

# Economic Growth

ECO 120: Global Macroeconomics

# Goals

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- 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.\*

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# Reading and Exercises

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- Module 21 describes the productivity curve model
- Module 22 describes government policies that can promote economic growth
- **Canvas Quiz due Wednesday 11:59 PM.**  
Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
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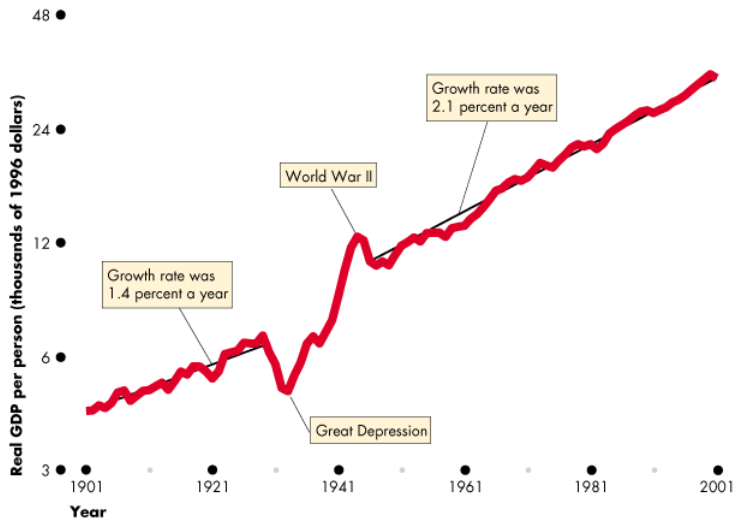
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# U.S. Trend



# Long-Term Real GDP Growth

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- 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 \$6,000 (using base year 2009)
- Real GDP per person in 2013 was approximately \$49,800 (base year 2009)
- Can you compute what GDP would be in 2013 if the average growth rate was always 1.4%?
  - Answer:  $\$6,000(1 + 0.014)^{113} = \$28,869.56$ .
- What if the average growth rate was always 2.1%?
  - Answer:  $\$6,000(1 + 0.021)^{113} = \$62,814.53$ .
- **Small differences in growth adds up to a lot!**

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# Economic Growth Facts Across Countries

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- 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.



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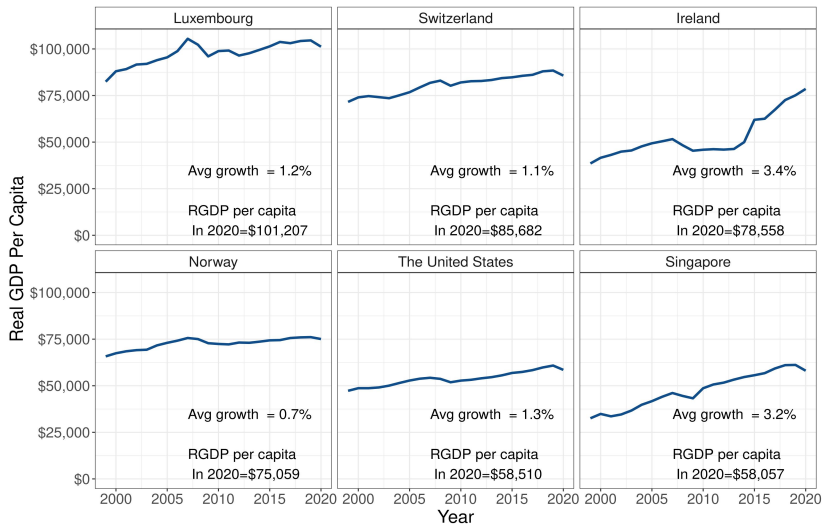
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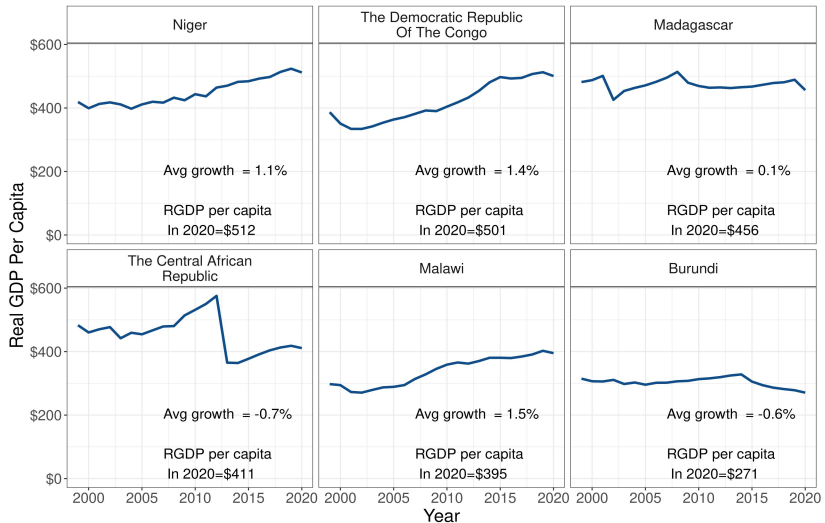
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# Richest Economies (Real GDP Per Capita in 2020)

