

Problem Set III

MIT (14.32)
Spring 2007

Due: March 20, 2007

A. From Wooldridge: 3.4, 3.10, 3.11, 3.13, 4.5, 4.8, 4.9, 4.10

B. Additional problems

1. More on wine

In the last problem set, you estimated

$$(1) \quad \ln[f(\tau)] \approx r\tau + \ln[f(0)],$$

where τ is the age of the wine. A major determinant of wine quality besides age is the weather at the time the grapes used to make the wine were grown. Good wine grapes are made by hot and dry summers.

The data set for this exercise includes observation on rainfall and temperature since 1952.

a. For comparison with what follows, re-estimate equation (1) using observations from the 1952 and later subsample only.

b. Suppose that $f(0)$, the price of wine when first bottled, is a Cobb-Douglas function of the weather:

$$(2) \quad f(0) = \delta_t W_t^\beta H_t^\gamma, \text{ for a wine bottled in year } t,$$

where

W_t is the average rainfall in August and September

H_t is the average temperature in July and August

δ_t is an unobserved random shock that is independent of W_t and H_t

Estimate and β and r assuming $\gamma = 0$. What impact does the inclusion of data on rainfall have on your estimate of r ? Why?

c. Estimate r , β , and γ together. How does your estimate of r change? Why?

d. Construct an F-test of the joint hypothesis: $\beta=0$ and $\gamma=0$.

e. Use your model and the 1984 and 1985 weather data to forecast the price of 1984 and 1985 vintages in the year when they are bottled.