

#### EXERCISE 4

I want you to download the EViews program Oranges.wf1. Use it to answer the following questions.

- (a) I want you to determine the stochastic orders (either  $I(0)$ ,  $I(1)$ , or  $I(2)$ ) of the individual orange series (regular and organic). You should provide some supporting computer outputs so that I can check if you used the ADF test correctly in arriving at your conclusions.
- (b) Apply the Engle/Granger and Johansen trace and lambda-max tests for cointegration on these series. Summarize and document the results you have obtained.
- (c) Consider the cointegrating relationship  $\text{orange}(\text{organic}) = a + b \cdot \text{orange}(\text{reg})$ . Using dynamic OLS, I want you to test the hypotheses  $H_0: b=1$  versus  $H_1: \text{not equal } 1$ . Use  $p=4$  forward and backward lags in the dynamic OLS equation.
- (d) Estimate an appropriate ECM for the orange price data. Report your estimated model. Use it to generate forecasts one step ahead through 12 steps ahead of both price series. Look at the one-step-ahead forecasts of the two orange prices. Do they satisfy the cointegrating relation that is implied by your ECM? Look at the 12<sup>th</sup> step ahead forecasts of the two orange prices. Do they satisfy the cointegrating relationship that is implied by your ECM? Which set of forecasts (the one-step-ahead or the 12-step-ahead) most closely satisfies the long run equilibrium relationship represented by the cointegrating relationship you obtained in your ECM? Is it the case that, "In the long-run the forecasts produced by an ECM exactly satisfy the cointegrating relationship?"  
Comment.