Economic Growth

ECO 120: Global Macroeconomics

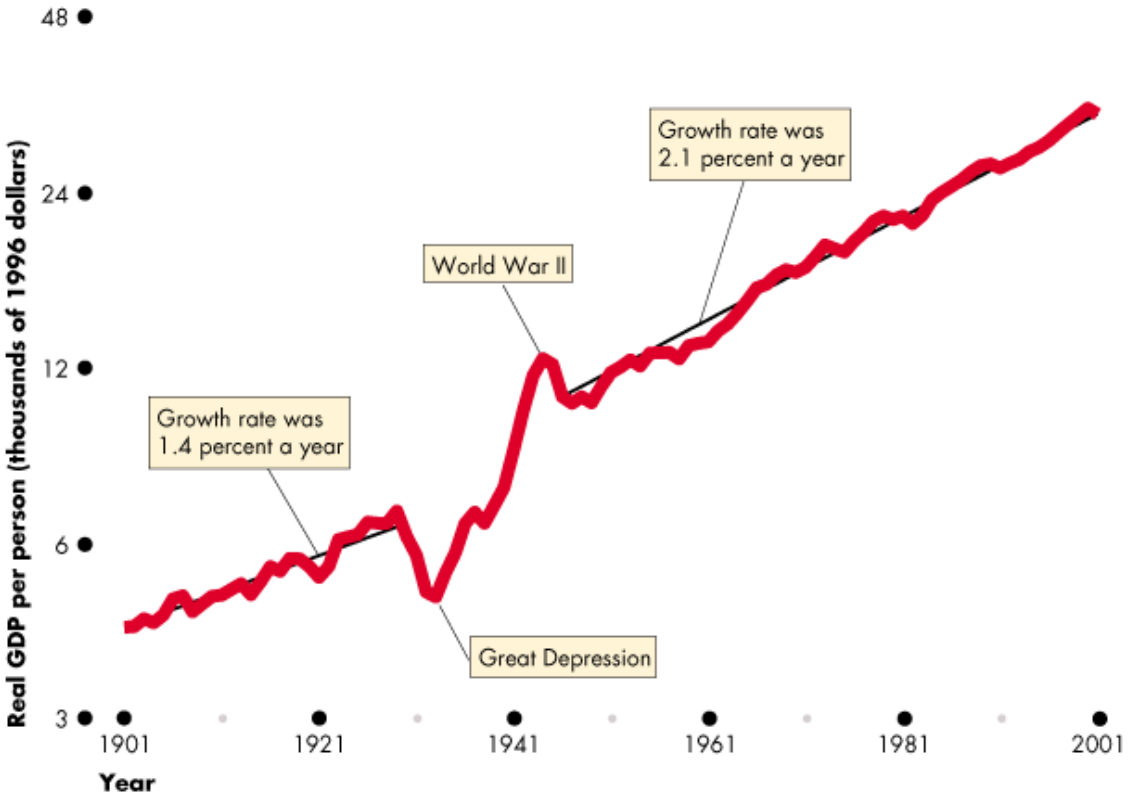
Goals

- Specific goals:
  - Appreciate the significance for economic growth.
  - Compare patterns of economic growth across countries.
  - Learn what factors affect economic growth.
- Learning objectives:
  - LO5: Compare and explain international differences in macroeconomic outcomes of production, prices, inflation, and employment.
  - LO11: Describe factors that may influence economic growth and use these to explain international difference in growth and development.*

Reading and Exercises

- Chapter 10 pp. 246-248: Differences in international growth rates
- Chapter 10 pp. 257-262: Productivity curve model
- Chapter 10 pp. 263-265: Government policies that can promote economic growth
- **Canvas Quiz due Wednesday 11:59 PM**.
  Multiple-choice, 15 questions, unlimited attempts allowed, only best score counts
- **Homework/In-class Exercise due Friday 11:59 PM**. We will work together in class on Thursday.

U.S. Trend


48
24
12
6
3
Real GDP per person (thousands of 1996 dollars)
1901
1921
1941
1961
1981
2001
Year
Growth rate was 1.4 percent a year
World War II
Great Depression
Growth rate was 2.1 percent a year

