November 2011

Regulation of Commodity Derivatives markets within MiFID – Price formation drivers

Introduction

ISDA, FOA and EFET (hereafter *the associations*) consider that rising prices of commodities can have a significant detrimental impact on consumers in both developed and developing countries. This is true in the energy sector as well as industrial or food commodities.

We also strongly believe that high volatility in commodity prices is an area where both consumers and producers may face problems; and, at the same time, that market participation allows hedging strategies against volatility and also allows liquidity which can contribute to *lower* volatility.

The seriousness of the issues makes it all the more important that the debate around commodities markets is based on objective evidence and dispassionate analysis. In this context, we welcome the numerous reports which have been released in the past two years relating to commodities markets (a number of which we list in annex).

The associations also recognise that the world's rising population in the coming decades (from 6bn in 2010 to an estimated 9bn in 2050), will imply ever-increasing demands on limited resources and provide a challenge for industrial producers, market intermediaries, policy makers, governments (including by extension the G20) and international organisations (UN, OECD, IOSCO). In this context, we are aware that food security is a primary objective.

This note 1) explains how commodity prices appear to be driven over various lengths of time (the short, medium and long term); 2) considers the role that investors may play, whether positive or negative; 3) explains the role of derivatives contract and linkage between cash-settled derivatives and the spot price; and 4) observes that fundamentals, in particular marginal production costs, have a leading role and that addressing the challenges raised by these fundamentals (demography, changes in demand, access to resources, transportation and storage, climate change …) is the key to mitigating, where possible, price volatility and excessive price levels in the coming decades.

Executive summary

- **In the middle and long-term, fundamentals are driving commodity prices and price volatility; transparency is needed in physical markets: the development of reliable and regularly-published statistics in physical markets is crucial**, in particular physical market information on the emerging markets.

- **Long-term oriented public policies are needed to address the challenges that the demographic pressure will create in the production and in the distribution of basic commodities, especially food**.

- **Fundamentals are more than just production, consumption, and inventories. They include standard costs at multiple stages of processing, and unavoidable and unpredictable risks that range across the political, economic, weather, and technological spheres**. Volatility is an inherent aspect of commodity markets because of these risks and the impossibility of perfectly aligning the investment and consumption cycles: the business cycle can never be abolished.

- **The recent impression of abnormal volatility in commodities markets, particularly in oil, is mostly an artifact of daily changes around a higher price level, which is itself mostly the result of rising marginal production cost. This impression disappears when the higher price level is compensated for by examining volatility as daily % change**. Moreover, while volatility increased in both 1990 and 2008 (which is normal in progressing from the peak of an economic cycle into recession), average realized volatility tended to be higher in 1996 to 2000 (before index investors entered commodity markets) than in the period 2000 to 2008.

- Monitoring of abusive trading is crucial and the introduction of **a specific definition of inside definition relating to commodity derivatives in the Market Abuse Directive reform shall be supported**.

- **Futures markets play a decisive role in commodity price discovery**, being underlined that a commodity futures is not trading the underlying commodity.

- **Commercial entities use futures to hedge, or insure their production, consumption, or working inventories** against the uncertain effects of fluctuating prices;

- **Long-term financial investors are helpful in the markets not only because they bring liquidity but also because they can bring balance**. In equity markets, long-term investors bring stability in issuers' shareholdings and governance; equally, in commodities markets long term investors also bring stability, especially when the markets have to face short term events that have immediate effects (climate shocks, changes in political situation).

- **While they might intensify very short term trends, investors cannot create them**; the empirical evidence, which comes from the CFTC, confirms that index investors do not amplify prices away from fundamentals beyond the very short term.

1. Fundamentals drive commodity prices and price volatility, but more transparency is needed in physical markets to prove this fact

Collectively, the numerous studies that have recently examined commodity markets reveal that fundamentals are the driver of commodity prices and price volatility in the medium and long term. The role of financialisation is debated in the short term.

We think that observation of how financialisation can affect short term trends is however blurred by the lack of transparency of the fundamentals and of the physical commodity markets, leading to concerns in some quarters about non-fundamental influences on price. This reality is aggravated in situations where data are hard to come by even for the most expert students of fundamentals (such as in Chinese demand and inventory patterns), spotlighting a general need for greater transparency in basic physical market information in the emerging markets.

The associations **strongly believe that the development of reliable and regularly-published statistics in the physical markets (applicable to both production and storage) would go a long way toward alleviating suspicions that commodity markets are not functioning properly or fairly**, levelling analytic asymmetries among stakeholders.

As such, the **associations affirm their support for the objectives of the regulation of commodities markets: enhancement of market integrity and transparency (in physical as much as financial markets) and prevention of market manipulation**.

