Econometrics Lab 1

Estimating Linear Regression

1. Engel's Law The Engel's Law states that, with a given set of tastes and preferences, as income rises, the proportion of income spent on food falls, even if actual expenditure on food rises. In other words, the income elasticity of demand of food is less than 1. The law was named after the statistician Ernst Engel (1821–1896).

This exercise uses the dataset engel.csv, which is a Chinese household survey data (Gong et al., 2005). We use the following variables

$food$	Food consumption per capita
totcper	Total consumption per capita
totcinc	Total income per capita
dcoast	A dummy for households in the coast area.
dmiddle	A dummy for households in the middle area.
dwest	A dummy for households in the west area.
age	The average age of husband and wife.

(1) Construct a table of "summary of statistics" for the first three variables, including: mean, median, maximum, minimum, and standard deviation.

(2) Draw histograms of *totcinc* and log(*totcinc*). Compare these two distributions. (Matlab command: hist(Y,M); where M is a scalar, uses M bins.)

(3) Draw scatter plots of $food$ v.s. *totcinc*, log($food$) v.s. log(*totcinc*), $food/totcper$ v.s. log(*totcinc*). Do you see any pattern?

(4) Estimate the following model,

$$\log(food) = \beta_0 + \beta_1 \log(totcinc) + u. \tag{1}$$

(5) According to your estimates, does the Engel's Law hold?

(6) Choose samples from the coast area and estimate the above model again. Does your conclusion in (5) still hold for this sub-sample? (To choose sample, we can use y=data(dcoast==1,:);)

(7) Do the same thing for households in the middle and the west area. Discuss your results.