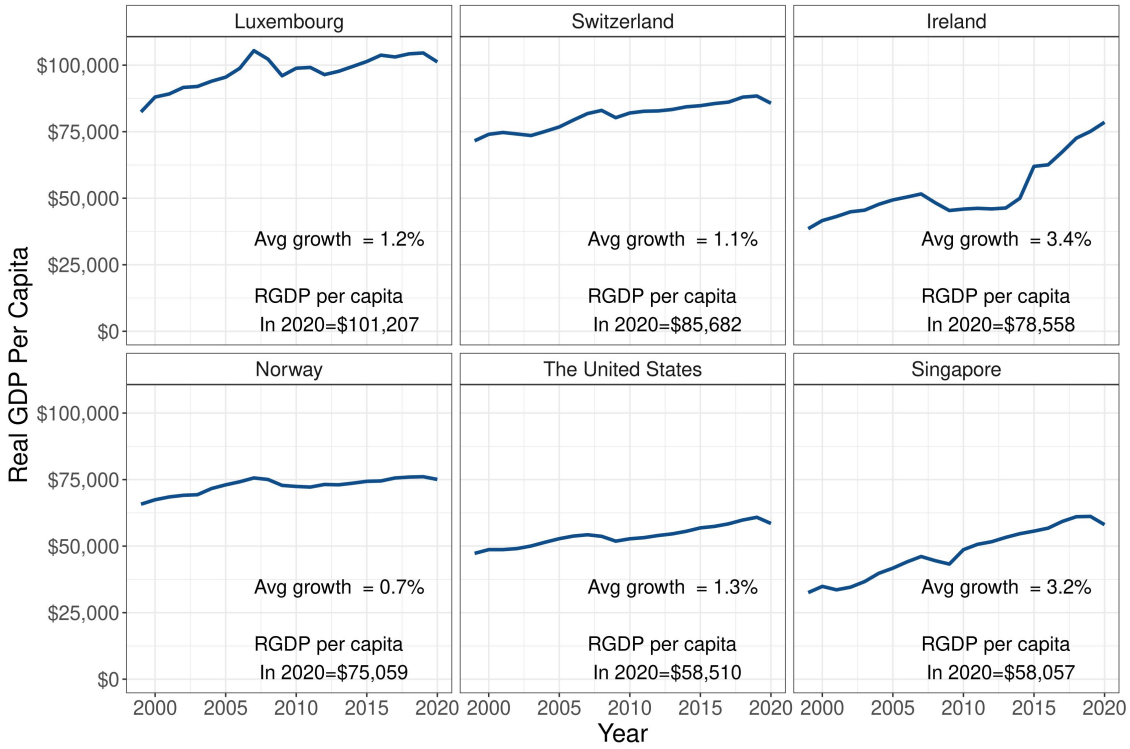
Long-Term Real GDP Growth

- Before the great depression, average growth rate was 1.4%
- After the great depression, average growth rate was 2.1%
- Real GDP per person in 1900 was approximately $6,775 (using base year 2017
- Real GDP per person in 2025 was approximately $69,500 (base year 2009)
- Can you compute what GDP would be in 2025 if the average growth rate was always 1.4%?
  - Answer: $\$6,775(1+0.014)^{125} = \$38,517$.
- What if the average growth rate was always 2.1%?
  - Answer: $\$6,775(1+0.021)^{125} = \$91,018$.
- **Small differences in growth adds up to a lot!**

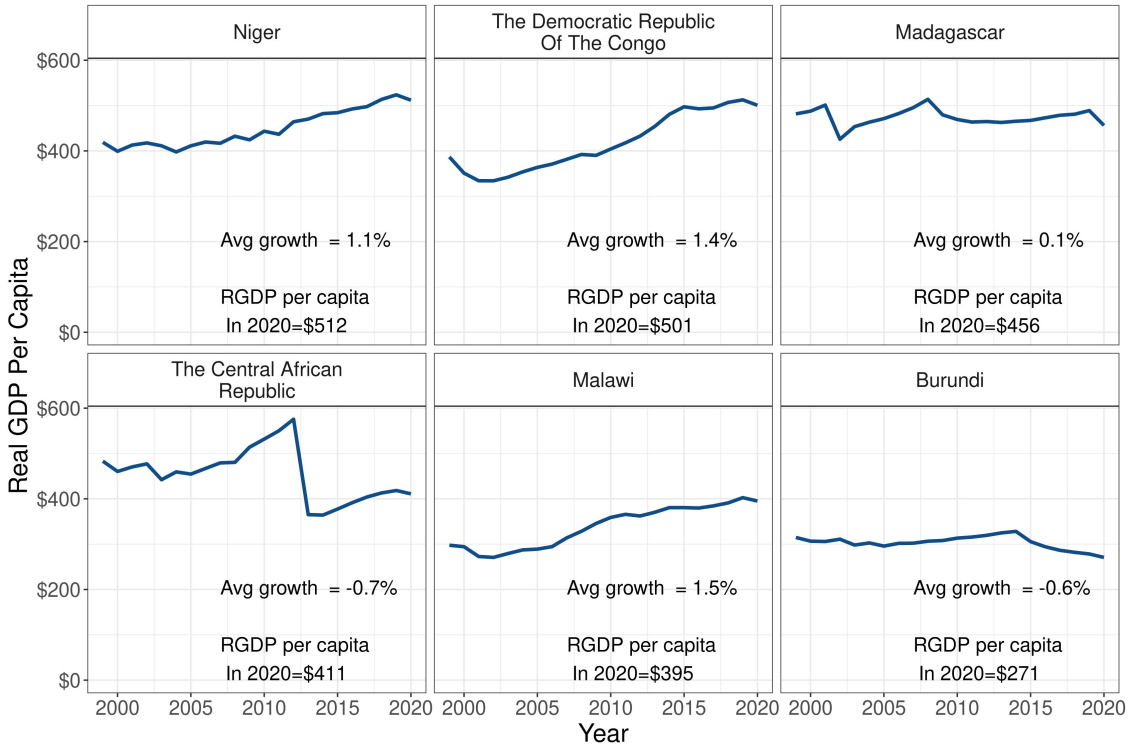
Economic Growth Facts Across Countries

- Before the industrial revolution, standards of living were similar across much of the world.
- Differences in per-capita income across countries have grown significantly since the industrial revolution.
- Rich countries today are similar in terms of per-capita income growth.
- Lesser-developed countries today are less alike in terms of per-capita income growth.

