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The Need for Transparency in Commodity and Commodity Derivatives Markets

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Abstract

Given the high level of uncertainty in commodity markets, this paper argues the need for transparency-boosting measures specifically tailored to commodity and commodity derivatives markets. In particular, encouraging the creation of a clearing infrastructure for OTC commodity and commodity derivatives markets would be desirable. Moreover, EU regulators should consider setting up a new, more effective market abuse regime aimed at preventing manipulation in both the physical and financial commodities markets. Finally, in cooperation with the G20, EU authorities should consider the creation of an International Commodity Agency to increase transparency and restore confidence in international physical markets for commodities.

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1. Introduction

Although commodity derivatives are lumped together with other alternative investments and seen as a new asset class to conveniently provide portfolio diversification, they are not classic financial instruments as such. Firstly, unlike interest rates, inflation rates, stocks, bonds or other financial or meteorological variables, commodity derivatives' underlying assets are physical commodities with finite supply and sizeable storage and transportation costs. Secondly, commodity and commodity derivatives markets are only partly transparent, and the paucity and unreliability of the data do not provide a foundation for sufficient market integrity. This brings us to a third difference with equity and fixed-income markets: commodity derivatives afford a fundamental price discovery function, coalescing in futures prices information about present and expected supply, demand and inventory, all of which directly affect spot commodity prices. Because of the social utility and informational role attached to futures markets, it is imperative to explore the implications of the *financialisation* of commodity derivatives, whereby more and more institutional investors have entered the market treating commodities as an alternative asset class.

Against this background, this paper argues that transparency-boosting measures specifically tailored to commodity and commodity derivatives markets are much needed. In particular, encouraging the creation of a clearing infrastructure for OTC commodity and commodity derivatives markets would be desirable. Moreover, EU regulators should consider setting up a new, more effective market abuse regime aimed at preventing manipulation in both the physical and financial commodities markets. Finally, in cooperation with the G20, EU authorities should consider the creation of an International Commodity Agency to increase transparency and restore confidence in international physical markets for commodities.

The paper is structured as follows: Section 2 briefly discusses the fundamentals of commodity spot and futures markets. Section 3 presents both physical commodity markets and commodity derivative markets in their usual breakdown categories: agriculture, metals and energy. Section 4 discusses the regulations in the EU and the US concerning commodity derivatives. Section 5 advances certain policy proposals and the last section draws the conclusions.

2. Fundamentals of Commodity Spot and Futures Markets

A commodity is defined as “an intermediate good with a standard quality, which can be traded on competitive and liquid global international physical markets” (Clark et al., 2001, p. 3). Some authors include carbon emissions, interest rates or other economic variables in the definition of commodities. However, for the purposes of this paper, only physical commodities with supply constraints, transportation costs and storage costs are considered.¹

This section starts by giving an historical overview of commodity markets. It then discusses the characteristics of spot commodity markets: responsibility for execution of contracts, market actors, freight and shipping costs, theory of storage, price volatility and transparency. Finally, it explores the fundamentals of futures markets: the price discovery function, the spot-future price relationship with the convenience yield and market actors.

2.1 Brief history of commodity markets

Commodity spot markets originated from trading in agricultural products. They have developed from local, medieval fairs into regional – sometimes global – liquid markets. The gradual organisation of supply and demand through commodity exchanges has brought several

¹ Electricity cannot be stored but has considerable transportation costs and supply constraints. I briefly discuss freight, which is not a physical commodity but has an impact on transportation costs.

advantages to producers, consumers, and to the world economy in general. First, the prices available on commodity exchanges provided information on fundamental market conditions, informing future decisions about production and consumption. Moreover, prices quoted on commodity exchanges supplanted prices set by monopolistic producers, which contributed to an increase in the competitiveness of commodity markets. Second, commodity exchanges lowered transaction costs by reducing intermediaries and facilitating the matching of buyers and suppliers. Third, they provided storage facilities and clearing services, thereby further increasing the liquidity and efficiency of commodity cash markets.

In spite of these advantages, international market integration has allowed producers to increase their market power. The more commodity markets become integrated, the more opportunities for consolidation and market concentration in the industry arise. For example, a handful of players control the world's aluminium market from extraction to semi-finished products. Soft commodities markets such as cocoa and coffee also experience a high level of concentration.

Price volatility has been an inherent characteristic of commodities for centuries because supply, demand and inventories – the main determinants of spot prices – can be affected by such diverse factors as floods, droughts, war, technology, fluctuations in economic activity and the disruption of distribution or production. Moreover, the seasonality of agricultural products has exacerbated this problem, and only with the advent of storage facilities has the issue been somewhat mitigated. In spite of their long-term decline, real commodity prices have witnessed ample short- and medium-term fluctuations throughout history. In particular, volatility has been rising since the early 1970s driven by the demise of fixed parities and increasingly volatile exchange rates (Cashin & McDermott, 2001). Because commodities are generally priced in dollars, massive swings in real and nominal dollar exchange rates vis-à-vis other currencies affect commodity prices both directly and indirectly. Directly means that prices move mechanically in light of exchange rate movements; indirectly means that these mechanical changes affect the supply and demand of the commodity (ibid, p. 23).

Risk management tools have emerged to battle against commodity price volatility. Although certain primitive forms of forward markets existed in the pre-Christian and Middle Ages, the modern practice of forward contracting slowly emerged in Japan in the 1700s and in the United States in the mid-1800s. *Forwards* are defined as contracts between two parties to deliver a certain product at a certain date at an agreed price. By selling crops at the time of planting, producers hedged against the risk that the price of the commodity would drop below a threshold under which production became unprofitable. Forward contracts, however, generated new risks for the parties involved in the forms of *transportation* risk, *delivery* risk and *credit* risk. The first category pertains to the deterioration of goods during transportation, unforeseen changes in shipping costs and extraordinary events such as wars, riots or strikes that may prevent the transportation from happening at all. Delivery risk refers to the concern that the quality and the quantity of the good delivered does not correspond to the agreed contract. Credit risk regards the payment of the good delivered.

The need to counter the risks associated with forwards and the lack of transparency in forwards markets led to the establishment of highly standardised contracts becoming freely exchangeable on the marketplace – futures contracts. *Futures* are similar to forwards, but they are standardised contracts in terms of quality, quantity, date and place of delivery, all of which reduce transportation and delivery risks. Moreover, they are cleared by a clearing-house, drastically reducing the scope of credit risk. From the 1970s on, the increased liquidity driven by the evolution of commodity derivatives has provided a wide variety of risk management tools to producers and consumers of commodities in the form of options, futures and over-the-counter

(OTC) contracts.² Finally, the high level of transparency in futures prices provides information about market conditions and expectations of supply and demand.

2.2 Characteristics of commodity spot markets

Transactions following the stipulation of commodity contracts take place generally with a lag because the goods must be physically delivered. The contract specifies the exact terms of the execution and delivery. At one end of the spectrum, we find Free on Board (FOB) contracts whereby the *buyer* pays for shipping and freight insurance; at the other end of the spectrum, we find Carriage, Insurance and Freight (CIF) contracts whereby the *seller* pays for these costs until the goods arrive at a determined location.³ Many other types of contract specifications exist, but the explanation of these goes beyond the scope of this paper.⁴ In some instances, intermediaries can play a role in the process with a resulting fragmentation of commercial responsibility.

The *actors* in commodity markets are very diverse, and players vary according to the commodities being traded. In general, producers (e.g. farmers, oil producers, refiners, electric utilities, mining companies and others) and consumers (e.g. food industry, wholesalers, airline industry, transportation networks operators, shipbuilding industry and others) of commodities are the main actors of commodity spot markets. In some commodities, however, especially agricultural and metals, traders may play an important role in connecting producers and consumers, sometimes accumulating stocks to clear the market at all times. Moreover, in the last decade financial players such as hedge funds and banks – previously active solely in commodity derivatives – have gradually entered the physical market to gain inside knowledge into the underlying assets. For instance, Goldman Sachs owns a stake in an oil refinery and a natural gas pipeline in the US. JP Morgan is also involved in the business through the hedge fund Highbridge Capital, which acquired a stake in the Louis Dreyfus Group – a historical French commodity trader (*Financial Times*, 2008a; *New York Times*, 2007). Finally, other actors are stockists, commodity brokers, warehouse operators, commodity carriers, insurance companies and insurance brokers. These actors do not usually engage in physical trading.

