

Fox Module 9 Multiple regression

- Two explanatory variables
- Several explanatory variables

Read Section 5.2, "Multiple regression," on pages 86-92. Focus on the concepts of multiple regression.

- You need not memorize equations 5.5, 5.6, or 5.7. The concepts are same as for simple linear regression, but the formulas are complex. You use Excel or other software for your student project; you don't solve for the parameters by pencil and paper.

You must know the *concepts* of multiple regression for the homework assignment, the final exam, and the student project. Focus on the following:

- If two explanatory variables are highly correlated, does adding the second explanatory variable raise or lower the estimated σ^2 of the regression?
- If two explanatory variables are uncorrelated and each is correlated with the dependent variable, does adding the second explanatory variable raise or lower the estimated σ^2 ?

For your student project, you must select the best explanatory variables. Using all variables is not optimal, since the inter-relations among the variables distorts the regression line.

In later modules, Fox explains how to select among explanatory variables. Statisticians differ on the best method of selecting variables:

- Some start with all the variables and eliminate the least useful one by one.
- Some start with the most useful variable and add others one by one.

The first method is simpler for the student project; the second method is often preferred in practice, when we know that certain explanatory variables are important but we don't know if others are.