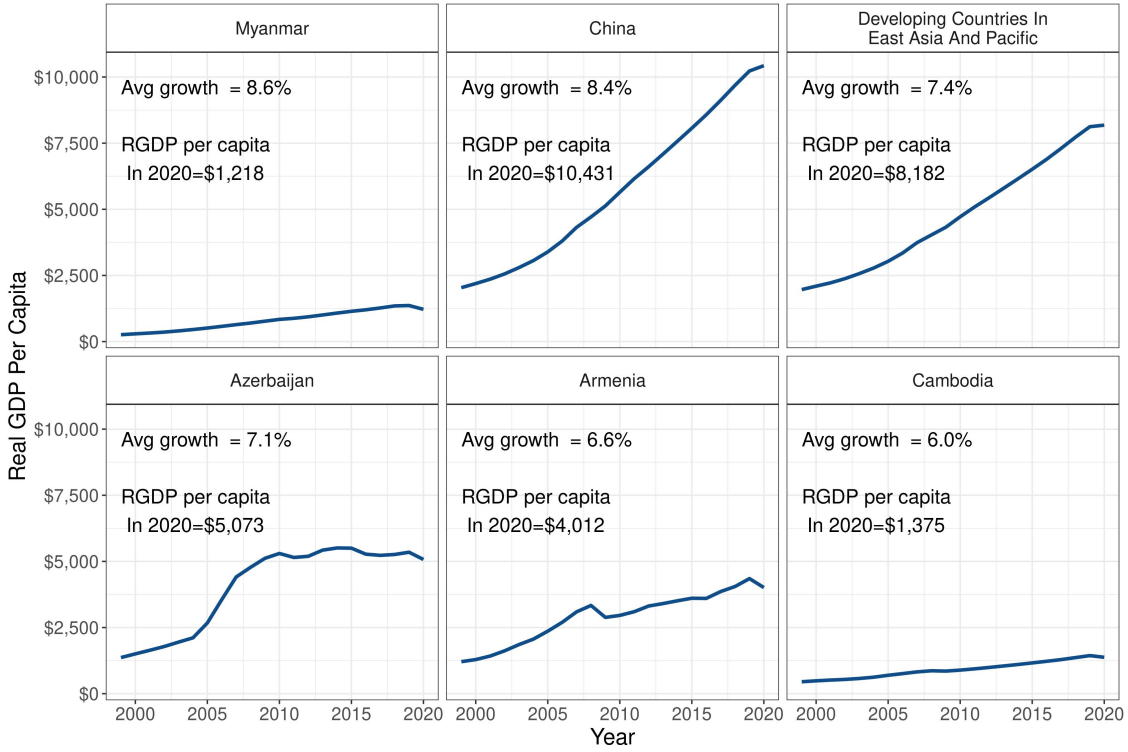
Richest Economies (Real GDP Per Capita in 2020)



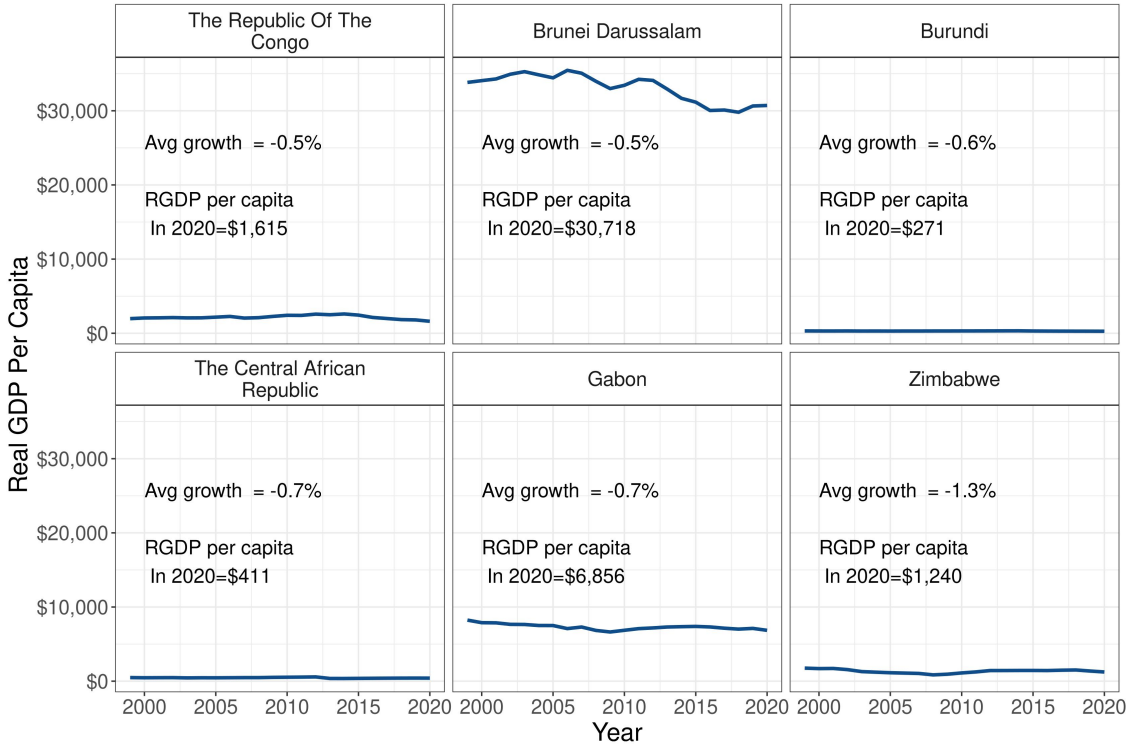
Poorest Economies (Real GDP Per Capita in 2020)



Fastest Growing Economies (1999-2019)



Slowest Growing Economies (1999-2019)



Growth Factors and Incentives

Saving and investment in new capital

- Savings is important for a sufficient equilibrium level of investment.
- What happens if savings supply increases?
- ↑ equilibrium investment → ↑ capital stock
- ↑ capital stock → ↑ production, → ↑ marginal product of labor

Prerequisites

- Markets for buyers and sellers to meet
- Property rights and protection
- Effective monetary exchange

