

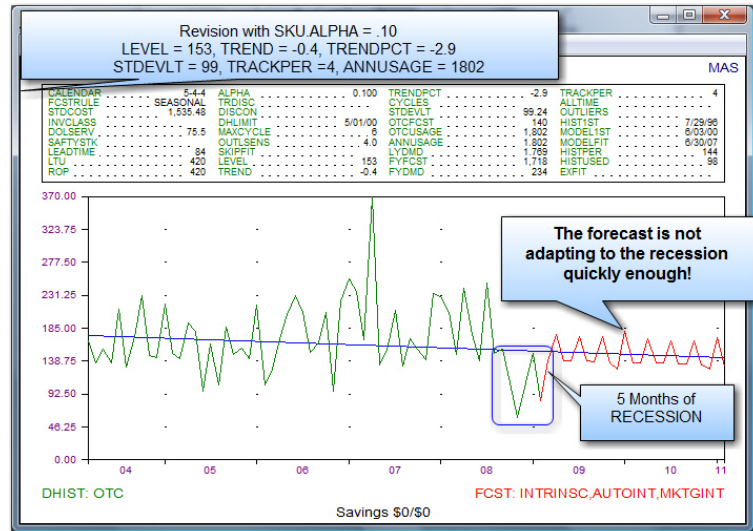
Respond to the Recession with *Fast Smoothing*

E/Step Software Newsletter – Fall 2009, by [Robert Duncan](#), CFPIM, Duncan Consulting

Many FGS users have seen the *recession dip* on their simulation screen. It looks like a decrease of 20% to 50% over the last several months.

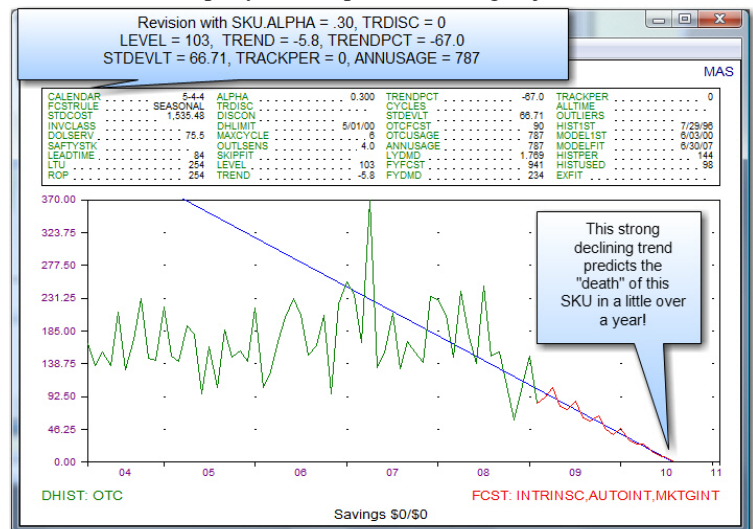
Because the drop in demand was sudden and steady, there is a good chance the forecasts have not adjusted quickly enough and have probably hit a tracking signal. If you responded to the tracking signal and lowered the forecast with marketing intelligence or a SKU.DHLIMIT, you might have caught the decreasing demand in time. If not, you might have built inventory while the demand dropped off (but the supply continued).

The example on the right shows 5 months of recession. A tracking signal picked it up 4 months ago, but the user did not adjust the forecast. A year before the recession, the level was 197 with a positive trend of +1.0, a trend percent of +6.0%. Exponential smoothing has brought the level down to 153 and the trend down to -0.4, but is still too high compared to an eyeballed level of about 100. To make it worse, the standard deviation of the forecast error increased from 68 a year ago to 99 after the recession hit. So not only is this SKU over-forecasted, it is over-safety stocked. That's adding insult to injury!

