International Trade – week 13
March 29th

Readings:

Ray chapter 16

Outline

- International trading patterns

- Why do countries trade?
  - Comparative advantage
  - Sources of comparative advantage

World trading patterns

• Growth in world exports:

1960–68 7.3%

1968–73 9.7%

1973–80 3.3%

1980–85 2.3%

1985–90 4.5%

1990–03 6.0%

LDC export growth:
→ rapid in Asia
→ highly variable in Latin America
→ slow in Africa.

Annual average percentage growth of export in developing countries

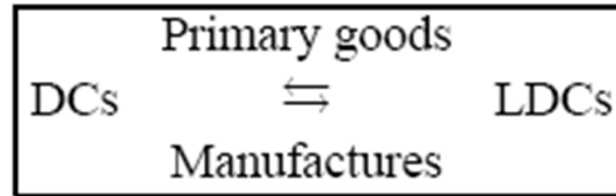| Region	1973-82	1983-86	1987-90
All LDCs	0.2	4.7	5.7
Africa	-2.4	4.4	2.3
Asia	9.2	10.5	11.8
Europe	4.3	5.1	-4.2
Middle East	-5.1	-1.1	5.4
Western Hemisphere	1.9	2.6	7.2
S. S. Africa	-1.0	1.7	1.0
Four Asian NIEs	13.3	13.4	11.4

World trading patterns

- The composition of exports from developing countries has significantly shifted toward manufactured exports.

- And the share of developed economies in manufactured export has declined.

Trends in the share of LDC manufactured exports

Region	1970	1975	1980	1985	1990
Share in world total					
All LDCs	7.0	7.4	10.0	13.3	17.1
Asia	3.7	4.7	7.2	9.5	14.1
Latin America	1.8	1.7	2.0	2.5	2.0
Africa	1.4	0.7	0.6	0.4	0.5
Share in LDC total					
Asia	52.4	62.8	71.8	71.2	82.7
Latin America	26.2	23.4	20.3	18.5	11.6
Africa	19.5	9.3	5.8	3.2	2.8

- Standard hypothesis of trade patterns:

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┌─────────────────────────────────┐
│         Primary goods           │
│ DCs          ⇆          LDCs    │
│         Manufactures            │
└─────────────────────────────────┘
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- LDCs export proportionately more primary goods
- BUT developed countries **do not import proportionately more primary** goods

- Why ?

→ large fraction of DC trade is within DCs and is in manufactured goods

Export shares (%) by product category from developed countries to other developed and developing countries

Product category	DCs	LDCs
Fuels, minerals, metals	8	5
Other primaries	12	11
Chemicals and related	39	35
Manufactures	41	48

- DCs export approximately the same composition of products to other DCc as they do to LDCs.

- The value of trade within the group of DCs has consistently exceeded the value of trade between developed and developing countries.

Why Do Countries Trade?
Comparative advantage

- Imagine there are only two countries in the world economy, North (N) and South (S).

- Only two commodities are produced: computers and rice.

- We suppose that labor is the only factor of production.

Comparative advantage

Labor required	One computer	One sack of rice
in N	10	15
in S	40	20

- The table describes how many units of labor are required to make one computer and one sack of rice.

- S is more inefficient (relative to N) in the production of computers as well as rice, yet we are going to show that the countries will prefer to trade with each other.

- Both N and S are blessed with a total of 600 units of labor

Production possiblity frontiers

Country North

rice

40

60 computers

Country South

rice

30

15 computers

11
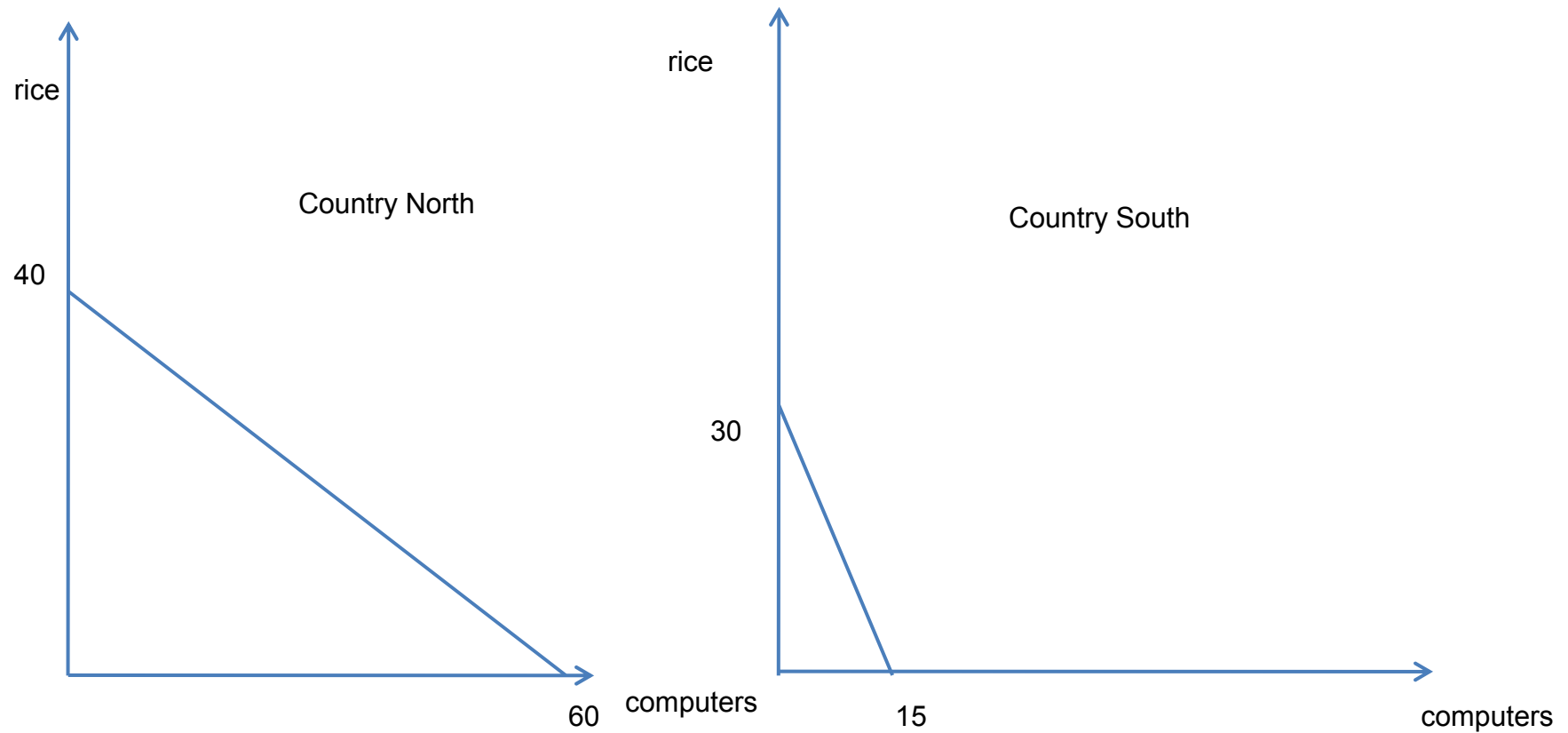
- Suppose that the two countries are barred from trading with each other, they will each have to produce all their domestic demands for rice and computers.

