Chapter Four

The Modern Trade Theories

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Aims and objectives

At the end of this chapter, students will be able to explain:

- How factor endowments determine the direction of trade
- How a demand factor affects the direction of trade between nations
- How trade according to factor endowment leads to equalization of factor price in the trading nations
- How trade according to factor endowment affects the distribution of income in the trading nations

- The extent to which factor endowment determines the direction of movement of goods and services in the real world from different empirical investigations.
- How Economies of scale in production affects the patterns of international trade
- How the demand factor affects the patterns of trade in manufactured goods

4.1 Introduction

Dear learner! As we have discussed in the previous chapter, the Ricardian principle of comparative advantage explains that mutually beneficial trade would exist in a two- nation – two – commodity world when nations have comparative advantage. It doesn't, however, explain why the production possibility schedules of different nations have different shapes, and thus why a nation's comparative advantage is in one product rather than another.

Ricardo thought that comparative advantage depended on comparative differences in labor productivity – that is *differences in technology*. However, he did not explain the basis for these differences. Moreover, Ricardo's assumption of single factor of production (labor) ruled out an explanation of how trade affects the

distribution of income with in a nation and why certain groups favor free trade, whereas other groups oppose it.

In 1920_s, and 1930s the Swedish economists Eli Heckscher and Bertlin Ohlin formulated a theory addressing two questions left largely unexplained by Ricardo:

1. What determines comparative advantage? I.e. what is base for technology differences among nations?
2. What effect does international trade have on the prices of factors of production (income distribution) in trading nations?

Because Heckscher and Ohlin maintained that factor endowments, underlie a nation's comparative advantage, their theory became known as ***factor- endowment theory*****.** It is also known as Heckscher – Ohlin theory (H-O theory for short); and Ohlin was a warded the 1977 Nobel Prize in economics for his contribution to the theory of international trade.

4.2 Factor – Endowment Theory (Heckscher – Ohlin Theory)

The factor endowment theory states that comparative advantage is explained exclusively by differences in the international supply conditions. The theory asserts that resource endowments determine a nation's comparative advantage.

Accordingly, a nation has a comparative advantage in the production and export of that commodity which uses more intensively the nation's relatively abundant factor of production.

The theory implies that Brazil exports coffee because she has an abundance of the soil and climatic condition required for coffee production; US and Canada export wheat because they are endowed with an abundance of temperate zone land which is well suited for wheat production, and China and India are huge exporters of shoes and garments because they are highly endowed with labor.

The factor endowment theory relies on several simplifying assumptions:

1. Nations have the same preferences and tastes (demand conditions are the same among nations)
2. Nations use factor inputs that are of uniform quality
3. Nations use the same technology. This assumption is made explicitly to neutralize the possibility that trade is based on international technological variations (Ricardo's theory) in favor of the possibility that trade is based solely on differences in supplies of labor and capital.
4. Production functions are the same for each good in the two nations.

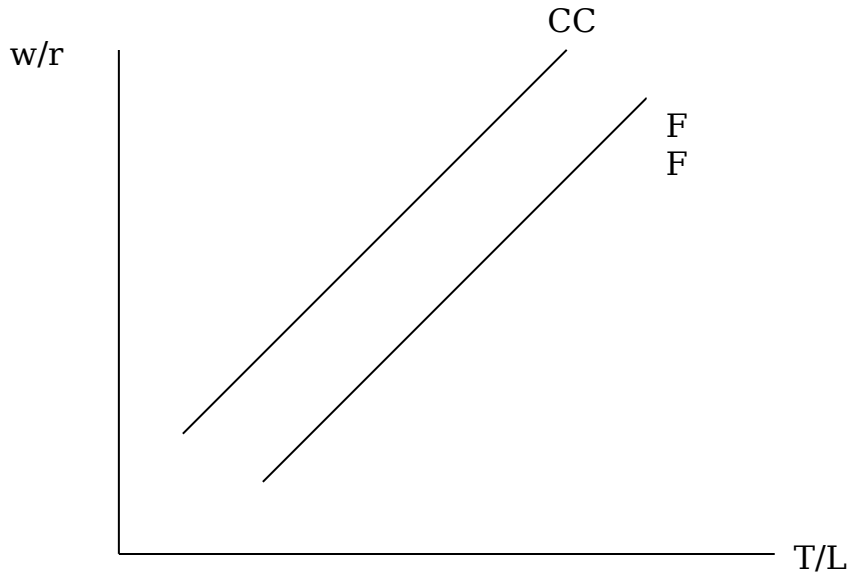
According to the H- O theory, relative price levels differ among nations because:

a. the nations have different relative endowments of factor inputs and
b. different commodities require that the factor inputs be used with different intensities in their production.

Given these circumstances, a nation will have a comparative advantage in and exports that commodity for which a large amount of relatively abundant (cheap) input is used; and will import that commodity in the production of which the relatively scarce (expensive)input is used. That is why the land abundant countries (such as Australia) export land – intensive goods, such as meat, while labor abundant nations (such as China and South Korea) export labor intensive goods, such as textiles.

Choice of inputs depends on relative cost of factor inputs. If land rent is high and wage rate is low then firms choose a lot of labor &little land. If land rent is low &wage rate is high then firms choose a lot of land & little labor. So land to labor ratio depends on ratio of wage to rent. I.e. T/L depends on w/r

Fig.4.1 Relationship between w/r &T/L



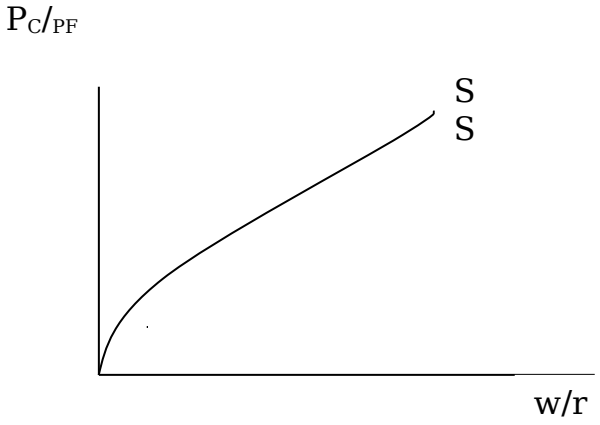
CC-curve is left of WW-curve indicating wheat always use higher ratio of land to labor then production of cloth. So, wheat is land intensive while cloth is labor intensive.

4.2.1. Factor price and goods price

Before trade a nation produces both cloth &wheat. The cost of goods depends on factor prices. If rent rate is higher, price of wheat will also be higher because wheat is land intensive. If wage rate is higher, price of cloth will be higher because cloth is labor intensive.

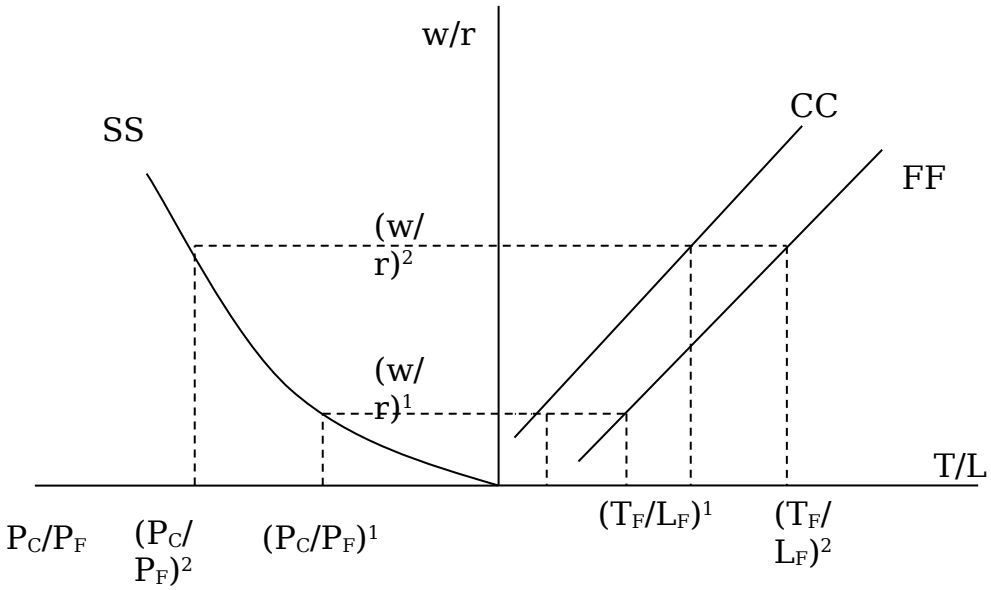
There is one to one relation ship between the ratio of wage to rent (w/r) &the ratio of the price of cloth to price of wheat (P_C/P_W)

Fig. 4.2 relationship between relative price of cloth &relative price of factor inputs



Putting two diagrams together, we see linkage of the price of goods to the ratio of land to labor used in the production of each goods.

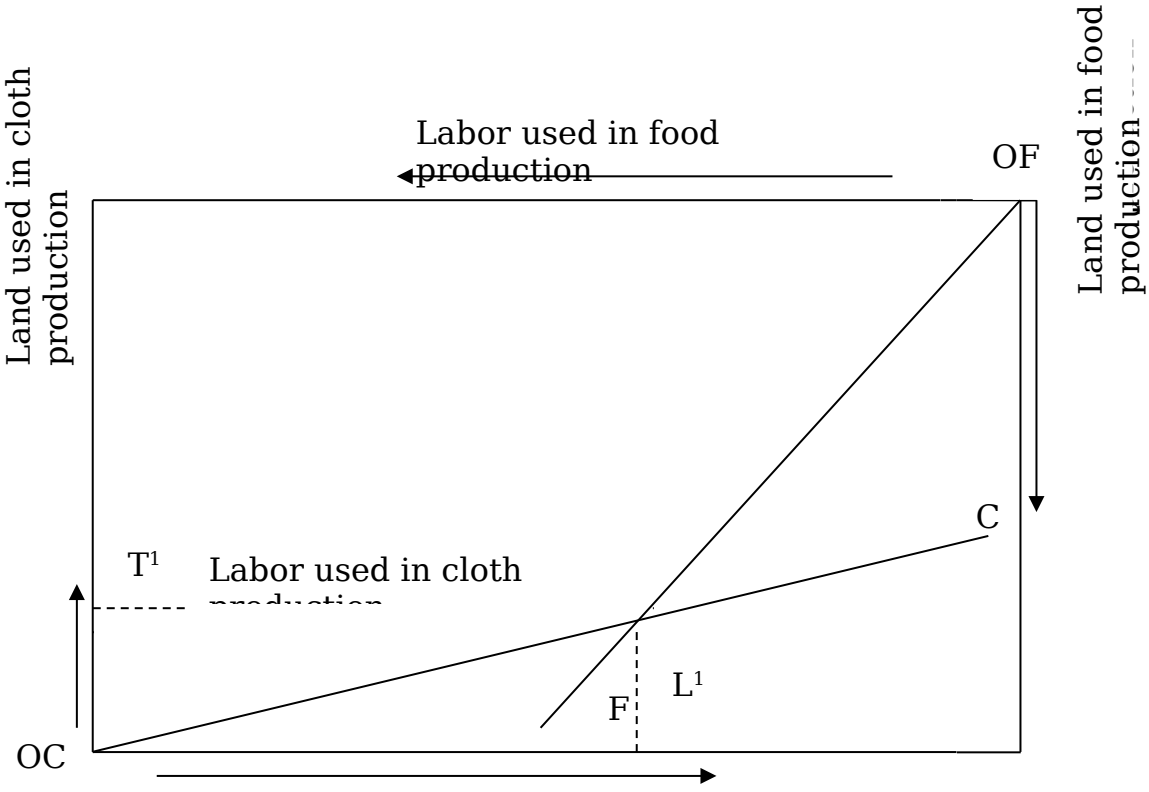
Fig.4.3. The effect of change in P_C/P_F



If relative price of cloth rises from ($P_C/P_F)^1$ to$(P_C/P_F)^2$, w/r increases from $(w/r)^1$ to$(w/r)^2$. This will cause the land to labor ratio in production of both goods to rise .As a result, income of the workers relative to land owners rise i.e. purchasing power of workers increases &purchasing power of land owners decrease. Producers substitute land to labor in both industries.

Dear learner! We have seen the relation ship between relative price of inputs &relative price of goods and relation ship between price of output & land to labor ratio. Now let’s see how land &labor can be allocated in two factor economy. We use box diagram as indicated below.

