

Chapter 6

Economies of Scale, Imperfect Competition, and International Trade

"When the market is very small, no person can have any encouragement to dedicate himself entirely to one employment, for want of the power to exchange all that surplus part of the produce of his own labor, which is over and above his own consumption, for such parts of the produce of other men's labor as he has occasion for."

Adam Smith, Wealth of Nations, Book I, Chapter III.

I. Chapter Outline

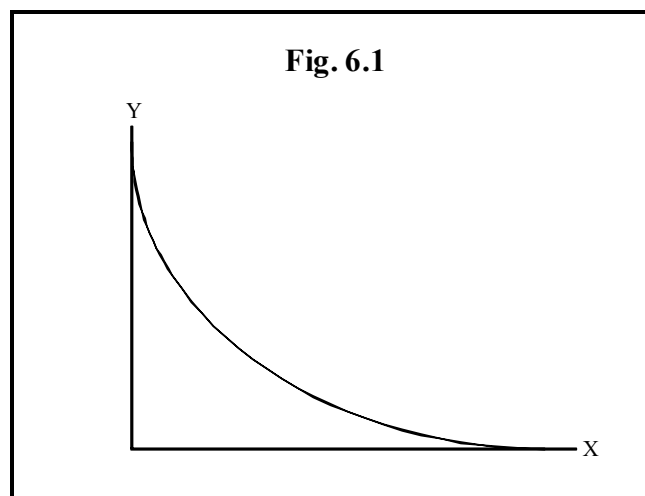
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II. Chapter Summary and Review

In response to the inability of the Heckscher-Ohlin (H-O) model to explain some trade patterns, new, complementary trade theories have arisen. These new theories are based on economies of scale, imperfect competition, technological differences, and transportation costs.

The H-O model assumes that opportunity costs increase as production within a nation increases. This produces a ppf that is concave from the origin,

which was used in Chapters 3-5. If, however, increased production makes possible a greater specialization of labor and/or capital, or other forms of cost savings, then opportunity cost may decrease as production increases which, is known as **economies of scale**. (The term “economies of scale” refers to any reduction in cost due to an increase in production in a firm. The term “increasing returns to scale” refers to a reduction in cost due to the nature of the production function. Increasing returns to scale is an example of economies of scale.) In the presence of economies of scale, the ppf is convex from the origin, as shown in Fig. 6.1, rather than concave from the origin. As more of X is produced, the amount of foregone Y necessary to produce an additional unit of X decreases. Likewise the opportunity cost of Y decreases as more Y is produced.



In the absence of trade each nation would produce both goods to satisfy domestic consumption of both goods under the reasonable assumption that consumption would not be limited to only one good. If there are economies of scale, then each industry will be at sub-optimal levels. If each nation produced only one good, selling any surplus to another nation, then the cost of production of each good would fall. Trade will allow each nation to specialize in the production of one of the goods, decreasing the cost and price of each good.

Because economies of scale exist for both goods, the actual good in which a nation specializes depends upon the historical circumstances unique to each country. Each country can specialize in either good.

Size can confer cost advantages at the firm level and at the industry level. Of interest here are the cost advantages of size at the firm level, called “economies of scale.” As the firm increases production, the cost of production falls due to the greater possibilities for specialization. If there are, for example,

more laborers, then a greater degree of specialization might occur. Where there are economies of scale the optimal size firm will be large relative to the market, so markets will not be competitive. Markets will take the form of **monopolistic competition**, **oligopoly**, or in the extreme, **monopoly**.

Outsourcing (the purchasing of inputs from abroad) and **offshoring** (the production of inputs by a domestic company in its own overseas plants) are often responses to economies of scale. If there are economies of scale, competitive pressures will force firms to produce in a limited number of plants no matter where the plants are located. These activities are referred to as the new **international economies of scale**.

H-O trade is trade between different industries or **inter-industry trade**. H-O trade occurs if a nation imports good X and exports good Y. However, a considerable volume of trade between nations is **intra-industry trade**. Intra-industry trade occurs when a nation both imports good X and exports good X. The exports are slightly different than imports, but occur in the same general industry classification. For example, the United States both exports automobiles made in Detroit and imports automobiles made in Italy, Germany and Japan. Intra-industry trade can be explained by economies of scale combined with **product differentiation**. Each nation specializes in a segment of the industry, producing a product that is differentiated in some way. For example, the United States tends to produce mid-size automobiles and Germany tends to export luxury automobiles.

Interestingly, if there are economies of scale, then prior to trade there may be no or little differences in costs across nations as both nations may produce in the vicinity of the middle of the ppf. Only as specialization proceeds will a comparative advantage develop. In this case, the comparative advantage that is developed is an acquired comparative advantage. By contrast, comparative advantage in the H-O model exists prior to trade and specialization, and so might be called natural comparative advantage. The ideas are similar to the abilities of humans. Some of our comparative advantages are innate, e.g. size, dexterity, strength, and native intelligence, and some is acquired through training, education, and experience.

H-O type trade, which is based on existing or natural comparative advantage, is likely to occur between dissimilar nations, i.e. nations that have very dissimilar resources bases. Much of the trade between the developed countries of the North and the developing countries of the South is H-O type

trade. Trade based on acquired comparative advantage, therefore, is more likely to be intra-industry trade and occur between countries that are similar, i.e., among the countries of the North and among the countries of the South. Because intra-industry trade means each nation produces similar products, most likely with similar factor intensities, it is not necessary for one factor to gain and another to lose. Labor and capital displaced in one industry are not necessarily released in different proportions, requiring an increase in one factor's price and a decrease in another, as in the H-O model. Consequently, it is more likely for intra-industry trade to expand without significant resistance.