- If both goods are consumed in North:

$$\frac{p_C^N}{p_R^N} = \frac{10}{15} = \frac{2}{3}$$

Why?

$$p_C^N = 10\, w_C \qquad \text{and} \qquad p_R^N = 15\, w_R$$

$$\text{If} \qquad \frac{p_C^N}{10} > \frac{p_R^N}{15} \rightarrow \frac{p_C^N}{p_R^N} > \frac{10}{15}, \qquad \text{then} \qquad w_C > w_R$$

- All workers flow into computers.

If $\quad \dfrac{p_C^N}{10} < \dfrac{p_R^N}{15} \rightarrow \dfrac{p_C^N}{p_R^N} < \dfrac{10}{15},\qquad$ then $\qquad w_C < w_R$

All workers flow into rice.

For both goods to be produced, we need $\quad w_C = w_R$

Similarly, if both goods are consumed in South:

$$\frac{p_C^S}{p_R^S} = \frac{40}{20} = 2$$

Free Trade

- If both goods are going to be produced:

    $2/3 < p_c/p_R < 2$

- Why?

- If $p_c/p_R < 2/3 < 2$, both countries specialize in rice
- If $p_c/p_R > 2 > 2/3$, both countries specialize in computers

- If $2/3 < p_c/p_R < 2$ North specializes in computers and South in rice

- If it is cheaper to produce rice in North, why don't people by rice there?

  – Market wages adjust so that rice is not cheaper in North, even though less labor is required.

  – Because labor in the technologically advanced country produces more, it must be paid a higher wage.

- This effectively nullifies N's advantage in rice production

- The international relative price settles somewhere between the two autarkic price ratios.

- Country N will produce only computers. Computers in North can now be "transformed" into rice via a better "possibility frontier" than the country had at its disposal under autarky.

- Because the relative international price of computers is less than the autarkic ratio of 2, this permits higher consumption of both goods in country N than under autarky.