We state that futures markets play a decisive role in the context of commodity price discovery. The relationship between futures markets and physical markets must be clearly assessed. It is crucial to clearly separate lawful activity and abusive trading which is already covered by Market Abuse Directive (for financial instruments), and by REMIT for power and gas European markets. We continue to support the implementation of these legislative tools and the policing of market behaviour by regulators. We **therefore strongly support the introduction of a tailored definition of inside information relating to commodity derivatives within the Market Abuse Directive reform**.

We also agree that there is a need to craft prudent, long-term-oriented policies to address the challenges that demographic pressures will create in the production and distribution of basic commodities, especially food. Commitments at the level of G20 and probably UN are crucial, and policy makers shall assess the necessary interconnectedness between necessary long-term investments and the policies to address these challenges: irrigation systems to provide people with potable water, access to seeds, fertilizers, mechanized equipment, storage elevators, barges and trucks.

Given the critical importance of meeting these challenges successfully, the associations have carefully studied and considered the analytic methodologies, evidence, and logic of many reports on the role of investors in commodity markets released by public institutions as well as the private sector and academics (see a list of reports in Annex).

2. The economic role of financial market participants in commodity markets

The role of financial investors

The associations highlight that the global production value across the 23 biggest commodity markets in 2011 exceeds US$8 trillion[1] and that in comparison managed money (investment portfolios) linked to commodity prices is around US$400 *billion*, of which more than half (US$260 billion) is in passive indices: passive index investors invest money in commodity markets and hold that investment for long-term gain.

Overall, this means that the total collective positions of all financial investors represent less than 5% of the production value of global physical commodities markets and that only 1.75% pursues an active investment strategy. The physical value calculation excludes all consumers and middle-men (e.g., transporters of commodities), which would shrink the relative size of commodity paper investments even further. We agree that investors with active investment strategies have to be monitored since their reactions to booms or busts within the cycle can affect short term prices and then accelerate some trends (the situation is not so different from short term active investors in equity markets who can accelerate price swings) but long term investors provide patient and ever-reliable capital and only expect a fair and reasonable rate of return over the long run.

In this regard, it is helpful to underline that a commodity futures market, such as ICE Brent or CBOT wheat, is not actually trading the underlying commodity. These futures markets are trading the *probabilities* of where crude and wheat prices will be at certain points in the future, as derived from the real and ever-changing fundamental risks in the underlying and other physical markets. As these risks change constantly due to unpredictable weather and numerous other fundamental factors (for instance export bans), greater futures paper volumes will produce better transparency and more precise price discovery. Moreover, arbitrage keeps physical and paper markets in constant communication with each other, while contract expiries regularly force a clearing (once per month in oil) of forward-looking assessments back to the current condition of the underlying physical markets.

In this context, investors in index products are regular sellers of futures, as they must routinely roll their positions as expiries near. Moreover, because they target certain dollar exposures as a share of their total portfolio, as prices rise the index investors' demand for futures falls and they buy less during rolls.

Conversely, when prices fall, the portfolio weights also fall below target and the index investor will buy more to offset the shortfall. In this way, the index investor adds to the overall stability of the market because he is a net seller when the market calls for supply and a net buyer when the market calls for demand. This effect is apparent in the data for index investor positions in the CBOT wheat market since 2006, especially in 2007-08 when the net position of index investors steadily dropped from 201 thousand contracts (week of January 5, 2007) to a low of 127 thousand contracts (week of December 19, 2008).

When foodstuff prices were at recession lows in 2008 and 2009, many developing countries have benefited from long term investment funds which bought the paper food markets and gave farmers liquidity for hedging their forward price risk, rather than carrying that risk entirely in a cash market depressed by economic recession. In parallel, after a poor wheat harvest in 2010, Russia banned physical wheat exports, exacerbating food shortages in poorer countries and creating higher price volatility for consumers least able to weather it.

[1] In 2010, the global production value of the physical commodities markets (excluding all other stages of processing and use) exceeded US$6.6 trillion (around 10.5% of world GDP). Source: Bloomberg, JP Morgan.

Contrary to assertions that index investors were (a) buying increasingly larger quantities of wheat during 2007 and 2008, and (b) doing so without regard to fundamentals, CFTC data show that index investors were steadily selling down their quantity exposures as the unit value of wheat increased. Perhaps even more important, as prices bottomed in 2009 and 2010, index investors started increasing their net exposure, from the 127 thousand contract low in late 2008 to nearly 230 thousand contracts by mid-May 2010.

The associations consequently believe that, while market participants might intensify very short term trends, they cannot create them; and the empirical evidence, which comes from the CFTC, does not support the contention that index investors amplify prices away from fundamentals beyond the very short term. To the contrary, the data show that the actions of investors tends to counteract the highest and lowest prices at moments of greatest fundamental stress, helping move markets back toward mean prices. This is an important reality to understand, as studies that have not carefully considered the CFTC data tend to reach the opposite conclusion.

