## Exercise 6 – Seasonal Adjustment

Copy and run the following commands to adjust the series *.\data\cr\CR Regional IPC.dat*

**ipc <- import.ts(“***[ directory ]***\\data\\cr\\cr regional ipc.dat”,format=”datevalue”)**

**c <- seas(ipc, outlier.types=”all”, automdl=””, x11 =””, slidingspans=””,regression.aictest=NULL)**

Examine the seasonality of the series. Should it be seasonally adjusted?

Create a seasonal object called fd.x11 for .\data\retail\fuel dealers.dat. Use the ARIMA model (0 1 1)(0 1 1). Perform an X-11 adjustment.

1. Describe the spectrum of the original series.
2. Look at the spectrum of the seasonally adjusted series, the irregular, and the residuals. (Use the spectrumgraph(seasonal object,component) function in X13Graphs.r, with component “sa”, “irr”, and “rsd” respectively.) Is there evidence of residual seasonality or residual calendar effects?
3. The seasonal filter was selected based on the global moving seasonality ratio. What was the GMSR for this series? What seasonal filter was selected?

Re-run the seasonal object with the seasonal filter hard-coded.

1. Look at the sliding spans diagnostics. Is this adjustment acceptably stable? Why or why not?
2. Look in the output file for the history tables. Which months have the largest revisions?
3. a) Look at the graph of the Seasonal Factors and SI Ratios by Month (using the sigraph() function in X13Graphs.r), or at Table D9. Which months have the most replaced SI ratios?

b) Create a new seasonal object called fd.x11sl for the series with the sigma limits raised to (1.8 2.8). Are there fewer replaced SI ratios in the months identified in 6a)?

Create a new seasonal object called fd.seats, running a default seats adjustment instead of X-11.

Create a new seasonal object called fd.seats2, which performs a default seats adjustment and starts the model span in 2004.1.

1. Compare the regARIMA models from fd.seats and fd.seats2. Which model has better model diagnostics?
2. Compare the sliding spans diagnostics and the revisions from the four adjustments. Which adjustment has the greatest stability?
3. Create graphs comparing the seasonal adjustments of fd.x11, fd.x11sl, fd.seats, and fd.seats2. Are they similar? Look at overlay graphs of the seasonal factors (use the sfcompgraph() function in X13Graphs.r). Where do you see the biggest differences?