[Lecture 7] International Trade and Economic Growth

Irrespective of government policies, there is always a tendency for economic growth to occur. Increases in population imply a growing labor force. Investment in new plant and equipment by firms implies a larger and larger capital stock (capital deepening). Over time, technological advances occur that allow for greater efficiency in production. Despite the fact that these general tendencies for growth occur around the world, actual patterns of factor growth and technical innovation differ quite substantially across various countries. Moreover, the manner in which a country grows will have implications for its pattern of trade as time progresses.

<Assumptions>

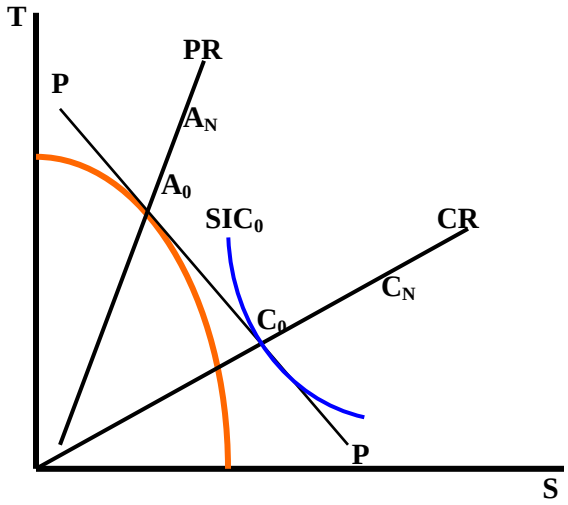
1. Two *normal* goods (S and T). S is relatively capital-intensive and T is labor-intensive.
2. Two factors of production (L and K).
3. Full employment of two factors in the long run (economy's actual production will be always on ( )).
4. This economy is *relatively abundant in labor*.
5. This country is *small* so that it should take world price as given and that it follows *free trade* policies.

Now, using PPF, growth can be depicted as an outward shift of the PPF. Hence, by HO-type arguments, this country initially has a comparative advantage in ( ) industry and exports these goods to the rest of the world in exchange for ( ).

How will this outward shift occur? According to *Rybczynski Theorem*, if only one factor grows, then the PPF will expand largely in the direction of the commodity whose production is relatively intensive in the growing factor. Suppose both factors grow. Then, as the PPF tends to expand more uniformly in all directions, the closer are the rates of growth of the two factors. If the two factors grow at exactly the same rates, then the overall capital/labor ratio in the economy will remain unchanged over time. In this situation, the PPF will preserve its original shape as it becomes larger.

International trade = (nation's production) – (nation's consumption)

As we have seen, growth necessarily affects production and also affects consumption. This is true because the price line that is tangent to the PPF will also be shifting out with growth, reflecting the fact that a nation with a growing endowment of productive resources is able to undertake a growing amount of consumption. Thus, since growth affects both production and consumption, it tends to affect international trade.



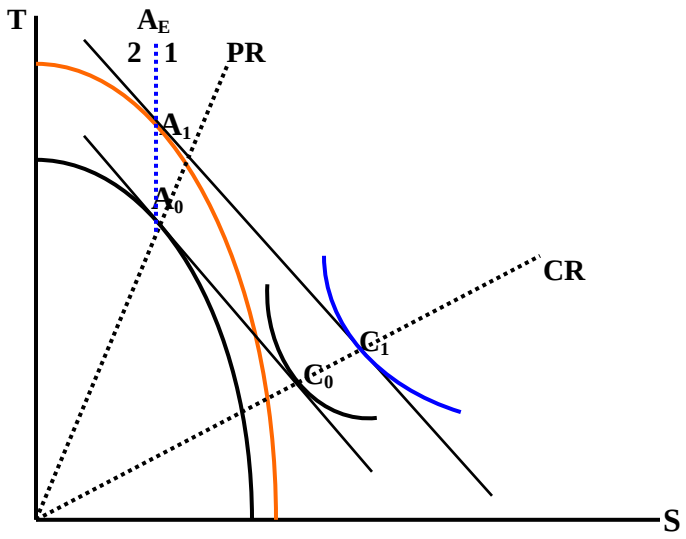
Economy before growth occurs

( ): the nation's production point
( ): the nation's consumption point
( ): international price of S
( ): Amount of T country exports
( ): Amount of S country imports
( ): slope means initial ratio of two goods produced in the economy.
( ): slope means the ratio of two goods consumed in the economy.

