Pandas and Statsmodels

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Background

- Recall human capital-augmented Cobb-Douglas production function:

$$Y = AK^{\alpha} (hL)^{1-\alpha}, \tag{1}$$

where:

  - Y: production of final goods and services
  - K: stock of physical capital
  - L: labor force
  - h: human capital *per worker*
  - A *total factor productivity* or TFP

Background

- In the production function, every variable *except* A is *measured*:
  - Y measured by (real) GDP
  - K: inferred from investment and depreciation data
  - L: measured as number of workers or number of worker hours
  - h: typically measured as average years of education
- Of course macroeconomic measurement is subject to *measurement error*.

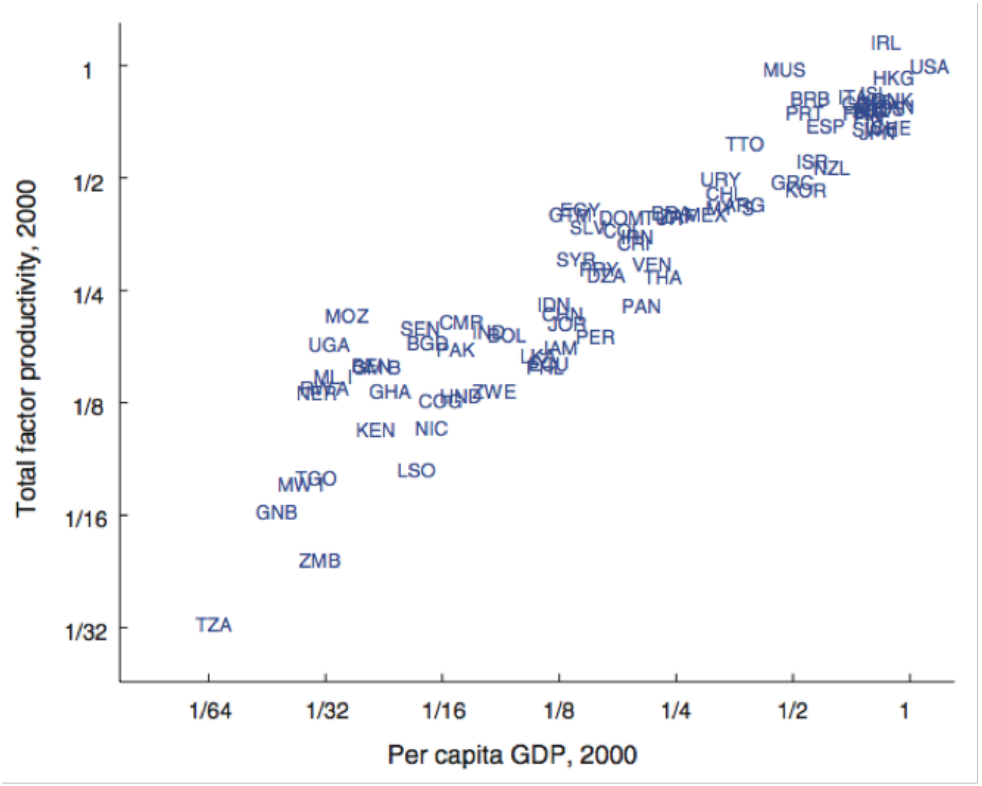
Background

- The production function *implies* a value for A:

$$A = \frac{Y}{K^{\alpha}(hL)^{1-\alpha}} \tag{2}$$

- A captures all other determinants of production that are not reflected in K, L, or h. For example:
  - Quality of economic and political institutions
  - Degree of technology adoption
  - Public health

Figure 1: **TFP and GDP per capita across countries.** All values relative to the US. Source: **?**



Jones and Romer (2010)

- *Even after accounting for their lower levels of human capital per worker and physical capital per worker*, workers in lower-income countries are less productive
- Workers in lower-income countries use what human and physical capital the *do* have less efficiently than workers in higher-income countries.
- Since TFP isn't directly observable, we still don't know exactly why.

References