Minsky, Andrei Shleifer, Robert Shiller, and the Nobel Prize winning researchers George Akerlof, and Daniel Kahneman.

As one important stream of alternative thinking, Shiller (1989, 2005) and Akerlof and Shiller (2009) emphasizes the role of investor psychology, independent of individual firm fundamentals, as a major determinant of asset market prices. As Schiller writes regarding equity markets, stock prices "change in substantial measure because the investing public en masse capriciously changes its mind" [1989, p 1]. Shiller's book, *Irrational Exuberance* (2005) as well as Akerlof and Shiller's updated study *Animal Spirits* (2009) examine in detail the social and psychological "anchors" that determine stock market prices beyond what might be explained by fundamentals. These "anchors" include a strong desire to accept evidence that could earn

[1] The modern statement of the efficient market approach begins with Milton Friedman's 1953 paper "The Case for Flexible Exchanges Rates, and was developed further by Fama, Jensen and others. See Fama's 1970 paper for a sympathetic review of the empirical evidence and Hubbard (2008) for a standard sympathetic textbook treatment.

traders lots of money. Moreover, because these and related anchors are fragile by their nature, they are liable to unexpected and sometimes rapid reversals. In Schiller's view, this explains the fact that the stock market and other asset markets fluctuate to a degree well beyond what can be explained by fundamentals.

Related to Schiller's critique are arguments about the centrality of asymmetric information in financial markets, and specifically the influence exerted by ill-informed "noise traders." For example, in Shleifer's (2000) presentation of the "behavioral finance" perspective, he models financial markets as containing two kinds of traders, fundamental traders and noise traders. But noise traders are not competed out of the market by the fundamental traders in this perspective. This is because arbitrage is risky, costly, and therefore limited. For example, if asset prices are inflated relative to fundamentals, arbitrageurs who chose to sell short face potential losses from prices moving still higher under the influence of noise traders—that is, their short-selling will not necessarily drive prices down to fundamentals. Thus, the actions of noise traders are not merely ephemeral to market activity, but rather exert a sustained influence on price formation.

A further point about the nature of speculation on asset markets also emerges from this perspective. As Keynes and Minsky emphasized, if markets are persistently and unpredictably moved away from fundamentals by noise traders, it no longer becomes logical for even well-informed traders and professionals to try to trade on the basis of fundamental information. It rather follows that professional traders should proceed as Keynes argued, to trade by trying to outguess market sentiment, moving ahead of the herd by "anticipating what average opinion thinks average opinion to be," (1936, p. 156). As such, one might even argue that while "fundamentals" such as the costs of producing commodities as well as the global demand for consuming the commodities certainly exist as factors in setting prices, they do not exist as the sole "fundamental" basis on which prices are formed, when markets are driven by what average opinion thinks average opinion will be.

When commodities futures markets operate under these conditions, a final crucial implication follows. That is, since markets can be moved away from fundamentals by various types of trading strategies—e.g. through buying or selling ahead of the herd—it follows that large-scale traders may be able to move the markets in directions that are favorable to themselves. Moreover, if one trader controls a disproportionate share of the overall market, this will facilite any efforts to push the market in their favored direction. For example, if one large trader Sachs controls, say, 20 percent of the open interest in the oil futures market, that means they can move ahead of the herd in shaping the direction that the market takes. They have the resources to initiate an upward price bubble, and they can then also be the first to start selling short before the herd movement reverses itself.

Of course, it was precisely to guard against this type of market bubble dynamics such bubble dynamics that regulations of these markets have long included position limts as one important measure. If increasing the liquidity of markets always drove prices toward

fundamentals, as argued by proponents of efficient market theory, then it would not matter what share of the market any one trader was able to control.

Evidence on Rising Liquidity, Price Levels and Volatility in Commodities Futures Markets

Liquidity and Rising Price Levels. A reasonable standard measure of liquidity in commodities futures markets is the *open interest* in any particular commodity market. The open interest in futures markets refers to the number of contracts which have not yet been fulfilled through delivery. Figure 1 shows the open interest (futures contracts only) for three futures markets at the Chicago Board of Trade - wheat, maize (corn), and soybeans from 1986 to 2011. Figure 2 shows the open interest in crude oil on the NYMEX market (futures contracts only). In all cases, open interest (i.e. liquidity) begins to increase around 2003/4. There is a short-lived reduction in open interest during the financial crisis which began in the second half of 2008, but open interest has since recovered. The increase is particularly noticeable with regard to the corn and crude oil markets.