Freight costs are an important part of commodity spot pricing. The freight spot market is opaque and bilateral. The Baltic Exchange in London collects data from international shipbrokers to form several reference prices among which the Baltic Dry Index (BDI) is the most commonly used benchmark. The BDI is a daily index composed of 22 reference prices of key dry bulk routes.⁵ In order to provide hedging tools, in 1985 the Baltic Exchange launched the Baltic International Freight Future Exchange (BIFFEX), but the lack of liquidity of the contracts convinced the operator to cease trading in 2001. Because the BIFFEX's settlement price was based on an index composed of substantially different routes, market agents were left with substantial risk even after hedging (Geman, 2005, p. 18). Today the most common derivative contracts are Forward Freight Agreements (FFA) specifically tailored to certain

² OTC contracts are direct bilateral financial contracts. This category encompasses forwards, swaps and other complex products such as 'swaptions', swing contracts, caps, floors and spread options. Some OTC contracts are cleared through an exchange, and have similar characteristics to exchange-traded futures – a condition that blurs the distinction between futures and OTC contracts.

³ It is up to the buyer, however, to pay for transportation and freight insurance from the specified location to its own storage facility.

⁴ For a detailed explanation of all types of contract, see the website of the International Chamber of Commerce, <http://www.iccwbo.org/incoterms/id3040/index.html>

⁵ <http://www.balticexchange.com>, accessed 8 September, 2008. The website lists six reasons for freight costs fluctuation (1) fleet supply (2) commodities demand (3) seasonal pressure (4) fuel prices (5) infrastructure bottle-necks (6) market sentiment.

routes. However, the International Maritime Exchange (Imarex) in Oslo still offers BDI-based futures contracts as well as clearing services for FFA.

Commodity stocks are a fundamental drive in determining prices together with supply and demand. The *theory of storage* was developed in the 1930s and 1940s and aims at explaining why economic agents hold inventories. Stocks are beneficial mainly to meet unexpected demand, to avoid frequent changes in produced quantities, and to minimise disturbances arising from production and distribution disruptions (Geman, 2005, p. 24). In order to understand the importance of stocks in determining prices, we shall take the example of the sole non-storable commodity: electricity. The electricity market witnesses spikes in spot prices in an order of magnitude of 20 or 30 times the ‘normal’ level. Because of the price inelasticity of demand, prices must rise considerably to secure equilibrium in the electricity cash market in case of supply shortage. Hence, without the buffer provided by inventory, electricity prices tend to vary widely. Deaton and Laroque (1992) find a strong inverse correlation between price volatility and world inventory across 13 different commodities. Put differently, high stocks reduce price volatility. All these elements demonstrate the importance of inventories in determining both prices and price volatility of commodities.

In light of the sheer number of variables involved, commodity *price volatility* is a complex issue to address. Weather events, seasonality and deterioration of agricultural products, storage and transportation costs, inventories, and fluctuations in economic activity are some of the intervening factors already mentioned. However, the list is not exhaustive. Three more issues are worth discussing: reserves, interrelation of prices, and transparency. The arrival of news regarding proven reserves may be a further shock affecting both the prices and the volatility of commodities, particularly in the case of gas and oil. Because of the exhaustible nature of fossil fuels, the inter-temporal decision to extract today rather than tomorrow depends both on price expectation and proved reserves (see Gros, 2008). Moreover, because the price of oil directly impacts freight and electricity costs (fuel prices), commodity prices show a high correlation. Specifically, the price of oil is the trend-setter in commodity markets. Finally, the lack of transparency in commodity markets affects price volatility, which is amplified by the fast transmission of news through futures markets. Although some markets are more transparent than others, in general complete and reliable information about demand, supply and inventory is hard to come by. This creates uncertainty, and market confidence in pricing mechanisms is generally low, especially in the electricity and gas markets.

2.3 Characteristics of commodity futures markets

The primary functions of futures markets are hedging and price discovery. As discussed above, forwards markets originated because producers needed to hedge against high volatility in the price of agricultural products. The literature also calls this function *risk transfer* because the risk is transferred from commercial players to those speculators who are willing to assume it. Forwards evolved into futures markets in order to limit the risks associated with forward contracting. As liquidity increased thanks to the transparency of futures exchanges and the standardisation of their contracts, the high number of participants has facilitated the transmission of information about commodities to the marketplace.

To see why this is the case, one must look at both commercial players and speculators. In spite of this theoretical divide, commercial players take some speculative positions, using the inside information about the market to bet on prospective price changes. By assuming some speculative risk in the market, hedgers transmit their information on the direction of prices. The same holds true for speculators striving to predict where prices are heading. Overall, the future price at which the market clears supply and demand is considered a fair price.

Sometimes increased participation in futures markets can heighten volatility insofar as information travels more quickly. Some would argue that the fact that information is transmitted quickly allows for arbitrage opportunities to be quickly spotted and neutralised. The evidence on whether commodity derivatives increase or reduce price volatility is contradictory.⁶ In spite of this, futures markets perform a fundamental *price discovery function* coalescing around futures prices all the market information regarding that commodity. Considering that commodity cash markets are professionals' markets in which few actors have good information, futures prices convey actual and expected supply, demand and inventory to a larger audience. When newspapers announce fluctuations in the price of oil, for instance, they generally refer to the price of the West Texas Intermediate (WTI) future contract traded on the New York Mercantile Exchange (NYMEX) rather than mentioning the crude oil spot price, highlighting the importance that futures prices have for the economy.

Box 1. Example of Commodity Derivative Contract

Let us suppose the spot price of wheat today is €180/ton and the 3-month future price is €180/ton. Futures and spot prices rarely converge, but this example would facilitate understanding. Stocking and opportunity costs of holding inventories are ignored. The wheat future contract is 100 tons and the crop has yielded 500 tons of wheat to the producer. The producer expects the spot price to fall further. Therefore he sells 10 future contracts with 5 uncovered contracts. He assumes some speculative risk because he believes he has good information.

On the contrary, by researching on data of supply, demand and inventories of wheat, a non-commercial player has come to the conclusion that future spot prices are bound to rise. He will then take on the risk of the commercial player by buying his 10 futures contracts. Let us assume the speculator is right and the spot price rises to €200/ton after 3 months. The producer has locked in the price of wheat and he will receive after 3 months:

$$€180 \times 1,000 = €180,000$$

The producer only holds 500 tons of wheat and he will have to buy another 500 tons in the cash market to meet his obligation at

$$€200 \times 500 = €100,000$$

Thus, he sold his crop of 500 tons for

$$€180,000 - €100,000 = €80,000$$

The crop could have been sold immediately on the spot market when harvested at €180/ton, hence he made a loss

$$(€180 \times 500) - €80,000 = €10,000$$

The speculator has to pay €180,000 to the producer, but the wheat is now worth

$$€200 \times 1,000 = €200,000$$

Therefore, the speculator receives the wheat and immediately sells it on the spot market, making a profit of

$$€200,000 - €180,000 = €20,000$$

The producer has foregone €20,000 of unrealised profit and made a €10,000 loss on the original crop. However, he has locked in the price of wheat, hedging against a price decline while assuming some speculative risk.

⁶ For differing views see for example (Sahi, 2007) and (Jacks, 2006).

The *spot-futures price relation* is a critical measure in commodity derivatives. The difference between the spot and future price is called *basis*. The basis represents the cost of carrying a riskless arbitrage between the cash and future markets, including storage, transportation, opportunity and financing cost. If the basis does not vary, it means that spot and futures prices are perfectly correlated and the basis risk is zero. Were that to be true, hedging would be perfect and market actors would be able to completely offset price risk in secondary markets (Geman, 2005, p. 14). However, the basis shows high volatility because of the variability of storage costs and of convenience yields. Storage costs depend directly on the level of stocks: when storage space is scarce because of high inventories, its cost increases (Working, 1934).

