

# COMMODITY RISK MANAGEMENT I

*Huge fluctuations and increases in raw material prices in the recent years have led to commodity risk management becoming an increasingly important focus area for the raw material dependent enterprises. It hurts when earnings are downward sloping and unpredictable, but there are ways to come around it...*



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Enterprise risk management deals with the risk of the entire company from a general point of view while commodity risk management deals with the risk concerning raw materials. Commodity risk management is therefore closer to the 'core' of traditional purchasing, because it deals with prices: What is the price of the raw material? How much do these prices fluctuate? And how do we ensure that we get the right price?

### Volatility

The volatility of commodities is a subject that has the attention of many companies. The term volatility simply means

'fluctuation', meaning the historical fluctuations of the price of a commodity. If the volatility is high, the prices fluctuate very much, which means that a higher level of control is required from the purchasing professional.

Price volatility has always been an important subject, but especially in the recent years it has been an area of focus due to the drastically increasing commodity prices. It has been costly for everyone that use raw materials, and this has generally reduced the earnings of most companies. Despite the year by year increasing prices in purchasing it has often been difficult for many companies to add these

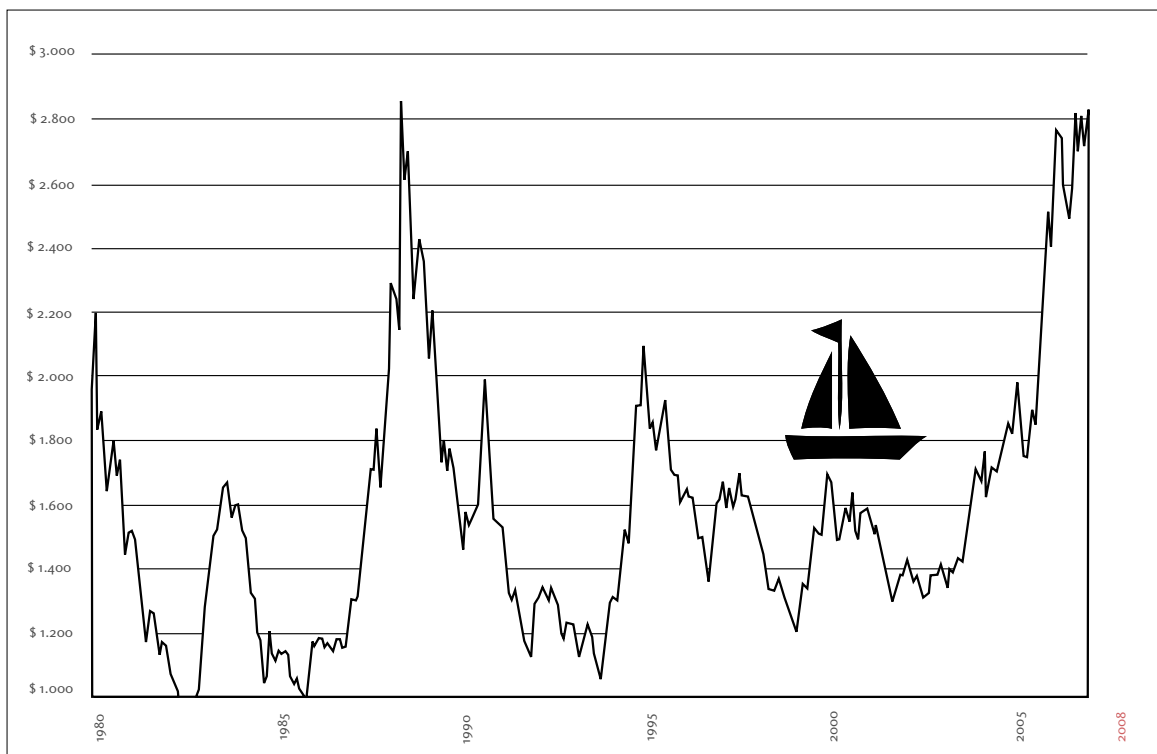


Figure 1: Aluminium prices, London Metal Exchange. The boat is a methaphor for the commodity market as a turbulent ocean in which we have to navigate



price increases to their sales prices. It has often only been a small part of the entire raw material price increase that could be covered by sales price increases. The effect has been lower earnings, which is quite paradoxical in a time where the general turnover has increased in a satisfactory manner. Many companies write in their annual accounts that turnover has developed in a satisfactory manner, but that earnings have suffered under the increasing raw material cost. Not only is it painful that earnings are dropping, they have also been unpredictable. But the natural function of pain is to focus on the sore spot in order to cure it. "Pain insists on being attended to" and that is why there is a lot more focus on commodity risk management today.

