

Commodity Price Formation in Boom-and-Bust Cycles

Diego Valiante

Highly volatile trends and rising inflation expectations lurk behind the recent increase in the price of food and some raw materials. Independently of their nature, commodity prices are increasingly playing a crucial role in a world with fast-growing demand and still-unanswered fundamental questions about the sustainability of its economies. Highly volatile and soaring price patterns are creating economic uncertainty and, particularly when it comes to food prices, contributing to political instability in emerging countries. The soar in volatility of commodities prices such as oil and agricultural products comes at a critical moment when European and US economies are struggling to regain the ground lost as a result of the recent financial crisis.

Climbing prices are also causing mounting worries and anger on the part of both policy-makers and the public, for whom it is unthinkable that after the amount of resources dedicated to rescuing the financial system from its own troubles, they are now being squeezed by sheer spending cuts and soaring commodity prices. Prices, in effect, made an astonishing recovery in 2010, reaching pre-crisis peaks. Now, however, they are beginning to show some instability after a recent one-week drop by 11% at the beginning of May. Food crises have gradually become a widespread phenomenon, raising fears that growth in emerging markets may ultimately be hindered. For instance, food prices in India have soared by 18%, while the global price of wheat is 80% higher than last year. This situation is fomenting outrage in the poorest countries across the world, contributing to some countries' strong political instability (e.g. Tunisia). The causes are multiple and should invite us to reflect on how we might restructure our economies to alleviate their adverse effects.

Despite the heterogeneity of commodities,¹ several common factors explain how their prices and volatility are formed:

1. Trading practices (both physical and purely 'financial')
2. Financial markets access
3. Market abuse and surveillance
4. Competition and market structure
5. Sustainability of current supply and demand

¹ Each commodity has its own market and its own characteristics, which are not necessarily related. Markets can be totally different in terms of price formation mechanisms.

These factors, some of which are not entirely new to these markets, do not necessarily affect all commodities with the same intensity, but they play a different role for different commodities.

Trading practices

On trading practices, there are generally two conflicting views about the surge in some commodity prices and volatility (the latter is an historical issue; see Cashin & McDermott, 2001), in particular on the role of the 'financialisation' of commodities, i.e. investments in commodity indexes and the role of dominant 'net' positions in derivatives markets (primarily futures and options). On the one hand, there are those who believe that the large increase in commodity prices has a positive correlation with investment in commodity indexes (Tang & Xiong, 2010). However, this view does not provide enough empirical evidence of an immediate link between soaring trade in commodity indexes and spot prices, while the meaningful linkage they show is with future prices. Nevertheless, this relationship showed negative values at the beginning of this century (Gorton & Rouwenhorst, 2006) and it may be explained by other underlying causes. In addition, a positive price correlation among commodities has consistently increased, especially in the last decade. The positive correlation, e.g. between energy and non-energy commodity prices may be explained by many other factors, such as the impact of transportation costs (linked to the oil price) on the price of non-energy commodities or exchange rates (the downward trend of the dollar against the euro, as well as currency revaluations in some emerging countries).

On the other hand, observers (e.g. Krugman, 2011) argue that commodities are in a boom-and-bust cycle, driven by the rapid growth of emerging countries and the fundamentals of the global economic system. The difference between supply and demand (net demand) determines the level of prices by reducing or increasing the stockpile levels, which ultimately affects spot prices. In particular, net demand has strong links with fundamentals and most of all with GDP growth, particularly in a world with low barriers to international trade.

