



Production and Growth

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Economic Growth

- **Real GDP per person**
 - Measures average living standard
 - Vary widely from country to country
- **Growth rate**
 - Measures how rapidly real GDP per person grew in the typical year
- **Because of differences in growth rates**
 - Ranking of countries by income changes substantially over time
 - Persistent growth is key to prosperity.
 - If you have chance to travel abroad...

Satellite Night-light Map



Overview of this chapter

- What determines productivity and living standard?
- What the government can do to promote productivity and economic growth?(long story.....)

Productivity

- **Productivity (also called labor productivity)**
 - Quantity of goods and services (or value?)
 - Produced from each unit of labor input
 - Y/L
- **Why productivity is so important**
 - Key determinant of (average) living standards
 - Growth in productivity is the key determinant of growth in living standards
 - An economy's income is the economy's output

Productivity

- **Determinants of productivity (direct reason)**
 - Physical capital
 - Stock of equipment and structures
 - Used to produce goods and services
 - Human capital
 - Knowledge and skills that workers acquire through education, training, and experience

Productivity

- **Determinants of productivity (direct reason)**
 - Natural resources
 - Inputs into the production of goods and services
 - Provided by nature, such as land, rivers, and mineral deposits
 - Technological knowledge
 - Society's understanding of the best ways to produce g & s

Saving and Investment

- **Raise future productivity**
 - Invest more current resources in the production of capital
 - Trade-off
 - Devote fewer resources to produce goods and services for current consumption
 - $Y = C + I + G + NX$

Investment and Savings

- Higher savings rate

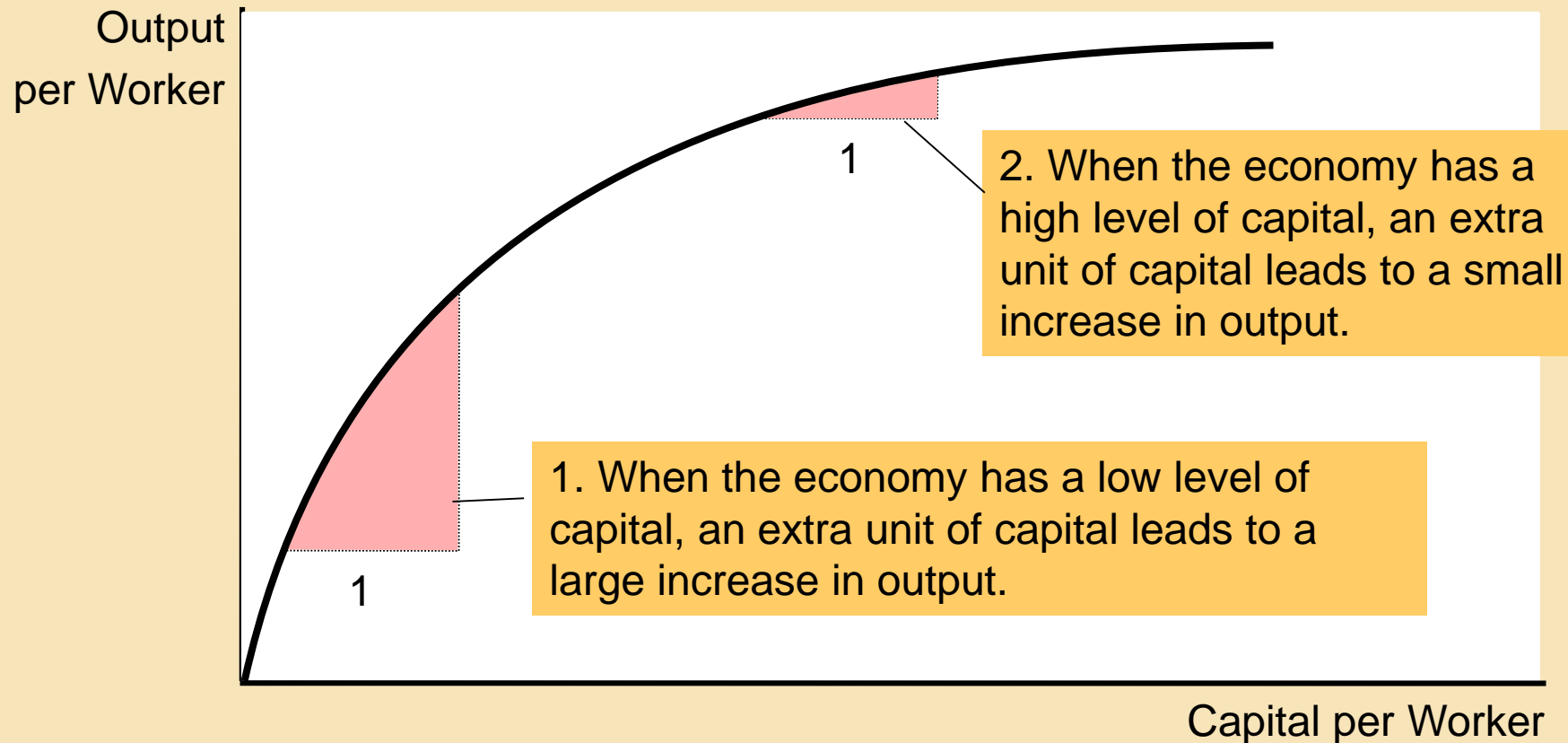
- Fewer resources – used to make consumption goods
- More resources – to make capital goods
- Capital stock increases
- Rising productivity in the future
- More rapid growth in GDP

