Economic Forecasting
Exercise Sheet 8

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1. (a) Open the *EViews* file **klein1.wf1**, which has annual data on US macroeconomic variables over the period 1920-1941. Estimate the two alternative consumption equations:

$$\begin{aligned}\text{consumption}_t &= \alpha_0 + \alpha_1 \text{ profits}_t + \alpha_2 \text{ profits}_{t-1} \\ &+ \alpha_3(\text{ priv\_wage\_bill}_t + \text{ gov\_wage\_bill}_t) + \epsilon_{1t}\end{aligned}$$

and

$$\begin{aligned}\text{consumption}_t &= \beta_0 + \beta_1 \text{ production}_t + \beta_2 \text{ production}_{t-1} \\ &+ \beta_3 \text{ consumption}_{t-1} + \epsilon_{2t}\end{aligned}$$

and save the *static* (one-step) forecasts for the two models. Then run the *Mincer-Zarnowitz* regression

$$y_t = \gamma_0 + \gamma_1 \widehat{y}_t + \epsilon_t$$

for each of the models and jointly test the null hypothesis that $\gamma_0 = 0$ and $\gamma_1 = 1$.

Hint: To jointly test two or more parameter restrictions, use the *Wald test of coefficient restrictions* option which is on the *Coefficient diagnostics* menu on the *View* tab in the equation window. Restrictions are specified in terms of elements of the coefficient vector **C** and should be separated by commas. In this case the restrictions can be specified as **C(1)=0,C(2)=1**.

(b) Run the encompassing regression

$$y_t = \delta_0 + \delta_1 \widehat{y}_t^a + \delta_2 \widehat{y}_t^b + \epsilon_t$$

where $\widehat{y}_t^a$ and $\widehat{y}_t^b$ are the forecasts from the two alternative consumption models and test whether one of the models encompasses the other.

Hint: If the first model encompassses the second then we expect that $\delta_1 = 1$, $\delta_2 = 0$ and $\delta_0 = 0$. Conversely, if the second model encompassses the first then we expect that $\delta_1 = 0$, $\delta_2 = 1$ and $\delta_0 = 0$. The restriction that $\delta_0 = 0$ ensures that the forecasts are unbiased.

(c) Consider combining the forecasts from the two models. Run the regression

$$y_t = \alpha_0 + \alpha_1 \widehat{y}_t^a + (1 - \alpha_1)\widehat{y}_t^b + \epsilon_t$$

to estimate the optimal combination weight α_1.

Hint: There are two ways of imposing the restriction that the coefficients on $\widehat{y}_t^a$ and $\widehat{y}_t^b$ sum to one. The first is to run the regression in the form:

$$y_t - \widehat{y}_t^b = \alpha_0 + \alpha_1(\widehat{y}_t^a - \widehat{y}_t^b) + \epsilon_t.$$

The other way is to impose the resriction explicitly by defining the regression as:

consumption=C(1)+C(2)*MOD1F+(1-C(2))*MOD2F

where **MOD1F** and **MOD2F** are the *EViews* variables holding the two model forecast values.