Econometrics Test
2014 - 06 - 24

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1. Say if the following statements are unambiguously true (TRUE), unambiguously false (FALSE) or impossible to classify the way they are stated (CAN'T SAY). Write the motivations to your answers **only** in the space provided. A "CAN'T SAY" answer with no motivations will be considered wrong.

   (a) The rank of the matrix $C = [1, 2, 3]$ is 1.
   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (b) An $n \times n$ identity matrix has rank n.
   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (c) A square matrix with n rows whose elements are all 1 is singular.
   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (d) The long-run multiplier in a dynamic model can never be negative.
   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (e) The Godfrey test makes no sense in a cross-section sample.
   TRUE ◯ FALSE ◯ CAN'T SAY ◯

2. A linear model was estimated on 90 observations and 6 explanatory variables yields a sum of squared residual equal to 350; after imposing 3 restrictions, it goes up to 420. Calculate the F and W tests, plus the R^2 indices for both models, assuming that the sample variance of the dependent variable is equal to $\frac{1}{n}\sum_{i=1}^{n}(y_i - \bar{Y})^2 = 14$

F test:	____________	p-value:	____________
Decision: ACCEPT	○	REJECT	○
W test:	____________	p-value:	____________
Decision: ACCEPT	○	REJECT	○
R_0^2:	____________	R_1^2:	____________

3. Suppose the following model was estimated on a sample of households:

$$\hat{c}_i = \beta_0 + \beta_1 n_i + \beta_2 y_i$$

where $\beta_0 = 1.25$, $\beta_1 = 0.42$ and $\beta_2 = 0.54$; c_i is the log of the consumption of some good for the whole household, n_i is the log of the number of household members and y_i is the log of total household income.

(a) discuss the economic meaning of the restriction $R\beta = 1$, where $R = [0, 1, 1]$;

(b) assuming that the estimated covariance matrix is

$$\hat{V} = \begin{bmatrix} 0.036 & -0.004 & -0.002 \\ -0.004 & 0.016 & -0.004 \\ -0.002 & -0.004 & 0.008 \end{bmatrix},$$

test the above hypothesis;

(c) assume that White's heteroskedasticity test accepts its null hypothesis, and that the robust estimate of the coefficient covariance matrix is

$$\tilde{V} = \begin{bmatrix} 0.044 & -0.003 & -0.002 \\ -0.003 & 0.022 & -0.001 \\ -0.002 & -0.001 & 0.005 \end{bmatrix}.$$

Do your conclusions change?