Diminishing Returns

- **Diminishing (marginal) returns**
 - Benefit from an extra unit of an input
 - Declines as the quantity of the input increases
- **In the long run, higher savings rate**
 - Higher level of productivity
 - Higher level of income
 - **Not higher** growth in productivity or income

Figure 1

Illustrating the Production Function



This figure shows how the amount of capital per worker influences the amount of output per worker. Other determinants of output, including human capital, natural resources, and technology, are held constant. The curve becomes flatter as the amount of capital increases because of diminishing returns to capital.

Diminishing Returns

- Catch-up effect

- Countries that start off poor
- Tend to grow more rapidly than countries that start off rich

- Poor countries

- Low productivity
- Even small amounts of capital investment
 - Increase workers' productivity substantially

Diminishing Returns

- **Rich countries**
 - High productivity
 - Additional capital investment
 - Small effect on productivity --- due to diminishing returns
- **Poor countries**
 - Tend to grow faster than rich countries

TABLE 1
The Variety of Growth Experiences

Country	Period	Real GDP per Person		Growth Rate (per year)
		At Beginning of Period ^a	At End of Period ^a	
Brazil	1900–2014	\$ 828	\$15,590	2.61%
Japan	1890–2014	1,600	37,920	2.59
China	1900–2014	762	13,170	2.53
Mexico	1900–2014	1,233	16,640	2.31
Germany	1870–2014	2,324	46,850	2.11
Indonesia	1900–2014	948	10,190	2.10
Canada	1870–2014	2,527	43,360	1.99
India	1900–2014	718	5,630	1.82
United States	1870–2014	4,264	55,860	1.80
Pakistan	1900–2014	785	5,090	1.65
Argentina	1900–2014	2,440	12,510	1.44
Bangladesh	1900–2014	663	3,330	1.43
United Kingdom	1870–2014	5,117	39,040	1.42

^aReal GDP is measured in 2014 dollars.

Source: Robert J. Barro and Xavier Sala-i-Martin, *Economic Growth* (New York: McGraw-Hill, 1995), Tables 10.2 and 10.3; *World Bank* online data; and author's calculations. To account for international price differences, data are PPP-adjusted when available.

