

Economic Forecasting

Exercise Sheet 9 Solutions

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- (a) Figure 1 illustrates two exponential smoothing models for the Canadian employment data series produced by *EViews* using values of the smoothing parameter α of 0.1 and 0.9 respectively. With the low value

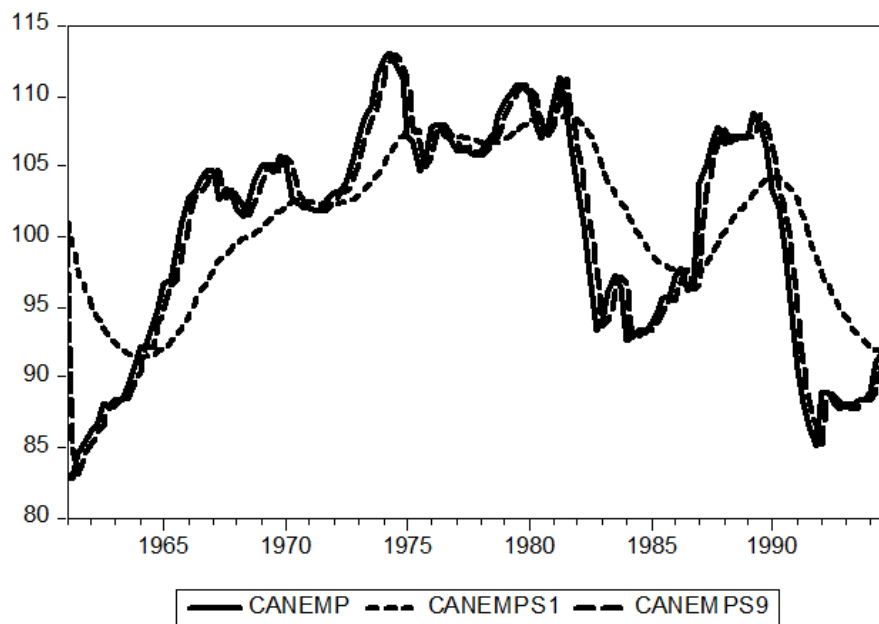


Figure 1: Exponential smoothing on Canadian employment data: $\alpha = 0.1$ and $\alpha = 0.9$

of $\alpha = 0.1$, the series is extremely smooth and as a result does not track the data values very well whereas with $\alpha = 0.9$, the smoothed series closely tracks the historical data. When the parameter α is estimated, then the estimated value is $\alpha = 0.990$. While this fits well in sample,

in the future it will simply project the last observed value and so will provide a poor forecast.

- (b) Figure 2 graphs the double exponential and the non-seasonal Holt-Winters smoothing models for the New York stock exchange data series, plotted over the period 1985-1992. The smoothing parameters were

