Chapter 2

A framework for the analysis of long-term growth

A PARABLE

Kim has a job for you

- He is puzzled:

Why are SKs so much richer than NKs?

- Kim, the friendly NK president, hires you to find out.

First task

- Estimate magnitude of difference.
- Measure GDP: Value of goods and services produced in each country.
- Results:
  - GDP SK = 8X GDP NK
  - Equal population sizes
  - SKs are 8X richer than NKs in per capita terms.

Searching for an explanation

1. Mission of observation to SK.
2. Summary of report:
    1. Goods are produced with two input types:
        - Labor
        - Capital: tools, machines, vehicles, buildings, …
    2. On average, SK has more capital per capita.
    3. Workers with more capital tend to produce more output.
    4. Conclusion: SK is richer because it has more capital.

Kim is further puzzled

- Why on earth does SK have more capital?
- How did they manage that?

Second observation mission

- Investment in SK is 32X higher than in NK.
- *Investment* is the quantity of goods and services used to produce capital instead of consumption goods. It represents a sacrifice called *savings*.
- SKs invest more because they save more.
- They save more for two reasons:
  1. Because they are richer (8X)
  2. Because they save a higher proportion of their income (4X)

Conclusion from second mission

- SKs are richer simply because they are more thrifty?
- A statistical test to verify this hypothesis:
  - Suppose that the sole difference between the two countries is this propensity to save. What would be the resulting difference in income?
- Results from analysis:
  - All else equal, a savings rate 4X larger can explain an income level 2X higher.
  - But SK is 8X richer. There remains a factor of 4 to explain elsewhere.

Productivity

- Residual difference: Productivity
- SKs appear to be able to achieve more with the same amount of capital.
- But why is productivity higher in SK?
- Proposition (theory):

Technology, or knowledge, about how to use inputs in order to produce outputs.

- Results from data collection and analysis:
  - NK's technology is 35 years behind SK's.

Technology and output

- How much output difference can a 35 year technology lag explain?
- Results from data collection and analysis:
  - If the only difference between SK and NK were the 35 year lag in technology, SK would be 2X richer.
- There still remains a factor of 2 to explain.

Third observation mission

- Theoretical proposition:

  It seems like SK is better organized to produce.

- Concept of efficiency: SK does more with same technology level and quantity of production factors.
- This explains the remaining factor of 2.

Final Report to Kim

- NK is 8X poorer for three reasons:
  1. Lower investment rate (2X)
  2. Technology lag (2X)
  3. Lower efficiency (2X)
- Those are *proximate* causes.

Kim is not satisfied

- What causes such differences in the first place?
- The *fundamentals* explain:
  1. Differences in savings rates
  2. Differences in technology adoption and knowledge creation
  3. Differences in the way technology and factors are used

Mission on fundamentals

- Propositions:
  1. Is it culture?
     - More or less thrifty?
     - More or less assiduous?
  2. Is it economic policies?
     - taxes
     - tariffs
     - regulations
  3. Is it Geography?
     - Natural resources
     - climate
     - Proximity to large markets
  4. What about government type?

Results from mission

1. Climates, geographies, cultures are all similar but…
2. In NK:
   - Investments generally get expropriated by Kim
   - Brains and capital are mainly used for population control and arms production
   - One becomes rich mainly through Kim's favors
3. In SK:
   - One becomes rich mainly by creating goods and services that people want.
   - Incentives to invest and increase productivity through technology and efficiency.

Framework of analysis for the study of long run growth

1. Two key elements:
    1. Factor accumulation
    2. Productivity in use of factors
2. Two productivity determinants:
    1. Technology
    2. Efficiency
3. Make difference between *proximate* and *fundamental* determinants.

