

淡江大學八十八學年度碩士班招生考試試題

系別：產業經濟學系

科目：計量經濟學

本試題共 2 頁

不得在本試題紙上作答，否則不予計分。

For each question, unless otherwise stated, the standard assumptions of the ordinary least squares (OLS) regression model are assumed to hold. For "True/False/Uncertain" questions, indicate whether the statement is true, false or uncertain, and explain your answer.

1. (a) Define B.L.U.E. and explain the statistical or mathematical meanings of B, L, and U. Under what assumptions and conditions are the OLS estimates B.L.U.E.? (10%)

(b) Consider the bivariate model $Y_t = B_1 + B_2 X_t + u_t, t=1, 2, \dots, T$.

(i) Express b_2 (the estimator of B_2) in the form of $\sum_{t=1}^T w_t Y_t$ and find w_t . (5%)

(ii) If $V(u_t) = \sigma^2$, use (i) to find $V(b_2)$. (5%)

(iii) If $V(u_t) = \sigma^2 Z_t$ (i.e., the error term is heteroscedastic), where Z_t is some non-random variable, find $V(b_2)$. Is b_2 B.L.U.E. in this case? Explain your answer in detail. (10%)

2. True/False/Uncertain

"Multicollinearity raises the standard errors of OLS estimates and hence the OLS estimates can no longer be unbiased." (5%)

3. Consider the model

$$\log(Y_t) = B_1 + B_2 \log(X_{1t}) + B_3 \log(X_{2t}) + u_t$$

(a) Explain why B_2 measures the elasticity of Y_t with respect to X_{1t} . (6%)

(b) Explain whether you can estimate the parameters of the model in each of the following cases: (9%)

(i) $\log(X_{1t}) + \log(X_{2t}) = 2$

(ii) $X_{1t} + X_{2t} = 2$

(iii) $X_{1t} = (X_{2t})^2$

◀ 注意背面尚有試題 ▶

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4. Define R^2 and explain why it is used to measure the goodness of fit of a regression model. What is the main shortcoming of R^2 ? How would you correct for the shortcoming? (15%)

5. You have a data set with three observations and three variables?

X	Y	Z
12	4	2
4	3	3
8	2	3

Consider the bivariate model $Y_t = B_1 + B_2 X_t + u_t, t = 1, 2, 3$.

- (a) Calculate the OLS estimates of B_1 and B_2 . Show your steps clearly. (10%)

- (b) Find \hat{Y}_t (predicted value) for each observation and $\bar{\hat{Y}}$ (the mean of \hat{Y}_t).

Is $\bar{\hat{Y}} = \bar{Y}$? \bar{Y} denotes the mean of Y_t . (10%)

- (c) If $V(u_t) = \sigma^2 Z_t$, re-estimate the model (correcting for the heteroscedasticity) and find the B.L.U.E. of B_1 and B_2 . (15%)

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