CHAPTER 5

THE STANDARD TRADE MODEL

Preview

- The Standard Model of Trade
- Effects of economic growth
- Effects of international transfers of income
- Effects of import tariffs and export subsidies

Introduction

- The Ricardian model and The Heckscher-Ohlin model with different assumptions about the determinants of production possibilities.
- The Ricardian model
  - Production possibilities are determined by the allocation of labor between sectors
  - Idea of comparative advantage
  - Not allow discuss the distribution of income
- The Heckscher-Ohlin model
  - Multiple factors of production can move between sectors
  - Deeper understanding of how resources may drive trade patterns
  - Model for understanding income distribution

Introduction (cont.)

- 1990s:
  - The rapid growth in exports from the newly industrializing economies (NICs).
  - NICs experiences rapid productivity growth;
  - Apply the Ricardian model.
- The changing pattern of trade has differential effects on different groups in the US and other countries in the world.
  - To understand the effect of increased trade for a country's income distribution, we may want to apply the Heckscher Ohlin model.

Introduction (cont.)

- The two models share a number of features
  - The production capacity: summarized by its PPF and differences in these PPFs give raise to trade.
  - Production possibilities determine a country's RS schedule.
  - World equilibrium : determined by world RS and RD and lies between national RS schedules.

Introduction (cont.)

- The standard trade model combines ideas from the Ricardian model and the Heckscher-Ohlin model.
  - Ricardian model and Heckscher-Ohlin model: special cases of strand trade model.
- The Standard Model of Trade is built on four key relationships
  - PPF and relative supply curve
  - Relative prices and relative demand
  - World relative supply and demand → world equilibrium
  - Terms of trade and welfare
- Use this model to explain how changes in economic growth and in income distribution can affect the world economy.

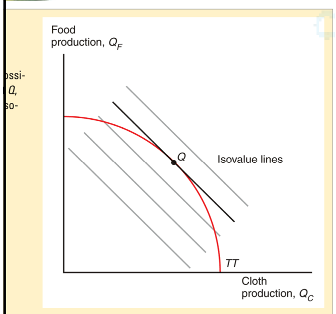
The Standard Model of Trade

- Production possibilities and Relative Supply
- Relative prices and Demand
- Welfare and Terms of trade
- Determining relative prices

Production possibilities and Relative Supply

- The point of production on PPF depends on the price of cloth relative to food (P_C/P_F)
- Market economy is efficient in production if maximizes the value of output at given market prices.
- The market value of output (V) is illustrated by isovalue line – a line along which the value of output is constant.

Production possibilities and Relative Supply (cont.)



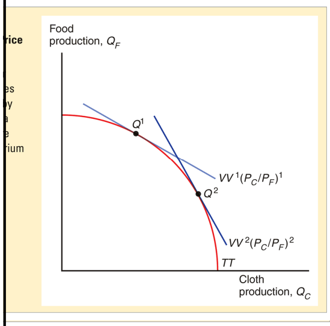
- *Iso-value line*

$V = P_C Q_C + P_F Q_F$

- The slope of isovalue line (P_C/P_F
- If relative prices change, the slop changes.
- The higher V is, the farther out ar isovalue line lies.

- The economy will produce the highest output it can: the point Q where TT is just tangent to an Iso-value line.

Production possibilities and Relative Supply (cont.)



-P_C/P_F increases
- The isovalue line is steeper

-The production point: Q^2
- Increase in the relative supply of cloth

<u>If relative price of cloth increases, the nation will produce more cloth and less food.</u>

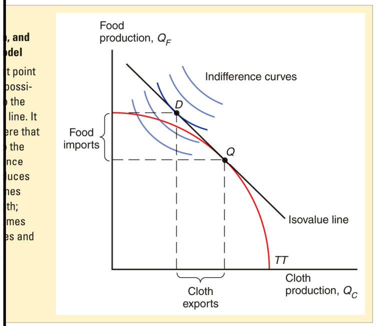
Relative prices and Demand

- The value of an economy's consumption is equal to the value of its production.
  - $P_C D_C + P_F D_F = P_C Q_C + P_F Q_F = V$
  - *Where: D_C and D_F are the consumption of cloth and food, respectively*
- Production and consumption must lie on the same isovalue line

Relative prices and Demand (cont.)

