

## Commodity risk management III – technical analysis

*In this third article we are looking into technical analysis. It is a type of analysis that by nature is very different from the fundamental analysis we covered in the last article. Technical analysis will give the answers that fundamental analysis cannot – the timing aspect for one. In this article we will continue to use aluminium as the practical example.*



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### Technical analysis

In short, technical analysis is a compilation of mathematical models that helps us understand and predict stocks and commodity prices. There is an impressive list of far more than a hundred mathematical models that can help us, but here we will limit ourselves to cover three of the most important ones.

Technical analysis is broad and – by its name – very technical of nature, and that makes it quite easy to make the mistake of writing a complicated and scientific article. However, as the aim of this article is to give a short and practical introduction, the article is written in an easy and exemplified manner.

In this article the mathematical models will be described as simple tools that we know already: A compass, a speedometer and a thermometer. If the mission of our company – figuratively speaking – is to sail to Greece to buy olives, then we

don't have any problems taking these tools on board. The compass tells us the direction, but it does not dictate where we must travel. Technical analysis is, in the same way, a toolbox we bring on board to help our voyage, but it does not dictate what our mission is.

### The compass

The first tool that we bring with us on our voyage is the compass. In reality the tool is called the simple moving average, which is the work horse in technical analysis, but in this article we call it the compass. This tool has an ability to tell north and south – what is up and what is down. When we use it on our raw materials, it can tell us if the price is heading north or south. In figure 1 we can see how it works.

Start by looking at the spot marked “X” in figure 1. Here we can see how the aluminium price (the black line) increase throughout all of 1994. The red line is our “compass” and it increases throughout 1994 also, and so the compass agrees with the price direction (up). In 1995 the aluminium price cross down through the red compass line (marked with a “Y”). This marks a crossover which is important. A

crossover is a shift in trend, which in this instance marks a long fall in the price of aluminium. Here we are looking at a falling price from middle of 1995 to the end of 1996, which is about 1 ½ year. The good thing about these crossovers is that we know they signal a long decrease (or increase) – usually lasting a year as minimum, but often longer.

At the spot marked “Z” we witness another crossover, which signal an increasing price. In this instance the price increases for about a year. The increase is not very huge, but the compass does not tell us anything about the size of the increase or decrease. In comparison, the other crossovers are showing a much bigger price increase and decrease.

On board a ship you only have to look at the compass to notice where the arrow is pointing. It is just as simple for us to



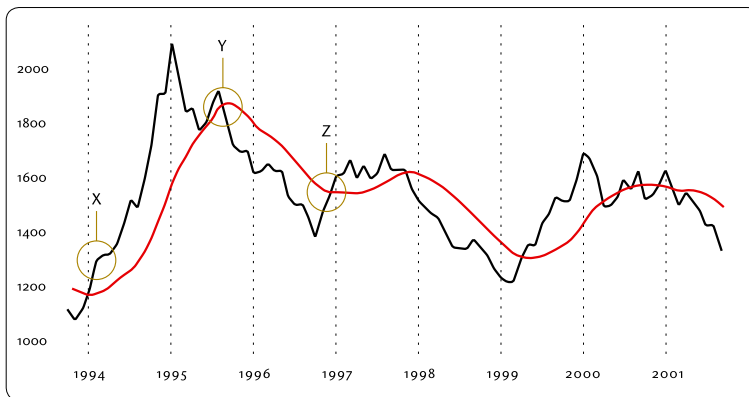


Figure 1. "The compass" or simple moving average (the red line). The aluminium price (the black line) is from London Metal Exchange

look at the graph and see where the price is heading. We just need to look at the direction of the red line. When a crossover occurs we know the future long term direction of the price.

### Speedometer

On our ship it is not only the direction that is important, but also the speed. Let us exemplify it this way: If you throw a tennis ball up in the air, you are able to see the direction of the ball. But what is the speed? This is not so easy to measure. So we go out to our car and rip the speedometer out and put it into our tennis ball. Now we can see the speed of the tennis ball when we throw it up in the air. While the tennis ball is on its way up, the speed is beginning to decrease. The tennis ball is still moving up, but slower and slower. Finally the tennis ball reaches the peak and – for a millisecond – is quite motionless in the air, and then gravity makes it fall to the ground.