FIGURE 1 HERE—ALL FIGURES AT END OF DOCUMENT

FIGURE 2 HERE

It is useful to compare these changes in liquidity with the price dynamics in spot markets. Figure 3 does this over the period 1990 to 2011 using indices of global commodity prices for wheat, maize (corn), rice, petroleum, and soybeans. The price indices for all commodities take on the value of 100 in 1990. The increased liquidity in the futures markets which began around 2003-04 is associated with very rapid commodity price inflation, with most commodity prices peaking in 2007-08.

That is, there is a strong and obvious correlation between the increase in liquidity in these commodity futures markets and the rapid rise of prices in spot markets. But observing *correlation* is not the same as explaining *causation*. We are not aware of any current research which fully explains the various causal channels operating in these markets. For now, we can say that other potential causal factors, including shifts in global supply and demand in spot markets and the rising demand for food commodities as biofuels are not themselves of sufficient magnitude to explain the huge run up in prices.[2] Equally, they are not close to being large enough to to explain the volatility in prices taking into account the periods of both increasing and falling prices.

FIGURE 3 HERE

[2] See Ghosh (2010, 2011 for details).

Liquidity and Price Volatility. The sharp increase in the trend of commodity prices is not the same as *volatility* in these prices around their average value. Volatility refers to significant swings in prices over time around an average value. Prices can be volatile around a constant average price; and similarly, markets can experience price inflation—a rise in the trend of the average price—while volatility can remain at a low level.

Has volatility in spot markets increased with liquidity in future markets? The short answer is "yes." But how much volatility has increased—in particular, as distinct from the run up in the average price—depends on how one measures volatility.

The most common way to measure price volatility is through the standard deviation around the average (mean) price level.[3] In Figure 4, we plot the standard deviation of the price indexes over the previous 12 months as an indicator of historical volatility of these prices. The standard deviation data presented in Figure 4 are derived from the price level figures presented in Figure 3.

FIGURE 4 HERE

We see in Figure 4 that the standard deviations of these commodity price indexes vary within a fairly constant range up until early 2007.

We make two observations based on this figure:

1. Volatility was relatively steady prior to the significant increase in liquidity. That is, there is no indication that price volatility was heightened in spot prices due to the low levels of market liquidity relative to the most recent years; and
2. The highest levels of volatility are associated with the rapid increases in liquidity towards the end of the period.

But in considering these results, it is important to also recognize that this measure of volatility is sensitive to the fact that, as we have observed above, the average price level also rose dramatically. If we are interested in observing changes in volatility by themselves, as distinct from the change in the average price, we need to modify our calculation of volatility. We can control for the effects of changes in average price through dividing the standard deviation by the average of the price indices over the same 12 month period. Figure 5 shows how using this modified measure of volatility alters the results.

FIGURE 5 HERE

[3] The standard deviation of a variable, along with its variance, are both measures of the dispersion of a variable around its average (mean) value. The variance of a variable is the expected value of the square of the deviation of the variable around its mean value. The standard deviation is the square root of the variance.

Thus, using this measure that isolates the effects of volatility from the rise in average prices, we see that volatility was significant in the 1990s. Volatility is then tempered somewhat from 2000-2006. However, again, even with this measure, volatility rises sharply again starting in mid-2007.

The reasons for the difference in this pattern relative to that which we observed in Figure 4—when we do not control for changes in the average price—are straightforward. The average prices were substantially lower during the earlier period. Thus, all else equal, any measure of volatility which adjusts for changes in the average price level will indicate greater volatility when prices are low than when prices are high.

This raises an important concern about volatility indicators and how we interpret them relative to broader economic and social implications. Volatility is most often measured, explicitly or implicitly, relative to the mean or average value of a variable. But what happens when the mean value of the variable changes over time, as has occurred recently with commodities prices? In such cases, a focus on volatility alone, independent of the rise in the average price, can divert attention from the fact that the average price is rising. As such, it is crucial that we consider both the sharp increase in average prices along with the volatility around the rising average price as the combination of changes that we need to examine.

Conclusions from Empirical Evidence

We can conclude the following from this brief examination of the relevant evidence:

1. There is no evidence that prices on the commodities markets that we observed behaved in a more volatile way when the markets were *less liquid*—i.e. when the open interest in the various markets was lower. At the very least, we can conclude that the dramatic rise in market liquidity is not associated with a lessening of price volatility.
2. There is clear evidence showing that the rise in market liquidity is associated with very rapid increases in spot market prices. Yet we also emphasize again, at this point, that we are referring only to correlations between rising liquidity and spot prices, without trying to sort out as yet the various causal channels.
3. The rapid increase in prices is also associated with the most rapid increases in price volatility, as measured by standard deviations around average prices. The sharp increase in the average price also creates more room for large fluctuations around the average price.
4. In considering the evidence on price volatility independently of the rise in average prices, we still observe that price volatility starting in mid-2007 is at least as strong, if not stronger, than any previous time during our full sample of years. As such, all evidence points to the conclusion that the recent sharp increase in market liquidity is associated with high levels of price volatility.