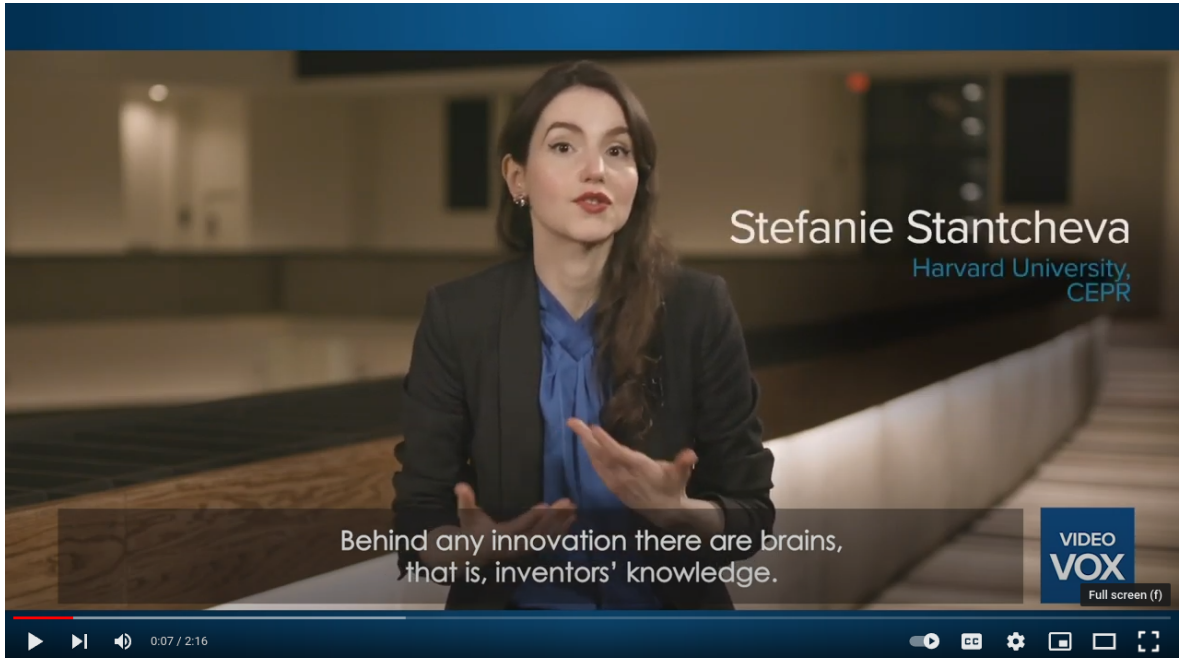
Investment in Human Capital

- **Human capital:** knowledge and skills of workers that can be used in the production of goods and services
- Improved education increases the marginal product of labor
- Human capital may not exhibit diminishing returns
  - Knowledge accumulation is **non-rivalrous**. One person learning something doesn't diminish or prevent another person from learning something.
  - Knowledgeable workers can have **positive externalities.** Not only is a knowledgeable worker more productive, other co-workers may benefit and be more productive
  - Acquiring and sharing knowledge gets easier as it grows. Example: Calculus, and you're no Isaac Newton.

Scholar Spotlight: Stefanie Stantcheva

Dancing with the Stars: Innovation through Interactions NBER Working Paper, March 2025.

Knowledgeable workers **makes it easier for peers and co-workers to acquire knowledge.**



Watch on YouTube

Discovery of new technologies

- Research and development leads to new technologies, more production possibilities
- Technological progress drives economic growth in the long run.
- There needs to be incentives to do research and development.
  - Patents on new products
  - Fund research and development through grants and state universities

Labor Productivity Curve

- **Labor productivity curve:** long-run economic growth model that illustrates how much output per person a country can enjoy with given levels of capital per person.
- Labor productivity is real GDP per hour of labor.

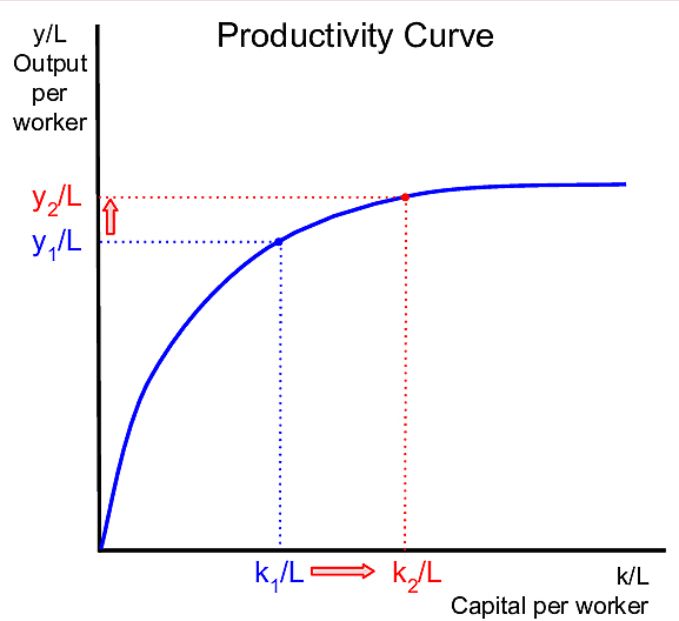
$$\text{Labor productivity} = \frac{\text{Real GDP}}{\text{Aggregate labor hours}}$$