Other fact-based analyses also conclude against causality from speculators, noting even the financial shock of 2008, the worst since the Great Depression, pales in comparison to fundamental factors:

- the European Central Bank, for example, has stated: " *the destabilizing financial shock only explains about 10 percent of the total variability in oil prices, and shocks to fundamentals are clearly more important*" [2];
- The FAO also states that: "*Unexpected crop failure in some major exporting countries followed by national responses and speculative behavior rather than global market fundamentals, have been amongst the main factors behind the recent escalation of world prices and the prevailing high price volatility*"[3]. This final remark does assess the part of the volatility that can be attributed to financialisation in the very short term but underlines that the speculative behaviors, which shall be fought, only followed the crop failures and the national protectionist responses.

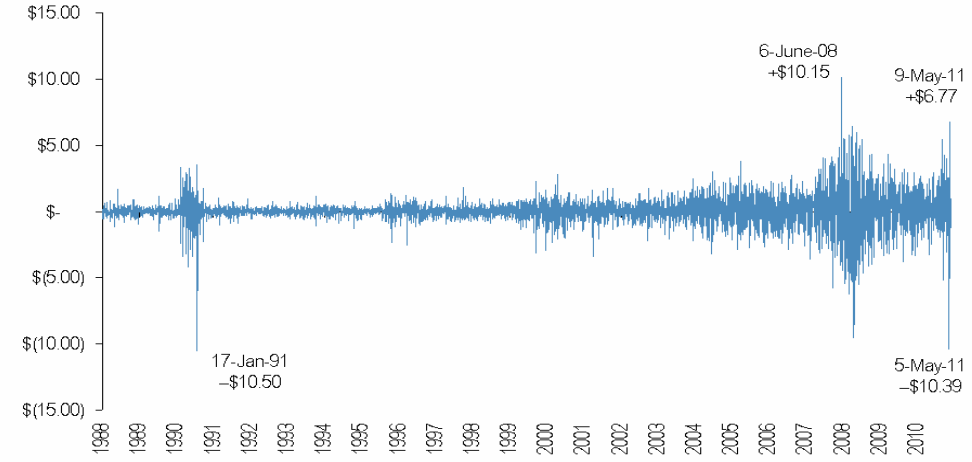
[2] European Central Bank, Working Paper Series, June 2011, "Do financial investors destabilize the oil price?".

The impression of abnormal volatility shall be confronted to the facts.

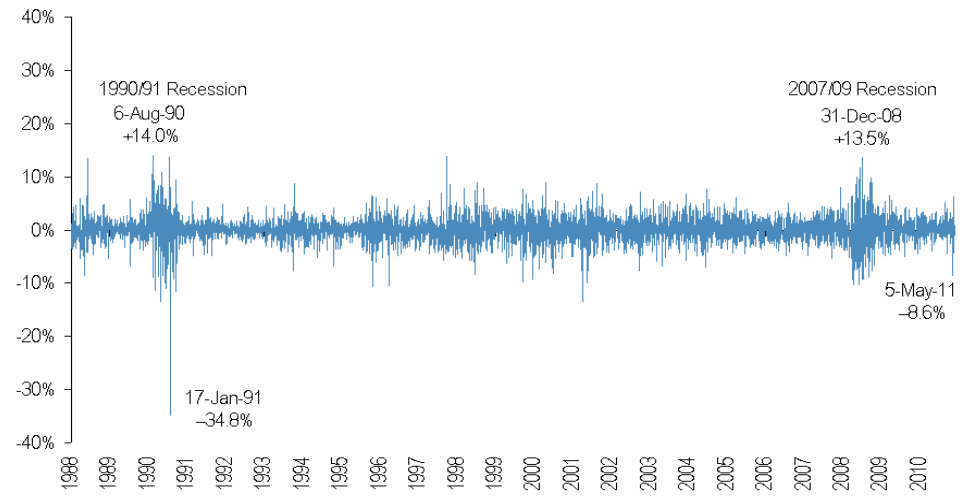
It is crucial to assess the actual condition of volatility as opposed to the impression of volatility.

For instance, in oil markets, the recent impression of abnormal volatility is an artifact of daily changes around a higher price level, which is itself the result of rising marginal production cost (a fundamental). **Defining volatility as the daily price change in currency per quantity terms ignores the fundamentally-driven increase in production cost**. **The effect disappears when the higher price level is compensated for by examining volatility as daily % change**. The following graphs illustrate this effect.

Daily price change in rolling prompt ICE Brent oil futures price
US$ per bbl



Daily price change in rolling prompt ICE Brent oil futures price
% change



The only difference in these charts is that the first one plots ICE Brent crude oil daily price changes in USD per bbl, while the second takes the same data and plots daily percentage change. Very quickly the impression of abnormal volatility must recognize its sensitivity to the price level.