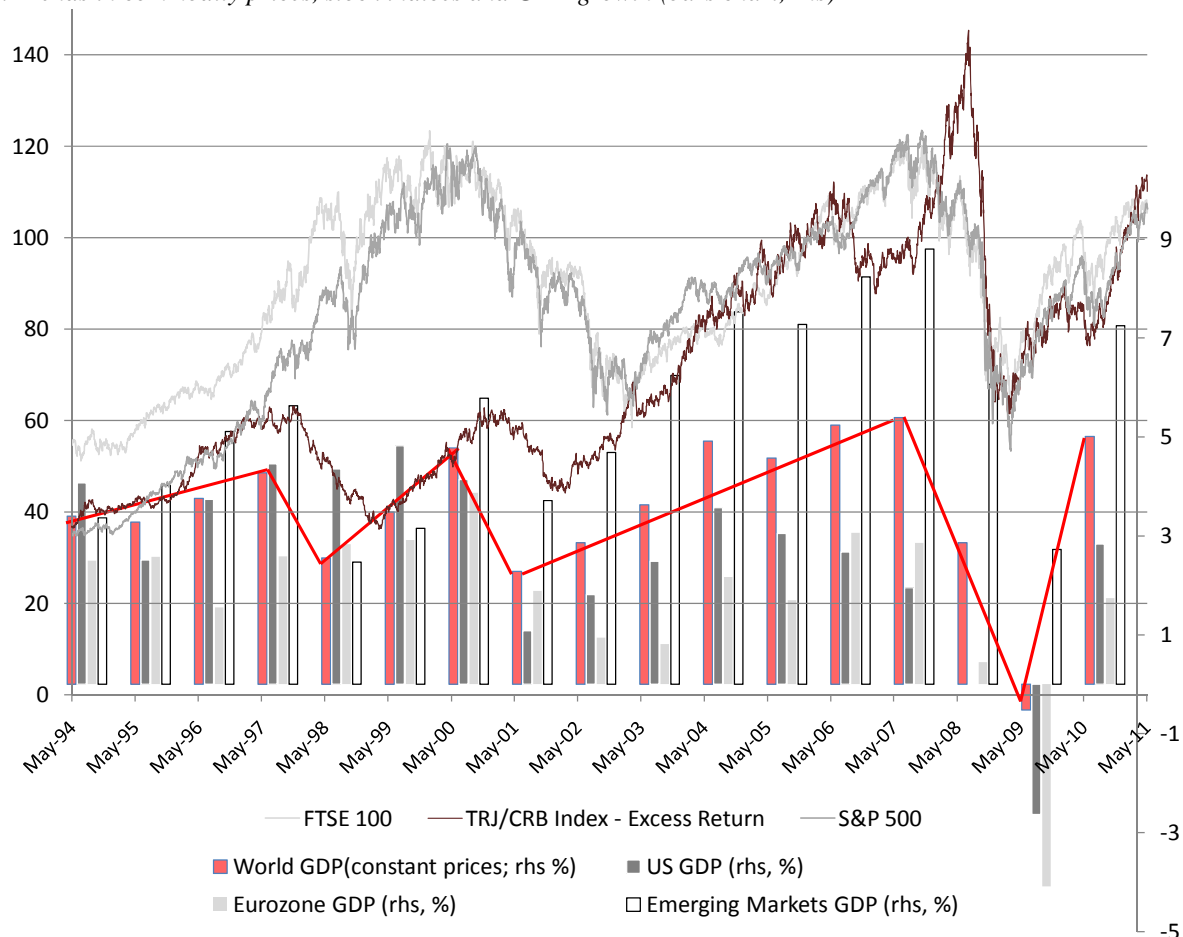
The position seems more plausible, but it does not dig deeply enough into the complexity of the issue. The figure on the following page suggests that this link may be strong but it does not necessarily explain the entire trend, which can be split into three periods.

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Figure 1. Trends in commodity prices, stock indices and GDP growth (bars chart, rhs)



Source: IMF database, TR-Jefferies and Yahoo Finance.

The first period, lasting until the internet bubble burst at the very beginning of the century, shows that the trend of commodity prices was led by a constant growth in western countries, with two abrupt breaks due to the Asian crisis in 1998 and the internet bubble in 2000-01. The second period is the so-called ‘financialisation’ period, with an astonishing growth in commodity prices, reflecting both an extraordinary expansion of credit markets and access to financial markets, and an unprecedented GDP growth in emerging markets as well as in some western countries. This period ends with another big drop in commodity prices due to the recent financial crisis. In 2008, prices have reached again the levels of the end of the first period. This situation fits with the classic boom-and-bust cycle.

Finally, we experienced in the last two years another astonishing upward race due to the recovery in western countries and the high growth in emerging markets, such as China, India and Brazil. However, prices are still below the 2008 peak and, in the first five months of 2011, the volatility of the Thomson Reuters-Jefferies index has doubled in comparison to the same period of 2010 (from 6.41 to 13.3). Price instability seems likely to remain as long as the economic global outlook does not stabilise. The possibility that commodities markets will suffer short boom-and-burst cycles is fairly high due to the complexity and instability of the current global long-term economic outlook.

