CHAPTER 5

THE STANDARD TRADE MODEL

(Chapter 6 of the textbook)

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Learning goals

- Understand how the components of the standard trade model fit together to illustrate how trade patterns are established by a combination of supply-side and demand-side factors.
- Recognize how changes in the terms of trade and economic growth affect the welfare of nations engaged in international trade.
- Understand the effects of tariffs and subsidies on trade patterns and the welfare of trading nations.
- Relate international borrowing and lending to the standard trade model, where goods are exchanged over time.

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Preview

- A standard model of a trading economy
- Effects of economic growth
- Effects of international transfers of income

4 key relationships in the standard trade model

- Production possibilities and Relative Supply
- Relative Prices and Relative Demand
- Determining world equilibrium by world relative demand and world relative supply
- The effects of Terms of trade on welfare

=> Identify relative supply, relative demand, relative prices, TOT and welfare

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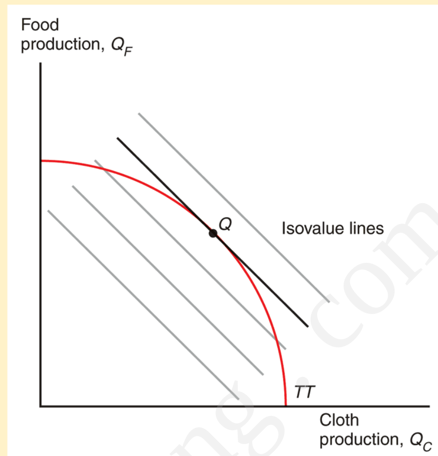
Production possibilities and Relative Supply

Figure 5-1

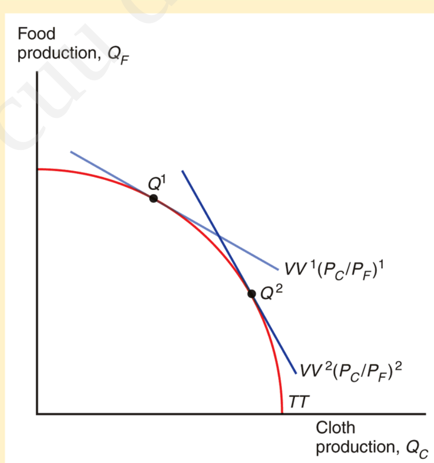
Relative Prices Determine the Economy's Output

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



- Production point is Q, where TT is just tangent to an Iso-value line => (P_C/P_F) = Opportunity cost

Production possibilities and Relative Supply (cont.)



-P_C/P_F increases

-The new production point: Q^2

- The nation will produce more cloth and less food.
- Increase in the relative supply of cloth (Q_C/Q_F)
=> Upward slopping relative supply curve

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Production possibilities and Relative Supply (cont.)