### The VaR model

The question is how to solve this problem. A good way to start is to make a VaR calculation (value at risk), which is a statistical calculation. This VaR model shows the maximum loss that you can expect on the price of a raw material. You put in the yearly purchase of your different raw materials in the VaR model, and it calculates the commodity risk exposure of the company. As an example you enter that you buy aluminium in the range of 15 million euros per year. The VaR model then calculates that you have a 95% risk of price increases of up to 4.5 million euros this year. This is done in a combined analysis of your entire portfolio of raw materials. The point of this exercise is to quantify the risk in order to present this to the management of your company. This statistical calculation will enable the management to better evaluate the risk exposure, so that they can decide if they can live with this exposure or if they want to initiate actions that can reduce the exposure.

This risk exposure can be viewed in a more practical way. As in the example above we will assume that we are working in a company that uses large quantities of aluminium in our products. To show the price volatility we could start by looking at the historical prices of aluminium. Figure 1 shows aluminium prices since 1980.

The picture given in figure 1 shows the concept of 'volatility' in a more direct way. Here we are not dealing with a calm picture or a steady market. It is easy to see directly that the prices fluctuate wildly from year to year. Imagine the above price graph as the surface of an ocean (a small boat is placed in the graph in order to

make the symbolism more plain). If you take your boat out on a sea with this kind of waves, you will be regarded as reckless. Some might remember an old warning in the television, "Only a fool does not fear the ocean".

At this point we are no longer talking about a theoretical approach that will calculate a statistical loss with a 95% probability. We do not even need to make a calculation in order to see very clearly that we are in a market, which is anything but calm and steady. We can also see that volatility is not a new concept for this raw material. The volatility has been high all along.

We could also illustrate the fluctuations of aluminium by comparing it to the price of a car. If the price of a car showed the same kind of fluctuations as the aluminium price, then the average price of your Volkswagen would be 15,400 euros, but for mysterious reasons (that we will not dwell on here) the price would – in some years – be 28,000 euros. Of equally mysterious reasons the price would – in some years – fall to around 10,000 euros. If the price of a new Volkswagen would fluctuate from 10,000 to 28,000 euros from one year to the other – for the same model – then timing of your car purchase would be a national sport! For the same reason we should time the purchase of our raw materials in the best way possible.

### Responsibility

It is stated in the theoretical approach to the VaR model that it is necessary to have a continuous surveillance of the risk parameters. This should ensure that the model always shows the updated risk level. But a practical person would probably ponder this question: What are the chances that the price of aluminium should suddenly abate and remain as calm as the surface of an icy lake? Looking at the extremely volatile graph in figure 1 it is quite clear that the chance is virtually non-existing. If prices have exhibited this kind of volatile waves since

the beginning of the 1980's, then we have no doubt that these fluctuations will continue – or even increase. So this leaves us with an image that both the purchasing professional and the management can understand. If our products are made of aluminium, then we are forced to navigate in a sea that is as turbulent as the above price graph. And when you enter turbulent seas, you have got to take your precautions if you want to safeguard your boat. We need to be in radio contact with the rescue team, we need to put on our life jackets, and we need to have the life-boats ready. We are interested in doing everything we can in order to minimize the risk of losing our boat. That is risk management from a practical perspective. As a company dealing with aluminium we have to navigate these seas, and so we are also obliged to show the responsibility in ensuring the boat and, not least, the crew. The important word is responsibility. One of the important reasons for dealing with raw material prices is not only the earnings but also being able to run your business in a responsible way.