Gains from trade
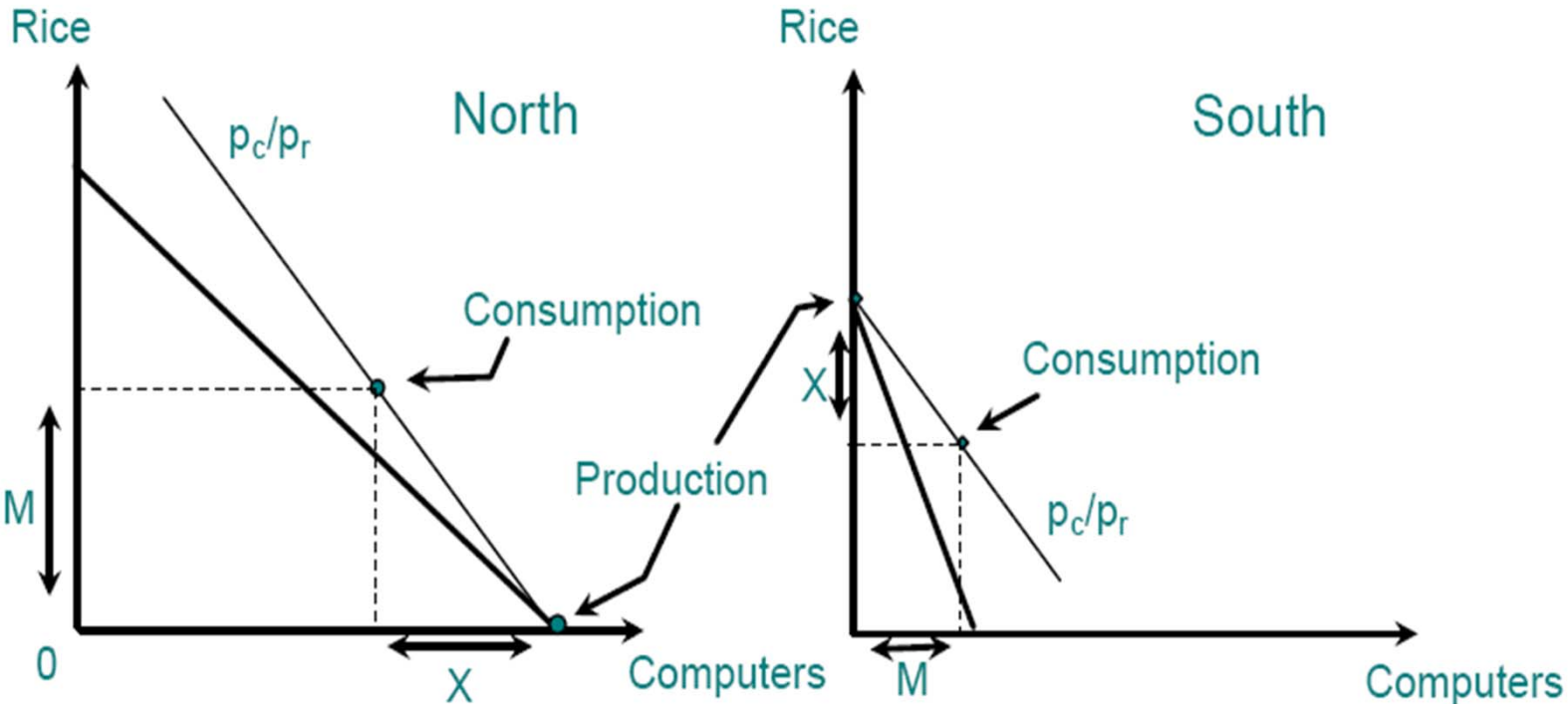
Comparative advantage

- This simple story is based on David Ricardo's theory of comparative advantage and is often called the Ricardian model.

- A country has an comparative advantage in the production of a good if the relative cost of producing a good (relative to the cost of producing other goods) is lower in this country than in another country.

- *Comparatively* speaking, country S is better at producing rice than country N, although N is *absolutely* better at producing rice.

Comparative advantage

- All that matter for determining the trade pattern in this simple example, is the relative costs of producing computers and rice in each country.

- The absolute cost of production turns out to be irrelevant for the trade pattern.

- Unless the relative costs of production in the two countries turn out to be exactly the same, there is always scope for profitable trade by both countries.

- Predicions of Ricardian Theory

  Each country specializes in the production of the goods in which it has a comparative advantage and export them in return for other goods.

- All households in both countries are unambiguously better off with free trade than in autarky
  - The wage in both countries rises
  - Consumption possibilities lie outside the production possibilities frontier.

- Caveats
  - Only one factor of production
  - Labor is perfectly mobile across sectors
  - Competitive markets

Comparative advantage

A country has a comparative advantage in the production of a particular commodity if it can domestically "transform" other commodities into this commodity more easily than other countries can.

The fact that a country may have an absolute advantage in the production of all commodities (or none) is irrelevant in this context.

Sources of comparative advantage

1. Technology

2. Factor endowments

3. Preferences

Sources of comparative advantage

1. ## Technology

    An important source of comparative advantage is that a country may have a relative technological advantage in the production of some good(s). In the example, the technical know-how is assumed to differ across countries.

    Technological differences form an important component of comparative advantage, but there are other determinants as well.

Sources of comparative advantage

2. <u>Factor endowments</u>

- One of the most important determinants of comparative advantage is the endowment of factors.

- Given that endowment differ substantially between countries, it is hardly surprising that even if two countries have identical technologies as well as identical preferences, they might find it profitable to trade with each other.

Factor endowments – The Heckscher-Ohlin (HO) model of trade

- Two countries: N and S

- Two goods: Cars and Textiles

- Two production factors: capital (K) and labor (L).

- Identical preferences across countries

- We assume that N is relatively well endowed with capital: $K^N/L^N > K^S/L^S$

- The production of cars is capital intensive and that production of textiles is labor intensive.

The Heckscher-Ohlin model of trade

The red curves are the isoquants for the production of cars, and the black curves are the isoquants for textiles.
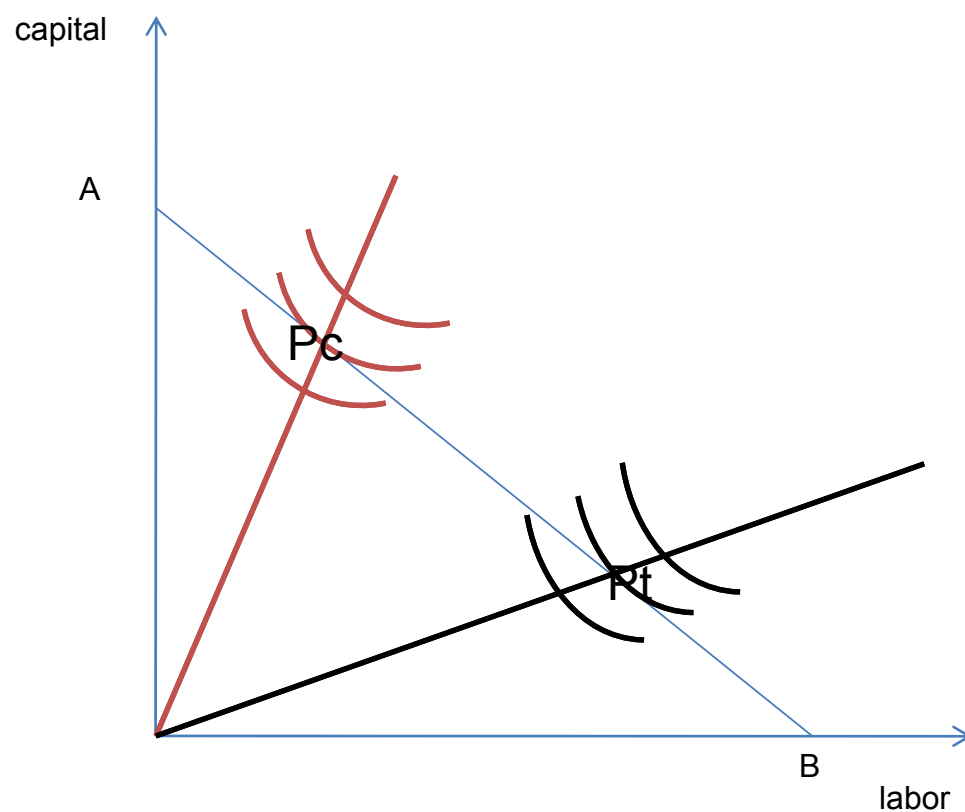
For every relative price of capital to labor, the production of cars employs a higher ratio of capital to labor than the production of textiles.