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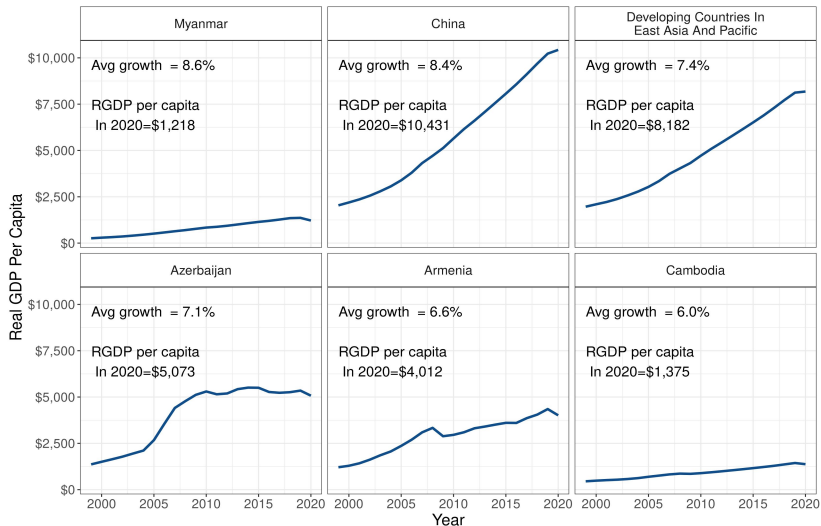


# Poorest Economies (Real GDP Per Capita in 2020) 7 / 28

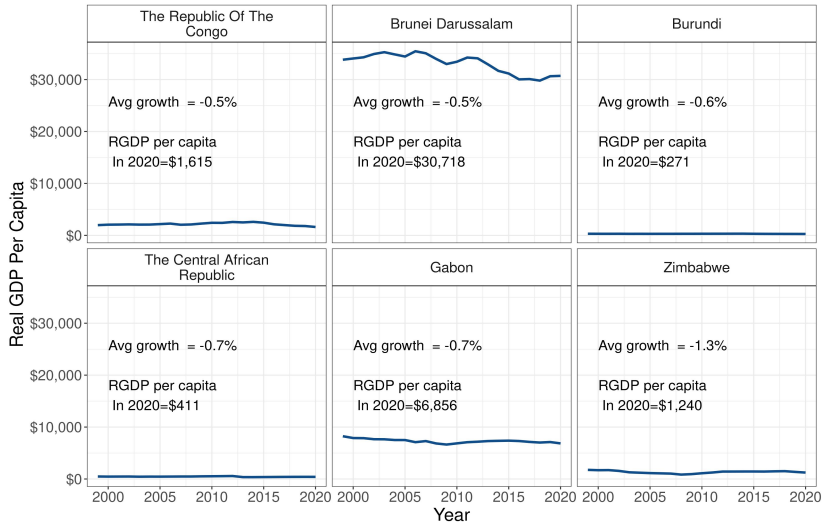


# Fastest Growing Economies (1999-2019)

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# Slowest Growing Economies (1999-2019)



