

OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAM 2000

**Econometrics (EC374)**  
B.A & B.Comm. Degree Examinations

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**Time allowed: Two hours.**

**Instructions: Answer four questions only. Each question is worth 35 marks. The coursework during the year is worth 60 marks, making a total of 200.**

1. a) Compare the effects of Heteroskedasticity and Autocorrelation on the least squares estimators in a Simple Regression model.  
  
b) Outline in detail one test you could use to test for heteroskedasticity and one test you could use to test for autocorrelation.  
  
c) What is the immediate alternative to GLS estimation if testing suggests that (i) heteroskedasticity or (ii) autocorrelation is a problem?
- 2 Describe the steps used in GLS/FGLS estimation when
  - a) heteroskedasticity is a problem (where  $\ln(\hat{e}_i^2) = \hat{\alpha}_0 + \hat{\alpha}_1 x_i$ ),.
  - b) autocorrelation is a problem (where testing suggests an AR1 process).
3. a) Compare behavioural assumptions of partial adjustment and adaptive expectations models where there is only one x variable.  
  
b) Explain how the KOYCK transformation is used in combination with the behavioural assumption to derive a typical econometric adaptive expectations model (with one X variable).  
  
c) Explain why instrumental variables are used in the latter model and outline the procedure for using one in this case.

- 3- (3) KLEAN, a laundry detergent, recently had a change in packaging and product formula. These changes were accompanied by a special promotion campaign. The data below represents the sales in 10 stores before and after the changes.

Store	Sales Before Changes	Sales After Changes
1	10	14
2	17	25
3	26	22
4	29	25
5	13	20
6	19	29
7	22	22
8	31	34
9	16	17
10	20	29

Use the Wilcoxon test for paired sample data to determine if the changes led to increased sales. Let the level of significance be .025, with a critical value for a one-tailed test of 6.