This example is just showing that direction and speed is not the same. This can help us. When the ball is still heading higher and speed is suddenly beginning to decrease, then we know that it is just a matter of time before the tennis ball reaches the peak and begins to fall. When direction and speed disagree, we get a clear signal that we can use as an early warning. That is why we install a speedometer in our aluminium price in order to benefit from these signals.

Our speedometer – which in reality is called rate of change – can be seen in figure 2.

The spot marked "X" shows a slight uptrend in price. The tennis ball is on its way up (marked with an upward line). If you look at spot marked "Y" in the top graph you can see that the speed – in the same time frame – is falling drastically

(marked with a downward line). This is a warning that price will soon reach the peak and reverse the direction. The same can be seen if you look at the spot marked "Z" where the price is also going up, whereas the speed is going down.

Much more can be said about this model. But it is more important to keep this article in a broad perspective, so we

only give a short introduction to the tools. The important aspect of our "speedometer" is that it gives us an early warning before our compass shows a crossover. This gives us time to prepare. Then when the crossover comes, we are ready to take action.

### Thermometer

The final tool we will show is a "thermometer" (which in reality is called relative strength index). We all know that when a thermometer line is at the lowest level, it is very cold and unpleasant. When the thermometer line is at the highest level, it is very hot and unpleasant. In both cases we are not comfortable. We would always try to go to the middle where the temperature is more bearable. The same thing happens to prices of raw materials. We can observe this behaviour in figure 3.

The top graph shows a Y axis starting at 0 and ending at 100. The area between 0 and 20 is the ice cold South Pole, and the area between 80 and 100 is the hot Sa-

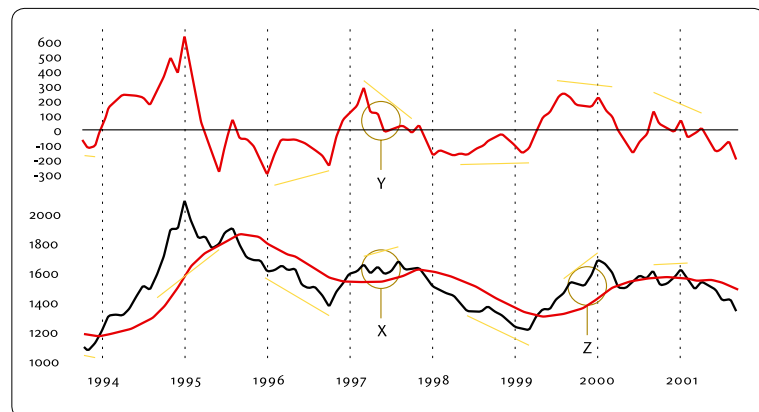


Figure 2. The lower graph is the aluminium price, and the top graph is our "speedometer" (rate of change)

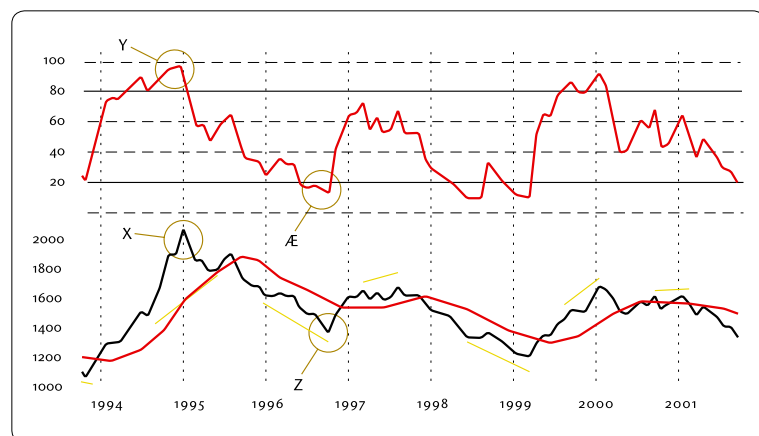


Figure 3. The lower graph is the price of aluminium, and the top graph is the "thermometer" (relative strength index)

hara. The price does not like to be in any of these two extreme areas, and will only tolerate a stay for a short while.

