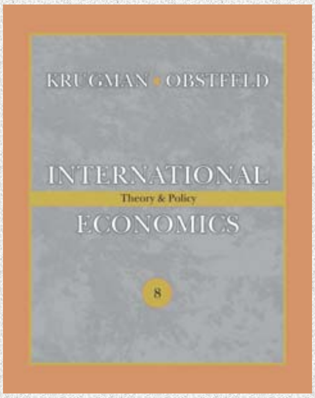


Chapter 5

The Standard Trade Model

Slides prepared by Thomas Bishop

Preview

- Measuring the values of production and consumption
- Welfare and terms of trade
- Effects of economic growth
- Effects of international transfers of income
- Effects of import tariffs and export subsidies
- Income distribution

Introduction

- The standard trade model combines ideas from the Ricardian model and the Heckscher-Ohlin model.
  1. Differences in *labor services, labor skills, physical capital, land, and technology* between countries cause productive differences, leading to gains from trade.
  2. These productive differences are represented as differences in production possibility frontiers, which represent the productive capacities of nations.
  3. A country's PPF determines its relative supply function.
  4. National relative supply functions determine world a relative supply function, which along with world relative demand determines an equilibrium under international trade.

The Value of Production

- Recall that when the economy maximizes its production possibilities, the value of output V lies on the PPF.
- $V = P_C Q_C + P_F Q_F$ describes the value of output in a two good model,
  - and when this value is constant the equation's line is called and isovalue line.
  - The slope of the isovalue line equals – (P_C / P_F), and if relative prices change the slope changes.

Fig. 5-1: Relative Prices Determine the Economy's Output

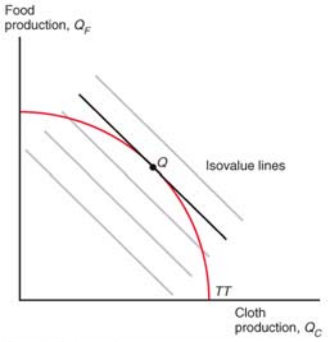
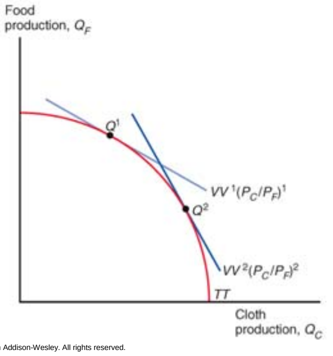


Fig. 5-2: How an Increase in the Relative Price of Cloth Affects Relative Supply



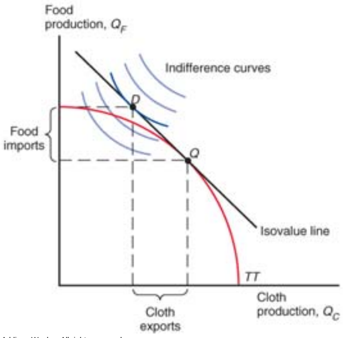
The Value of Consumption

- The value of the economy's consumption is constrained to equal the value of the economy's production.
  - $P_C D_C + P_F D_F = P_C Q_C + P_F Q_F = V$
- Production choices are determined by the economy's PPF and the prices of output.
- What determines consumption choices (demand)?

The Value of Consumption (cont.)

- Consumer preferences and prices determine consumption choices.
- Consumer preferences are represented by **indifference curves**: combinations of goods that make consumers equally satisfied (indifferent).
  - Each consumer has his or her own preferences, but we pretend that we can represent the preferences of an average consumer that represents all consumers

Fig. 5-3: Production, Consumption, and Trade in the Standard Model



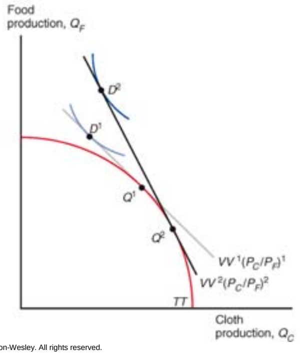
The Value of Consumption (cont.)

- Indifference curves are downward sloping to represent the fact that if an average consumer has less cloth, he or she could have more food and still be equally satisfied.
- Indifference curves farther from the origin represent larger quantities of food and cloth, which should make consumers more satisfied: more goods are assumed to be more satisfying (or at least more valuable)
- Indifference curves are flatter when moving to the right to represent the fact that as more cloth and less food is consumed, an extra m^2 of cloth relative to an extra calorie of food becomes less valuable.

