Topic 4
Economic Growth

Agenda

- Modern Economic Growth

- Production Possibilities Frontier (PPF)

- What drives growth

Economic Growth

Growth can be tricky

- Which one of these demonstrates economic growth
  - NGDP increases from $2 trillion to $3 trillion
  - RGDP increases from $1.5 trillion to $2 trillion

Growth can be tricky

- Which one of these demonstrates economic growth
  - Depends on the GDP deflator
  - RGDP increases from $1.5 trillion to $2 trillion

Growth can be tricky

- Which one of these demonstrates economic growth
  - Depends on the GDP deflator
  - Real growth in aggregate, but what about per person?

Definitions

- Real GDP per capita: Real GDP per person

- Economic Growth: The increase in real GDP per capita **over time**

- Example:
  - RGDP: US: $14 trillion; China: $7 trillion
  - RGDP pc: US: $47k; China: $5k

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RGDP pc is not perfect

- Doesn't capture
  - Improved products and services
  - Added leisure
  - Other impacts (environment and stress)
  - What about distribution of income?

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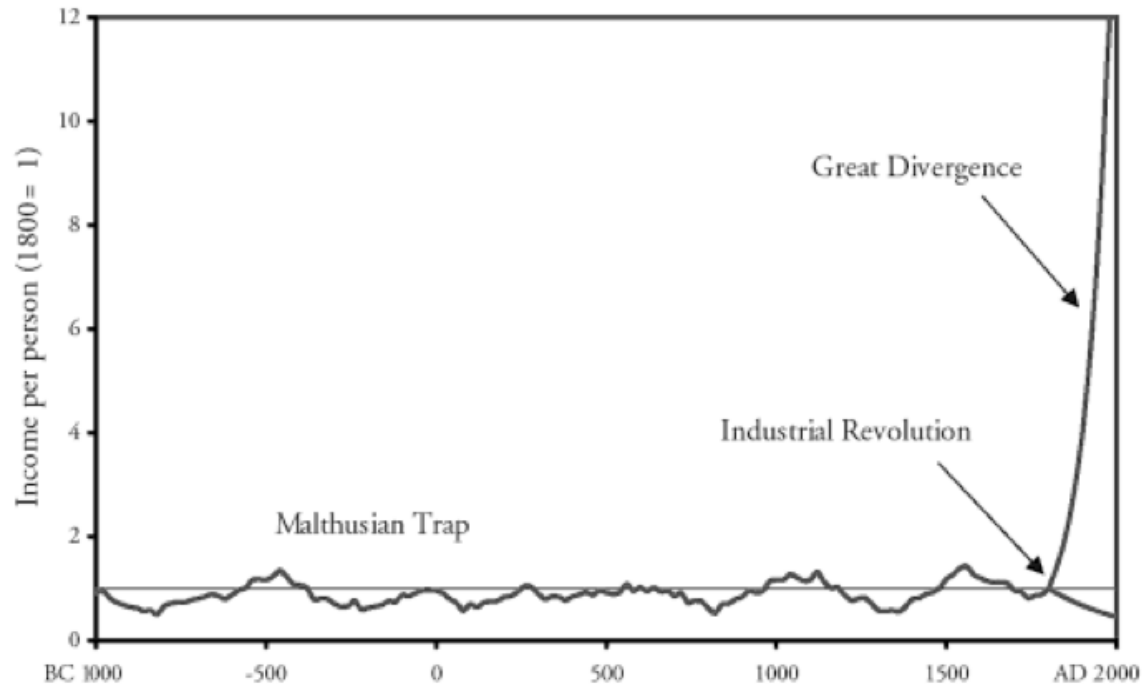
RGDP increased, but are we better off?

Figure 1.1 World economic history in one picture. Incomes rose sharply in many countries after 1800 but declined in others.

Economic Growth | PPF | What drives growth

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Modern Economic Growth

- Malthusian Trap: Any technology improvements will result in population increases resulting in everyone still living at a subsistence level

- Definition: Modern Economic Growth is characterized by sustained and ongoing increases in RGDP pc

- Notes about growth in the data:
  - RGDP pc doesn't capture increases in variety of consumption, lifespan, etc.
  - We are even better off than graph indicates

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But is everyone better off?

- Gapminder – [Great Divergence, Growth Miracles, Growth Disasters](#)

- How do countries' GDP vary in 1800? How about in 2010?

- What happened with South Korea between 1950 and 2000?

- What happened to the Democratic Republic of Congo?

How can we encourage modern growth?

- How do we measure growth?
  - Increase in real GDP pc

- In equilibrium, this is?
  - Supply and Demand (per capita)

- What determines supply?
  - Production factors and technology

- What determines demand?
  - Consumption, G, NX, I

So, How do we increase all of these?