Labor Productivity Curve

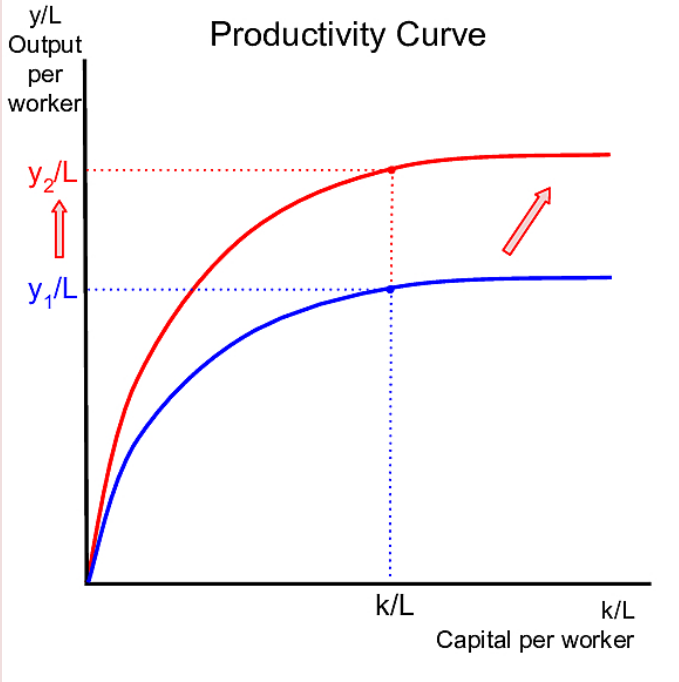
- Think of labor productivity curve as a production function, in per-capita terms.
- Real GDP per unit of labor increases as you increase the amount of capital.
- But at a decreasing rate. Due to *diminishing marginal product of capital*.

How Labor Productivity Grows

Increase in Capital Stock



Anything Else Improving Productivity



Labor productivity curve

- For given levels of capital stock per worker, curve shows output per worker.
- Increases in capital correspond to *movements* along the curve.
- Increases in technology or human capital *shift* the curve.

Catch-Up Theory

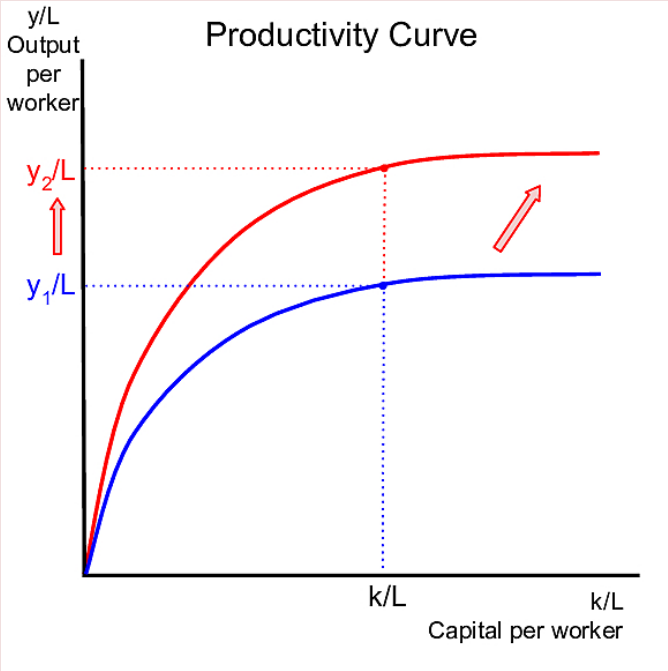
- Diminishing returns explains catch-up theory.
  - Lesser-developed countries have low levels of capital → high return to investing in new capital
  - Developed countries (like the U.S.) have high levels of capital → low return to investing in new capital
- Not all countries catch up: preconditions may not be met
  - Poorly developed goods and services markets, financial markets
  - Corruption, violence, war can threaten property rights
  - Hyperinflation

Improvement In Human Capital

Mechanism

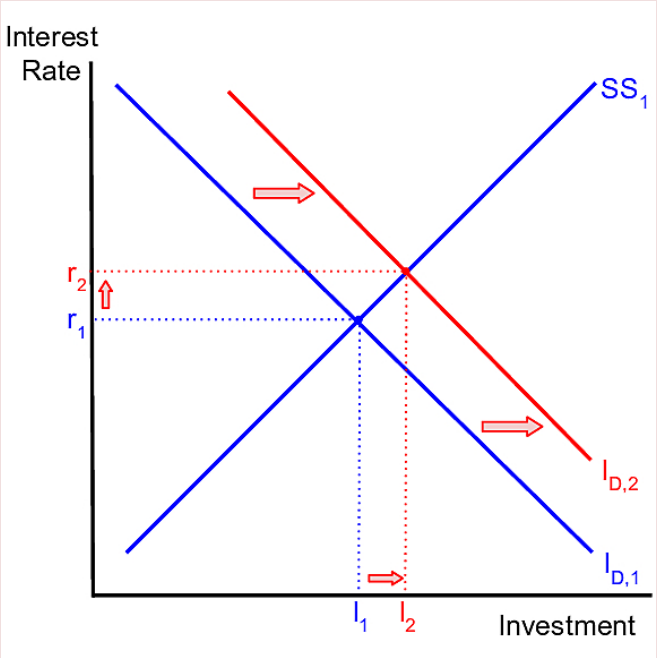
- Human capital is defined as the knowledge and skills workers use in production of goods and services
- Improvements in human capital lead to higher productivity
- Higher productivity shifts out the productivity curve
- Even without increases in capital stock, results in higher long-run output per worker