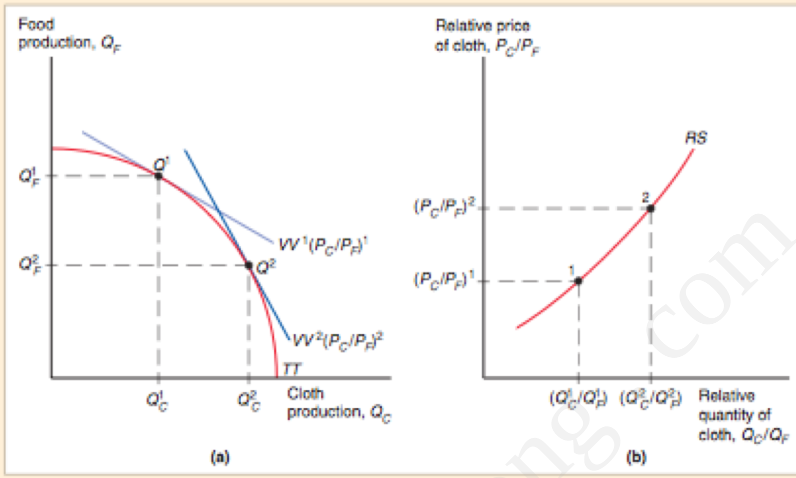


Figure 6-2

How an Increase in the Relative Price of Cloth Affects Relative Supply

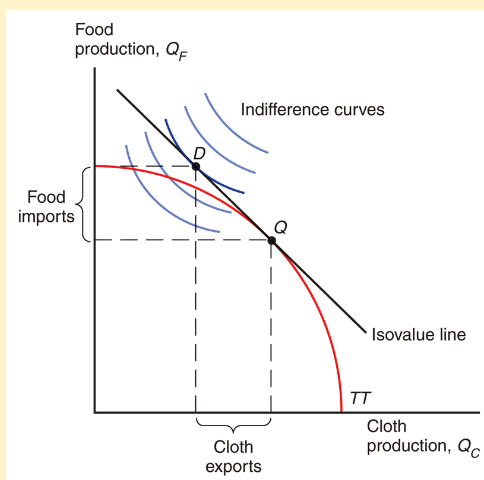
In panel (a), the isovalue lines become steeper when the relative price of cloth rises from $(P_C/P_F)^1$ to $(P_C/P_F)^2$

Relative prices and Demand

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.



Consumption point: Where the isovalue line is tangent to the highest reachable indifference curve, at point D.

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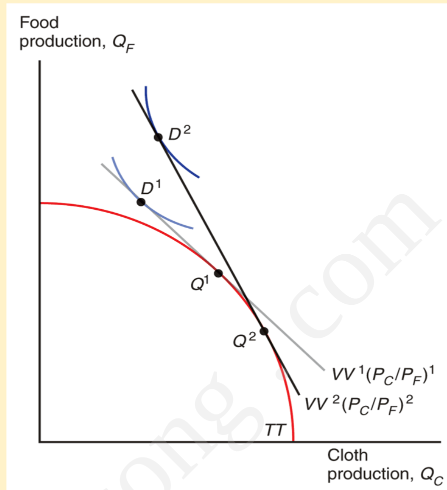
Relative prices and Demand (cont.)

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.)

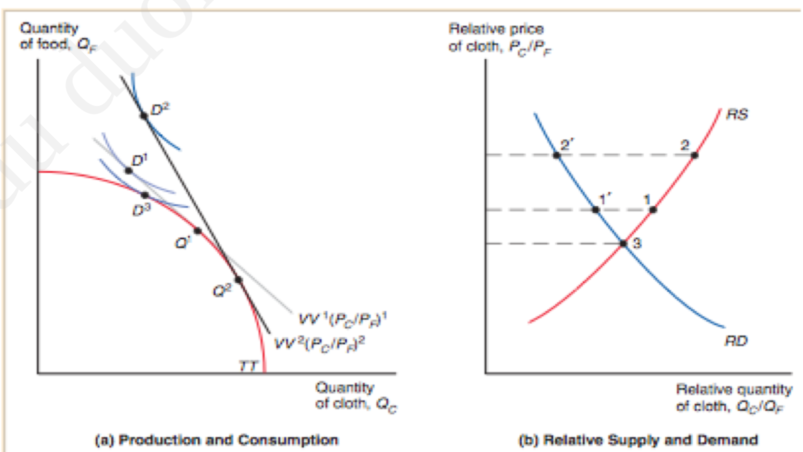


Figure 6-4

Effects of a Rise in the Relative Price of Cloth and Gains from Trade

In panel (a), the slope of the isovalue lines is equal to minus the relative price of cloth, P_C/P_F. As a result, 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 and consumption shifts from D^1 to D^2. If the economy cannot trade, then it produces and consumes at point D^3. Panel (b) shows the effects of the rise in the relative price of cloth on relative production (move from 1 to 2) and relative demand (move from 1' to 2'. If the economy

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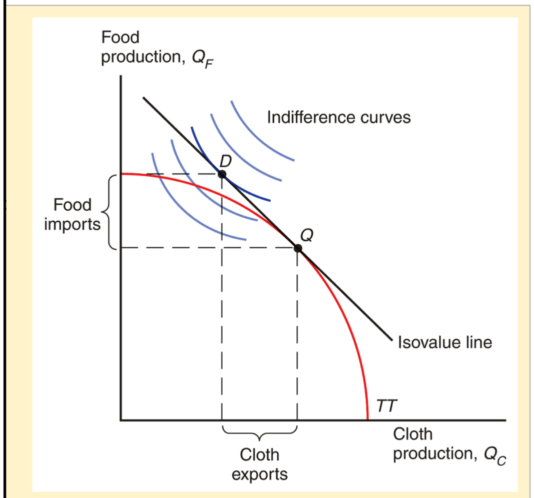
Relative prices and Demand (cont.)