Increasing Supply

- Production Factors
  - Increase the quantity and quality of natural resources per worker (i.e. oil)
  - Increase in the human capital per worker (i.e. skills)
  - Increase in the supply of capital goods per worker
- Production Technology
  - Improvement in technology
  - Productive efficiency (using resources effectively)

But wait. These ideas look familiar

- Changing these components will also increase what?

- So modern growth is simply a per capita increase in?
  - LRAS

Increase Demand

- Through increased consumption
- Increased trade (and net exports)

Sample problem: Calculating future GDP

- US GDP pc = $50,000

- GDP growth ~3%.

- What is RGDP pc next year?
  - (1+0.03)*50000 = 51500

- In two years?
  - 1.03*1.03*50000 = (1.03)*51500 = 53045

In general

- Current GDP pc = y
- GDP growth = g
- GDP pc in "n" years

$$newGDP = (1+g)\uparrow n * y$$

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What exactly is efficient production?

How do we reconcile LRAS (which is a single number) with how much the economy can actually produce?

The Production Possibilities Frontier (PPF)

- Start with an example
- 300 machines to make t-shirts
- Production: 200 t-shirts
- 100 workers
- Each works 2hrs/day

- Capital/worker
  – Total capital / #workers
  – 300/100 = 3 machines/worker
- Labour productivity per worker
  – Total output / total hours
  – 200/200 = 1 t-shirt per labour hour

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But are these values efficient? i.e. can we do better?

- Suppose this is the best that we can do (i.e. **all** resources are being used efficiently).
  - Can we do better?

- What if we aren't making optimal use of **all** resources. Can we do better?
  - Why might we not be using all resources efficiently?
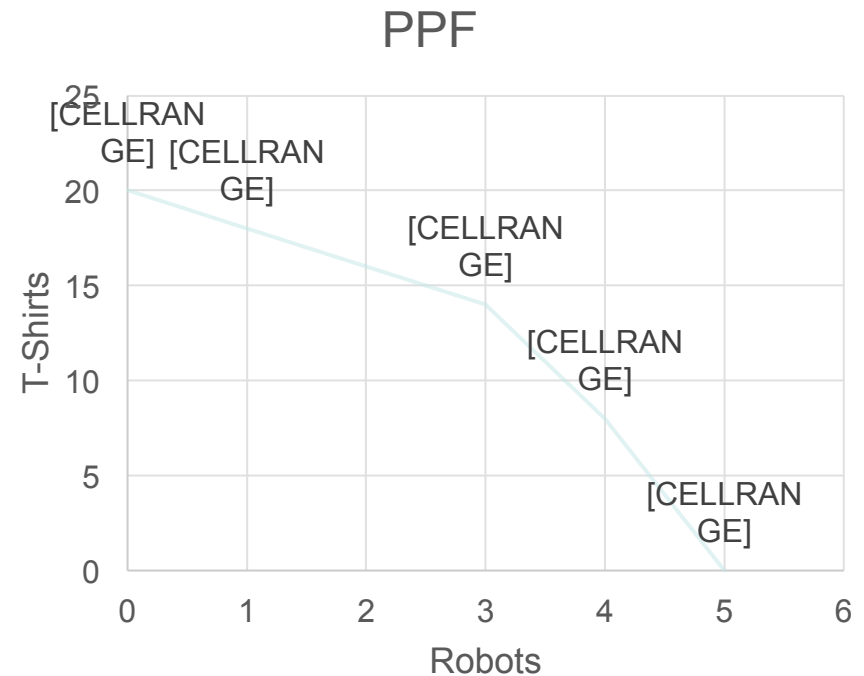
We need a way to describe this idea of efficient resource use

Data

The Production Possibilities Frontier

Plan	Robots	T-Shirts
A	0	20
B	1	18
C	3	14
D	4	8
E	5	0

PPF

Economic Growth · PPF · What drives growth

Note basic assumptions about PPF

- Full employment of resources
- Fixed resources
- Fixed technology

Question: These should look familiar. They are also the assumptions for what?