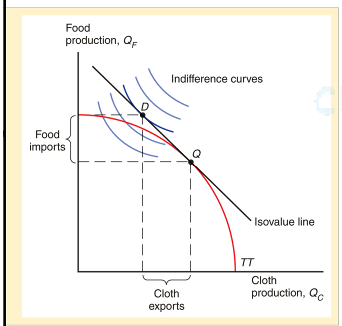
- Consumption choices are determined based on
  - Consumer preferences/tastes
  - Relative prices
- Consumer preferences/tastes are represented by **indifference curves.**
  - combinations of goods that make consumers equally satisfied (indifferent).
  - Indifference curves are downward sloping.
  - Indifference curves farther from the origin: more satisfied and better off.
  - Indifference curves are flatter when moving to the right.

Relative prices and Demand (cont.)



- Consume at the point on the isolvalue line that yields the highest possible welfare.
- Where the isovalue line is tangent to the highest reachable indifference curve, at point D.

Relative prices and Demand (cont.)



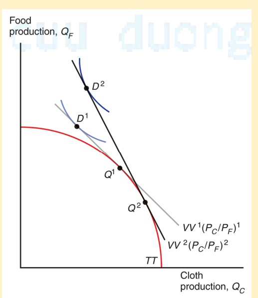
- The economy produces more cloth than it consumes and therefore exports cloth
- It consumes more food than it produces and therefore imports food

Relative prices and Demand (cont.)

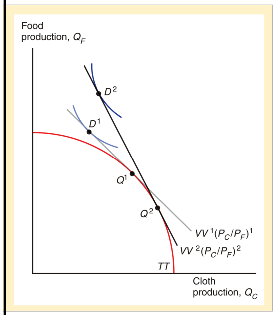
Figure 5-4

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.

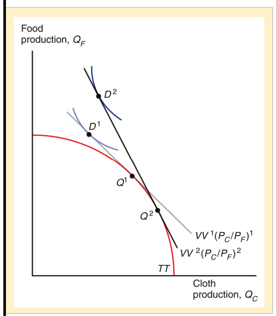


Relative prices and Demand (cont.)



- The move from D^1 to D^2 represents two effects of the rise in P_C/P_F:
  - First:
    - A higher indifference curve results.
    - The country exports cloth
    - A higher price for cloth exports means that more food can be imported.

Relative prices and Demand (cont.)



- The move from D^1 to D^2 represents two effects of the rise in P_C/P_F:
  - Second:
    - a shift along the indifference curve, toward food and away from cloth
    - A higher P_C/P_F makes consumers willing to buy less cloth and more food.

Relative prices and Demand (cont.)

- **Income effect -** the change in welfare (income) when the price of one good changes relative to the price of another
  - graphically represented by shifting the indifference curve
- **Substitution effect -** the substitution of one good for another when the price of the good changes relative to the other
  - graphically represented by a moving along a given indifference curve

=> When relative price changes => changes in demand represented by income and substitution effect

Welfare and the Terms of Trade

- The **terms of trade** refers to the price of exports relative to the price of imports.
  - How much is terms of trade of Home and Foreign?
  - -Home: export cloth -> P_C/P_F
  - -Foreign: export food -> P_F/P_C
- 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

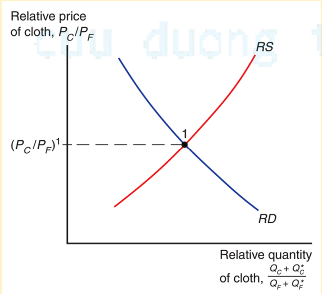
- Use relative supply (RS) and relative demand (RD).
- RS
  - *World* supply of cloth relative to that of food at each relative price.
  - RS curve: upward sloping.
- RD
  - W*orld* demand of cloth relative to that of food at each relative price.
  - RD curve: downward sloping.

Determining Relative Prices (cont.)

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.



