Chapter 7

Production and Growth

Difference in Living Standards Across Countries

A typical family with all their possessions in the U.K., a developed economy

GDP per capita: $36,130
Life expectancy: 80 years
Adult literacy: 99%

Difference in Living Standards Across Countries

A typical family with all their possessions in Mexico, a middle income country

GDP per capita: $14,270
Life expectancy: 76 years
Adult literacy: 86%

Difference in Living Standards Across Countries

A typical family with all their possessions in Mali, a poor country

GDP per capita: $1,090
Life expectancy: 52 years
Adult literacy: 46%

Economic Growth Across the World

1) There are great differences in living standards around the world.

1) Growth rates of real GDP also vary substantially, and as a result, the ranking of countries by income per person changes dramatically over time.
   - Poor countries are not necessarily doomed to poverty forever.
   - Rich countries may be overtaken by poorer but faster-growing countries.

Questions to Answer

- Why are some countries richer than others?
- Why do some countries grow quickly while others seem stuck in a poverty trap?
- What policies may help raise growth rates and long-run living standards?

Important Factors:

- Productivity
- Saving and investment
- Education
- Property rights
- Political stability
- Free trade
- Research and development
- Population growth

Productivity

Productivity is the **amount of goods and services produced by one worker.**

$$\text{Productivity} = \frac{Y}{L}$$

Why productivity is so important?

- A country's standard of living depends on its ability to produce goods and services.
- As productivity increases, workers can produce more goods and services for each unit of their time. As a result, **the output and income increase.**

Determinants of Productivity

1) Physical capital (K) per worker (L) = $\frac{K}{L}$

   Physical capital = the stock of equipment and structures that are used to produce goods and services.

2) Human capital (H) per worker = $\frac{H}{L}$

   Human capital = the knowledge and skills that workers acquire through education, training, and experience.

Determinants of Productivity

3) Natural resources (N) per worker = $\frac{N}{L}$

   Natural resources = the inputs that are provided by nature, such as land, water, and mineral deposits.

4) Technological knowledge = A

   Technological knowledge = society's understanding of the best way to produce goods and services.

Production Function

A production function describes the relationship between the quantity of inputs used in production and the quantity of output produced.

Y = A F(L, K, H, N)

All firms hire labour (L), rent capital (K), and use other inputs to produce output.

But the composition of these inputs differs across countries because different countries have **different resources and different opportunity costs of using each resource.**

Bangladesh: lots of labour

Canada: lots of natural resources and capital

Production Function

Many production functions have a property called constant returns to scale (CRS).

This property implies that as all inputs are doubled, output will exactly double.

$sY = A\,F(sL, sK, sH, sN)$

Set $s = 1/L$ and we would get the following:

$Y/L = A\,F(1, K/L, H/L, N/L)$

Economic Growth and Public Policy: What the Government can do to Encourage Growth

1. Saving and investment

We can boost productivity by increasing ***K***, which requires **investment.**

More investment requires more **saving, which requires less consumption.**

There is a trade-off between current consumption and future consumption.

Diminishing Returns to Capital

BUT there are *diminishing returns to capital*:
as the capital stock rises, the extra output produced from an additional unit of capital falls.