Graphical Demonstration

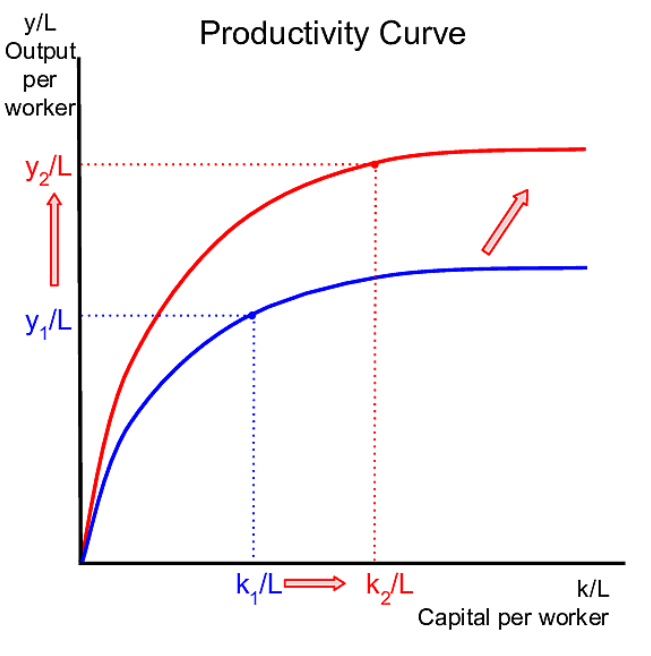


Improvement In Technology

Loanable Funds Market



Productivity Curve

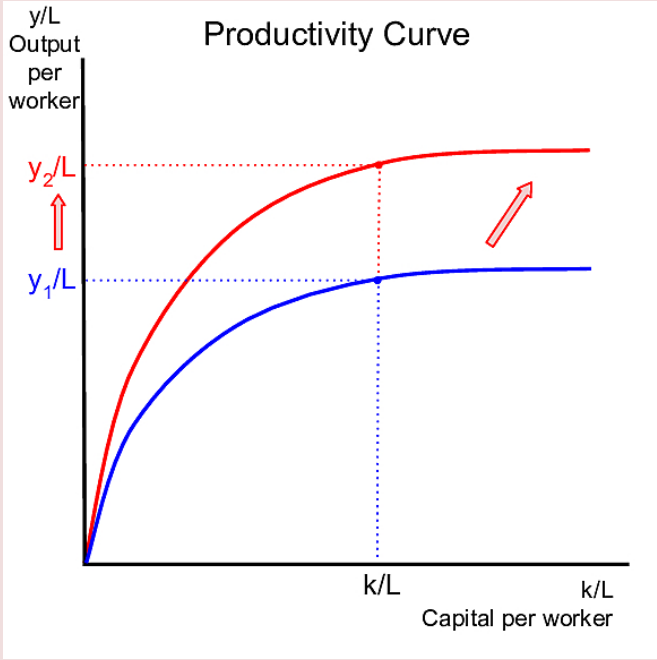


Improvement In Public Health

Mechanism

- Public health: policies and behaviors that lead to better health outcomes for entire populations, including actions that promote healthy lifestyles, adequate nutrition, disease prevention
- Healthier workers have fewer sick days and are more productive
- Higher productivity shifts out the productivity curve
- Even without increases in capital stock, results in higher long-run output per worker

Graphical Demonstration



Scholar Spotlight: Nabamita Dutta and Haley Maus

Share of Women in Parliament & Health & Educational Outcomes, *Journal of Economic Development, 2021*

Better Health and Human Capital

- Data: 70+ countries from 1974-2003
- Health outcomes children under 5 yrs, HIV/AIDS treatment, vaccination rates
- Post-high school education rates
- Controls for real GDP per capita, urbanization, financial development, etc.
- Result: More female representation in parliament leads to better health and education outcomes for men and women

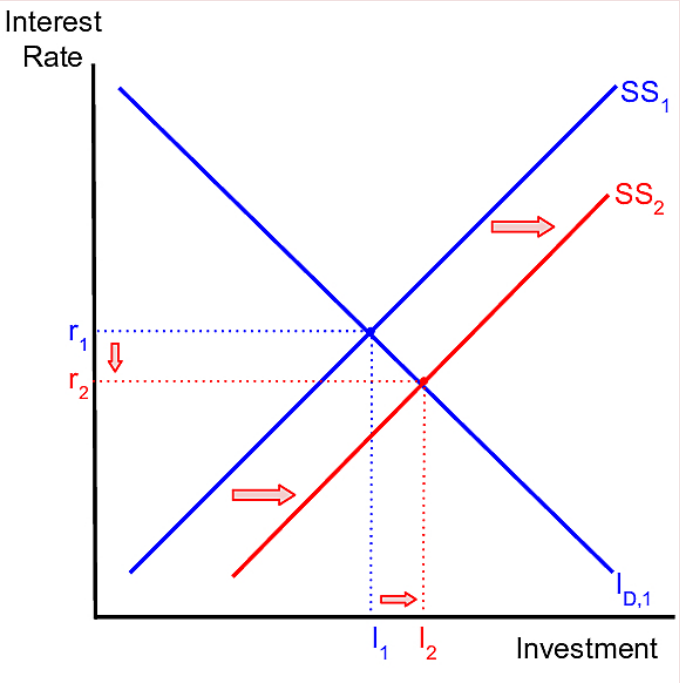
About the Scholars

Left: Dr. Nabamita Dutta, Professor
Department of Economics
University of Wisconsin-La Crosse

