Energy and raw materials prices: no panic

by
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The crisis seems to be behind us (at least the global macroeconomic crisis), but raw materials prices appear to be evolving irrationally, with highly variable increases or decreases even though underlying demand is identical.

After falling to $40/barrel in December 2009, the price of oil has soared, fluctuating between $70 and $75/ barrel, and copper and palladium are close to their price levels of the first half of 2008.

But "basic" steel has not hit such heights: it is less than half its price at the peak of June 2008. And natural gas (in the USA) is barely above its low of October 2009, three to four times cheaper than it was in summer 2005 or summer 2008, which saw the highest prices.

Like dominos, the price of gas (still correlated with oil despite increasingly divergent costs), the price of electricity and the price of all manufactured products where raw materials represent a significant cost, have been subject to tremendous fluctuations in the last three years and could continue to evolve dramatically and in an apparently erratic manner.

Under these circumstances, how does one construct budgets and support profitability and decisions for developments and investments which consume a large amount of energy or raw materials?

Back to basics

The technical response is simple: prices are and will remain adjusted according to the supply/demand equilibrium, visualised by a supply curve.

In this curve, for the relevant market scope[1], the production capacities (or the different competitors) are ranked in increasing order of production costs (variable costs, cash or total costs, depending on needs) and total market demand. The position of the latter (where the supply and demand curves meet) defines the relevant level of cost for the prices.

The same old rules still apply:

- In the event of significant over-capacity (supply much greater than demand), the prices could fall, at least temporarily, to the level of the variable costs (each euro recovered beyond the variable costs covers part of the fixed costs). Otherwise they will adjust to the cash costs, in the medium term, which is sufficient to survive but not to reinvest;
- When supply and demand are balanced, the prices will adjust to the total costs (including capital remuneration) of the marginal player[2]; in a market which is undergoing strong growth, they will adjust to the development costs of new capacities, necessary to satisfy future additional demand;

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[1] Which can be a country or a group of countries (in the case of electricity), a continent or the world (for most types of ore and for oil)

[2] The marginal player is the player whose production is necessary to meet demand and that has the highest costs amongst all those in the same situation

- When supply is lower than demand, prices soar, with different methods and adjustments depending on the circumstances. Recycling costs will adjust the prices if recycling is significant enough to be considered a substitute to extraction or to production. Depending on whether or not the product is crucial, buyers are prepared to raise prices, sometimes sharply, to ensure supply. A speculative "premium", which may be extremely high, can thus push prices up, with operators preferring to stockpile in fear of an even stronger shortage in the future.

Supply and demand difficult to perceive

This approach has a proven track record. It is made complex by the principle of reality which often prevents us from correctly identifying and quantifying the supply curve.

Supply does not evolve instantly, particularly in industries as capital-intensive as mines, upstream oil or electric production. It takes three to five years for a new mine to become operational or to extend an existing mine. It takes six years to build a nuclear power station and two years for a combined gas cycle (if the gas and electric connections are already present). During this period, for macroeconomic or specific reasons, investments may be frozen or more staggered than expected, challenging the anticipated change in supply. We have to attentively monitor the main projects to formulate a reliable prediction of the change in supply. The slowdown from 2008-2010 thus pushed back investments in zinc mines, causing a medium-term rise in prices, at constant demand.

Some raw materials are related by-products: indium is found in the form of traces with zinc. Its supply is linked to the development of zinc extraction and suffers the consequences. When development of flat screens was increased at the beginning of the 2000s, demand for indium (used to cover the screens) rocketed, without supply being able to follow suit. As a result, the price multiplied by ten, and a very costly recycling industry developed. It is only with the development of new capacities for zinc extraction and technologies which use less indium, that prices fell again (to five times their level of the 1990s).

Prices are not always transparent. Whilst some materials are listed on the stock exchange (on the LME, for example), others employ price-setting procedures which are anything but transparent. Iron-ore used to be in the latter category: the first negotiations between a major producer (Australian) and a major consumer (Chinese) would historically adjust the prices for the year to come, irrespective of changes in supply and demand. No spot rates or futures rates, sharp changes in costs for the key steelmakers and difficulty in including them in the prices for the steel buyers. This advantageous upstream situation came to an end in 2010, after much successful arm-wrestling by Chinese steelmakers. This should imply a rapid decline in the cost of iron-ore in three years or so, with new capacities opened and a price which will be a more accurate reflection of supply and demand.

