LECTURE 3
COMPARATIVE ADVANTAGE AND THE GAINS FROM SPECIALIZATION
January 26, 2016

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LECTURE 3

Comparative Advantage and the Gains from Specialization

January 26, 2016
Announcements

• Problem Set 1 is being handed out.

• It is due at the beginning of lecture next Tuesday.

• You may work together on the problems, but:
  • We strongly recommend working on the problems by yourself first.
  • Your answers must be handwritten and in your own words.
  • You must list anyone you worked with at the start of your answers.

• Optional problem set work session: Friday, 4:40–6:30, in 639 Evans and 648 Evans.
I. The Key Role of Differences in Relative Ability
Example #1: Specialization within a Household

• Two activities: dishwashing and painting.

• Abilities:
  • Christina: Wash 16 dishes per hour, or paint 4 walls per hour.
  • David: Wash 20 dishes per hour, or paint 2 walls per hour.

• There are 3 walls that need painting (and many dirty dishes).
Outcomes If We Allocate Our Time the Same Way

- Christina: Spends 1/2 hour painting and gets 2 walls done; spends 1/2 hour washing dishes and gets 8 dishes done.
- David: Spends 1/2 hour painting and gets 1 wall done; spends 1/2 hour washing dishes and gets 10 dishes done.
- Total: 3 walls, 18 dishes.
Outcomes If We Specialize According to What We’re Each Best At

• Christina: Spends 3/4 hour painting and gets all 3 walls done; spends 1/4 washing dishes and gets 4 dishes done.

• David: Spends 1 hour washing dishes and gets 20 dishes done.

• Total: 3 walls, 24 dishes.
Opportunity Costs

• The opportunity cost of Christina painting 1 wall is 4 clean dishes.

• The opportunity cost of David painting 1 wall is 10 clean dishes.

• Christina is the low opportunity cost provider of painting.

• Similarly, David is the low opportunity cost provider of dishwashing.
II. **Specialization and the Curvature of the Production Possibilities Curve**
Example #2: Specialization in a Two-Person Economy

- Two goods: fish and coconuts.
- Abilities:
  - Robinson: 1 fish/hour, or 1 coconut/hour.
  - Friday: 8 fish/hour, or 2 coconuts/hour.
- Each of them works 6 hours a day.
Robinson’s Production Possibilities Curve

Fish

Coconuts

6 0 0 PPC
Friday’s Production Possibilities Curve

Fish

48

PPC

0

12

Coconuts
Opportunity Costs When Robinson and Friday Allocate Their Time the Same Way (No Specialization)

• In an hour, they could catch 9 fish (1 from Robinson and 8 from Friday).

• Or they could gather 3 coconuts (1 from Robinson and 2 from Friday).

• So, they trade off 9 fish for 3 coconuts.

• The opportunity cost of 1 coconut is 3 fish.
Combined PPC with No Specialization

Fish

54

PPC

Slope = -3

0  18

Coconuts
Opportunity Costs with Specialization

• In an hour, Robinson could catch 1 fish or gather 1 coconut.
  • So, the opportunity cost of having Robinson gather 1 coconut is 1 fish.
• In an hour, Friday could catch 8 fish or gather 2 coconut.
  • So, the opportunity cost of having Friday gather 1 coconut is 4 fish.
• Robinson is the low opportunity cost provider of coconuts.
Combined PPC with Specialization

Fish

Slope = $-1$

Slope = $-4$

Coconuts
The Gains from Specialization

PPP with specialization

PPP without specialization

Coconuts

Fish

0 6 18

0 48 54
Comparative Advantage

- In both examples, what determined how people should specialize was opportunity costs:
  - It makes sense for the person with the lowest opportunity cost of doing something to be the first one to engage in that activity.

- Another term for this idea: Comparative advantage.

- Someone has a comparative advantage in an activity relative to another person if they have the lower opportunity cost of engaging in that activity.
Comparative Advantage Is Inherently a Relative Concept

• When there are only two activities, if someone has a comparative advantage at one activity, they necessarily have a comparative disadvantage at the other activity.
Will Both Robinson and Friday Benefit?

• Yes! As long as there is no coercion, if two parties choose to trade, both must be benefitting.
Messages

• The PPC with specialization lies outside the PPC without specialization.

