THE IMPACT OF ECONOMIC ON SCIENTIFIC OUTPUT: A GLOBAL PERSPECTIVE IN 2020

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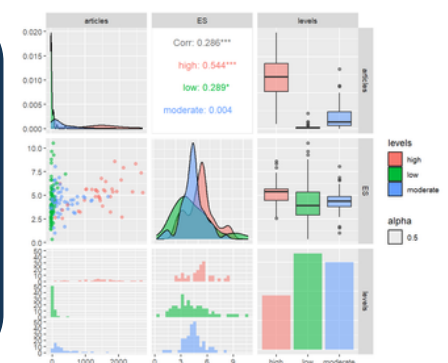
INTRODUCTION

This research explores the relationship between education spending and the number of scientific and technical journal articles published per million people, and how this relationship varies across economies of different sizes.

RESEARCH QUESTIONS

1. How do education spendings depend on articles ?
2. What are the differences in the impact of education spending on the number of articles among countries of three GDP levels?

VISUALIZATION IN R

From the scatter plot, in high GDP countries, there appears to be a correlation, with higher education spending generally corresponding to greater research output. Moderate GDP countries show a more dispersed pattern, suggesting that education spending alone may not be a strong predictor of scientific output.

$$\hat{y} = \widehat{\alpha} + \widehat{\beta}_{es} \cdot es + \widehat{\beta}_{levelm} \cdot I_{levelm}(x) + \widehat{\beta}_{levelh} \cdot I_{levelh}(x) + \epsilon_i$$
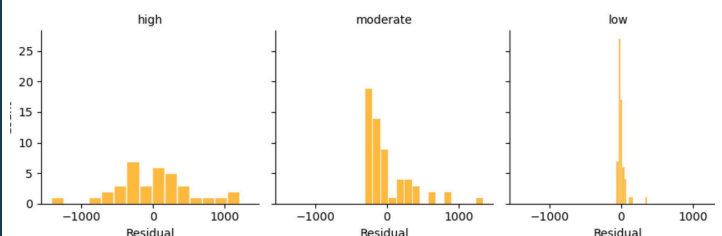
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============================================================================
                   coef    std err       t     P>|t|    [0.025     0.975]
----------------------------------------------------------------------------
Intercept        -0.0121    97.383    -0.000    1.000   -192.402   192.378
levels[T.moderate] 316.1268 189.576    1.668    0.097    -58.397   690.651
levels[T.high]    238.1202  225.387    1.056    0.292   -207.151   683.392
ES                  8.6800   20.207    0.430    0.668    -31.241    48.601
ES:levels[T.moderate] -7.4839 40.871  -0.183    0.855    -88.228    73.261
ES:levels[T.high]  222.8656  42.638    5.227    0.000    138.630   307.102
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RESULTS

- High GDP countries produce significantly more scientific articles compared to moderate and low GDP countries.
- On average, education spending is higher in high GDP countries, while moderate and low GDP countries exhibit similar levels of it.

ASSUMPTION CHECKING

The residuals for high GDP countries appear to be approximately normally distributed, centered around zero, suggesting that the model performs well in these countries. However, the residuals for moderate and low GDP countries deviate from normality.

CONCLUSION

- Education spending and scientific output are positively related. In high GDP countries, an increase in education spending corresponds to a significant rise in published articles.
- In contrast, moderate and low GDP countries show a weaker relationship, suggesting that factors such as research infrastructure and government policy may play a more significant role in influencing scientific output.

REFERENCES: