
Question:	1	2	3	4	5	Total
Points:	4	4	4	8	30	50

Justify all your answers (except for multiple choice questions). You are required to show your work on each problem (except for multiple choice questions). **Organize your work.** Work scattered all over the page will receive very little credit. A correct answer in a multiple choice question worths 4 points; an incorrect one worths -1 point.

Please, submit the assignment by email latest the 19th of December 2017, 11 am.

- (4) 1. Which of the following is TRUE.
- A process is highly persistent because is not constant on time.
 - A weakly dependent process cannot have a trend on time.
 - A random walk process has a variance that depends on time.
 - None of the previous statements is correct.
- (4) 2. Consider the following model $y_t = e_t - 0.25e_{t-2}$ with e_t a white noise process with mean zero and variance σ^2 . Then, one can conclude that,
- $Var(y_t) = 0.75\sigma^2$
 - $Cov(y_t, y_{t+1}) = -0.25\sigma^2$ and $Cov(y_t, y_{t+2}) = 0$
 - $Cov(y_t, y_{t+1}) = 0$ and $Cov(y_t, y_{t+2}) = -0.25\sigma^2$
 - $Cov(y_t, y_{t+2}) = -0.25$
- (4) 3. Which of the following is FALSE.
- A serially correlated process may be weakly dependent.
 - A process is I(1) if it is stationary of order 1 and weakly dependent.
 - A random walk is not weakly dependent.
 - A random walk with a drift is not covariance stationary.

4. With a sample of 75 annual observations the following equations were estimated:

$$\hat{y}_t = 0.15 + 0.26x_t - 0.11x_{t-1} \quad R^2 = 0.721 \quad (1)$$

$$\hat{u}_t = -0.021 + 0.007x_t + -0.001x_{t-1} + 0.358\hat{u}_{t-1} \quad R^2 = 0.167$$

(5) (a) The second equation has the aim to perform a test. Identify that test, write the test hypothesis, and conclude.

(3) (b) Is model (1) dynamically complete? Justify.

5. To explain the logarithm of CO2 emissions, LCO2, as a function of the logarithm of GDP, LGDP, the model in equation 1 in the Annex was estimated.

(7.5) (a) Interpret the estimates of the coefficients associated to LGDP and to the trend.

(7.5) (b) What was the aim of estimating Equation 2? What can you conclude from the results in that equation?

(7.5) (c) Write the condition that states that the model estimated in Equation 1 is dynamically complete.

(7.5) (d) Assume that LGDP is sequentially exogenous. Moreover, suppose that $\text{corr}(LCO2_t, LCO2_{t-1}) = 0.28$ and that $\text{corr}(LGDP_t, LGDP_{t-1}) = 0.53$. Discuss the verification in Equation 1 of the assumptions needed to state the asymptotic properties of OLS.