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

Determining Relative Prices

- 2 nations: Home and Foreign
  - Home has lower Pc/Pf
- Use relative supply (RS) and relative demand (RD) to determine relative prices
- RS
  - *World* supply of cloth relative to that of food at each relative price.
  - RS curve: upward sloping.
- RD
  - *World* demand of cloth relative to that of food at each relative price.
  - RD curve: downward sloping.

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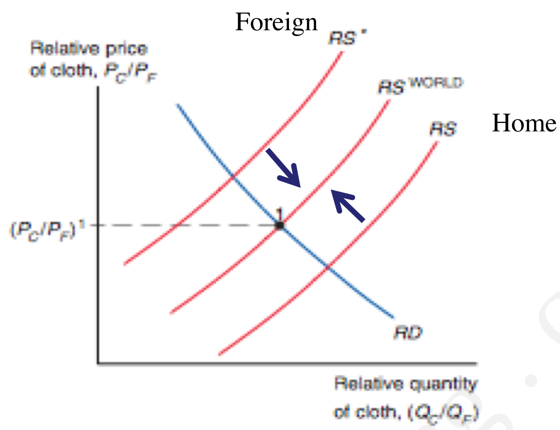
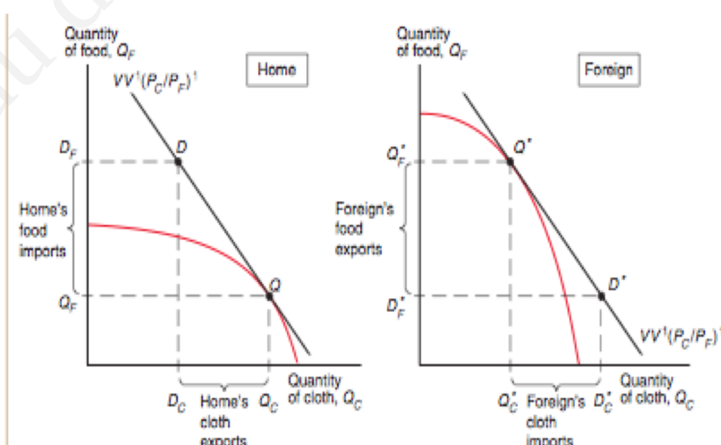
Determining Relative Prices (cont.)



(a) Relative Supply and Demand

Determining Relative Prices (cont.)



(b) Production, Consumption, and Trade

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Welfare effects of changes in the Terms of Trade

- The **terms of trade** (TOT)
  - refers to the price of exports relative to the price of imports of a nation in a certain period of time.
  - Determined by the intersection of the world RD and RS
- In two-good two-country model

$$TOT = \frac{Price - of - exports}{Price - of - import}$$

- In multi–commodity two-country model

$$TOT = \frac{P_x}{P_m} \times 100$$

P_x: Index of export prices
P_m: Index of import prices

Welfare effects of changes in the Terms of Trade (cont.)

- E.g: Over a given period, the index of export prices rises by 10% and the index of import prices rises by 5%, the terms of trade are

$$TOT = \frac{110}{105} \times 100 = 104.8\%$$

- TOT has improved by 4.8%

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Welfare effects of changes in the Terms of Trade (cont.)