What might cause the PPF to shift?
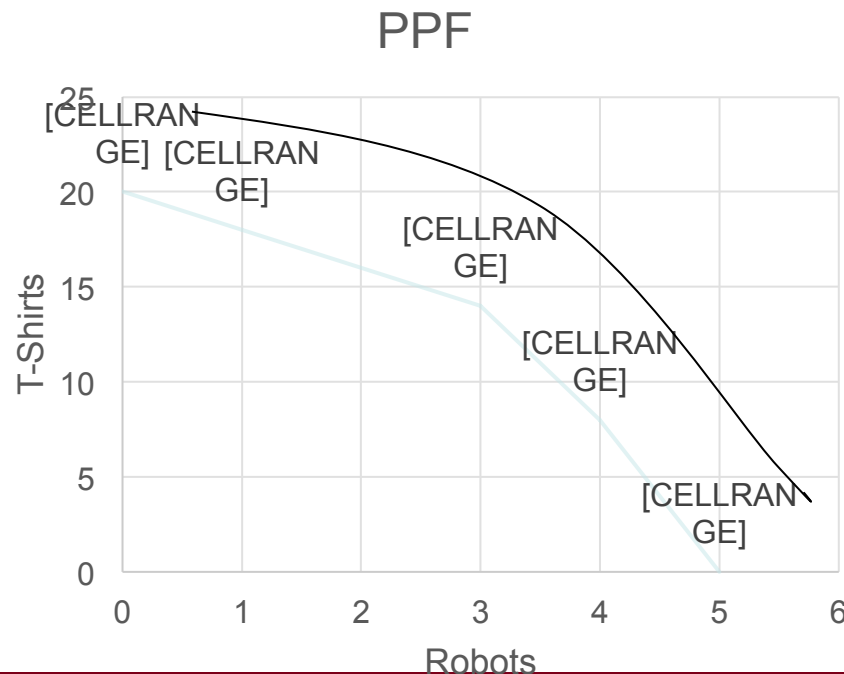
- Increase in production capabilities
  - Given previous question, what can cause this?

PPF

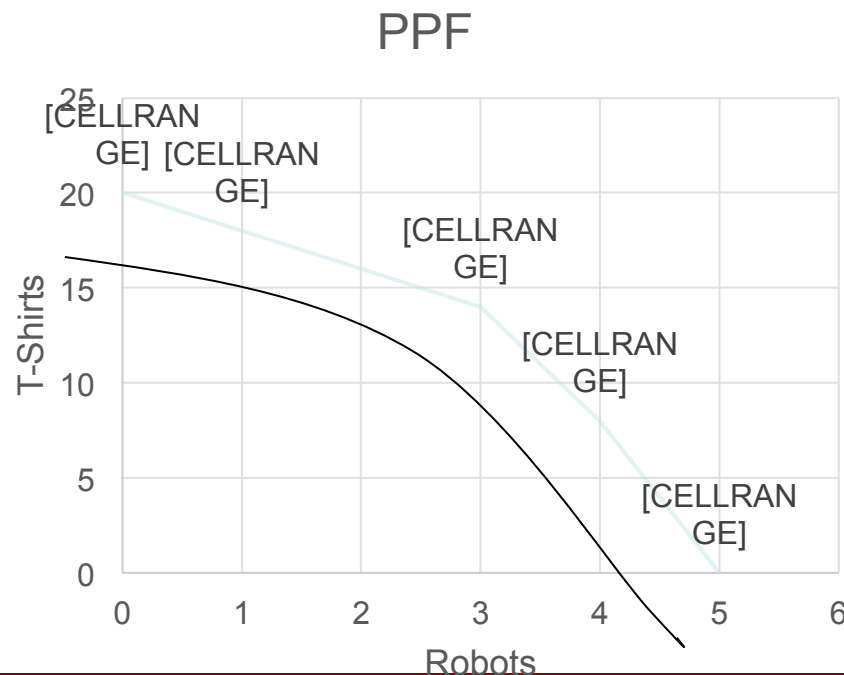# What might cause the PPF to shift?

- ## Decrease in production capabilities
  - Given previous question, what can cause this?

PPF

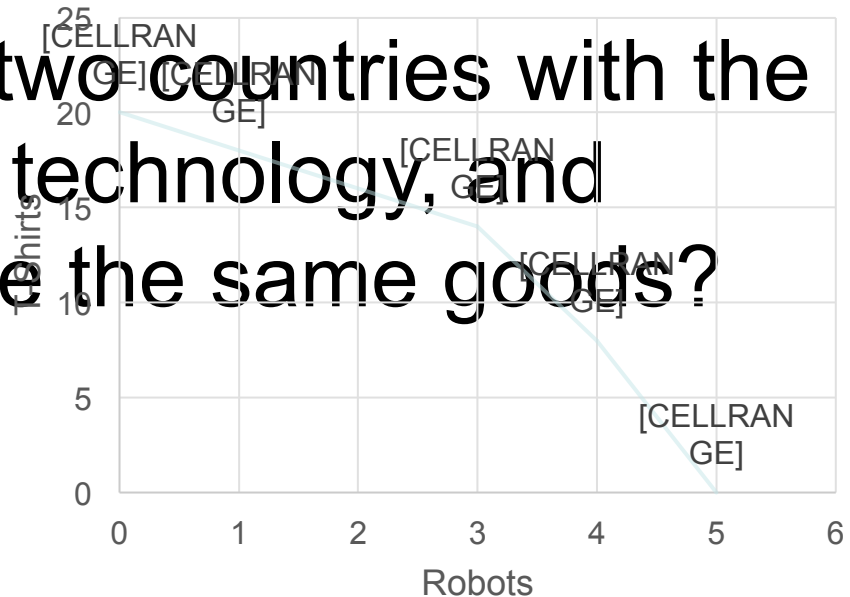# Is there an "ideal" production level (given assumptions)?

