**Knowledge Enrichment Seminar for Senior Secondary Economics Curriculum**

**Macroeconomics Series (3): Extension of trade theory**

by

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# Lecture Outline

1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)
2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

## 1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)

- The Determinants of Trade
- Illustration of comparative advantage and gains from trade with the aid of production possibilities frontier
  - Constant cost analysis
  - Increasing cost analysis



## 1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)

Teaching advice

- This topic may be difficult to teach and very difficult for students to understand and accept.
- Be prepared for a skeptical reaction from students who have been told that free international trade may harm the domestic economy (e.g. job losses).
- For various historical, cultural, and political reasons, free trade has few defenders outside of the economics profession.

## 1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)

Teaching advice

- Point out that international trade issues are not different from trading as it applies to individuals within a community or between states and regions within a country.
- The gains from trade between countries occur for the same reasons that we observe gains from trade between individuals.
- Pick a state adjacent to Hong Kong. Ask students why we do not seem to worry about "importing" goods from other states.



## The Determinants of Trade

- Example:

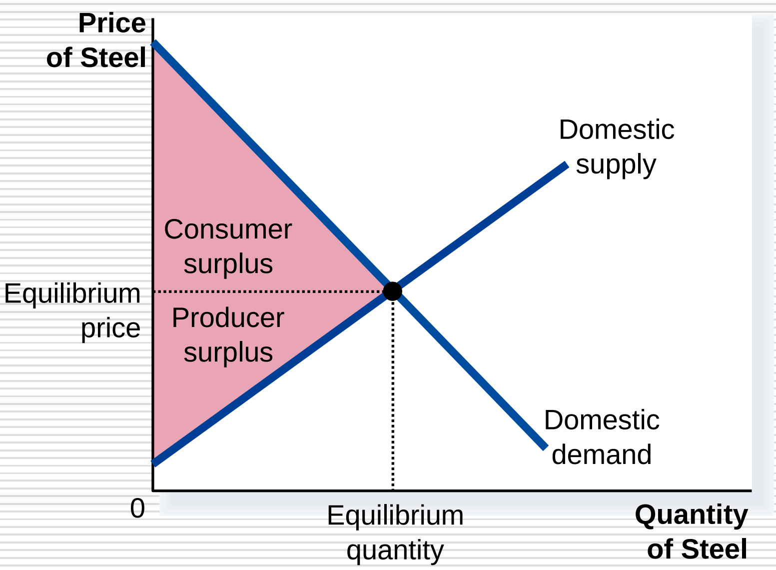
  The market for steel in a country called Isoland.

# The Determinants of Trade

- The Equilibrium Without Trade
  - If there is no trade, the domestic price in the steel market will balance supply and demand.
  - A new leader is elected who is interested in pursuing trade. A committee of economists is organized to determine the following:
    - If the government allows trade, what will happen to the price of steel and the quantity of steel sold in the domestic market?
    - Who will gain from trade, who will lose, and will the gains exceed the losses?
    - Should some sort of import restriction be put in place in the market for steel?



Figure 1The Equilibrium without International Trade



## The Determinants of Trade

- The World Price and Comparative Advantage
  - The first issue is to decide whether Isoland should import or export steel.
    - The answer depends on the relative price of steel in Isoland compared with the price of steel in other countries.
  - Definition of **world price: the price of a good that prevails in the world market for that good.**



## The Determinants of Trade

- The World Price and Comparative Advantage
  - If the world price is greater than the domestic price, Isoland should export steel; if the world price is lower than the domestic price, Isoland should import steel.
    - Note that the domestic price represents the opportunity cost of producing steel in Isoland, while the world price represents the opportunity cost of producing steel abroad. It tells how much a Isolandian must give up in order to get one unit of steel.
    - Thus, if the domestic price is low, this implies that the opportunity cost of producing steel in Isoland is low, suggesting that Isoland has a comparative advantage in the production of steel. If the domestic price is high, the opposite is true.

1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)

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## Gains from Trade - Constant cost analysis

- Example: two goods—meat and potatoes and two people—a cattle rancher and a potato farmer (each of whom like to consume both potatoes and meat).
  - The gains from trade are obvious if the farmer can only grow potatoes and the rancher can only raise cattle.
  - The gains from trade are also fairly obvious if, instead, the farmer can raise cattle as well as grow potatoes, but he is not as good at raising cattle. The rancher can grow potatoes in addition to raising cattle, but her land is not well suited for growing potatoes.
  - The gains from trade are not as clear if either the farmer or the rancher is better at producing **both** potatoes and meat.

## Gains from Trade - Constant cost analysis

- Production Possibilities
  - The farmer and rancher both work 8 hours per day and can use this time to grow potatoes, raise cattle, or both.
  - Table 1 shows the amount of time each takes to produce 1 ounce of either good:

| | Minutes Needed to Make 1 Ounce of: | | Amount of Meat or Potatoes Produced in 8 Hours | |
|---|---|---|---|---|
| | Meat | Potatoes | Meat | Potatoes |
| Farmer | 60 min/oz | 15 min/oz | 8 oz | 32 oz |
| Rancher | 20 min/oz | 10 min/oz | 24 oz | 48 oz |