Pc and Pt are the cost-minimizing production of cars and textiles when the relative price is given by AB.

The ratio of labor to capital, as captured by the slope of the line from the origin to these points, is higher for textiles than for cars.

capital

A

Pc

Pt

B

labor

The Heckscher-Ohlin model of trade
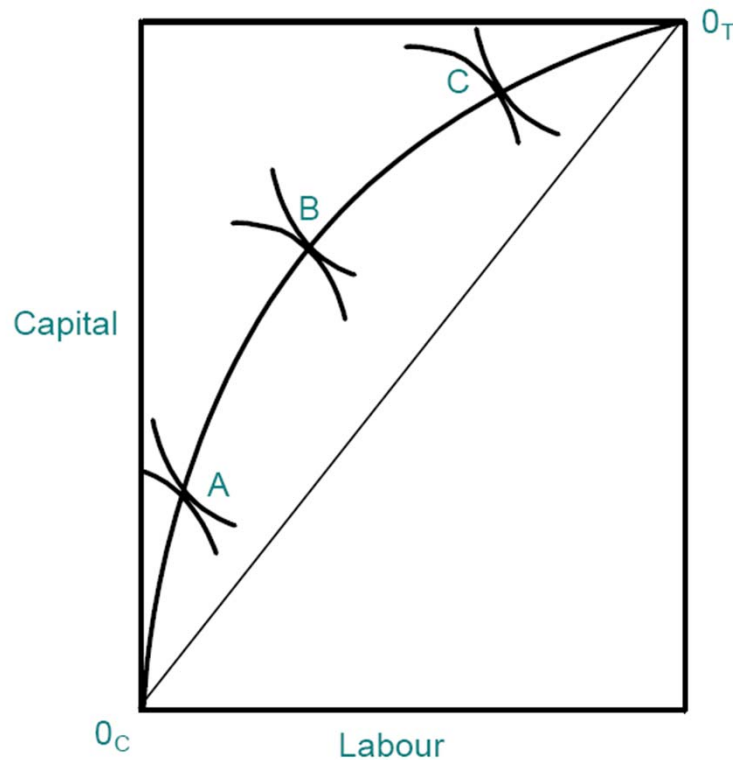
Edgeworth box for North

The figure shows the efficient production of cars and textiles for North.

The curve ABC shows various efficient production combinations of cars and textiles.

The combinations are efficient in the sense that none of these points can be "improved" upon by some other combination that produces more cars and more textiles at the same time.
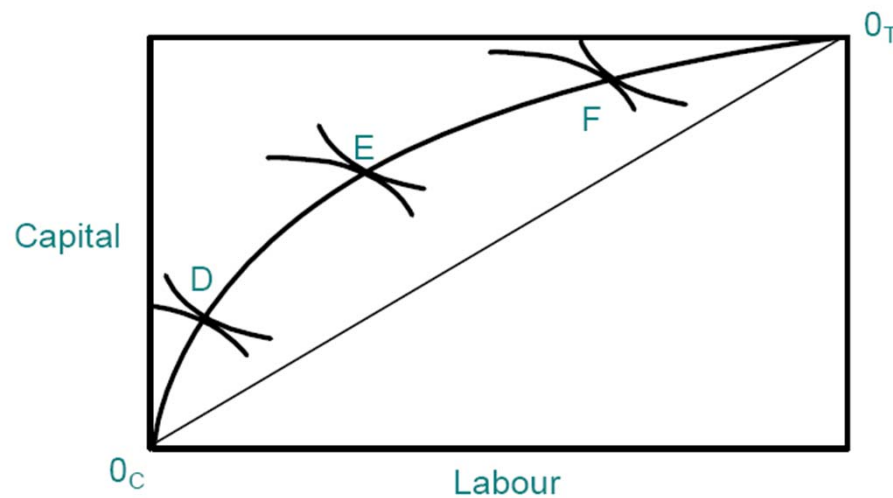
The Heckscher-Ohlin model of trade
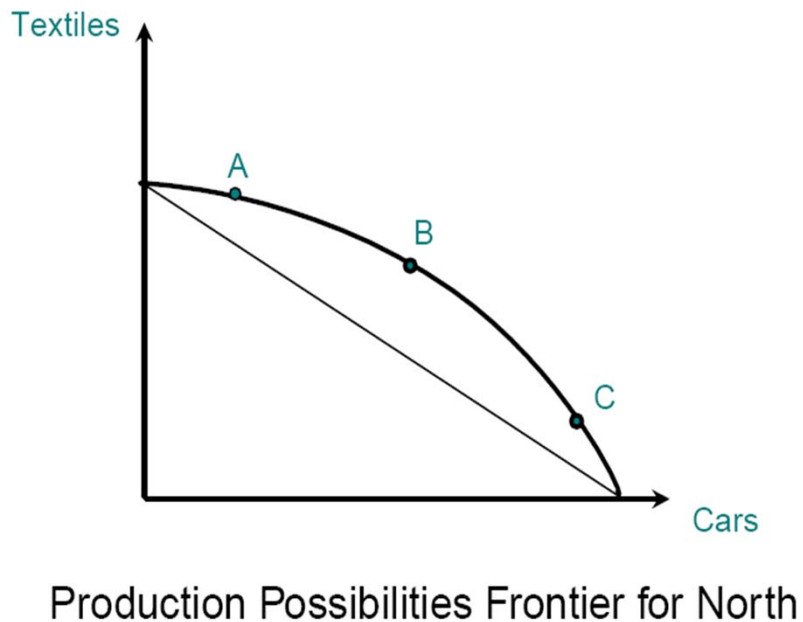
Production Possibilities Frontier for North

The points from last figure are collected together in the production possibility frontier of North.