# Growth Factors and Incentives

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## Saving and investment in new capital

- Savings is important for a sufficient equilibrium level of investment.
- What happens if increase savings supply?
- $\uparrow$  eqm investment  $\rightarrow$   $\uparrow$  capital stock
- $\uparrow$  capital stock  $\rightarrow$   $\uparrow$  production,  $\rightarrow$   $\uparrow$  marginal product of labor

## Prerequisites

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



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# Investment in Human Capital

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- **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
- Argued that human capital does 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.

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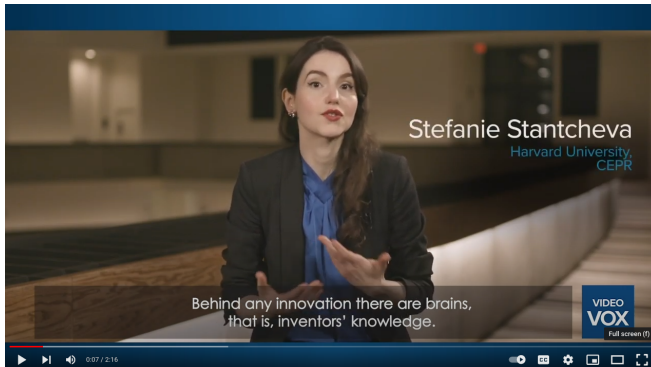
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# Scholar Spotlight: Stefanie Stantcheva

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- **Dancing with the Stars: Innovation through Interactions**  
Under consideration at *Econometrica*, 2018.
- Knowledgeable workers **makes it easier for peers and co-workers to acquire knowledge.**



Stefanie Stantcheva  
Harvard University,  
CEPR

Behind any innovation there are brains,  
that is, inventors' knowledge.

<https://www.youtube.com/watch?v=U5wfxjmlwtE>

# Discovery of new technologies

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- 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

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- **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.

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- But at a decreasing rate. Due to *diminishing marginal product of capital*.

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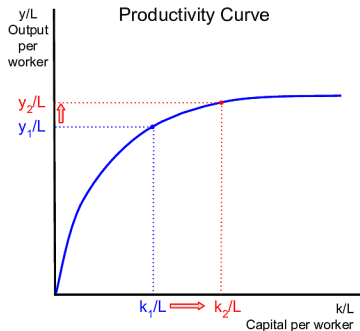
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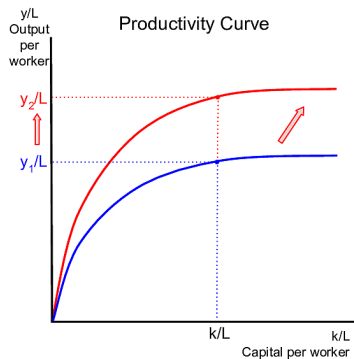
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# How Labor Productivity Grows

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Effect of an Increase in  
Capital Stock



Effect of *Anything Else*  
Increasing Production  
Possibilities Per Person

# Labor productivity curve

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- 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.



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# Catch-Up Theory

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- 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

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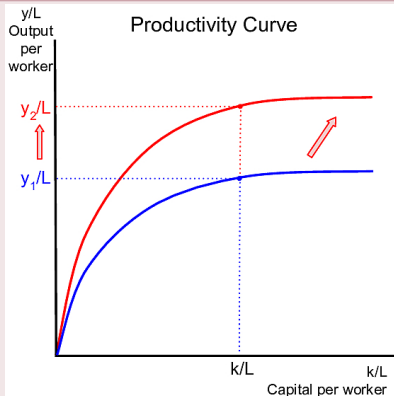
# Improvement In Human Capital

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## 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



