

Chapter 5

The Standard Trade Model

Preview

- Introduction
- Production and consumption choice
- Terms of trade and welfare
- Effects of economic growth: shifting world RS
- Effects of international transfers of income: shifting world RD
- Summary

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Introduction

1. Sources of comparative advantage, such as differences in *labor, labor skills, physical capital, land and technology* between countries, cause differences in production possibility frontiers (PPFs), the productive capacities of nations.
2. Each country's PPF determines its relative supply curve.
3. National relative supply curves determine world relative supply.
4. World relative supply and demand determine the equilibrium relative price under international trade.

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Introduction

- Standard trade model is a general model that includes Ricardian and Factor Proportions models as special cases.
 - ◆ Two goods, food (F) and cloth (C).
 - ◆ Each country's PPF is a smooth curve, representing increasing opportunity costs.
 - ◆ Suppose the domestic country exports cloth and imports food.

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Production

- **Isovalue lines** are lines along which the value of output is constant.

$$V = P_C Q_C + P_F Q_F$$
 - ◆ Slope of isovalue line is $-(P_C/P_F)$
 - ◆ Changes in relative prices change slope.

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Production

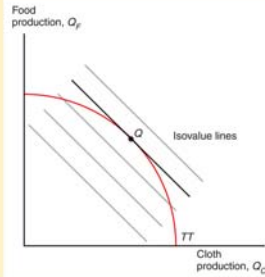
- Production choice based on PPF and relative price:
 - ◆ Production bundle Q where isovalue line tangent to PPF.
 - ◆ Any other point on PPF lies on a lower isovalue line.
 - ◆ Any point on a higher isovalue line is not feasible (lies beyond PPF so cannot be produced).

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Production

Figure 5-1
Relative Prices Determine the Economy's Output

An economy whose production possibility frontier is TT will produce at Q , which is on the highest possible iso-value line.



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Production

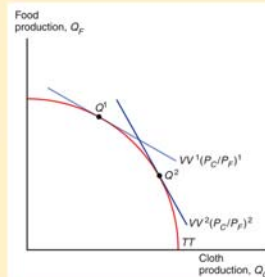
- Relative prices and relative supply:
 - ◆ An increase in the price of cloth relative to food P_C/P_F makes the iso-value line steeper.
 - ◆ Production shifts from point Q^1 to point Q^2 .
 - ◆ Supply of cloth relative to food Q_C/Q_F rises.
 - ◆ Relative supply of cloth to food increases with the relative price of cloth to food.

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Production

Figure 5-2
How an Increase in the Relative Price of Cloth Affects Relative Supply

The iso-value lines become steeper when the relative price of cloth rises from $(P_C/P_F)^1$ to $(P_C/P_F)^2$ (shown by the rotation from VV^1 to VV^2). As a result, the economy produces more cloth and less food and the equilibrium output shifts from Q^1 to Q^2 .



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Consumption

- Budget constraint (TPF): value of an economy's consumption equals value of its production.

$$P_C D_C + P_F D_F = P_C Q_C + P_F Q_F = V$$

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Consumption

- Consumer preferences are represented by **indifference curves**: combinations of goods that make consumers equally satisfied (indifferent).
 - ◆ Indifference curves are downward sloping.
 - ◆ If have more cloth, could have less food and still be equally satisfied.

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Consumption

- ◆ Indifference curves farther from the origin represent larger quantities of food and cloth, which make consumers more satisfied and better off.
- ◆ Indifference curves are flatter when moving to the right: the more cloth and the less food that is consumed, the more valuable an extra pound of food becomes relative to an extra yard of cloth.

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Consumption

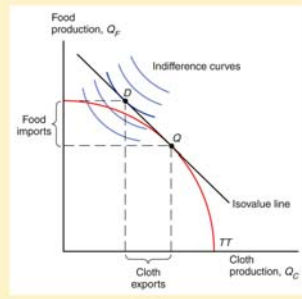
- Consumption choice based on preferences and relative price:
 - Consumption bundle D where isovalue line tangent to indifference curve.
 - Any other point on isovalue line lies on a lower indifference curve.
 - Any point on a higher indifference curve is not feasible (lies beyond isovalue line so too expensive).

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Consumption

Figure 5-3

Production, Consumption, and Trade in the Standard Model
The economy produces at point Q , where the production possibility frontier is tangent to the highest possible isovalue line. It consumes at point D , where that isovalue line is tangent to the highest possible indifference curve. The economy produces more cloth than it consumes and therefore exports cloth; correspondingly, it consumes more food than it produces and therefore imports food.