Unlike the model with just one input, this production possibility frontier will not be a straight line.

It will be bowed outward to reflect the increasing difficulty of transforming one good to another as more and more of the latter good is produced.
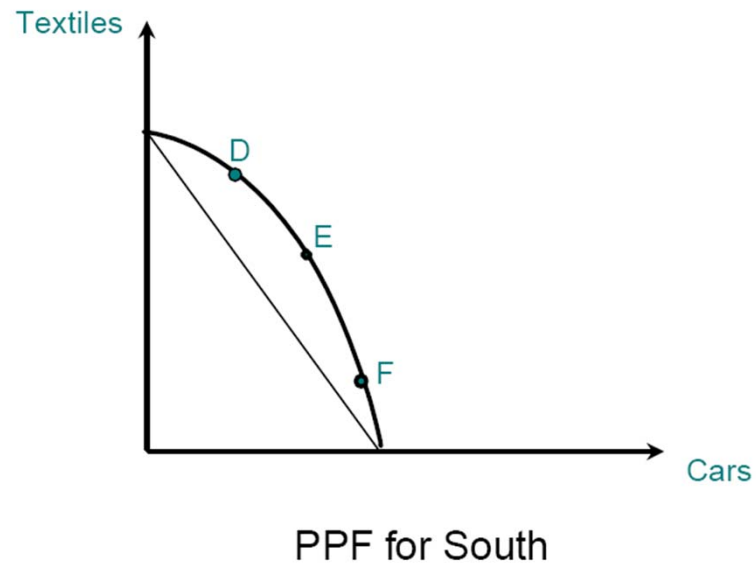
The Heckscher-Ohlin model of trade

The figure shows the efficient production of cars and textiles for South.

Note that compared to North, the box is wider, because South is relatively well endowed with labor.

The curve DEF shows various efficient production combinations of cars and textiles.

Edgeworth Box for South

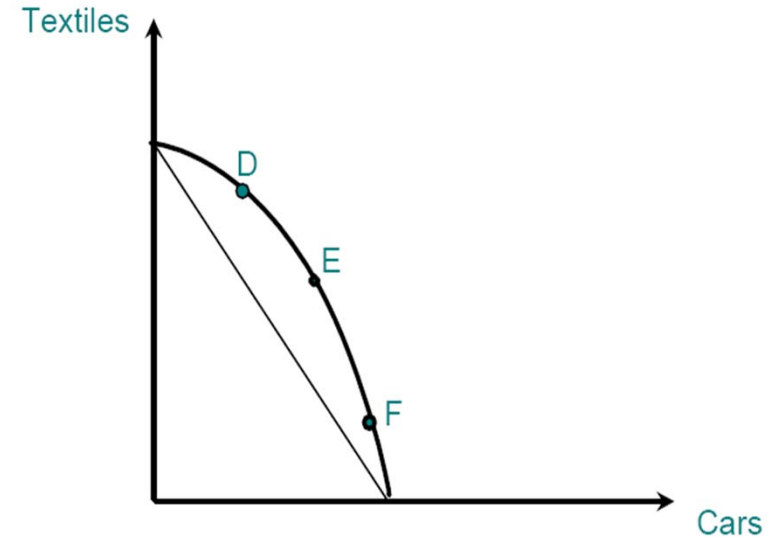# The Heckscher-Ohlin model of trade

Textiles

D

E

F

Cars

PPF for South

The points from last figure are collected together in the production possibility frontier of South.

The Heckscher-Ohlin model of trade
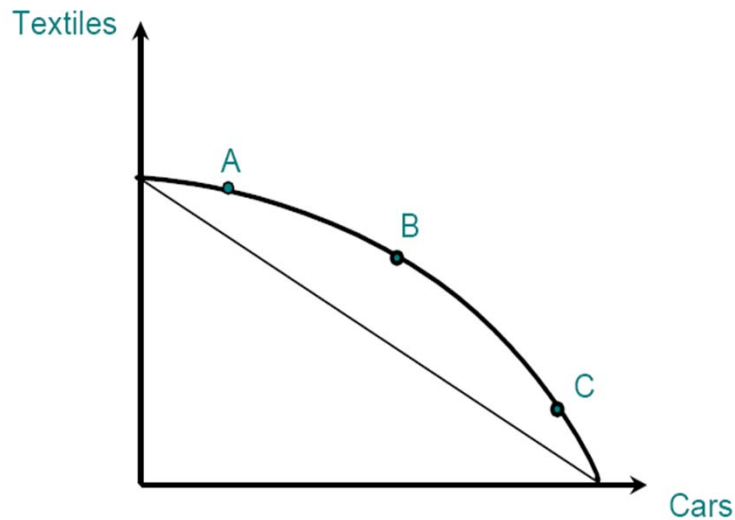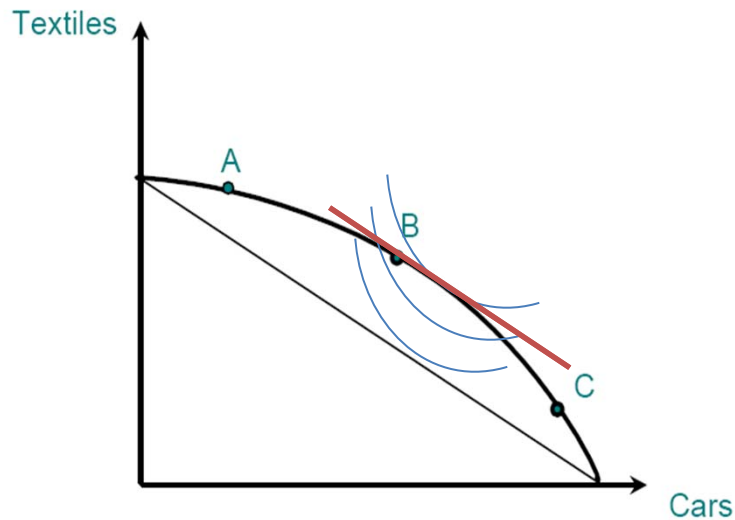