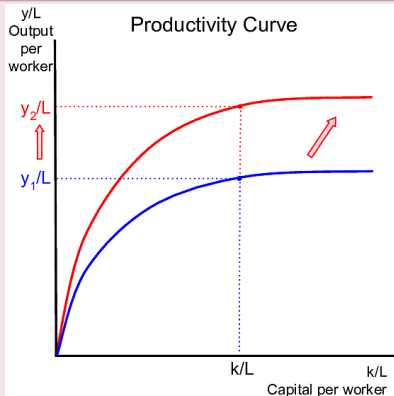
# Improvement In Human Capital

19 / 28

## 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

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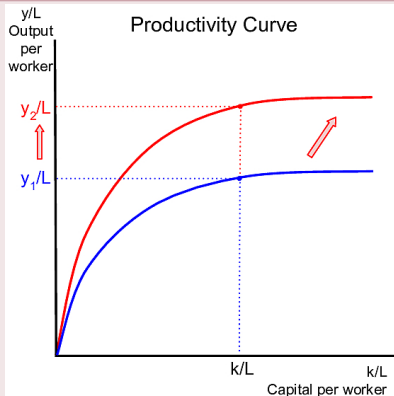
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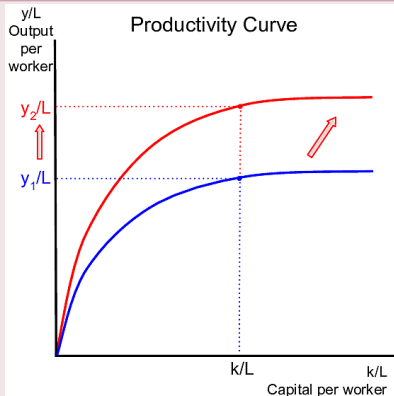
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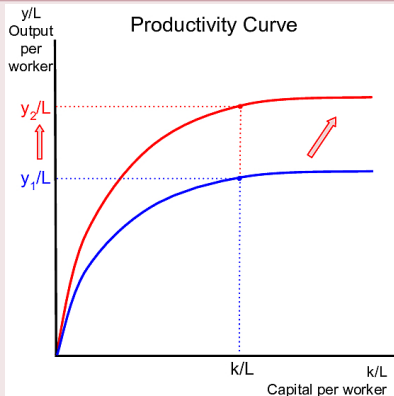
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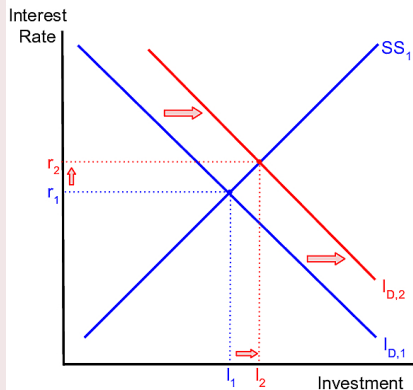
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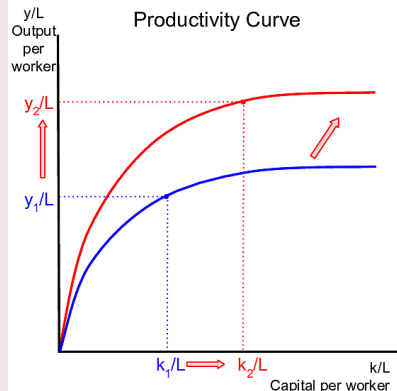
# Improvement In Technology

An improvement in technology, increases productivity and increases investment demand

## Loanable Funds Market



## Productivity Curve



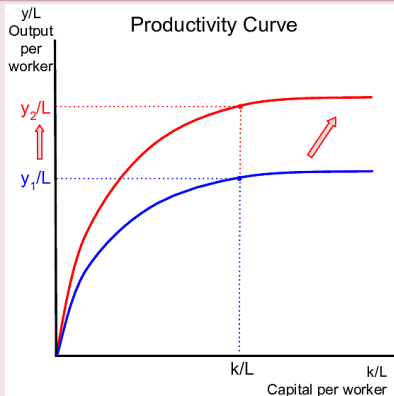
# Improvement In Public Health

21 / 28

## 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
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## Graphical Demonstration





