

Encouraging model forecast

Lehman Wave-based demand forecasting in and outside the crisis

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In April 2010 ECJ published an article called "The Lehman Wave shakes the coating industry", which explained why the sales volume of coating resin suppliers to construction markets end 2008 first went down 30-50 %, then end of 2009 recovered to around original levels, and in 2010 was going down again, while the construction end market in 2009/10 had only seen a steady decline of some -/-15% from 2007. A close cooperation between DSM and

Eindhoven University of Technology had found that de-stocking in the long value chains of the coating industry were the cause of a significant part of the decline, and that said de-stocking was triggered by the collapse of Lehman Brothers mid-September 2008. The de-stocking caused a wave in the industrial supply chains which they called the Lehman Wave. The team built a model and was able to depict the first 18 months of the crisis accurately.

The model predicted a 2nd dip, not as deep as the first one, but with a similar wavelength. After a 2nd peak demand was predicted to settle closer to construction end markets that by then were supposed to recover slightly. This article will give further insights in the reliability of the built model comparing sales results since 2010 against the generated model curve almost two years ago.

One can see in figure 1 that the model correctly predicted the second dip and second peak, except for the timing of the 2nd peak. We have to be aware that a good match between the actual sales curve and the model curve is not scientific proof that the theory behind the model drivers is correct, but here the match is of such a high level, and there is meanwhile so much other evidence about the stock moves, that we can conclude that indeed simultaneous active de-stocking caused a significant part of the economic dip in the (coatings) industry.

Managing expectations of the market

Last year ECJ already reported that these insights were the basis for DSM's approach of the crisis in resins. DSM quickly gained confidence in these models and decided early to leave its core resin segments intact and to keep all key personnel on board as the effects and outlooks on recovery were well understood. DSM's innovation program for coating resins and its investment programs were continued. Two new resin factories were opened, creating extra capacity aiming to be ready when demand started to pick up. In April 2009 DSM started in advance of market pick-up to rebuild the stocks. And in January 2010 DSM started preparing itself for the forecasted second dip by managing its stocks down. Main gain of the model was the predictability which gives the possibility to manage the expectations of the market. The results are depicted in figure 2, where the sales development of DSM's business in coating resins during the crisis period is compared with the published figures for the coating resins business of a direct competitor with a portfolio that is sufficiently comparable for this purpose. Interestingly, DSM and the competitor show to have experienced a very similar demand pattern, consistent with the theory that demand is mainly determined by the end markets and underlying stock movements.

The insight from the Lehman Wave model curve was included in the Sales & Operations Planning process as a

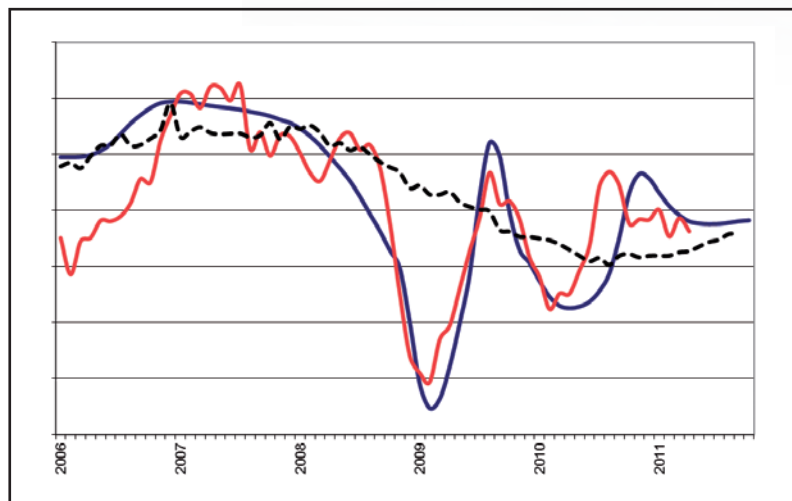


Figure 1: Model forecast (blue) and actual sales curve (red) in segment "joinery", supplying resin for industrial paint for the construction market (dotted black line).