5. Analyzing the change in spot market prices entails that we consider together both the rapid run-up in the average prices along with the absence of any dampening of volatility due to the rise in market liquidity.
6. Overall then, we can conclude confidently at this point that:
    a. The liquidity of the commodities futures market that we have observed increased dramatically starting in the early 2000s, and especially from 2007 onward;
    b. This rapid rise in liquidity was associated with a similarly rapid increase in average prices; and
    c. By one common measure of volatility, the rise in liquidity was also associated with a rapid increase in volatility. But even considering alternative measures of volatility, there is no evidence that the rise in liquidity is associated with a dampening of volatility, and still strong evidence that the rise in liquidity is associated with higher levels of volatility.

As a final overall conclusion, we return to the CFTC's point regarding the standards they have established in justifiying regulations through position limits, and that these position limits apply across-the-board to all commodities futures markets. As noted above, the CFTC has set the following reasonable standard for justifying a policy of uniform position limits: " *the Commission may impose position limits prophylactically, based on its reasonable judgment that such limits are necessary for the purpose of 'diminishing, eliminating or preventing; such burdens on interstate commerce that the Congress has found result from excessive speculation."* In our view, the arguments and evidence we have reviewed are more than sufficient as a basis for the CFTC to proceed with his aim of establishing uniform Commission-set position limits.

FORMULAS FOR SETTING POSITION LIMITS

As noted above, we are broadly supportive of the CFTC formula of setting position limits such that "no single speculator can constitute more than 10 percent of a market, as measured by open interest, up to 25,000 contracts of open interest, and 2.5 percent thereafter." At the same time, it may well be that controlling 10 percent of the market may well enable a single speculator to establish power in setting market prices. We therefore would support the CFTC sponsoring or conducting research itself on the adequacy of this existing formula for achieving the intended purpose of preventing large speculators to exercising control over setting market prices. In that regard, we would like to offer a somewhat different approach as an alternative basis for settting position limits.

As a reference point for this discussion, it will be useful to review the experiences in food commodities futures during the huge price run up from 2006-08. Table 1 below shows the position limits at that time for corn, soybeans and wheat, along with the average position size for three types of long traders, as defined by the CFTC, i.e, commercial, non-commercial, and index traders. "Commercial traders" are producers or consumers of commodities, such as farmers, oil companies or airlines who wish to hedge against future market risks; "non-commercial traders" are brokerage houses or hedge funds that will sell futures or swap contracts to commercial traders; and "index traders" are those holding positions in an basket—i.e. index fund—of

commodities. They trade based on the movements of this index fund relative to movements in other asset markets, such as stocks, bonds, and real estate. The index traders are generally large hedge funds or equity holding companies.

To begin with, the data in Table 1 below show clearly that the position limits that operated in 2006-08 were relevant only for index traders. The average position sizes for both commercial and non-commercial traders were far below the stipulated limits.

TABLE 1 HERE

In terms of the index traders, with corn, the position limit was 22,000 contracts, a figure well above the average position of index traders of 16,260. These figures suggest that the stipulated position limit was not likely binding on the behavior of most index traders, though there may have been some cases of very large index traders holding positions well above the average. A similar story holds with soybeans, where the position limit was 10,000 contracts, while the average position size for index traders was 6,024. However, the situation is different with wheat. The position limit there was 6,500, but the average index trader held 8,326 contracts. These figures for wheat futures suggest two things: 1) the position limits were set at a level that would have been binding for a significant share of index traders; but 2) the limits were not binding in fact, since the average trader held nearly 30 percent more contracts than the position limits permitted. Obviously, large index traders in wheat futures were granted exemptions from the stipulated position limits (UNCTAD 2009, p. 65)

These contrasting experiences with the corn, soybeans and wheat markets over 2006-08 can shed light on how to effectively use the tool of position limits in preventing index traders from exercising excessive market power. One approach would be to set position limits based on the actual position levels of commercial traders, as opposed to index traders, assuming that the distinctions between these can be clearly established through the data. For example, one could set the position limits as one standard deviation greater than the median position levels for commercial traders.

However, the most serious problem here is that as trading practices have become more complex, it becomes increasingly difficult to clearly establish distinctions between "commercial" and "index" traders, certainly for purposes of writing regulations that could hold firm against legal challenges. Given this difficulty in distinguishing categories of traders in commodities futures markets, the simplest solution for establishing position limits is to develop an approach that does not rely on making such distinctions. In fact, this can be accomplished readily, by generalizing from the idea of defining position limits relative to the median trading levels of commercial traders. That is, we can simply set limits relative to the median trading level of *all* traders in the market. The total number of index traders is small relative to other traders, even though their average positions are much larger. As such, to set position limits relative to the *median* for the overall market will accomplish the same outcome as attempting to set limits only after having distinguished commercial from index traders. In addition, to prevent the position

limits from moving excessively based on possible large swings in the levels of market activity, this approach could be adjusted by, for example, defining the median position as a moving average of actual positions over, say, a three year period.