So, the type of growth can be categorized according to where, in relation to the PR and CR lines, the new production and consumption points are located after growth has occurred.

Neutral economic growth is a situation where the new production and consumption points lie farther to the right along the original PR and CR lines, respectively. In other words, after growth the economy continues to *produce and consume the two goods in the same ratios* as it had before growth. In this case, exports and imports will both rise by amounts proportional to the increase in production.

Suppose that supply of labor were to increase by a greater percentage than the supply of capital. What will happen to the output of the two goods? Since T is a labor-intensive industry, and, by assumption, economic growth has made the country relatively more labor abundant, the PPF will tend to grow proportionately more along the T axis than along the S axis.



Holding prices constant, the new production point will lie above the old PPF, with new PR rotating counter-clockwise around point A_0 to divide regions 1, 2, and on the line A_0A_E . (Region 1: amounts of T and S rise Region 2: T rises and S falls).

Now, consider the case where the economy receives an infusion of new labor and capital, at a rate that will lower the overall capital/labor ratio.

This ratio will decide what happens to the output of S and T.
If the ratio of new capital to new labor equals the original capital-labor ratio in T industry, then the new production point will lie on the vertical line segment above A_0. That is, the output of T will rise after growth, while S will remain constant. The intuition behind this result is relatively straightforward. The economy has received new factors of production in precisely the combination that is used to produce T. Hence, these factors can be allowed efficiently to the T industry without affecting S industry.
What if the new ratio is larger (less) than the original ratio between capital and labor? If larger, the new production point will be in Region ( ), and in Region ( ) if smaller (Remember Rybczynski Theorem! What would be the case?). For example, if the ratio of new capital to new labor is less than the original ratio used in T industry, then in order for T to be able to employ these new factors, it will need some additional capital, which can come only from the S industry. So, S output will fall and graphically, the production point moves into the Region ( ).
After growth has occurred there will be a tendency of for the economy to produce relatively more T and relatively less S than before growth occurred following the assumption of Rybczynski Theorem.

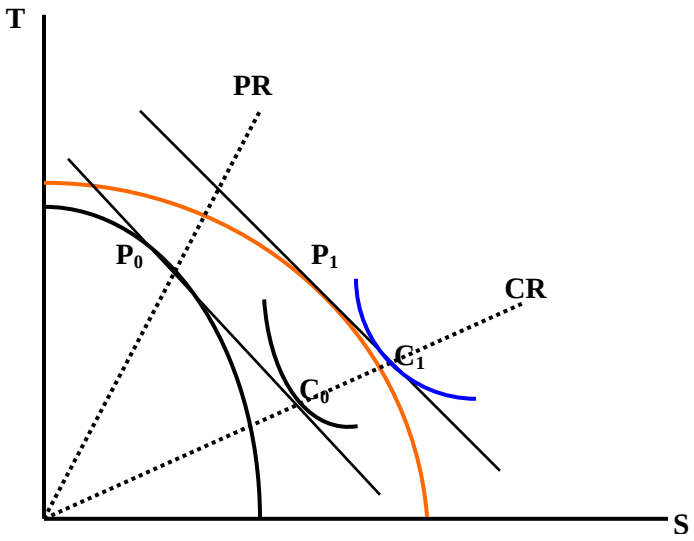
If, as we have assumed, the economy still wants to consume S and T in the same ratios as before, then there will be a tendency for a large expansion in both exports and imports. As PPF shifts out with GDP, the demand for both goods will rise even in the situation that S is producing less than before (why?). Since the demand for S rises with reduced S production in this country, it needs to import more S. And also since world prices (price of imports) have remained unchanged, the only way the economy can expand its imports of S is through an expansion in exports of T.