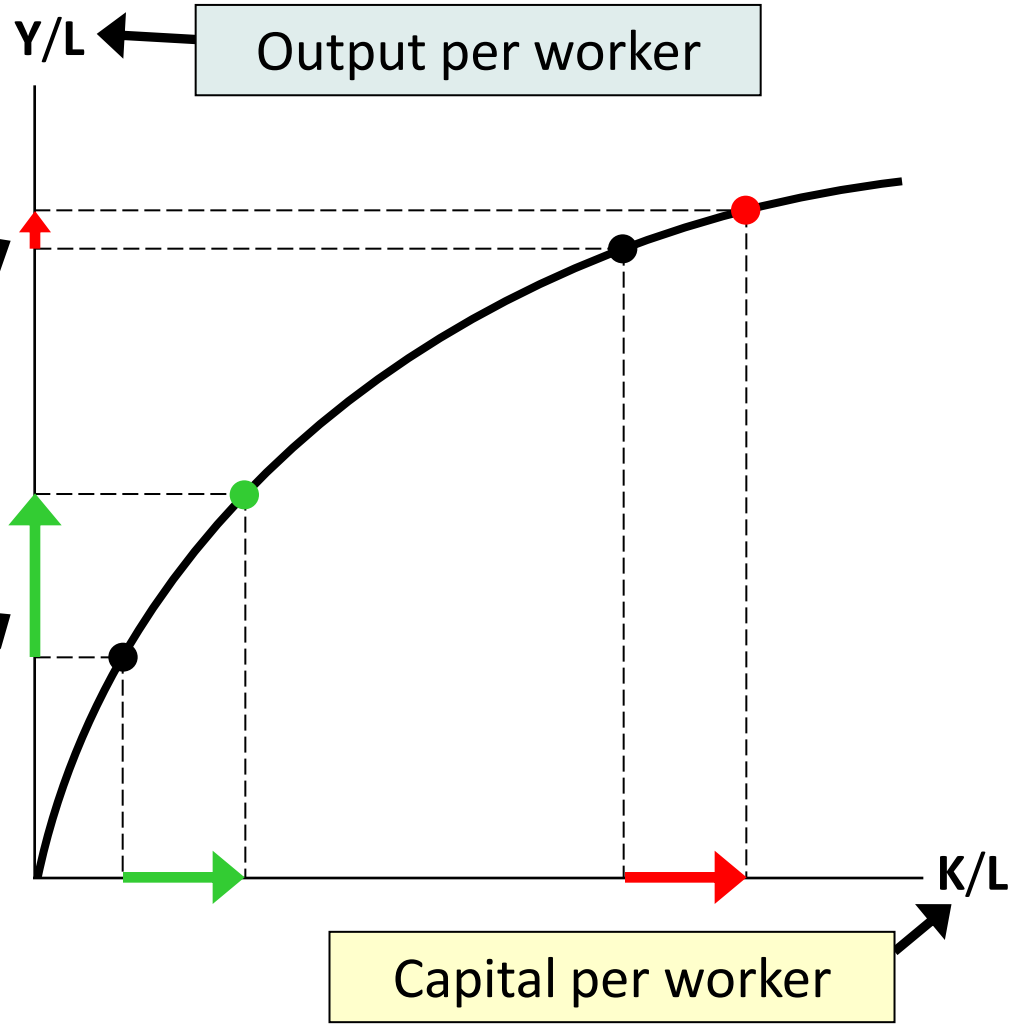
Thus, if workers already have a large amount of capital to work with, giving them an additional unit of capital increases their productivity only slightly.

So more saving and investment leads to faster growth rates only in countries that start with low levels of capital per worker.

Diminishing Returns to Capital

If workers already have a lot of **K**, giving them more increases productivity fairly little.

If workers have little **K**, giving them more increases their productivity a lot.



The Catch-up Effect

Catch-up effect = **countries that start off poor tend to grow more rapidly than countries that start off rich.**

Because of *diminishing returns to capital*, the return to capital is very **high in poor countries, so poor countries can grow more rapidly.**

Example: Over 1960-1990, Canada and South Korea devoted a similar share of GDP to investment, but growth was > 6% in Korea and only 2.5% in Canada.

Explanation: In 1960, K/L was far smaller in Korea than in Canada, so Korea grew faster.

2. Investment from abroad

Investment from abroad takes two forms:

- **Foreign direct investment:** **A physical capital investment that is owned and operated by a foreign entity. Foreign direct investment takes the form of physical assets.**
- **Foreign portfolio investment:** **A capital investment that is financed with foreign money but operated by domestic residents. Foreign portfolio investment takes the form of financial assets.**

3. Education

Government can increase productivity by promoting education – investment in human capital.

In Canada, each year of schooling has historically raised a person's wage on average by about 10 percent.

Investment in human capital also has an opportunity cost: spending a year in school requires sacrificing a year's wages now to have higher wages later.

4. Health and Nutrition

Government can increase productivity by promoting health because **healthier workers are more productive.**

Example: It is believed that 30% of Great Britain's growth from 1790-1980 was due to improved nutrition.

5. Property rights and political stability

If businesses are not safe from theft or damage then **there is little incentive to produce products or invest in a business.**

Countries with questionable enforcement of property rights or an unstable political climate will also have difficulty in attracting foreign (or even domestic) investment.

In many poor countries, the justice system does not work very well:

- Contracts are not always enforced
- Corruption often goes unpunished
- Firms may have to bribe government officials for permits

These inefficiencies hinder economic activity.

6. Free trade

Trade allows a country to specialize and thus consume beyond its production possibilities.

Inward-oriented policies = **aim to avoid interaction with other countries (e.g., tariffs, limits on investment from abroad).**

Outward-oriented policies = **aim to promote integration with the world economy (e.g., the elimination of restrictions on trade or foreign investment).**

Countries with inward-oriented policies have generally failed to create growth. Countries with outward-oriented policies have often succeeded.

7. Research and development

Technological progress is the main reason why living standards rise over the long run because **better technology increases productivity.**

Policies to promote technological progress:

- Patent laws **give incentive to create.**
- Tax incentives or direct support for research and development
- Grants for basic research at universities

8. Population growth

- Diluting the capital stock
- Stretching natural resources

  High population growth reduces output per worker because rapid growth in the number of workers results in decrease in capital stock per worker and natural resources per worker.

- Promoting technological progress

  A larger population may enhance technological progress because there are more scientists, engineers and inventors, and as a result, output per worker increases.

Exercise

1) List the determinants of productivity.

2) List three policies that attempt to raise living standards and explain how each of them affects the determinants of productivity.

Answer