Do Certain Unique Factors Impact a Country's Education Rank/Test Score?

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Introduction

- Countries education standing is based on Programme for International Student Assessment (PISA) scores:
  Approximately 500,000 students around the globe take the test

Data

- All of the data can be found in the World Data Bank, United Nations Development Programme: Human Development Reports, World Prison Brief, United Nations Educational, Scientific and Cultural Organization, PISA 2000:Overview of the Study Design, Method and Results written by Stanat · Artelt · Baumert · Klieme · Neubrand · Prenzel · Schiefele · Schneider · Schümer · Tillmann · Weiß, and Organisation for Economic Co-operation and Development (OECD)
- Picked out by hand

Data cont.

- 30 Countries and 8 interaction terms
- yi=Average of the Reading, Math, Science Scores on PISA test
- x1= Enrollment rate of both sexes
- x2= The education index
- x3= School Expenditure as a percentage of GDP
- x4= Unemployment Rate
- x5= Health expenditure per capita
- x6= Pupil/Teacher Ratio
- x7= Prison Population Rate per hundred thousand of the national population
- x8= Gross Domestic Savings as a percentage of GDP

Methods

- Year 2000
- R2<-lm(x ~ x1+x2+x3+x4+x5+x6+x7+x8, data=RealEconExcel2000)
- Year 2010
- R21<-lm(x0 ~ x11+x21+x31+x41+x51+x61+x71+x81, data=RealEconExcel2010)
- Altering model

Findings

Table 1: Year 2000 Regression

	Dependent variable:
	x
x1	0.165 (0.301)
x2	321.682*** (71.789)
x3	−0.484 (3.965)
x4	0.016 (1.370)
x5	−0.002 (0.005)
x6	1.181 (0.874)
x7	−0.043 (0.027)
x8	−0.258 (0.557)
Constant	232.685*** (50.959)
Observations	30
R^2	0.648
Adjusted R^2	0.513
Residual Std. Error	21.719 (df = 21)
F Statistic	4.826*** (df = 8; 21)

Findings cont.

- Year 2000
- Prediction: 561.1137
- Original: 529.7 (Australia)
- Difference: 31.41366

Findings cont.

Table 2: Year 2010 Regression

	Dependent variable:
	x0
x11	−0.044 (0.494)
x21	261.602*** (75.110)
x31	−1.453 (3.230)
x41	−0.656 (1.198)
x51	0.0004 (0.002)
x61	0.234 (0.778)
x71	−0.053 (0.031)
x81	−0.222 (0.500)
Constant	309.655*** (59.026)
Observations	30
R^2	0.511
Adjusted R^2	0.325
Residual Std. Error	19.888 (df = 21)
F Statistic	2.747** (df = 8; 21)

Findings cont.

- Year 2010
- Prediction: 529.7426
- original: 518.7 (Australia)
- Difference: 11.04265

What did we learn?

- The Education Index is significant
- Though the rest were insignificant, significance can be found in these varibales with further research. Ex. Prison Population rate
- "Children with incarcerated parents are 33 percent more likely to have speech or language problems—like stuttering or stammering—than otherwise similar children whose fathers have not been incarcerated" (Morsy,2016).