FIG.4.4 Land &Labor allocation in both sectors

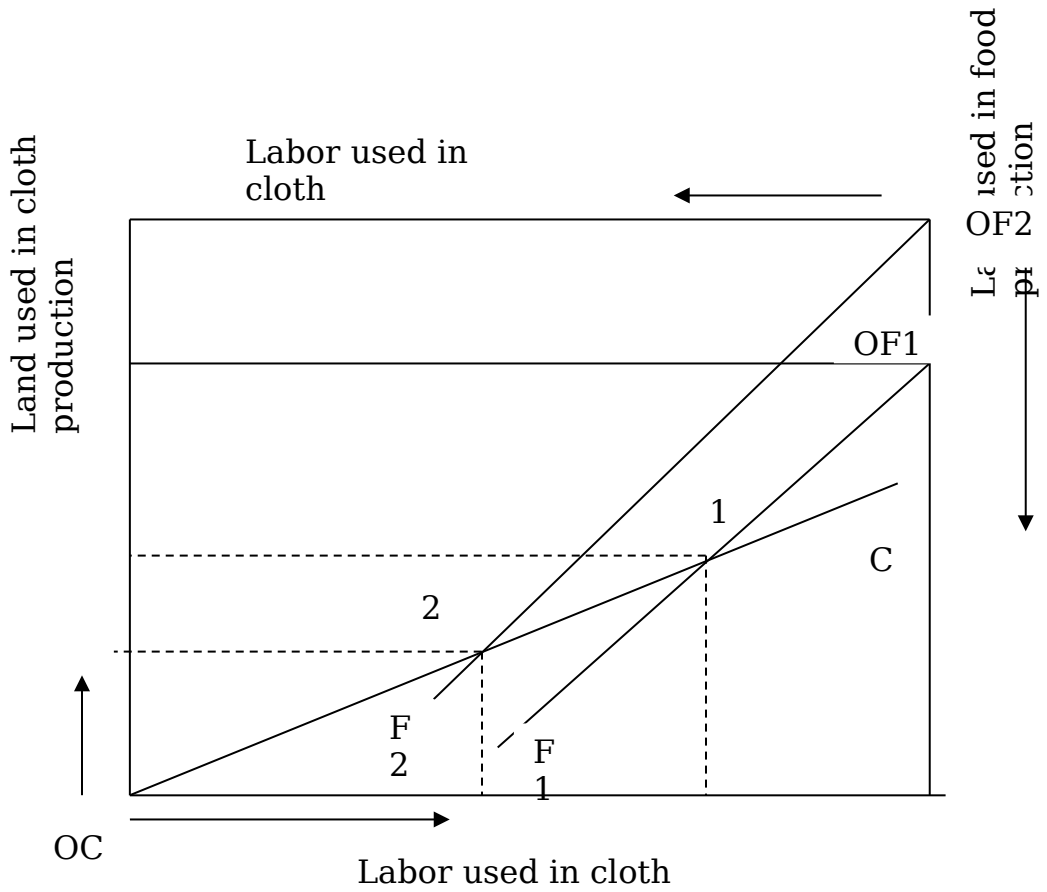


OWW is steeper than OCC because land to labor ratio is higher in wheat sector. Intersection point shows land to labor allocation to wheat &cloth production.

What will be the effect of change in resources (land &labor) on out put (wheat &cloth)?

If supply of land increases, holding prices of output &labor supply constant, box become taller.

FIG.4.5 The effect of change in supply of land



When land supply increases:

- box become taller
- resource allocation (land& labor) move from point 1 to point 2

- more land &more labor devoted to wheat production
- output of wheat increases &output of cloth decreases

Self-assessment question 4.1

1. Define the H-O Theory.

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2. Explain the effect of increase in supply of labor holding prices of output &supply of land constant

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Generally, an economy will be relatively effective at producing goods that are intensive in the factor with which the economy is relatively abundant (well endowed).

The factor endowment theory is explained in the following figure, which shows the PPS, of U.S. and Canada. Assume that

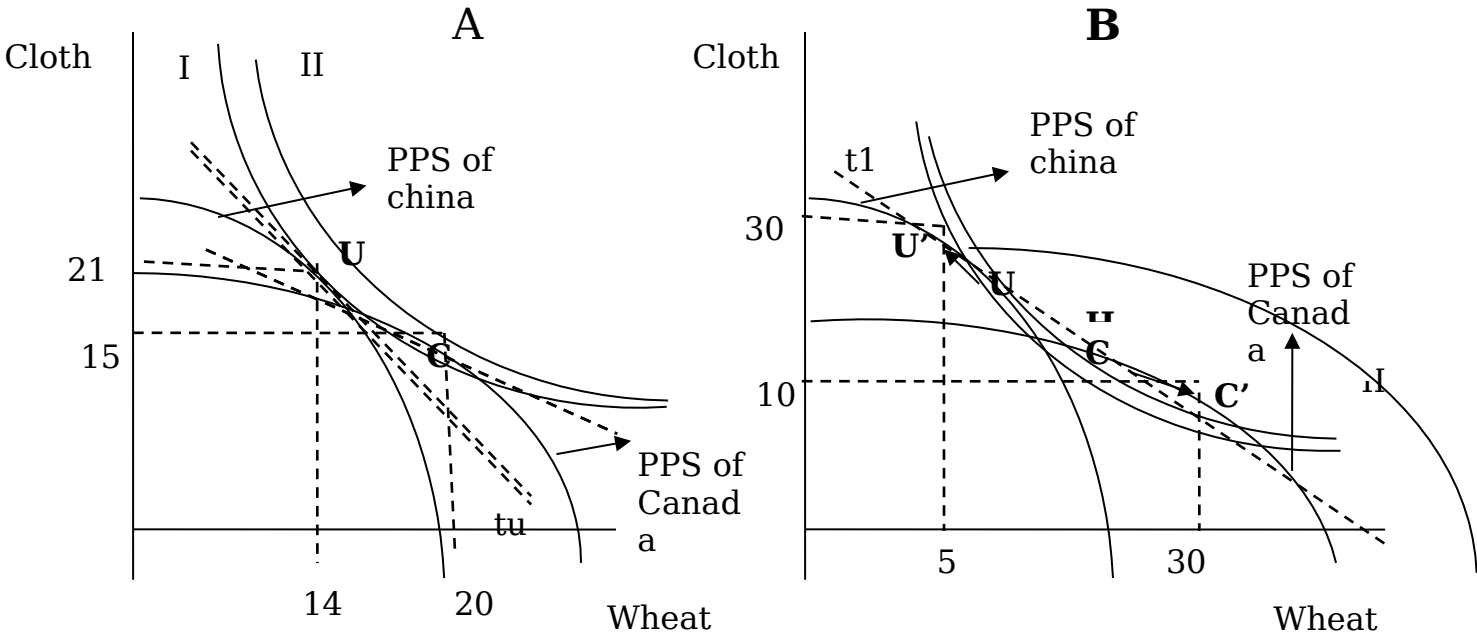
- Cloth production is labor – intensive (requires large amount of labor and little land); and wheat productions is land intensive – requiring large amount of land and little labor.
- Labor is relatively abundant (its price is low) in china and land is relatively abundant (its price is relatively low) in Canada.

The abundance of labor in china causes the china's PPS to be biased towards the cloth axis; the abundance of land in Canada causes her PPS to be biased toward the wheat axis.

According to the H-O theory demand conditions are assumed to be identical for each nation. This is shown in the following figure (figure 4.1) by community indifference curves (CIC), which are common for the two nations. In the figure, the points where CIC_1 is tangent to each nation's PPS define the equilibrium condition for each nation under autarky. Under autarky china produces at point U on her PPS and Canada produces at point C on her PPS.

The relative price ratio at these points suggests that china has a comparative advantage in cloth because china is labor abundant and Canada (land abundant) in wheat

Figure 4.5.Difference in factor endowment and patterns of trade



Panel A depicts the following assertion of H-O theory:

Given identical demand conditions and input productivities, differences in the relative abundances of resources determine relative price levels and patterns of trade. Labor is cheaper in china (because of its large abundance) and land is relatively cheaper in Canada (because of its large abundance).

The labor abundant country (china) thus exports cloth (the labor intensive product) and the land abundant country (Canada) exports wheat (land – intensive product).

Refer now to panel B

With trade, each nation continues to specialize in the production of the commodity of its comparative advantage until the relative prices are equalized with the other nation. This happens when china reaches point **U**' and Canada reaches point **C**' at which each nation's PPS becomes tangent to a common relative price line **t1**. With trade, china maximizes her welfare by exchanging 10 yards of cloth for12 wheat with Canada. Both countries achieve a post trade consumption point at point H which lays on a higher indifference curve (II), outside their PPS.

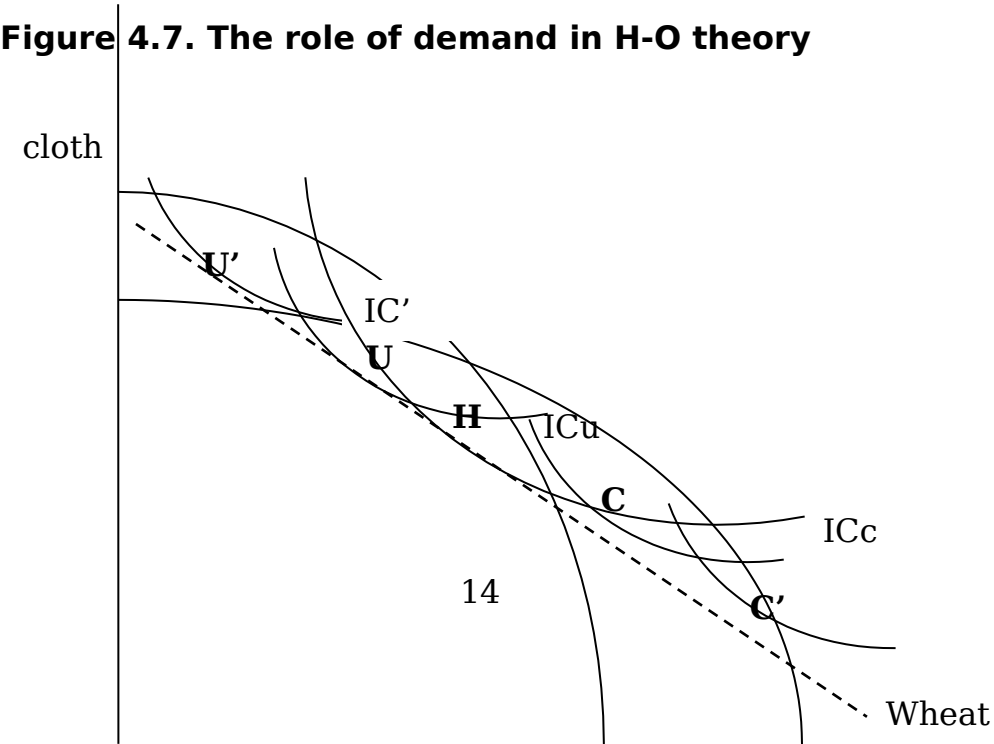
4.3 The role of demand in H-O theory

The H-O theory asserts that, a land/labor abundant country will have a comparative advantage in the production of land/labor intensive commodity and exports it. *But does a land /labor abundant country necessarily export land/labor intensive commodity?*

The answer depends largely on the demand factors

- If *consumption bias* and *production biases* of a country are towards the same direction, a country will import rather than export the commodity of her comparative advantage. The H-O Prediction of the direction of trade would then be invalid.
- If consumption and production biases are in the opposite direction, then the H-O prediction will be valid, i.e.; a country would export a commodity of her comparative advantage, and import a commodity of her comparative disadvantage. Consider the following figure (figure 4.2):

Figure 4.7. The role of demand in H-O theory



IC
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Referring to figure 4.2, china specializes in cloth production, producing at point U, and Canada specializes in wheat, producing at point C.
If post specialization consumption preferences for china residents lies to the left of point U (say at point U’) and that of Canada lies to the right of point C (say at point C’), china would import cloth rather than exporting it and similarly Canada would import wheat in this situation. Thus, H-O theory is invalid under this situation.

If, however, post specialization consumption preferences of china lie to the right of point U and that of Canada lie to the left of point C (such as point H), both nations would export the commodity of their comparative advantage and H-O theory remains valid.

4.4 Alternative Explanation of H-O theory: Price criterion

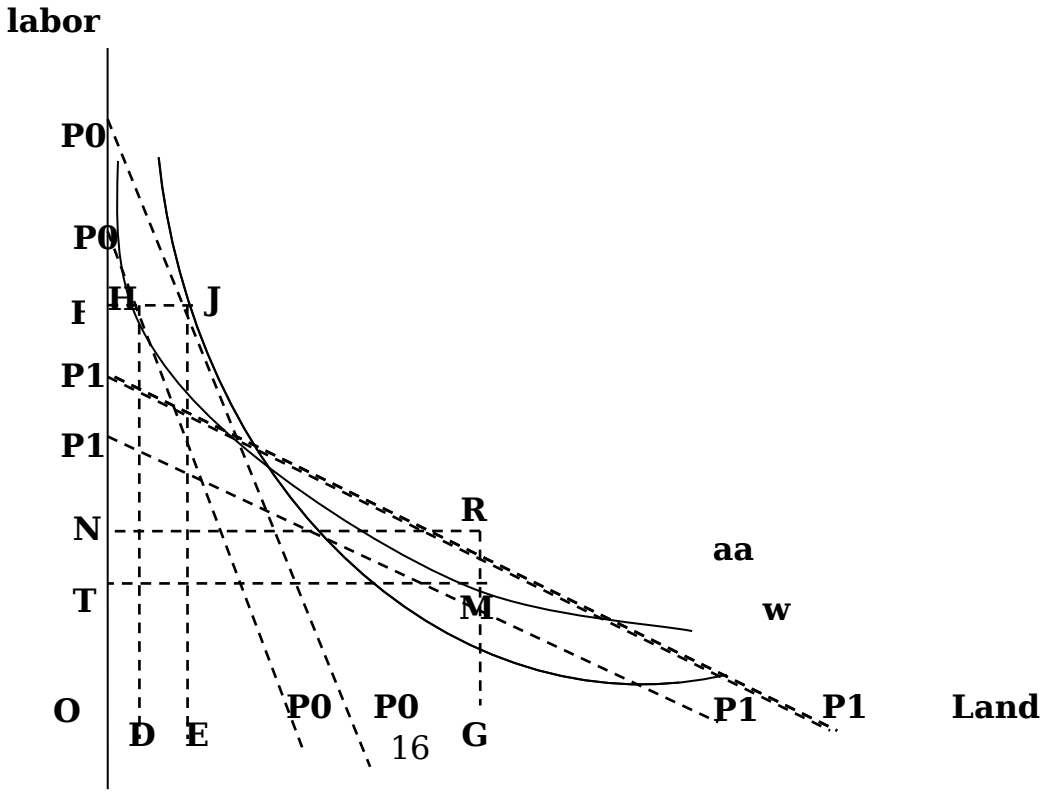
The previous section explains how the H-O theory works when factor abundance is explained by the physical quantity of resources owned by a nation. Factor abundance of a country can also be explained by the relative factor prices. Ohlin himself explained the relative factor

abundance using the price criterion. The fact that the price of labor is lower in china indicates that china is a labor abundant nation and the price of land is lower in Canada because she is endowed with land.