Other factors that can affect stockpile levels and consequently spot commodity prices include price volatility, future prices, supply constraints, transportation costs, market settings and exogenous factors (e.g. wars, bad weather).

Financial markets access

In the last two decades, access to financial markets has become easier and commodity buyers and suppliers are increasingly making use of markets to hedge short-term and long-term positions. In effect, the nature of commodities is fairly complex and their multi-faceted characteristics influence the way they are actually traded. For instance, non-storable commodities such as electricity need to have immediate access to both financial and spot markets. Electricity companies need to minimise peaks in demand and supply; thus when there is a drop in the demand, the company will need to find a buyer connected to the network able to absorb part of the supply in excess. The use of electricity exchanges and more generally of financial transactions to hedge critical exposures in the spot market for electricity has benefitted the market as a whole in terms of keeping the supply of energy stable over time to avoid unmanageable operational and infrastructural issues. As a result, the nature of hedging non-storable commodities positions is driven by the volatility of net demand at a specific point in time, rather than by long-term net position. This situation leads market participants to seek protection in the spot (exchange) and futures markets at a specific date (short-term oriented). For storable commodities, however, hedging positions are based on the uncertainty on levels of storage driven by the net demand and future prices on a wider time horizon (long-term oriented). The different nature gives market participants the possibility to manage their exposures over time and rely less on spot market transactions.

Growing uncertainty surrounding the economic outlook, evidenced by the rise in the price of commodities such as gold, has increased small and big producers and buyers' needs to find protection through the use of sophisticated financial transactions, particularly in derivatives markets. These markets provide formidable means of hedging against price changes in the physical product markets. To be able to offer hedging products (thereby allowing 'inter-temporal choice') for all kinds of commodities and market participants, it is vital to be able to access liquid markets² to provide a counterparty to hedgers, but also to provide financial intermediaries (who most often provide this access) with the possibility to hedge their financial exposures and to design more customised products than plain vanilla exchange-traded futures and options. The role of investment funds was originally confined to indexes to contribute to the liquidity of markets (noise trading) that offer hedging solutions in competition with future exchanges (dealer markets). It remains unclear whether these activities are the origin of price volatility and spiking market trends. Price volatility in commodity markets has been historically high (Cashin & McDermott, 2001). However, in recent years, the growing uncertainty around the economic outlook, mainly stemming from the financial crisis, has boosted volatility even higher. Most notably, the daily standard deviation of a major commodity index (TRJ-CRB index) from 7.15 in 1994 skyrocketed to 74.22 in 2008 before settling down to a relatively more stable figure in 2009 (22.68). Uncertainty exerts a crucial influence on production levels and so prices.

Also monetary policies matter. There is currently a significant amount of liquidity (M2) in the economy, due to the uncertain global economic outlook and, more importantly, to the loose monetary policies (quantitative easing) implemented by central banks to contain the spillover effects of the financial crisis. This excess of liquidity is most likely putting strong upward pressure on prices and will gradually lead central banks to tighten their monetary policies by raising interest rates. In the eurozone, however, after the rate rise last March, the ongoing government debt crisis and the feeble economic growth may discourage interventions to cool prices, at least in the short run.

Market abuses and surveillance

The instability of price patterns also creates political and public resentment against undefined enemies, such as 'market speculation'. Since markets would not be liquid with only investors betting in the same direction (hedgers), those who are investing in private information become an indispensable part of the system to create a sufficient buffer of 'noise'

² A financial market is liquid when it "is almost infinitely tight, which is not infinitely deep, and [...] resilient enough so that prices eventually tend to their underlying value" (Kyle, 1985, p. 1317). Three aspects emerge from this definition: i) tightness (which is the possibility to turn over a position at the fastest speed technically possible, when needed); ii) depth (which refers to the ability of the market to absorb quantities without having a large effect on price; it is usually not constant over time in some asset classes); and iii) resiliency, which is the speed to which prices return to their fundamental value after a move due to regular trading or – with more intensity – to external shocks.

trading. 'Curbing speculation' is thus a vague objective, since it is hard to simply draw the line between trading based on hedging purposes or on private information, and whether these trades are benefitting price formation or have a manipulative purpose. Instead, regulators may need to examine the risks of price manipulation arising from the accumulation of dominant/relevant net positions in derivatives markets. For instance, the attempt to squeeze the market by collecting a dominant/relevant share of commodity futures for a specific settlement date may have disruptive effects on spot prices, since the dominant owner of a long position for that date may exercise unreasonable upward pressures on futures prices and thereby indirectly on stockpiles and so on spot market prices.