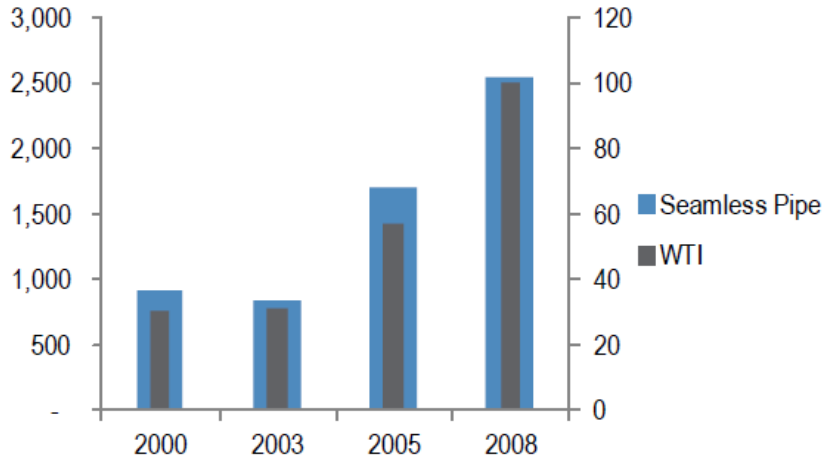
Behind the fact, we consider that **defining volatility as the daily price change in currency per quantity terms introduces systemic distortion in two main ways**.

First, it is the natural tendency for nominal prices to appreciate through time, all the more that marginal production costs also increase (or decrease) at a rate often beyond the rate of headline consumer price inflation. Marginal production costs are among the most powerful drivers of commodity prices.

Cost analysis is however surprisingly absent in most papers on commodity price formation and the role of speculators. As regards Oil markets, you never find the asking or the answering of the essential business question: how long is the pipe? Changes in extraction requirements and associated production costs are a critical factor in setting prices: : Petrobras reports that the well depths of its key oil discoveries offshore Brazil have increased from 4,343m in 2003 (Roncador) to 7,000m in 2007 (Lula), a 12.7% annual compound growth rate. The *two miles* of extra steel to make the drilling well long enough are costly. The extra cost raises the market price required to break even on getting oil from Lula instead of Roncador—large incremental supplies needed to meet global demand growth. At the same time, conventional discoveries are becoming scarcer: the global count of shallow water wells dropped by 25% between 2005 and 2009, despite the increase in oil prices

The following graphs shows how the price of seamless pipes used in oil extraction have risen in the past ten years and have helped guide the evolution of oil price.

Figure 1: Rising seamless pipe prices are one of the several key cost drivers of oil prices
Seamless steel pipe cost, $/t (LHS), prompt NYM WTI crude oil price in US$/bbl (RHS), annual averages



Source: Company Reports, ICE, J.P. Morgan Commodities Research

In summary, rising marginal production costs in energy in turn raise production costs for most other commodities (e.g. diesel fuel used by farm equipment to harvest wheat). As rising costs drive market price levels higher, volatility remains proportional to price in percentage terms; however, by definition this means that price swings in absolute terms ($/bbl) are larger than before. With fixed costs relatively high, larger swings in revenues mean even average-cost and low-cost producers have greater incentives to hedge than before. Combined with the hedging needs of the high-cost producers who are bringing new marginal supplies to meet new demand, this creates a rapid increase in the volume of offered hedges. These hedges allow optimization of free cash flow and working capital, while protecting the hedged enterprises in the event of very large and inherently unpredictable price moves (such as the volatility in oil prices spurred

by the Libyan Civil War and the strong price decline that followed the Japanese earthquake one month later).

Consumers and investors willingly take the other side of the hedges the producers wish to make, as doing so enables them to hedge their own risks. This insurance transaction is beneficial to all involved parties and, by extension, to the general public. Good policy should focus on the investment requirements necessary to expand spare production capacity and lower marginal and average production costs. Over time, greater production capacity will significantly reduce both market prices and price volatility. Good policy should also focus on protecting the financial tools used to manage capital expenditure hurdle rates and earnings volatility, including the vital liquidity and patient capital supplied by investors.

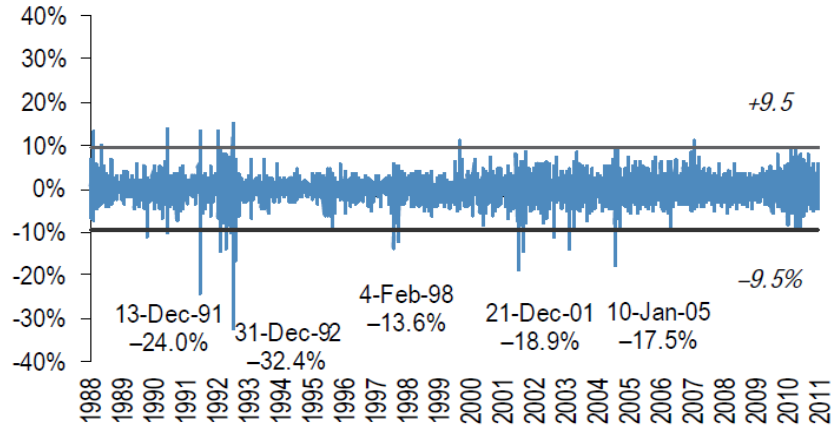
The second error is that the dollar per unit portrait of volatility cannot detect whether volatility is high or low on a proportional basis. Yet, as cost-driven price levels increase, it is axiomatic that normal variation (due to weather, economic cycles, and so on) on the higher base will result in larger absolute price movements. Similarly, price movements will appear smaller in unit terms, when excess production capacity causes market-clearing prices to fall, even if those moves are quite large in percentage terms, demonstrating higher proportional volatility.