So it is important to see how the H.O theory works in this circumstance. Referring to the following figure (figure 4.3),

- Labor(L) and land (T) are measured along the vertical and horizontal lines respectively.
- Parallel lines $p_o p_o$ show factor price ratios in china, a labor surplus nation. The steepness of these lines shows that labor is cheaper and land is expensive china
- Parallel lines $P_1 P_1$ show factor price ratios in Canada, land surplus nation. The flatness of these lines shows that land is relatively cheaper and labor is expensive in Canada.

Figure 4.8. H-O theory



- We have the two isoquants labeled by ***aa*** and ***ww*** and these two isoquants denote one yard of cloth and one kg of wheat respectively. Note that the two isoquants cut each other only once. This indicates that there is no reversal of factor intensity, meaning that one commodity is labor intensive in both countries and the other good is land intensive in both countries. This is in conformable with the H-O assumption that the production functions are identical for each commodity in both nations.

We can now see how the labor surplus country (china) would export labor intensive good (cloth), and how the land surplus country (Canada) would export land intensive good (wheat).

Take china first:

- The cost of producing one unit of auto is DH amounts of labor and HF land, because the isocost line is tangent to isoquant ***aa*** at point H.
- The cost of producing one unit of wheat is JE (=HD) amount of labor and JF(>HF) amount of land.

Thus, china can produce one yard of cloth cheaper, and has comparative advantage in cloth. Hence, china should specialize in the production of cloth.

Take now the case of Canada.

- The cost of producing one yard of cloth is MG amounts of labor and MT land.
- The cost of producing one kg of wheat is RG (>MG) amounts labor and RN (=MT) land.

Thus, Canada can produce one kg of wheat at relatively lower cost. Canada should specialize in the production of, and export wheat.

Therefore, a country which is relatively abundant in a given factor of production will export a commodity which involves the use of this relatively abundant (cheaper) factor of production.

4.5 The Factor Price equalization theorem

In the previous chapter and earlier in this chapter, we have seen that free trade tends to equalize commodity prices among trading partners.

Can the same be said for factor prices?

A nation with trade finds output expanding in its comparative advantage industries, which uses a lot of the cheap, abundant factor. As a result of the rise in demand for the abundant factor its price increases. At the same time, the scarce, expensive factor is being realized from the comparative disadvantage industries and its price falls along with its demand.

Because this process occurs at the same time in both nations, each nation experiences a rise in the price of the abundant factor and a fall in the price of the scarce factor.

In our example of China and Canada, prior to specialization we have the following situations:

- *China is a labor abundant country and price of labor is lower in china. Canada is a labor scarce country and thus the price of labor is high.*

china has a comparative advantage in cloth (labor intensive good) and specializes in the production of it, while Canada reduces the production of cloth. When china continues to specialize in cloth, the demand for labor tends to rise and the price of labor gets higher and higher. On the other hand, as Canada reduces the production of cloth, the demand for labor decreases and labor becomes cheaper. Thus, trade tends to equalize the price of labor in the two nations.

Similarly, the price of land is higher in china than Canada under autarky. But, as Canada specializes in wheat and reduces the production of wheat, the price of land increases in Canada and decreases in china. Thus, with trade the price of land tends to equalize in the two nations.

We conclude that by redirecting demand away from the scarce factor and toward the abundant factor in each nation, trade leads toward factor price equalization. In each nation, the cheaper factor becomes more expensive, and the expensive factor becomes cheaper. Note that, the factor prices tend to equalize with out actual movement of factors.

Though the factor endowment theory suggested that free trade tends to equalize the factor prices among trading nations, in the real world, differences in factor prices do exist. Ohilin (1933) argued that full factor price equalization can not occur in practice. Ohilin asserted that free trade brings about only a tendency towards factor price equalization, and only partial factor price equalization is possible.

So long as the assumptions underlying the factor endowment theory are not completely born out in the real world, we should not expect that trade can fully equalize the factor prices. For example, the existence transport costs and trade barriers, market imperfections and different technological capabilities limit the extent to which the factor prices and commodity prices can be equal.

Empirical Evidences on factor price equalization

Lets see the tendency towards factor price equalization which was shown in the US auto industry. By the early 1980s, the compensation

of the U.S. auto workers was roughly doubles that of Japanese auto workers. In 1981, the average *general motors'* worker earned hourly wage and benefits of $19.55, compared to the $10.70 earned by the average Japanese auto worker. Due to recession, high gasoline prices, and other factors in US the demand for US produced autos deteriorated. However, the US consumers continued to purchase Japanese automobile to the extent that quota restriction is imposed on the number of autos imported. To save its members' Jobs with struggling U.S. auto companies, the *united auto workers union* reluctantly accepted wage cuts so that the companies could remain in Business.

4.6 Trade and the distribution of income

Can you explain the effect of trade on income distribution?We have seen how free trade can increase the level of output and income for trading nations. Trade also affects the internal distribution of income among owners of resources.

With trade, nations specialize in the production and export of their comparative advantage commodity (the commodity that intensively uses the nation's abundant factor).

This situation increases the demand and price of the abundant factor. At the same time, nations reduce the production of their comparative disadvantage commodities, which results in low demand and prices of the expensive (scarce) input. Trade, thus, tends to redistribute income from the scarce input to the cheap (abundant) input. In our example of china and Canada, trade tends to increase the returns of workers and reduce the returns of land owners in china. The reverse happens in Canada.

4.7. Are actual trade patterns explained by the factor endowment theory?

A. The Leontief paradox

Daer learner! We have seen trade pattern explained by H-O factor endowment theory. Now lets see Leontief paradox. The first comprehensive and detailed investigation of the H-O theory was the one undertaken by Wassily Leontief. It had been widely recognized that in the U.S capital was relatively abundant and labor was relatively scarce. According to the factor endowment theory, one would expect that U.S should export capital intensive goods and its import competing (import) goods should be labor intensive.

In 1954, Leontief tested this proposition by analyzing the capital/labor ratios for some 200 export industries and import competing industries in U.S based 1947 data. Contrary to the H-O theory prediction, Leontief's study has shown that the capital/labor ratio for US export industries was lower (about $14,000 per worker year) than that of its import competing industries (about $18,000per worker year). Leontief concluded that exports were less capital – intensive than import competing goods! These findings, which contradicted the predictions of the H-O theory, became known as ***the Leontief paradox***. See the table below

	Import substitutes	Exports	import/export
Capital	$3,091,339	$2,550,780	
Labor(per person)	70	182	
Capital/ per person years	$18,184	$14,015	1.30

Leontief's paradoxical results simulated similar studies in other countries such as Japan, Canada, India and Germany. The result of these studies became again a paradox. All studies disproved the H-O theory.

Several explanations have been provided to resolve the Leontief paradox and to rehabilitate the H-O theory. Some of these are:

1. The first attempt to explain the Leontief paradox was made by Leontief himself. He asserted that apparent capital abundance in U.S is an illusion. The U.S., Leontief argued, is a labor abundant country because the U.S workers are several times more productive than their foreign counter parts. In particular, Leontief suggested that one man year of U.S labor is equivalent to three man year of foreign labor. The number of workers must, therefore, be multiplied by three in order to correctly estimate the labor supply in U.S. This would then make U.S a labor abundant country and there is no surprise if the U.S exports are labor intensive.
2. Several economists maintained that 1947 was not a normal year, because the World War II reconstruction of the world economy had not been corrected at that time. To silence his critics, Leontief repeated his investigation in 1955 using 1951 trade data. Leontief again determined that U.S import – competing industries were more capital intensive than U.S exports.

Leontief paradox would be better understood if we take in to account the methodological procedure which Leontief adopted in his

work. Leontief didn’t study the capital labor ratio of the goods which were actually imported by the U.S. Instead, he studied the capital labor ratio in the import replacement goods produced in U.S. If Leontief had studied the capital labor ratios in the goods actually imported by U.S, he would have certainly found them to be labor intensive imports.

B/ Recently (1990), a research was made on the validity of H-O theory by taking the U.S. trade with China by two economists, Sachs and Shatz.

It is a widely held fact that human capital (skilled labor) is abundant, but unskilled labor is scarce in U.S. Conversely, China is rich in unskilled labor.

Thus, the H-O theory predicts that the U.S will export to China goods for which a large amount of skilled labor is used; and China will export to US goods for which a large amount of unskilled labor is used.

The researchers did the following to test the H.O theory

- They took 131 sample industries
- They divided these industries in to 10 groups according to their skill intensity such that the industries of group one embodied the highest number of skilled workers and the industries of group 10 were the least skill intensive.

The result of the study strongly confirmed (supported) the H-O theory conclusion. U.S exports to China were concentrated in the higher skilled industries: 78 percent of U.S exports to China were originated from the three most skill- intensive groups of industries. Conversely, Chinese exports to the U.S fell in to the lower skill industries: 41 percent of Chinese exports to U.S were originated from the two least skill – intensive groups of industries.

Self-assessment question 4.2

1. Explain the factor price equalization theorem.

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2. How does the Heckscher-Ohlin theory differ from the Ricardian theory in explaining the trade patterns?

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4.8 Economies of scale and specialization

What is economies of scale? What is the effect of comparative advantage? Another explanation of trade patterns involves efficiencies of large-scale production, which reduce a firm's per-unit costs. Such economies of scale are pronounced in industries that use mass-

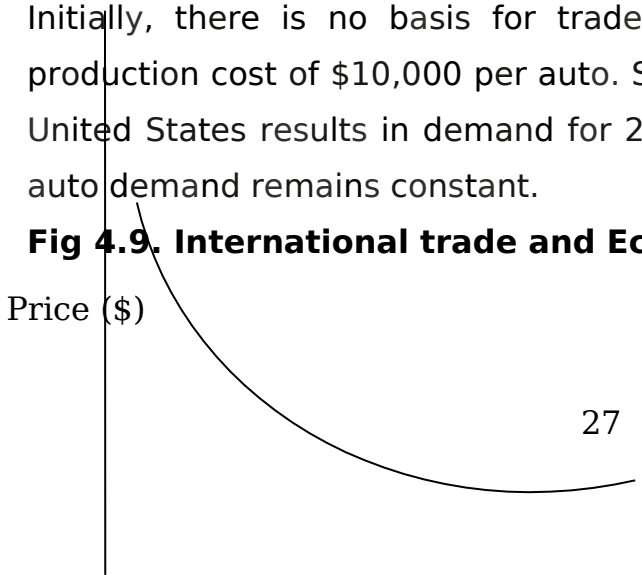
production techniques and capital equipment. The economic justification for economies of scale is that a large organization may reduce costs by specializing in machinery and labor, operating assembly-line production using its by-products, and obtaining quantity discounts obtained on the purchase of inputs.

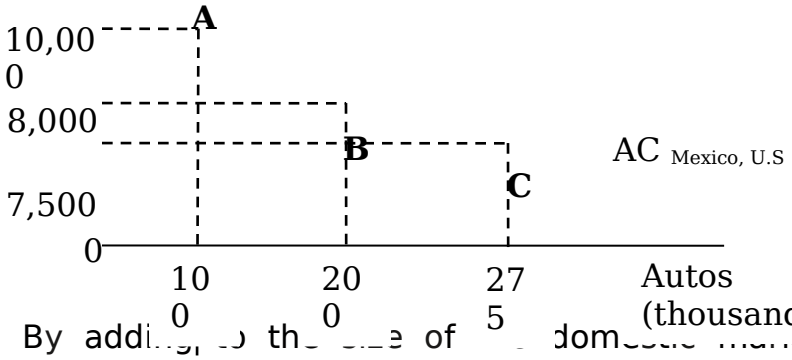
How do economies of scale underlie a nation's comparative advantage? Adam Smith gave the answer in his 1775 classic, *The Wealth of Nations,* which stated that the division of labor is limited by the size of the market. By widening the size of a firm's market, international trade permits the firm to take advantage of longer production runs, which lead to increasing efficiency. An example is Boeing, which has sold about half of its jet planes overseas in recent years. Without exports, Boeing would have found it difficult to cover the large design and tooling costs of its jumbo jets, and the jets might not have been produced at all.

The following figure illustrates the effect of economies of scale on trade. Assume that a U.S. auto firm and a Mexican auto firm are each able to sell 100,000 vehicles in their respective countries. Also assume that identical cost conditions result in the same long-run average cost curve for the two firms, *AC.* Note that economies of scale result in decreasing unit costs over the first 275,000 autos produced.

Initially, there is no basis for trade, because each firm realizes a production cost of $10,000 per auto. Suppose that rising income in the United States results in demand for 200,000 autos, while the Mexican auto demand remains constant.

Fig 4.9. International trade and Economies of scale





By adding to the size of the domestic market, international trade permits longer production runs by domestic firms, which can lead to greater efficiency and reductions in unit costs.

The larger demand allows the u.s. firm to produce more output and take advantage of economies of scale. The firm's cost curve slides downward until its cost equals $8,000 per auto. Compared to the Mexican firm, the u.s. firm can produce autos at a lower cost. With free trade, the United States will now export autos to Mexico.

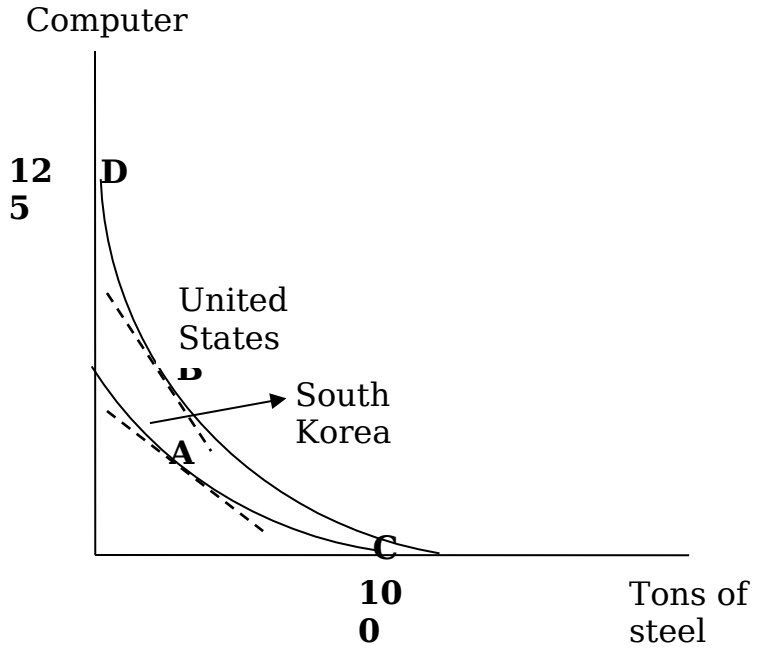
Economies of scale thus provide additional cost incentives for *specialization* in production. Instead of manufacturing only a few units of each and every product that domestic consumers desire to purchase, a country specializes in the manufacture of large amounts of a limited number of goods and trades for the remaining goods. Specialization in a few products allows a manufacturer to benefit from longer production runs, which lead to decreasing average costs.

How might trade operate with economies of scale? The following figure represents the production possibilities schedules of the United States and South Korea for computers and steel. Note that the two nations' production possibilities schedules are *bowed inward* (convex from the diagram's origin), indicating that the cost of producing steel becomes less and less in terms of computers sacrificed. At each point, the

(absolute) slope of the production possibilities schedule reflects the cost of steel in terms of computers sacrificed.

Without trade, suppose South Korea and the United States desire both computers and steel. Both countries would have to manufacture some of each good at inefficient points, such as point A for South Korea and point B for the United States. Reflecting the (absolute) slopes of the production possibilities schedules at these points, South Korea has a comparative advantage in steel, while the United States has a comparative advantage in computers. The two countries should not remain for long at these inefficient production points.

Fig 4.10. Economies of scale and patterns of international trade



With decreasing costs, a country has the cost incentive to specialize completely in the product of its comparative advantage. Devoting additional resources to steel (computer) production results in economies of large-scale production and

falling unit cost. With specialization, South Korea produces 100 tons of steel at point C, while the United States produces 125 computers at point D.

They can reduce costs by *specializing completely* in the production of the goods of their comparative advantage.
As South Korea moves to the right of point *A* along its production possibilities schedule, the relative cost of steel continues to decrease until South Korea totally specializes in steel production at point C. Similarly, as the United States moves to the left of point *B* along its production possibilities schedule, the relative cost of computers continues to fall until the United States totally specializes in computer production at point D. With trade, both countries can attain consumption points that are superior to those attained in the absence of trade.

4.10 Summary

The immediate basis for trade stems from relative commodity price differences among nations. Because relative prices are determined by supply and demand conditions, such factors as resource endowments, technology, and national income are important determinants of the basis for trade.

The Heckscher-Ohlin theory suggests that differences in relative factor endowments among nations underlie the basis for trade. The theory asserts that a country will export that commodity in the production of which a relatively large amount of its abundant and cheap resource is used. Conversely, it will import commodities in the production of which a relatively scarce and expensive resource is used. The theory also

states that with trade, the relative differences in resource prices will be eliminated.

The validity of factor endowment theory however depends on the demand patterns of the trading nations. A nation would export the commodity of its comparative advantage only if its consumption bias is towards different commodities than the commodity of its comparative advantage. Otherwise, a nation may import, instead of export, the commodity of its comparative advantage.

Contrary to the prediction of Heckscher – Ohlin model, the empirical tests of Wassily Leontief demonstrated that for United States exports are labor intensive and import competing goods are capital intensive. His finding became known as the Leontief paradox.

One factor that determines the pattern of trade is economies of scale. By widening the size of domestic market, international trade permits firms to take advantage of longer production runs and increasing efficiencies (such as mass production). Such economies of large scale production can be translated in to lower product prices, which improve a firm’s international competitiveness.

Staffan Linder offers two explanations of world trade patterns. Trade in primary products and agricultural goods conforms well to the factor endowment theory. But trade in manufactured goods is best explained by overlapping demand structures among nations. For manufactured goods, the basis for trade is stronger when the structure of demand in the two nations is more similar-that is when the nations’ per capita incomes are similar.

4.11. Model Examination Questions

1. The Heckscher-Ohlin theory demonstrates that international trade tends to equalize commodity and factor prices. Explain.
2. How can trade affect the distribution of income with in trading partners according to the Heckscher-Ohlin theory?
3. How does the Leontief paradox challenge the overall applicability of the factor endowment theory?
4. How can economies of large- scale production affects the patterns of world trade?
5. According to Linder, there are two explanations of international trade patterns- one for manufactured goods and another for primary (agricultural) goods. Explain.

Chapter Five

Theory of international Commercial policy: The tariff issue

Contents

5.1. Introduction

5.2. The tariff concept

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5.7. Subsidies

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5.9. Domestic Content Requirements

5.10. Economic Sanctions

5.11. Summary

5.12. Model Examination Questions

Aims and Objectives

At the end of this chapter students will be able to explain:

- The different types of trade barriers (such as tariff, quota, domestic content requirement, etc.)
- The motives for these trade barriers, and
- The welfare implications of such barriers for the trading nations, and the world as a whole.

5.1 Introduction

In the previous chapters we have seen different trade theories. The conclusion of all the trade models presented so far is that free trade leads to the most efficient use of world resources. When nations specialize according to the comparative-advantage principle, the level of world output is maximized. Not only does free trade enhance world welfare, but it can also benefit each participating nation. Free trade generally allows each nation to consume a combination of goods that exceeds the best it can produce in isolation.

However, free-trade policies meet major resistance among those companies and workers who face losses in income and jobs because of import competition. Most of the time, policy makers face dilemma between the appeal of greater global efficiency made possible by free trade and the needs of the voting public whose main desire is to preserve short-run interests such as employment and income. The benefits of free trade may take years to achieve and are spread out over wide segments of society, whereas the costs of free trade are immediate and fall on specific groups (for example, workers in the import-competing industry).

Researchers at Harvard University have investigated the factors that make people more likely to favor or oppose free trade. Analyzing a survey of more than 28,000 people in 23 countries, they found the expected result that well-educated people in well-educated countries are more likely to favor free trade, while workers in industries exposed to foreign competition in any country are more likely to be against it. Surprisingly, however, even well-educated workers in poorer nations tend to be against free trade.

This opposition, from those who might be expected to be allies of globalization, may make it more difficult to extend free trade.

This chapter considers barriers to free trade. In particular, it focuses on the role that tariffs play in the global trading system.

5.2 The tariff concept

Dear reader! We have no doubt that you will always hear the name 'tariff' through medias. How do you understand it? What types of tariffs do you know? A tariff is simply a tax (duty) levied on a product when it crosses national boundaries. The most widespread tariff is the *import tariff,* which is a tax levied on an imported product. A less common tariff is an *export tariff,* which is a tax imposed on an exported product. Export tariffs have often been used by developing nations. For example, cocoa exports have been taxed by Ghana, and oil exports have been taxed by the Organization of Petroleum Exporting Countries (OPEC) in order to raise revenue or promote scarcity in global markets and hence increase the world price.

In our country, for instance, tariff is imposed on coffee export. However, to promote exports the current government has lifted export tariff from other export commodities.

a. Why tariff?

Tariffs are imposed for two reasons: protection or revenue purposes. A protective tariff is designed to protect import-competing producers from foreign competition. A protective tariff generally is not intended to totally prohibit imports from entering the country, but rather it is

used to place foreign producers at a competitive disadvantage when selling in the domestic market. A revenue tariff, on the other hand, is imposed for the purpose of generating tax revenues for the government and may be imposed on either exports or Imports. Revenue tariffs are more common in developing nations than developed nations.

 **Self-assessment question 5.1**

1. Why governments impose tariff?

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b.Types of tariffs

Tariffs can be specific, ad valorem, or compound.

A specific tariff is expressed in terms of a fixed amount of money per physical unit of the imported product. For example, an Ethiopian importer of a German computer may be required to pay a duty to the Ethiopian government of birr1000 per computer, regardless of the computer's price.

An ad valorem tariff is much like a sales tax. It is expressed as a fixed percentage of the value of the imported product. For example, an Ethiopian importer of automobile may be required to pay a duty of 300% of the price of the automobile to the Ethiopian government.

A compound tariff is a combination of specific and ad valorem tariffs. For example, an Ethiopian importer of a television might be required to pay a duty of birr200 plus 5 percent of the value of the television.

Self-assessment question 5.2

1. What is the difference between compound tariff &specific tariff?

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2. What is the difference between specific tariff & *An ad valorem tariff?*?

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Dear reader, now let's see the relative merits of specific, ad valorem, and compound tariffs and the specific cases where they are appropriate.

i) Specific tariff

As a fixed monetary duty per unit of the imported product, a specific tariff is relatively easy to apply and administer, particularly to standardized commodities and staple products where the value of the dutiable goods cannot be easily observed. A main disadvantage of a specific tariff is that the degree of protection it provides to domestic producers varies inversely with changes in import prices. For example, a specific tariff of birr 1,000 on autos will discourage imports priced at $20,000 per auto to a greater degree than those priced at birr 25,000. During times of rising import prices, a given specific tariff loses some of its protective effect. The result is to encourage domestic firms to produce less expensive goods, for which the degree of protection against imports is higher. On the other hand, a specific tariff has the

advantage of providing domestic producers more protection during a business recession, when cheaper products are purchased. Specific tariffs thus protect domestic producers progressively against foreign competitors who cut their prices.

ii) Ad valorem tariff

Ad valorem tariffs are appropriate usually to manufactured goods, because they can be applied to products with a wide range of grade variations. As a percentage applied to a product's value, an ad valorem tariff can distinguish among small differentials in product quality to the extent that they are reflected in product price. Under a system of ad valorem tariffs, a person importing a birr200, 000 Honda would have to pay a higher duty than a person importing a birr199, 900 Toyota. Under a system of specific tariffs, the duty would be the same.

Another advantage of an ad valorem tariff is that it tends to maintain a constant degree of protection for domestic producers during periods of changing prices. If the tariff rate is 20 percent ad valorem and the imported product price is $200, the duty is $40. If the product's price increases, say, to $300, the duty collected rises to $50; if the product price falls to $100, the duty drops to $20. An ad valorem tariff yields revenues proportionate to values, maintaining a constant degree of relative protection at all price levels. An ad valorem tariff is similar to a proportional tax in that the real proportional tax burden or protection does not change as the tax base changes. In recent decades, in response to global inflation and the rising importance of world trade in

manufactured products, ad valorem duties have been used more often than specific duties.

The major disadvantage of an ad valorem tariff is that determination of duties under the ad valorem principle at first appears to be simple, but in practice it has suffered from administrative complexities. The main problem has been trying to determine the value of an imported product, a process referred to as ***customs valuation***. Import prices are estimated by customs appraisers, who may disagree on product values. Moreover, import prices tend to fluctuate over time, which makes the valuation process rather difficult.

Another customs-valuation problem stems from variations in the methods used to determine a commodity's value. For example, the United States has traditionally used free-on-board (FOB) valuation, whereby the tariff is applied to a product's value as it leaves the exporting country. But European countries have traditionally used a cost-insurance-freight (CIF) valuation, whereby ad valorem tariffs are levied as a percentage of the imported commodity's total value as it arrives at its final destination. The CIF price thus includes transportation costs, such as insurance and freight.

iii) Compound duties

Compound duties are often applied to manufactured products embodying raw materials that are subject to tariffs. In this case, the specific portion of the duty neutralizes the cost disadvantage of domestic manufactures that results from tariff protection granted to domestic suppliers of raw materials, and the ad valorem portion of the duty grants protection to the finished-goods industry. In the United States, for example, there is a compound duty on woven fabrics (48.5 cents per kilogram plus 38 percent).

The specific portion of the duty (48.5 cents) compensates U.S. fabric manufacturers for tariff protection granted to U.S. cotton producers(note that the tariff protection granted to the U.S's cotton producers will result in higher production cost for domestic woven fabrics, and when the U.S government imposes a compound duty on imports of woven fabrics, the specific portion of the duty is aimed at compensating the domestic producers for their rising costs due to tariff imposed on import of cotton), while the ad valorem portion of the duty (38 percent) provides protection for their own woven fabrics.

 **Self-assessment question 5.3**

Explain the advantages & disadvantages of:

A. specific tariff

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_____

B. Ad valorem tariff

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_____

C. Compound duties

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5.3 Effective rate of protection

A main objective of an import tariff is to protect domestic producers from foreign competition. By increasing the domestic price of an

import, a tariff serves to make home-produced goods more attractive to domestic consumers. Output in the import-competing industry can thus expand beyond what would exist in the absence of a tariff. *The degree of protection afforded by a tariff reflects the extent to which domestic prices can rise above foreign prices and the home producers can still be competitive in the market*.

The nominal tariff rate published in a country's tariff schedule gives us a general idea of the level of protection afforded the home industry. But it may not always truly indicate the actual, or effective, protection given. For example, it is not necessarily true that a 25-percent import tariff on an automobile provides the domestic auto industry a protective margin of 25 percent against foreign producers. This is because the nominal tariff rates apply only to the total value of the final import product. But in the production process, the home import-competing industry may use imported material inputs or intermediate products that are subject to a different tariff than that on the final product; in this case, the effective tariff rate will differ from the nominal tariff rate.