Some markets are illiquid, sometimes producers form a cartel and prices have little to do with economics. For a few years, China has had a virtual monopoly on certain "rare earths" exploited in Lower Mongolia. This recently prompted other countries (USA, South Africa, etc.) to activate mining investments to compete with China (and to push prices down).

Finally, speculation can play a part, at least over a period of a few weeks or months, in small or not very liquid markets. Remember the Hunt brothers who bought more than half of the silver production at the end of the 1970s and increased the spot rate (by a factor of 4-5). Even though their attempt was to fail, with a dramatic fall in prices, the fact remains that prices were distorted for several years.

In terms of demand, we know that change in demand for raw materials roughly follows global GDP growth. Today therefore it is China, followed by India, Brazil and a few others, that influence raw materials prices.

But not everything grows at the same pace as GDP: steel consumption in China grows much faster than GDP due to the rate of growth in buildings, infrastructure and equipment. Demand for coal and iron-ore will grow much faster than that of other raw materials. The same is true for zinc, more than 50% of which is used for buildings.

Electricity production is particularly complex

Electricity is a particularly complex example, as it cannot be stored. The production capacity is not the same at all times (for example, in periods of weak demand, the "peak" capacity is not in the supply curve).

Furthermore, the electricity imports and exports of one country or region must be integrated to another (depending on the relative costs between zones), in the knowledge that the capacities to do so are limited, and that electricity does not always follow the shortest path from one point to another (French exports to the Netherlands often cross Germany, as do flows from the south to the north of Poland, etc.).

Added to this is the real complexity in separating variable and fixed costs for nuclear energy (a nuclear power station cannot be shut down; at most, in France only, you can reduce the power) and for gas. Gas prices for a combined cycle are "take or pay", that is to say that not consuming gas costs just as much as consuming it, due to contractual volumes.

In addition, some markets are not very liquid (the physical volumes exchanged sometimes represent less than 5% of national consumption) and the buyers are often the same entities as the sellers, which creates a somewhat unusual situation. Predicting wholesale electricity prices is not an easy task...

Electricity demand varies globally depending on GDP, particularly industrial GDP. An old rule was that electricity intensity (the ratio between GDP growth and the growth in electricity consumption) would fall from 1.5 to 0.8, from an emerging country to one which is industrialising to a mature country. Today, China's electricity intensity is less than 1 due to the considerable efforts made to reduce consumption, all other things being equal.

Nevertheless, China can face the future with serenity, as production capacities closely follow demand, money-saving measures taken are on the whole efficient and production costs are under control and are even likely to fall as the average age of equipment is falling rapidly, and inefficient, polluting facilities are being closed. The final tariffs obey a more political and strategic logic rather than a financial one.

In Western Europe, demand is stagnating or falling, due to the reduction in industrial production and the fall in household purchasing power, and despite the development of air conditioning. The renewal of equipment is underway (coal, nuclear). Unless there is a sharp rise in the price of natural gas (unlikely in the short term, other in a global crisis, due to widespread over-capacities in the liquefied gas sector), the production cost of electricity is not likely to rise. The only possible cause could be a sharp CO_2 tax applied to all emitters without significant quotas.

We need to construct and maintain databases and models

Supply and demand complexity is manageable, however. Today, models can provide a reliable three-year forecast of changes in raw materials prices, with a given global macroeconomic change.

The last table gives our own view (disguised) for some types of ore.

A rough estimate of price changes is possible even for oil, known for its price volatility, bearing in mind that the geopolitical system can have a dramatic effect on supply, in the Middle East in particular.

We do not think that a price significantly above $100/barrel is realistic in the medium term. Current capacities and those in the process of being set up will ensure that supply will cover demand without the need to resort to costly extraction conditions (Arctic under ice floes, for example), which would push the price up to much higher levels. Nor is the accident in the Gulf of Mexico likely to have a strong effect on prices: heightened security measures on similar oil wells would not have a tangible impact on supply.

Just as a buyer knows and follows the costs of his current and potential suppliers, a company has to provide itself with the means to forecast its purchase costs for raw materials and

energy. Such knowledge is indispensable, even downstream after processing, to be able to adapt the changes in product prices and manage the requirements of the end clients.

We cannot plan or invest without these decision-making tools. They are an integral part of strategy-building. A fatalistic approach to prices will penalise a company compared to more astute competitors.

