esercizi svolti

EN-US esame

2\) A CLASSIC LINEAR REGRESSION MODEL IS A MODEL THAT WE CAN WRITE IN THIS WAY:

$y = X\beta + \varepsilon$ / $y_i = x_i'\beta + \varepsilon_i$ $i = 1, \dots, m$ $\Sigma = \sigma^2 I_m$

MATRIX

IT'S CHARACTERIZED BY HOMOSKEDASTICITY (SAME VARIANCE) AND UNCORRELATION ($cov = 0$)
WE CAN USE THE OLS.

3\) $y_i = \beta_1 + \beta_2 D_i + \beta_3 X_i + e_i$ (HOMOSKEDASTIC & UNCORRELATED), $i = 1, 2, \dots, m$ → COUNTRIES CONSIDERED

y_i: LOGGED ANNUAL TEMPERATURE IN COUNTRY i (average across the year)

D_i: IS A DUMMY; 1 → SOUTH, 0 → NORTH

X_i: logged volume of CO_2 emissions registered in country i

a\) THIS MODEL TRY TO EXPLAIN THE CORRELATION BETWEEN THE ANNUAL TEMPERATURE IN COUNTRY i AND IF IT CHANGES THROUGH REGIONS (SOUTH OR NORTH) AND CONSIDERING THE CO_2 EMISSIONS REGISTERED IN COUNTRY i

β_3 = IN THIS MODEL IF β_3 REPRESENTS HOW MUCH THE CO_2 CONTRIBUTE TO THE ANNUAL TEMPERATURE.
IF β_3 IS 0 THIS MEANS THAT CO_2 DOESN'T INFLUENCE AT ALL THE ANNUAL TEMPERATURE WHILE IF IT'S BIGGER THAN 0 IT MEANS THAT IT WILL INFLUENCE IN A WAY THE RESULTS.

b\) SOUTH COUNTRIES → 1 NORTH COUNTRIES → 0

$H_0: \beta_2 = 0$ → THE INTERPRETATION IS THAT THE FACT THAT IT'S SOUTH OR NORTH DOESN'T INFLUENCE THE OVERAL OUTCOME.

β_2 REPRESENTS THE AVERAGE TEMP. BETWEEN COUNTRIES

$\boxed{\text{there are no differences between north and south}}$

c\) $\Sigma = E(ee')$ $\Sigma = \begin{pmatrix} \sigma^2 & 0 & 0 \\ 0 & \sigma^2 & \\ 0 & 0 & \dots \sigma^2 \end{pmatrix}$

COVARIANCE $COV = 0$ → UNCORRELATION

VARIANCE HOMOSKEDASTICITY

$X = \begin{bmatrix} 1 & 1 & X_1 \\ 1 & 0 & X_2 \\ \vdots & & \\ 1 & 1 & X_i \end{bmatrix}$

CONSTANT

37%