Pro-trade biased growth: when an economy grows because of a relative expansion in the supply of the factor used intensively in the production of exportables, there will be a tendency for the output of exportables to rise relative to the output of importables and for international trade to rise in percentage terms by an amount greater than the percentage expansion of GDP.

If the amount that a country trades is growing over time at a rate that exceeds that country's growth in GDP, then the relative importance of trade to that country (measured by the ratio of exports to GDP) is also growing. *So, for the countries with small economy sizes especially, they can accomplish economic growth through the international trade by exporting goods with abundant factor of production.* And since WWII, trade has tended to grow faster than GDP for most countries. This indicates a general tendency for pro-trade biased growth in the world.

It is also possible that a country could grow so that its relative endowment of initially scarce factors increases. For instance, the capital-scarce country could experience a relative expansion in its overall ratio of capital to labor. As might be expected from our preceding discussion, if this were to happen, there would be a tendency for an expansion of S production relative to T production. In fact, production of T could even fall if the ratio of new capital to new labor were greater than that used originally in S industry. If we assume that consumption rises in proportion to the overall growth in the economy, then, because the production of S, the importable, is rising faster than the overall growth of the economy, the amount this country will trade will ( ).

When an economy grows because of a relative expansion in the supply of the factor used intensively in the production of importables, there will be a tendency for the output of importables to rise relative to the output of exportables and for the international trade of this country to ( ). This type of growth is called ***antitrade biased growth***.



Compare the distance P_0C_0 and $P_1C_{1.,}$ which measure the sizes of international trade.
Therefore, if the scarce factor of production increases due to the economic growth, it will result in the reduction of trade relative to the size of the economy.

Additional Comments on Trade and Growth

The analysis we have conducted so far has made a number of quite restrictive assumptions about the sources of economic growth, the size of economy, and the trade policies that it follows. Now, we want to explain how the results we have established so far change when some of the assumptions we made are relaxed.

1) Technological (technical) Change

Same amount of output can be produced by fewer factor inputs, or, equivalently, when the same amount of inputs can produce greater amount of output. Technical change can occur in a variety of ways (by John Hicks, *The Theory of Wages*, 1932).

Neutral technical change is defined as innovation that results in an equiproportionate reduction in the use of all factors in the production of one unit of output.

Labor-saving (capital-saving) technical change is an innovation that results in a more than proportionate reduction in the use of labor (capital) relative to other factors in the production of one unit of output.

If technical progress allows an industry to save on the use of the factor it uses relatively less intensively, then almost anything can happen. The output of the industry when the innovation occurred could rise, or it could fall. This is true because there are two opposing effects at work. The effect of the innovation is to lower costs to the industry where the innovation occurred. This would tend to lead to an expansion in output of that industry. Working against this is the ***Rybczynski Effect*** – the output of the other industry must rise to absorb the factor that is "saved" by the innovation.

2) Growth, Prices, and Welfare

<Assumptions>

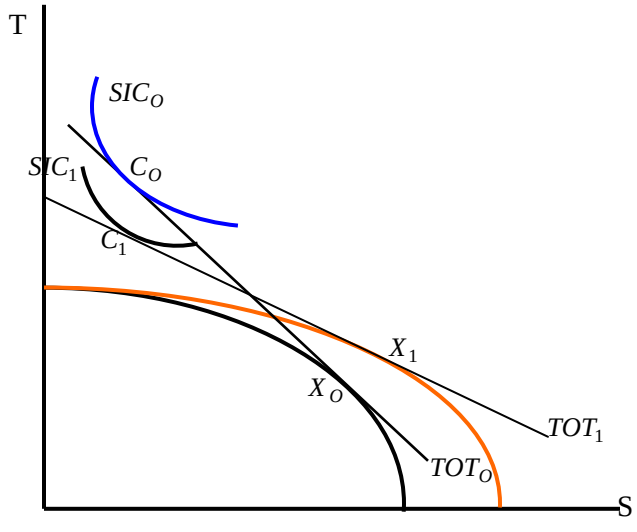
1. A *large economy* rather than small. So the way in which the country grows will have strong implications for world prices.
2. This country is *relatively abundant in capital*.

