14.452: Problem Set 1

Due date: November 4, 2016.

Using the data provided, estimate the following two equations:

$$y_{ct} = \alpha D_{ct} + \delta_c + \gamma_t + \varepsilon_{ct}$$

and

$$\Delta y_{ct} = \alpha D_{ct} + \delta_c + \gamma_t + \varepsilon_{ct},$$

where y_{ct} denotes log of GDP per capita in country c in year t, D_{ct} is a binary democracy index in country c in year t, δ_c denotes a full set of country fixed effects, and γ_t are year dummies.

1. Explain why these two specifications lead to different estimates of α.

2. Provide assumptions under which each estimate would correspond to the causal effect of democracy on GDP per capita. Do you find these assumptions plausible?

3. Suggest, and, if you can, estimate, an alternative model that you find more plausible, and carefully defend (or criticize) the assumptions this model requires for estimating causal effects.

4. Some researchers, worrying about omitted variables, prefer to include average education of the population on the right-hand side of such equations. What might be wrong with this practice? What else could one do if one is worried about countries with different levels of education experiencing differential changes in GDP per capita and democracy?

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