Prices and the Value of Consumption

- Prices also determine the value of consumption.
  - When the price of cloth rises relative to the price of food, the economy is better off when it exports cloth: the isovalue line becomes steeper and a higher indifference curve can be reached.
  - A higher price for cloth exports means that more food can be imported.
  - A higher relative price of cloth will also influence consumption decisions about cloth versus food: a higher relative price of cloth makes consumers willing to buy less cloth and more food.

Fig. 5-4: Effects of a Rise in the Relative Price of Cloth



Prices and the Value of Consumption (cont.)

- The change in welfare (income) when the price of one good changes relative to the price of another is called the **income effect**.
  - The income effect is represented by moving to another indifference curve.
- The substitution of one good for another when the price of the good changes relative to the other is called the **substitution effect**.
  - The substitution effect is represented by a moving along a given indifference curve.

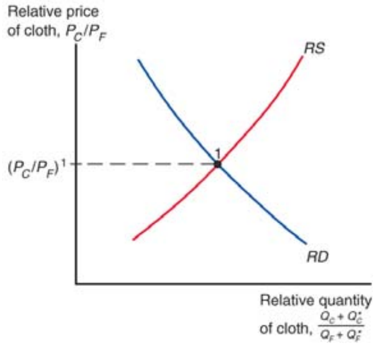
Welfare and the Terms of Trade

- The **terms of trade** refers to the price of exports relative to the price of imports.
  - When a country exports cloth and the relative price of cloth increases, the terms of trade increase or "improve."
- Because a higher price for exports means that the country can afford to buy more imports, an increase in the terms of trade increases a country's welfare.
- A decrease in the terms of trade decreases a country's welfare.

Determining Relative Prices

- To determine the price of cloth relative to the price food in our model, we again use relative supply and relative demand.
  - Relative supply considers *world* supply of cloth relative to that of food at each relative price.
  - Relative demand considers *world* demand of cloth relative to that of food at each relative price.
  - In a two country model, world quantities are the sum of quantities from the domestic and foreign countries.

Fig. 5-5: World Relative Supply and Demand



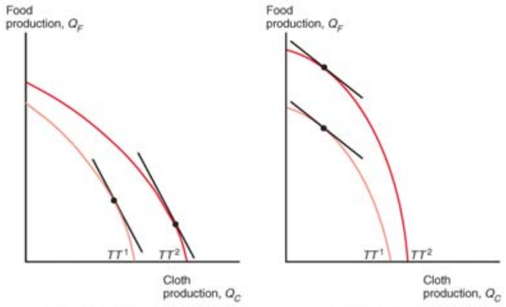
The Effects of Economic Growth

- Is economic growth in China good for the standard of living in the U.S.?
- Is growth in a country more or less valuable when it when it is integrated in the world economy?
- The standard trade model gives us precise answers to these questions.

The Effects of Economic Growth (cont.)

- Growth is usually **biased**: it occurs in one sector more than others, causing relative supply to change.
  - Rapid growth has occurred in U.S. computer industries but relatively little growth has occurred in U.S. textile industries.
  - According to the Ricardian model, technological progress in one sector causes biased growth.
  - According to the Heckscher-Ohlin model, an increase in one factor of production (ex., an increase in the labor force, arable land, or the capital stock) causes biased growth.

Fig. 5-6: Biased Growth



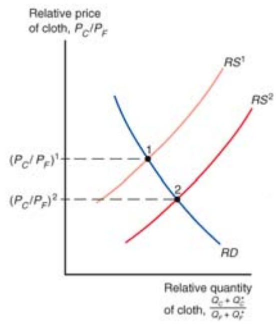
(a) Growth biased toward cloth

(b) Growth biased toward food

The Effects of Economic Growth (cont.)

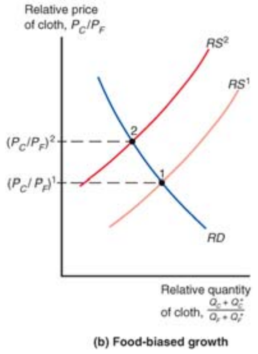
- Biased growth and the resulting change in relative supply causes a change in the terms of trade.
  - Biased growth in the cloth industry (in either the domestic or foreign country) will lower the price of cloth relative to the price of food and lower the terms of trade for cloth exporters.
  - Biased growth in the food industry (in either the domestic or foreign country) will raise the price of cloth relative to the price of food and raise the terms of trade for cloth exporters.
  - Suppose that the domestic country exports cloth and imports food.

