

1. Table 5.11 provides data on the lung cancer mortality index (100 = average) and the smoking index (100 = average) for 25 occupational groups.
 - a. Plot the cancer mortality index against the smoking index. What general pattern do you observe?
 - b. Letting Y = cancer mortality index and X = smoking index, estimate a linear regression model
 - c. Test the hypothesis that smoking has no influence on lung cancer at $\alpha = 5\%$

2. The demand for roses. Table 7.6 gives quarterly data on these variables:

Y = quantity of roses sold, dozens

X_2 = average wholesale price of roses, \$/dozen

X_3 = average wholesale price of carnations, \$/dozen

X_4 = average weekly family disposable income, \$/week

X_5 = the trend Variable taking values of 1, 2, and so on, for the period
1971–III to 1975–II in the Detroit Metropolitan area

You are asked to consider the following demand functions:

$$Y_t = \alpha_1 + \alpha_2 X_{2t} + \alpha_3 X_{3t} + \alpha_4 X_{4t} + \alpha_5 X_{5t} + u_t$$

$$\ln Y_t = \beta_1 + \beta_2 \ln X_{2t} + \beta_3 \ln X_{3t} + \beta_4 \ln X_{4t} + \beta_5 X_{5t} + u_t$$

- a. Estimate the parameters of the linear model and interpret the results.
 - b. Estimate the parameters of the log-linear model and interpret the results.
 - c. β_2, β_3 , and β_4 give, respectively, the own-price, cross-price, and income elasticities of demand. What are their a priori signs? Do the results concur with the a priori expectations?
3. Table 7.11 gives data for the manufacturing sector of the Greek economy for the period 1961–1987.
 - a. See if the Cobb-Douglas production function fits the data given in the table and interpret the results. What general conclusion do you draw?
 - b. Now consider the following model:

$$\text{Output / labor} = A(K / L)^\beta e^u$$

where the regressand represents labor productivity and the regressor represents the capital labor ratio. What is the economic significance of such a relationship, if any? Estimate the parameters of this model and interpret your results.

4. Table 7.12 gives data for real consumption expenditure, real income, real wealth, and real interest rates for the U.S. for the years 1947-2000.
 - a. Given the data in the table, estimate the linear consumption function using income, wealth, and interest rate. What is the fitted equation?
 - b. What do you estimated coefficients indicate about the variables' relationships to consumption expenditure?