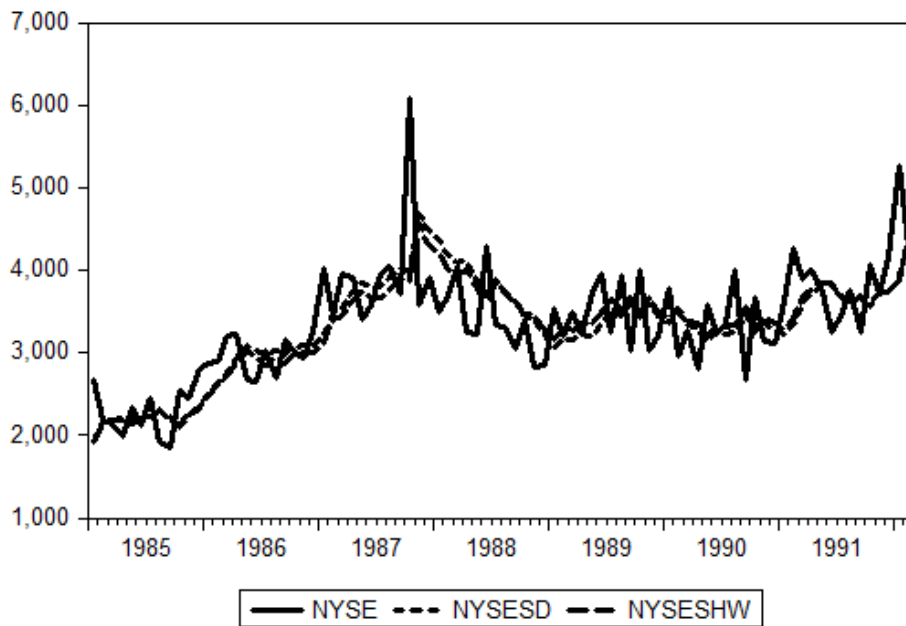


Figure 2: Double exponential and HW smoothing on NYSE data

freely estimated at $\alpha = 0.15$ for the double exponential smoothing model and $\alpha = 0.31$ and $\beta = 0.01$ for Holt-Winters. Both smoothed series look similar so it is not clear that the extra flexibility of the Holt-Winters model with its two different smoothing parameters adds much in this particular case.

- (c) Figure 3 shows the Holt-Winters seasonal smoothing model applied to the the US liquor series where the smoothing parameters α , β and γ have been estimated over the period 1960-1990 and the smoothed series forecast over the period 1991-1994. The estimated parameter values were $\alpha = 0.32$, $\beta = 0$ and $\gamma = 0.95$. The parameter value estimated for β means that the trend component T_t remains constant over time while the seasonal smoothing parameter γ being close to one means that the seasonal component also does not change much over time. This can be

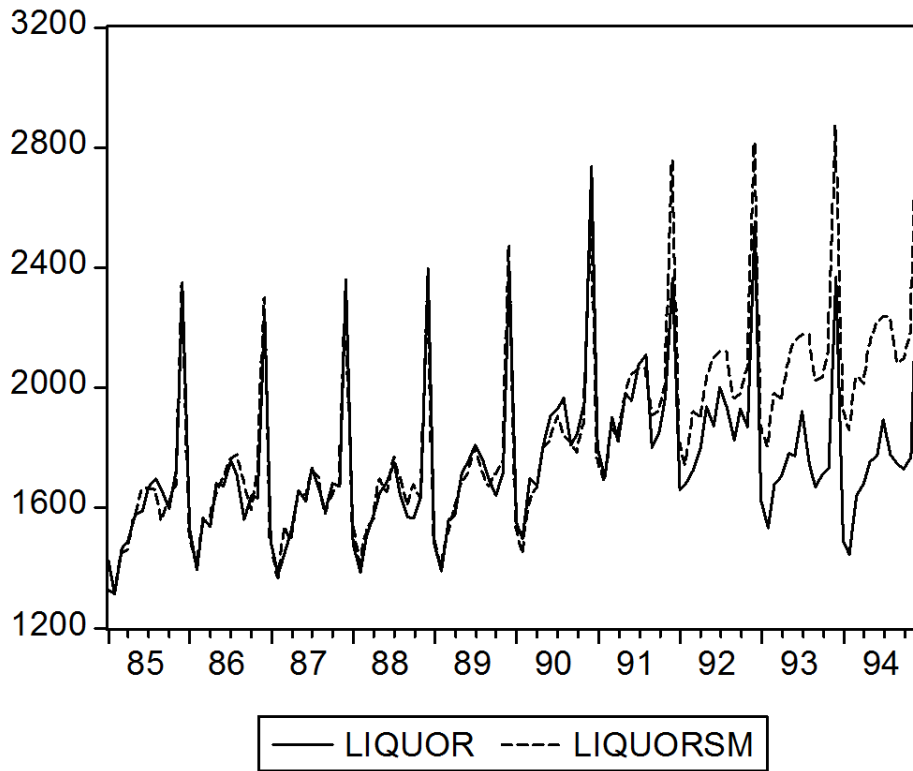


Figure 3: Holt-Winters seasonal smoothing on US Liquor series

seen in the graph where the smoothed forecast is close to a straight line trend plus a constant seasonal factor.