

淡江大學九十三年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

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本試題共 2 頁

本試題雙面印刷

一、(16%) Consider the following classical normal linear regression (CNLR) model $Y_i = \beta_1 + \beta_2 X_i + u_i$, please derive the ordinary least square (OLS) and maximum likelihood (ML) estimator of $\hat{\beta}_2$.

二、Consider a production function of the popular Cobb-Douglas form that $Q_t = \beta_1 L_t^{\beta_2} K_t^{\beta_3} e^{u_t}$ where Q is gross domestic product (NT\$ million) and L and K are labor (per thousand persons) and capital (NT\$ million) inputs respectively. Using Taiwan's manufacturing data over the 1980-2002 period, we obtain the following results:

$$\ln Q_t = -2.337 + 0.498 \ln L_t + 0.689 \ln K_t$$

$$(2.095) \quad (0.198) \quad (0.202)$$

$$t = (-1.116) \quad (2.515) \quad (---)$$

$$R^2 = 0.942 \quad \bar{R}^2 = 0.922 \quad \text{cov}(\hat{\beta}_2, \hat{\beta}_3) = -0.01$$

- a. (6%) Please interpret the coefficient of $\ln L$
- b. (6%) Is the coefficient of $\ln K$ significant at the 5 percent level?

[Note: $t_{(\alpha=0.05, df=20)} = 2.086$, $t_{(\alpha=0.05, df=21)} = 2.080$]

- c. (6%) 請檢定台灣製造業的生產在該期間是否為固定規模報酬？
- d. (8%) What does the R^2 mean? And what is the logic of \bar{R}^2 ?

三、Suppose we have estimated $y = 18 + 2x + 3D$ where y is earning (NT\$ thousand), x is experience (year) and D is zero for females and one for males.

- a. (6%) If we were to rerun this regression with the dummy redefined as one for females and two for males, what results would we get?
- b. (6%) Explain how you would test for discrimination against females.

四、In a regression of average wages (W) on the number of employees (N) for a random sample of 30 firms, the following regression results were obtained:

$$\hat{W} = 7.5 + 0.009N$$

$$t = (24.5) \quad (16.10) \quad R^2 = 0.90 \quad (1)$$

$$\frac{\hat{W}}{\sqrt{N}} = 0.008\sqrt{N} + 7.8 \frac{1}{\sqrt{N}} \quad R^2 = 0.99 \quad (2)$$

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- a. (6%) What is the author assuming in going from Eq. (1) to (2)? Was she worried about heteroscedasticity? How do you know?
- b. (6%) Can you relate the slopes and intercepts of the two models?
- c. (6%) Can you compare the R^2 values of the two models? Why or why not?

五、請回答下列問題為對或錯，並解釋理由。未說明理由者不予計分

- a. (6%) In the CLR model, multicollinearity leads to bias, not in the estimation of the regression coefficients themselves, but rather in the estimation of their variances.
- b. (6%) If the errors in the classical linear regression (CLR) model are not normally distributed, although the OLS estimator is no longer BLUE, it is still unbiased.
- c. (6%) A Durbin-Watson d value that equals 2 means there is no autocorrelation.

六、(10%) 請簡單設計一個採用 Logit model 進行分析的經濟議題。[Note: 寫出迴歸模型，並對被解釋變數與解釋變數加以說明。]