• Specialization causes the PPC to be bowed out.
The PPC in an Economy with Many Workers with a Wide Range of Relative Abilities
III. COMPARATIVE ADVANTAGE AND INTERNATIONAL TRADE
Example #3: Trade between Two Countries

- Two countries: the United States and Indonesia.
- Two goods: clothes and pharmaceutical drugs.
- Productivities (per day):
  - A typical worker in the U.S. can produce 10 shirts or 10 bottles of drugs.
  - A typical worker in Indonesia can produce 4 shirts or 2 bottles of drugs.
PPCs (per Worker) When There Is No Trade

United States

Indonesia

Drugs

Shirts

United States

Indonesia

$\text{PPC}_{\text{US}}$

$\text{PPC}_{\text{INDONESIA}}$
Opportunity Costs

- The opportunity cost to the U.S. of producing 1 shirt is 1 bottle of drugs.
- The opportunity cost to the U.S. of producing 1 bottle of drugs is 1 shirt.
- The opportunity cost to Indonesia of producing 1 shirt is 1/2 bottle of drugs.
- The opportunity cost to Indonesia of producing 1 bottle of drugs is 2 shirts.
Comparative Advantage

• The U.S. has the lower opportunity cost of producing drugs.

• Indonesia has the lower opportunity cost of producing shirts.

• So, the U.S. has a comparative advantage in producing drugs; Indonesia has a comparative advantage in producing shirts.
The Benefits from Trade

• We know (from our two previous examples) that specialization according to comparative advantage will allow the two countries to produce more shirts and drugs than they could without specialization.

  • That is, the PPC with specialization lies outside the PPC for the two countries when they allocate their effort the same way.

• But: Will both countries benefit, or will one benefit and one be harmed?
The Terms on Which the Two Countries Trade

• Suppose the U.S. got less than 1 shirt for each bottle of drugs it exported to Indonesia?
  • Then the cost of getting an Indonesian-made shirt would be more than 1 bottle of drugs.
  • No one in the U.S. would trade U.S.-made drugs for Indonesian-made shirts.

• Suppose Indonesia received less than ½ bottle of drugs for each shirt?
  • No one in Indonesia would trade Indonesian-made shirts for U.S.-made drugs.
The Terms on Which the Two Countries Trade Drugs and Shirts

• The terms of trade must be between 1 and 2 shirts for each bottle of drugs.
  
  • Equivalently, they must be between 1/2 and 1 bottle of drugs for each shirt.

• For concreteness, let’s suppose that it’s 1½ shirts for each bottle of drugs.
  
  • Or equivalently, that it’s 2/3 of a bottle of drugs for each shirt.
The Consumption Possibilities Curve

• Recall: The production possibilities curve (PPC) shows the combinations of goods that are just attainable through production when all of the economy’s available resources are being used.

• The consumption possibilities curve (CPC) shows the combinations of goods that are just attainable through production and trade (again, when all of the economy’s available resources are being used).
The PPC and the CPC with Trade for the U.S.

Drugs

Shirts

Slope = $-\frac{2}{3}$

Slope = $-1$

Slope = $-2/3$
The PPC and the CPC with Trade for Indonesia

Drugs

Slopes:
- CPC: Slope = $-\frac{1}{2}$
- PPC: Slope = $-\frac{2}{3}$
International Trade and Technological Progress

- In terms of its impact on what a country can obtain, opening up to international trade is just like technological progress.
Winners and Losers from International Trade

• In our example, all workers in both countries benefit from trade – there are no losers.

• But suppose, realistically, that workers within each country differ in their relative abilities.

• Specifically, suppose a few U.S. workers are good at shirt production and bad at drug production.

• Do they benefit from trade? (And similarly, what happens if a few workers in Indonesia are bad at shirt production and good at drug production?)
Why Isn’t International Trade More Popular?

• The usual answer: Because it hurts some people.
• Is there more to it than that?
Note: A more-peaked, less-spread-out distribution corresponds to less inequality. A distribution farther to the right corresponds to higher average income. Thus, the chart shows that average world incomes have risen and that world inequality has fallen.

## Most and Least Free-Trade Oriented Policies

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<th>Highest</th>
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<td>North Korea</td>
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<td>Canada</td>
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**Source:** Wall Street Journal and Heritage Foundation, “Trade Freedom” index.
Some Variants You Could Try

- Derive the PPC in Example 1 with and without specialization.
- Derive the PPC in Example 1 with specialization along traditional gender lines.
- Redo Example 1 for a case where Christina has an absolute advantage in both activities but still has a comparative advantage in painting.
- Redo Example 2 with Friday twice as productive as Robinson in both activities.
- In Example 3, find the combined PPC of an American worker and an Indonesian worker, both without and with specialization.
- Think of more!