As it turns out, the data show that the largest actual volatility since 1988 occurred during the First Gulf War in 1991, not 2008-2011. Moreover, while volatility increased in both 1990 and 2008 (which is normal in progressing from the peak of an economic cycle into recession), average realized volatility tended to be higher in 1996 to 2000 (before index investors entered commodity markets) than in the 2000 to 2008 period to which most studies confine their analysis. This suggests that studies that begin their analyses with 2000 data are excluding important information that policymakers should consider.

The demonstration is even more obvious in NYM heating oil (the primary vehicle for all jet fuel hedging in the world): daily price changes have only once violated a +/- 9.5% band since 2005, though this band was violated more than twenty times between 1988 and 2005:

Figure 17: Daily price change in prompt NYM heating oil

% chg. Controlling for higher cost reveals vol is actually more inbounds than before.



Changes in investors' net positions often move in the same direction as price changes in the short-run, but this association does not prove causality. Indeed, usually both changes are responding to a

third, fundamental factor, such as information about inventory changes or the development of a hurricane.

The warning that “correlation is not causation” shall be kept in mind when interpreting commodity market data. An accounting of fundamentals is not completely or even adequately described by just production, consumption, and inventories. Trade flows are a fundamental, as are production and storage costs, production quotas, export controls, weather events, armed conflict, and risk itself.

Financial investors respond to current and probable future fundamentals; and help communicate this information into markets in real time. This is a valuable economic activity, as this information then becomes available to everybody.

Oil markets dominate commodity studies because in any given year they represent between one and one third of the worldwide production value of commodity markets. Second, oil plays an important role in setting costs and guiding the price evolution of most industrial commodities and agricultural commodities in two ways:

- First, biofuel production is an important demand factor: “*The decision by some governments to introduce blending requirements and subsidies for biofuel production is considered to play a significant role in the recent price hikes of grains; they also strengthen the correlation between oil markets and agricultural markets*”, see UNCTAD report on Price formation in financialised commodity markets, June 2011, box 2, page 11.
- Second, we shall consider how far agricultural production would get without the diesel that runs the tractors.

The role of derivative contracts

Commercial entities use futures to hedge, or insure their production, consumption, or working inventories against the uncertain effects of fluctuating prices. The acquisition of this valuable hedging enables them to lock in certainty on cash flows, thus reducing earnings volatility and freeing up working capital for more productive uses, such as investment in equipment and hiring labor.

This economic activity, which reveals private information to the market both reduces risk for the hedger and facilitates price discovery in the physical markets, as it allows market participants to establish and to update continuously fact-based opinions about the condition of the world.

Financial actors are essential for the performance of this economic function, as they provide liquidity that tends to be lacking when markets are confined to producers and consumers alone. This gap filled by investors emerges because it is easier to substitute physical consumption during adverse price movements (buy cheaper wheat than expensive corn to feed cattle) than it is to substitute production (the farmer planted corn not wheat).

This difference in flexibility in the physical market in turn means that producers tend to have stronger incentives to hedge than consumers, who can try to change their physical procurement on the basis of relative price rather than trying to manage that risk through futures market operations. In providing the cost-effective liquidity that the futures market needs to find equilibrium, investors often but not always are seeking a profit on price movements. Sometimes they seek to hedge risks, such as the embedded oil cost risk they may possess in owning the shares of an airline that refuses to hedge some or all of its fuel consumption.

Insufficient participation by financial actors will tend to result in low liquidity and potentially large seasonal price swings, as shown in the following graph taken from a David S. Jacks analysis on onion futures markets half a century ago (i.e., before any passive index investors)[4]:

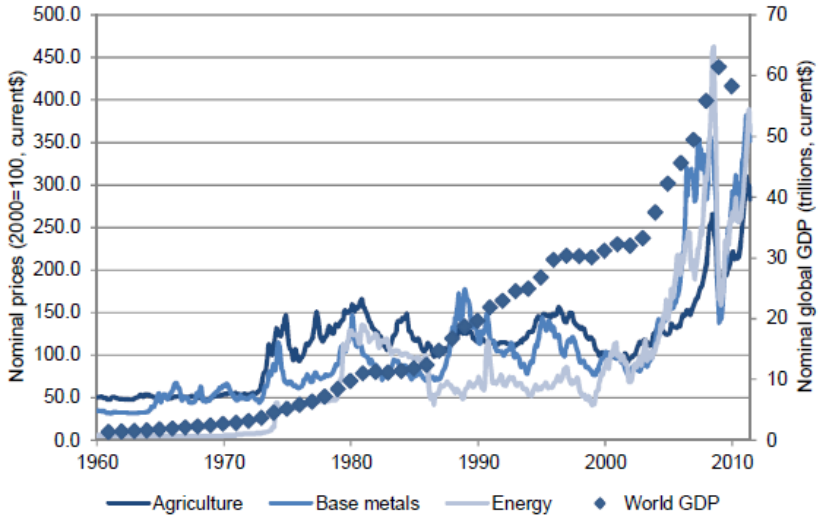
	5 YEARS		***3 YEARS***		***1 YEAR***	
CHICAGO ONIONS, 1953-63 (monthly)	*With futures*	*Without futures*	*With futures*	*Without futures*	*With futures*	*Without futures*
I. Coefficient of variation	*0.0978*	*0.0691*	*0.0770*	*0.0708*	**0.0631**	**0.1027**
II. Average monthly change	**0.1926**	**0.1996**	**0.1883**	**0.1942**	**0.1633**	**0.2543**
III. Likelihood ratio test (all years, k=2)			**3.8744**			

[4] David S. Jacks, «*Populists versus theorists: futures markets and the volatility of prices*»: "futures prices are reliably anticipatory as they represent close approximations to the best possible current appraisals of prospects for the future" (p.346); about the prohibition of the Chicago onion futures market in 1958: "as [figures] show, there is reason to believe that futures markets were again associated with lower levels of price volatility. Although the coefficient of variation only Weakly corroborates this interpretation, the other two tests provide strong support. Moreover, the coefficient of variation may be unduly affected by the massive increase in the average price of onions over the period from $1.30 to nearly $2.50 per 50 pound sack, clearly seen in Fig. 2. Another aggravating factor in the statistics for the 5-year horizon has been identified by earlier researchers: the aftermath of the Korean War and the accompanying drop in war-time procurements by the Department of Defence. Making due allowance for these concerns, it seems that the combined evidence on the average monthly movement of prices—which, of course, makes no recourse to the highly variable figures for average price—and the likelihood-ratio test—which is also significant given the highly seasonal nature of the onions market—is in accord with the interpretation of dampening effects of futures markets on commodity price volatility».

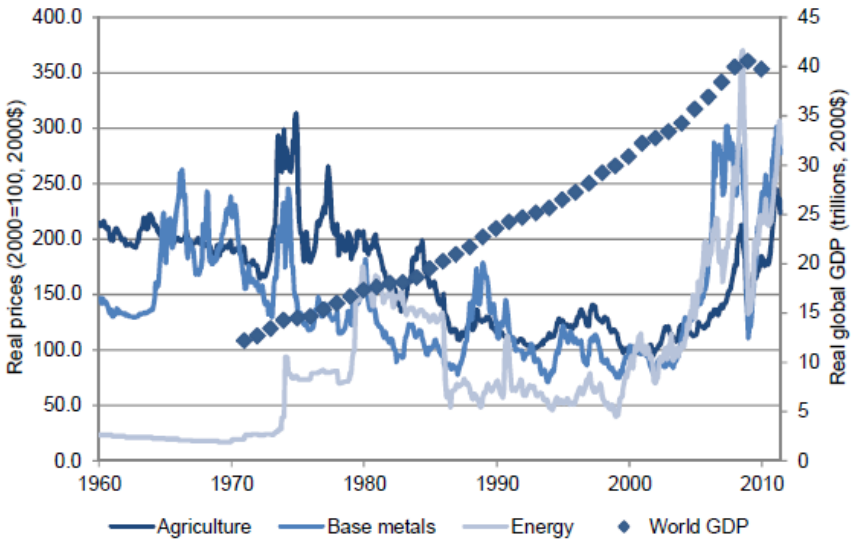
Last but not least, the associations underline that policy makers have a tendency to focus only on years of high increase in prices (like 2010) without considering long stretches of flat or decreasing prices (1996 to 2005). Indeed, it is problematic that many analyses exclude low price periods altogether, such as prevailed in 1998 and 1999. These sustained, very-low-price environments, which resulted in substantial production cutbacks, go a long way toward explaining the subsequent booms in commodity prices when strong emerging market demand arrived.

In the period up to 1995, commodity prices were generally flat in comparison to global GDP (they increased at the same rate). From 2005, the period of rapid commodity price growth has merely been sufficient to realign prices with global GDP once more. The real anomaly was the 1995-2005 period and not the recent period of what might be considered price correction, as the following graphs suggest[5]:

Nominal commodity prices and global GDP (1960-2011)



Real commodity prices and global GDP (1960-2011)



[5] See FTI, « *the impact of speculative trading in commodity markets – a review of the evidence* », page 16 and 17: "commodity prices have decreased or remained flat from the mid-70s to the early 2000s whereas real GDP has increased substantially during the same period. However, during the 2000s real commodity prices have risen much faster than GDP".