EXEMPTION FROM POSITION LIMIT REGULATIONS

As noted above, we understand the aim being sought by the Dodd-Frank law and the CFTC regulations in offering exemptions, that are, in principle, on a narrow and well-defined basis. The purpose of such exemptions is to prevent the position limits from imposing excessive burdens on derivative market participants who are legitimate hedgers, and are thereby not contributing to destabilizing the markets. In practice, however, it will be difficult for the CFTC to sort out which market participants truly merit exemptions by the standards being established.

The basic problem here is that, as noted above as regards the formula for setting position limits, as trading practices have become more complex, it becomes increasingly difficult to clearly establish distinctions between various types of traders, especially for purposes of writing regulations that could hold firm against legal challenges. This point was illustrated well in a paper by Silber, "On the Nature of Trading: Do Speculators Leave Footprints?" This paper was published in 2003, years before index trading exploded in commodities futures markets. Silber describes how two types of traders, what he terms "market-makers" and "speculators" establish their positions and manage their risk exposure. The key relevant point here is that Silber's discussion makes clear that balance sheets are insufficient to determine whether a trader is a market-maker or a speculator. This means that speculators can readily engage in activities that, a least through examining their balance sheet, would make them appear to be market-makers.

It is important to also recall the negative experiences of 11 years ago with providing what were supposed to have been narrow-defined exemptions from CFTC regulations. We refer here to the exemptions to the then prevailing regulatory laws, beginning with the so-called "Enron loophole" in 2000. The Enron loophole exempted over-the-counter energy trading undertaken on electronic exchanges from CFTC oversight and regulation. Enron quickly seized this market opportunity to create an artificial electricity shortage in California in 2000-01, which led to multiple blackouts and a state of emergency, and, finally, the collapse of Enron itself and its once big-five accounting firm, Arthur Andersen. Nevertheless, following Enron's example, the large market players subsequently took advantage of similar major loopholes—the "London loophole" for nominally foreign market trading and the "Swap dealer loopholes," which permitted all swap trading to move into OTC markets. The overall effect was to enable the OTC markets to flourish alongside the regulated markets.

The experiences with exemptions that began in 2000 with Enron and proceeded from there are actually only a specific case of the more general problem identified by Professor Silber. That is, it will almost certainly be extremely challenging, if not impossible, to identify different types of traders through examining their balance sheets or, the specific types of instruments they are trading, or the physical location of their trading platform. As such, the only way to prevent

making invidious distinctions between traders in allowing exemptions is to establish viable regulations that apply to all traders, without exceptions.

