

Econ 220B, Winter 2008
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Problem Set 2
Due Monday January 28

This problem set asks you to replicate and extend the analysis by Hayashi and Nerlove of cost functions for electricity generation. You can download the data set from <http://fhayashi.fc2web.com/hayashi%20econometrics/ch1/NERLOVE.ASC> This text file has data on 145 electric utility companies in 1955 for the following:

- Column 1: total costs (call it TC) in millions of dollars
- Column 2: output (Q) in billions of kilowatt hours
- Column 3: price of labor (PL)
- Column 4: price of fuels (PF)
- Column 5: price of capital (PK)

Note that Columns 4 and 5 are in reverse order to that reported in equation (1.7.7) in Hayashi's text— in equation (1.7.7), the price of capital p_{i2} is the next-to-last variable and the price of fuel p_{i3} is the last variable, whereas in the database, the price of fuel is the next-to-last variable and the price of capital is the last variable. You can analyze this data set using any package you like. You should hand in a copy of your computer output along with a brief write-up of your calculations and answers to the following specific questions. This problem set includes instructions for carrying out some of the steps on EVIEWS, since that is up in the lab.

To run EVIEWS, you would choose File-New-Workfile, choosing “undated or irregular” for a cross-section data set such as this, and indicate that the ending observation is 145, the number of data points. You import the ASCII data file using Procs-Import to surf to wherever you've stashed nerlove.asc. Note that the data are organized with each series forming an individual column of the file nerlove.asc. Give the series names, such as tc, q, etc. Use the Genr command to create logged versions of the series, e.g., ltc = log(tc).

You run a regression in EVIEWS with Object-New object-Equation, and then type in the left-hand followed by right-hand variables, e.g., ltc c lq lpl lpf lpk. Note that c stands for the constant, which you would usually want to include in the regression.

1.) Replicate the estimate of the unrestricted model in equations (1.7.4) and (1.7.7) of Hayashi's text.

2.) Suppose that you wanted to test the null hypothesis that the coefficient on the price of fuel is really 0.4. Calculate the test statistic for this hypothesis and its p -value three different ways, and summarize in each case whether you would accept or reject the hypothesis.

- i.) a t -test of the null hypothesis that $\beta_F = 0.4$.

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ii.) Formulate an F test using equation (1.4.9). What are \mathbf{R} and \mathbf{r} ? Note— in EVIEWS this is done by bringing your equation into a window, and choosing View-Coefficient tests-Wald restrictions.

iii.) Re-estimate the regression imposing the restriction and use formula (1.4.11).

3.) Suppose next that you wanted to test the null hypothesis of homogeneity ($\beta_3 + \beta_4 + \beta_5 = 1$). Again test this restriction two ways, using formulas (1.4.9) and (1.4.11).