EXERCISE SHEET 6: AJR (2001) ON THE COLONIAL ORIGINS OF GROWTH, PART 2.

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Main learning goals: 1. Understanding the basics of 2SLS

2. Estimating IV models

3. Interpreting diagnostic tests for over-identification and weak instruments

Hand-in: As usual: do-file and the corresponding log-file (saved in .log-format) containing the following steps (numbered in the do-file).

1. Continue using the dataset `AJRdata` from last time and implement the IV strategy in two stages estimating first the equation

$$R_i = \zeta + \beta \ln M_i + \boldsymbol{X}_i' \boldsymbol{\delta} + v_i \tag{1}$$

(p. 1384), including latitude and continent dummies as controls, i.e. column (8) of panel A in table 4.

Collect the predicted values $\hat{R}_i$, and estimate once again

$$\ln y_i = \mu + \alpha R_i + \boldsymbol{X}_i' \boldsymbol{\gamma} + \epsilon_i \tag{2}$$

(p. 1378) using $\hat{R}_i$ instead of R_i.

State the two main assumptions for this approach to yield consistent estimates. What kind of problem did we create with this procedure?

2. Perform both stages of the IV estimation jointly, using `ivregress, 2sls`.

Reproduce columns (2), (4), and (8) of table 4 (panels A and B). Interpret the results of column (8) statistically and economically.

Include the interpretation in your do-file.

3. Correct the standard errors from your 2SLS regressions that you implemented by hand. To do so you simply have to correct the variance-covariance matrix, `e(V)`, from the second stage regression. Remember that this matrix is simply given by $\hat{\sigma}^2 (\hat{X}'\hat{X})^{-1}$, where $\hat{\sigma}^2$ is the "wrong" mean squared error, `e(rmse)`^{2}. The corrected mean squared error can be computed as:

$$\hat{\sigma}^2 = \frac{1}{n-k-1} \sum_{i=1}^n \hat{\varepsilon}_i^2,$$

where

$$\hat{\varepsilon}_i = \ln y_i - \mu - \hat{\alpha} R_i - X_i' \gamma.$$

4. Re-estimate columns (2), (6) and (9) from table 6 (panels A and B).

Test for joint significance of the included climate and natural resource variables in all three columns using `test`. What is the purpose of these tests?

Comment shortly on the omitted climate and natural resource coefficients and the test results in your do-file.

5. Re-estimate columns (7), (8) and (9) from table 7 (panels A and B). Notice the use of multiple instruments.

Comment shortly on the overall results in your do-file.

6. Re-run your results for column (7) from table 7 using `ivreg2`.

Interpret the results from the over-identification tests and tests for weak instruments, produced by the command and comment on these in your do-file.

Further comments: Submit 2 files (.do, .log) to Ilias. Usual procedures apply.