- TOT improvement means
  - ♦ for every unit of exports sold, it can buy more units of imported goods.
  - ♦creates a benefit in terms of how many goods needed to export to buy a given amount of imports
  - => An increase in the terms of trade increases a country's welfare
- Worsening TOT means
  - ♦ has to export more to purchase a given quantity of imports.
  - ♦ creates a loss
  - ⇒ A decrease in the terms of trade decreases a country's welfare.
- When P_C/P_F increases, a country that exports cloth will be better off

Preview

- A standard model of a trading economy
- Effects of economic growth
- Effects of international transfers of income

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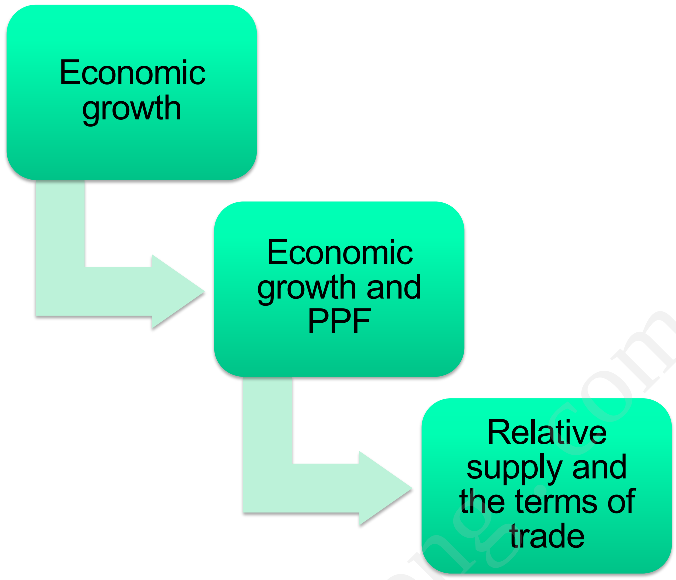

Economic Growth – 2 questions

- Is economic growth of other countries good or bad for our nation?
  - Good : larger markets for our exports, lower prices for our imports
  - Bad: increased competition for our exports and producers
- Is growth in a country is more or less valuable to itself?
  - 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 clearer and more precise answers to these questions.

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Economic Growth and PPF

- Economic growth: outward shift of a country's PPF, resulting 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: **<u>PPF shifts out more in one direction than in the other</u>**

Economic Growth and PPF (cont.)

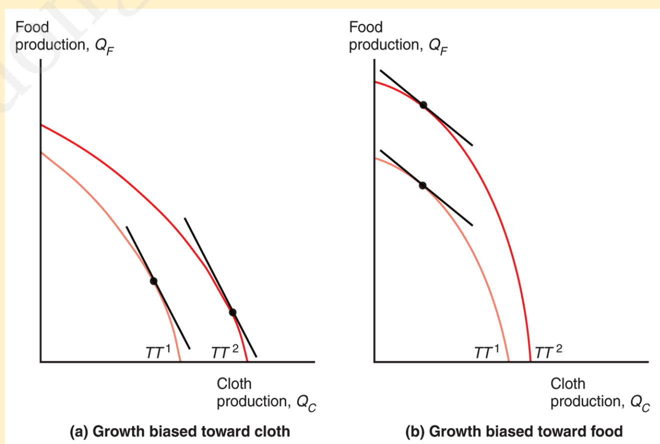

Figure 5-6

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.

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Economic Growth and PPF (cont.)

- E.g: 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.)

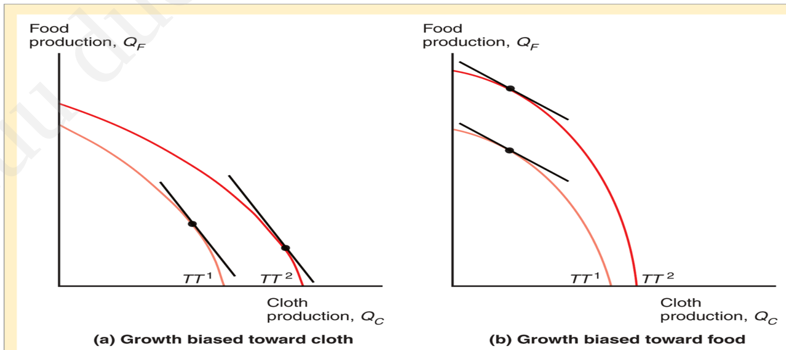

Figure 5-6
Biased Growth
Growth is biased when it shifts production possibilities out more toward one good than toward another. In both cases shown the production possibility frontier shifts out from TT^1 to TT^2. In case (a) this shift is biased toward cloth, in case (b) toward food.