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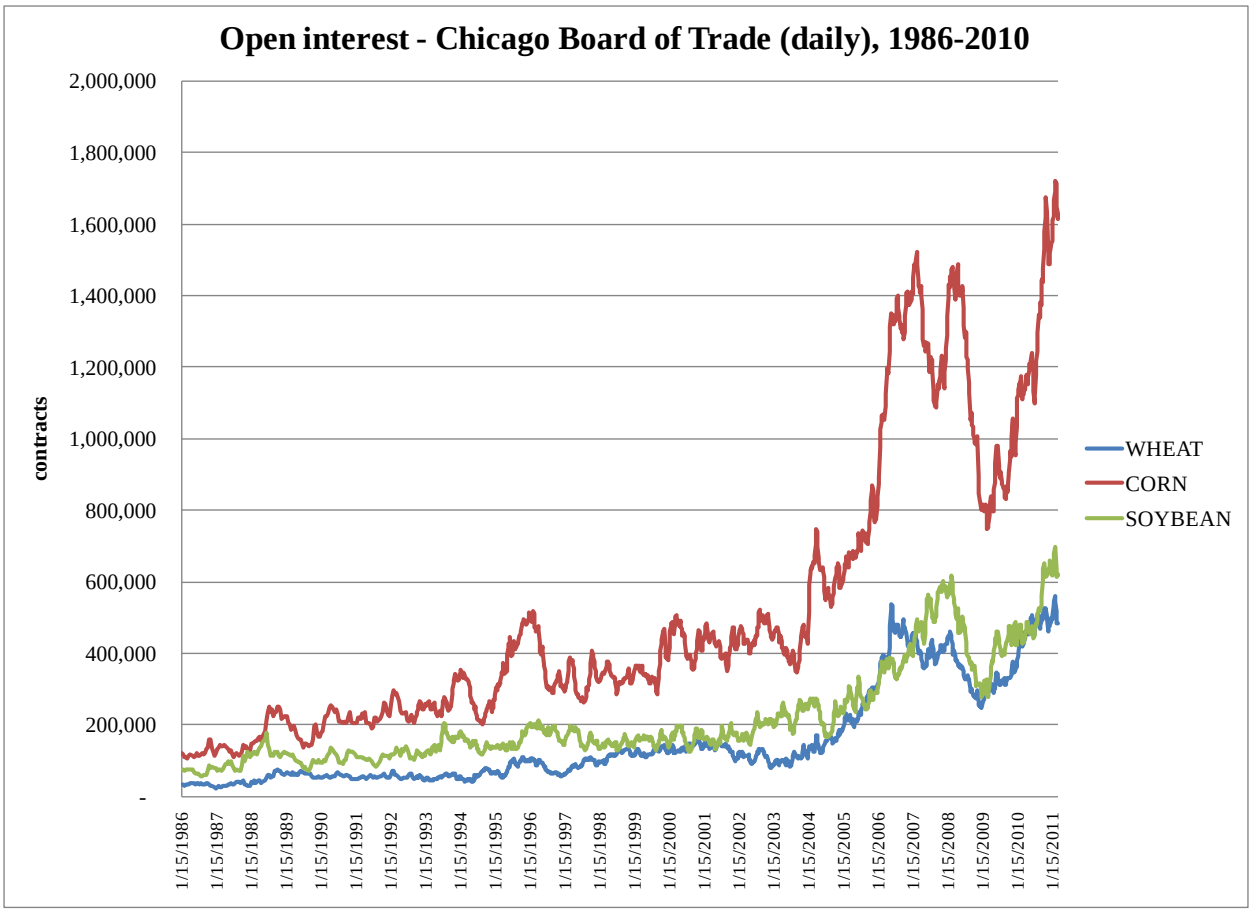
Figure 1


Open interest - Chicago Board of Trade (daily), 1986-2010
contracts
2,000,000
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
1/15/1986
1/15/1987
1/15/1988
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1/15/2005
1/15/2006
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1/15/2010
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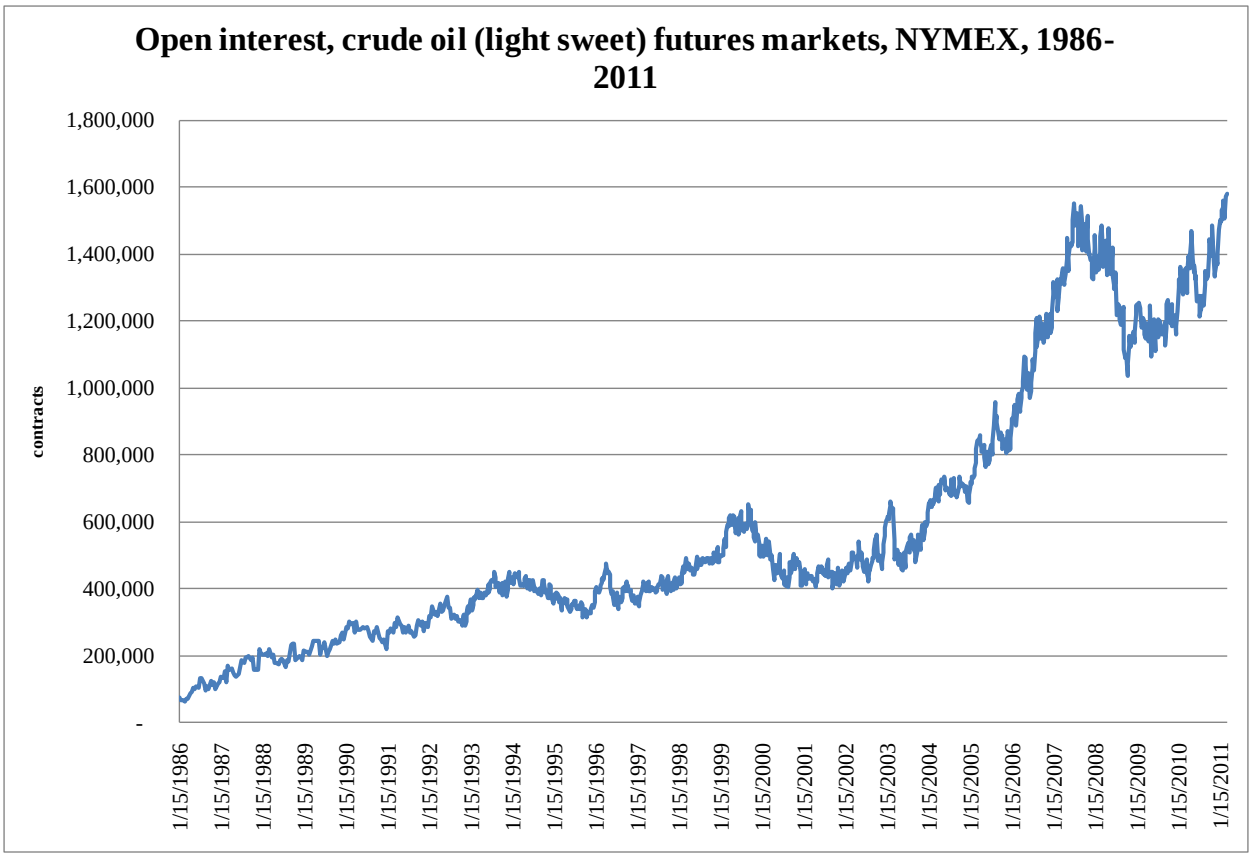
WHEAT
CORN
SOYBEAN