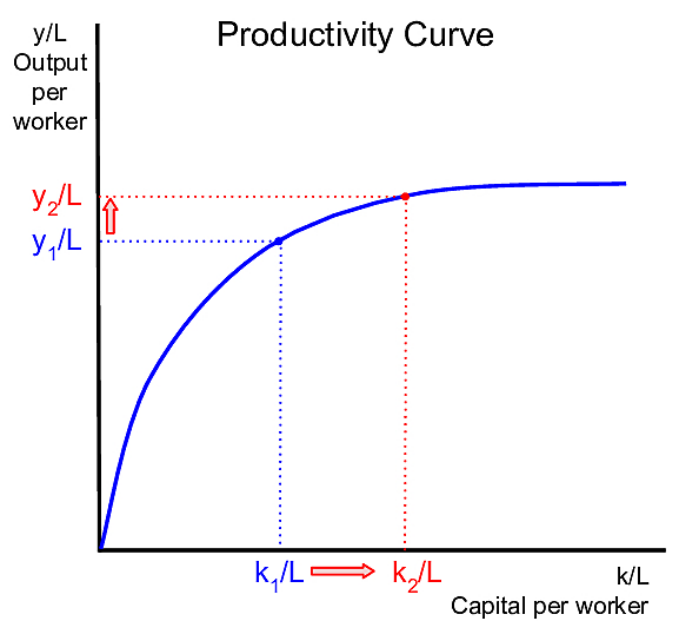
Right: Haley Maus
Former student and graduate
University of Wisconsin-La Crosse

