Physical Capital

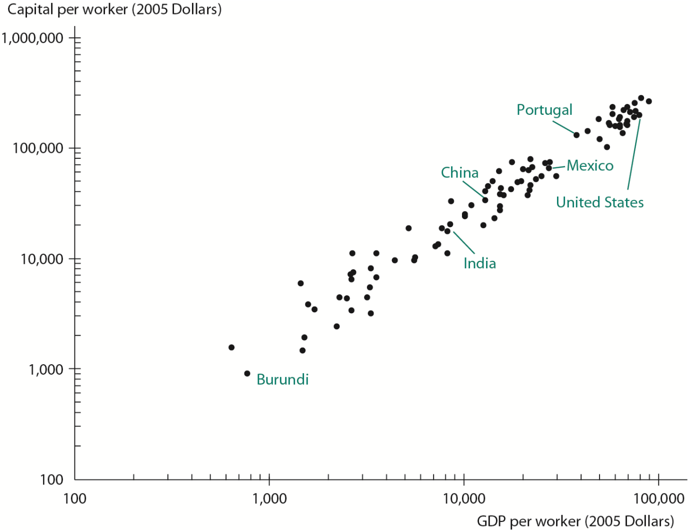
ECON 499: Growth and Development

Spring 2018

- Reading
  - Textbook, chapter 3
- Homework
  - On Canvas
- Next class
  - Bexell 120 (we'll work on the homework)

Physical capital

- Capital is a collection of things that workers use to produce output
- Workers can produce more with capital than without it
- Countries with more capital can produce more, have higher income


Capital per worker (2005 Dollars)
1,000,000
100,000
10,000
1,000
100
100
1,000
10,000
100,000
GDP per worker (2005 Dollars)
Portugal
Mexico
China
United States
India
Burundi

Properties of capital

- Capital is:
  1. Productive
  2. Produced
  3. Rival
  4. Depreciating

Productive capital

- Workers use capital to produce goods and services (machines, tools, factories, etc)
- More capital means workers are more productive
- Increasing capital per worker $\rightarrow$ increasing output per worker $\rightarrow$ increasing income per worker

Investment

- Capital is itself produced by a production process
- Only things that are produced are capital (land is not capital)
- Resources that are used to produce capital are called *investments*
- There is a tradeoff between producing consumption goods and capital
- Consumers (and governments) either consume or save, therefore savings=investment (Keynesian IS curve)

Rivalry

- If a hammer is being used by one worker, it cannot be used by another worker
- Capital has a finite capacity, not every worker can use the same capital equipment

Depreciation

- Capital wears out (depreciates) over time
- Tools break, machines need maintenance, etc
- Some continued investment is needed to maintain a level of capital

The production function

- Workers use capital to create consumption goods and services (and capital)
- A production function describes the way in which labor and capital can be combined to create output goods
- In mathematics, a *function* transforms inputs (labor, capital) into output (GDP)

$$Y = F(K, L)$$

Assumptions

- Constant returns to scale (CRS):
$$F(zK, zL) = zF(K, L)$$
- Diminishing marginal product: MPK and MPL diminish as additional units are added