The effective tariff rate is an indicator of the actual level of protection that a nominal tariff rate provides the domestic import-competing producers. It signifies the total increase in domestic productive activities (value added) that an existing tariff structure makes possible, compared with what would occur under free-trade conditions. The effective rate tells us how much more expensive domestic production can be relative to foreign production and still compete in the market.

Assume that the domestic radio industry adds value to imported inputs by assembling component radio parts imported from abroad. Suppose the imported components can enter the home country on a duty-free

basis. Suppose also that 20 percent of a radio's final value can be attributed to domestic assembly activities (value added), the remaining 80 percent reflecting the value of the imported components. Furthermore, let the cost of the radio components be the same for both the domestic country and the foreign country. Finally, assume that the foreign country can produce a radio for $100.

Suppose the home country imposes a nominal tariff of 10 percent on finished radios, so that the domestic import price rises from $100 to $110 per unit. Does this mean that home producers are afforded an effective rate of protection equal to 10 percent? Certainly not! The imported component parts enter the country duty-free (at a nominal tariff rate less than that on the finished import product), so the effective rate of protection is 50 percent. Compared with what would exist under free trade, domestic radio producers can be 50 percent more costly in their assembly activities and still be competitive!
Under free trade (zero tariffs), a foreign radio could be imported for $100. To meet this price, domestic producers would have to hold their assembly costs down to $20, because they should pay $80 for imported components. But under the protective umbrella of the tariff, domestic producers can afford to pay up to $30 for assembly and still meet the $110 domestic price of imported radios, given the cost of imported components. The result is that domestic assembly costs could rise to a level of 50 percent above what would exist under free trade conditions: ($30 - $20)/$20 = 0.5.
In general, the effective tariff rate is given by the following formula:

$$e = \frac{(n - ab)}{(1 - a)}$$

Where

e = the effective rate of protection

n = the nominal tariff rate on the final product

a = the ratio of the value of the imported input to the value of the final product

b = the nominal tariff rate on the imported input

When the values from the radio example are plugged into this formula, we obtain

$$e = \frac{0.1 - 0.8(0)}{1 - 0.8} = 0.5$$

The nominal tariff rate of 10 percent levied on the final import product thus affords domestic production activities an effective degree of protection equal to 50 percent-five times the nominal rate.

Two consequences of the effective-rate calculation are worthy of mention. First, the degree of effective protection increases as the value added by domestic producers declines (the ratio of the value of the imported input to the value of the final product increases). In the formula, the higher the value of *a*, the greater the effective-protection rate for any given nominal tariff rate on the final product. Second, a tariff on raw material imports used in the production process reduces the level of effective protection. The higher the value of *b*, the lower the effective protection rate for any given nominal tariff on the final product. In the formula, as *b* rises, the numerator of the formula decreases and hence *e* decreases. Note that is possible for the effective tariff rate to assume a negative value, depending on the values of the components in the formula for the calculation of the effective-tariff rate.

Generalizing from this analysis, *when material inputs or intermediate products enter a country at a very low duty while the final imported commodity is protected by a high duty, the result tends to be a high protection rate for the domestic producers.* The nominal-tariff rate on finished goods thus understates the effective rate of protection. But when a tariff is imposed on imported input that exceeds that on the finished good, the nominal-tariff rate on the finished product would tend to overstate its protective effect. Such a situation might occur if the home government desired to protect suppliers of raw materials more than domestic manufacturers.

Tariff Escalation

What is tariff escalation?

Dear students! We seen how to calculate effective rate of protectionism, now let's see tariff escalation. In many industrialized nations the effective rate of protection is more than twice the nominal rate. An apparently low nominal tariff on a final import product may thus understate the effective rate of protection, which takes into account the effects of tariffs levied on raw materials and intermediate goods.

In addition, the tariff structures of industrialized nations have generally been characterized by rising rates that give greater protection to intermediate and finished products than to primary commodities. This is commonly referred to as ***tariff escalation***. Although raw materials are often imported at zero or low tariff rates, the nominal and effective protection increases at each stage of production. Tariffs often rise significantly with the level of processing in many industrial countries. This is especially true for agricultural products.

The tariff structures of the industrialized nations may indeed discourage the growth of processing, thus hampering diversification into higher value-added exports for the less-developed nations. The industrialized nations' low tariffs on primary commodities encourage the developing nations to expand operations in these sectors, while the high protective rates levied on manufactured goods pose a significant entry barrier for any developing nation wishing to compete in this area. From the point of view of the less-developed nations, it may be in their best interest to discourage disproportionate tariff reductions on raw materials. The effect of these tariff reductions is to magnify the discrepancy between the nominal and effective tariffs of the industrialized nations, worsening the potential competitive position of the less developed nations in the manufacturing and processing sectors.

 **Self-assessment question 5.4**

1. If nominal tariff rate on final products 20%, ratio of value of imported inputs to value of final product is 50%, nominal tariff rate on imported inputs is zero, then calculate the effective rate of protectionism.

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_____

2. What is the effect of tariff structure of developed nations manufactured &processed products?

_____

_____

3. Under what conditions does a nominal tariff applied to an import product overstate or understate the actual, or effective, protection afforded by the nominal tariff?

_____

_____

4. How can the developed nation’s tariff escalation hinder industrialization in the developing nations?

_____

_____

5.4 Welfare Effects of Tariff

Consumer and producer surplus

What is the effect of tariff on national welfare? What is consumer surplus &producer surplus? To analyze the effect of trade policies on national welfare, it is useful to separate the effects on consumers from those on producers. For each group, a measure of welfare is needed and we use the consumers and producers surplus to measure the welfare of each.

Consumers’ surplus is the difference between the maximum amount buyers are willing to pay for a given quantity of a good and the amount actually paid. Graphically, consumer surplus is represented by the area under the demand curve and above the good’s market price.

Producers’ surplus, on the other hand, is the revenue producers’ receive over and above the minimum necessary for production. Graphically, the producer surplus is represented by the area above the supply curve and below the good’s market price.

A. Welfare effects of tariff: small- Nation model

Assume the case a nation whose imports constitute a very small portion of the world market supply. This small nation would be a price taker, facing a constant world price level for its import commodity. In fact, this is not a rare case; many nations in the world are not important (large) enough to influence the terms at which they trade (the world price of a commodity).

Referring to the following figure, the small nation before trade produces at market equilibrium point E, as determined by the intersection of its domestic supply and demand schedules. At equilibrium price $ 9,500, the quantity supplied and demanded is 50 units.

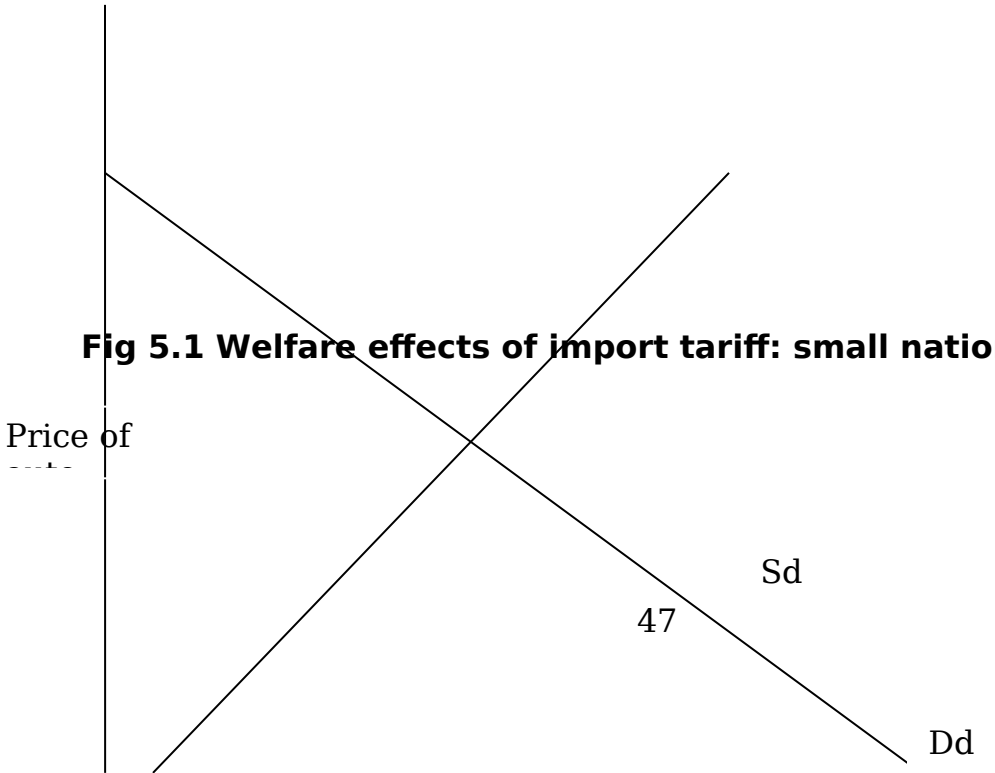
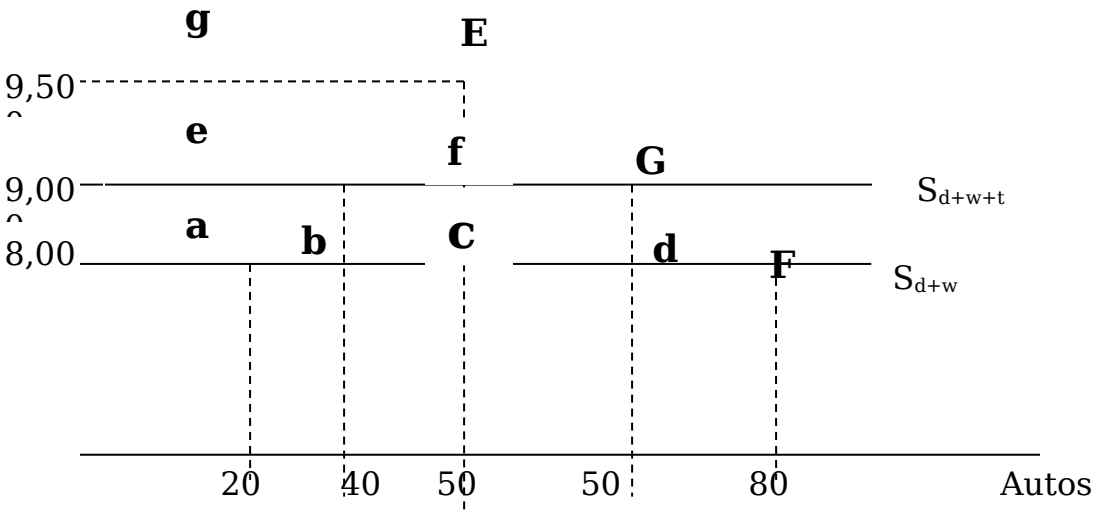


Fig 5.1 Welfare effects of import tariff: small nation model

H



Now suppose that the economy is opened to foreign trade and that the world auto price is $ 8,000, less than the domestic price. Because the world market will supply an unlimited number of autos at price $ 8,000, the world supply schedule would appear as a horizontal (perfectly elastic) line. Line S_{d+w} shows the supply of autos available to the small nation consumers from the domestic and foreign sources combined. This over all supply is the one that would prevail in free trade.

Free trade equilibrium is located at point F in the figure. At this equilibrium point:

- The number of autos demanded is 80 units

- The domestic producers will supply 20 units, and
- The excess auto demand of 50 units (80 units – 20 units) will be fulfilled by imports.

Compared with the situation before trade occurred, free trade results in:

- a fall in the domestic price from $ 9,500 to $ 8,000
- consumers are better off because they can import more autos at a lower price.
- domestic producers of auto now sell fewer autos at a lower price than they did before trade.

Under free trade, the domestic auto industry is being damaged by foreign competition. Industry sales and revenues are falling, and workers are losing their jobs. Suppose management and labor unite, and convince the government to levy a protective tariff on auto imports. Assume a small nation government imposes a specific tariff of $ 1,000 on auto imports. Because this small nation is not important enough to influence market conditions, the world supply price of auto remains constant, unaffected by the tariff. This means that the small nation’s terms of trade remains unchanged.

How ever, the introduction of the tariff raises the home prices of imports by the full amount of the duty, and the increase falls entirely

on the domestic consumers. As a result, the overall supply curve shifts upward by the amount of tariff, from S_{d+w} to S_{d+w+t}.

The protective tariff results in a new equilibrium quantity at point G, where:,

- domestic auto price is $ 9,000,
- domestic production increases by 20 units, where as domestic consumption falls by 20 units, and
- imports decrease from their pre tariff level of 50 units to 20 units. This reduction can be attributed to falling domestic consumption and rising domestic production.

The effects of the tariff are to impede imports and protect domestic producers. *But what are the effects of tariff on national welfare?*

From the figure above,

- Before the tariff was levied, consumer surplus equaled areas ***a + b + c + d + e + f +g***. With tariff, the consumer surplus equals to areas ***a + b + c + d***. This change affects the nation's welfare in a number of ways. The welfare effects of tariff can be decomposed in to revenue effects, a redistribution effects protective effect and a consumption effect.

i) The revenue effect

Tariff provides the government with additional tax revenue. The revenue effect thus represents the government's collection of duty. The government revenue equals area 'C' (which can be found by multiplying the quantity imported by the specific tariff i.e.20x $1,000 = 20,000). This represents the portion of the loss of consumer surplus, in monetary terms, that is transferred to the government.

For the nation as a whole, the revenue effect does not result in an overall welfare loss; consumer surplus is merely shifted from the private to the public sector.

ii) The redistributive effect

This represents part of consumer surplus that is transferred to the domestic producers of import competing industry. This is represented by area '**a**' which equals $30,000.