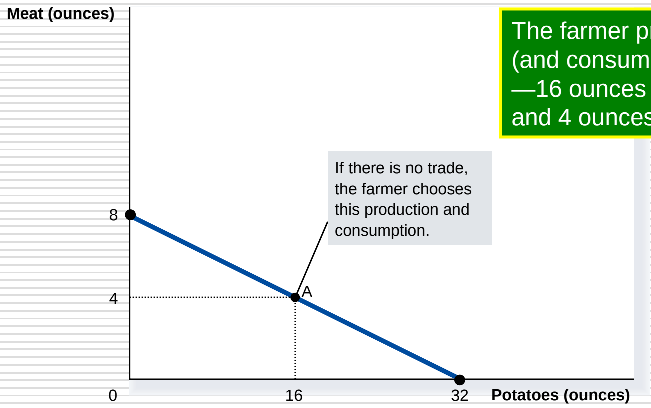


## Gains from Trade - Constant cost analysis

- Production Possibilities
  - The production possibilities can also be graphed.
    - These production possibilities frontiers are drawn linearly instead of being bowed out. This assumes that the farmer's and the rancher's technology for producing meat and potatoes allows them to switch between producing one good and the other at a constant rate.
    - These production possibilities frontiers represent the principles of tradeoffs and opportunity costs.
  - We will assume that the farmer and rancher divide their time equally between raising cattle and growing potatoes.

# Figure 2 The Production Possibilities Curve

**(a) The Farmer's Production Possibilities Frontier**

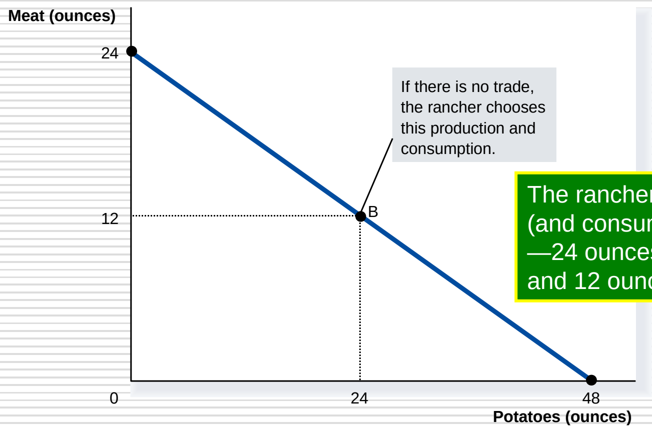



The farmer produces (and consumes) at point A —16 ounces of potatoes and 4 ounces of meat.



# Figure 2 The Production Possibilities Curve

**(b) The Rancher's Production Possibilities Frontier**




The rancher produces (and consumes) at point B —24 ounces of potatoes and 12 ounces of meat.

## A Parable for the Modern Economy - Constant cost analysis

- Specialization and Trade
  - Suppose the rancher suggests that the farmer specializes in the production of potatoes and then trade with the rancher for meat.
    - The rancher will spend 6 hours a day producing meat (18 ounces) and 2 hours a week growing potatoes (12 ounces).
    - The farmer will spend 8 hours a day growing potatoes (32 ounces).
    - The rancher will trade 5 ounces of meat for 15 ounces of potatoes.



Figure 3 How Trade Expands the Set of Consumption Opportunities

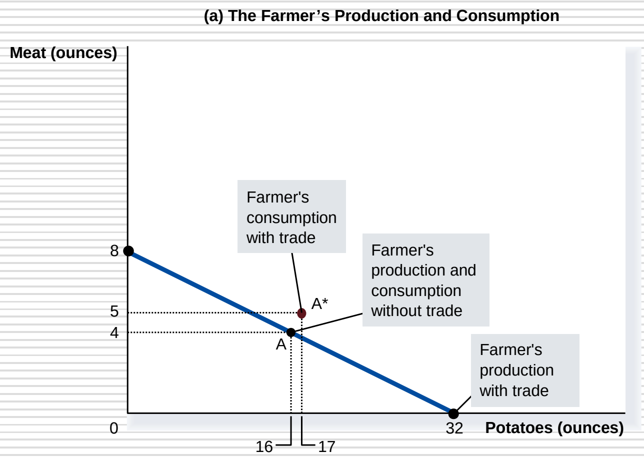
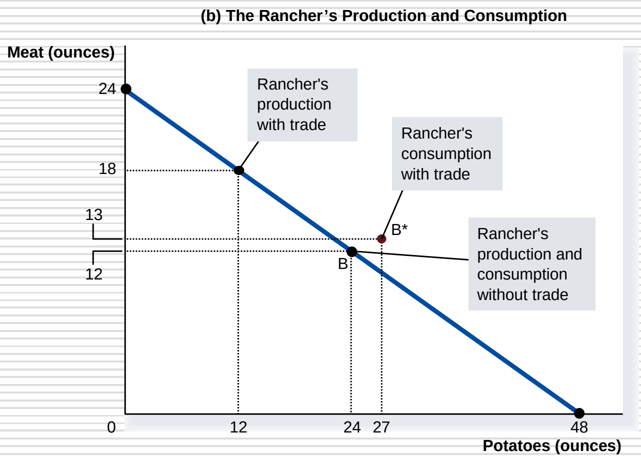


Figure 3 How Trade Expands the Set of Consumption Opportunities






# A Parable for the Modern Economy - Constant cost analysis

- Specialization and Trade
  - End results:
    - The rancher produces 18 ounces of meat and trades 5 leaving him with 13 ounces of meat. He also grows 12 ounces of potatoes and receives 15 ounces in the trade, leaving him with 27 ounces of potatoes.
    - The farmer produces 32 ounces of potatoes and trades 15 leaving him with 17 ounces. He also receives 5 ounces of meat in the trade with the rancher.
  - In both cases, they are able to consume more quantities of potatoes and meat after trade, compared with the quantities before trade.

