Chapter 4. Econometrics

1. For a class project you are expected to estimate the own-wage elasticity of labor demand at various wage rates for fast food workers in your city. Explain how you would proceed, including what data you would need to collect and what model you would estimate.

2. To estimate elasticities in practice, you must first obtain an accurate estimate of the effect of wages on labor demand. To proceed, a researcher collects the relevant data and estimates the following model:

   \[ L_i = \alpha_0 + \alpha_i \omega_i + \varepsilon_i, \quad i = 1, \ldots, N \]

   However, in practice labor demand actually depends on both the wage and the cost per unit of capital. Furthermore, wages and capital costs are positively correlated, and capital and labor are gross substitutes. How do you think the failure to control for differences in the cost of capital in the determination of labor demand will affect estimates of the own-wage elasticity of demand?

3. To test the empirical effect of minimum wage laws on unemployment, you wish to estimate the following model:

   \[ UR_i = \alpha_0 + \alpha_i MW_i + \varepsilon_i, \quad i = 1, \ldots, 50 \]

   where \( UR_i \) is the unemployment rate for unskilled workers (i.e., those most likely to be employed in minimum wage jobs) in state \( i \) and \( MW_i \) is the federally mandated minimum wage which is constant across all states (i.e., \( MW_i = MW \) for all states).

   (a) Do you think it is feasible to estimate the above model given the data available? *Hint: Think about what the scatter plot of the data would look like.*

   (b) To circumvent the problem in (a), you could estimate the following model instead:

   \[ UR_i = \alpha_0 + \alpha_i MWRATIO_i + \varepsilon_i, \quad i = 1, \ldots, 50 \]

   where \( MWRATIO_i \) is the ratio between the federally mandated minimum wage (which is constant across states) and the average wage in state \( i \). Give the theoretical model discussed in the chapter, what is the expected sign of \( \alpha_i \)?