Empirical Banking and Finance
Tutorial 2

Konrad Adler

Institute for Financial Economics and Statistics
University of Bonn

Summer 2020

Tutorial 2

- Overall, good work!
- Some issues I want to highlight

Question 3: Regression 2

- a) Comment and explain the intuition in two sentences why OLS is so sensitive to outliers.
  - Most of you mentioned that using the square distance makes the influence of outliers worse
  - $\beta = \mathbb{E}\left[X_i X_i'\right]^{-1} \mathbb{E}\left[X_i Y_i\right]$
  - The expectations are estimated by using sample *means*
  - The mean is very sensitive to extreme values

Question 3: Regression 2

- b) Why are the authors using government ownership of banks in 1970 and not, for example average ownership share between 1970 and 1995? Would it be preferable to use government ownership in 1960, and if yes, why?
    - Debate of whether finance causes growth or increases along with growth
    - Taking the average value would not help at all to disentangle the two versions
    - 1960 value would be prefereable because it is determined before average per captia gdp (RHS variable) is measured

Question 4; Regression 3

- a) Add the variables schooling and birth_rate_1970 to Regression 2. Why does it make sense to include these variables?

Incomplete answer:

- "schooling and birth rate matter for GDP per capita growth, therefore we should include them"
- true, but not the main reason
- we really don't care about including *all* determinants of GDP per capita growth when we are interested in the effect of government ownership of banks on GDP

instead....

Question 4; Regression 3

- a) Add the variables schooling and birth_rate_1970 to Regression 2. Why does it make sense to include these variables?
  - The two variables probably matter for gdpgrowth
  - But, and as importantly, they might be correlated with our variable of interest
  - If we omit them, our coefficient of interest might be wrong
- c) Interpret the sign of the coefficients if they are statistically significant. What is the economic size implied by these coefficients?
  - *log*gdp1960: a 1 sd increase in log gdp is not instructive
  - Look at the table again

Question 5; Regression 4

Regression with interaction

- c) Interpret the sign of public_banks_1970 and private_credit_1960. What exactly do they measure?
  - "When the fraction of government ownership of banks increases by 1 percentage point, average annual growth falls by 0.04 percent, because the coefficient of public_banks_1970 is -0.0397587."
  - No No No!
  - the coef "public_banks_1970" by itself tells us the marginal impact of public ownership of banks when private_credit_1960 = 0
  - This is rule # 2 of the interaction terms!
- d) Interpret the sign of the interaction term.
  - ...

Question 6 & 7

Question 6 - Regression 5

$$\text{Not OECD } gdpgr = (\beta_0 + \beta_1) + \beta_2 loggdp_{1960} + \beta_3 publicbanks_{1960}$$
$$\text{OECD } gdpgr = \beta_0 + (\beta_2 + \beta_4) loggdp_{1960} + (\beta_3 + \beta_5) publicbanks_{1960}$$

Question 7 - Regression 6

$$\text{Not OECD } gdpgr = \delta_0 + \delta_1 loggdp_{1960} + \delta_2 publicbanks_{1960}$$
$$\text{OECD } gdpgr = \delta_3 + \delta_4 loggdp_{1960} + \delta_5 publicbanks_{1960}$$

Question 6 & 7

- 6 b) What is the interpetation of the constant? What is the interpretation of the non-OECD country dummy?
  - Constant: average GDP per capita when all covariates are at 0, including the non-OECD dummy, therefore average for OECD countries when all covariates are at 0
  - non-OECD dummy: together with the constant average GDP per capita when all covariates are at 0 for non-OECD countries
- 7 b) How do you interpret the two dummies?
  - OECD: average GDP per capita when all covariates are at 0 for OECD countries
  - Not OECD: average GDP per capita when all covariates are at 0 for non-OECD countries
- 7 d) How are the results different from Regression 5?
  - The results in terms of coefficients are the same
  - Strange thing about the R^2 in a model without a constant