## A Parable for the Modern Economy - Constant cost analysis

The Gains from Trade: A Summary

| | Farmer | | Rancher | |
|---|---|---|---|---|
| | Meat | Potatoes | Meat | Potatoes |
| **Without Trade:** | | | | |
| Production and Consumption | 4 oz | 16 oz | 12 oz | 24 oz |
| **With Trade:** | | | | |
| Production | 0 oz | 32 oz | 18 oz | 12 oz |
| Trade | Gets 5 oz | Gives 15 oz | Gives 5 oz | Gets 15 oz |
| Consumption | 5 oz | 17 oz | 13 oz | 27 oz |
| **Gains from Trade:** | | | | |
| Increase in Consumption | +1 oz | +1 oz | +1 oz | +3 oz |



## The Principle of Comparative Advantage

- Absolute Advantage
  - Definition of **absolute advantage: the comparison among producers of a good according to their productivity.**
  - The rancher has an absolute advantage in the production of both potatoes and meat.
- Opportunity Cost and Comparative Advantage
  - Definition of **opportunity cost: whatever must be given up to obtain some item.**

# The Principle of Comparative Advantage

| | Opportunity Cost of: | |
|---|---|---|
| | **1 oz of Meat** | **1 oz of Potatoes** |
| **Farmer** | 4 oz potatoes | 1/4 oz meat |
| **Rancher** | 2 oz potatoes | 1/2 oz meat |

- Opportunity Cost and Comparative Advantage
  - For the rancher, the opportunity cost of producing an ounce of potatoes is ½ ounce of meat.
  - For the farmer, the opportunity cost of producing 1 ounce of potatoes is only ¼ ounce of meat.
  - The opportunity cost of producing 1 ounce of meat is the amount of potatoes foregone and vice versa.



# The Principle of Comparative Advantage

- Opportunity Cost and Comparative Advantage
  - Definition of **comparative advantage: the comparison among producers of a good according to their opportunity cost.**
    - The farmer has a lower opportunity cost of producing potatoes and therefore has a comparative advantage in the production of potatoes.
    - The rancher has a lower opportunity cost of producing meat and therefore has a comparative advantage in the production of meat.
  - Because the opportunity cost of producing one good is the **inverse of the opportunity cost of producing the other,** it is impossible for a person to have a comparative advantage in the production of both goods.

# The Principle of Comparative Advantage

- Comparative Advantage and Trade
  - When specialization in a good occurs (assuming there is a comparative advantage), total output will grow.
  - As long as the opportunity cost of producing the goods differs across the two individuals, both can gain from specialization and trade.
    - The rancher buys 15 ounces of potatoes for 5 ounces of meat. The price of each ounce of potatoes is 1/3 ounce of meat. This is lower than the rancher's opportunity cost of ½ ounce of meat and is therefore beneficial to the rancher.
    - The farmer buys 5 ounces of meat with 15 ounces of potatoes. This implies that the price of each ounce of meat is 3 ounces of potatoes, which is lower than the farmer's opportunity cost of 4 ounces of potatoes. Thus, trade also benefits the farmer.
    - For both parties to gain from trade, the price they trade (terms of trade) must lie between the opportunity costs of the trade partners. The term of trade in our example is 3 ounces of potatoes for 1 ounce of meat.
    - The terms of trade of a country defined as the ratio of its export prices to its import prices.



# 1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gain from trade)

- The Determinants of Trade
- Illustration of comparative advantage and gains from trade with the aid of production possibilities frontier
  - Constant cost analysis
  - Increasing cost analysis

## Increasing cost analysis

- Differences in *labor, labor skills, physical capital, land and technology* between countries cause productive differences, leading to gains from trade.
- These productive differences are represented as differences in production possibility frontiers, which represent the productive capacities of nations.

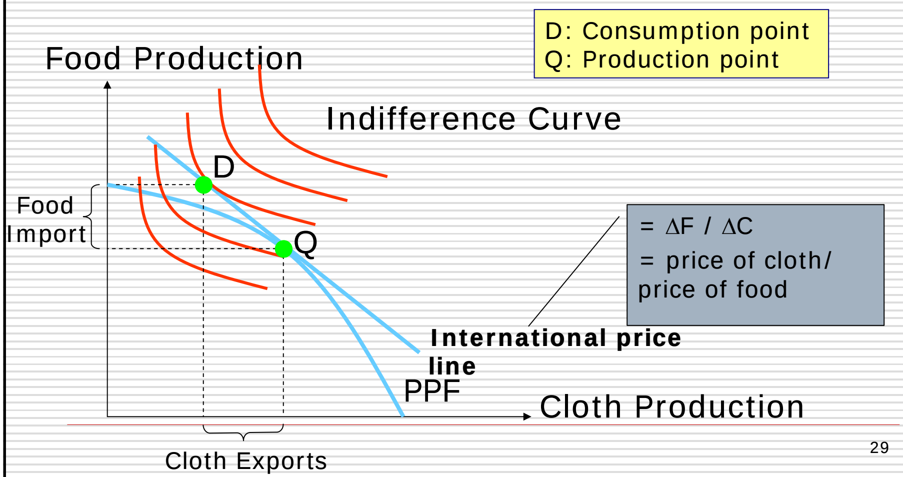


## Increasing cost analysis

- Recall that when the economy maximizes its production possibilities, the value of output lies on the PPF.
- The value of the economy's consumption is constrained to equal the value of the economy's production.
- Production choices are determined by the economy's PPF and the prices of output.
- What determines consumption choices (demand)?
- Consumer preferences and prices determine consumption choices.
- Consumer preferences are represented by **indifference curves**: combinations of goods that make consumers equally satisfied (indifferent).