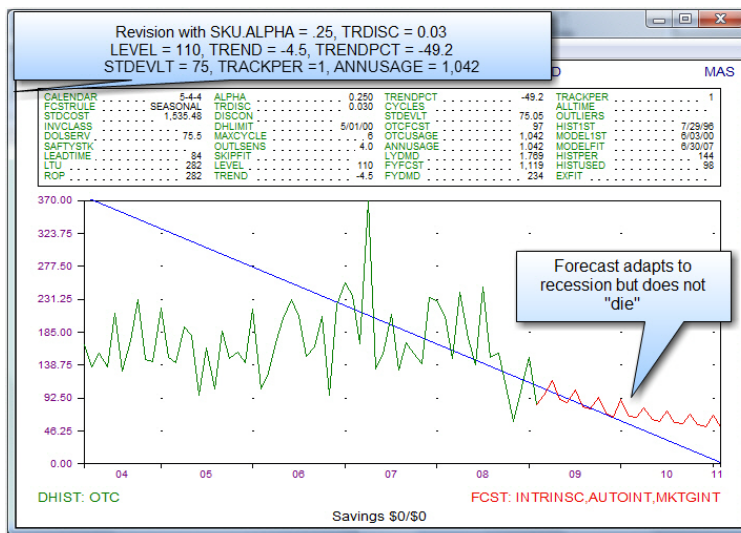


But if you have hundreds or thousands of SKUs that are dropping in the recession, is there an automated process to adjust? Wasn't exponential smoothing supposed to adjust the forecasts automatically? Typically alpha factors (SKU.ALPHA) used during the revision process for monthly forecasts are 0.1 (*normal smoothing*) for mature SKUs (more than 1 year of history) and 0.25 (*fast smoothing*) for new SKUs. But in effect, since the recession started, this forecast model has a completely new pattern, just as an immature part has a new pattern. The alpha factor of 0.10 is insufficient.

Does fast smoothing help? To test this, we used an alpha of 0.30 and revised the SKU for 12 months. The results are on the second simulation graph. The level has dropped to 103 and looks good. The trend has dropped too, from +6.0 before the 12 months of revisions to -5.8, a decline of 67% per year. Alpha smoothing adjusts the level (called *single exponential smoothing*), the trend (*double exponential smoothing*), and to a lesser degree the seasonality (collectively called *adaptive smoothing*) if present. Although the forecast looks good in the near term, the trouble with this model is that with a decline of 67% per year, the forecast will hit zero by mid 2010. The user said this would never happen. Rather, if the recession continues but does not get worse, the forecast should level out.

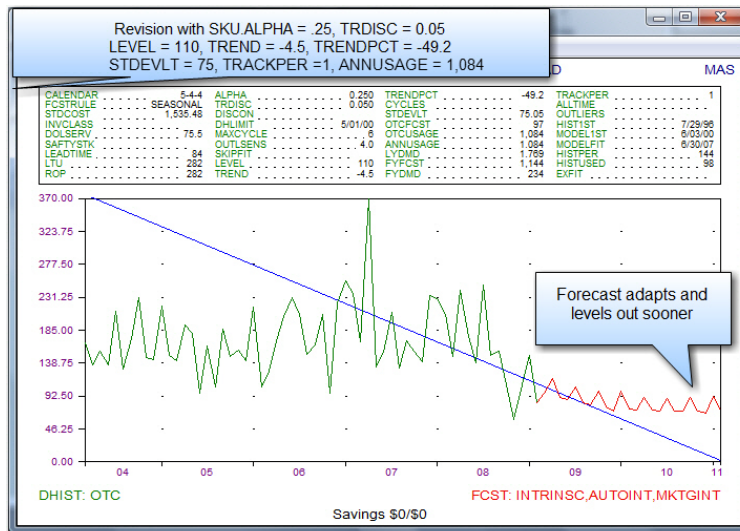


FGS has a forecast adjustment field to deal specifically with this issue - the trend discount, SKU.TRENDISC. To test it, we set the alpha factor to 0.25, gave the SKU a trend discount of 0.03, and revised the forecast for 12 months. The results are on the right. A trend discount of 0.03 means the trend adjusts at 1-ALPHA (97%) each month. If the trend is -4.5 for this month, next month it will be 97% of -4.5 = -4.365. The following month the trend will be 97% of -4.365 = -4.234. The following months the trends are: -4.11, -3.98, -3.86, -3.75 ... until it eventually approaches 0 and levels out.



The forecast analyst felt that trend should not continue to drop for so long. We tested a trend discount of 0.05. In this simulation screen below, you can see the red forecast levels out sooner. The 12 month forecast (ANNUUSAGE) increases from 1,042 at a trend discount of .03 to 1,084 at a trend discount of .05.

An issue with a high alpha factor is that when you do a model fit, it can go back from fast smoothing to regular smoothing (0.10 for a monthly calendar). To solve this problem the analyst added an expression edit in her command right before the revision process. It uses the FASTSMOOTHING keyword introduced in service pack 126¹. The command does an expression edit for any SKU.ALPHA in the fast smoothing list that is not on fast smoothing (SKU.ALPHA NE FASTSMOOTHING SKU.REVISNS) and makes it fast smoothing.



So what happens when the recession is over? You will find that fast smoothing and a trend discount also help the forecast recover quickly. Eventually you want to take the mature SKUs off fast smoothing and put them on normal smoothing (SKU.ALPHA = NORMALSMOOTHING SKU.REVISNS)².

For additional information about the revision process and alpha factors, please read other FGS Newsletter Articles:

1. *Automatic Alpha Factors in Non-Monthly Calendars:* [full PDF article](#).
2. *Respond to Changing Demand with the Smoothing Factor:* [full PDF article](#).

Link to the [E/Step Software website](#).