- **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.**
- The reverse is true for growth biased toward food

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Economic growth and domestic relative supply

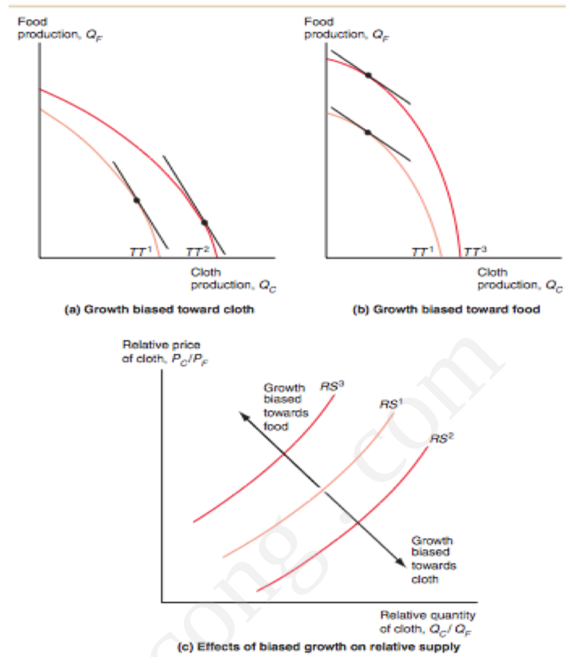

Figure 6-6

World relative supply and the terms of trade

- Suppose Home grows biased toward cloth (exported products)

=> A rise in the output of cloth relative to that of food in Home

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

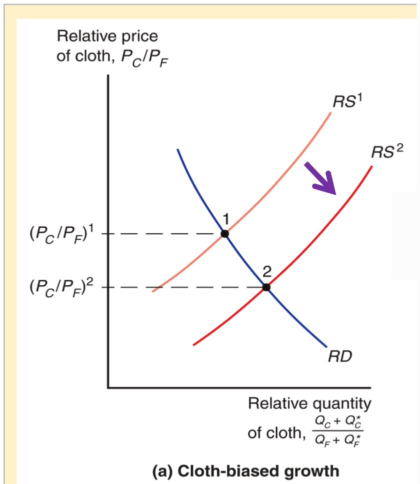

Figure 5-7

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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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, then Home will be worse off
- Terms of trade of Foreign will increase, then Foreign will be better off.

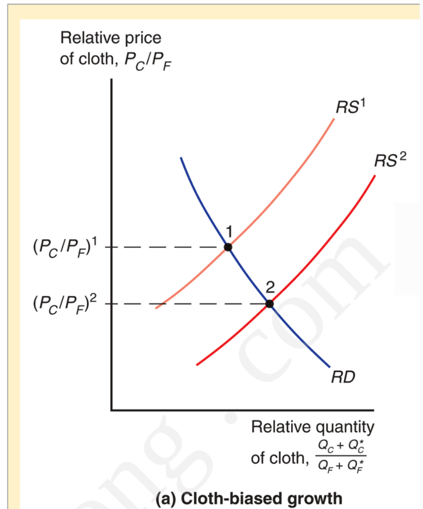

Figure 5-7
Growth and Relative Supply
Growth biased toward cloth shifts the *RS* curve to the right (a), while growth biased toward food shifts it to the left (b).

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.
- **Export-biased growth in Home**
  - ♦ Home: export cloth, Foreign: export food
  - ♦ reduces Home's terms of trade (Explain???)
  - ⇒ generally reducing its welfare
  - ⇒ increasing the welfare of Foreign

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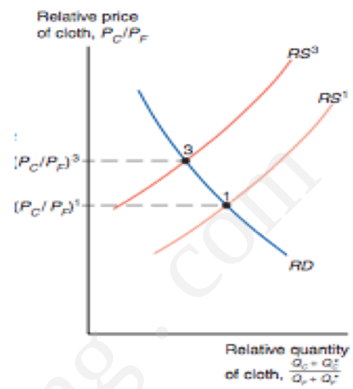
Relative supply and the terms of trade (cont.)