Fig. 5-7a: Growth and Relative Supply



(a) Cloth-biased growth

Fig. 5-7b: Growth and Relative Supply



The Effects of Economic Growth (cont.)

- **Export-biased growth** is growth that expands a country's production possibilities disproportionally that country's export sector.
  - Biased growth in the food industry in the foreign country is export-biased growth for the foreign country.
- **Import-biased growth** is growth that expands a country's production possibilities disproportionally in that country's import sector.
  - Biased growth in cloth production in the foreign country is import-biased growth for the foreign country.

The Effects of Economic Growth (cont.)

- Export-biased growth reduces a country's terms of trade, generally reducing its welfare and increasing the welfare of foreign countries.
- Import-biased growth increases a country's terms of trade, generally increasing its welfare and decreasing the welfare of foreign countries.

Has Growth in Asia Reduced the Welfare of High Income Countries?

- The standard trade model predicts that *import* biased growth in China reduces the U.S. terms of trade and the standard of living in the U.S.
  - Import biased growth for China would occur in sectors that compete with U.S. exports.
- But this prediction is not supported by data: there should be negative changes in the terms of trade for the U.S. and other high income countries.
  - In fact, changes in the terms of trade for high income countries have been positive and negative for developing Asian countries.

Table 5-1: Average Annual Percent Changes in Terms of Trade

	1986–1995	1996–2005
Advanced economies	0.8	−0.1
Developing Asia	−0.4	−1.1

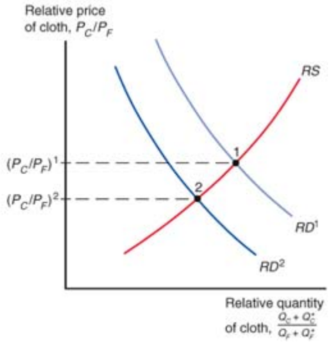
The Effects of International Transfers of Income

- Transfers of income sometimes occur from one country to another.
  - War reparations or foreign aid may influence demand of traded goods and therefore relative demand.
  - International loans may also influence relative demand in the short run, before the loan is paid back.
- How do transfers of income across countries affect relative demand and the terms of trade?

The Effects of International Transfers of Income (cont.)

- If the domestic country generates national income for transfers by
  - increasing the price of imports to reduce their purchases and by decreasing the price of exports to increase their sales,
  - the terms of trade would fall and the demand of cloth relative to food would decrease (represented by shifting the relative demand curve left).

Fig. 5-8: Effects of a Transfer on the Terms of Trade



The Effects of International Transfers of Income (cont.)

- But after the transfer of income from the domestic country,
  - demand of foreign goods could fall in the domestic country and demand of domestic goods could rise in the foreign country,
  - so the relative demand might not decrease and the terms of trade might not fall.

The Effects of International Transfers of Income (cont.)

- How much does demand of domestic goods increase in the foreign country when it receives a transfer of income from the domestic country?
  - ♦ If the foreign country has a higher marginal propensity to spend on its own goods than on imports, demand of its own goods will rise more than demand of imports from the domestic country.

The Effects of International Transfers of Income (cont.)

- How much does demand of foreign goods decrease in the domestic country when it reduces its income through a transfer?
  - ♦ If the domestic country has a higher marginal propensity to spend on its own goods than on imports, demand of its own goods will fall more than demand of imports from the foreign country.
- If each country has a higher marginal propensity to spend on its own products, relative demand would decrease after a transfer of income from the domestic country.

The Effects of International Transfers of Income (cont.)

- In fact, countries spend most of their (marginal) income on their own products.
  - ♦ Americans spend only 11% of national income on imports and 89% on domestically produced goods.
- Transportation costs, tariffs, other barriers, and preferences cause domestic residents to favor domestic goods.
- We predict that the relative demand will decrease with a transfer of income, decreasing the terms of trade for the donor nation.

The Effects of International Transfers of Income (cont.)

- In addition, production of non-traded goods and services may change, affecting the relative *supply* of traded goods and reinforcing the change in the terms of trade.
  - Industries that produce non-traded goods and services compete for resources with industries that produce traded goods.
  - A transfer of income from a donor country will reduce demand *and production* of non-traded goods in the donor country, so that these resources can be used in its export sector.