# Increasing cost analysis

**Figure 4 Gains from Trade with Increasing Costs**






# Increasing cost analysis

- Indifference curves are downward sloping to represent the fact that if a consumer has more cloth he could have less 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 and better off. **More is preferred to less.**
- Indifference curves are flatter when moving to the right: the more cloth and the less food that is consumed, the more valuable an extra calorie of food becomes relative to an extra $m^2$ of cloth.

* **(Indifference curve analysis is not required in the NSS Economics Curriculum.)**

## Increasing cost analysis

- Prices determine the value of consumption.
  - When the price of cloth rises relative to the price of food (international price line becomes steeper), the economy is better off (gains from trade) when it exports cloth: a higher utility results (more goods available for consumption).
  - A higher price for cloth exports means that more food can be imported.
  - In this case, we say that the terms of trade of this country improve.



## Lecture Outline

1. Comparative advantage and its relation to globalization (production possibility frontier, terms of trade, gains from trade)
2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

- The Winners and Losers from Trade
- Case Study: Cheap clothes from China
- The effect of a Tariff
- The effect of a Import Quotas
- Comparative advantage and its relation to globalization



## The Winners and Losers from Trade

- We can use welfare analysis to determine who will gain and who will lose if free trade begins in Isoland.
- We will assume that, because Isoland would be such a small part of the market for steel, they will be price takers in the world economy. This implies that they take the world price as given and must sell (or buy) at that price.

2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

## Teaching advice

- Be prepared for students to argue that trade cannot be good for everyone. More than likely at least one of your students will know an individual who lost his or her job when a factory closed and moved to another country.
- Take this opportunity to point out that this individual is one of the "losers," but remind the class that the gains from trade exceed the losses, so the well-being of society, on the whole, is increased.



# The Winners and Losers from Trade

- The Gains and Losses of an Exporting Country
  - If the world price is higher than the domestic price, Isoland will export steel. Once free trade begins, the domestic price will rise to the world price.
  - As the price of steel rises, the domestic quantity of steel demanded will fall and the domestic quantity of steel supplied will rise. Thus, with trade, the domestic quantity demanded will not be equal to the domestic quantity supplied.

