UNIVERSITY OF NORTH CAROLINA
Department of Economics

Economics 275 — Dr. Gallant
Homework 6 — Fall 2000
Due November 15, 2000

For the Berndt-Wood linear factor demand system with symmetry imposed

$$M_K = \theta_1 + \theta_2 \ln P_K + \theta_3 \ln P_L + \theta_4 \ln P_E + \theta_5 \ln P_M + e_K$$

$$M_L = \theta_6 + \theta_3 \ln P_K + \theta_7 \ln P_L + \theta_8 \ln P_E + \theta_9 \ln P_M + e_L$$

$$M_E = \theta_{10} + \theta_4 \ln P_K + \theta_8 \ln P_L + \theta_{11} \ln P_E + \theta_{12} \ln P_M + e_M$$

endogenous: $y = (M_K,\ M_L,\ M_E,\ M_M,\ \ln P_K,\ \ln P_L,\ \ln P_E,\ \ln P_M)'$

$$\text{exogenous: } x = (1, z_1, \cdots, z_{10})'$$

$$\text{parameters: } \theta = (\theta_1, \theta_2, \cdots, \theta_{12})'$$

use the data in file klem.dat and documented in file klem.doc which are available either by anonymous ftp from ftp.econ.duke.edu in directory pub/arg/data or by clicking "Browse ftp site" on the course web page, to estimate the elasticity of substitution of capital for energy

$$\hat{\sigma}_{KE} = 1 + \hat{\theta}_4 / (\hat{M}_K \hat{M}_E)$$

$$\hat{M}_K = \hat{\theta}_1 + \hat{\theta}_2 \ln P_K + \hat{\theta}_3 \ln P_L + \hat{\theta}_4 \ln P_E + \hat{\theta}_5 \ln P_M$$

$$\hat{M}_E = \hat{\theta}_{10} + \hat{\theta}_4 \ln P_K + \hat{\theta}_8 \ln P_L + \hat{\theta}_{11} \ln P_E + \hat{\theta}_{12} \ln P_M$$

for the year 1959 using three stage least squares and set a 95% confidence interval on your estimate.