

# International Trade: Costs and Benefits

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# Issues

- ▶ Why do countries trade?
- ▶ Is trade beneficial?

## Concerns about trade

### Imports cost jobs

*"It requires about 2.5 million full-time workers to produce \$100 billion worth of exportable goods and services. Since the rest of the world has been running a \$100 billion trade surplus with the United States, at least 2.5 million workers in the rest of the world owe their jobs to that surplus." – Lester Thurow*

### Trade reduces wages

*"Companies that produce goods in foreign countries to take advantage of cheap labor should not be permitted to **dictate the wages** paid to American workers." – Philadelphia Inquirer*

### Trade costs "good" manufacturing jobs

# Competitiveness

How can we compete with low wage countries?

*Each nation is “like a big corporation competing in the global marketplace” - President Clinton*

Competitiveness is a major concern when it comes to

- ▶ regulation
- ▶ wage setting
- ▶ taxes
- ▶ trade restrictions

## Concerns about trade

Most of the above concerns are (largely) based on a misunderstanding.

There are valid concerns about trade.

But they are mostly about **redistribution** within the U.S.

# Comparative Advantage

# Comparative Advantage

The key benefit of trade:

Countries can **specialize** in what they are particularly good at.

A major insight of economics:

International trade is determined by comparative advantage.  
(So is within country trade)

# Absolute advantage

Simple example:

- ▶ there are 2 good (Apples, Computers)
- ▶ there 2 countries (North, South).
- ▶ productivities are  $z_{i,c}$
- ▶ e.g.: one unit of labor produces  $z_{A,N}$  Apples in North.

## Definition

N has an absolute advantage in A, if it has higher productivity:

$$z_{A,N} > z_{A,S}.$$



# Absolute advantage

Rich have an absolute advantage in most goods.

- ▶ Except for highly localized goods (bananas), rich countries are highly productive at making just about anything.

This is where the (poor country's) concern about competitiveness comes from.

- ▶ How can we compete with the U.S., if our productivity is so much lower?

## Fact

*Absolute advantage is irrelevant for international trade.*

# Comparative advantage

## Definition

N has a comparative advantage in A, if it has higher relative productivity (lower relative unit costs):

$$\frac{z_{A,N}}{z_{C,N}} > \frac{z_{A,S}}{z_{C,S}} \quad (1)$$

The basic idea:

Should Tiger Woods cut his own grass, do his own taxes, drive his own car ...?

## Comparative advantage example

Productivities:

	North	South
Apples	10	2
Computers	10	1

North has an absolute advantage in both goods:  $10 > 2$  and  $10 > 1$ .

South has a comparative advantage in Apples:  $\frac{2}{1} < \frac{10}{10}$ .

Looking ahead: South will (successfully) export Apples to North.

## Trade with production – Example

- ▶ 2 countries
- ▶ 2 goods
- ▶ Households spend half of their incomes on each good.
- ▶ North is more productive in all goods (**absolute advantage**).
- ▶ The point: there are still gains from trade for both countries.

## Trade with production

	North	South
Labor force	100	400
Productivity: apples / worker	160	100
Productivity: computers / worker	16	2

Absolute advantage:

Labor productivity is higher in the North for all goods.

Comparative advantage:

- ▶  $\frac{160}{10} < \frac{100}{2}$
- ▶ South has comparative advantage in Apples.

# Popular concerns about trade

- ▶ South:
  - ▶ can we compete with the productive North?
  - ▶ We need protection.
- ▶ North:
  - ▶ can we compete with the low wage South?
  - ▶ It will drive down our wages.

The poin we will make:

## Key point

Countries can always compete with each other.  
Competitiveness applies to firms, but not to countries.

# Autarky

Let's solve for the equilibrium without trade (autarky).