Figure 5 International Trade in an Exporting Country

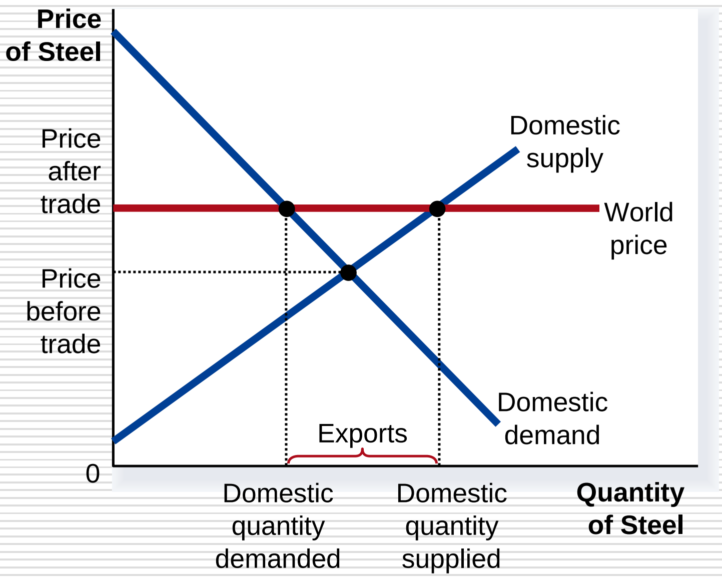





Figure 6 How Free Trade Affects Welfare in an Exporting Country

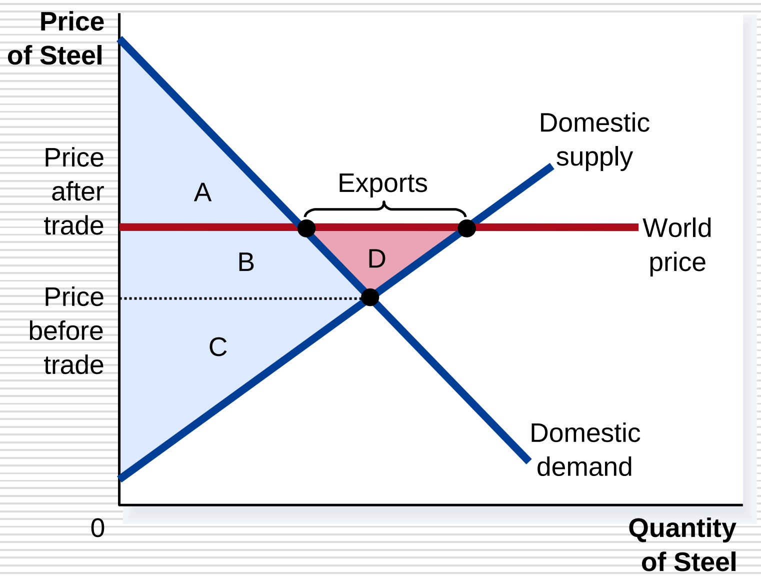
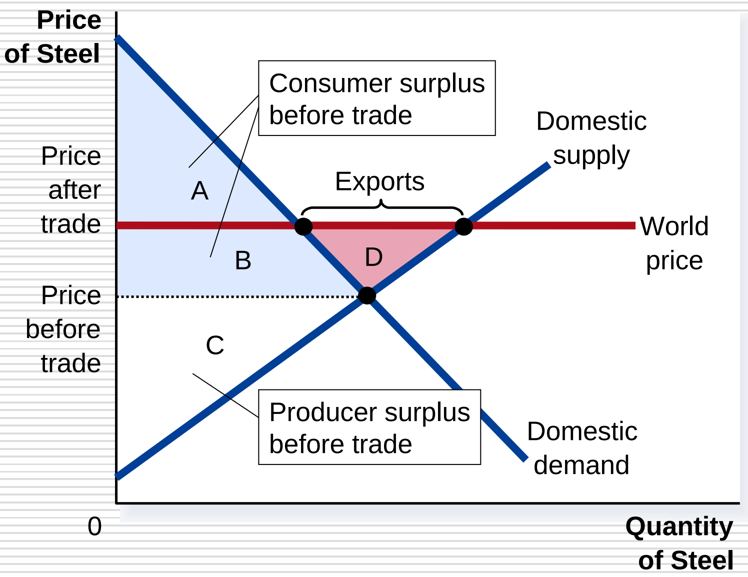


Figure 7 How Free Trade Affects Welfare in an Exporting Country






# The Winners and Losers from Trade

- The Gains and Losses of an Exporting Country

| | Before Trade | After Trade | Change |
|---|---|---|---|
| Consumer Surplus | A + B | A | −B |
| Producer Surplus | C | B + C + D | +(B + D) |
| Total Surplus | A + B + C | A + B + C + D | +D |

The area D shows the increase in total surplus and represents the gains from trade.

- When a country exports a good, domestic producers are better off and domestic consumers are worse off.
- When a country exports a good, total surplus is increased and the economic well-being of the country rises.

# The Winners and Losers from Trade

- The Gains and Losses of an Importing Country
  - If the world price is lower than the domestic price, Isoland will import steel. Once free trade begins, the domestic price will fall to the world price.
  - As the price of steel falls, the domestic quantity of steel demanded will rise and the domestic quantity of steel supplied will fall.
    - Thus, with trade, the domestic quantity demanded will not be equal to the domestic quantity supplied.
    - Isoland will import the difference between the domestic quantity demanded and the domestic quantity supplied.