Figure 2


Open interest, crude oil (light sweet) futures markets, NYMEX, 1986-2011
contracts
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
1/15/1986
1/15/1987
1/15/1988
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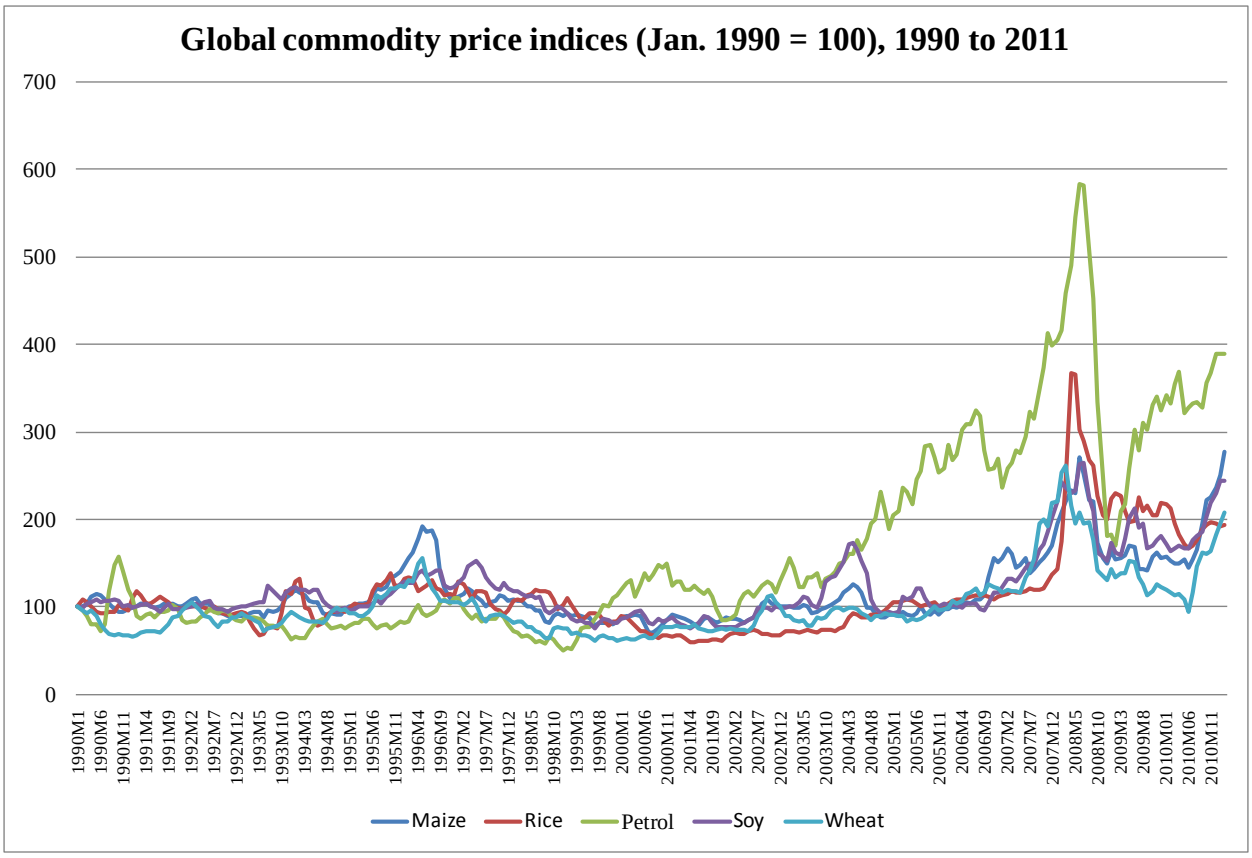
1/15/2011

