

國立中興大學九十一年度研究生博士班招生考試試題

科目：計量經濟學

所別：應用經濟學系（博）

1. Explain briefly the meaning of the following terms. (60%)

- (1) The Durbin-Watson test.
- (2) Mean squared error.
- (3) Asymptotic efficient.
- (4) Consistent estimator.
- (5) Generalized least squares.
- (6) Best linear unbiased estimator.
- (7) Heteroscedasticity.
- (8) Logit model.
- (9) First-order autoregressive process.
- (10) Instrumental variable estimator.

2. The simple regression model: $Y = \alpha + \beta X + u; u \sim IN(0, \sigma^2)$ is estimated by OLS.

Suppose X can only assume the values 0 and 1. The sample consists of n_1 observations for which $X = 0$, and n_2 observations for which $X = 1$. Let \bar{Y}_1 be the mean of Y for the n_1 observations for which $X = 0$, and \bar{Y}_2 be the mean of Y for the n_2 observations for which $X = 1$. Find $\hat{\alpha}$, $\hat{\beta}$, and $Var(\hat{\beta})$. (20%)

3. For the three-equation model

$$y_1 = \beta_{13}y_3 + \gamma_{12}x_2 + u_1$$

$$y_2 = \beta_{21}y_1 + \beta_{23}y_3 + \gamma_{21}x_1 + \gamma_{22}x_2 + u_2$$

$$y_3 = \gamma_{33}x_3 + u_3$$

where y_1 , y_2 , and y_3 are endogenous, and x_1 , x_2 , and x_3 are exogenous.

- (1) Discuss the identification of each of the equations, based on the order and rank conditions.
- (2) Suppose that you want to estimate the first equation by two-stage least squares, but you have only an ordinary least squares program available. State how you would estimate β_{13} , γ_{12} , and $Var(u_1)$. (20%)