



# B.E. International Program

Faculty of Economics, Thammasat University

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## EE325 INTRODUCTORY ECONOMETRICS

SEMESTER 2/2011

### PROBLEM SET 3

#### Instructions

- 1) The Problem Set 3 count towards your final score accumulation of EE325: Introductory Econometrics. ATTEMPT ALL QUESTIONS.
- 2) To complete the assignment, you are allowed to discuss the problems with your classmates but have to write up solutions completely on your own.

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- 3) The date of submission is on Tuesday 20<sup>th</sup> March 2012 by 11.15 hrs. (in class)
  - 4) If you have questions, please send me an e-mail at [pwrasai@gmail.com](mailto:pwrasai@gmail.com)
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1. What are Type I and Type II errors? What is the problem when we use too high or too low confident level?
2. Gujarati: Q 5.5, p. 135
3. Gujarati: Q 5.8, p. 136
4. Gujarati: Q 5.9, p.137
5. Consider the model  $Y = \beta_0 + \beta_1 x + u$  under the Gauss-Markov Assumptions. The usual OLS estimators  $\hat{\beta}_0$  and  $\hat{\beta}_1$  are unbiased for their respective population parameters. Let  $\tilde{\beta}_1$  be the estimator of  $\beta_1$  obtained by assuming the intercept is zero.
  - 5.1) Find  $E(\tilde{\beta}_1)$  in terms of the  $x$ ,  $\beta_0$ , and  $\beta_1$ . Verify that  $\tilde{\beta}_1$  is unbiased for  $\beta_1$  when  $\beta_0 = 0$ . Are there other cases where  $\tilde{\beta}_1$  is unbiased.
  - 5.2) Find the variance of  $\tilde{\beta}_1$ . (Hint: The variance does not depend on  $\beta_0$ .)

5.3) Show that  $Var(\tilde{\beta}_1) \leq Var(\hat{\beta}_1)$ . (Hint: For any sample of data,  $\sum x_i^2 \geq \sum (x_i - \bar{x})^2$  with strict inequality unless  $\bar{x} = 0$ )

5.4) Comment on the tradeoff between bias and variance when choosing between  $\hat{\beta}_1$  and  $\tilde{\beta}_1$

6. Gujarati: Q6.10, p.177 (Make sure that you interpret all equations)

7. Gujarati: Q6.15, p.178

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