Figure 3


Global commodity price indices (Jan. 1990 = 100), 1990 to 2011
700
600
500
400
300
200
100
0
1990M1
1990M6
1990M11
1991M4
1991M9
1992M2
1992M7
1992M12
1993M5
1993M10
1994M3
1994M8
1995M1
1995M6
1995M11
1996M4
1996M9
1997M2
1997M7
1997M12
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1998M10
1999M3
1999M8
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2001M4
2001M9
2002M2
2002M7
2002M12
2003M5
2003M10
2004M3
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2005M1
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2006M4
2006M9
2007M2
2007M7
2007M12
2008M5
2008M10
2009M3
2009M8
2010M01
2010M06
2010M11
Maize
Rice
Petrol
Soy
Wheat

Table 4

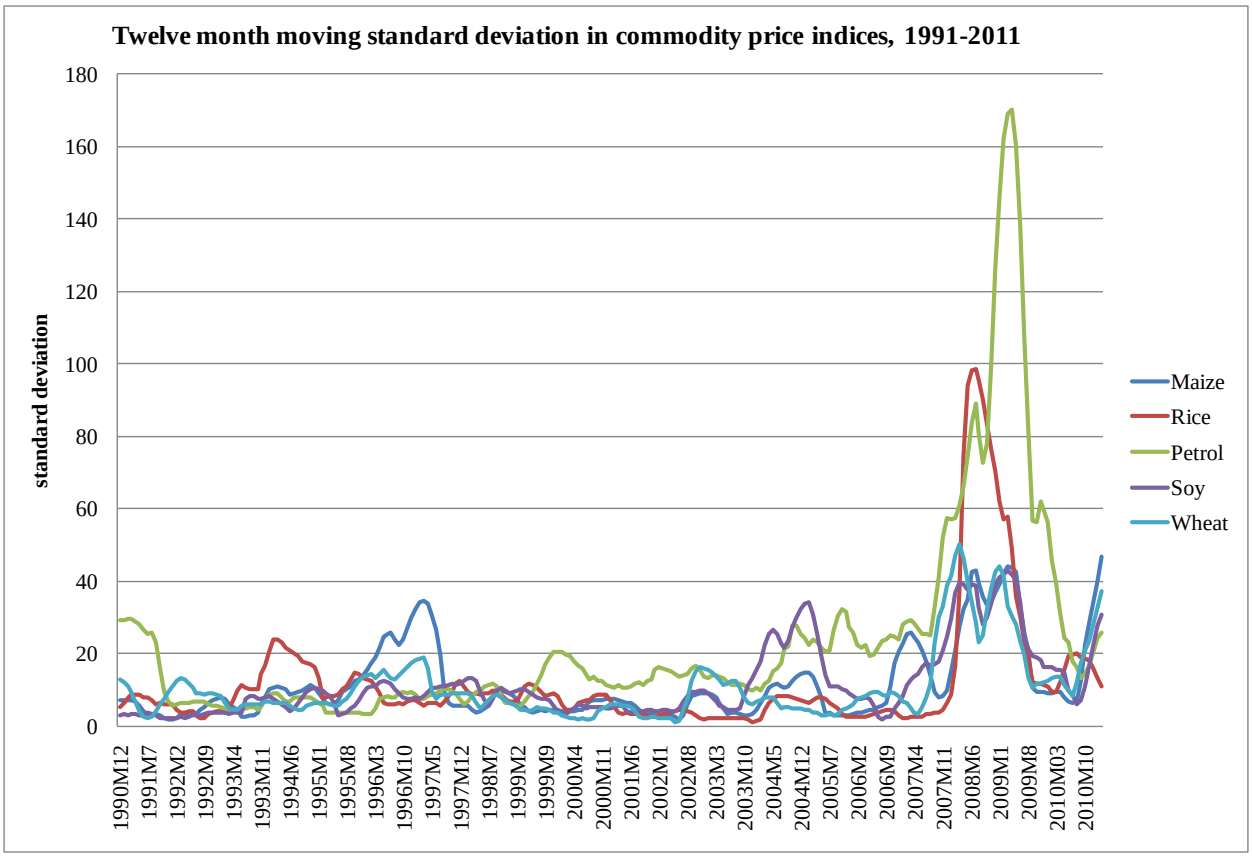
Twelve month moving standard deviation in commodity price indices, 1991-2011
standard deviation
180
160
140
120
100
80
60
40
20
0
1990M12
1991M7
1992M2
1992M9
1993M4
1993M11
1994M6
1995M1
1995M8
1996M3
1996M10
1997M5
1997M12
1998M7
1999M2
1999M9
2000M4
2000M11
2001M6
2002M1
2002M8
2003M3
2003M10
2004M5
2004M12
2005M7
2006M2
2006M9
2007M4
2007M11
2008M6
2009M1
2009M8
2010M03
2010M10
Maize
Rice
Petrol
Soy
Wheat