Production Possibilities Frontier for North

PPF for South

The production possibility frontier for S is relatively more "stretched" in the direction of textiles, simply because labor is used more intensively in the production of textiles than in the production of cars, and labor is what S has in relative abundance.

The Heckscher-Ohlin model of trade

- Country S is able to produce relatively more of the labor-intensive commodity – textile – and less of the capital-intensive commodity – cars.

- Country N is able to produce relatively more of the capital-intensive commodity – cars – and less of the labor-intensive commodity – textiles.
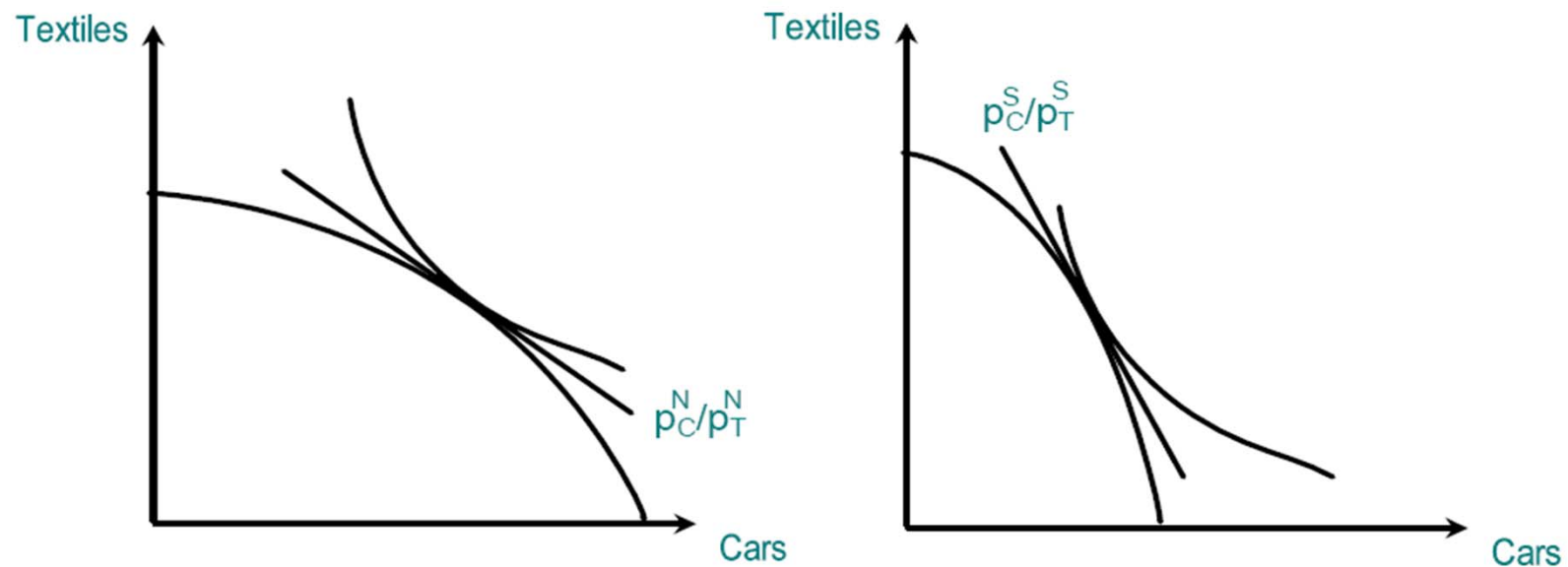
The Heckscher-Ohlin model of trade

Production Possibilities Frontier for North
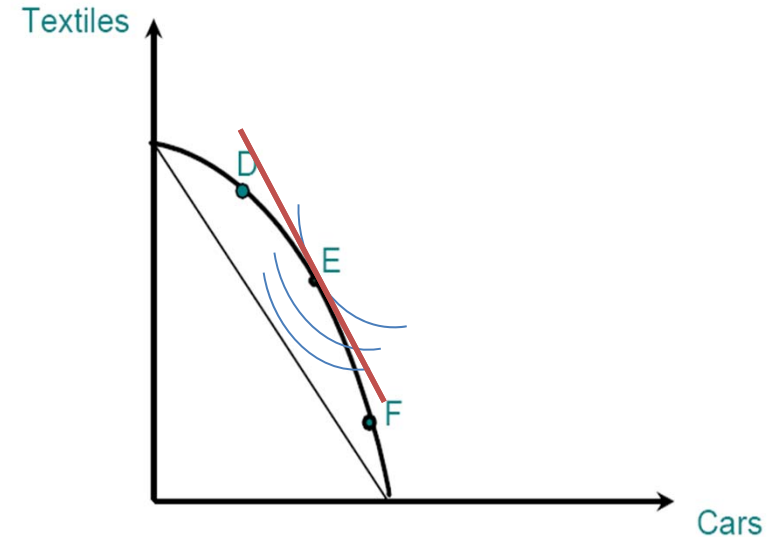
PPF for South

Preferences are given by the indifference curves. In the autarky equilibrium, domestic prices will be determined by the tangency of the indifference curves with the production possibility frontier in both countries.