The Effects of International Transfers of Income (cont.)

- The supply of exports relative to imports in the donor country increases, reducing the terms of trade for the donor country.
- A transfer of income from a donor country will increase demand of and production of non-traded goods in the foreign country, so that fewer resources can be used in its export sector.
- The supply of exports relative to imports in the foreign country decreases, reducing the terms of trade for the donor country.

Import Tariffs and Export Subsidies

- **Import tariffs** are taxes levied on imports
- **Export subsidies** are payments given to domestic producers that export.
- Both policies influence the terms of trade and therefore national welfare.

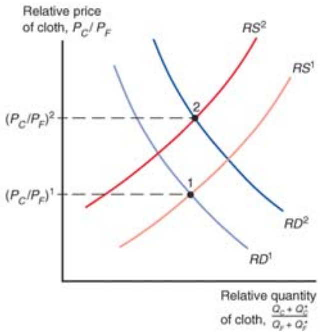
Import Tariffs and Export Subsidies (cont.)

- Import tariffs and export subsidies drive a wedge between prices in world markets (or external prices) and prices in domestic markets (or internal prices).
  - Since exports and imports are traded in world markets, the terms of trade measures relative *external* prices.

Import Tariffs and Distribution of Income Across Countries

- If the domestic country imposes a tariff on food imports, the price of food relative to price cloth that domestic individuals and institutions face rises.
  - Likewise, the price of cloth relative to the price of food that domestic individuals and institutions face falls.
  - Domestic producers will receive a lower relative price of cloth, and therefore will be more willing to switch to food production: relative supply will decrease.
  - Domestic consumers will pay a lower relative price of cloth, and therefore be more willing to switch to cloth consumption: relative demand will increase.

Fig. 5-9: Effects of a Tariff on the Terms of Trade



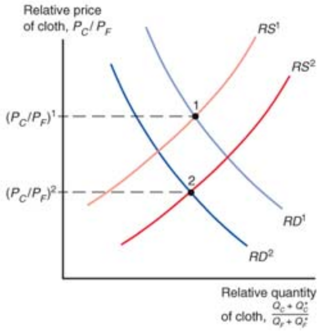
Import Tariffs and Distribution of Income Across Countries (cont.)

- When the domestic country imposes an import tariff, the terms of trade increases and the welfare of the country may increase.
- The magnitude of this effect depends on the size of the domestic country relative to the world economy.
  - If the country is small part of the world economy, its tariff (or subsidy) policies will not have much effect on world relative supply and demand, and thus on the terms of trade.
  - But for large countries, a tariff rate that maximizes national welfare at the expense of foreign countries may exist.

Export Subsidies and Distribution of Income Across Countries

- If the domestic country imposes a subsidy on cloth exports, the price of cloth relative to price food that domestic individuals and institutions face rises.
  - Domestic producers will receive a higher relative price of cloth when they export, and therefore will be more willing to switch to cloth production for export: relative supply will increase.
  - Domestic consumers must pay a higher relative price of cloth to producers who have the option of exporting, and therefore will be more willing to switch to food consumption: relative demand will decrease.

Fig. 5-10: Effects of a Subsidy on the Terms of Trade



Export Subsidies and Distribution of Income Across Countries (cont.)

- When the domestic country imposes an export subsidy, the terms of trade decreases and the welfare of the country decreases to the benefit of the foreign country.

Import Tariffs, Export Subsidies and Distribution of Income Across Countries

- The two country, two good model predicts that
  - ♦ an import tariff by the domestic country can increase domestic welfare at the expense of the foreign country.
  - ♦ an export subsidy by the domestic country reduces domestic welfare to the benefit of the foreign country.

Import Tariffs and Export Subsidies in Other Countries

- But we have ignored the effects of tariffs and subsidies that occur in a world with many countries and many goods:
  - ♦ A foreign country may subsidize the export of a good that the US also exports, which will reduce the price for the U.S. in world markets and decrease its terms of trade.
    - The EU subsidizes agricultural exports, which reduce the price that American farmers receive for their goods in world markets.
  - ♦ A foreign country may put a tariff on an imported good that the U.S. also imports, which will reduce the price for the U.S. in world markets and increase its terms of trade.

Import Tariffs and Export Subsidies in Other Countries (cont.)