### Offensive or defensive policy

There will often be different reasons behind using commodity risk management. That is why the tools must be adapted to the risk profile of the company. Each company has to find their own goals and risk profile. Some goals are defensive while others are offensive. We are not talking about good or bad goals. We are simply talking about different goals that must be suited to the culture of the individual company. Figure 2 shows some defensive and offensive goals.

As mentioned before, there is no goal that is better than others, objectively speaking. But the tools of commodity risk management have to be adapted to the policy of choice for the company. For some companies it will be enough to ensure a sensible price level for their physical deliveries. Others might want a more offensive coverage stretching longer into

Goal	Policy
"To safeguard that the purchasing budget is not exceeded"	Defensive policy
"To ensure the earnings of the company"	Responsible policy, aligned with the overall goal of the company
"To obtain competitive advantages by getting better prices than competitors"	Offensive policy, aligned with the goal of sales

Figure 2: Some goals for commodity risk management. Source: Own make





Figure 3. The commodity site Kairos (under construction)

the future, combined with financial instruments (like futures and options).

### Current state

As we are now familiar with the volatility of raw materials, we can start looking at how this is handled today. Danish Purchasing and Logistics Forum (DILF) has conducted a 'Commodity Risk Management Survey' together with A.T. Kearney. The survey shows the current state of commodity risk management in the Nordic countries. It turns out that 33% of the companies in the survey do not try to get an overview of the raw material price fluctuations. This does not indicate a responsible handling given the volatile nature of the prices. The remaining 67% use the following sources in trying to get an overview of the raw material prices:

- 48% ask their raw material supplier about his forecast for the price development
- 40% follow the forward price curve on LME
- 36% read market reports
- 34% read price forecasts
- 23% read newspaper articles about raw material prices
- 14% ask their customers
- 3% use various sources

It turns out that the most widely used method in obtaining an overview of the future prices of raw materials is to ask the supplier. This is hardly a laudable practise. Most purchasing professionals know

that they are not going to get an objective answer from the raw material supplier. The fact that companies are asking anyway could indicate that relevant material is hard to get, or that it is hard to qualify the sources. Regardless of the reason it is highly questionable to seek the council of the raw material supplier – seen from the perspective of negotiation tactics. Asking the raw material supplier about the future development of prices is like saying that you are at a loss, and not well informed. Naturally this is a rather weak starting point for future price negotiations. It is important in negotiation tactics to know the cost-drivers of the supplier as well as, or better than, he does (and if you do not know them, you should not advertise the fact).

### Analytical methods

If you do not want to ask the raw material supplier, then there are some good alternatives. There are several analytical methods that can help predict the price development of raw materials. Two of the analytical models will in the following be discussed briefly:

### Fundamental analysis

This analytical model uncovers the fundamental aspects that influence the price of a raw material. Many are quite familiar with the term "supply & demand". In the context of raw materials we need to look at the supply side (what is the output and how many new factories are being built) and the demand side (how is the demand

developing in the different sectors). We also need to monitor the world stock of materials, as this is a function of supply vs. demand. Finally we need to monitor the cost-drivers of the raw materials (what are the mining costs, the smelting costs and so on). The end result of this analysis is a broad overview of many factors that either depress or inflate the price.

The nature of fundamental analysis is such that it tends to be subjective. The factors influencing the price can be solid data, but the weight each factor has is more subjective. Another weak point of fundamental analysis is a timing issue. It is difficult to convert a fundamental analysis into a specific recommendation about the time of the next price development. Nevertheless it is a vital analysis that gives us an overview of all the important cost-drivers.

### Technical analysis

If we want to add timing and more objective criteria to our analysis we should turn to technical analysis. Here we are dealing with mathematical calculations that will tell us the price development in a more objective and less emotional manner. Technical analysis is a range of different mathematical indicators that in combination will tell us a great deal about the future development of the price. Technical analysis is not widely known in the purchasing communities yet, but it is the next level that purchasing professionals can employ to their advantage.

As with all analytical models it is imperative that they do not stand alone. That is why the fundamental analysis and the technical analysis must be combined. The combination of these two will give a much more reliable view of where the raw material price is heading. And then we can start to buy at the right time and at the right prices, which will ensure the earnings of our company and the calm nerves of the purchasing professional. /