Notation:

- ▶ price of apples = 1 (why can we do this?)
- ▶ price of computers =  $p$ .
- ▶ wage rate  $w$ .
- ▶ all differ across countries

**Demand functions:**

Everyone spends half of their income of each good:

$$a = 0.5w$$

$$pc = 0.5w$$

- ▶ This is for analytical simplicity only.

## Autarky wages

Workers are paid their marginal products in both sectors

North:

- ▶ producing apples (the numeraire):  $w = 160[\text{apples}] = 160$
- ▶ producing computers:  $w = 16[\text{computers}] = 16p$
- ▶ mobile labor:  $160 = 16p \implies p = 10[\text{apples/computer}]$

South:

- ▶ producing apples:  $w = 100$
- ▶ producing computers:  $w = 2p$
- ▶  $p = 50[\text{apples/computer}]$

No surprise: computers are expensive where they are difficult to make.



# Employment and output

How is labor allocated across sectors?

That's determined by the demand for goods.

Assumption: half of income ( $0.5w$ ) is spent on each good

▶  $a = pc = 0.5w$

The value of output equals factor costs

Apples:

▶ labor is the only input; cost  $wL_a$

▶ demand:  $0.5wL$

Half of employment is in apples, half in computers

## Autarky summary

	North	South	Note
Wage	160	100	$w = z_A$
Price of computers	10	50	$p = z_A/z_C$
Consumption: A	80	50	$0.5w$
Consumption: C	8	1	$0.5w/p$
Fraction working in A sector	50%	50%	cost = revenue
Fraction working in C sector	50%	50%	
Apple output	8,000	20,000	$z_A L_A$
Computer output	800	400	$z_C L_C$

Note: all prices are in apples (the numeraire)

# Comparative Advantage

- ▶ North has higher labor productivity in both goods – **absolute advantage**.
- ▶ **Comparative advantage** looks at relative labor productivities.
- ▶ South: Productivity apples / computers =  $100/2 = 50$
- ▶ North: Productivity apples / computers =  $160/16 = 10$ .
- ▶ South has comparative advantage in apples.

## Comparative Advantage – Intuition

Think again about Tiger Woods's lawn...

What is the opportunity cost of a computer in North / South?

# Free trade

- ▶ Let's open up trade between North and South.
- ▶ It looks like we need money.
- ▶ How else to calculate the all important **exchange rate**?

## Free trade

- ▶ Who produces what?
- ▶ With free trade, each good costs the same in both countries.
  - ▶ Law of one price
- ▶ Normalize the price of apples to 1 again.
- ▶ It costs 10 to produce computers in the North, but 50 in the South.
- ▶ The price of computers must be between 10 and 50.

Let's try to find an equilibrium with  $10 < p < 50$  (strict inequalities)

## Free trade: South

Apple sector:

- ▶  $z_{A,S} = 100$
- ▶ price of apples = MC:  $1 = w_S/100$
- ▶ that pins down  $w_S = 100$  (for both sectors!)

Computer sector:

- ▶ price of home grown computers = MC:  $w_S/2 = 50 > p$

South cannot produce computers - it specializes in **apples**.

## Free trade: South

Let's compute prices and quantities produced.

- ▶ employment in apples (everyone):  $L_{A,S} = 400$
- ▶ apple production = income:  $100L_{A,S} = 40,000$
- ▶ consumption of apples: 20,000 (half of income)
- ▶ consumption of computers:  $20,000/p$ .

We don't know  $p$  yet.



## Free trade: North

Computer sector:

- ▶  $z_{C,N} = 16$
- ▶  $p = w_N/16$ .

The example is rigged so that the North only produces computers. In general, one country would produce both goods and the other would produce the good with comparative advantage.

