HSE and University of London Double Degree Programme in Data Science and Business Analytics

Elements of Econometrics, 2023-2024

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Seminar 2. Hypothesis testing

Problem 1.

For the models $y_i = \alpha + \beta x_i + \epsilon_i$ and $y_i = \beta x_i + \epsilon_i$ compare bias and variance for the OLS estimator of β. Explain the difference.

Problem 2.

Derive confidence for the coefficient of linear regression in a model with 1000 observations

$y_i = 0.3x_i + \hat{\epsilon}_i$

(0.1)

from test statistic.

Problem 3.

What is p-value? Calculate p-value for the test for coefficient significance in a model with 1000 observations

$y_i = 0.3x_i + \hat{\epsilon}_i$

(0.1)

Problem 4.

What is the relation between type I and type II error? Between type I and power?

Calculate power for the test for coefficient significance in a model with 1000 observations

$y_i = 0.3x_i + \hat{\epsilon}_i$

(0.1)

in case true value of β is 2.