- Anything on the PPF is "efficient". Where a country chooses to produce depends on the preferences of individuals

- Question: Would two countries with the same population, technology, and resources produce the same goods?
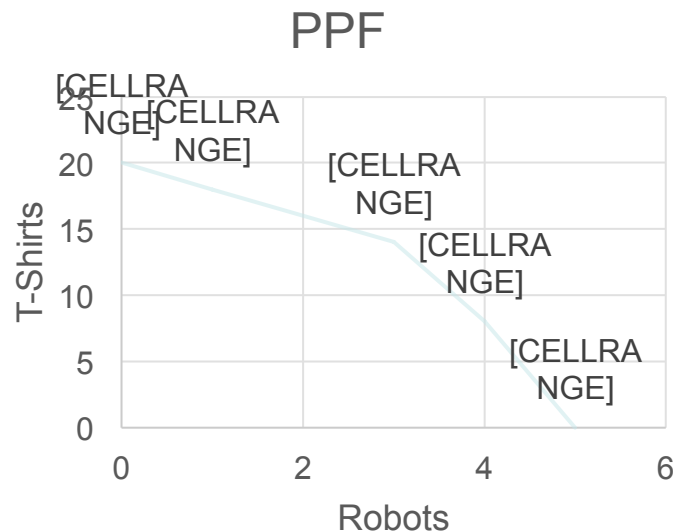
PPF

25
[CELLRANGE] [CELLRANGE]
20
[CELLRANGE]
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15
[CELLRANGE]
T-Shirts
10
[CELLRANGE]

5
[CELLRANGE]

0
0   1   2   3   4   5   6
Robots

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What if we aren't producing efficiently?

- Where would we be producing if we had 10% unemployment?

PPF

T-Shirts vs Robots
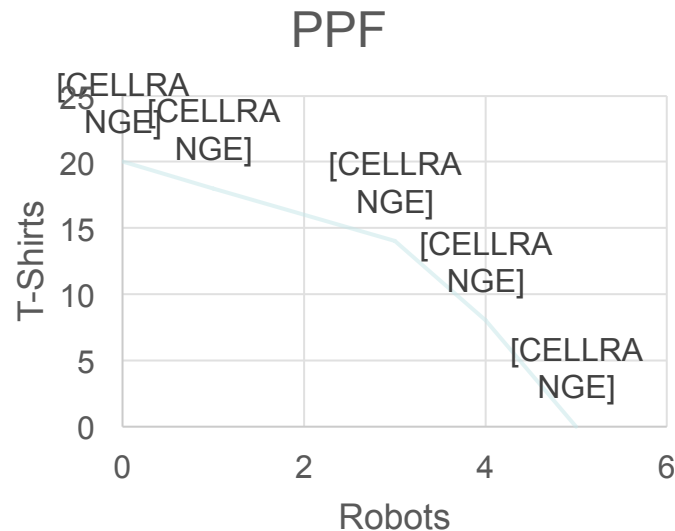
What if we aren't producing efficiently?

- Can we produce above the PPF?

PPF

Which factors drive growth?

And how important are they relative to each other?

We know that the PPF can shift

- In practice, what drives country growth?

	Capital	Labour	Technology
South Korea	51%	30%	19%
Taiwan	48%	27%	25%
Singapore	54%	26%	20%
USA	37.5%	22.5%	40%

Productivity growth in East Asian Tigers ('60-'94) versus USA ('50-'05)

- Why the difference?

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Key Ideas and Things To Think About

Note: This is NOT a study guide – i.e. do not limit yourself to these items when studying

Key Ideas

- What economic growth is and how to measure it
- What characterizes Modern Economic Growth
- What was the Great Divergence?
- Issues with measurements

Key Ideas

- Calculating GDP growth
- What drives modern growth
- The production possibilities frontier
- What causes shifts in the PPF
- How important are various factors to growth?

Things To Think About

- What can we say about economic growth if all we know is NGDP has decreased from $3 trillion to $2.5 trillion

- How do we measure inequality?
  - [Inequality in wages](#)
  - [Inequality in opportunity](#)

Things to Think About

- Do we actually every produce at the PPF?

- Where is the LR equilibrium on the PPF?

- Do you think 8% RGDP growth is sustainable forever? Why or why not? Give an example.

Things to think about

- Consider Ethiopia. If it wanted to grow, on which factor might it be best to focus (of the three we discussed). The least.