



Econometrics 2, Class 1

Problem Set #4
October 3, 2005



Practical information

- Due to popular request, the slides I use here are now available for download at www.keynes.dk/econometrics2

Please note:

- They have not been proofread.
- They are not part of the curriculum.
- You use them at your own risk!
- If you find an error, please send me an e-mail...
- ...and you are of course always welcome to e-mail me with any questions: paul.sharp@econ.ku.dk



Problem Set #4

- This is an important problem set, since it helps you prepare for the exam.
- 4.1 is a multiple choice test.
- 4.2 is a real live exam question.
- Information about the exam:
 - 4 hours
 - Closed-book
 - 4 questions (25% each)
 - 3 parts to each question:
 - (a) should be easy!
 - (b) should be a bit more difficult!
 - (c) is for the eggheads!
 - If you answer all the part (a) questions 100% correctly, you will pass...but maybe this is a dangerous strategy.



4.1 Multiple choice test

- You get the rest of the hour to answer the questions.
- Give reasons for your answers.
- Decide whether you are brave enough to present your answers!

Consider a linear regression model

$$y_t = x_t' \beta + \epsilon_t, \quad t = 1, 2, \dots, T, \quad (4.1)$$

where y_t and x_t are stationary and weakly dependent time series. Table 4.1 contains a number of statements on the properties of OLS in the regression model. Decide whether you think the statements are true or false, and prepare arguments for your choice. During the exercise class, do the following:

- (1) Discuss the answers in groups of three. For each question, prepare a small presentation of your argument.
- (2) Discuss in class.



Questionnaire 1-5

Table 4.1: Questionnaire		True	False
1	“The two assumptions, $E[\epsilon_t x_t] = 0$ and $E[x_t\epsilon_t] = 0$, are equivalent if x_t is stationary”.		
2	“The OLS estimator is never unbiased if y_t and x_t are time series”.		
3	“The GLS transformation to remove autocorrelation produces a non-linear regression model”.		
4	“For $\hat{\beta}$ to be asymptotically normal, we need to assume normality of the error term: $\epsilon_t \sim N(0, \sigma^2)$ ”.		
5	“Non-modelled structural shifts can result in residual autocorrelation”.		



Questionnaire 6-10

6	“The DW test for autocorrelation is invalid if x_t contains the lagged dependent variable, y_{t-1} ”.		
7	“OLS is consistent whenever the regression corresponds to a conditional expectation”.		
8	“In economics, we often assume that the regressors in x_t are fixed and deterministic”.		
9	“The OLS estimator is inconsistent under autocorrelation of the error term”.		
10	“Consistency of the GLS estimator under autocorrelation requires stronger assumptions than consistency of OLS”.		



4.2 ML estimation in an exponential model

I will go through this on the blackboard.