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5. Literacy is important for human development. Suppose you are part of a research team assigned to the task of studying the determinants of literacy. You want to test the hypothesis economic development will lead to higher levels of literacy.

You use country-level data. As your dependent variable, you will use the adult **literacy rate** in the country in question: The percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. To measure economic development, your main independent variable is the country's **GDP per capita** in USD (so, the higher this value, the higher the level of economic development).

Using **gdp per capita** as the independent variable, and the **literacy rate** as the dependent variable, you run a bivariate regression. The results are in the column entitled model 1 in Table 3.

	Model 1
GDP per capita	0.0004
	(0.0001)
Constant/Intercept	71.824
	(3.15)
Observations	67
R2	0.15
Adj. R2	0.14
Root MSE	21.7

. a) Is there a relationship between between **gdp per capita** and **literacy rate** in a country? Is it strong or weak? Interpret the results in model 1 of Table 3. Use all available information and discuss. Do not forget to assess whether the hypothesis that more economically developed countries will have higher literacy rates is supported or not by the analysis. **(5p)**

. b) The variable that measures economic development (i.e. the variable **gdp per capita**) ranges from 723 to 69542. In light of this, would you say that the effect of the variable **gdp per capita** on literacy documented in Table 3 is strong or weak? **(2.5p)**

. c) A colleague points out that there exists research that shows that linguistic fractionalization in a country has a negative effect on its literacy rate. The colleague therefore suggests that you include a measure that captures how many different languages are spoken in the countries under study. The more languages are spoken, the higher the linguistic fractionalization. Discuss whether this measure of linguistic fractionalization is a good or bad control variable to include? **(2.5p)**

. d) It turns that irrespectively of whether linguistic fractionalization is a good or bad control, you cannot find any good data on this variable. Instead you decide to control for women's representation, reasoning that more women in parliament may lead to policies prioritizing literacy. You add the control variable **womens' representation**, which is measured as the percentage share of women in parliament. The results from this multivariate model are

shown in the column entitled model 1 of Table 4. Use all available information to interpret the multivariate analysis. Is there still a relationship between the gdp per capita and the literacy rate or has that changed when going from the bivariate to the multivariate model? What is the relationship between women's representation and the literacy rate? Which model do you prefer, the bivariate model in Table 3 or the multivariate model in in Table 4? As always, remember to motivate your answers. **(7.5p)**

e) The variable that measures women's representation (the percentage share of women in parliament) ranges from 0 to 53. In light of this, would you say that the effect of the variable **women's representation** on literacy documented in Table 4 is strong or weak? Also, discuss whether this effect is stronger or weaker than the effect of **gdp per capita** in Table 4. **(5p)**

Table 4. Regression models with adult literacy rate in the country as the dependent variable (standard errors are in parentheses)

	Model 1
GDP per capita	0.0005
	(0.0001)
Women's representation	0.4466
	(0.2370)
Constant/Intercept	62.444
	(5.856)
Observations	67
R2	0.19
Adj. R2	0.17
Root MSE	21.3

Levels of confidence and their cut-points used on this exam

Level of confidence	Cut-point/critical value
90%	1.65
95%	1.96
99%	2.58

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