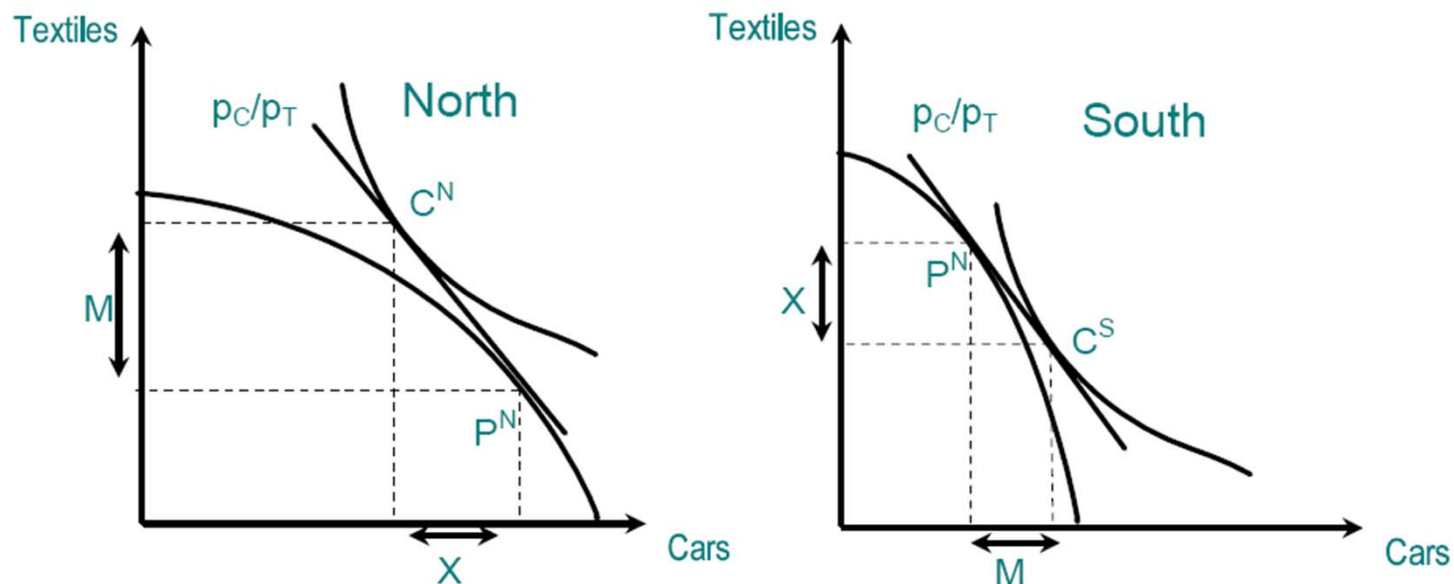# The Heckscher-Ohlin model of trade

The autarkic price ratio will be steeper in South than in North.

The relative price on cars is higher in South than in North because cars are capital intensive and North has relatively greater endowment of capital.

The Heckscher-Ohlin model of trade

- We can now use exactly the same agrument as we did for the Ricardian model.

- When the two countries are opened up to trade with each other, the equilibrium international price will settle at a level that is between the two autarkic price ratios.

- N will export cars and import textiles, and S will export textiles and import cars.

The Heckscher-Ohlin model of trade

Even with perfect identity of technical know-how, a country will tend to export commodities that are intensive in factors that are possessed by that country in relative abundance.

This is the essence of the Heckscher-Ohlin model of international trade.

- Both the Heckscher-Ohlin and Ricardian models predict trade between developed and developing countries.

- We expect technological differences to be relatively small between countries that are in similar stages of development and possibly to be large between countries that are at different stages.

- The same goes with factor endowments. One of the main characteristics of developing countries is a low ratio of capital per person.

- The two theories predict large volumes of trade between the developed and developing world, and relatively low volumes of trade across similar countries.

- As we have seen, this is not exactly consistent with empirical observations.

- Households in both countries are **potentially better off with free trade** BUT there are **distributional consequences.**

Sources of comparative advantage

3. Differences in Preferences

Varying conditions may indeed cause certain societies to demand different levels of certain goods.
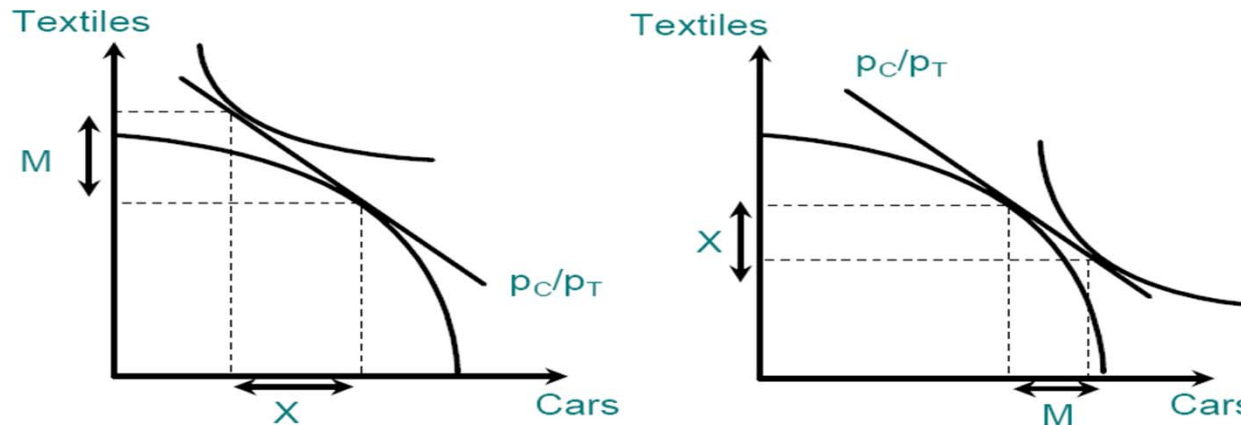

Under autarky, the domestic price of cars relative to textiles in S will exceed the corresponding ratio for N. When the two countries open up to trade, S will export textiles to N and import cars.