The relationship between cash settled derivatives and the spot price

A common complaint about the so-called financialisation of commodity markets is that commodity futures markets are many multiples larger than the size of the underlying physical market.

For instance, some studies note that the annual volume of CME wheat trades is 46 times the size of US production (2008 data). This observation, which is meant to suggest that futures markets are trading phantom bushels of wheat, confuses volume (a measure of velocity of supply) with production (a measure of output of supply).

Paper volume rises as risks associated with production shift through time and those changes in physical risk prompt associated changes in paper exposures. Imagine a major hurricane that suddenly flares up and genuinely threatens the Gulf Coast, only to peter out without causing any damage.

Importantly, physical markets also have volume: there are multiple physical transactions that bring a single bushel of wheat from the seed vendor to the farmer to the trucker to the elevator to the marketer to the barge captain to the miller to the baker.

A better like-for-like comparison would be to compare the total volume of transactions in the paper market against the total volume of transactions in the physical market. The latter is difficult to estimate: it is a scalar times production and the scalar will change through time as risks change.

Note that in the simple illustration above, there are already 8 physical agents making transactions on a single bushel (8X production) and the wheat has not yet reached a single food packager, wholesaler, retailer, restaurant, or consumer. This supply chain is an example of velocity in commodity physical markets.

Furthermore, if the CBOT paper volume were to be some large multiple of the physical volume, would this result in non fundamental prices? It seems unlikely, because the large volumes (each of which represents a purchase and a sale) would constantly stress-test assumptions and opinions against a regular touch to the physical markets at expiry. The CBOT futures price would be closer to the fundamentals of the underlying, not further away.

Indeed, the cash market can only tell us information about the state of the world here and now: the paper market tells us *today* about fundamental risks associated with the future. This is extraordinarily valuable information. Anybody with an internet connection can access that information through CBOT prices, essentially for free.

The annual world production risk in crude oil is worth some US$3.8 trillion, before any velocity effects (89 million b/d * 365 days * $116 per bbl). The total OI of the three major crude oil contacts for the 12-month forward window now tallies to about $207Bn, including all of the commercial positions, not just the investors'. The math implies an aggregate hedge ratio below 7%. Even if the analysis of the relative sizes of the paper and physical markets focuses on a VAR metric (let's say the standard deviation of annual global production value), that number is still at least $950Bn, implying a hedge ratio of about 22%. By definition, investors' positions represent a fraction of this fraction.

Index positions across all commodities tallied to about $260Bn at the 2008 cyclical peak. Even if we were generously to assume that 40% of these assets went to crude futures, the investors' oil allocation would equate to about US$108 Bn. This begs an obvious question: why is the US$108 Bn of passive index money so exclusively more important for price discovery than the $3.8 Tn of active producer transactions each year? Or the tens of trillions of dollars in physical crude transactions once we tally all of the middle-market transactions that bring petrol from the bottom of the Atlantic Ocean to local fuel stations?

Information in physical market flows is important.

In conclusion, it appears that:

- Fundamentals are more than just production, consumption, and inventories. They include costs at multiple stages of processing, and unavoidable and unpredictable risks that range across the political, economic, weather, and technological spheres.
- Volatility is an inherent aspect of commodity markets because of these risks and the impossibility of perfectly aligning the investment and consumption cycles, which means the business cycle can never be abolished.
- Cost analysis has been inappropriately excluded -and volatility analysis has been inaccurately specified -in nearly all of the studies that purport to find a causal relationship between commodity speculators and supposedly non-fundamental commodity prices and price volatility. When these errors in cost and volatility analysis are corrected, the studies will reach different conclusions about the drivers of price.
- Futures markets, relying in no small part on the contribution from speculators and investors, reduce physical market price volatility, to the benefit of the hedgers and to broader society.
- Appropriately calibrated market transparency (on both physical and financial markets) and rules preventing market manipulation can address the issues arising from financialisation of the markets.
- Long-term financial investors are helpful in the markets not only because they bring liquidity but also because they can bring balance. In equity markets, long-term investors bring stability in issuers' shareholdings and governance and we think that in commodities markets they can also bring stability, especially when the markets have to face short term events that have immediate effects (climate shocks, changes in political situation).

3. The inclusion of cost analysis is broadening and deepening the understanding of what is happening in commodity markets

ISDA observes that the principal driver of rising price levels is the rapid escalation of marginal production costs. These rising costs are the direct consequence of strong and sustained emerging market demand growth, exhausting spare capacity and forcing investment in costlier and ever-more-difficult-to-access sources of supply. As a result, marginal costs of production are much higher than average costs and are driving price levels. It is critical that regulators and market participants acknowledge the impact of these costs.