Investment from Abroad

- **Investment from abroad**
 - Another way for a country to invest in new capital
 - **Foreign direct investment (FDI)**
 - Capital investment that is owned and operated by a foreign entity
 - **Foreign portfolio investment (FPI)**
 - Investment financed with foreign money but operated by domestic residents

Investment from Abroad

- **Benefits from investment**

- Increase the economy's stock of capital
- Higher productivity
- Higher wages
- State-of-the-art technologies
- Some economist argue that governments in less developed countries should encourage FDI

Examples of FDI for China since 1978

- Panasonic
- Coca-Cola
- GE(general electronic)
- German Volkswagen

Investment from Abroad

- **World Bank**

- Encourages flow of capital to poor countries
- Funds from world's advanced countries
- Makes loans to less developed countries
 - Roads, sewer systems, schools, other types of capital
- Advice about how the funds might best be used

Investment from Abroad

- **World Bank and the International Monetary Fund**
 - Set up after World War II
 - 1944---1945
 - Economic distress leads to:
 - Political turmoil, international tensions, and military conflict
 - Every country has an interest in promoting economic prosperity around the world

Education

- Education

- In macro: investment in human capital
- Gap between wages of educated and uneducated workers
- Opportunity cost: wages forgone
- Conveys positive externalities
- Public education - large subsidies to human-capital investment

- Problem for poor countries: Brain drain...

Health and Nutrition

- Human capital can be increased by:
 - Education
 - Expenditures that lead to a healthier population
- Healthier workers
 - More productive
- Wages
 - Reflect a worker's productivity

Health and Nutrition

- Right investments in the health of the population
 - Increase productivity
 - Raise living standards
- Historical trends: long-run economic growth
 - Improved health – from better nutrition
 - Taller workers – higher wages – better productivity

Health and Nutrition

- **Vicious circle in poor countries**
 - Poor countries are poor
 - Because their populations are not healthy
 - Populations are not healthy
 - Because they are poor and cannot afford better healthcare and nutrition

Health and Nutrition

- **Virtuous circle**
 - Policies that lead to more rapid economic growth
 - Would naturally improve health outcomes
 - Which in turn would further promote economic growth

Property Rights, Political Stability

- To foster economic growth (deeper reason --- institution)
 - Protect property rights
 - Ability of people to exercise authority over the resources they own
 - Courts – enforce property rights
 - Promote political stability
- Property rights
 - Prerequisite for the price system to work

Property Rights, Political Stability

- Lack of property rights
 - Contracts are hard to enforce
 - Fraud goes unpunished
 - Corruption
 - Impedes the coordinating power of markets
 - Discourages domestic saving
 - Discourages investment from abroad

Free Trade

- Inward-oriented policies

- Avoid interaction with the rest of the world
- Infant-industry argument
 - Tariffs
 - Other trade restrictions
- Adverse effect on economic growth

Free Trade

- **Outward-oriented policies**
 - Integrate into the world economy
 - International trade in goods and services
 - Boost economic growth
- **Amount of trade – determined by**
 - Government policy
 - Geography
 - Easier to trade for countries with natural seaports

Research and Development

- Knowledge – public good
 - Government – encourages research and development
 - Farming methods
 - Aerospace research (Air Force; NASA)
 - Research grants
 - National Science Foundation
 - National Institutes of Health
 - Tax breaks
 - Patent system

Population Growth

- Large population naturally means
 - More workers to produce goods and services
 - Larger total output of goods and services
 - More consumers
- However, stretching natural resources
 - Malthus: an ever-increasing population
 - Strain society's ability to provide for itself
 - Mankind - doomed to forever live in poverty

Population Growth

- **Diluting the capital stock**
 - High population growth
 - Spread the capital stock more thinly
 - Lower productivity per worker
 - Lower GDP per worker
- **Reducing the rate of population growth**
 - Government regulation
 - Increased awareness of birth control
 - Equal opportunities for women
 - Current policies in China: 2nd and 3rd Children

Population Growth

- Promoting technological progress
 - World population growth
 - Engine for technological progress and economic prosperity
 - More people = More scientists, more inventors, more engineers



谢谢!

THANK YOU!