Effects of economic growth

- Economic growth
- Economic growth and PPF
- Relative supply and the terms of trade

Economic Growth – 2 questions

- Is economic growth of other countries good or bad for our nation?
  - E.g; Economic growth in China good for the standard of living in the US?
  - Good : larger markets for our exports.
  - Bad: increased competition for our exports.
- Is growth in a country more or less valuable when it is integrated in the world economy?
  - More valuable: sell some of its increased production to the world market.
  - Less valuable: the benefits of growth may be passed on to foreigners in the form of lower prices for the country's exports rather than retained at home.
- The standard trade model gives us precise answers to these questions.

Economic Growth and PPF

- Economic growth: outward shift of a country's PPF. Results from:
  - An increases in a country's resources
  - Improvements in the efficiency with which resources are used
- Growth is usually **biased**
  - The international trade effects of biased growth : **PPF shifts out more in one direction than in the other**

Economic Growth and PPF (cont.)

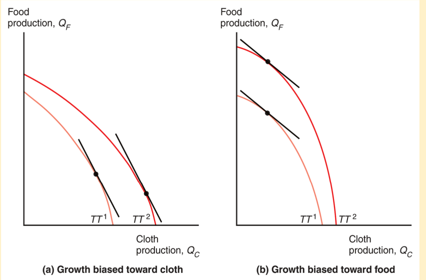


Figure 5-6
Biased Growth
Growth is biased when it shifts production possibilities out more toward one good than toward another. In both cases shown the production possibility frontier shifts out from TT^1 to TT^2. In case (a) this shift is biased toward cloth, in case (b) toward food.

Economic Growth and PPF (cont.)

- Rapid growth has occurred in US computer industries but relatively little growth has occurred in US textile industries.
- Reason for biased growth:
  - The Ricardian model: technological progress in one sector
  - The Heckscher-Ohlin model: an increase in one factor of production.

Economic Growth and PPF (cont.)

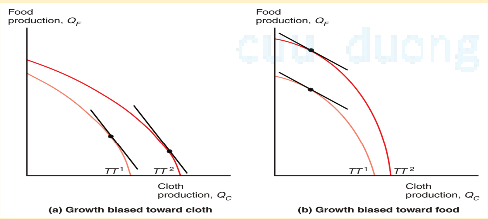
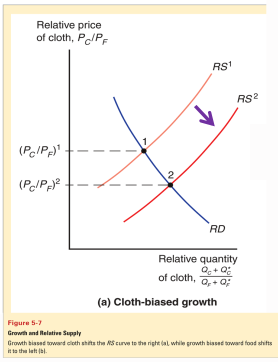


Figure 5-6
Biased Growth
Growth is biased when it shifts production possibilities out more toward one good than toward another. In both cases shown the production possibility frontier shifts out from TT^1 to TT^2. In case (a) this shift is biased toward cloth, in case (b) toward food.

- **<u>If relative price is hold constant, growth that is biased toward cloth will lead to a rise in the output of cloth and a decline in the output of food.</u>**
- The reverse is true for growth biased toward food

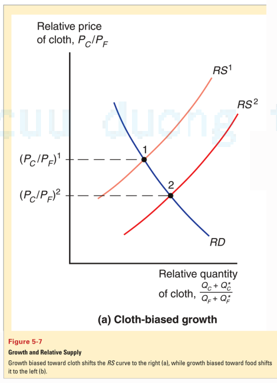
Relative supply and the terms of trade

- A rise in the output of cloth relative to that of food
- For the whole world: the output of cloth relative to food will rise at any given price
- RS will shift to the right from RS^1 to RS^2



Relative supply and the terms of trade (cont.)

- RS will shift to the right from RS^1 to RS^2
- Relative price of cloth P_C/P_F will decline
- Terms of trade of Home will decline => worse off
- Terms of trade of Foreign will increase => better off.



Relative supply and the terms of trade (cont.)

- **Export-biased growth:** expands a country's PPF in the direction of the goods that that country exports.
  - cloth for Home, food for Foreign
- **Import-biased growth** is growth that expands a country's PPF disproportionally in production of that country's imports.
  - food for Home, cloth for Foreign

Relative supply and the terms of trade (cont.)

