Computational Econometrics with R

Simple Regression Analysis: Food Expenditure Example

We use data on weekly food expenditure and income to estimate a simple linear regression model and examine the determinants of weekly food expenditure. The following variables are available in the data set `food.csv`:

Variable	Explanation
FOOD_EXP	weekly food expenditure in $
INCOME	weekly income in $100

1. Preliminaries

1.1 Import the data set `food.csv` to R and label the variables appropriately. Take a look at the data values, as well as the summary statistics.

1.2 Provide a scatter plot of the variables FOOD_EXP and INCOME. Enhance the graph by adding a title and by changing the vertical axis scale so that it begins at zero.

2. Estimating a Simple Regression Model

2.1 Estimate the simple linear regression model

$$\text{FOOD\_EXP}_i = \beta_0 + \beta_1 \text{INCOME}_i + \varepsilon_i$$

by OLS.

2.2 Generate a new variable that contains the residuals of this linear regression.

2.3 Interpret the regression output by commenting on (i) the statistical significance of the parameter estimates, (ii) the economic meaning of the parameter estimates and (iii) the goodness of fit of the regression.

3. Predicted Values and Residual Analysis

3.1 Generate a new variable containing the predicted values of the variable FOOD_EXP.

3.2 Provide a residual plot, i.e. a scatter plot of the predicted values of the variable FOOD_EXP versus the residuals. Comment on the residual plot.