FINM3133 Time Series for Finance and Macroeconomics

Chapter 3 Exercises

1. Suppose $Y_t = \mu + e_t - e_{t-1}$. Find $Var(\overline{Y})$. In particular, compare your answer to what would have been obtained if $Y_t = \mu + e_t$.

2. Suppose $Y_t = \mu + e_t + e_{t-1}$. Find $Var(\overline{Y})$. Compare your answer to what would have been obtained if $Y_t = \mu + e_t$. Describe the effect that the autocorrelation in $\{Y_t\}$ has on $Var(\overline{Y})$.

3. The data file **wages** contains monthly values of the average hourly wages (in dollars) for workers in the U.S. apparel and textile products industry for July 1981 through June 1987.

   (a) Display and interpret the time series plot for these data.

   (b) Use least square to fit a linear time trend to this time series. Interpret the regression output. Save the standardized residuals from the fit for further analysis.

   (c) Construct and interpret the time series plot of the standardized residuals from part (b).

   (d) Use least squares to fit a quadratic time trend to the wages time series. Interpret the regression output. Save the standardized residuals from the fit for further analysis.

   (e) Construct and interpret the time series plot of the standardized residuals from part (d).

4. The data file **winnebago** contains monthly unit sales of recreational vehicles from Winnebago, Inc., from November 1966 through February 1972.

   (a) Display and interpret the time series plot for these data.

   (b) Use least squares to fit a line to these data. Interpret the regression output. Plot the standardized residuals from the fit as a time series. Interpret the plot.

   (c) Now take natural logarithms of the monthly sales figures and display and interpret the time series plot of the transformed values.

   (d) Use least squares to fit a line to the logged data. Display and interpret the time series plot of the standardized residuals from this fit.

(e) Now use least squares to fit a seasonal-means plus linear time trend to the logged sales time series and save the standardized residuals for further analysis. Check the statistical significance of each of the regression coefficients in the model.

(f) Display the time series plot of the standardized residuals obtained in part (e). Interpret the plot.