- **Export-biased growth in Home**
  - reduces Home's terms of trade
  - ⇒ generally reducing its welfare
  - ⇒ increasing the welfare of Foreign
- **Import-biased growth in Home**
  - increases Home's terms of trade
  - ⇒ generally increasing its welfare
  - ⇒ decreasing the welfare of Foreign

Answers to the Initial Questions

- Export-biased growth in the rest of the world is good for us, improving our terms of trade
- Import-biased growth abroad worsens our terms of trade

=> **Growth in the rest of the world can hurt you if it takes place in the sector that compete with your exports.**

- Export-biased growth in our country worsens our terms of trade, reducing the direct benefits of growth.
- Import-biased growth in our country leads to an improvement of our terms of trade

Effects of international transfers of income

- International transfers of income
- Effects of a transfer on the terms of trade

Changes in relative world demand

- Reasons for changes in world RD
  - Tastes: e.g food
  - Technology: e.g mobile
  - International transfer of income: most important and controversial
- International transfer of income: transfers of income from one country to another.
  - Example of international transfer of income: war reparations, foreign aid..

The Effects of International Transfers of Income on Terms of trade

- If Home makes a transfer of some of its income to Foreign

=> Home's income is reduced

=> Home reduces its expenditures and Foreign increases its expenditures

=> might lead to a shift in world relative demand

=> might affect the terms of trade

(The RD curve does not necessarily shift when world income is distributed)

The Effects of International Transfers of Income on Terms of Trade (cont.)

- After the transfer of income from Home, demand for goods could fall in Home and demand for goods could rise in Foreign.
- If Foreign allocates its extra income between cloth and food in the same proportions that Home reduces its spending

⇒ world spending will not change

⇒ RD curve will not shift

⇒ No terms of trade effect

(RD curve does not shift left and the terms of trade does not change)

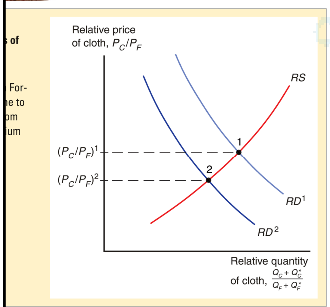
The Effects of International Transfers of Income on the Terms of Trade (cont.)

- If two countries do not allocate their changes in spending in the same proportions => there will be a terms of trade effect.
- The direction of the effect will depend on the difference in Home and Foreign spending pattern.

The Effects of International Transfers of Income on the Terms of Trade (cont.)

- Suppose Home transfers incomes to Foreign and Home exports cloth
- If Home has **higher marginal propensity to spend on cloth** than Foreign (has lower marginal propensity to spend on food than Foreign)
  - Home allocates a higher proportion of a marginal shift in expenditure to cloth than Foreign does
- Home's transfer payments reduce demand for cloth and increase demand for food at any given relative price

The Effects of International Transfers of Income on the Terms of Trade (cont.)



⇒RD curve shifts to left from RD¹ to RD²
⇒ Lowering the relative price of cloth
⇒ Worsening Home's terms of trade
⇒ Improving Foreign's terms of trade

The Effects of International Transfers of Income on the Terms of Trade (cont.)

- Suppose Home transfer incomes to Foreign , Home export cloth
- If Home has **lower marginal propensity to spend on cloth** than Foreign
- A transfer of income from Home to Foreign shifts RD curve to the right

=> Improve Home's terms of trade at Foreign's expenses.

The Effects of International Transfers of Income on the Terms of Trade (cont.)

- An income transfer worsens the donor's terms of trade if the donor has a higher marginal propensity to spend on its export good than the recipient
- If the donor has a lower marginal propensity to spend on its export, its terms of trade will improve (RD curve shift to the right).

=> better to give than to receive

=> however, this possibility is almost surely purely theoretical

The Effects of International Transfers of Income on the Terms of Trade (cont.)

- Countries spend most of their (marginal) income on their own products.
- Transportation costs, tariffs, and other barriers cause domestic residents to favor domestic goods.

=> The possibility of improving Home's Terms of trade when Home transfer income is almost surely purely theoretical

=> Generally, RD curve will shift left with a transfer of income, decreasing the terms of trade for the donor nation.