To reduce the harmful effects of settlement squeezes, regulators and supervisors may typically adopt two tools: position limits and position management. Position limits generally impose a cap on the size of commodity traders' transactions. Some argue, however, that these measures can be easily circumvented by trading more frequently with smaller sizes, which makes supervision more difficult. However, it may be an effective tool in spot markets for non-storable commodities (such as electricity exchanges), where the unjustified acquisition of a relevant share of the market may create immediate operational and financial issues for competitors. Position management instead seems to be a more effective tool for tackling issues in futures markets in general and spot markets for storable commodities, since manipulation in such markets usually does not result from the price impact of the availability of investors to transact a security at a specific price but rather from the availability of counterparties to bargain a future position. Futures prices may be more generally affected by the holding of a dominant net position in a commodity for a particular settlement date (so-called 'settlement squeezes'), futures prices may thus be driven up. This situation may have a similar effect on spot prices. Since the availability of settlement dates is actually limited, it would be meaningful to collect all trading reports and calculate the total net position of an investor in that specific market. Position management allows the detection of dominant net positions at the end of the trading day. If these positions reach a pre-defined threshold, this may create unreasonable upward or downward pressures on prices, with the consequence that market operators can require traders, at the beginning of the next trading day, to reduce their positions below a certain level. Other surveillance mechanisms should aim at: increasing market transparency; improving general access to market data information; sharing information; enhancing enforcement powers to fight market abuses and creating a sufficiently strong and uniform regime of sanctions for this kind of market abuses.

Competition and market structure

Other issues related to market structure – such as competition bottlenecks, supply constraints and exogenous shocks – can affect the 'regular' price trends for commodities, in particular for spot markets. Supply constraints, such as limited extraction activities due to environmental sustainability measures, can reduce the level of stockpiles and increase spot

prices. Higher spot prices may also be the result of the competitive design of a commodity market, e.g. the OPEC cartel's efforts to determine the oil price by controlling oil extraction is a classic example. Other competitive bottlenecks may affect prices too, such as the use of reference price indexes that are the result of special agreements among a few big industry players in order to determine the final spot price. Yet, the bottleneck in the final distribution of the commodity, due to high freight costs or directly to anti-competitive practices, is another determinant of price formation in commodities spot markets. Likewise, exogenous factors are also a primary source of price changes. In 2010, weather and other exogenous shocks, such as war tensions and political instability in some Middle Eastern countries, have affected the production levels of large exporters. The weather-related supply shock for wheat, for instance, has significantly contributed to upward pressures on food prices (Roache, 2010).

Conclusions

The sharp and widespread increase in most commodity prices has alarmed the world and raised questions around the sustainability of our economies. The global demand for some commodities (e.g. oil) has reached unprecedented peaks. Fears that rising food and commodity prices can create severe political instability and violent internal and cross-border tensions have prompted leading policy-makers (e.g. the G20) to issue warnings about the future of the global economy. The reasons for this dramatic rise are multiple, and engaging in a witch-hunt benefits neither the market as a whole nor our economies. Solutions need to be more differentiated and oriented towards two factors: preventing price manipulation (through financial transactions and anti-competitive market structures) and fostering sustainability. Reducing the market conditions that can stimulate manipulative behaviour means not only intervening in financial markets to limit price manipulation through more active controls on dominant net positions but also creating competitive market settings where production becomes gradually less subject to manipulation by vested interests and cartels. Finally, more attention must be given to the elephant in the room. The uncontrolled growth of emerging markets, which may ultimately generate strong incentives to increase profits by wasting natural resources, if not properly managed, raises questions about the sustainability of some economic policies.

The future challenge will be not so much to capture the complexity of these variables in a sophisticated mathematical model to predict price movements but rather to hold all these variables together to design more efficient and sustainable policies for the future. Prices are ultimately only the warning signal of a more fundamental question that looms over the world's economies.

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