Before tariff (under free trade), domestic consumers will buy from domestic firms only 20 autos at a price of $ 8,000, for a total expenditure of $ 150,000. With tariff, however, the price of auto rises to $ 9,000 in the domestic market and domestic producers supply 40 autos. The total revenue of the domestic auto industry becomes $ 350, 000. That is the imposition of tariff results in additional revue of ***a + b*** for the domestic producers. However, producers must pay part of the increased revenue as higher costs of producing the increased put. This depicted by area '***b***' which equals $ 10,000. The remaining revenue,

area ‘a’ which equals $ 30,000 is a net gain of domestic producers as a result of imposition of tariff.

The redistributive effect, therefore, represents a transfer of income from consumers to producers. Like the revenue effects, it does not result in an overall loss of welfare for the nation.

iii) Protective effect

This is represented by area ‘b’, totaling $10.000. It illustrates the loss to the domestic economy resulting from wasted resources used to produce additional autos at increasing costs. As the tariff – induced domestic auto production expands, resources that are less adaptable to auto production are eventually used, increasing unit production costs. This means that resources are used less efficiently than they would have been with free trade, in which case autos would have been purchased from low – cost foreign production. A tariff’s protective effect thus arises because less efficient domestic production is substituted for more efficient foreign production. Referring to the above figure, as domestic auto production increases from 20 to 40 units, the domestic cost of production rises, as shown by the supply schedule S_d. But the same increase in auto could have been obtained at a unit cost of $8,000 before the tariff was levied. Area ***b***, which

depicts the protective effect, thus represents a real welfare loss to the economy.

iv) The Consumption effect

Most of the consumer surplus lost because of the tariff has been accounted for:

c – went to the government as revenue;

a – was transferred to home suppliers as income, and

b –was lost by the economy because of in efficient domestic production.

The consumption effect, represented by area ***d***, which equals $ 10, 000, is the residual not accounted for else where. It arises from the increased price and lower consumption resulting from tariff imposition. Like the protective effect, the consumption effect represents a real cost to the society, not a transfer to other sectors of the economy. Together, these two effects (***b+d***) equal the ***dead weight loss*** of the tariff.

As long as it is assumed that a small nation accounts for a negligible portion of international trade, its levying an import tariff necessarily lowers its national welfare. This is because there is no favorable welfare effect resulting from the tariff, which would offset the dead

weight loss of consumer surplus. If a nation could impose a tariff that would improve its terms of trade vis-à-vis its trading partners, it would enjoy a larger share of the gains from trade. This would tend to increase its national welfare, offsetting the dead weight loss of the consumer surplus. Because it is so insignificant relative to the world market, however, a small nation is unable to influence the terms of trade. Levying an import tariff, therefore, reduces a small nation's welfare.



Self-assessment question 5.5

If domestic equilibrium price $50(million) before trade &quantity supplied is 50 autos world price of auto after trade is 40$.Now home nation introduce 10(million dollar) import tariff.

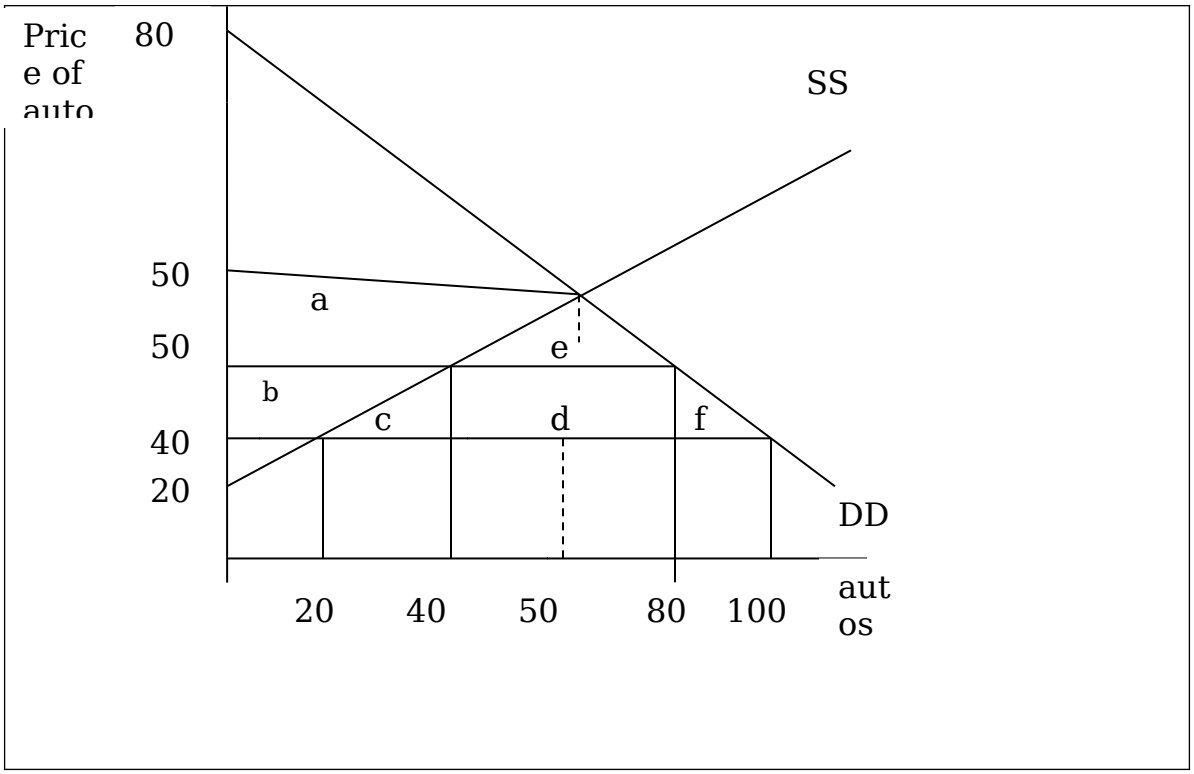
Calculate

a. consumer surplus before &after tariff

b. producer surplus before &after tariff

c. dead weight loss

d. government revenue



B. Tariff welfare effects: Large – nation model

Dear learner! In the previous section we have seen that imposing an import tariff generally adversely affects the welfare of small nation. Now consider the case of an importing nation that is large enough so that changes in its quantity of imports, by means of tariff policy, influence the world price of the product.

This large-nation case could apply to the United States, which is a large importer of autos, steel, oil and consumer electronics, and to other economic giants such as Japan and the European Union.

If the U.S imposes a tariff on automobile imports from Japan, price increases for American consumers. The result is a decrease in the

quantity demanded, which may be significant enough to force Japanese firms to reduce the price of their exports. Because Japanese firms can produce and export smaller amounts at a lower marginal cost, they are likely to prefer to reduce their price to the United States not to loose their customers.

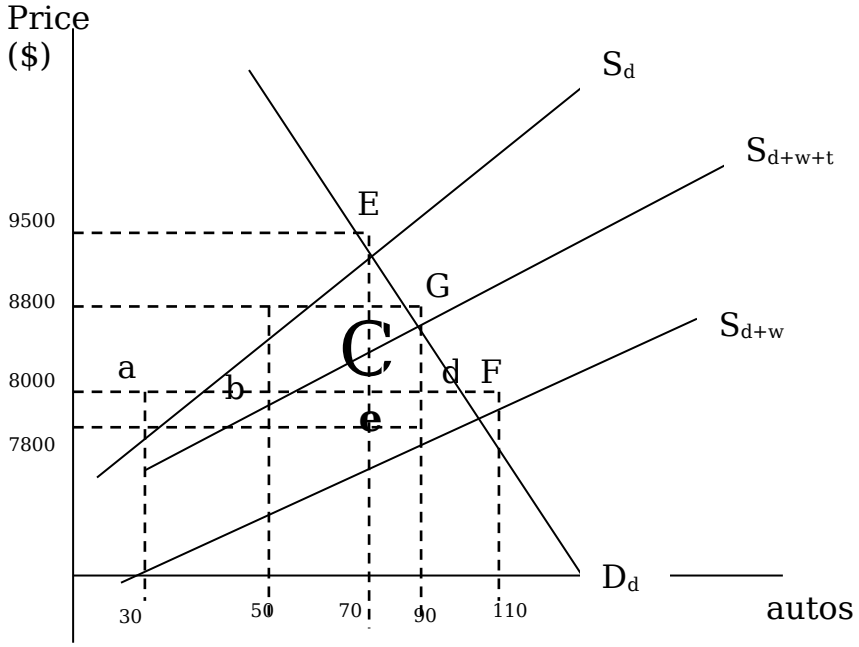
The tariff incidence is thus shared between U.S consumers, who pay a higher price than under free trade for each auto imported, and Japanese firms, which realize a lower price than under free trade for each auto exported. The U.S welfare rises when she can shift some of the tariff to Japanese firms via export price reductions. Thus, the terms of trade improves for the U.S at the expense of Japan.

What are the economic effects of an import tariff for a large country?

Referring to the figure below, suppose lines Sd and D_d represent the domestic supply and demand schedule. Autarky equilibrium occurs at point E. With free trade, the importing nation faces a total supply schedule of S_{d+w}. This schedule shows the number of autos that both domestic and foreign producers together offer domestic consumers. The total supply curve is up ward sloping because the foreign supply price is not constant. The price depends on the quantity purchased by an importing country when it is a large buyer of the product. With free trade, the domestic country (U.S) achieves equilibrium at point F. The price of auto falls to $ 8,000, domestic consumption rises to 110 units,

and domestic production falls to 30 units. The excess auto demand (80 units) will be satisfied through import.

Fig 5.2 Welfare effects of import tariff: Large nation model



Suppose that the importing nation imposes a specific tariff of $ 1,000 on imported autos. By increasing the selling cost, the tariff results in a shift in the total supply schedule from S_{d+w} to S_{d+w+t}. Market equilibrium shifts from point F to point G, while the product price rises from $ 8,000 to $ 8,800.

The tariff – levying nation's consumer surplus falls by an amount equal to area ***a + b + c + d***.

- Area '***a***' totaling $32,000 represents the redistributive effect; this amount is transferred from domestic consumers to domestic producers.

- Areas ***d + b*** depict the tariff's dead weight loss, the deterioration in national welfare because of reduced consumption (consumption effect = $ 8,000) and an inefficient use of resources (protective effect = $ 8,000).
- Areas ***c +e*** show a tariff's revenue effect. As in the small nation example, the revenue effect equals the import tariff rate multiplied by the quantity of autos imported (= $ 40,000). Notice, how ever, that the tariff revenue accruing to the government now comes from foreign producers as well as domestic consumers. This differs from the small–nation case, in which the supply schedule is horizontal and the tariff's burden falls entirely on domestic consumers.

The tariff of $1,000 is added to the free- trade import price of $8,000. Although the price in the protected market will exceed the foreign supply price by the amount of the duty, it will not exceed the free-trade foreign supply price by this amount. Compared with the foreign supply price, $8,000 the domestic consumers pay only an additional $800 per imported auto. This is the portion of tariff shifted forward to the consumers. At the same time, the foreign suppliers earn smaller revenue, $ 7,800 for each auto exported. Because foreign production takes place under increasing – cost conditions, the reduction of imports from abroad results in a decline in foreign production, and unit costs

decline. The reduction in foreign supply price, $200, represents that portion of the tariff borne by the foreign suppliers. The levying of the tariff raises the domestic price of the import by only part of the duty as foreign producers lower their prices in an attempt to maintain sales in the tariff – levying nation.

The importing nation finds its terms of trade has improved if the price that it pays for auto imports decreases while the price it charges for its exports remain the same. Thus, the revenue effect of an import tariff in the large nation case includes two components.

- The first is the amount of tariff revenue shifted from domestic consumers to the tariff- levying government; area ***c*** denotes the domestic revenue effect.
- The second element is the tariff revenue extracted from foreign producers in the form of a lower supply price. This is called the terms of trade effect and it is represented by area ***e***. The terms of trade effect represents a redistribution of income form the foreign nation to the tariff-levying nation because of the new terms of trade.

The tariff's revenue effect thus includes the domestic revenue effect and the terms of trade effect.

A nation that is importer of a product is in a favorable trade situation. It can use its tariff policy to improve the terms at which it trades, and therefore, its national welfare. But remember that the negative welfare effect of a tariff is the dead weight loss of consumer surplus that results from the protection and consumption effects.

In the figure above, to decide if a tariff levying nation can improve its national welfare, we must compare the impact of the dead weight loss (areas ***b+d***) with the benefit of a more favorable terms of trade(area ***e***). The conclusion regarding the welfare effects of tariff are thus as follows:

1. If ***e > (b + d),*** national welfare is increased.
2. If ***e < (b + d)***, national welfare is diminished
3. If ***e = (b + d),*** national welfare remains constant.

In the preceding example, the domestic economy's welfare would have declined by an amount equal to $ 8,000. This is because the dead weight losses, totaling $15,000, more than offset the $8,000 gain in welfare attributable to the terms of trade effects.

Self-assessment question 5.5

1. When a nation imposes tariff on import commodities, economic inefficiencies develop that reduces the domestic welfare. Explain.

_____

_____

2. Under what conditions an import tariff improve the welfare of an imposing nation?

_____

_____

3. What impact does the imposition of a tariff have on a nation's terms of trade and volume of trade?

_____

_____

Optimum tariff

We have seen that a large nation can improve its terms of trade by imposing a tariff on imports. However, a tariff causes the volume of imports to decrease, which lessens the nation's welfare by reducing its consumption of low – cost imports. There is thus a gain due to improved terms of trade and a loss due to reduction in import volume. A nation thus optimizes its economic welfare by imposing a tariff rate at which the positive difference between the gain of improving terms of trade and the loss of declining import volume is maximized. Such a tariff rate is called ***optimum tariff rate***.

5.5 Non-Tariff Trade Barriers (NTBs)

This section considers policies other than tariffs that restrict international trade, referred to as not tariff trade barriers (NTBs). The

post – World War II success in international negotiations for the reduction of tariffs has made remaining NTBs even more visible.