Analyzing the proximate causes of long run growth

A useful tool:
The production function

FIGURE 2.1
The Production Function

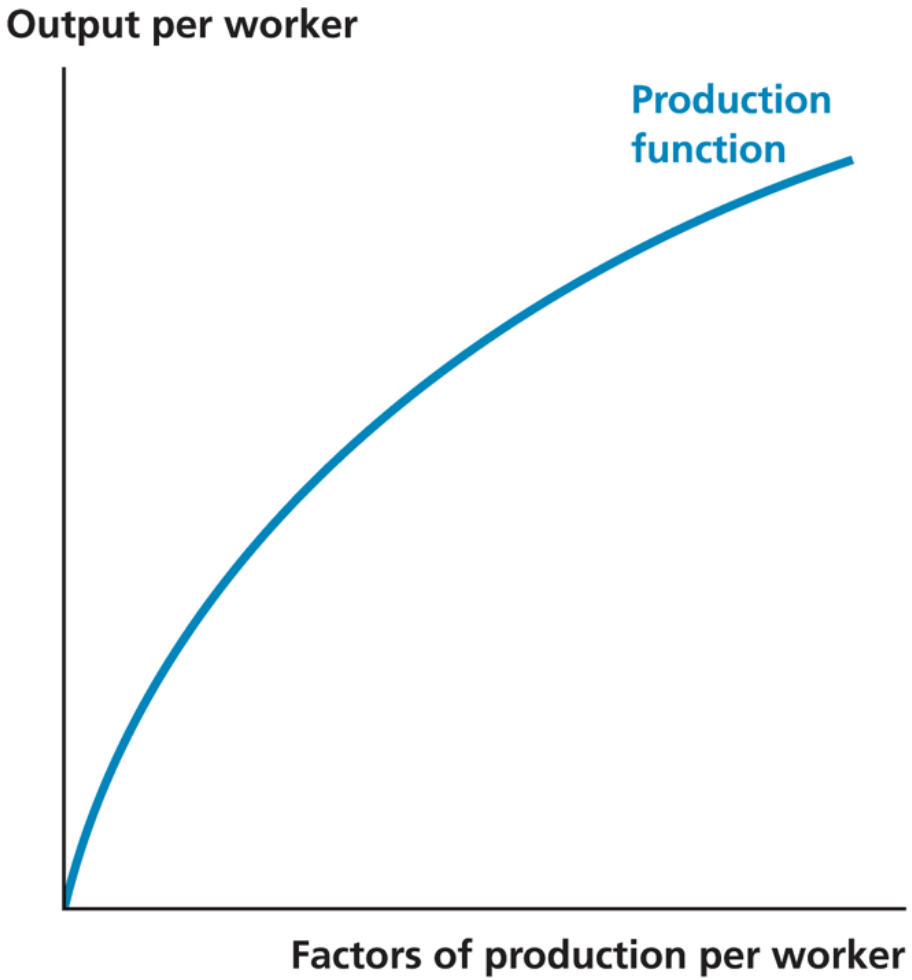
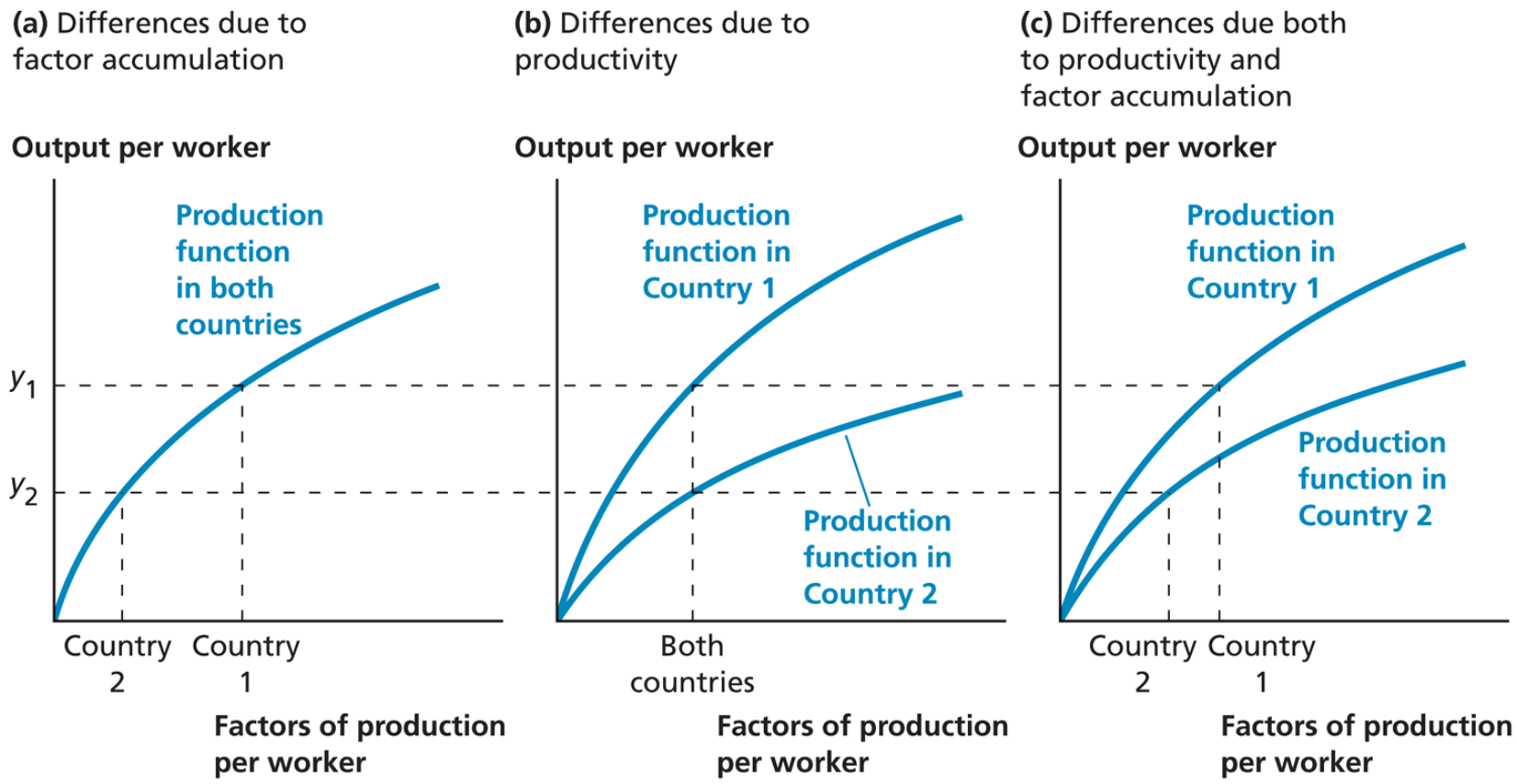