Figure 8 International Trade in an Importing Country

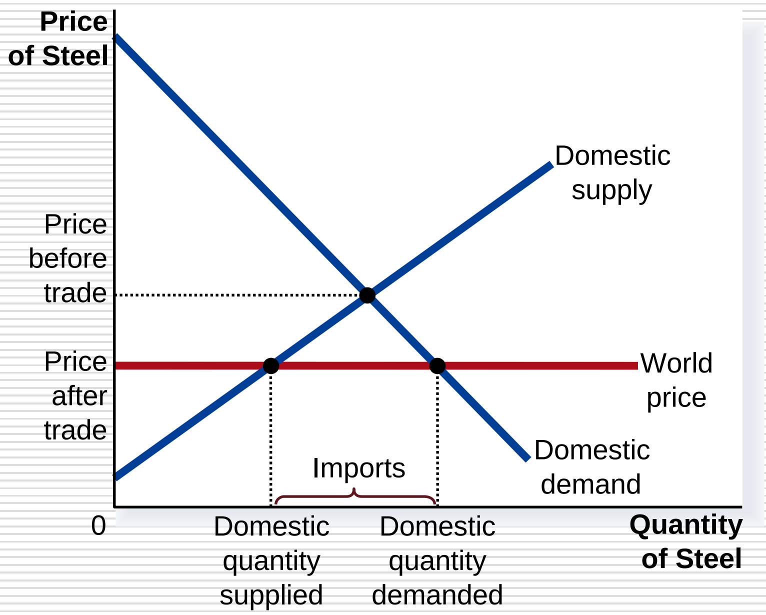


Figure 9 How Free Trade Affects Welfare in an Importing Country

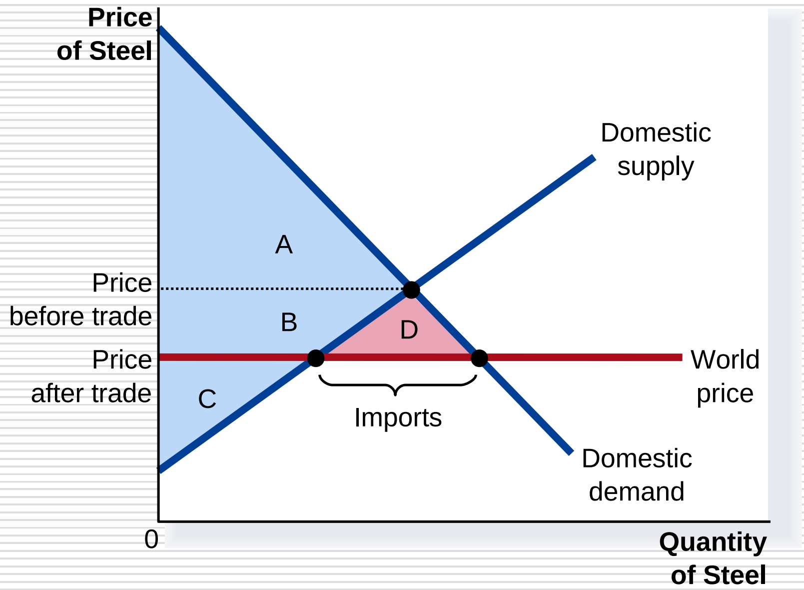





Figure 10 How Free Trade Affects Welfare in an Importing Country

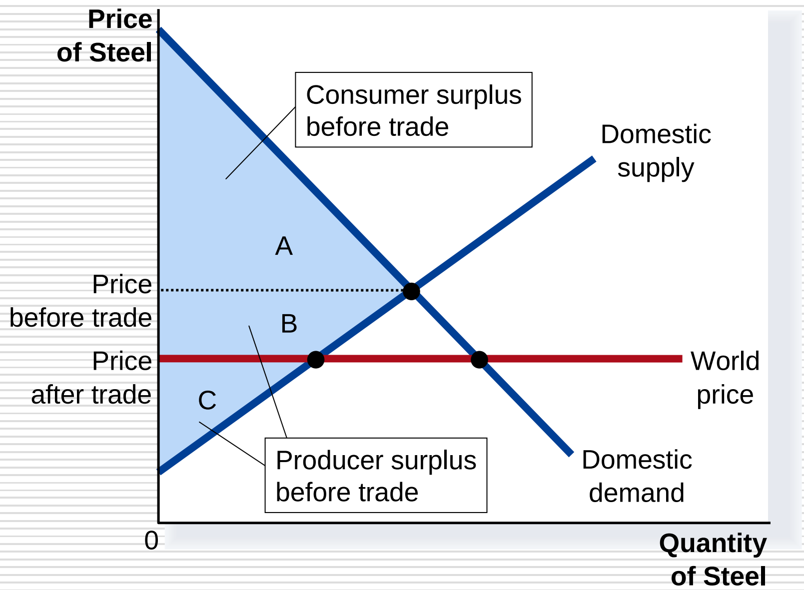
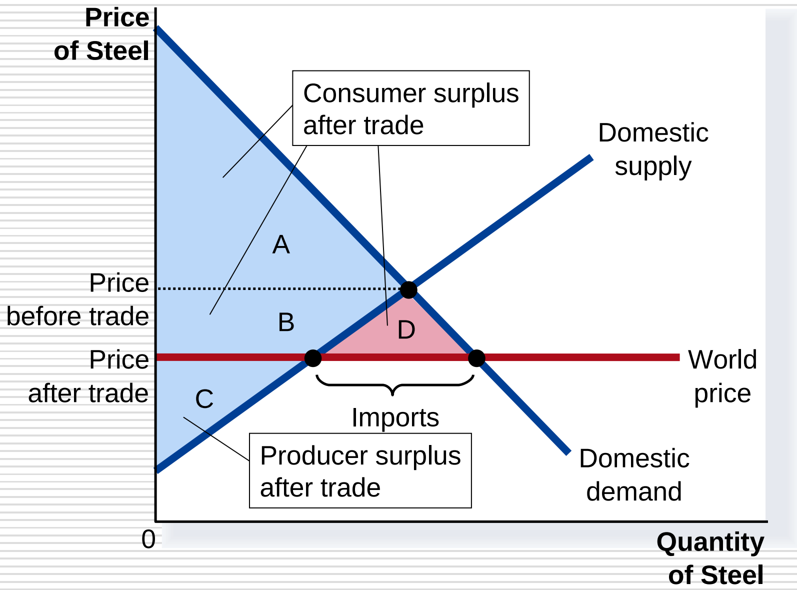


Figure 11 How Free Trade Affects Welfare in an Importing Country






# The Winners and Losers from Trade

- The Gains and Losses of an Importing Country

| | Before Trade | After Trade | Change |
|---|---|---|---|
| Consumer Surplus | A | A + B + D | +(B + D) |
| Producer Surplus | B + C | C | −B |
| Total Surplus | A + B + C | A + B + C + D | +D |

The area D shows the increase in total surplus and represents the gains from trade.

- When a country imports a good, domestic consumers are better off and domestic producers are worse off.
- When a country imports a good, total surplus is increased and the economic well-being of the country rises.

# The Winners and Losers from Trade

- International trade often creates winners and losers.
- The losers may insert political pressure on the government to impose trade restrictions such as tariffs and quotas.



## 2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

- The Winners and Losers from Trade
- Case Study: Cheap clothes from China
- The effect of a Tariff
- The effect of a Import Quotas
- Comparative advantage and its relation to globalization

## Case Study: Cheap clothes from China

### Textile Imports from China

- On 12/31/2004, U.S. quotas on apparel & textile products expired.
- During Jan 2005:
  - U.S. imports of these products from China increased over 70%.
  - Loss of 12,000 jobs in U.S. textile industry.
- The U.S. textile industry & labor unions fought for new trade restrictions.
- The National Retail Federation opposed any restrictions.
- November 2005: Bush administration agreed to limit growth in imports from China.