The *convenience yield* is the benefit accrued by the holder of a physical stock of a commodity. The benefits may be speculative – buying or holding the commodity when prices are low and selling it when prices are high – or industrial – meeting unexpected demand and avoiding disruption in distribution or production. The convenience yield is inversely correlated to interest rates, since the cost of capital will determine the opportunity cost of investing in the commodity; and it is decreased by the cost of storage: the higher the cost of storage, the lower the convenience yield. This stems from the observation that when storage costs are high, the level of stocks is high. Hence, the advantage of holding inventories when stocks are high is low. When the basis is positive the market is in *contango*; when it is negative the market is in *backwardation*.⁷ The basis represents a guide in inventory control, indicating how much the market values holding inventories.

For the futures market to function properly, the underlying commodity has to be homogeneous enough to allow contract standardisation. In the case of BIFFEX, for example, the diversity of the routes traders use to ship their goods did not allow for enough contract standardisation. This left buyers of BIFFEX futures contracts with substantial risk even after hedging, and the contract's lack of liquidity led to its demise. On the contrary, successful futures contracts' underlying assets are homogenous commodities with easily interchangeable qualities such as crude oil, corn and natural gas.

Table 1. World's most traded commodities by number of futures traded

| Rank | Commodity | Volume, Number of contracts traded | | % change from previous year |
|------|--------------|------------------------------------|-------------|-----------------------------|
| | | 2007 | 2006 | |
| 1 | Crude Oil | 253,715,412 | 160,042,943 | + 58.5% |
| 2 | Corn | 119,038,170 | 117,219,536 | + 1.6% |
| 3 | Soybeans | 93,039,576 | 44,794,047 | + 107.7% |
| 4 | Soybean Meal | 76,936,516 | 40,913,814 | + 88.0% |
| 5 | Sugar | 70,779,566 | 48,225,932 | + 46.8% |
| 6 | Wheat | 66,047,895 | 39,442,523 | + 67.5% |
| 7 | Gold | 62,792,565 | 51,541,207 | + 21.8% |
| 8 | Natural Gas | 59,076,945 | 57,717,050 | + 2.4% |
| 9 | Copper | 57,031,798 | 32,859,329 | + 73.6% |
| 10 | Rubber | 49,490,827 | 36,291,679 | + 36.4% |
| 11 | Aluminium | 40,230,422 | 36,420,118 | + 10.5% |
| 12 | Gas Oil | 36,523,730 | 31,032,804 | + 17.7% |
| 13 | Gasoline | 30,971,279 | 17,895,708 | + 73.1% |
| 14 | Soybean Oil | 27,262,059 | 20,709,263 | + 31.6% |

⁷ Contango refers to a situation in which futures prices are higher than spot prices. Backwardation refers to a situation in which futures prices are lower than spot prices.

| | | | | |
|----|-------------|------------|------------|----------|
| 15 | Zinc | 26,323,848 | 12,269,286 | + 114.6% |
| 16 | Silver | 23,416,398 | 20,698,591 | + 13.1% |
| 17 | Heating Oil | 18,078,976 | 13,990,589 | + 29.2% |
| 18 | Coffee | 10,958,189 | 10,362,645 | + 5.7% |
| 19 | Live Cattle | 9,522,395 | 8,601,710 | + 10.7% |
| 20 | Cotton | 9,294,712 | 6,594,563 | + 40.9% |
| 21 | Platinum | 9,169,890 | 11,018,069 | -16.8% |
| 22 | Pepper | 7,681,015 | 4,579,906 | + 67.7% |
| 23 | Lean hog | 7,264,832 | 6,481,001 | + 12.1% |
| 24 | Cocoa | 6,654,679 | 6,264,548 | + 6.2% |
| 25 | Guar Seeds | 6,504,242 | 14,095,704 | -53.9% |

Sources: Commodity Research Bureau, author's own calculations.

The spot market for the commodity has to be competitive, that is no single producer, consumer or trader can offer or demand such a large quantity that its actions affect market prices. If the market structure is not competitive, large players can manipulate spot prices and abuse futures markets to make illicit profits.⁸ In turn, this can decrease market confidence in pricing mechanisms and reduces participation.

The *actors* in futures market can be divided in three categories: arbitrageurs, hedgers and speculators. Arbitrageurs connect cash and futures markets by pursuing arbitrages *cash and carry* and between different maturities. In the case of cash and carry, arbitrageurs sell a forward contract, buy the commodity in the cash market by taking out a loan, repay the storage costs and the loan with the proceeds from the forward, and make a profit. A similar technique is used for arbitrages between maturities. These operations keep cash and futures prices at different maturities in constant interaction and that is why futures prices and spot prices converge at maturity.⁹ Hedgers need derivative contracts to transfer the risk in commodity price to another actor. Speculators are the actors willing to assume that risk, providing liquidity to the contracts. Hedgers and arbitrageurs generally operate with contract maturities below one year: commodity derivatives with longer maturity have low open interest.

As discussed in the box above, commercial players with an interest in the underlying physical commodity do not fall exclusively under the 'hedger' category. By the same token, financial actors who have entered the physical market may have to 'hedge' their positions. Moreover, some commercial players employ *swap dealers* in order to obtain OTC tailor-made contracts. Swap dealers are generally financial institutions such as banks that assume commercial players' risk with OTC contracts, offsetting it with exchange-traded derivatives. An example would help to illustrate this point. No futures exchange offers a liquid future contract for jet fuel. Airline Company A is in need of hedging the price risk of jet fuel, but it must use crude oil futures to offset its exposure. However, A is left with substantial risk after hedging, since crude oil and jet fuel prices may diverge and transportation costs from the contract's point of delivery to A's storage facility are not covered. Hence, A buys an OTC contract from swap dealer B, which tailors the contract to A's needs. B's superior expertise in financial markets and greater appetite for risk drives this choice. B is able to hedge the risk associated with the spread between crude oil and jet fuel prices as well as transportation costs between the exchange's point of delivery

⁸ One of the most effective ways to manipulate markets in commodities is a technique known as "corner and squeeze." See glossary for a full explanation.

⁹ This characteristic is shared by most commodities. There are cases, however, when these two prices do not converge: this may reflect the risk inherent in arbitrage operations.

and A's storage facility. In sum, in today's markets the boundaries between hedgers, speculators and arbitrageurs are increasingly blurred (CFTC, 2008).

In the last decade, new financial players have entered commodity derivatives markets through commodity index funds, exchange-traded funds (ETFs) and exchange-trade notes (ETNs) for commodities. The underlying assumption of this trend is that commodity prices have been – historically – negatively correlated with stocks and bonds prices, providing portfolio diversification and a hedge against inflation. Moreover, they are said to provide a hedge against 'event risk', i.e. to give returns in case financial assets are underperforming due to financial crises or geopolitical events. However, these assumptions do not take into account that as more and more investors enter commodity markets, the correlation between stocks, bonds and commodities prices is likely to increase. As current financial conditions show, investors do not differentiate between equity, debt securities or alternative investments when they have to service their debt obligations or meet margin calls: herd behaviour and de-leveraging can take a toll on commodities as well.

The investment strategy of index funds, ETFs and ETNs is generally to passively follow a commodity index, benefiting from spot returns and roll yields.¹⁰ In the US, this development raised concerns about the role of index traders in feeding ever-rising commodity prices because of their long-only strategy. According to one oft-cited source, assets allocated to commodity indexes have shot up to \$260 billion in March 2008 from \$13 billion at the end of 2003.¹¹ The CFTC has estimated the notional value of index trading to be lower, placing it at \$200 billions as of 30 June 2008 (CFTC, 2008, p. 21). Of \$200 billions, 24% was held by index funds, 42% was held by pension funds and endowment funds, 9% was held by sovereign wealth funds and 25% was held by retail investors (ibid).

3. Commodity and Commodity Derivatives Markets

Commodity markets have greatly different characteristics, resulting from chemical-physical properties of the commodity, market structure, market organisation, regulation and the economics of the industry involved. Based on these elements, commodities are divided into three categories: agricultural, metals and energy. This section discusses each category in order.

Table 2. World's most traded commodities by type and by volume of futures

| 2007 | % of total | 2006 | % of total | Type |
|---------------|------------|-------------|------------|--------------|
| 479,187,728 | 41% | 332,982,389 | 39% | agricultural |
| 398,366,342 | 34% | 280,679,094 | 33% | energy |
| 218,964,921 | 19% | 164,806,600 | 19% | metals |
| 81,288,952 | 7% | 71,594,482 | 8% | soft |
| 1,177,807,943 | 100% | 850,062,565 | 100% | all |

Sources: Commodity Research Bureau, author's own calculation.

