Tasks for Introductory Econometrics

6. Autocorrelation

6.1 Which problems are associated with autocorrelation of the error terms of an econometric model?

6.2 What are the characteristics of a Markov process?

6.3 The residuals of the demand function for natural gas in relation to the gas price (Energy Model Ia) are as follows:

t	1	2	3	4	5	6	7
$\hat{u}_t$	-0,062	0,069	-0,067	-0,051	-0,119	0,038	0,191

Determine the 1st, 2nd and 3rd order autocorrelation coefficients!

6.4 Test the disturbance term (residuals see Aufg. 6.3) of the demand function for natural gas as a function of the gas price (Energy Model Ia) with the Durbin-Watson test for autocorrelation (α=0.05)! (with extrapolation)

6.5 Determine regression coefficients β_1 and β_2 2 of the demand function for natural gas as a function of the gas price (energy model Ia) using the Cochran-Orcutt method!

Note: Calculate the transformed variables with three decimal places!

6.6 The OLS estimation of energy model III (n = 16, k = 4) reports an Durbin-Watson statistic of 1,461. The result of the Breusch-Godfrey test is given:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.829749	Probability	0.464089
Obs*R-squared	2.277282	Probability	0.320254

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/25/07 Time: 15:21
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.082397	5.704853	0.365022	0.7227
GASPR	-1.018045	3.637415	-0.279881	0.7853
FERNWPR	-0.029593	4.465805	-0.006627	0.9948

VEINKR	-0.000772	0.002214	-0.348600	0.7346
RESID(-1)	0.314813	0.313126	1.005389	0.3384
RESID(-2)	-0.340237	0.367477	-0.925873	0.3763

R-squared	0.142330	Mean dependent var	-5.90E-16
Adjusted R-squared	-0.286505	S.D. dependent var	0.633593
S.E. of regression	0.718648	Akaike info criterion	2.457107
Sum squared resid	5.164552	Schwarz criterion	2.746828
Log likelihood	-13.65685	F-statistic	0.331899
Durbin-Watson stat	2.257740	Prob(F-statistic)	0.882416