Source: "Free of Quota, China Textiles Flood the U.S." *New York Times*, 3/10/2005, pp.A1 and C6



## 2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand, using China as example)

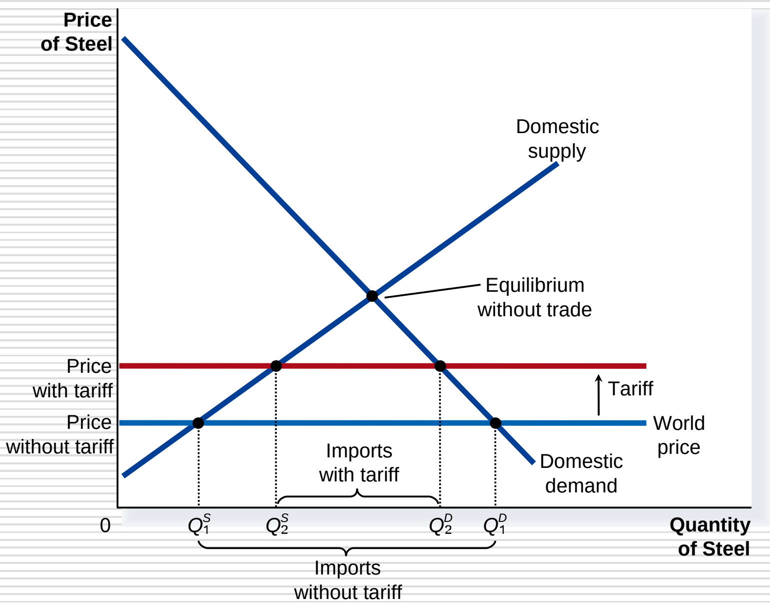
- The Winners and Losers from Trade
- Case Study: Cheap clothes from China
- The effect of a Tariff
- The effect of a Import Quotas
- Comparative advantage and its relation to globalization

# The Effects of a Tariff

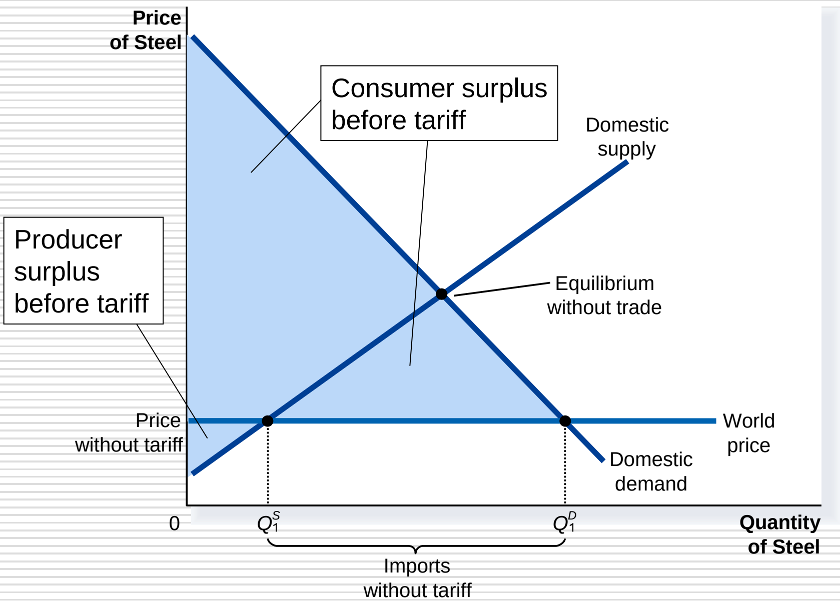
- The Effects of a Tariff
  - Definition of **tariff: a tax on goods produced abroad and sold domestically.**
  - A tariff raises the price above the world price. Thus, the domestic price of steel will rise to the world price plus the tariff.
  - As the domestic price rises, the domestic quantity of steel demanded will fall and the domestic quantity of steel supplied will rise. The quantity of imports will fall and the market will move closer to the domestic market equilibrium that occurred before trade.