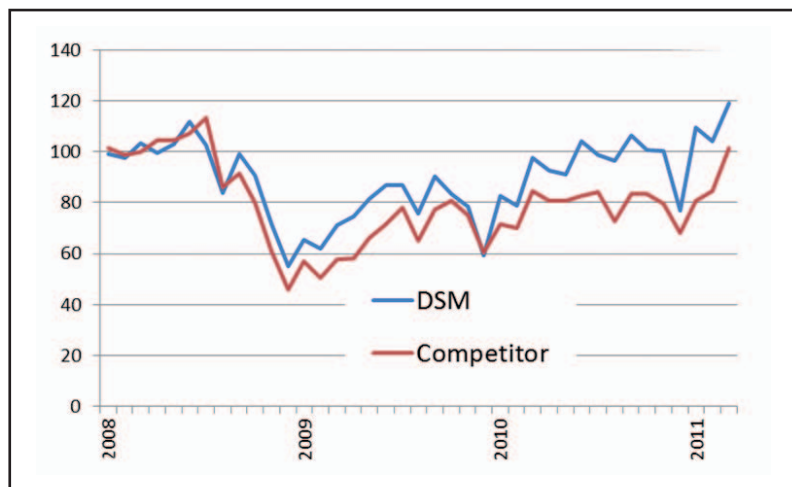


Figure 2: Comparison of DSM's sales in coating resins with a competitor's sales in coating resins (Competitor's data taken from presentation to investors, October 2010 and April 2011; DSM's data provided by DSM; both curves were indexed at Q1'08=100%). Cumulative difference between the curves is EUR 0.25 billion.

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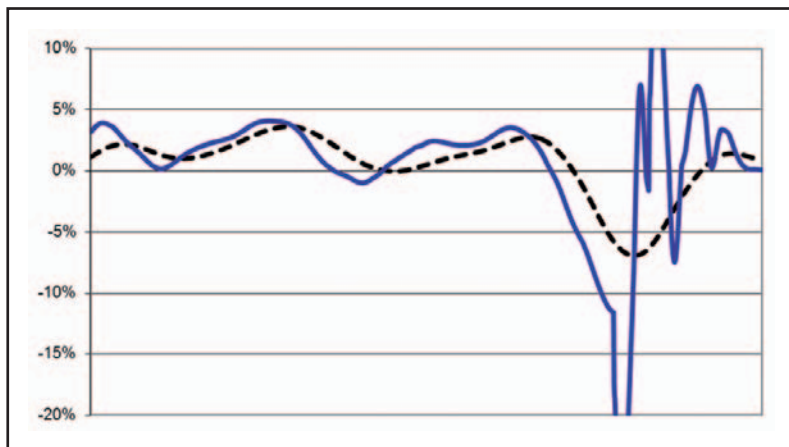


Figure 3: A 20 year curve (1993-2012) of the growth yoy of the European construction industry (dotted black), and a blue curve with the growth yoy of a 5th echelon. (incl. 10% de-stocking in Sep 2008)