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Consumption

- Relative prices and relative demand
 - An increase in the relative price of cloth P_C/P_F causes consumption choice to shift from point D^1 to point D^2 .
 - Demand for cloth relative to food D_C/D_F falls.
 - Relative demand for cloth to food falls as the relative price of cloth to food rises.

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Consumption

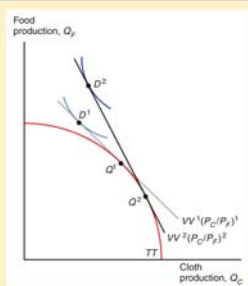
- Impact of an increase in the relative price of cloth to food.
 - Economy is better off if it exports cloth: a higher indifference curve results.
 - A higher relative price for cloth exports means that more food can be imported.

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Consumption

Figure 5-4
Effects of a Rise in the Relative Price of Cloth

The slope of the isovalue lines is equal to minus the relative price of cloth P_C/P_F , so when that relative price rises all isovalue lines become steeper. In particular, the maximum-value line rotates from VV^1 to VV^2 . Production shifts from Q^1 to Q^2 ; consumption shifts from D^1 to D^2 .



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Welfare and the Terms of Trade

- The **terms of trade** refers to the price of exports relative to the price of imports.
 - The home country exports cloth, so its terms of trade are P_C/P_F .
 - When the relative price of cloth increases, the home country's terms of trade increase (or improve).
 - The foreign country exports food, so its terms of trade are P_F/P_C .
 - When the relative price of cloth increases, the foreign country's terms of trade decrease (or deteriorate).

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Welfare and the Terms of Trade

- 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.

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Determining Relative Prices

- The free trade relative price of cloth to food is determined by the intersection of world relative supply and world relative demand.
 - ◆ World quantities are the sum of quantities from the domestic and foreign countries.

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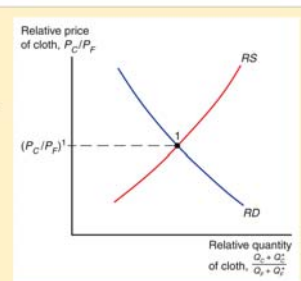
Determining Relative Prices

- World relative supply considers *world* supply of cloth relative to that of food at each relative price.
 - ◆ World relative supply curve (*RS*) is upward sloping because an increase in P_C/P_F leads both countries to produce more cloth and less food.
- World relative demand considers *world* demand of cloth relative to that of food at each relative price.
 - ◆ World relative demand curve (*RD*) is downward sloping because an increase in P_C/P_F leads both countries to shift their consumption mix away from cloth toward food.

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Determining Relative Prices

Figure 5-5
World Relative Supply and Demand
The higher P_C/P_F is, the larger the world supply of cloth relative to food (*RS*) and the lower the world demand for cloth relative to food (*RD*). Equilibrium relative price (here, $(P_C/P_F)^1$) is determined by the intersection of the world relative supply and demand curves.



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Effects of Economic Growth

- The standard trade model is useful for understanding the effects of forces that shift world relative supply or world relative demand.
- Is economic growth in China good for the standard of living in the US?
- Is growth in a country more or less valuable when it is integrated in the world economy?

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Effects of Economic Growth

- Growth and production possibilities.
 - ◆ Economic growth causes outward shift of a country's production possibility frontier so can produce bundles that could not before.
 - ◆ Arises due to productivity improvements or factor accumulation.
- Primary benefit: holding relative prices constant, economic growth is good for a country.

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Effects of Economic Growth

- Biased growth
 - ◆ Economic growth tends to be biased toward one of the sectors.
 - ◆ The PPF shifts out more in one direction than in the other.
 - Technological progress in one sector of the economy.
 - Increase in a factor of production.

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Effects of Economic Growth

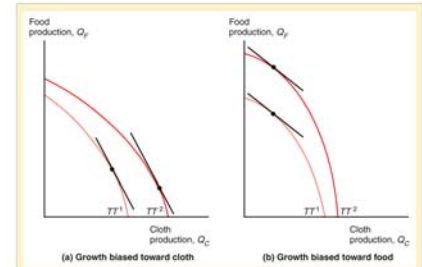


Figure 5-6

Biased Growth

Growth is biased when it shifts production possibilities out more toward one good than toward another. In both cases shows the production possibility frontier shifts from TT^1 to TT^2 . In case (a) this shift is biased toward cloth, in case (b) toward food.