¹⁰ See glossary for terms explanation.

¹¹ Testimony of Michael W. Masters, Managing Member/Portfolio Manager of Masters Capital Management, LLC before the Committee on Energy and Commerce, Subcommittee on Oversight and Investigations, United States House of Representatives, 23 June 2008.

3.1 Agriculturals

Worldwide, futures on agricultural commodities as a group have the highest volume of trading (see Table 2). This fact may reflect the origins of futures markets from agricultural products or it may be linked to high price volatility due to meteorological events and seasonality. Another explanation could be that markets have more confidence in the pricing mechanism of underlying assets because of a relatively lower concentration in the industry.

Agricultural products can be further divided into grains (corn, soybean and its derived products, and wheat), soft (cocoa, coffee, cotton, and sugar), citrus fruit (oranges, frozen orange juice) and livestock (cattle, hogs and pork bellies). This section gives an overview of the market structure, market organisation, and physical and derivative markets of agricultural products.

Market structure

Market structure refers to the degree of competitiveness and informational efficiency of cash markets. Each agricultural product corresponds to different market structures, but there is an overall tendency in agricultural markets towards concentration, especially in the industries of seeds, international trading, food-processing and retail supermarkets. International trading in soft commodities, in particular, is dominated by a small number of firms. For instance, the global coffee chain has four international traders and three international roasters controlling 39% and 45% of world's market, respectively. In cocoa, 10 trading houses control the London market – the world's largest where international prices are formed – and the six largest chocolate manufacturers account for 50% of world sales (FAO, 2004). However, it would be a mistake to consider agricultural markets as monopolistic or even cartelised. In effect, markets for livestock, grains and citrus fruits show a lower concentration and the number of producers results in sufficient competition. Moreover, in developed countries, national governments collect statistics about world demand, supply, inventories and trade, and publish periodic reference prices on which cash transactions may take place. Futures prices give a clear indication of market expectations and aid in the transmission of local price changes to international markets. This reduces the scope for price fixing or anticompetitive behaviours.

Market organisation and characteristics of physical and financial markets

Agricultural cash markets are decentralised OTC markets with bilateral contracts using either published prices or futures prices +/- a differential. The International Coffee Organization and the International Cocoa Organization in London publish daily prices collected from commitments of brokers across the globe. In other instances, such as livestock and citrus fruits, price dynamics are more regional. Soft commodities are the most heavily-traded because they are produced in tropical regions and then exported to developed countries. For instance, world coffee exports represent over 80% of world production (FAS-USDA, 2008). Grains and citrus fruits are somewhere in between – with some production consumed locally and some exported to international markets – and livestock markets are the least integrated.

Derivatives transactions on agricultural commodities take place mainly on centralised exchanges. The main futures exchanges for agricultural products are the Chicago Board of Trade (CBOT) – owned by the CME Group – with liquid contracts for corn, soybean, soybean oil, soybean meal; the Chicago Mercantile Exchange (CMEX) – also owned by the CME Group – with fairly liquid contracts in lean hogs and live cattle; the New York Board of Trade (NYBOT) – owned by the Intercontinental Exchange (ICE) – with liquid contracts in cocoa, coffee, white sugar, and cotton; Euronext LIFFE with liquid contracts in cocoa, coffee and white sugar; and finally the Kansas City Board of Trade (KBOT) with liquid contracts in wheat. All contracts are priced in dollars, except futures on cocoa that are priced in sterling. Futures markets in agricultural commodities tend to see a lower presence of banks and other financial

institutions with respect to metals and energy: local producers, agribusiness companies and specialised traders are the most active players (Geman, 2005, p. 163).

3.2 Metals

Metals markets are quite distinct from agricultural and energy markets. In these two latter groups of commodities, the physical form at the downstream level (retail) and upstream level (wholesale) does not change much. Cocoa may become a chocolate bar and crude oil may become gasoline, but the amount of processing from industrial metals to cars or electronic components is infinitely more complex and multi-layered (Geman, 2005, p. 171). Hence, the raw material price does not have a major impact on the finished good and the short-term demand for metals is highly inelastic.¹² For the purposes of this paper only the most actively traded non-ferrous base metals (copper, aluminium, tin, lead, zinc, and nickel) and precious metals (gold, silver, platinum and palladium) are reviewed.

Market structure

Competition in the production of non-ferrous base metals and precious metals is fairly limited. Global aluminium production is concentrated in six dominant firms; production for platinum and palladium is concentrated in two countries with dominant firms: South Africa and Russia. In one recent study, Slade and Thille (2006) found relatively high market concentration in most non-ferrous base metals, except lead. Moreover, they found a statistically significant positive correlation between market concentration and price levels. That is, the higher the competition in the industry, the lower the prices.

Market organisation and characteristics of physical and financial markets

Non-ferrous base metals cash markets are decentralised OTC markets using generally reference prices quoted on the London Metal Exchange (LME) +/- a differential. Gold and silver are traded OTC, and the London Bullion Market Association (LBMA) is the main hub for cash transactions, also publishing widely-followed spot prices (so-called *fix price*) and forward rates (so-called *gofo rate*). Non-ferrous metals have high storage costs and their demand is closely related to the business cycle. Hence, fundamentals are likely to be a major factor in determining prices. By contrast, gold is akin to financial commodities in light of its historical role as anchor of the monetary system and its negligible storage costs. Gold is seen as an inflation hedge, and gold prices have complex interrelations with the euro/dollar exchange rate, interest rates and oil prices (Malliaris & Malliaris, 2008). Silver, platinum and palladium trade generally with gold, but their price dynamics are rather different because they do not share the gold status of quasi-international currency.

LME is a centralised forward exchange with liquid contracts in copper, aluminium, tin, lead, zinc and nickel. All contracts are physically delivered, in the sense that they cannot be financially-settled. However, less than 1% of LME contracts result in actual delivery as most players offset their positions before contract expiration. Other futures markets for metals are: COMEX, a division of NYMEX – which was recently acquired by the CME Group – offers liquid contracts in gold, silver and copper; the Tokyo Commodity Exchange (TOCOM) with liquid contracts in platinum and gold; and the LBMA with forward contracts in gold. Futures markets in metals, especially in gold and other precious metals, see important investments of banks, exchange-traded funds specialised in precious metals, and commodity funds.

¹² This is less valid for precious metals, especially when they are used for non-industrial purposes.

3.3 Energy

Futures in energy have received the most political attention because of the critical importance of crude oil and its derived products for the world economy. Crude oil is the single most traded commodity in terms of volume of futures contracts exchanged, and its price is a fundamental benchmark for inflation expectations and worldwide market sentiment. Moreover, derivatives markets in energy are the most sophisticated, witnessing a large participation of financial players such as banks, asset managers and insurance companies. The energy sector encompasses crude oil and its derived products, natural gas, electricity and coal.

Market structure

Energy markets are quite distinct from each other. The crude oil and the coal markets are global; the natural gas market and refined products markets are largely regional, whereas the electricity market is sub-regional. These differing market structures depend on the cost of transporting gas over long distances; on the non-storability of electricity; on differing environmental legislations; and on the economics of refining capacity¹³ and extraction. However, the crude oil price is a unifying factor insofar as all energy products are influenced by its movements. For instance, long-term natural gas contracts in Europe have their prices tied to reported spot prices for fuel oil and gasoil (Geman, 2005, p. 202). Moreover, changes in crude oil prices affect both electricity and coal prices.

Energy markets witness high levels of concentration in production, but – unlike metals – this is due to the location of reserves rather than economies of scale. Although its domination of the world oil market has diminished since the 1970s, the Organization of the Petroleum Exporting Countries' (OPEC) production still represents 37.3% of global supply and 78% of proved reserves. Saudi Arabia plays a critical role in the crude oil market, since it is the only country with significant spare capacity – a characteristic for which pundits call it “swing producer.” Considering that non-OPEC supply growth is stalling, it is likely that most growth in production will come from OPEC countries in the near future.