NTBs encompass a variety of measures. Some have unimportant trade consequences; for example, labeling and packing requirements can restrict trade, but generally only marginally. Other NTBs significantly affect trade patterns; examples include import quotas, voluntary export restraints, subsidies, and domestic content requirements. These NTBs are intended to reduce imports and thus benefit domestic producers. Let’s see them one by one.

5.5.1 Import Quota

An import quota is a physical restriction on the quantity of goods that may be imported during a specific time period; the quota generally limits imports to a level below that would occur under free trade. For example, the Ethiopian government might prohibit the import of more than 1000 automobiles in a given year.

For several reasons that we will soon investigate, import quotas are considered more restrictive than tariffs.

Types of import quota

One way of administering import limitations is thorough a ***global quota***. This technique permits a specified number of goods to be

imported each year, but it does not specify where the product is shipped from or who is permitted to import.

When the specified amount has been imported (the quota is filled), additional imports of the product are prevented for the remainder of the year.

In practice, the global quota becomes un widely used because of the rush of both domestic importers and foreign exporters to get their goods shipped in to the country before the quota is filled. Those who import early in the year get their goods; those who import late in the year may not. More over, goods imported from distant locations tend to be discriminated against because of the longer transportation time. Smaller merchants with out good trade connections may also be at a disadvantage relative to large merchants.

To avoid the problems of global quota system, import quotas are usually allocated to specific countries; this type of quota is called ***selective quota***. For example, Ethiopia might impose a global quota of 1000 automobiles per year, of which 300 must come from Germany, 200 from Italy, 500 from Japan. In this case customs officials in the importing nation monitor the quantity of a particular good that enters

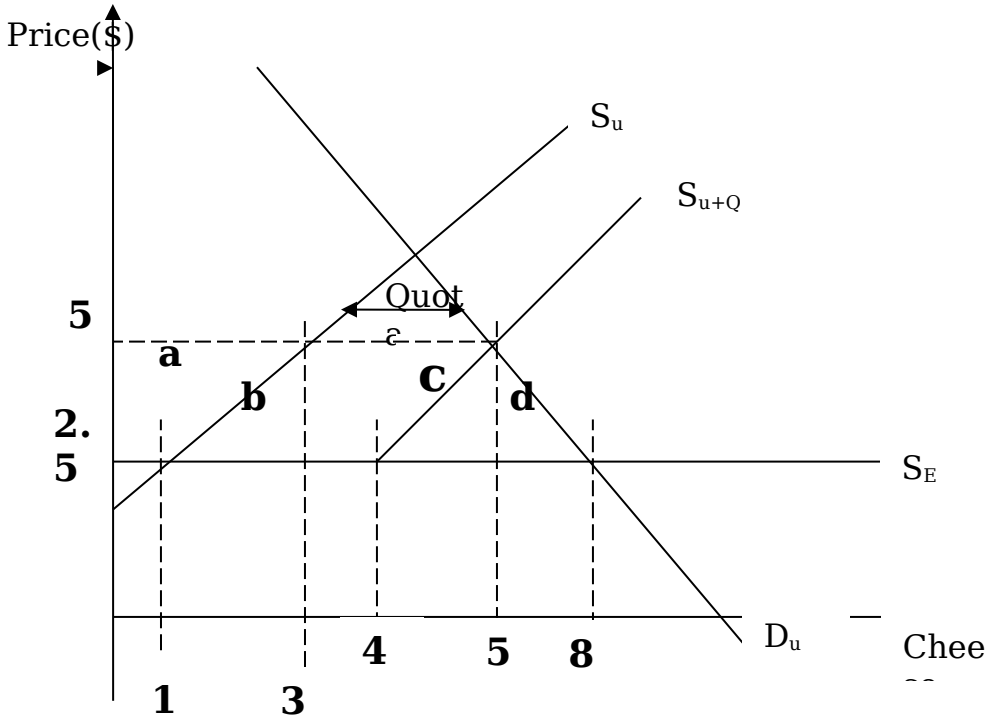
the country from each source; once the quota for that source has been filled, no more goods are permitted to be imported this source.

Import quotas yield higher degree of protection to the domestic producers than equivalent tariffs. This is because their use may lead to domestic monopoly of production and higher prices. Because a domestic firm realizes that foreign producers cannot surpass their quotas, it may raise its prices. Tariffs do not necessarily lead to monopoly power, because no limit is established on the amount of goods that can be imported in to the nation.

5.5.2 Trade and welfare effects of import quota

Like a tariff, an import quota affects an economy's welfare. The following figure represents the case of cheese, involving the U.S in trade with European Union. Suppose the United States is a "small" country in terms of the world cheese market. Assume that S_u and D_u denote the supply and demand schedules of cheese in U.S. S_e denotes supply schedule of European Union. Under free trade, the price of European Union cheese and U.S cheese equals $ 2.50 per unit. At this price, U.S firms produce 1 unit, U.S. consumers purchase 8 units, and imports from the European Union total 7 units.

Fig 5.3 Trade and welfare effects of import quota



Suppose the U.S. limits its cheese imports to fixed quantity of 3 units by imposing an import quota. At each price, the total U.S supply of cheese now equals U.S. production plus the quota. This is illustrated in the figure by a shift in the supply curve from S_u to S_{u+Q} .The reduction in imports from 7 units to 3 units raises the equilibrium price to $ 5; this leads to an increase in the quantity supplied by U.S. firms from 1 units to 3 units, and a decrease in U.S. quantity demanded from 8 units to 5 units.

Because the quota results in a price increase to $ 5 per unit, U.S consumer surplus falls by an amount equal to areas ***a + b + c + d***.

- Area '***a***' represents the redistributive effect

- Area '***b***' represents the protective effect, and
- Area '***d***' represents the consumption effect.

The dead weight loss of welfare to the economy resulting from the quota is depicted by the protective effect plus the consumption effect ***(b + d).***

But what about the quota's revenue effect, denoted by area ***C***? This amount arises from the fact that U.S. consumers must pay an additional $2.50 for each of the 3 units of cheese imported under the quota, as a result of the quota – induced scarcity of cheese.

Where does this revenue go?

- One outcome occurs when U.S importers organize as buyers. Such importers might bargain favorably with European Union exporters and purchase cheese at the prevailing world price of $ 2.50 pre unit, reselling the cheese at $ 5 per unit. In this case, the quota's revenue accrues to the U.S importers as profit.
- Alternatively, European exports might organize as sellers and drive up the delivered price of cheese to $ 5 per unit, there by capturing the quota's revenue effect.
- Lastly, another outcome results if the U.S government auctions import licenses to the highest bidder in a competitive market. Such auctions are intended to permit the government to recoup

the quota revenue that would have accrued to the importers in the form of monopoly profits.

Generally, by restricting available supplies of an imported product, a quota leads to higher import prices. This price umbrella allows domestic producers of the import competing goods to raise prices. The result is a decrease in consumer surplus. Of this amount, the welfare loss to the importing nation consists of the protective effect, the consumption effect, and that portion of the revenue effect that is captured by the foreign exporter.

5.7 Subsidies

National governments sometimes grant subsidies to their producers to help improve their trade position. By providing domestic firms a cost advantage, a subsidy allows them to market their products at prices lower than warranted by their actual cost or profit considerations. Governmental subsidies assume a variety of forms, including

- Out right cash disbursements(direct money payments to the producers)
- Tax concessions
- Insurance arrangements, and
- Loans at below- market interest rates.

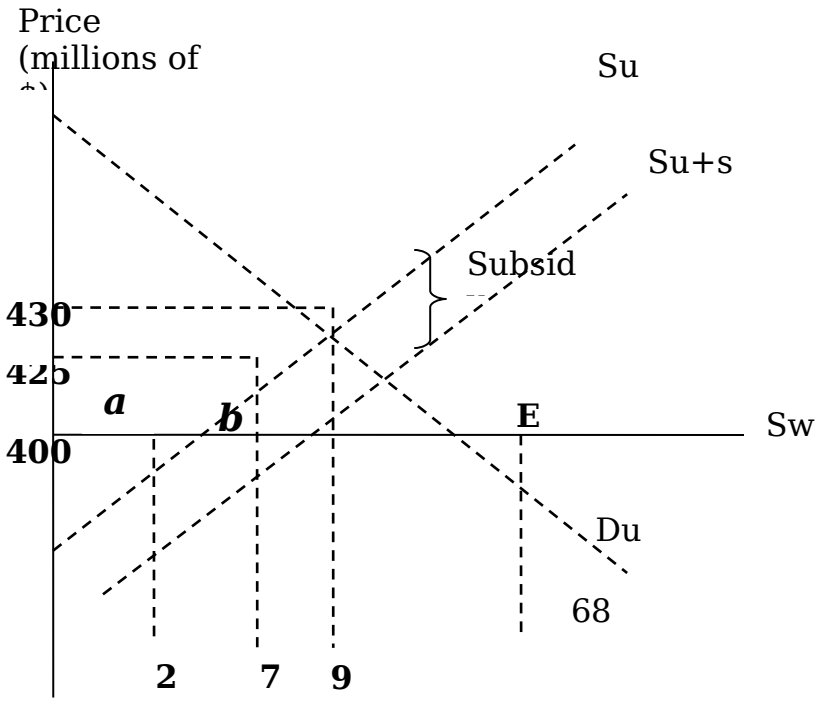
There two types of subsidies: a ***domestic subsidy***, which is sometimes granted to producers of import-competing industries and an ***export subsidy***, which goes to producers of goods that are to be sold overseas.

In both cases, the government adds an amount to the price the purchaser pays rather than subtracting from it. The net price actually received by the producer equals the price paid by the purchaser plus the subsidy. The subsidized producer is thus able to supply a greater quantity at each consumer's price. Now let's see the trade and welfare effects of the two types of subsidy separately.

5.7.1 Trade and Welfare effects of Domestic Subsidy

The following figure (fig 5.4) illustrates the trade and welfare effects of a production subsidy granted to import- competing manufacturers. Assume that the initial supply and demand schedules of the U.S for steel are depicted by curves S_u and D_u, so that the market equilibrium price is $430 per ton. Assume also that, because the U.S is a small buyer of steel, changes in its purchases do not affect the world price of $ 400 per ton. Given a free trade price of $400 per ton, the United States consumes 14 tons of steel, produces 2 tons, and imports 12 tons.

Fig 5.4 Trade and welfare effects of domestic subsidy



To partially insulate domestic producers from foreign competition, suppose the U.S government grants them a production subsidy of $25 per ton of steel. *The cost advantage made possible by the subsidy results in a shift in the U.S supply schedule from S_u to S_{u+s}. Domestic production expands from 2 to 7 million tons, and imports fall from 12 to 7 million tons. These changes represent the subsidy's trade effect.*

The subsidy also affects the national welfare of the U.S. From the above figure, the subsidy permits U.S output to rise from 2 to 7 million tons. Note that, at this output, the net price to the steel maker is $425- the sum of the price paid by the consumer ($ 400) plus the subsidy ($25). To the U.S government, the total cost of protecting its steel makers equals the amount of the subsidy ($25) times the amount of output to which it is applied (7 million tons) or $ 175 million, which is represented by are at ***a+b***.

Where does this subsidy revenue go?

- Part of it is redistributed to the more efficient United States producers in the form of producer surplus. This amount is denoted by area "***a***" in the figure.
- Area "***b***" represents the protective effect, where by more costly domestic output is allowed to be sold in the market as a result of subsidy. To U.S as a whole, the protective effect represents a *dead weight loss of welfare*.

Note that, because consumers pay the same price before and after subsidy, there is no consumer surplus loss due to subsidy. The result is that the familiar consumption effect of protection attached with import tariffs and quota is absent in the subsidy case. Thus,

subsidy tends to yield the same result for domestic producer, as does an equivalent tariff or quota, but at a lower cost in terms of national of national welfare.

However, subsidies are not free goods for they must be financed by someone. The direct cost of the subsidy is a burden that must be financed out of tax revenues paid by the public. Moreover, when a subsidy is given to an industry, it is often in return for accepting government conditions on key matters (such as wage and salary levels). Thus, a subsidy may not be as superior to other types of commercial policies as this analysis suggests.

5.7.2 Trade and Welfare Effects of Export subsidy

Besides attempting to protect import-competing industries, many national governments grant subsidies, including special tax exemptions and the provision of capital at favored rates, to increase the volume of exports. By providing a cost advantage to domestic producers, such subsidies are intended to encourage a nation's exports by reducing the price paid by foreigners. Foreign consumers are favored over domestic consumers to the extent that the foreign price of a subsidized export is less than the product's domestic price.

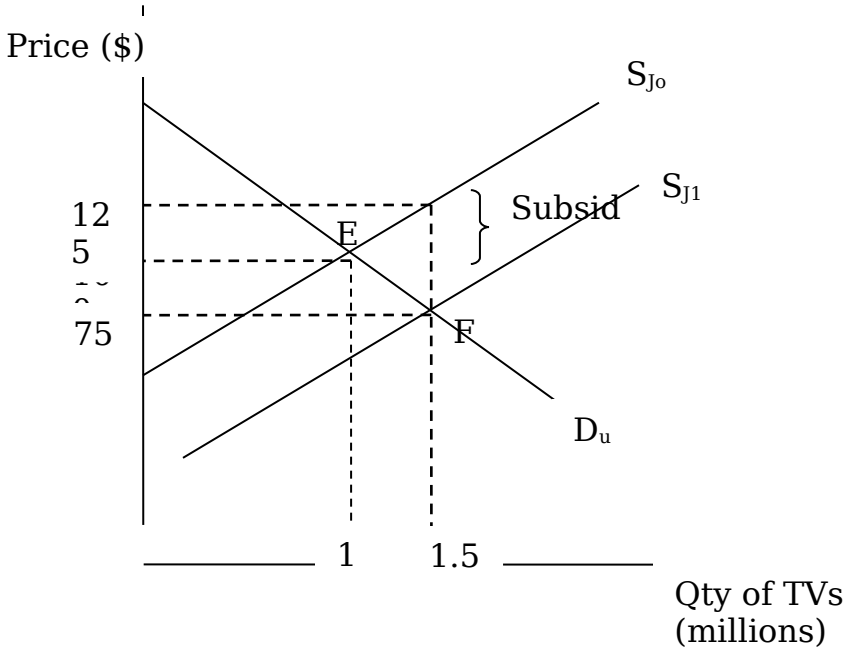
The granting of subsidy yields two direct effects for the home economy: terms of trade effect and an export revenue effect.

