Simple Exponential Smoothing Explained

For simple exponential smoothing methods, the forecast is calculated by multiply relative weights, which are calculated based upon what is termed a smoothing pa hear this called the alpha or **α**. This is the magnitude of the weight applied to the the weights decreasing exponentially as the observations get older. The formula l

$$\text{Forecast} = \text{Weight}_t\, Y_t + \text{Weight}_{t-1}\, Y_{t-1} + \text{Weight}_{t-2}\, Y_{t-2} + \ldots + (1-\alpha)^n\, Y_n$$

where

t is the number of time periods before the most recent period (e.g. **t** = 0 for the m period, **t** = 1 for the time period before that).

$\mathbf{Y_t}$ = actual value of the time series in period t

$\mathbf{Weight_t} = \alpha(1-\alpha)^t$

n = the total number of time periods

This model basically gives us a smooth line or **LEVEL** in our forecast that we can next period.

Here are a few key points to help understand the smoothing parameter:

- The smoothing parameter can be set for *any value between 0 and 1*.
- If the smoothing parameter is close to one, more recent observations carry influence over the forecast (if **α** = 0.8, weights are 0.8, 0.16, 0.03, 0.01, etc.).
- If the smoothing parameter is close to zero, the influence or weight of recen observations is more balanced (if **α** = 0.2, weights are 0.2, 0.16, 0.13, 0.10, et

Choosing the Smoothing Parameter α

Choosing the correct smoothing parameter is often an iterative process. Luckily, a tools, like Alteryx, will select the best smoothing parameter based upon minimizir Otherwise, you will need to test many smoothing parameters against each other best fits the data.

The advantage of exponential smoothing methods over simple moving averages i depreciated at a constant rate, gradually declining in its impact, whereas the impa value in a moving average, will have a constant impact. However, this also means smoothing methods are more sensitive to sudden large or small values.

The simple exponential smoothing method does not account for any trend or sea rather, it only uses the decreasing weights to forecast future results. This makes t only for time series without trend and seasonality.

Want to learn more?

To ready more about the math behind simple exponential smoothing, see here. To learn how to do simple exponential smoothing in Microsoft Excel, see here