Figure 5

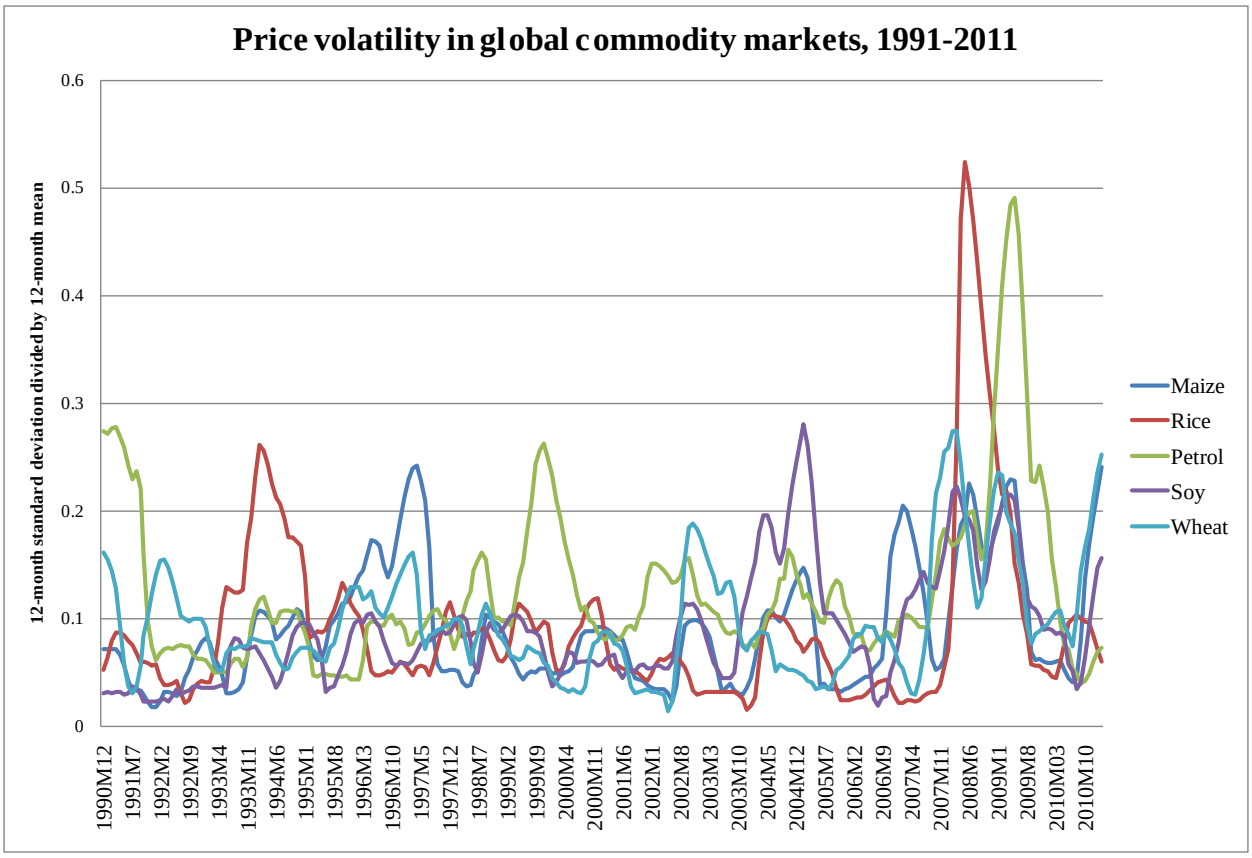
Price volatility in global commodity markets, 1991-2011
12-month standard deviation divided by 12-month mean
0.6
0.5
0.4
0.3
0.2
0.1
0
1990M12
1991M7
1992M2
1992M9
1993M4
1993M11
1994M6
1995M1
1995M8
1996M3
1996M10
1997M5
1997M12
1998M7
1999M2
1999M9
2000M4
2000M11
2001M6
2002M1
2002M8
2003M3
2003M10
2004M5
2004M12
2005M7
2006M2
2006M9
2007M4
2007M11
2008M6
2009M1
2009M8
2010M03
2010M10
Maize
Rice
Petrol
Soy
Wheat

Table 1. Futures and Options Market Long Positions by Trader Group
January 2006 – December 2008

	Position Limit (# of contracts)	**Average Position Size (# of contracts)**		
		Commercial traders	Non-commercial traders	Index traders
Corn	22,000	1,499,	1,134	16,260
Soybeans	10,000	1,052	590	6,500
Wheat	6,500	964	553	8,326

Source: UNCTAD Trade and Development Report 2009, p. 64.