Erasmus School of Economics

MOOC Econometrics

Test Exercise 2

Notes:

- See website for how to submit your answers and how feedback is organized.
- This exercise uses the datafile TestExer2 and requires a computer.
- The dataset `TestExer2` is available on the website.

Goals and skills being used:

- Experience the process of practical application of multiple regression.
- Get hands-on experience with performing multiple regression.
- Give correct interpretation of regression outcomes.

Questions

This test exercise is of an applied nature and uses data that are available in the data file TestExer2. The exercise is based on Exercise 3.14 of 'Econometric Methods with Applications in Business and Economics'. The question of interest is whether the study results of students in Economics can be predicted from the scores on entrance tests taken before they start their studies. More precisely, you are asked to investigate whether verbal and mathematical entrance tests predict freshman grades of students in Economics. Data are available for 609 students on the following variables:

- FGPA: Freshman grade point average (scale 0-4)
- SATV: Score on SAT Verbal test (scale 0-10)
- SATM: Score on SAT Mathematics test (scale 0-10)
- FEM: Gender dummy (1 for females, 0 for males)

(a) (i) Regress FGPA on a constant and SATV. Report the coefficient of SATV and its standard error and p-value (give your answers with 3 decimals).

(ii) Determine a 95% confidence interval (with 3 decimals) for the effect on FGPA of an increase by 1 point in SATV.

(b) Answer questions (a-i) and (a-ii) also for the regression of FGPA on a constant, SATV, SATM, and FEM.

(c) Determine the (4×4) correlation matrix of FGPA, SATV, SATM, and FEM. Use these correlations to explain the differences between the outcomes in parts (a) and (b).

(d) (i) Perform an F-test on the significance (at the 5% level) of the effect of SATV on FGPA, based on the regression in part (b) and another regression.
Note: Use the F-test in terms of SSR or R^2 and use 6 decimals in your computations. The relevant critical value is 3.9.

(ii) Check numerically that $F = t^2$.

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