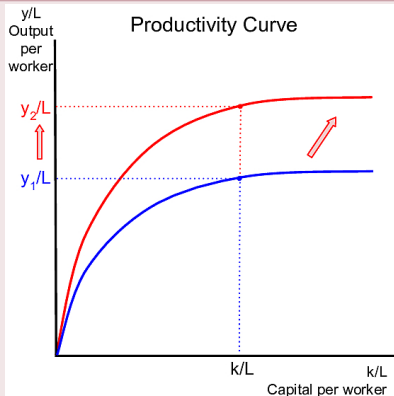
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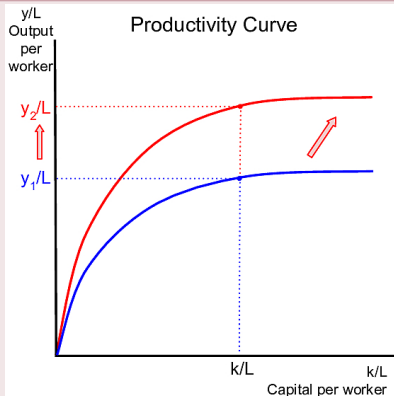
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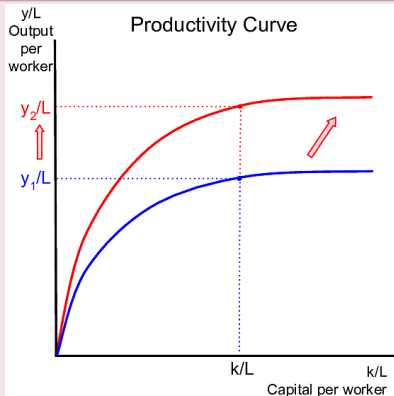
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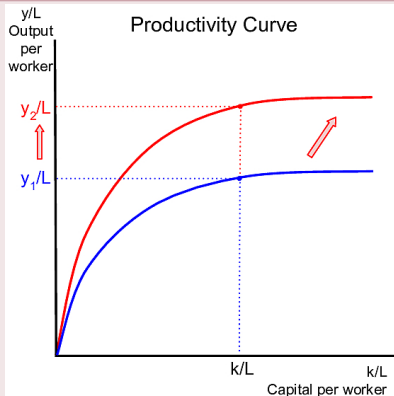
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## Graphical Demonstration