- Because subsidies tend to reduce the foreign price of the nation's exports, the home nation's terms of trade is worsened.
- On the other hand, lower foreign prices of export commodity generally stimulate export volume. Should the foreign

demand for export be relatively elastic, so that a given percentage drop in foreign price is more than offset by the rise in export volume, the home nation's export revenue will increase.

The following figure illustrates the case of an export subsidy applied to television sets in trade between Japan and United States.

Fig 5.5 Trade and welfare effects of Export subsidy



In the figure Du depicts U.S nation's demand curve for Japanese TVS and

$S_{J\,o}$ denotes Japanese firms' export supply of television.

Under free trade, market equilibrium exists at point E, when Japan exports 1 million television sets to U.S at a price of $ 100 per unit. Suppose, the Japanese government, to encourage export sales, grants

to its exporters a subsidy of $50 per set. The Japanese supply schedule shifts from $S_{J\,O}$ to S_{J1}, and market equilibrium moves to point F. The terms of trade thus turns against Japan because its export price falls from $ 100 to $75 per television set exported. Whether Japan's export revenue rises depends on how U.S. buyers respond to the price decrease. If the percentage increase in the number of television sets sold to U.S. buyers more than offsets the percentage decrease in price, Japan's export revenue will rise.

Although export subsidies may benefit industries and workers in a subsidized industry by increasing sales and employment, the benefits may be offset by certain costs that fall on the society as a whole.

- Consumers in the exporting nation suffer as the international TOT moves against them. This situation comes about because, given a fall in export prices, a greater number of exports must be exchanged for a given dollar amount in imports.
- Domestic Consumers also find they must pay higher prices than foreigners for the goods they help subsidize.
- Furthermore, to the extent that taxes are required to finance the export subsidy, domestic consumers find themselves poorer.

5.8 Dumping and Anti-dumping strategies

Dumping is a form of international price discrimination. It occurs when foreign buyers are charged lower prices than domestic buyers for an identical product, after allowing for transportation costs and tariff duties. Selling in foreign markets at a price below the cost of production is also considered as dumping.

Forms of dumping

Commercial dumping may take different forms such as sporadic dumping, predatory or persistent. Each type is practiced under different circumstances.

Sporadic dumping (distress dumping)

This occurs when a firm disposes of excess inventories on foreign markets by selling abroad at a lower price than at home. This form of dumping may be the result of misfortune or poor planning by foreign producers. Unforeseen changes in demand and supply conditions can result in excess inventories and thus dumping.

Although sporadic dumping maybe beneficial to importing consumers, it can be quite disruptive to import –competing producers, who face falling sales and short-run losses.

Predatory dumping

This occurs when a producer temporarily reduces the prices charged abroad to drive foreign competitors out of business. When the producer succeeds in acquiring a monopoly position, prices are then raised to commensurate with its market power. The new price level must be sufficiently high to offset any losses that occurred during the period of cutthroat pricing.

The firm would presumably be confident in its ability to prevent the entry of potential competitors long enough for it to enjoy economic profits.

Home governments are generally concerned about predatory pricing for monopolizing purposes and may *retaliate* with antidumping duties that eliminate the price differential. Although predatory dumping is a theoretical possibility, economists have not found empirical evidence that supports its existence.

Persistent dumping

As its name suggests, persistent dumping goes on indefinitely. In an effort to maximize economic profits, a producer may consistently sell abroad at lower prices than at home

 **Self-assessment question 5.7**

1. Explain: a. Sporadic dumping

_____

_____

b. Predatory dumping

_____

_____

c. Persistent dumping

_____

_____

Anti dumping regulations

Despite the benefits that dumping may offer to importing consumers, governments have often levied penalty duties against commodities they believe are being dumped in to their markets from abroad. The best example is the U.S. antidumping law that is designed to prevent price discrimination and below cost sales that injures U.S. industries. Under U.S. law, an antidumping duty is levied when the U.S. department of commerce determines a class or kind of foreign merchandise is being sold at less than fair value (LTFV) and the U.S International Trade Commission (ITC) determines that LTFV imports are causing or threatening material injury (such as unemployment, and lost sales and profits) to a U.S industry. Such antidumping duties are imposed in addition to the normal tariff in order to neutralize the effects of price discrimination or below cost sales.

The margin of dumping is calculated as the amount by which the foreign market value exceeds the U.S price. The foreign market price (value) is defined in two ways:

1. Price based definition. According to this definition, dumping occurs whenever a foreign company sells a product in the U.S. market at a price below that for which the same product sells in the home market.
2. Cost based definition. In case where the price based definition cannot be applied, a cost-based definition of foreign market value is permitted. Under this approach, Commerce Department" constructs" a foreign market value equal to the sum of:
    a. the cost of manufacturing the merchandise
    b. general expenses, which must equal at least 10 percent of the cost of manufacturing.
    c. profit on home-market sales (which must equal 7% of the manufacturing cost plus general expense).

If the Commerce Department investigation finds evidence of dumping, the U.S importers must immediately pay a special tariff (equal to the estimated dumping margin) on all imports of the product in question.

5.9 Economic Sanctions

What is economic sanction? & why governments use economic sanctions? Dear learner! Instead of promoting trade, governments may restrict trade for domestic and foreign policy objectives. Economic sanctions are government mandated limitations placed on customary trade or financial relation among nations. Economic sanctions have been used for several reasons such as:

- To protect domestic economy

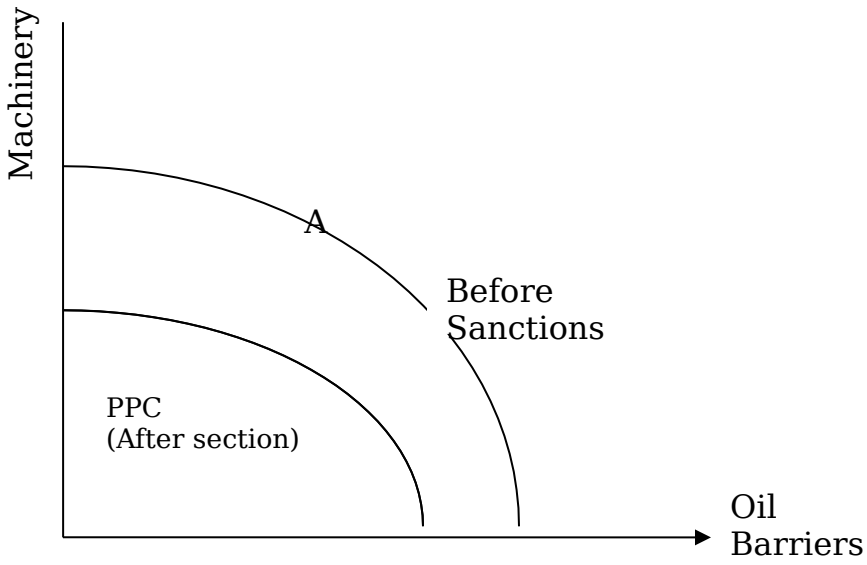
- To reduce nuclear proliferation
- To set compensation for property expropriated by foreign governments
- To combat international terrorism,
- To preserve national security, and
- Protect human rights.

The nation initiating the economic sanctions, the imposing nation hopes to impair the economic capabilities of the target nation to such an extent that the target nation will succumb to its objectives.

The imposing nation can levy several types of economic sanctions**.** ***Trade sanctions*** involve boycotts on imposing nation exports. The United States has used its role as a major producer of grain, military hardware, and high- technology goods as a lever to win overseas compliance with its foreign – policy objectives. Trade sanctions may also include quotas on imposing nation imports from the target nation. ***Financial sanctions***, the other form of economic sanction, can entail limitations on official lending or aid. For instance, during the late 1970s, the U.S. policy of freezing the financial assets of the U.S. hostages.

The following figure illustrates the goal of economic sanctions levied against a target country, say, Iraq. The figure shows the hypothetical production possibilities curve of Iraq for machines and oil. Prior to the imposition of sanctions, suppose that Iraq is able to operate at maximum efficiency as shown by point A along production possibilities curve PPCo.

Fig 5. Effects of Economic sanctions



Economic sanctions placed against a target country have the effect of forcing it to operate inside its production possibilities curve. Under the sanctions can also result an in ward shift in the target nation's production possibilities curve.

Under the sanctions program, a refusal of the imposing nations to purchase Iraq oil leads to idle wells, refineries, and workers in Iraq. Unused production capacity thus forces Iraq to move inside PPCo. If imposing nations also impose export sanctions on productive inputs, and thus curtail equipment sales to Iraq, the output potential of Iraq would decrease. This is shown by an inward shift of Iraq's production possibilities curve to PPC_1. Economic inefficiencies and reduced production possibilities, caused by economic sanctions, are thus intended to inflict hardship on the people and government of Iraq.

Overtime, sanctions may cause a reduced growth rate for Iraq. Even if short run welfare losses from sanctions are not large, they can appear in inefficiencies in the usage of labor and capital, deteriorating domestic expectations, and reductions in savings, investment and employment. Thus, sanctions do reduce the Ira's output potential.

Factors influencing the success of sanctions

Dear reader, we have seen that economic sanctions affect the production capacity of a target nation. However, the historical record of economic sanctions provides some insight in to the factors that govern their effectiveness. Among the most important determinants of the success of economic sanctions are:

- The number of nations imposing sanctions.
- The degree to which the target nation has economic and political ties to the imposing nations (s)
- The extent of political opposition in the target nation, and
- Cultural factors in the target nation.

5.11. Summary

Even though the free-trade argument has strong theoretical justifications, trade restrictions are widespread throughout the world. Trade barriers consist of tariff restrictions and non tariff trade barriers.

There are several types of tariffs. A specific tariff represents a fixed amount of money per unit of the imported commodity. An ad valorem tariff is stated as a fixed percentage of the value of an imported commodity. A compound tariff combines a specific tariff with an ad valorem tariff.

Concerning ad valorem tariffs, several procedures exist for the valuation of imports. The free-on-board (FOB) measure indicates a commodity's price as it leaves the exporting nation. The cost-insurance-freight (CIF) shows the product's value as it arrives at the port of entry.

The effective tariff rate (the actual level of protection that a nominal tariff yields the domestic import competing industries) tend to differ from the nominal tariff rate when the domestic import competing industry uses imported resources whose tariffs differ from those on the final commodity. Developing nations have traditionally argued that many advanced nations the tariff structures on industrial commodities to yield an effective rate of protection several times the nominal rate.

The welfare effects of a tariff can be measured by its protective effect, consumption effect, redistributive effect, revenue effect, and terms of trade effect. If a nation is small compared to the rest of the world its welfare necessarily falls by the total amount of the protective effect plus the consumption effect if it levies a tariff on imports. If the importing nation is large relative to the rest of the world, the imposition of an import tariff may improve its international terms of trade by an amount that can offsets the welfare losses associated with the consumption effect and the protective effect.

Although tariff may improve one nation's economic position, any gains generally come at the expense of other nations. Should tariff retaliation occur, the volume of international trade decreases, and world welfare suffers. Tariff liberalization is intended to promote freer markets so that the world can benefit from expanded trade volumes and international specialization of inputs.

Tariffs are sometimes justified on the grounds that they protect domestic employment and wages, help create a level playing field for international trade, equate the cost of imported products with the cost of domestic import competing products, allow domestic industries to be insulated temporarily from foreign competition until they can grow and develop, or protect industries necessary for national security.

With the decline in import tariffs in the past two decades, non tariff trade barriers have gained in importance as a measure of protection. NTBs include such practices as import quota, orderly marketing agreements, domestic content requirements, subsidies, anti dumping regulations, etc. An import quota is a government-imposed restriction on the quantity of a product that can be imported. Quotas are imposed on global (worldwide) basis or a selective (individual country) basis. Although quotas have many of the same economic effects as tariffs, they tend to be more restrictive.

Domestic content requirements try to limit the practice of foreign sourcing and encourage development of domestic industries. They typically stipulate the minimum percentage of a product’s value that must be produced in the home country for that product to be sold there.

Government subsidies are sometimes granted as a form of protection to the domestic exporters and import competing companies. They may take the form of direct cash payments, tax concessions, credit extended at lower interest rates, or special insurance arrangements. Direct production subsidies for import competing producers tend to involve a smaller loss in economic welfare than an equivalent tariffs and quotas.

International dumping occurs when a firm sells its product abroad at a price that is less than average total cost or that are charged to domestic buyers of the same product. Governments often impose stiff penalties against foreign commodities that are believed to be dumped in the home country.

The worst form of trade restriction is that of sanctions. By curtailing the target countries relation with the trading partners, sanctions can severely limit the production capacity of the nation. The success of sanctions in doing so however depends on several factors such as the number of nations imposing sanctions, the degree of political and economic ties between the target nation and the imposing nations, the extent of political opposition in the target nation, etc.

5.12. Model Examination Questions

1. What are the methods that customs appraisers use to determine the value of commodity imports?
2. List and explain the non tariff trade barriers used by different governments
3. How does the revenue effect of an import quota differ from that of a tariff?
4. Which one is more restrictive- an import quota or an equivalent tariff?
5. What is a sanction? How can it affect the production and employment in the target nation?
6. What are the factors that affect the success of sanctions?