淡江大學 99 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

准帶項目請打「V」	
V	計 算 機

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1. Consider the following equation:

$$\widehat{bwght} = \hat{\beta}_0 + \hat{\beta}_1 cigs + \hat{\beta}_2 inc$$

where *bwght* is the child birth weight, in **gram**, *cigs* is the **number** of cigarettes smoked by the mother per day, *inc* is annual family income, in **thousands of dollars**.

Assume the estimated results are $\hat{\beta}_0$=116.974 (standard error = 1.049), $\hat{\beta}_1$=-0.4634 (standard error = 0.0916), $\hat{\beta}_2$=0.0927 (standard error = 0.0292). R^2=0.281

(i) if the measurement unit of *bwght* is changed to **kilogram**, rather than gram, and no change on other variables, then how do the estimated results change? (10%)

(ii) if the unit of *cigs* is changed to **pack**, rather than number, and no change on other variables, then how do the estimated results change? (10%)

2. Consider the following linear probability model:

$$approved = 0.112 - 0.021 black + 0.058 income$$

Where *approved* is a dummy variable, equals 1 if the individual can get the bank loan and 0 if not. *black* is a dummy variable, equals 1 if the individual is a black and 0 if not. *income* is the individual's income (in thousands of dollars).

(i) Please interpret the estimated coefficients of "-0.021" and "+0.058". (10%)

(ii) Please provide two shortcomings of the linear probability model. (10%)

3. Consider the following regression model:

$$\log(wage) = \beta_0 + \beta_1 edu + \beta_2 \exp + \beta_3 \exp^2 + \mu$$

Where *wage* is the individual's wage, *edu* is the individual's educational level (in years), *exp* is the individual's working experience and exp^2 is the square of *exp*.

(i) if you believe there are some unobservable factors, such as ability, which can affect the individual's wage but are correlated with the educational level (variable "*edu*"), then what kind of problem will occur if we still regress the model using OLS? (10%)

(ii) How do you take care of this problem? Please provide at least two methods.(10%)

4. Consider the following estimated results:

$$\log(wage) = \underset{(0.129)}{0.410} - \underset{(0.091)}{0.189\, female} + \underset{(0.006)}{0.077 edu} - \underset{(0.006)}{0.012\, female \cdot edu} + \underset{(0.004)}{0.088 \exp} - \underset{(0.00011)}{0.0034 \exp^2}$$

, where *wage* is the worker's wage, *female* is a dummy variable with value of 1 if the worker is a female and 0 if the worker is a male, *edu* is the worker's years of schooling, *exp* is the years of the worker's working experience, $\exp^2$ is the square of *exp*. The number in parentheses is the standard error of estimated coefficient.

(i) What is the effect of education on wage for female worker?
What is the effect of education on wage for male worker?
Please interpret the results completely using the estimated coefficients. (8%)

(ii)Based on the estimated results, is there discrimination in the labor market? Explain. (6%)

(iii)At what year does the marginal effect of experience on log(*wage*) become negative? (6%)

5. Interpret the following results on $\hat{\beta}_1$. That is, explain the meaning of $\hat{\beta}_1$ for each equation. (*wage* : unit = dollar), (*edu* : unit = years)

(i) $wage = \beta_0 + \beta_1 \cdot edu$, $\hat{\beta}_1 = 1{,}000$ (5%)

(ii) $\log(wage) = \beta_0 + \beta_1 \cdot edu$, $\hat{\beta}_1 = 0.079$ (5%)

(iii) $\log(wage) = \beta_0 + \beta_1 \cdot \log(edu)$, $\hat{\beta}_1 = 0.00021$ (5%)

(iv) $wage = \beta_0 + \beta_1 \cdot \log(edu)$, $\hat{\beta}_1 = 50$ (5%)