- Export subsidies by foreign countries on goods that
  - the U.S. imports *reduce the world price of U.S. imports* and increase the terms of trade for the U.S.
  - the U.S. also exports *reduce the world price of U.S. exports* and decrease the terms of trade for the U.S.
- Import tariffs by foreign countries on goods that
  - the U.S. exports *reduce the world price of U.S. exports* and decrease the terms of trade for the U.S.
  - the U.S. also imports *reduce the world price of U.S. imports* and increase the terms of trade for the U.S.

Import Tariffs and Export Subsidies

- Export subsidies on a good *decrease the relative world price* of that good by increasing relative supply of that good and decreasing relative demand of that good.
- Import tariffs on a good *decrease the relative world price* of that good (and increase the relative world price of other goods) by increasing the relative supply of that good and decreasing the relative demand of that good.

Import Tariffs, Export Subsidies, and Distribution of Income Within a Country

- Because of changes in relative prices, import tariffs and export subsidies have effects on income distribution among producers *within a country*.

Import Tariffs, Export Subsidies, and Distribution of Income Within a Country (cont.)

- Generally, a domestic import tariff increases income for domestic import-competing producers by allowing the price of their goods to rise to match increased import prices, and it shifts resources away from the export sector.
- Generally, a domestic export subsidy increases income for domestic exporters, and it shifts resources away from the import-competing sector.

Summary

1. A change in relative prices, say due to trade, causes an income effect and a substitution effect.
2. The terms of trade refers to the price of exports relative to the price of imports in world markets.
3. Export-biased growth reduces a country's terms of trade, generally reducing its welfare and increasing the welfare of foreign countries.
4. Import-biased growth increases a country's terms of trade, generally increasing its welfare and decreasing the welfare of foreign countries.

Summary (cont.)

5. The effect of international transfers of income depend on the marginal propensity to spend on domestic goods, but generally the relative demand of a donor will decrease with such transfers, causing a decrease in its terms of trade.
6. When the domestic country imposes an import tariff, its terms of trade increases and its welfare may increase.

Summary (cont.)

7. When the domestic country imposes an export subsidy, its terms of trade decreases and its welfare decreases.
8. Generally, a domestic import tariff increases income for domestic import-competing producers and shifts resources away from the export sector.
9. Generally, a domestic export subsidy increases income for domestic exporters and shifts resources away from the import-competing sector.

Additional Chapter Art

Fig. 5A-1: Home's Desired Trade at a Given Relative Price

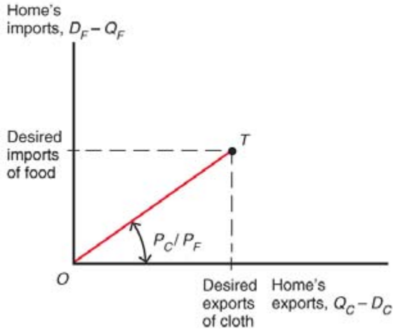


Fig. 5A-2: Home's Offer Curve

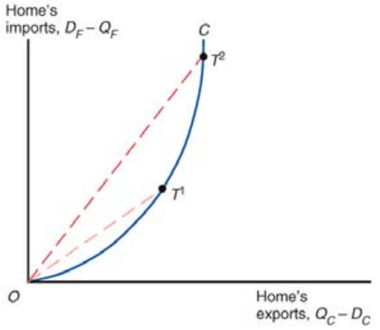


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Fig. 5A-3: Foreign's Offer Curve

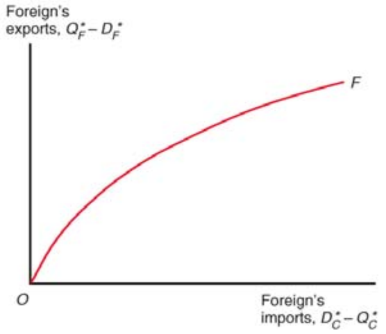

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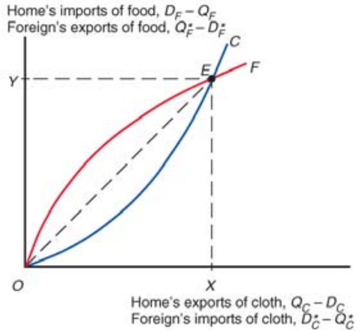
Fig. 5A-4: Offer Curve Equilibrium



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