If this country undergoes neutral economic growth, then, over time, it will export more ( ) and import more ( ). Because it is a large country, the increase in supply of ( ) on world markets and increase in demand for ( ) will tend to lower the world price of ( ) relative to ( ). In other words, the TOT (P_S / P_T) will tend to ( ) as it grows through the neutral economic growth.

Biased economic growth will also have effects on a large country's TOT. Pro-trade biased growth will cause the TOT to deteriorate even more than neutral growth. It occurs because growth has caused a more than proportionate increase in the supply of exports to the world market and in the demand for imports from the world market. On the other hand, antitrade biased growth will lead to an improvement in the growing country's TOT (is it correct?).

Changes in a country's TOT have implications for the welfare level of the country. Economic growth at constant prices shifts a country's price line out (actually it will rotate counter-clockwise. Why?), thereby expanding its consumption possibilities set and raising its standard of living. *For a large country, this effect is diminished to some extent if growth leads to a deterioration in its terms of trade.*

The fact that, for a large country, growth has both positive and potentially negative welfare effects means that it might be possible for growth to actually make a country worse off.
Immizerizing Growth: growth that makes a country worse off (Jagdish Bhagwati, 1958).



Suppose there is strong pro-trade biased growth in this large economy. This will cause the PPF to shift out along the S axis and will produce a large expansion in the desired level of exports of the country.
Suppose further that the demand for this good in the rest of the world is relatively inelastic. In this case, the price of that good in the world market must ( ) substantially ($TOT_O \Rightarrow TOT_1$). Under this circumstances, consumption moves to C_1, and the country's welfare level falls to SIC_1. The deterioration in the growing country's terms of trade has been so great as to lower overall welfare below its pre-growth level.

All right. Is immizerizing growth a common phenomenon? Probably not, for the following two reasons.

(1) Precise conditions on both the nature of growth and world demand must hold for immizerizing growth to occur. (2) As we will learn from our discussion of the tariff, if a country has the ability to affect world prices with its tariff policy, it can improve its welfare. This is clearly the situation here. If the world price of the growing country's export is falling, the government of that country will act to prevent this by imposing an export tariff. Thus, government policy can be used to mitigate any potential negative consequences of growth. A phenomenon somewhat similar to immizerizing growth is perhaps more common. This is knows as the ***Dutch Disease*** (see your textbook, p.116 and "Case Study" handout).

International Flows of Factors (Ch. 10, pp. 292~312)

1) Labor

Up to this point, we have modeled economic growth as originating from within the growing country. Countries can also grow because they receive factor inputs from other countries. It is estimated that about 65 million people migrated to the United States from foreign countries between 1820 and 1998.

The influx of new population helped to expand the labor force of the U.S. just at the time when other factors, such as land (through purchase, conquest, and expropriation) and capital (through domestic- and foreign-sourced investment), were also growing. Thus, immigration played a large in the emergence of the U.S. as a leading world economy by the end of the 19th century.

In addition to moves that migrants view as essentially permanent, a considerable amount of temporary immigration occurs today. These temporary moves are often the result of specific policies instituted by governments in host countries. Under these programs, workers from foreign (source) countries are invited to relocate in host countries for short time spans to work in various industries.

(1) Beginning in the 1960s and extending through at least 1975, rich Western European countries invited **guest workers** (or *gastarbeiter*) from neighboring poorer countries, such as Italy, Spain, Portugal, Turkey, Greece, and Yugoslavia. All in all, about 6.3 million workers were invited to move to Western Europe, and they composed a substantial proportion of the workforce there. The amount of workers participating in this program tended to reduce by substantial proportions the workforces in the source countries.
(2) The OPEC countries of the Middle East have imported large numbers of workers from countries such as Egypt, Jordan, Pakistan, India, and even Korea.
(3) For many years migrant workers from Mexico have crossed the border to work in U.S. during the agricultural harvests.

