

Econometrics Test

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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) A random variable with support $[0, 1]$ must possess moments of all orders.
TRUE ☐ FALSE ☐ CAN'T SAY ☐

(b) A random variable with support $[0, \infty)$ may not possess moments of all orders.
TRUE ☐ FALSE ☐ CAN'T SAY ☐

(c) A random variable with support $(-\infty, \infty)$ does not possess moments of any order.
TRUE ☐ FALSE ☐ CAN'T SAY ☐

(d) Suppose we have two consistent estimators of the same parameter μ , and call them m_1 and m_2 . Then, $(m_1 - m_2) \xrightarrow{P} 0$
TRUE ☐ FALSE ☐ CAN'T SAY ☐

(e) When estimating a model via OLS, the order of magnitude of t statistics is independent of the unit of measurement of the dependent variable, but depends on of the unit of measurement used for the corresponding regressor.
TRUE ☐ FALSE ☐ CAN'T SAY ☐

2. A linear model was estimated on 600 observations with 6 explanatory variables and its R^2 was 0.25; after omitting two of them, the R^2 index went down to 0.225. Calculate the corresponding W test and indicate whether the model reduction is supported by the data.

W : _____ Distribution: _____

degrees of freedom: _____ p -value: _____

Decision: ☐ Accept reduction ☐ Reject reduction

3. The following is a time-series quarterly model of h_t , housing starts in the US (in logarithm). The explanatory variables are g_t (GDP growth) and r_t (real rate on mortgages).

Dependent variable: h_t OLS, using observations 1971:2–2013:2 ($T = 169$)

	Coefficient	Std. Error	t -ratio	p-value
const	0.575335	0.164468	3.4982	0.0006
g_t	4.56901	0.861873	5.3013	0.0000
r_t	0.00381087	0.00250490	1.5214	0.1301
h_{t-1}	0.924456	0.0200582	46.0886	0.0000
Mean dependent var	8.298695	S.D. dependent var	0.348349	
Sum squared resid	1.178929	S.E. of regression	0.084528	
R^2	0.942170	Adjusted R^2	0.941119	
$F(3, 165)$	896.0709	P-value(F)	7.5e-102	

Godfrey for autocorrelation up to order 4 –

Test statistic: LMF = 3.2731 (p -value = 0.0130359)

Comment on the estimates and suggest modifications to the model you think may be appropriate.