Market dynamics for natural gas are more regional because of the high transportation costs associated with Liquefied Natural Gas (LNG), though oil prices may have an impact. The biggest natural gas producers are the US, Canada, Russia, Iran and Qatar, but proved reserves are mostly located in Russia, Iran and Qatar. Although some integration is taking place in Europe, electricity markets are largely national with concentration due to high barriers to entry and difficulties in transportation.

Table 3. Commodity markets by type

| Type of commodity | Market | Market Structure | Market Organisation | Characteristics |
|-------------------|------------|------------------|----------------------|--|
| Agriculturals | Cash | Competitive | OTC, decentralised | Grains and soft global; citrus and livestock regional. Futures prices perform price discovery. |
| | Derivative | / | Futures, centralised | CMEX, CBOT, NYBOT, Euronext |

¹³ Oil refineries cannot process all types of oil, and this has an impact on trade patterns. For instance, it may be more cost-effective to import light sweet oil from distant regions than to build refining capacity to process heavy sour oil extracted from nearby regions.

| | | | | |
|---------------|------------|---|---|---|
| Metals | Cash | Oligopolistic | OTC, decentralised and LME forward market, centralised | Pricing based on LME prices with long-term contracts, global in scope |
| | Derivative | / | Futures, centralised | LME and, to a lesser extent, Shanghai Metal Exchange. |
| Energy | Cash | Production oligopolistic, distribution and extraction low competition | OTC decentralised | Pricing based on information providers as well as futures prices |
| | Derivative | / | Predominantly OTC, decentralised; substantial activity in futures | NYMEX and ICE |

Market organisation and characteristics of physical and financial markets

The crude oil spot market is a decentralised OTC market that is global in scope. By contrast, the natural gas and electricity spot markets in continental Europe are characterised by long-term contracts associated with state-owned companies. On the other hand, in the UK, Scandinavia and the US liquid spot and forward markets in electricity and gas have emerged because of the unbundling of generation and distribution of electricity and gas price liberalisation. Platts is a critical player in energy markets, collecting and distributing data from principals and brokers to form reference spot and forward prices for a wide variety of products: from crude oil to natural gas; from electric power to coal prices. Platts' prices are widely used in conjunction with futures prices (+/- differential) to stipulate cash contracts.

NYMEX and ICE are the most important centralised exchanges for energy futures. NYMEX boasts liquid futures contracts on WTI crude oil, natural gas, heating oil, gasoline, and various contracts based on differentials between qualities of energy products (so-called *crack spreads*). ICE offers liquid futures contracts on Brent crude oil, financially-settled WTI crude oil, gas oil, and natural gas. The Multi Commodity Exchange of India has some liquid contracts in energy, but its futures prices are not used internationally for price discovery. Futures contracts in electricity are still scarcely developed, although they are growing rapidly. In recent years, OTC transactions have come to dominate energy derivatives markets.

4. Regulation of Commodity Derivatives

Although a considerable part of commodity derivatives is traded on regulated exchanges, the majority of transactions take place over-the-counter or on multilateral trading facilities (MTF).¹⁴ By definition, OTC transactions are less supervised than on-exchange contracts, which – to different degrees – are cleared and monitored for market abuse. This section gives an overview of regulation concerning the three main global commodity hubs: London, New York and Chicago. To this end, it will first explore EU regulation to then regulation in the UK. The second part looks at US regulation.

¹⁴ Given the lack of data on commodity derivatives, it is difficult to assess the share of OTC/exchange-traded commodity derivatives. The Bank for International Settlements does not provide notional amounts outstanding for exchange-traded derivatives, but solely for OTC commodity derivatives. The FSA (2007, 17) reports that 85% of commodity derivatives take place OTC. However, this is likely to apply mostly to energy derivatives, as agriculturals and metals derivatives are traded extensively on-exchange.

4.1 EU regulation

The Market in Financial Instruments Directive (MiFID) that entered into force on 1 November 2007 across EU member states includes – unlike its predecessor – commodity derivatives in its definition of financial instruments. Regulated exchanges and MTFs do not have pre- and post-trade transparency obligations for commodity derivatives.¹⁵ Under articles 2(1)(i) and (k) some specialist commodity firms are outside the scope of regulation, and, as a consequence, do not have to comply with capital requirements,¹⁶ organisational requirements and conduct-of-business rules. Exempted firms do not enjoy the passport, but they are still free to provide services by establishing subsidiaries. By contrast, banks, other investment firms and some specialist firms active in commodity derivatives markets fall under MiFID, and by registering in accordance with the home-country principle they can provide services across EU countries without further authorisation. The exemptions for certain specialist commodity firms stem from three related considerations. First, commercial firms should be allowed to manage their commodity price risk without stringent regulation. Second, commodity markets are largely wholesale markets with minimal retail involvement: professionals do not need the same level of protection as consumers. Third, commodity firms pose a low systemic risk as highlighted by the limited consequences on systemic stability of the bankruptcy of firms such as Amaranth Advisors LLC, Metallgesellschaft AG, Enron and Refco.¹⁷

The MiFID exemptions as well as the inclusion of pre- and post-trade transparency obligations for commodity derivatives are currently under review at the DG Internal Market and Services and DG TREN of the European Commission. The Committee of European Securities Regulators (CESR) and the Committee of European Banking Supervisors (CEBS) published joint advice to the European Commission after this had been requested in December 2006 (CESR-CEBS, 2008). CESR/CEBS' advice broadly proposes to leave the exemptions in place for commodity firms but to clarify the extant wording, and to slightly modify the client categorisation regime. Moreover, it recommends to devise “adequate financial resources requirements and qualitative risk management” rather than a full application of the Capital Requirements Directive (CRD) in order to cope with possible systemic risks.¹⁸ Finally, it suggests not extending pre- and post-trade transparency obligations for commodity derivatives contained in MiFID.

As far as market abuse is concerned, the present regulatory framework does not cover most of the market. In effect, the Market Abuse Directive (MAD) does not apply to MTFs and OTC transactions, raising concerns about possible manipulation occurring in these markets. Furthermore, the Commission's sector enquiry into European electricity and gas markets have found evidence of a lack of integration and competition, mistrust of pricing mechanisms, concentration and low transparency (EC, 2007). Against this background, CESR and the European Regulators' Group for Electricity and Gas (ERGEG) have called for a tailor-made market abuse regime and transparency disclosure obligations for electricity and gas markets in Europe, especially for the physical market (CESR-ERGEG, 2008).

¹⁵ However, article 65(1) of MiFID mandates that the Commission consider whether to extend pre- and post-trade transparency obligations to securities other than shares. The Commission decided against implementing this obligation for fixed-income securities and it is about to publish its decision on commodity derivatives.

¹⁶ Articles 45 and 48 of the Capital Adequacy Directive (CAD).

¹⁷ As some have pointed out, the collapse of Amaranth and Enron brought disruption to the natural gas and electricity markets, respectively. However, their collapses did not have systemic implications.

¹⁸ It should be noted that this is similar to the UK approach.

Overall, EU regulation of commodity derivatives contracts is light-touch, relying on the supervision of actors rather than the markets themselves. Moreover the market abuse regime leaves OTC and MTFs uncovered, a fact that raises substantial concerns about possible market manipulation.

4.2 UK regulation

Given London's global importance as a commodity hub with global shares of 14% of OTC contracts and 15% of exchange-traded derivatives, it would be relevant here to briefly outline UK regulation on the matter. The British regulatory framework is certainly based on MiFID, but with a slightly wider scope. Out of 79 firms operating in UK commodity derivatives markets, 58 fall within MiFID and 21 are MiFID-exempt. Those firms that must not apply the CRD – whether under MiFID or exempt – are subject to 'Chapter 3' capital requirements, which were originally devised for metals firms. However, one Energy Market Participant (EMP) meeting certain stringent requirements has a capital carve-out. Oil Market Participants (OMPs), EMPs and MiFID-exempt firms must still abide by FSA's high level Principles for Businesses, Senior management arrangements, Systems and Controls, and Threshold Conditions (FSA, 2007, p. 26). The monitoring and reporting of market abuse as well as the drafting of transparency rules are delegated to exchanges or MTFs, which have the obligation to refer to the FSA in case of suspicious activity. Finally, in keeping with the EU regulation, the supervision of OTC transactions takes place indirectly through the actors rather than through the supervision of the markets themselves.

