

Study Guide for Midterm 2

EC1630, Fall 2011

Like the first exam, the 2nd exam (November 9-th) is with closed books but you should bring a calculator and one (cheat) sheet. There should be one blank side on the regular letter sized sheet. Review the Study Guide for Exam 1, although Exam 2 will be about the new material: Chapters 6, 7, 8, 9, 10 and 11. (Handout is no exam material).

A lot can be learned from the empirical studies in the book, and you should know how to interpret regression output and tables like those in the book.

About half of the exam deals with empirical questions and the other half consists of theory.

Main exam material:

- 1. Multiple Regression Model (overlaps with previous exam):** $Y_i = \beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki} + u_i$.
 - (a) Hypotheses on several parameters: How to compute the homoscedasticity F-statistic (formula based on R^2 etc.)
 - (b) How is the $F_{q,\infty}$ related to the χ_q^2 .
 - (c) Goodness of fit measures: R^2 , \bar{R}^2 . What are the advantages/disadvantages of these measures. Standard error of the regression.
 - (d) How can you test hypotheses on several parameters using the t -statistic.
- 2. Non-Linear Regression Models:** Reformulated as a linear model.
 - (a) Simple transformations of Y_i and X_i (such as log).
 - (b) Polynomial specifications ($ax + bx^2 + cx^3 \dots$ like a Taylor expansion).
 - (c) Interaction terms; the various cases for binary and continuous variables.
- 3. Validity of Regression Results:** The difference between internally and externally validity. Problems from Errors-in-Variables.
- 4. Regression with Panel Data:** If the omitted variable is constant across time, the omitted variable problem can be solved with the Differences method (data from two periods) and the Fixed Effect Regression model (data from three or more periods).
- 5. Binary Dependent Variables:** The regression line shows the probability that the dependent variable is equal to one.
 - (a) The linear regression model is the linear probability model. Pros and cons.
 - (b) Probit and Logit model. What kind of distributions are used by Probit and logit.
 - (c) How are these models estimated?
 - (d) What is the likelihood and the maximum likelihood estimator? Can you construct them?
 - (e) What are the properties of the maximum likelihood estimator.
 - (f) Are t and F -tests valid in Probit and logit regression. How to interpret the parameter estimates.
 - (g) Goodness of fit measures.