Brain Drain: The permanent relocation of skilled workers from one country to another. More recently, concern has grown that rich industrialized countries may be draining skilled labor from poor developing countries, where, at the margin, the contribution of skilled labor to economic development may be quite high.

Brawn Drain: Because of relatively higher wage levels and general standards of living, poor country to rich country movements of low-skilled workers are a common phenomenon.

2) Capital

Capital, both in financial and in physical forms, does flow across international boundaries. International flows of capital have become an everyday fact of life in the international economy and, because of their enormous size, and probably much more important than labor flows in influencing economic growth and the location of economic activity.

Foreign Direct Investment (FDI)

A (parent) firm is said to directly invest abroad if it has a direct or indirect ownership interest of 10 percent or more in a foreign business enterprise (foreign affiliate corporation). American firms have engaged in foreign direct investment by setting up (or buying previously existing) production and marketing facilities in foreign countries, or by becoming minority owners of competing foreign

corporations. Firms that own and operate capital in one or more foreign countries are known as **Multinational Enterprises (MNEs)** or **Multinational Corporations (MNCs)**.

Table 1. Employment of Non-Bank U.S. MNEs in 2000 (worldwide, parent, and affiliate)

	Number of Employees (thousands)			Affiliates Employment as
	Worldwide	Parent	Affiliate	% of Total
All Industries	31,231.6	23,166.9	8,064.7	25.8
Mining	257.1	120.4	136.7	53.2
Utilities	405.3	347.6	57.7	14.2
Manufacturing	13,589.4	9,236.9	4,352.5	32.0
Wholesale trade	1,491.4	822.3	669.1	44.9
Information	2,360.4	2,027.4	333.0	14.1
Finance and Insurance	1,738.5	1,428.7	309.8	17.8
Professional Services	1,463.3	1,040.4	422.9	28.9
Other	9,926.1	8,143.2	1,782.9	18.0

Source: Raymond J. Mataloni, Jr., "U.S. Multinational Companies in 2000," *Survey of Current Business* (U.S. Department of Commerce, December 2002)

Table 2. Employment of U.S. MNE Foreign Affiliates, by Area, 2000

	Number of Employees (thousands)		Number of Employees (thousands)
All countries	8,064.7	***Developing Countries***	2,653.9
Developed Countries	5,410.8	Latin America	1,583.8
Canada	1,038.7	*Of which:*	
Europe	3,687.9	Mexico	804.4
Of which:		Africa	70.2
France	544.0	Middle East	64.7
Germany	605.2	Asia and Pacific	878.3
U.K.	1,185.7	*Of which:*	
Japan	233.7	India	67.2
Australia, New Zealand, and South Africa	349.1	Korea	56.4

Source: Raymond J. Mataloni, Jr., "U.S. Multinational Companies in 2000," *Survey of Current Business* (U.S. Department of Commerce, December 2002)

Economic theory suggests that there must be special advantages to being multinational, or lese these firms would cease such operations. What sort special advantages might there be?

1) MNEs might have access to special technology
2) There may be IRS that accrue to a firm that operates plants in many locations.

Trade liberalization between rich and poor countries will induce firms in high-wage countries to relocate their manufacturing operations to low-wage countries. In the process, employment would fall in high-wage countries and production would be replaced by imports from low-wage countries. (But, the numbers in tables 1 and 2 suggest that, to date, U.S. MNEs have not made widespread use of this practice. First, across all types of industries the vast bulk of U.S. MNE employment remains inside the United States. Second, more than two-thirds of overseas U.S. MNE employment is in the high-wage foreign countries of Europe, Canada, and Japan. In addition, studies of MNE-related trade flows suggest that infra-firm trade shares of U.S. exports and imports of goods have changed little over the past two decades. All of this seems to suggest that the location of overseas production by U.S. MNEs appears to be determined more by access to markets than by access to low-wage labor or natural resources.)