***EViews* Exercises for Chapter 9**

**Seasonal patterns in time series**

**[9.1-9.2]** Figure 9.1 is constructed by opening the series beer from the workfile beer.wf1, clicking ***View/Correlogram*** and checking ‘1st difference’. Figure 9.2 is constructed analogously by opening the series rainfall from the workfile rainfall.wf1.

**EXAMPLE 9.1: A deterministic seasonal model for England & Wales rainfall**

Continuing to use the workfile rainfall.wf1, all statistics reported in this example may be obtained using the program rain\_seasonal.prg:

for !1 = 1 to 12

genr s{!1} = @seas(!1)

next

ls @sqrt(rainfall) s1 s2 s3 s4 s5 s6 s7 s8 s9 s10 s11 s12

for !2 = 1 to 12

scalar seas\_factor\_{!2} = (c(!2)^2)\*10

next

**[9.3]** The SACF of the transformed beer sales shown in Figure 9.3 may be obtained with the command show d(beer,1,4) and then viewing the correlogram.

**EXAMPLE 9.2: Seasonal ARIMA modelling of beer sales**

The various models fitted in this example may be obtained with the commands

ls d(beer,1,4) ma(1) sma(4)

ls d(beer,1,4) ma(1) sma(4) sma(8)

ls d(beer,1,4) ma(1) ma(4) ma(5)

The Wald test of the restriction may be obtained from the third regression by clicking ***View/Coefficient Diagnostics/Wald Test-Coefficient Restrictions*** and entering c(1)\*c(2) – c(3) = 0 in the restrictions box.

Forecasts from the airline model are obtained by extending the sample to 2020q4 and following the procedure set out in the examples of Chapter 7, noting that the forecast period runs from 2017q4.

**EXAMPLE 9.3: Forecasting global temperatures using exponential smoothing**

This example once again uses the temp series from the workfile global\_temps.wf1. The ARIMA(0,1,1) model is estimated with the command

ls d(temp) ma(1)

To fit the various exponential smoothing models to temp, open the series and click ***View/ Exponential Smoothing/Simple Exponential Smoothing***. The results for the models are then obtained by checking the appropriate smoothing method (single, double, Holt-Winters-no seasonal).

**EXAMPLE 9.4: Holt-Winters seasonal modelling of beer sales**

Analogous to the previous example, the beer series can be fitted by checking the ‘Holt-Winters-additive’ and ‘Holt-Winters-multiplicative’ methods, respectively. The damped models can be fitted by clicking ***Exponential Smoothing/ETS Exponential Smoothing*** and selecting ‘Additive’ and ‘Multiplicative’, respectively, for the ‘Season Type’.