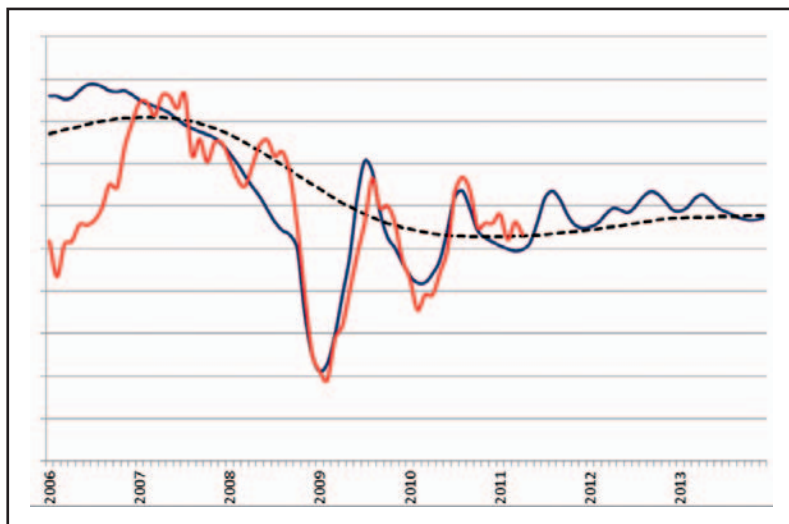


Figure 4: For "Joinery" the Actual sales curve (red) till Q1'11 and the latest forecast for the construction market (dotted black line) from Euroconstruct/Experian, June 2011). The Model forecast (blue) as made by Flostock is used by DSM as one of a number of possible scenarios for the future

2nd source of info next to the regular sales forecasts. The model has been of great value as it predicted DSM's running sales in Joinery with >95% accuracy. That enabled DSM to manufacture and supply more effectively at minimal working capital impact. And DSM used the model to build its budget based on its real end market.

When from July - October 2010 higher sales indicated an earlier recovery than predicted, they re-calibrated the model to show the 2nd peak with the right timing.

Forecasting outside a crisis

The encouraging results of model forecasting in a crisis situation triggers the question whether these models can also help predicting demand outside a crisis, thus outside a Lehman Wave. Obviously it takes time for an order to travel backwards in the supply chain, so if an upstream company has access to current end market information that he can put in a model he will know what

his demand will be in a few weeks' time. More practical, a lot of end markets have quite reliable forecasts about future growth because these markets are driven by demographic macro factors such as population growth and GDP. Certain industries, such as ship building, construction, and aviation have very long lead times, so the order portfolio of these industries gives a reliable view on the future for companies supplying to these end markets.

A second question is whether outside a Lehman Wave actual demand is significantly different from the end market itself. In other words: whether stock changes have such a strong effect on an upstream company's turnover that it is worth creating a model for it.

From figure 3 can be seen that the growth in the end market has a different phasing than the growth for a company 5 steps away from it. The model sales were higher than end-market sales in all periods of growth and lower than end-market sales in periods of stagnation or shrinkage. The higher amplitude for the upstream supplier explains part of the cyclicity of the basic industries: they follow end market demand like everyone, but in times of changing growth their swings are much larger. Since the timing and magnitude of the upstream growth figures are impossible to estimate intuitively based on end market growth alone, the answer is: yes, a model brings strong advantages here.

Has the Lehman Wave subsided?

If we put the latest figures for the European construction markets (source: Euroconstruct/Experian) into the model, the Joinery demand in 2012 and 2013 will recover slightly. As can be seen in figure 4 the effects of the Lehman Wave are continuing (at least for this segment), but dampening because of the elastic settings of the supply chains. The slow recovery of the end market in 2012/2013 plus the reactive restocking will give a reasonably strong growth for joinery, where no new oscillation is to be expected.

A new wave can be expected if again something happens that creates a panic response in the global markets. Since the world is getting more and more integrated, these panic responses will increase in force. And since supply chains are leaner than before the crisis, companies will be tempted to respond even stronger to a crisis to free-up the same amount of cash. If for example a major country would default on its financial obligations, and banks would again face bankruptcy risks, a new credit crisis and de-stocking round will follow. The recent Japanese disasters are not creating big Lehman Waves because the responses from the world supply chains are very varied, but the supply interruptions may create a lot of problems in the specific end markets involved (and could be modelled).

Conclusion

The authors have shown that it is essential for companies to really know their end markets and to have an understanding of the general stockpiling in the industry. And they have shown that a relatively simple computer tool can strongly improve demand forecasting. Companies with a model can translate end market developments to their actual demand with high forecast accuracy. And these companies will be ready for the next crisis.

Further info: Build your own model on www.flostock.nl ◀



Learn more about model forecasting! Listen to Robert Peel's presentation at EC MARKET DAY Coil & Can on 11 Oct. 2011. For more info please go to: www.european-coatings.com/events/ecc-market-day/sessions.cfm

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