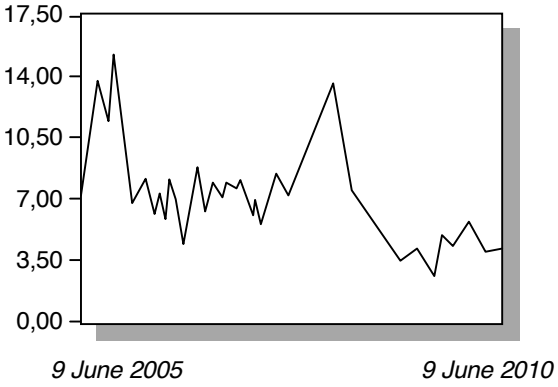
June 2010

Estin & Co is an international strategy consultancy based in Paris, London, Geneva and Shanghai. The consultancy assists CEOs and senior executives of European, Chinese and North American corporations in their growth strategies and assists private equity funds in analysing and evaluating their investments.

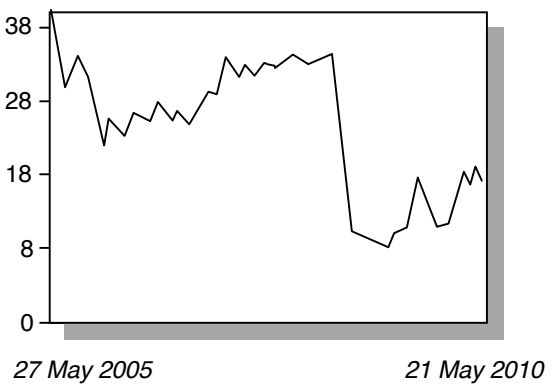
- Table 1 -

Contrasting developments for different types of ore

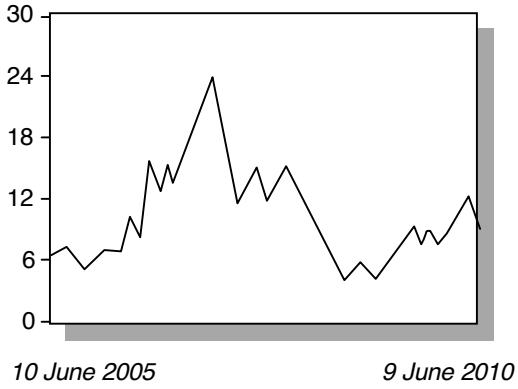
Natural gas
(NYMEX, $/mmBTU)



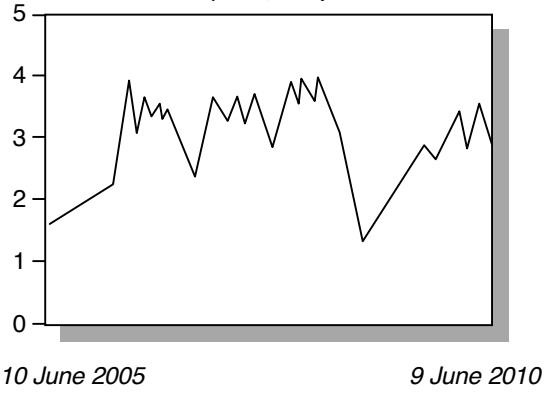
Molybdenum oxide
(FOB N. America, $/lb)



Nickel
(LME, $/lb)