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Effects of Economic Growth

- Biased growth and the resulting shift in relative supply causes a change in the terms of trade.
 - ◆ Biased growth in the cloth industry (in either country) will lower the relative price of cloth and lower the terms of trade for cloth exporters.
 - ◆ Biased growth in the food industry (in either country) will raise the relative price of cloth and raise the terms of trade for cloth exporters.

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Effects of Economic Growth

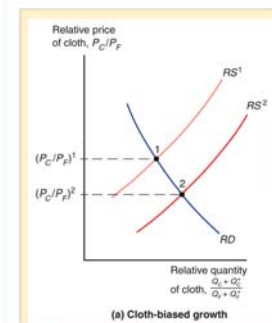


Figure 5-7

Growth and Relative Supply

Growth biased toward cloth shifts the RS curve to the right (a), while growth biased toward food shifts it to the left (b).

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Effects of Economic Growth

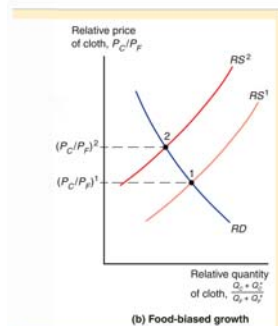


Figure 5-7

Growth and Relative Supply

Growth biased toward cloth shifts the RS curve to the right (a), while growth biased toward food shifts it to the left (b).

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Effects of Economic Growth

- Export-biased growth
 - ◆ Disproportionately expands a country's production possibilities in direction of the good it exports.
 - ◆ Secondary burden: worsens a growing country's terms of trade, to the benefit of the rest of the world.
- Import-biased growth
 - ◆ Disproportionately expands a country's production possibilities in direction of the good it imports.
 - ◆ Secondary benefit: improves a growing country's terms of trade at the rest of the world's expense.

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Effects of Economic Growth

- International effects of growth
 - ◆ Export-biased growth in the rest of the world improves our terms of trade, while import-biased growth abroad worsens our terms of trade.
 - ◆ Export-biased growth in our country worsens our terms of trade, reducing the direct (primary) benefits of growth, while import-biased growth leads to an improvement of our terms of trade.

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

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

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Has Growth in Asia Reduced the Welfare of High Income 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

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Effects of International Transfers

- Transfers of income sometimes occur from one country to another.
 - ◆ War reparations or foreign aid may influence demand for traded goods and therefore relative demand.
- How do transfers of income across countries affect relative demand and the terms of trade?

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Effects of International Transfers

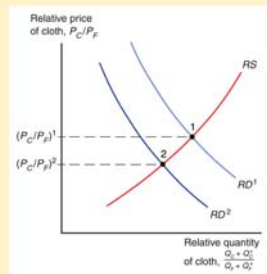
- Terms of trade effects of transfers
 - ◆ Donor country gives money to recipient country.
 - ◆ International transfers of income may affect terms of trade by shifting world relative demand curve.
 - ◆ A transfer will worsen the donor's terms of trade if the donor has a higher marginal propensity to spend on its export good than the recipient.
 - ◆ Often true due to barriers to trade, both natural and artificial.

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Effects of International Transfers

Figure 5-8
Effects of a Transfer on the Terms of Trade

If Home has a higher marginal propensity to spend on cloth than Foreign, a transfer of income by Home to Foreign shifts the *RD* curve left from *RD*¹ to *RD*², reducing the equilibrium relative price of cloth.



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Effects of International Transfers

- 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.
- Suppose that we spend 80 cents of each dollar on domestically produced goods and Sri Lanka spends 40 cents of each dollar on imports from the United States.
 - ◆ Every dollar we give to Sri Lanka decreases relative demand for our products.

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Effects of International Transfers

- If each country has a higher marginal propensity to spend on its own products, the relative demand curve would shift left after a transfer of income from the domestic country.
- Usually an international transfer of income will deteriorate the donor's terms of trade.
- Means donating say one million dollars will cost in excess of that amount due to adverse terms of trade effects.

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Summary

1. A change in relative prices causes changes in production and consumption choices.
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, reducing its welfare and increasing the welfare of foreign countries.

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Summary

4. Import-biased growth increases a country's terms of trade, increasing its welfare and decreasing the welfare of foreign countries.
5. The effect of international transfers of income depend on the marginal propensity to spend on domestic goods. Usually the donor's terms of trade deteriorate.

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