
Homework 6

Due: Sunday, November 22, 2015, 10:00 hours to our staff. Late homework will not be accepted.

Instruction: Answer all questions. Homework must be handwritten. Nevertheless, when asking to use Eviews, you have to answer by copying results from Eviews and pasting in Word from which you get a computer print-out. Credit will not be given to photocopying or duplication of files.

I. Consider the following model to study housing investment and housing index in the United States for 1947 through 1988. Use the data in *hw6_hseinv_excel* for this question. Variables include

price: housing price index; 1982 = 1
invpc: per capita investment
t: time trend ($t=1, 2, \dots, 42$)

(This is an annual data. Generating a new series in proportionate changes)

- 1) Use Eviews to find the first order autocorrelation in $\log(invpc)$. Next find the autocorrelation after linearly detrending $\log(invpc)$. Do the same for $\log(price)$. Which of the two series may have a unit root?
- 2) Based on your findings in #1, use Eviews to estimate the equation,

$$\log(invpc_t) = \beta_0 + \beta_1 \Delta \log(price_t) + \beta_2 t + u_t$$

and report the results in standard form. Interpret the coefficient on $\Delta \log(price_t)$. Determine whether the variable $\Delta \log(price_t)$ is statistically significant at the 1% significance level. How about the statistical significance of the time trend?

- 3) Linearly detrend $\log(invpc_t)$ and use the detrended version as the dependent variable in the regression from #2 (see Section 10.5 or Power Point handout). Use Eviews to find R^2 when detrended $\log(invpc_t)$ is used. What happens to R^2 ?
- 4) Now use $\Delta \log(invpc_t)$ as the dependent variable and reestimate the equation by using Eviews. How do your results change from #2? Is the time trend still statistically significant? Why or why not?

II. Use the data from *hw6_consump_excel* to study of the effect of the growth in real income (*gy*) on the growth in real consumption (*gc*) over 1959-95 in the United States. Data given are as follows.

y is the per-capita real disposable income and
cons is the per-capita consumption of nondurables and services.

1. Use Eviews to generate two new series: the growth in real per capita consumption gc and the growth in real disposable income gy (in decimals). Explain how you generate new series in Eviews.
2. Use Eviews to estimate

$$gc_t = \beta_0 + \beta_1 gy_t + u_t \quad (I.1)$$

Report the results in the usual form. Interpret the equation and discuss economic and statistical significance.

3. Test the equation (I.1) for AR(1) serial correlation.

III. Use the same data set as in question I. One version of the permanent income hypothesis (PIH) of consumption is that the growth in consumption is unpredictable. Note that gc_t is the growth in real per capita consumption. Then the PIH implies that $E(gc_t | I_{t-1}) = E(gc_t)$ where I_{t-1} denotes information known at time $(t-1)$.

1. Use Eviews to estimate

$$gc_t = \beta_0 + \beta_1 gc_{t-1} + u_t$$

Report the results in the usual form. Interpret the coefficient on gc_{t-1} .

2. Test the PIH (the coefficient of gc_{t-1}). Clearly state the null and alternative hypotheses. What do you conclude?
3. Use Eviews to test for heteroskedasticity by regressing the squared residuals on gc_{t-1} and gc_{t-1}^2 . What do you conclude?
4. To the regression #1, add gy_{t-1} and $i3_{t-1}$. Use Eviews to test whether we should add these two additional variables.