4.3 US regulation

The US has had a long history of regulating commodity derivatives: the Anti-Gold Futures Act of 1864 and the Grain Futures Act of 1922 are the oldest examples. Today, the pertinent legal acts concerning commodities in the US are the Commodity Exchange Act of 1936 (CEA), the Commodity Futures Trading Commission Act of 1974, and the Commodity Futures Modernization Act of 2000 (CFMA).

The CEA is still the centrepiece legislation of today's regulatory framework, though it was repeatedly modified to adapt to changing circumstances. Since its approval, CEA's primary objectives have been to prevent speculation from exacerbating price volatility and to protect small investors (Greenspan, 1997). To achieve these objectives, CEA distinguished between 'bona-fide hedgers' – commercial entities in need of risk transfer – and 'speculators' – financial actors subject to speculative limits. Moreover, it established an authorisation regime for brokers ('futures commission merchants') in order to protect consumers. The underlying assumption of regulation was that excessive speculation is an undesirable feature of futures markets.

The Commodity Futures Trading Commission Act of 1974 enlarged the definition of 'commodities' to include financial products, services, and intangible assets as well as physical commodities. By contrast, in EU regulation the definition of 'commodities' includes only physical commodities. More recently with the CFMA, the US has embraced a tiered approach of regulatory oversight of derivatives markets. On 18 June 2008, the CFTC Reauthorization Act of 2008 was enacted to close the so-called 'Enron Loophole.' However, the statute only partially achieved its objective because OTC transactions on exempt commodities are still not entirely monitored. The CFMA established four market tiers, increasingly regulated in view of the likelihood of market manipulation and the nature of market participants: excluded markets,

OTC transactions in exempt commodities, exempt markets and designated contract markets (DCMs).¹⁹

Excluded markets consist of derivative contracts whose underlying assets are ‘excluded commodities’, and that are exchanged OTC or on electronic trading platforms between sophisticated counterparties (‘eligible contract participants’).²⁰ Excluded markets do not have reporting obligations and no market monitoring is in place.

OTC transactions in ‘exempt commodities’ are derivative contracts traded bilaterally (no trading facility involved) subject to the same set of rules as the previous category, except that anti-manipulation and partial anti-fraud authority rests with the CFTC.²¹ However, it is hard to see how the CFTC could enforce anti-manipulation and anti-fraud rules, given its limited authority over OTC transactions in exempt commodities. This market tier includes transactions conducted with swap dealers in exempt commodities.²²

The third market tier is *exempt markets*. These transactions are exempt from most but not all CEA provisions: they are not subject to accountability and position limits but transactions must be *notified* to the CFTC. Anti-fraud and anti-manipulation apply fully, but the CFTC has no power to sanction suspicious behaviour, it can only issue special calls. Exempt markets can be either ‘exempt boards of trade’ or ‘exempt commercial markets’. Exempt boards of trade are facilities dealing transactions in excluded commodities such as financial commodities between eligible counterparties; exempt commercial markets are electronic facilities dealing on a principal-to-principal basis in derivative contracts on exempt commodities only between bona-fide hedgers (‘eligible commercial entities’).

Exempt commercial markets are popularly referred to as the ‘Enron Loophole’ because energy and metals derivatives traded on these venues are subject to limited supervision. Following criticism that exempt commercial markets were being used to circumvent legislation and that they were causing a price bubble, the US Congress has enacted the CFTC Reauthorization Act of 2008 to extend CFTC powers to cover contracts with “significant price discovery function” in exempt commercial markets. Thus, the CFTC now has the authority to single out exempt commercial markets that perform a significant price discovery and ask them to impose position and accountability limits for the contracts as well as certain disclosure requirements. It remains to be seen how extensively the CFTC will interpret these powers.²³

The fourth market tier is *designated contract markets* (DCMs). DCMs are fully regulated under the CEA and have to submit weekly commitment of trades to the CFTC. Moreover, the CFTC has the legislative authority to step in and ask to reduce positions if it deems that an actor went beyond authorised limits. Because they are fully regulated markets, DCMs allow retail investors to access their trading facilities. Certain ‘foreign boards of trade’ – exchanges physically located

¹⁹ A further category – the derivative transaction execution facility – was established, but no entity has registered under this denomination, so will not be discussed here.

²⁰ ‘Excluded commodities’ are all financial commodities, intangible assets and services. Excluded markets include among others: credit default swaps, interest rate swaps, foreign exchange swaps and the like.

²¹ ‘Exempt commodities’ are energy, metals, chemicals, pollution allowances, wood pulp and others.

²² For example, index funds, ETNs, and ETFs trading metals and energy commodities replicating an index would use commodity swaps and fall under this category.

²³ For more information on the changes enacted, see <http://www.sidley.com/files/News/0e124f9a-8f3f-48e5-8e75-b57238434d89/Presentation/NewsAttachment/baf03505-8a7a-466a-bb96-b88223f63878/MarketRegulation0608.pdf> and http://www.dechert.com/library/FS-14_8-08_CFTC_Reauthorization_Act_of_2008.pdf

outside US territory and subject to foreign supervision – can ask the CFTC to issue a ‘no-action letter’ in order to become DCMs. If the foreign board of trade meets certain requirements such as adequate supervision and appropriate internal procedures, the venue can operate as a DCM without CFTC supervision, and US brokers and customers can access the facilities. This is popularly referred as the ‘London Loophole’ or ‘Dubai Loophole’ because while US clients can access the facilities, the CFTC does not police the markets but cooperates on information-sharing with foreign authorities.

US supervision of commodity markets appears to be more rigorous than its European equivalent. However, given that excluded markets and OTC contracts in exempt commodities are not completely monitored, only DCMs and, to a lesser extent, exempt commercial markets can be considered as being subject to firm supervision. Nevertheless, compared to the EU, US regulation provides a more comprehensive, yet extremely complex, market abuse regime for financial and physical commodities.

5. Policy Options

From the analysis outlined above, a very varied picture of commodities markets emerges. In terms of actors, market structures, market organisation, regulation and diversity of commodities themselves, it is tempting just to discard the possibility of looking at commodities markets as a coherent whole. In effect, some argue that commodities are so diverse that studying them together or trying to regulate them as a group risks obscuring the specificities of each one commodity. Yet, as this paper has attempted to demonstrate, commodities share fundamental characteristics that are common to no other set of goods or services. These are: quality standardisation, exhaustibility, the importance of stocks, spot-futures prices interconnectedness, sizeable transportation and storage costs.

Once established commodities markets can be analysed as a group, it is imperative to explore the consequences of the growing financialisation of commodities. Whether a massive inflow of speculative capital in commodity derivatives can aid and abet the price volatility of spot prices is a legitimate question to ask. From a policy perspective, the fact that so many developing and less-developed countries rely so heavily on the export of raw materials to earn foreign exchange makes the question all the more pressing. Furthermore, a considerable part of commodity producers are poor farmers with no access to sophisticated financial instruments to hedge against price volatility. Finally, the fact that so much uncertainty surrounds the issue of commodities raises the question of whether more information and transparency of this sector would be welcome.

In effect, the debate has seen two sides exchanging intellectual jabs, and both camps boast eminent voices in their ranks. George Soros and Michael Masters²⁴ led the side arguing that speculation is to blame for massive swings in commodity prices (Soros, 2008). Guillermo Calvo and Jeffrey Frankel had a more subtle and indirect argument: low interest rates are the culprit, driving financial players to increase commodity assets (Calvo, 2008; Frankel, 2008). On the other side of the debate, Paul Krugman, the Interagency Task Force on Commodity Markets, and the financial press have dismissed theories about speculation and pointed to the historical price volatility in commodities as well as fundamentals to explain the surge in commodity prices (Krugman, 2008; ITF, 2008; *The Economist*, 2008; *Financial Times*, 2008b). Moreover, they argue that commodities that are not exchange-traded such as iron ore, molybdenum and cobalt have witnessed higher price changes than exchange-traded commodities. However, some commentators and even regulators themselves have emphasised that both explanations are

²⁴ See footnote 11.

possible because we do not know enough about futures markets (Dunn, 2008; Hasset, 2008; CFTC, 2008, pp. 60-62).