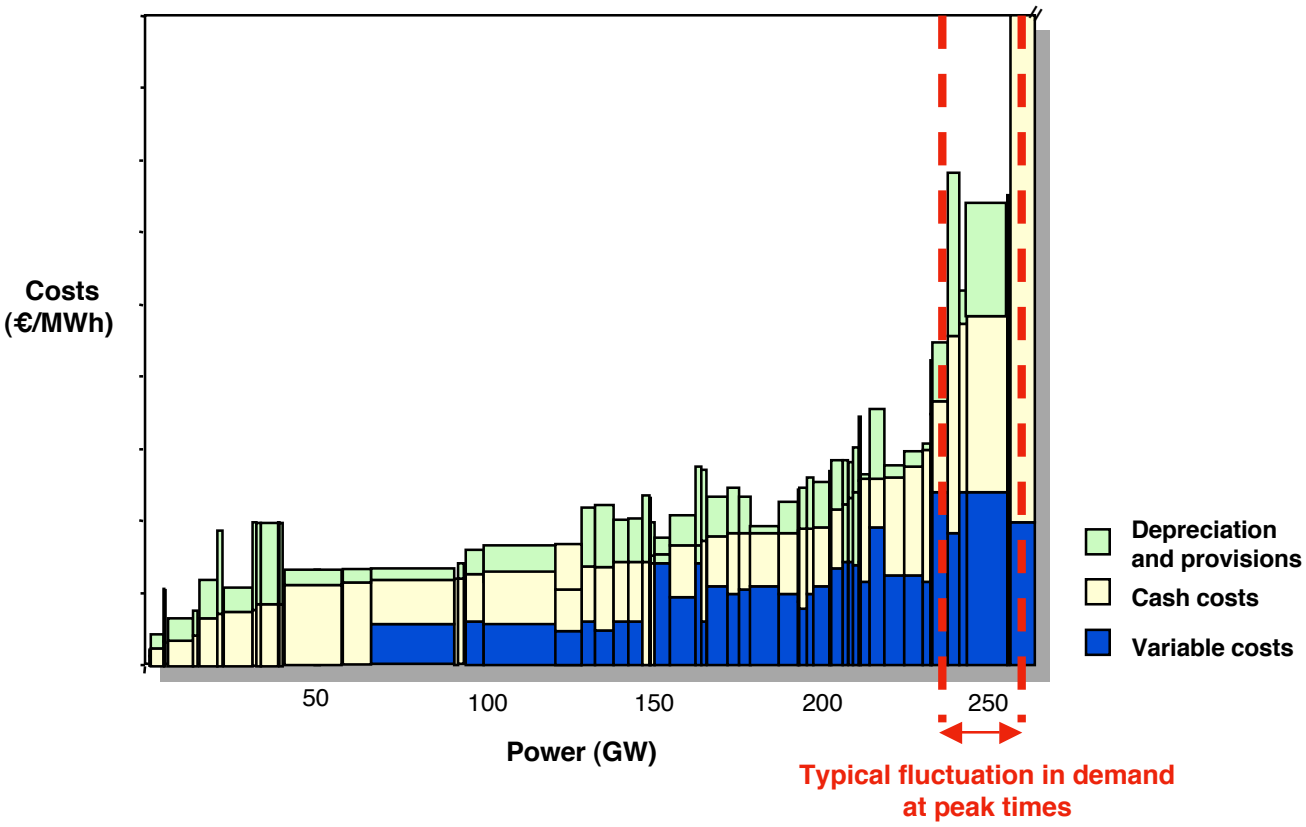
Copper
(LME, $/lb)



Source: LME, Metalprices

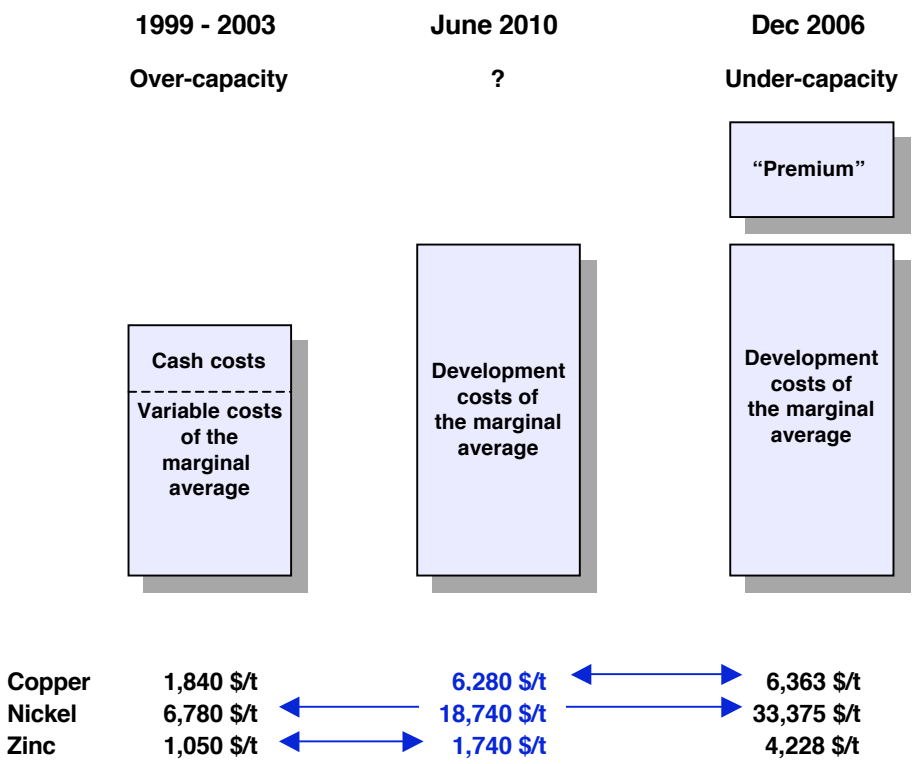
- Table 2 -

Example of a supply curve: production sectors per competitor on the French-German marketplace at peak times