FIGURE 2.2

Possible Sources of Differences in Output per Worker



Analyzing the fundamental causes of long run growth

A useful approach:
People react to incentives

Incentives

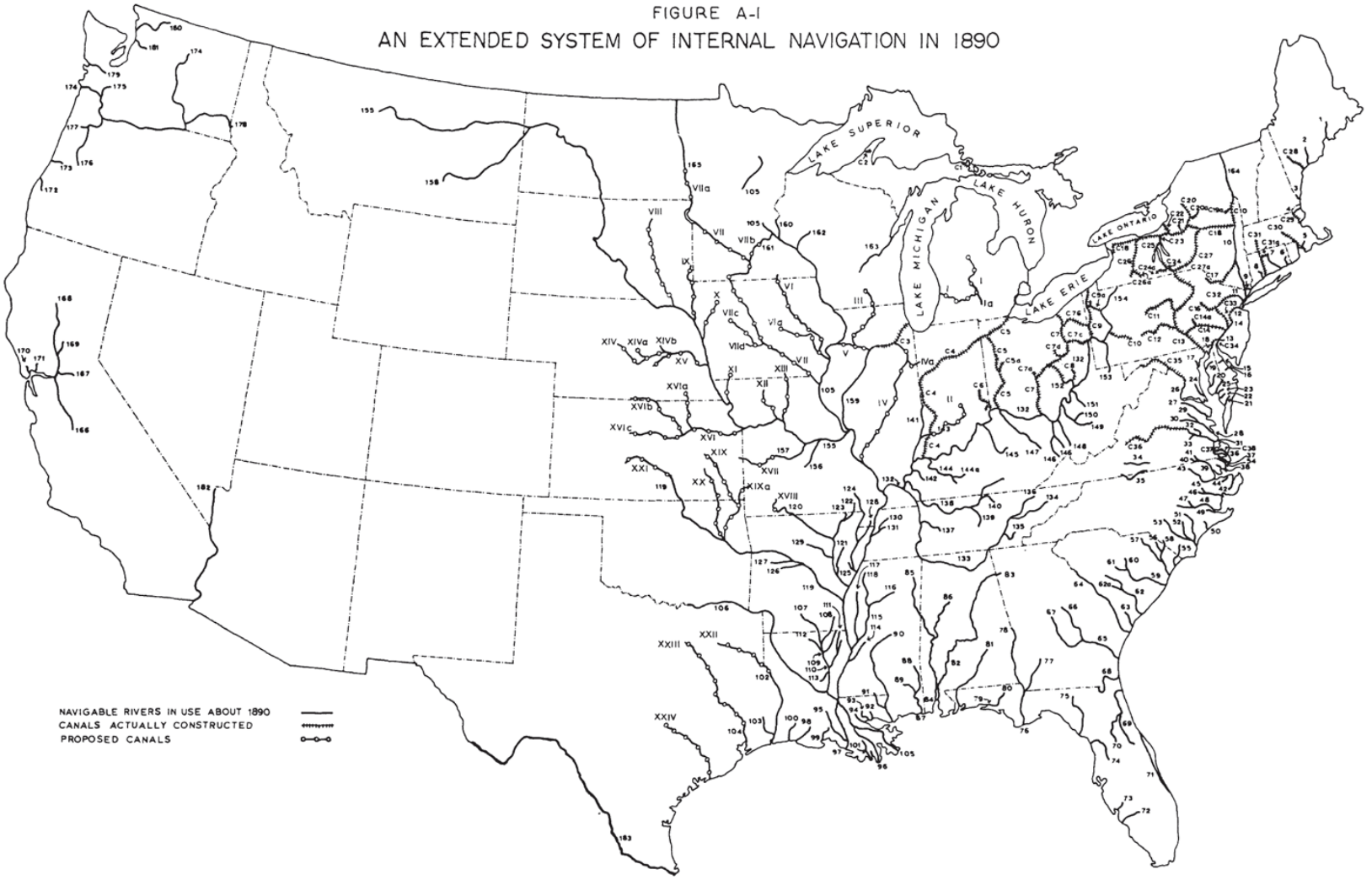
- At the individual level, there are two basic ways to get rich:
  1. Create new wealth that others want
  2. Acquire pre-existing wealth that others already have
- Look at where people's incentives mainly lie. This includes all agents:
  - Household members
  - Firms
  - Leaders
  - Government employees

Outlook

- We will begin by looking at the proximate causes.
- Next in line:

Capital accumulation

FIGURE 2.5
Fogel's Map of a Potential Water Transport Network for 1890



Source: Fogel (1964).