Increase in Private Savings

Loanable Funds Market

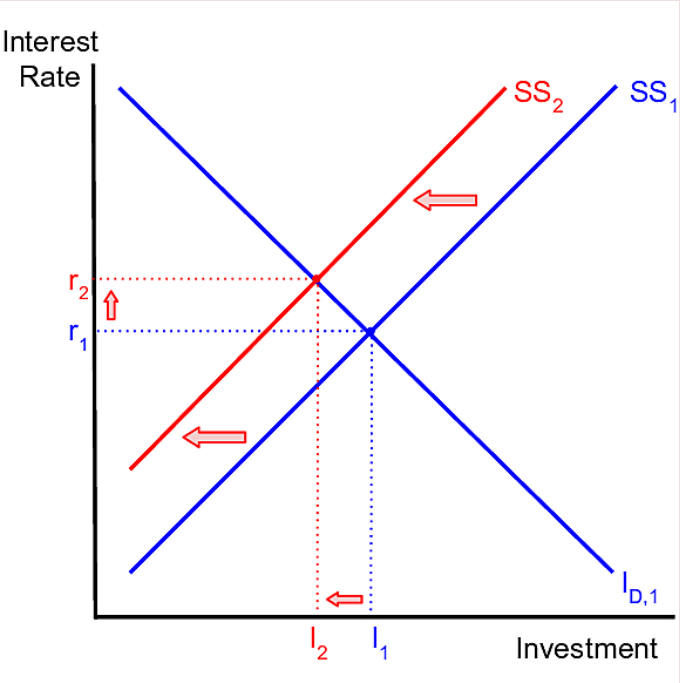


Productivity Curve

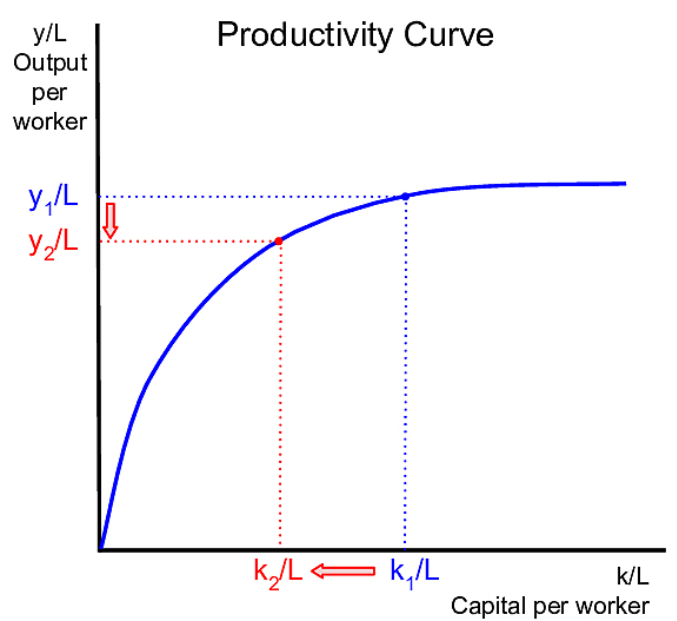


Increase in Government Budget Deficits

Loanable Funds Market

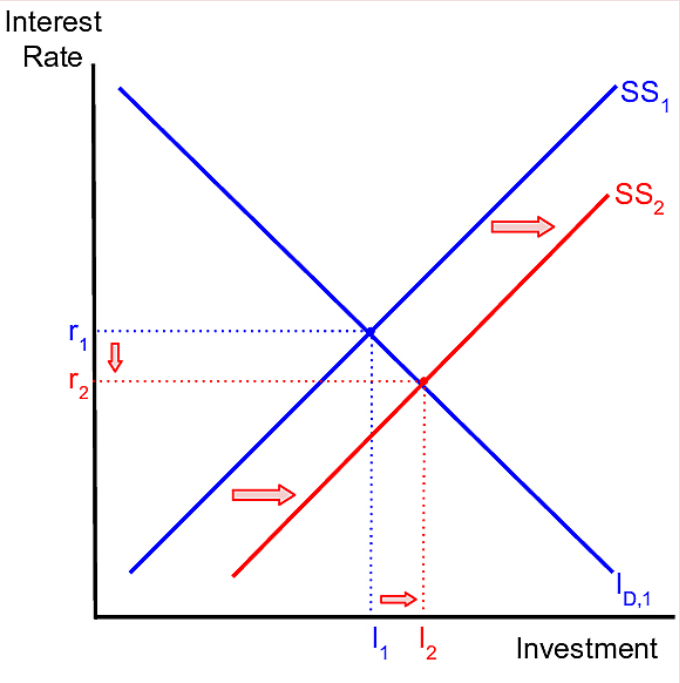


Productivity Curve

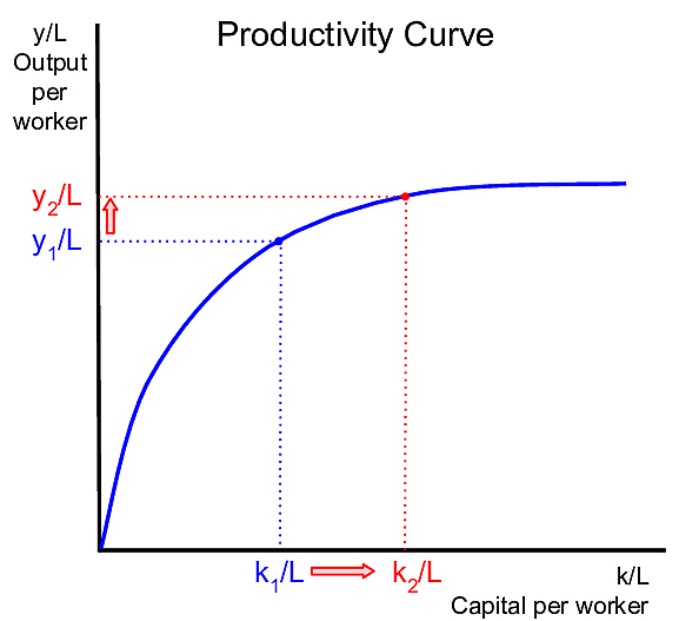


Increase in Trade Deficits

Loanable Funds Market

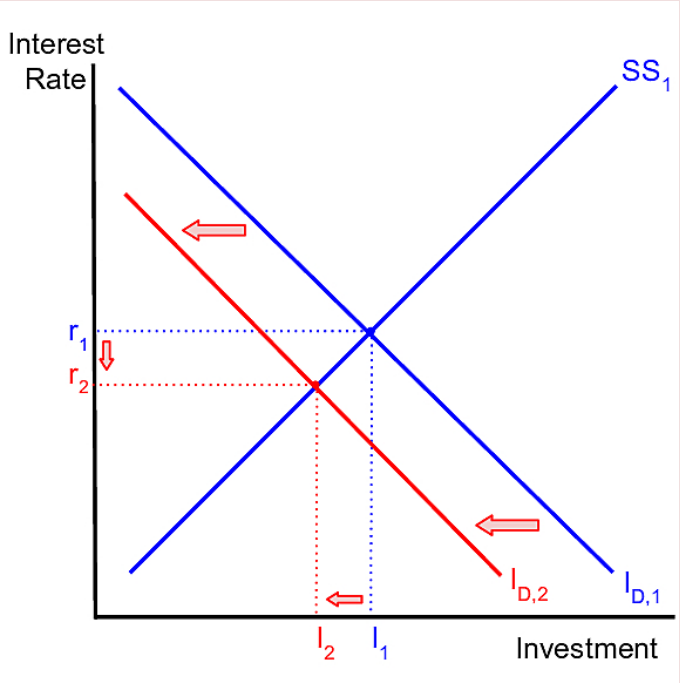


Productivity Curve

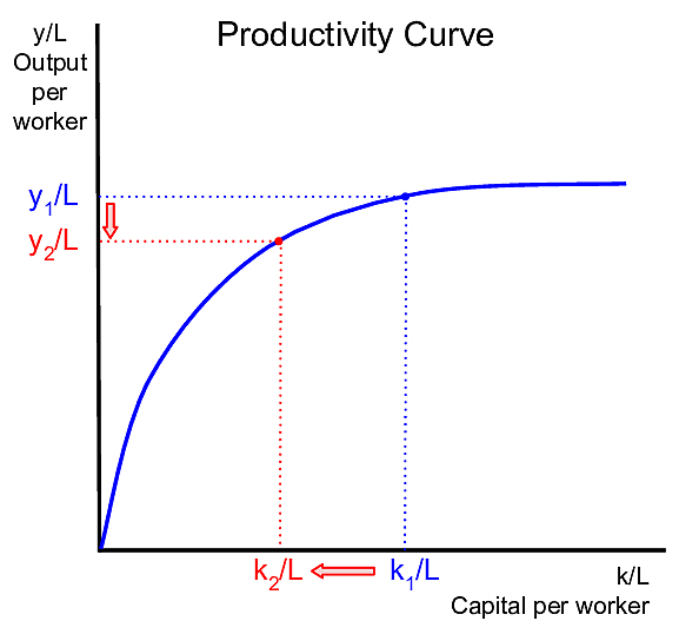


Improvement in Business Economic Outlook

Loanable Funds Market



Productivity Curve



Government Policies Encourage Economic Growth

Improve Human Capital

- Improve the quality of education
- Encourage higher educational attainment
- Encourage/subsidize education and training

Improve Public Health

- Public investment in meeting nutritional needs
- Access and affordability of preventative healthcare

More Government Policies Encourage Economic Growth

Stimulate Investment and Savings

- Global companies create operations in new countries, invest in capital
- Tax incentives for retirement accounts
- Sales taxes reduce consumption / increase saving

Stimulate research and development

- R & D is inherently risky - Protect return on R & D with patents
- Encourage R&D with subsidies and research grants

Reading and Exercises

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