Why Do Countries Trade?
Economies of Scale

- Trade allows concentration of production in some countries to maximize the effects of economies of scale

- **Example:**

- 2 identical countries — East and West
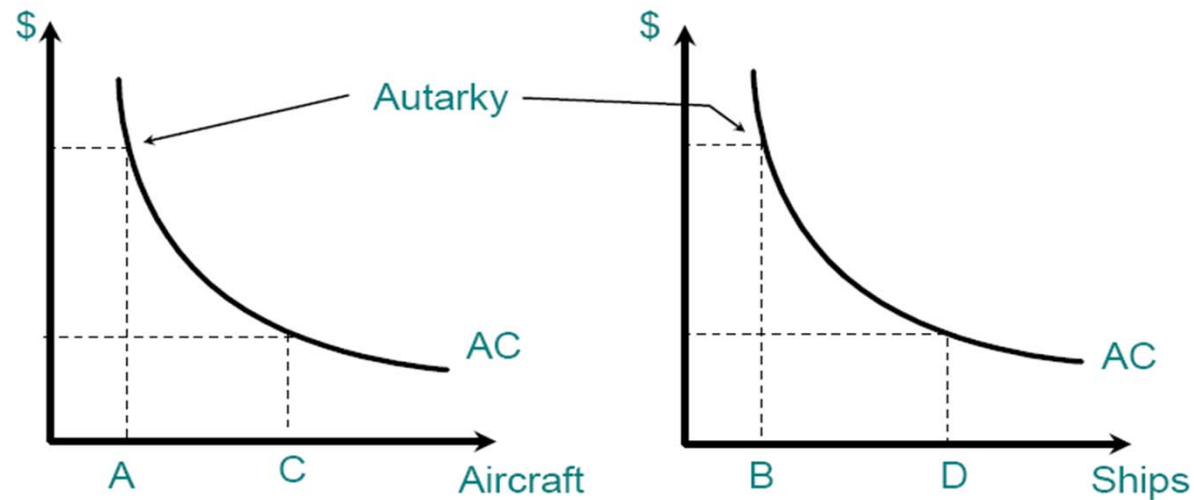
- 2 goods — ships and aircraft

Economies of Scale
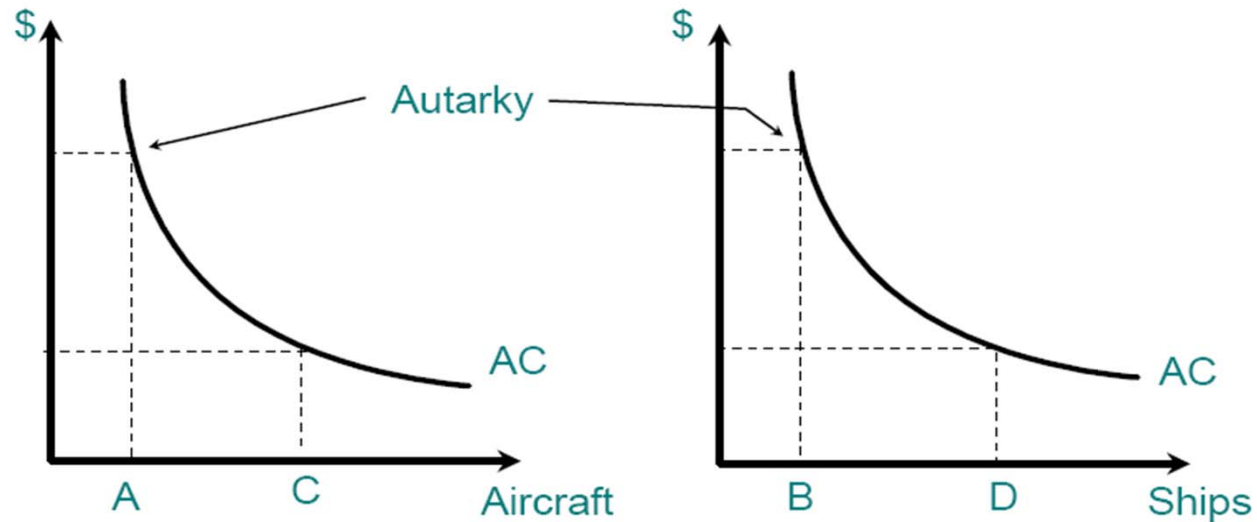
Each industries are assumed to display economies of scale in production – the average cost of production delines with an expansion in production scale.

In autarky both countries produces 0A ships and 0B aircrafts.

Economies of Scale

If country E tilts its production slightly more in favor of ships, while country W does the same with aircraft, it will be the case that E appears to have a comparative advantage in shipbuilding, while W will appear to have a comparative advantage in aircraft building.

- Trade may be viewed as a way to concentrate the production of industries in some countries, to maximize the effect of increasing returns to scale.

- The end result is that country E produces ships, while country W produces aircraft.

- Because both countries are able to use the full power of increasing returns, unit costs are reduced globally, which is just another way of saying that productivity has been increased globally.