# Scholar Spotlight: Nabamita Dutta and Haley Maus 22/ 28

## 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



**Dr. Nabamita Dutta** (left)  
Professor, UW-La Crosse

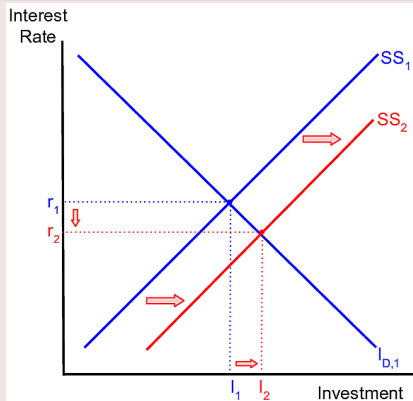


**Haley Maus** (right)  
Graduate of UW-La Crosse

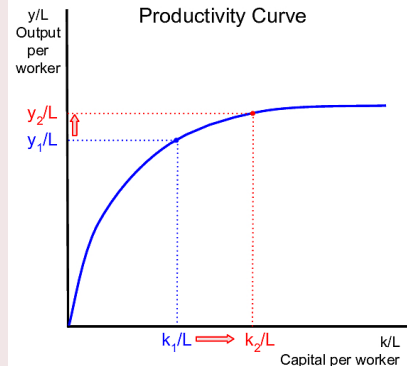
# Private Savings

An increase in private saving leads to an increase in saving supply

## Loanable Funds Market



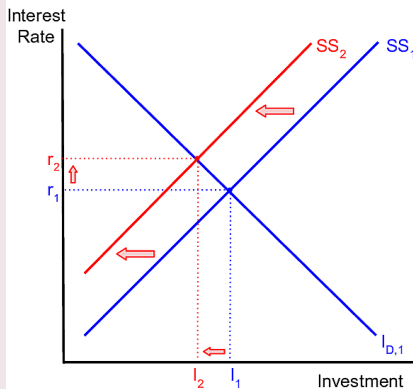
## Productivity Curve



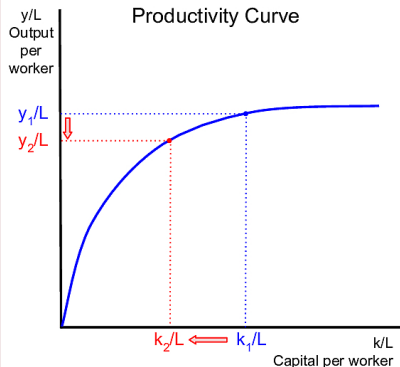
# Government Budget Deficits

An increase in government budget deficits leads to a decrease in saving supply

## Loanable Funds Market



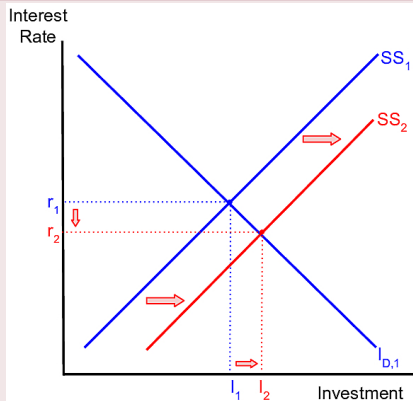
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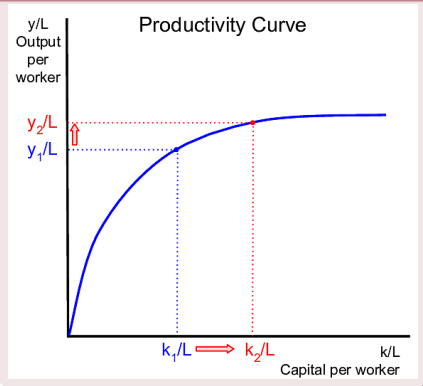
# Trade Deficits

An increase in trade deficits (M-X) leads to an increase in saving supply

## Loanable Funds Market



## Productivity Curve

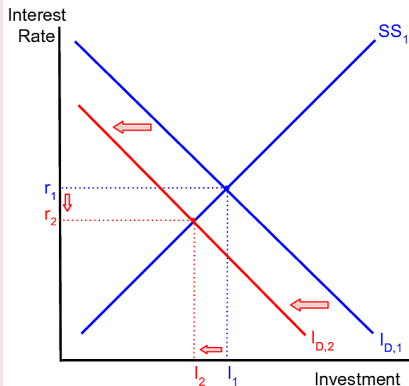




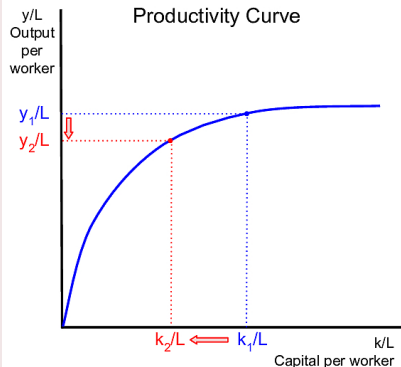
# Business Economic Outlook

A drop in business confidence leads to a decrease in investment demand

## Loanable Funds Market



## Productivity Curve



# Government Policies Encourage Economic Growth

27 / 28

## 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

## 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

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# Reading and Exercises

28 / 28

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- Module 21 describes the productivity curve model
- Module 22 describes government policies that can promote economic growth
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Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
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