Given the uncertainties surrounding the issue, it would be foolhardy to move decisively in favour of the strict regulation of commodity markets. However, more transparency is needed to understand the drivers of commodity and commodity derivative markets and to assuage public concerns about speculation, especially in light of present market conditions.

First, the social utility of futures markets lies in the process of price discovery. Arguably the opacity of commodity and commodity derivatives markets prevents market participants from completely trusting the pricing mechanisms of commodities. In this uncertain environment and without reliable data on the drivers of physical markets and of derivative markets, a considerable number of companies and individuals are sceptical about the soundness of commodity prices' dynamics. For example, the European Commission found considerable evidence of this mistrust in gas and electricity markets (EC, 2007). The same could be said of WTI crude oil futures prices that went from around \$94 in November 2007 to a peak of \$147 in July 2008 to drop below \$55 in November 2008. In 8 months prices went up by 56% and in less than 5 months they declined by 62%. Even for commodity standards, this year's volatility has been unprecedented. Moreover, some market participants have maintained that the entry of financial players weakens the price discovery of futures markets because they buy and sell contracts regardless of fundamentals (Masters, 2008). This fact, it is argued, augments the correlation of commodity prices with financial variables and reduces the purported advantage of portfolio diversification. In light of all these elements, more transparency would restore market confidence and help to clarify whether speculation is to blame for aiding and abetting price volatility.

Second, heightened transparency would boost the informational efficiency of commodity markets. Informational efficiency means that prices reflect all the available information across markets. Today the exact share of on- and off-exchange contracts is not known and easily comparable data on volumes of futures contracts traded and cash prices do not exist. The Bank for International Settlement (BIS) publishes data on OTC commodity derivatives, but the statistics are only broken down by "gold," "precious metals" and "other." However, agriculturals, industrial metals and energy are increasingly traded and BIS statistics do not capture these new trends. Moreover, cash prices on which spot contracts are based are not widely disseminated. The lack of references on the movements of cash markets with respect to futures markets obscures commodities' price dynamics. Publicly available and reliable statistics would facilitate the transmission of prices from domestic to international markets, increase liquidity, and improve hedging and price discovery.

Third, more transparency would enhance the disclosure of financial risk. With the knowledge of the exposure to certain markets and to specific contracts, counterparties would be able to trust each other more. In effect, lack of transparency led to a freezing of commodity markets. Some oil companies and commodities firms have stopped trading altogether with banks (sic!) for fear of counterparty risk, drying up liquidity and making hedging and price discovery more difficult (*Financial Times*, 2008c). Thus, even long-standing players of commodities have come to fear the markets they are supposed to trust to transfer risk and to inform them about prices. This situation confirms that markets have a sub-optimal amount of information and therefore some sort of intervention is warranted.

Three clear and powerful proposals to increase transparency and restore market confidence are advanced:

(1) OTC transactions over a certain value (say >10 million euro) both in physical commodities markets and commodity derivatives markets should be processed by authorised clearing-houses.

This critical goal can be attained through market-led initiatives, but if these fail to materialise regulation should be devised. Not only would clearing of OTC transactions drastically reduce counterparty risk with relative little cost, but it would also give a clear picture of the size, risk and liquidity of these markets.²⁵

Some would say that concentrating risk in few clearing-houses would augment rather than reduce counterparty risk. However, the evidence suggests otherwise: in the history of financial markets, no clearing-house has ever defaulted on its obligations. Thanks to provisions such as daily margin calls and the distribution of losses across members in case of a counterparty default, the risk that the clearing-house itself would not be able to service its obligations is extremely low. Initiatives are underway on both sides of the Atlantic towards more standardisation of contracts to ensure transparency and towards the interoperability of central counterparties.²⁶

Some others would contend that requiring the clearing of OTC transactions is excessively burdensome because the clearing-house may not accept complex contracts that it cannot easily price. But this is exactly why transactions over a certain value should be cleared. If a clearing-house with substantial resources to back its commitments and with specific expertise in managing and mitigating counterparty risk will not accept a transaction, why should an eligible counterparty? In situations of market disruption when counterparty risk is at its peak, the opaque nature of the contract due to its complexity and its difficulty in pricing may pose risks to financial stability. What may be a bearable risk between counterparties at the individual level, if taken collectively in the order of thousands, could endanger the whole financial system. A move towards clearing may slightly reduce the flexibility and standardisation of OTC contracts, but the benefits to be gained in terms of stability are great.

(2) A market abuse regime specifically tailored to commodities should be considered at the EU level.²⁷ Commodity derivative markets are no less susceptible than other financial markets to being manipulated, as admitted by the FSA (FSA, 2007, pp. 22-23). The cases of the Hunt Brothers in the silver market (1979-80), of Sumimoto in the copper market (early 90s), of Enron in the electricity market (2001), of British Petroleum in the propane market (2004), and of Amaranth in the natural gas market (2006) have shown that manipulation in physical commodities is not a theoretical fancy of regulators. On the contrary, as price liberalisations have been implemented, commodity markets are more rather than less at risk of manipulation. The CFTC, a federal agency solely dedicated to financial and physical commodities, prosecutes abuses almost on a weekly basis, with 40 new enforcement actions undertaken in the 2008 fiscal year involving fraud, manipulation and other misconduct.²⁸ The FSA also enforces anti-manipulation rules, but to a lesser extent with 27 new market protection cases over the same period.²⁹ If the EU wants to instil trust in the pricing mechanisms of commodities across the

²⁵ Central clearing for credit default swaps is already being studied and implemented. When transactions are cleared, clearing-houses possess consolidated information on the market. See <http://www.cftc.gov/stellent/groups/public/@newsroom/documents/speechandtestimony/opalukken-49.pdf> and http://www.cftc.gov/stellent/groups/public/@newsroom/documents/speechandtestimony/radhakrishnansenate_ag_cds1120.pdf

²⁶ For more information on clearing and settlement, please refer to <http://www.bis.org/publ/cpps77.pdf>.

²⁷ This would resemble the CESR-ERGEG proposals but extend the regime to *all* commodities.

²⁸ CFTC website, accessed November 18, 2008. <http://www.cftc.gov/newsroom/enforcementpressreleases/2008/pr5562-08.html>

²⁹ Moreover, it should be noted that the FSA covers the functions of both the CFTC and the Securities and Exchange Commission (SEC) in the US. The data are taken from the FSA website, accessed November 18, 2008. http://www.fsa.gov.uk/pubs/annual/ar07_08/Enforcement_report.pdf

single market, all abuses should be readily detected and prevented under a single European framework.

However, a simple extension of MAD to commodity derivatives would not work. Because of the interconnectedness with physical markets as well as the difficulty in applying the concept of insider trading to commodities, a specific regime would be best fit for purpose. The new regime would cover *both* physical and the derivatives markets as the two are intimately related: any disjunction would diminish its effectiveness. Legal requirements for standardised disclosure should be adopted to the extent they are necessary to prevent market abuse, especially in regional electricity and gas markets. The EU should also consider whether speculative limits similar to those enforced in the US are necessary to thwart attempts to manipulate the market, and whether “preventing excessive speculation” could become an objective of the new market abuse regime.³⁰ This proposal comes at the right time, as the Commission is looking into updating the MAD regime in the coming months.

(3) Without increased transparency in physical markets, more information on financial transactions would not address the root issue. Given the tight relation of cash and futures commodity markets, regulators and market actors must look at ways to improve information flows on supply, demand, inventories, reserves and prices of commodities. To this end, the creation of an **International Commodity Agency** (ICA) incorporating the existing International Energy Agency (IEA) would be a clear step forward. ICA would collect and consolidate cash market statistics on all internationally-traded commodities, and it would be a pure consultative body. Cash prices are presently dispersed across multiple sources (e.g. Platts, Metal Bulletin, IEA, US Dept of Agriculture, National agencies, OPEC and others), and this fragmentation does not help the optimal functioning of commodity markets. Developed and developing countries could come together in agreeing on the uncontroversial issue of transparency in physical commodity markets.