Effects of import tariffs and export subsidies

- Import tariffs
- Export subsidies
- Import Tariffs and Distribution of Income Across Countries
- Export subsidies and Distribution of Income Across Countries

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.
- External price – price at which good is traded internationally
- Internal price – price at which good is traded within a country

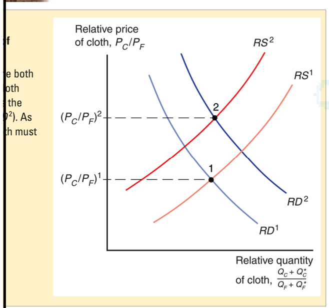
Import Tariffs and Export Subsidies (cont.)

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

Import Tariffs and Distribution of Income Across Countries

- If Home imposes a tariff on food imports, the P_F/P_C that domestic citizens face is higher.
  - P_C/P_F that domestic consumers and producers pay is lower.
  - Domestic producers will receive a lower relative price of cloth => more willing to switch to food production => RS curve will shift to the left
  - Domestic consumers will pay a lower relative price of cloth => more willing to switch to cloth consumption => RD curve will shift to the right.

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



Home imposes a tariff on food imports, P_F/P_C increases

- RS curve will shift to the left

- RD curve will shift to the right.

-The world relative price of cloth will increases from $(P_C/P_F)^1$ to $(P_C/P_F)^2$

- Home's terms of trade improve at Foreign's expense.

When the domestic country imposes an import tariff, the terms of trade increases and the welfare of the country may increase.

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

- 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

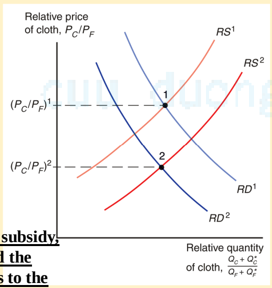
- If Home imposes a subsidy on cloth exports, P_C/P_F that *domestic citizens* face is higher.
  - Domestic producers will receive a higher P_C/P_F, => willing to switch to cloth production => RS curve will shift to the right.
  - Domestic consumers will pay a higher P_C/P_F, => more willing to switch to food consumption => RD curve will shift to the left.

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

Figure 5-10

Effects of a Subsidy on the Terms of Trade

An export subsidy's effects are the reverse of those of a tariff. Relative supply of cloth rises, while relative demand falls. Home's terms of trade decline as the relative price of cloth falls from $(P_C/P_F)^1$ to $(P_C/P_F)^2$.



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

Implications of Terms of trade Effects: Who gains and who loses?

- 2 dimensions:
  - International distribution of income
  - Distribution of income within each of the country
- The model of two countries producing two goods

Implications of Terms of trade Effects: Who gains and who loses? (cont.)

- The first dimension: International distribution of income
  - If Home imposes an tariff

  => Home's terms of trade will improve at Foreign's expense.
    - Tariff hurt the rest of the world
    - Effects on Home's welfare is not quite as clear-cut.
      - Even though Home's the terms of trade improvement will benefit Home, however, a tariff also imposes costs (efficiency loss) by distorting production and consumption within Home country.
      - Home will gain if benefits from improvement in Terms of trade outweigh efficiency losses of tariff.

Implications of Terms of trade Effects: Who gains and who loses? (cont.)

- The first dimension: International distribution of income
  - If Home use an export subsidy, Foreign's terms of trade improves at Home's expense.
    - The rest of the world gain
    - Home loses

Import Tariffs and Export Subsidies in Other Countries

- The first dimension: International distribution of income
  - 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 Home also exports, which will reduce its price in world markets and decrease the terms of trade for Home.
    - 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 Home also imports, which will reduce its price in world markets and increase the terms of trade for Home.

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

- The second dimension: The 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*.
- Generally, if Home imposes a tariff
  - Increase income for domestic import-competing producers
  - Shift resources away from the export sector.
- Generally, if Home use an export subsidy
  - Increase income for domestic exporters
  - Shift 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 curve of donor will shift left leading to a decrease in the donor's terms of trade.
6. When the domestic country imposes an import tariff, the terms of trade increases and the welfare of the country may increase.

Summary (cont.)

7. When the domestic country imposes an export subsidy, the terms of trade decreases and the welfare of the country 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.

END OF CHAPTER 5