- Table 3 -

A complex, differentiated situation today

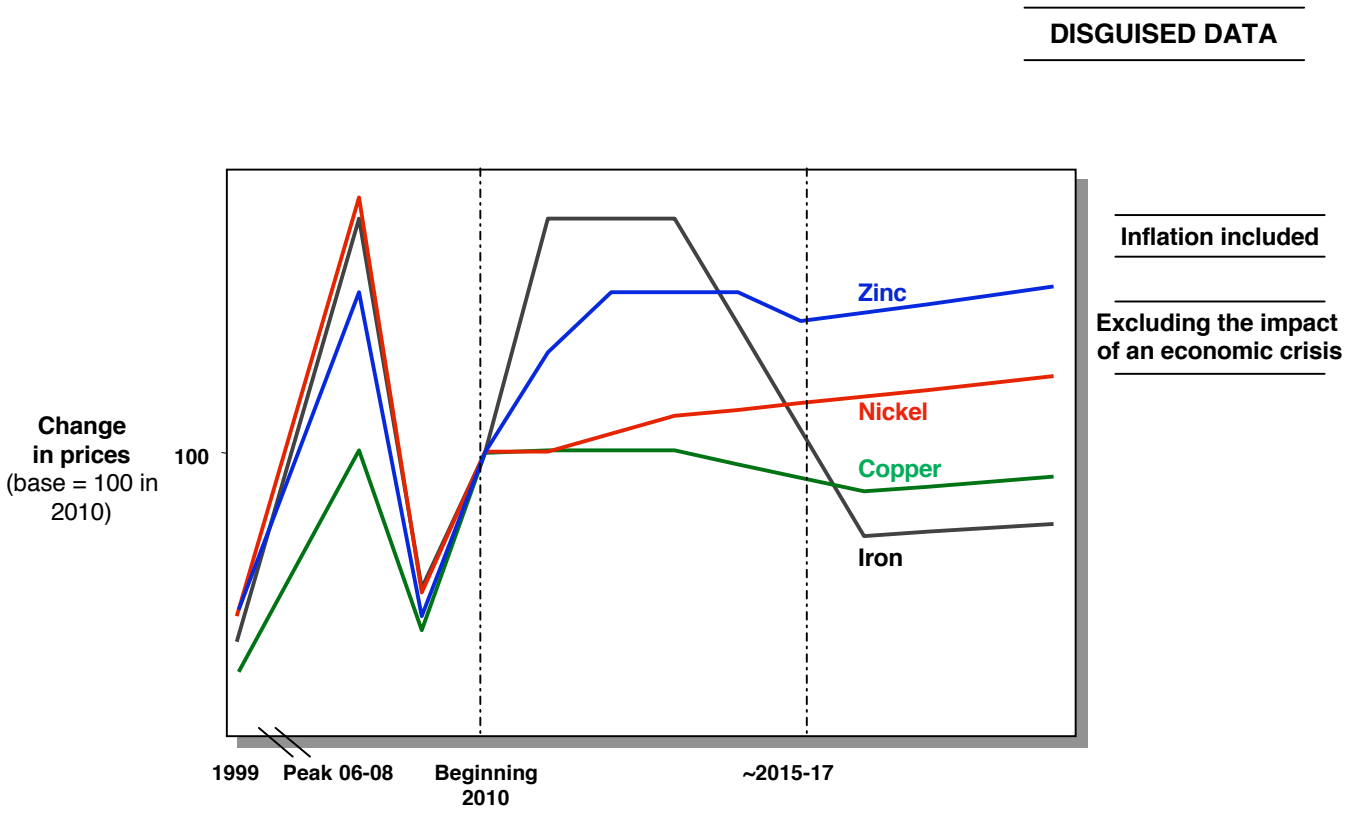


Copper	1,840 $/t	6.280 $/t	6,363 $/t
Nickel	6,780 $/t	18,740 $/t	33,375 $/t
Zinc	1,050 $/t	1,740 $/t	4,228 $/t

Source: LME, Metalprices, analysis and estimates Estin & Co

- Table 4 -

It is possible to model the change in the price of ores



Sources: Raw Material Data, analysis and estimates Estin & Co