Exercise Sheet 6

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1. Read in the file EJCON.WF1. This file includes annual observations for the UK on

RC	real total consumers' expenditure
PC	nominal total consumers' expenditure
Y	real disposable income

   (a) Form the variables $LC = \log(RC)$ and $LY = \log(Y)$ and also form a variable that is a measure of inflation - INF. (Form INF as the first difference of the logarithm of the consumers' expenditure deflator).

   (b) Estimate the model

$$\begin{aligned} LC_t &= \beta_1 + \beta_2 LC_{t-1} + \beta_3 LY_t + \beta_4 LY_{t-1} \\ &\quad + \beta_5 INF_t + \beta_6 INF_{t-1} + \varepsilon_t \end{aligned}$$

      (i) From your estimated model, obtain estimates of the short and long run income elasticities

      (ii) Carry out a test for first order autocorrelation.

      (iii) Carry out a test of the hypothesis:

$$H_0 : \beta_2 + \beta_3 + \beta_4 = 1$$

      against

$$H_1 : \beta_2 + \beta_3 + \beta_4 \neq 1.$$

      Can you give an interpretation of H_0?

      (iv) Show that by imposing the restriction in (iii) we can rewrite the above model as

$$\begin{aligned} \Delta LC_t &= \gamma_1 + \gamma_2 \Delta LY_t + \gamma_3 (LY_{t-1} - LC_{t-1}) \\ &\quad + \gamma_4 INF_t + \gamma_5 INF_{t-1} + \varepsilon_t. \end{aligned}$$

2. Read in the file *ALMON.WF1*. In this file there are observations for the *USA* from 1953:1 to 1967:4 on 2 variables:

Y	capital expenditures
X	appropriations.

(a) Estimate an unrestricted distributed lag with lags up to X_{t-7} (i.e. allowing previous appropriations to affect current capital expenditures). Obtain estimates of the impact and long-run multipliers.

(b) Assuming that the lag length is 7 and that the maximum degree of polynomial is 4, use a statistical procedure to choose the degree of an *Almon polynomial lag model* for this data. Obtain an estimate of the long run multiplier. Give some general comments on the results from your estimated models. (Hint: you will need to create the *Almon variables*

$$Z0 = X + X(-1) + X(-2) + X(-3) + X(-4) + X(-5) + X(-6) + X(-7)$$

$$Z1 = X(-1) + 2X(-2) + 3X(-3) + 4X(-4) + 5X(-5) + 6X(-6) + 7X(-7)$$

$$Z2 = X(-1) + 4X(-2) + 9X(-3) + 16X(-4) + 25X(-5) + 36X(-6) + 49X(-7)$$

etc.)