The extent of intra-industry trade is measured by an **intra-industry trade index**. Letting X be the value of exports and M the value of imports, the intra-industry index, T , is defined as

$$T = 1 - \frac{|X - M|}{(X + M)}$$

The highest level of intra-industry trade occurs if the value of exports equals the value of imports in an industry. If $X=M$, then $T=1$, indicating that intra-industry trade is 100%. If there are only exports and no imports, or only imports and no exports, then it can be seen from the equation that $T=0$, indicating that intra-industry trade is 0%. For both industrial and developing countries, the share of intra-industry trade has increased considerably since WWII, currently accounting for more than one-half of manufacturing trade for many nations.

A number of countries like Japan and the newly industrializing countries (NICs) of Asia have developed their economies by producing goods that were initially originated and produced by developed countries. Examples include radios and computers. This suggests that comparative advantage can shift from one country to another. Such shifting comparative advantage is due to **technological gaps** between nations and a **product cycle**.

New products and processes originate in countries abundant in highly skilled labor and R&D, like many European nations, Japan, and the United States. Once the process of producing a new good is perfected and standardized (capable of being produced on assembly lines) comparative advantage shifts to nations that have an abundance of semi-skilled (assembly line) labor.

A final consideration in the explanation of trade patterns is transportation costs and government regulations. A nation with a comparative advantage in

gravel is unlikely to export a significant volume of gravel due to the high transportation costs. Industries that use such raw materials are called **resource-oriented industries**, and will be located near the source of the raw materials. Interestingly, very high transportation costs can explain some intra-industry trade. France may both export coal to Germany and import coal from Germany because some regions of France are closer to German mines than French mines, and some regions of Germany are closer to French mines than German mines.

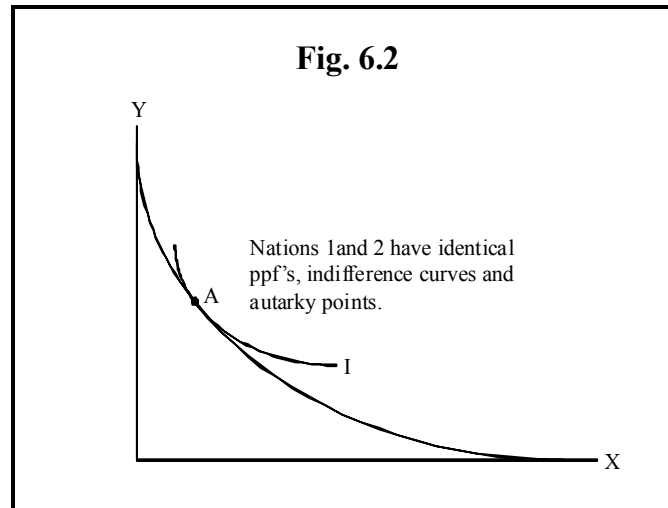
Market-oriented industries, on the other hand, are located close to the market because some goods become more difficult to transport at higher stages of production. The text provides the production of soft drinks as an example. Bottling plants will be located near the source of demand because syrup is relatively cheap to ship, but when water is added and the product is bottled, transportation costs become high. For market-oriented industries, therefore, we observe trade in the inputs (syrup) and little trade in the final product (soft drinks).

Footloose industries are those where transportation costs are not a factor in any stage of processing. Footloose industries produce products that have a very high value relative to weight, like computer chips and precision instruments. These industries will locate where inputs are available that minimize the cost of production.

Like transportation costs, industry regulations can affect export and import patterns. A nation with less stringent **environmental standards** will tend to attract production that is "dirtier". Because it is not clear that all nations should have identical environmental regulations due to different standards of living and national preferences, it is very difficult to disentangle the anti-import interest of particular groups from a genuine concern over environmental standards. This became painfully clear during the debate over the costs and benefits of the North American Free Trade Agreement.

III. Questions

1. The identical ppfs and identical preferences of Nations 1 and 2 are shown in Fig. 6.2.



- a) Based on the ppf in Fig. 6.2, do economies of scale exist in the production of both goods X and Y?
 - b) Which nation has the comparative advantage in Good X at the equilibrium shown in Fig. 6.2?
 - c) Explain the outcome of a shift in Nation 1's preferences such that slightly more of Product X (and slightly less of Product Y) is demanded.
 - d) Explain why comparative advantage in the presence of economies of scale should be considered acquired rather than natural.
2. a) Why is product differentiation, by itself, incapable of explaining intra-industry trade?
- b) Why does the explanation of intra-industry trade require both product differentiation and economies of scale?
3. The EU may eventually include all Eastern European nations. In terms of factor endowments, countries like Macedonia and Croatia are similar to each

other but differ from many of the long-standing EU countries like France. As trade expands between Macedonia, Croatia and France, why will the resistance to trade differ between the following pairs of countries?

a) France and Macedonia

b) Macedonia and Croatia

4. Describe the nature and likely source of the comparative advantage of the products traded between the regions indicated below. ("South" refers to the developing countries and "North" to the more developed nations.)

a) North ↔ South

b) North ↔ North

5. Calculate the intra-industry trade index for each of the industries in Table 1. (Numbers are in millions of dollars.)

Table 1				
	Automobiles	Wheat	Aircraft	Beer
Exports	365	252	0	180
Imports	365	0	320	90

6. Consumer durables, like audio equipment and computers, were developed in the United States and now they are being produced and assembled for export by countries like China, South Korea and Mexico. What's going on here?

7. Predict whether the intra-industry index will more likely be relatively high or low for the following products. Explain your prediction.

a) Cheese

b) Wheat

c) Common sand

d) Children's toys

8. What role might history play in the explanation of particular patterns of intra-industry trade?

9. Explain why there may be long-term net benefits to outsourcing.