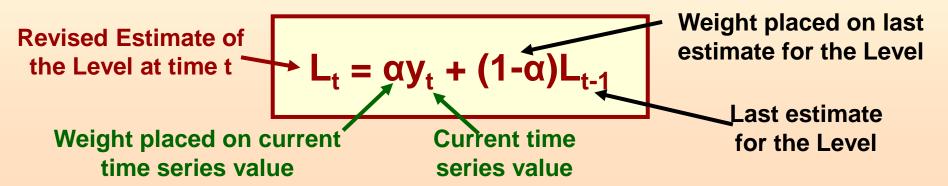
Forecasting

Exponential Smoothing For Stationary Models

Basic Concept

- Exponential smoothing is actually a way of "smoothing" out the data by eliminating much of the "noise" (random effects).
- At each period t, an exponentially smoothed level, L_t, is calculated which updates the previous level, L_{t-1}, as the best current estimate of the unknown constant level, β₀, of the time series by the following formula:



α in Exponential Smoothing

- The idea behind "smoothing" the data is to get a more realistic idea about what is "really going on".
 - The value of the **smoothing constant**, α , is selected by the modeler.
 - Higher values of α allow the time series to be swayed quickly by the most recent observation.
 - Lower values keep the smoothed time series "flatter" as not that much weight will be given to the most recent observation.
 - Usual values of α are between about .1 and .7
 - See graphs for α = .1 and α = .7 later in this module.
 - The value $(1-\alpha)$ is called the damping factor.

Review

- Exponential smoothing is a way to take some of the random effects out of the time series by using all time series values up to the current period.
- The smoothed value (Level) at time period t is:
 α(current value) + (1-α)(last smoothed value)
- Forecast for period t+1= Smoothed Value at t
- Initialization:

First smoothed value = first actual time series value

- The smaller the value of α , the less movement in the time series.
- Excel approach to exponential smoothing

E10 - : × / fx				
A	Α	В	С	D
1	Month	Period	Actual	
2	Jan	0	13	
3	Feb	1	9	
4	Mar	2	17	
5	Apr	3	11	
6	May	4	13	ė S
7	Jun	5	11	
8	Jul	6	8	
9	Aug	7	7	
10	Sep	8	9	
11	Oct	9	12	S. G.
12	Nov	10	11	
13	Dec	11	13	
14				