EU authorities should push these proposals in current G20 discussions about the overhaul of the global financial architecture. In combination with the reform of international financial institutions, the establishment of ICA and the clearing of OTC transactions would increase transparency, reduce counterparty risk, improve pricing mechanisms and provide robust supervision of commodity markets. These goals are coherent with the communiqué released on 15 November 2008 in Washington by the leaders of the G20. Among others, the principles contained in the final document of “Strengthening Transparency and Accountability,” “Enhancing Sound Regulation,” “Promoting Integrity in Financial Markets” and “Reinforcing International Cooperation” are all in line with the proposals outlined here.³¹

³⁰ In the US, speculative limits are in place to prevent non-commercial entities from manipulating commodity markets. In these markets, finite supply constrains production, and positions in the secondary market can squeeze the physical market. In the words of an authoritative report: “Due to the characteristics of markets for non-financial commodities with finite supplies, however, the Working Group is unanimously recommending that the exclusion [*from CFTC supervision*] not be extended to agreements involving such commodities. For example, in the case of agricultural commodities, production is seasonal and volatile, and the underlying commodity is perishable, factors that make the markets for these products susceptible to supply and pricing distortions and to manipulation. There have also been several well-known efforts to manipulate the prices of certain metals by attempting to corner the cash or futures markets. Moreover, the cash market for many non-financial commodities is dependent on the futures market for price discovery” (*Over-the-Counter Derivatives Markets and the Commodity Exchange Act*, Report of the President’s Working Group on Financial Markets, November 1999, 16, writing in italics added). No physical commodity is immune from market abuse.

³¹ For access to the final communiqué, see: http://www.nytimes.com/2008/11/16/washington/summit-text.html?_r=1&oref=slogin&pagewanted=all

6. Conclusion

This research report has presented a review of the characteristics of commodities markets. Physical commodity markets have evolved from local fairs to regional – sometimes global – liquid markets. In response to wide price swings, commercial players have sought ways to transfer the risk of volatile prices to actors willing to assume it. Forward and futures markets are the result of that need. The establishment of commodity futures has also provided information on overall market conditions and on expectations of demand, supply and inventory, boosting market transparency. Futures markets' social functions are therefore *hedging* and *price discovery*.

However, a radical transformation of commodity markets has taken place. On the one hand, financial players have invested in physical commodities to gain inside knowledge of derivatives' underlying assets. On the other hand, a wide spectrum of investors has been looking at commodities as an alternative asset class in order to provide portfolio diversification. The financialisation of commodities unsettles the framework regulators have employed to interpret these markets: the boundaries between 'hedgers' and 'speculators' have become less clear-cut. Some have argued that excessive speculation in commodities is the sole culprit for high volatility. As this paper has tried to show, this is not the case. Commodity prices have always been volatile, whether futures markets were in place or not. However, whether speculation aids and abets volatility is a different story. Informed observers disagree on this matter. It has been argued that a lack of data and information lies at the root of the controversy and more research is needed to assess whether futures market increase volatility. To achieve more transparency and instil market confidence three clear initiatives have been advanced: (1) clearing of OTC transactions over a critical threshold whether physical or derivative (2) an EU-wide market abuse regime covering both physical and financial commodities (3) the establishment of an International Commodity Agency (ICA).

Glossary

Basis. Basis is the spread between cash and future markets. It represents the premium paid for the risk arbitrage derived from transaction costs, storage costs, insurance and financing costs.

BDI (Baltic Dry Index). BDI is an index operated by the London-based Baltic Exchange formed by 22 reference prices of bulk dry routes. These reference prices are created collecting bids and offers on specific routes from traders or commodity carriers.

BIFFEX (Baltic International Freight Future Exchange). BIFFEX was a future exchange operated by the Baltic Exchange between 1985 and 2001 when the operator decided to cease its activities.

Brent. Brent is a type of crude oil extracted in the North Sea used as a benchmark for other types of oil in a similar fashion of WTI.

Cash market. The commodity cash market is for immediate or near immediate delivery (generally one month or less). The transaction is settled at the spot price when the delivery takes place.

CIF (Carriage, Insurance and Freight). CIF is a type of commercial contract whereby the seller pays for carriage, insurance and freight up to a predetermined location. The buyer takes commercial responsibility for these costs from the agreed point of delivery to its storage facilities.

CFTC (Commodity Futures Trading Commission). US federal agency competent for the supervision of derivative markets.

Commodity index funds. Commodity index funds are funds that enter into contracts with swap dealers. These contracts track published commodity indexes such as the S&P Goldman Sachs Commodity Index, the Dow Jones AIG Commodity Index or the Reuters-CRB Index in order to gain exposure to commodities.

‘Corner and squeeze.’ Corner and squeeze is a market manipulation technique used in commodities. “When ‘cornering’ a market, a manipulator builds up large positions in the underlying commodities market in order to create an artificial shortage. This is usually done in conjunction with long positions in the forward/futures market. The manipulator will then demand delivery of the commodity (i.e. squeeze the market). As he simultaneously withholds his stock of supply, the sellers of the future will find it hard to acquire enough of the commodity to fulfil their contracts. The manipulator can then use his market power on the commodity market and charge high prices for his stock of the commodity” (FSA, 2007).

ETFs and ETNs (Exchange-Traded Funds and Exchange-Traded Notes). ETFs and ETNs are financial products traded on securities exchanges. They produce a return with a passive long-only investment in a commodity, a group of commodities or tracking a commodity index.

Excluded commodities. This term refers to the Commodity Futures Modernization Act of 2000. Excluded commodities are commodities such as financial products, services and intangible assets whose derivative contracts are excluded from most supervision.

Exempt commodities. Exempt commodities are energy and metals commodities whose derivative contracts are exempted from some supervisory provisions. Popularly referred to as the ‘Enron Loophole’ for the lobbying role Enron played when the rule was approved.

FFA (Forward Freight Agreement). FFA are OTC derivative contracts on freight rates tailored to specific routes. The commercial entity buys FFA from a counterparty to ensure it will pay certain freight rates in the future on that specific route.

FOB (Free on Board). FOB is a type of commercial contract whereby the responsibility of execution lies with the buyer. All the costs related to transportation and insurance of the commodity fall onto the buyer.

Forward market. The forward market is similar to the cash market, but the delivery and payment are deferred for reasons of commercial convenience or necessity.

Market manipulation. Commodity markets may be subject to manipulation through ‘corner and squeeze’ (see above) or ‘banging the close’, which refers to the practice of acquiring a substantial position leading up to the closing period, followed by offsetting the position before the close of trading for the purpose of attempting to manipulate prices. There have been some high-profile cases of market manipulation: 1979-80 in the silver market (Hunt brothers); early 90s in the copper market (Sumimoto); 2004 in the propane market (BP); 2006 in the natural gas market (Amaranth).

OTC (over-the-counter). OTC refers both to derivative and spot transactions. OTC contracts are characterised by the absence of an intermediary between two counterparties. Sometimes OTC contracts are cleared through an exchange or a clearing-house to mitigate counterparty risk.

Price Discovery. Price discovery is one of the two social functions attached to futures markets, the other being hedging. Futures markets are believed to ‘discover’ the price of a commodity thanks to the multiple interactions of speculators and hedgers in secondary markets. Futures prices signal real and expected market conditions for commodities determined by supply, demand and inventories.

Roll yield. In commodity indexes, the roll yield is calculated as the return made when rolling over futures contracts, i.e. selling future contracts about to expire to buy longer-dated contracts in order to avoid delivery. In a backwardated market, the roll yield is positive, whereas in a contango market, the roll yield is negative. This means that following commodity indices is a profitable strategy only when the market is in backwardation, a situation in which spot prices are rising.

Speculative limits. The amended Commodity Exchange Act of 1934 gives the CFTC the authority to set speculative limits to prevent excessive speculation from driving spot prices away from fundamentals.

Spot market. See cash market.

Spot price. Price for immediate or near immediate delivery (generally one month or less).

Spot return. In commodity indexes, the spot return is calculated as the daily appreciation of the underlying futures contracts used to price the index.

WTI (West Texas Intermediate). The WTI is a quality of crude oil extracted in North America. It is widely used as a benchmark to price other type of crudes, which are sold/bought at a differential. The WTI future contract traded on the NYMEX is the most liquid of all commodity derivatives contracts.

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