

Part I Paper 3: Quantitative Methods

Introduction to Statistical Inference - Correlation and Regression

Meredith A. Crowley

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This course will cover the following material:

Bivariate distributions and bivariate regression - bivariate probability distributions; the bivariate Normal distribution; conditional and marginal probability distributions; conditional expectation; statistical estimation of bivariate models where errors are independently and normally distributed with common variance; sampling distributions of regression coefficients under these assumptions; testing of simple hypotheses about regression coefficients; distribution of correlation coefficient under the null of zero correlation, and associated tests for significance. Multiple regression - interpretation of multiple regression coefficients; dummy variables; significance tests for individual regression coefficients; graphical analysis of regression residuals.

The primary textbook is:

Introductory Econometrics by Arthur S. Goldberger, Harvard University Press (1998).

An alternative textbook that covers similar material is:

Econometric Models and Economic Forecasts, 4th ed. by Pindyck and Rubinfeld, McGraw Hill (1998).

Outline of lectures (subject to alterations):

- Lecture 1: Two sample problems
 - Goldberger Ch. 2 and 5
- Lecture 2: Bivariate Populations
 - Goldberger Ch. 4
 - Pindyck and Rubinfeld Ch. 2.1 - 2.2
- Lecture 3: Least Squares I
 - Goldberger Ch. 2

- Pindyck and Rubinfeld Ch. 1.1 - 1.2
- Lecture 4: Least Squares II
 - Goldberger Ch. 2
 - Pindyck and Rubinfeld Ch. 1.1 - 1.2
- Lecture 5: Classical regression model - univariate regression
 - Goldberger Ch. 6
 - Pindyck and Rubinfeld Ch. 3.1 - 3.2
- Lecture 6: Inference in the classical regression model - hypothesis testing
 - Goldberger Ch. 7
 - Pindyck and Rubinfeld Ch. 3.3
- Lecture 7: Classical regression model - prediction and fit
 - Goldberger Ch. 8
 - Pindyck and Rubinfeld Ch. 3.4
- Lecture 8: Multivariate regression - dummy variables
 - Goldberger Ch. 9
 - Pindyck and Rubinfeld Ch. 5.2