## Free trade: North

### North:

- ▶ employment in computers: 100 (complete specialization)
- ▶ computer production:  $16L_c = 1600$
- ▶ income:  $1,600p$ .
- ▶ spending on apples:  $800p = 20,000$  (not eaten in South)
- ▶ this pins down  $p = 20,000/800 = 25$
- ▶ income:  $1,600p = 40,000$

## Free trade

	North	South
Wage	400	100
Price of computers	25	25
Consumption: apples	200	50
Consumption: computers	8	2
Fraction working in apple sector	0%	100%
Fraction working in computer sector	100%	0%
Apple output	0	40,000
Computer output	1,600	0

# Free trade

- ▶ Consumption of both goods rises in both countries (weakly).
- ▶ Welfare definitely improves.
- ▶ Real wages rise in both countries.
  - ▶ South:  $w = 1$  (apple), but  $w$  rises in terms of computers
  - ▶ North:  $w = 16p$  (computers), but  $w$  rises in terms of apples.

# Competitiveness

Both countries worry about competitiveness:

- ▶ North: Wages are too low in the South
- ▶ South: Productivity is too high in the North

Both are mistaken.

- ▶ Wages are low because productivity is low.
- ▶ This ensures that both countries are competitive in some goods.

## Productivity Growth in the South

	North	South	Note
Labor force	100	400	unchanged
Productivity: apples / worker	160	200	was 100
Productivity: computers / worker	16	4	was 2

We double productivity in the South.

## Productivity Growth in the South

Try an equilibrium where the North specializes in computers and the South in apples.

South:

North:

In both countries:  $C_a = 40,000$  and  $C_c = 800$ .

Welfare gains.

# Lessons

- ▶ Trade improves welfare:
  - ▶ allowing a country to borrow and save
  - ▶ allowing a country to specialize in highly productive goods
- ▶ The more different the countries, the more beneficial trade is.



# Lessons

- ▶ Both rich and poor countries benefit from trade.
  - ▶ Your wages are not set in China.
  - ▶ They are the marginal product of U.S. labor.
- ▶ Competitiveness is not an issue.
- ▶ One way of thinking about trade: a production technology.
  - ▶ make (U.S.) corn into (Japanese) cars.

## Opposition to Trade

# Why so much opposition to free trade?

If trade is so great, why is it not popular?

Trade debates are usually about **redistribution**, not about efficiency

- ▶ Workers in import competing industries lose their jobs (U.S. cars, European agriculture).
  - ▶ Displaced workers suffer permanent earnings losses (Autor, 2016)
- ▶ Trade can increase the skill premium / reduce demand for unskilled labor.
- ▶ Loss of high value added jobs
  - ▶ “Our standard of living can only rise if capital and labor increasingly flow to industries with high value-added per worker.” – Magaziner and Reich
- ▶ Trade policy as a lever for human rights or environmental concerns
  - ▶ E.g.: WTO/Seattle. MFN for China.

# Could trade lower a country's GDP?

One idea: **strategic sectors**

Imagine a world with 2 goods: apples and computers

- ▶ Apples are boring: grow trees and pick apples
- ▶ There is innovation in computers
- ▶ Innovators earn monopoly rents

If a country can specialize in computers, its GDP (growth) can rise

Key: **temporary** trade restrictions can **permanently** rearrange comparative advantage

Main motivation of industrial policies

# Summary

Trade increases the size of the pie through

- ▶ specialization (comparative advantage)
- ▶ scale effects

Competitiveness is not an issue at the country level.

Trade also redistributes the pie.

Losers are:

- ▶ those employed in import competing sectors (textiles, toys, ...)
- ▶ the unskilled

# Reading

Blanchard / Johnson, Macroeconomics, 6th ed., ch. 19-6

Additional reading:

- ▶ Jones, Macroeconomics, ch. 14.

Advanced reading:

- ▶ Coughlin (2002) nicely summarizes the benefits of free trade.
- ▶ Autor (2016) summaries the costs of trade as well.

# References I

- Autor, D. H. (2016): "International trade and U.S. worker welfare: understanding the costs and benefits," Washington Center for Equitable Growth.
- Coughlin, C. C. (2002): "The controversy over free trade: the gap between economists and the general public," *Federal Reserve Bank of St. Louis Review*, 84.