- Suppose Home grows biased toward food (imported products)

=> A rise in the output of cloth relative to that of food

- RS will shift to the left from RS^1 to RS^3
- Relative price of cloth P_C/P_F will increase
- Terms of trade of Home will increase, then Home will be better off
- Terms of trade of Foreign will decrease, then Foreign will be worse off.



(b) Food-biased growth

Relative supply and the terms of trade (cont.)

- **Import-biased growth** is growth that expands a country's PPF disproportionally in production of that country's imports.
- **Import-biased growth in Home**
  - ♦ Home: export cloth, Foreign: export food
  - ♦ increases Home's terms of trade

  ⇒ generally increasing its welfare

  ⇒ decreasing the welfare of Foreign

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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

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

- 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

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Preview

- A standard model of a trading economy
- Effects of economic growth
- Effects of international transfers of income

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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

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International transfer of income

- International transfer of income: transfers of income from one country to another.
  - Example: war reparations, foreign aid..
    - Foreign reparation: after WW2 (Allies – Germany)
    - Aid: after WW2 US – Japan, ODA

=> War reparations or foreign aid may influence demand for traded goods and therefore relative demand.

  - International loans may also influence relative demand in the short run, before the loan is paid back.

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

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

=> Home's income reduces and Foreign's income increases

- After the transfer of income from Home
  - Demand for goods could fall in Home
  - 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

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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 of payments reduces world demand for cloth and increase world demand for food at any given relative price

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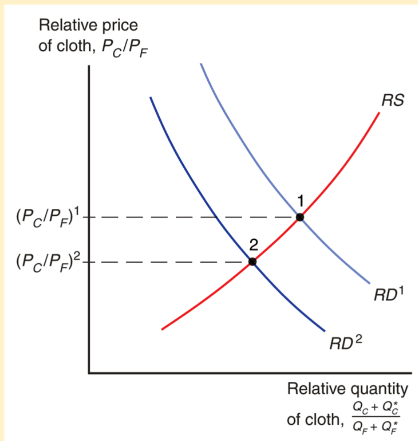
The Effects of International Transfers of Income on the Terms of Trade (cont.)



⇒RD curve shifts to left from RD^1 to RD^2
⇒ Lowering the relative price of cloth (P_C/P_F)
⇒ Worsening Home's terms of trade
⇒ Improving Foreign's terms of trade
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

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 (spend less on its own products and spend more on its imported products)
- A transfer of income from Home to Foreign shifts RD curve to the right

⇒ Improve Home's terms of trade at Foreign's expenses.

- In this case, it is definitely that it is better to give than to receive

=> however, this possibility is almost surely purely theoretical

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

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Key points of the standard trade model (read more page 130-131)

1. The standard trade model:
   - Production point lies on PPF and the highest possible iso- value line
   - A change in the relative price => how relative supply and consumption change
   - A world RS curve – upward sloping - is derived from production possibilities
   - A world RD curve – downward sloping - is derived from preferences
   - The world relative price is the intersection of the world RD and RS.
2. Terms of trade
   - Definition: the price of exports relative to the price of imports in world markets.
   - Formula
   - Meaning of TOT improvements
   - Meaning of TOT worsening

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Key points of the standard trade model (cont.)

3. Economic growth:
   - Economic growth is often biased and results from changes in technology or resources
   - Effect of economic growth depends on the direction of growth
   - Export-biased growth
     - expands a country's PPF in the direction of the goods that that country exports
     - Impacts: reduces a country's terms of trade, generally reducing its welfare and increasing the welfare of foreign countries
   - Import-biased growth
     - growth that expands a country's PPF disproportionally in production of that country's imports.
     - Impacts: increases a country's terms of trade, generally increasing its welfare and decreasing the welfare of foreign countries.

=> Growth is good or bad?

Key points of the standard trade model (cont.)

4. The effect of international transfers of income depend on the marginal propensity to spend on domestic goods (export good).

- If the income receiving nation allocates its extra income in the same proportion that the donor reduces its spending => TOT will not change.
- 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
- An income transfer improves the donor's terms of trade if the donor has a lower marginal propensity to spend on its export good than the recipient

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END OF CHAPTER 5

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