At the spot marked "W" you can see that the price of aluminium is very high. At this time everyone thinks that the price will continue to increase. In fact, price could continue to increase for a long time. But if you look at the spot marked "X" in our "thermometer", you can see that we are in the region of 80-100, which is the fiercely hot Sahara. It is just a matter of time before the price must fall because this is not a comfortable place. Naturally this is a "popularized" explanation, but that does not make the tool any less efficient. At the spot marked "Y" we have a low price, but we don't know if this price decrease will continue. If we look at our thermometer in the top graph (at the spot marked "Z"), then we see the level is placed between 0 and 20, which is the ice cold South Pole. It is therefore reasonable to expect the price to increase before long in order to seek out a more temperate zone - which it does. Our thermometer is then also an "early warning" like our speedometer.

### A voyage with tools

The idea is that we use all our tools during voyage. Some tools give us an early warning - so that we have time to prepare - and others give us the final confirmation. But when all our tools tell us the same story, we are much more confident that they tell us the right thing. So we

combine the tools. We can see that temperature is in the area of 80-100, and we prepare ourselves mentally for a scenario where the price soon will reach the top and start falling. Then we look at the speedometer, and it shows us a decreasing speed (despite increasing price). Now we have two valid signals that tell us the same story. After a while the compass makes a crossover in a downward direction and that is the third and final confirmation that the price is going to fall. As all three models have confirmed the same story, we are more confident, and it is therefore responsible to act on their signals.

### Aluminium right now

Please turn to figure 4 for the current aluminium price. The first warning came from the thermometer being in the 80-100 area. The next warning came from the speedometer that for a long time has shown a decreasing speed despite an increasing price. Both facts point towards the possibility of a falling price. So we only lack the final confirmation from our compass. We don't do anything before the price cross the red line. This is close to happening as the black line is already touching the red line. When and if a crossover happens, we have three models that point towards a falling price market for aluminium. That is a piece of knowledge that we as purchasing professionals can put to use. We must - to name a few examples - avoid making long-term fixed

price contracts, and we must secure price reductions are obtained from our suppliers when the official aluminium price is falling.

In the next article we will conclude the work by combining fundamental analysis with technical analysis and explore how this affects the work we do with prices, suppliers and contracts. /

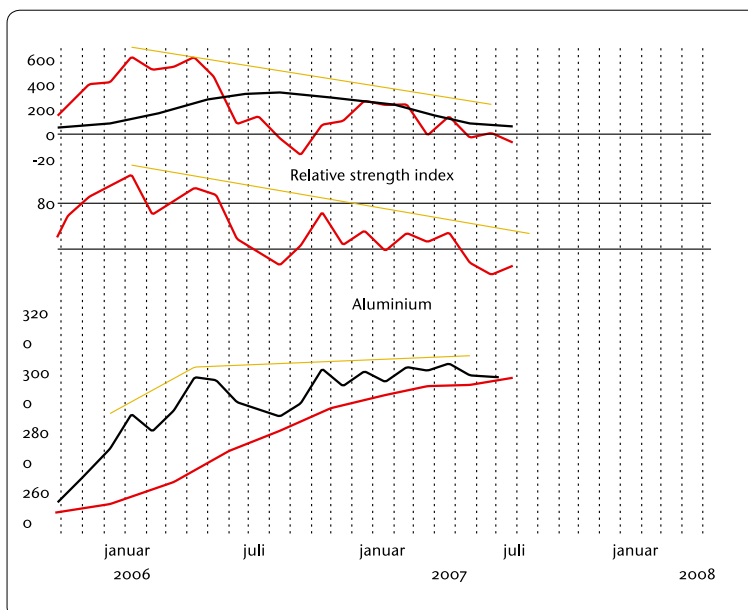


Figure 4. The current price graph of aluminium together with the "compass", "thermometer" and "speedometer"