We also note that:

- Measurements of volatility over time should compensate for price level by calculating in % terms, not currency per unit because currency per unit gives a false idea of the real volatility when price levels are high;
- Passive commodity investors seek portfolio stability and therefore buy more at low price and sell more at high price; in other words, they will tend to dampen volatility and trends, rather than add to them;
- Producers face massive downside price risks, as higher prices spur new investments and technologies; hence a very high financial risk exposure if market prices are going down;
- Trade barriers, such as export bans, create artificial bottlenecks and increase prices and price volatility: protectionism is definitely the enemy of balance in commodity markets.

The centrality of fundamentals in explaining commodity price volatility has been acknowledged over and over again. Consider this passage from a joint report by the world's leading NGOs:

- **European Central Bank**, Working Paper Series, **June 2011**, "***Do financial investors destabilize the oil price?***", highlighting that: "*Financial investors in the futures market can destabilize oil spot prices, although only in the short run (…). However, shocks to oil demand and supply remain the main drivers of oil price swings* (p. 4)";
- **FAO, IFAD, IMF, OECD, UNCTAD, WFP, the World bank, the WTO, IFPRI and the UN HLTF** report on "***Price volatility in food and agricultural markets: policy responses***", 3 May 2011, highlighting that "*Most agricultural markets are characterized by a high degree of volatility. Three major market fundamentals explain why that is the case. First, agricultural output varies from period to period because of natural shocks such as weather and pests. Second, demand elasticities are relatively small with respect to price and supply elasticities are also low, at least in the short run. In order to get supply and demand back into balance after a supply shock, prices therefore have to vary rather strongly, especially if stocks are low. Third, because production takes considerable time in agriculture, supply cannot respond much to price changes in the short term, though it can do so much more once the production cycle is completed.*" (p. 8)

  This study spotlights the key fundamental drivers that are really driving current and coming food prices and price volatility (p 18-20):

  - **Growing population and income in emerging and developing countries** will add significantly to the demand for food in the coming decades. By 2050 the world's population is expected to have reached about 9bn people and the demand for food to have increased by 70% to 100%. This alone is sufficient to exert pressure on food commodity prices, unless production, storage capacities and transportation

networks are tremendously and rapidly improved in emerging and developing countries;

- **Agricultural commodity prices are becoming increasingly correlated with oil prices**. Oil prices affect agricultural input prices directly and indirectly (through the price of fuel and fertiliser, for example). In addition, depending on the relative prices of agricultural crops and oil, biofuel production may become profitable (without government support) in some OECD countries;
- **Climatic factors** have indisputably contributed to the price rises in 2007-2008 and again in 2010. In 2008, an already tight market situation for wheat was aggravated by drought in Australia, which is an important supplier of wheat to world markets. Canada, another important supplier, also experienced weather related low yields for several crops. More recently, drought followed by fire in the Russian Federation, fears about the Australian and Argentinian crops, and several downward revisions of US crop forecasts in late 2010 and early 2011 have brought strong market reactions and soaring prices;
- During the 2007-2008 period, some **policy measures put in place by a number of governments** contributed directly and indirectly to the crisis (**export restrictions, hoarding**), increasing the amplitude of price movements and in some cases provoking price increases that were otherwise inexplicable in terms of the market fundamentals. Inappropriate policy responses also contributed to volatility and could continue to do so unless the international community is able to take steps to avoid such actions. Additionally, private and public actors responding to the general nervousness of the markets, or for speculative reasons, engaged in hoarding or precipitated purchases in an already tense market situation;

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Annex – List of reports

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- **IOSCO (International organisation of securities commissions)**, "*Principles for the regulation and supervision of commodity derivatives markets*", September 2011;
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- **European Commission, DG Agriculture and Rural Development**, "*High commodity prices and volatility … what lies behind the roller coaster ride?*", June 2011;
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- **FAO, IFAD, IMF, OECD, UNCTAD, WFP, the World bank, the WTO, IFPRI and the UN HLTF** report on "*Price volatility in food and agricultural markets: policy responses*", May 2011,
- **De Schutter, O.** (**UN Special Rapporteur on the Right to Food**), "*Food commodities speculation and food price crises: Regulation to reduce the risks of financial volatility*", 2010;
- **Baffes, J. (World Bank) and Haniotis, T. (European Commission)**: "*Putting the 2006/2008 commodities Boom into Perspective*". World Bank Research Working Paper 5371, 2010;
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- **Fenton, Colin P., Waxman, Jonah D.** (JP Morgan), "*Fundamentals or fads? Pipes, not punting, explain commodity prices and volatility*", July 2011;
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- **Ghosh, J.**, "*Commodity Speculation and the Food Crisis*", 2010;
- **Jacks, D.S**., "*Populists versus theorists: futures markets and the volatility of prices*", ScienceDirect, June 2006.