Figure 12 The Effects of a Tariff

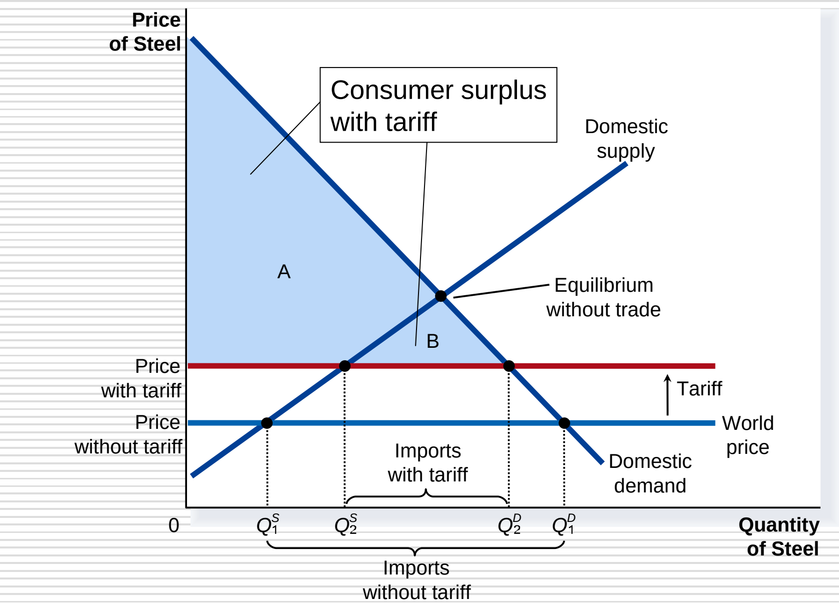


## Figure 13 The Effects of a Tariff

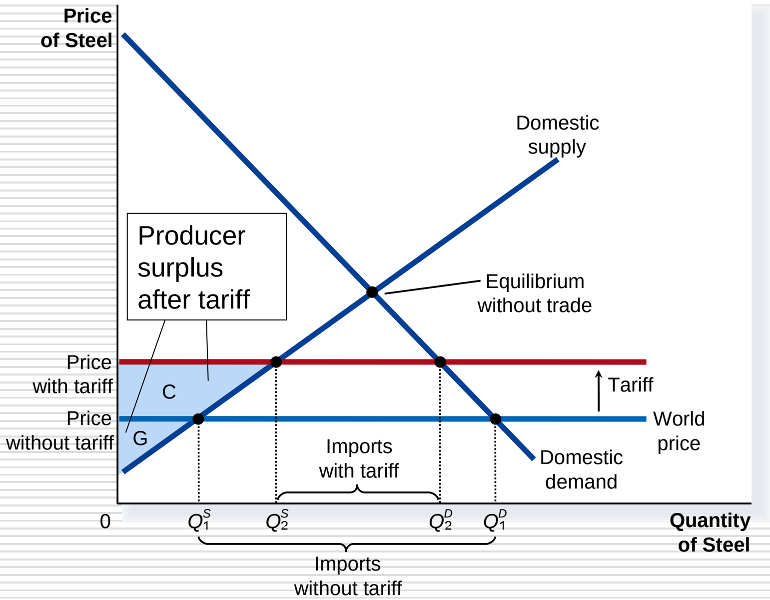





## Figure 14 The Effects of a Tariff



## Figure 15 The Effects of a Tariff






## Figure 16 The Effects of a Tariff

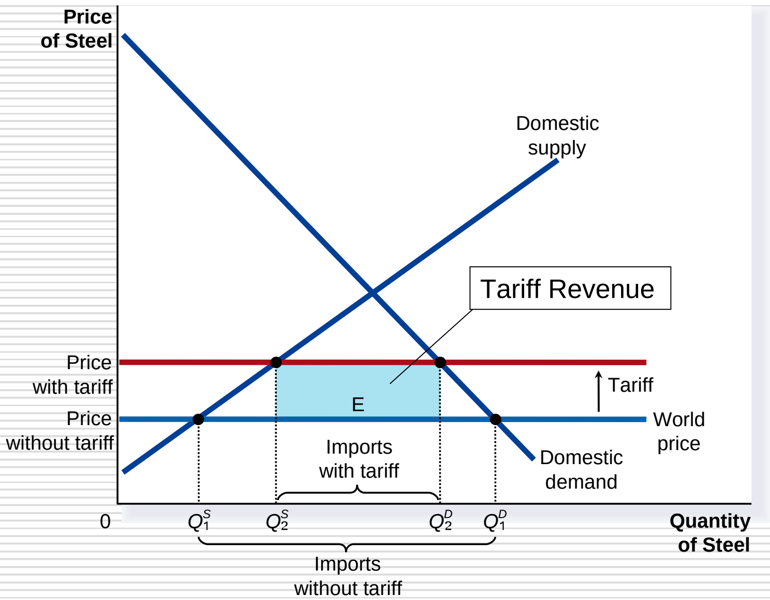
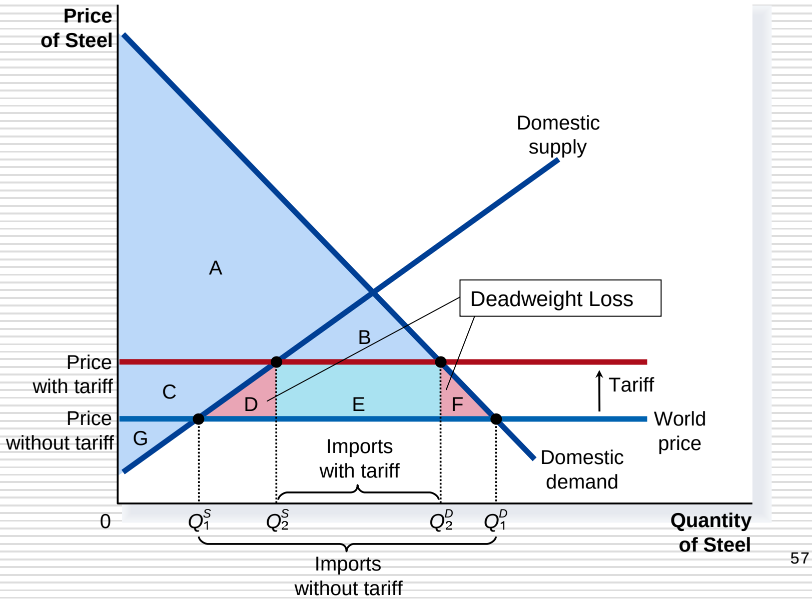


Figure 17 The Effects of a Tariff






# The Effects of a Tariff

- The Effects of a Tariff

| | Before Tariff | After Tariff | Change |
|---|---|---|---|
| Consumer Surplus | A + B + C + D + E + F | A + B | −(C + D + E + F) |
| Producer Surplus | G | C + G | +C |
| Government Revenue | None | E | +E |
| Total Surplus | A + B + C + D + E + F + G | A + B + C + E + G | −(D + F) |

The area D + F shows the fall in total surplus and represents the deadweight loss of the tariff.

- A tariff reduces the quantity of imports and moves the domestic market closer to its equilibrium without trade.
- With a tariff, total surplus in the market decreases by an amount referred to as a deadweight loss.

2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand, using China as example)

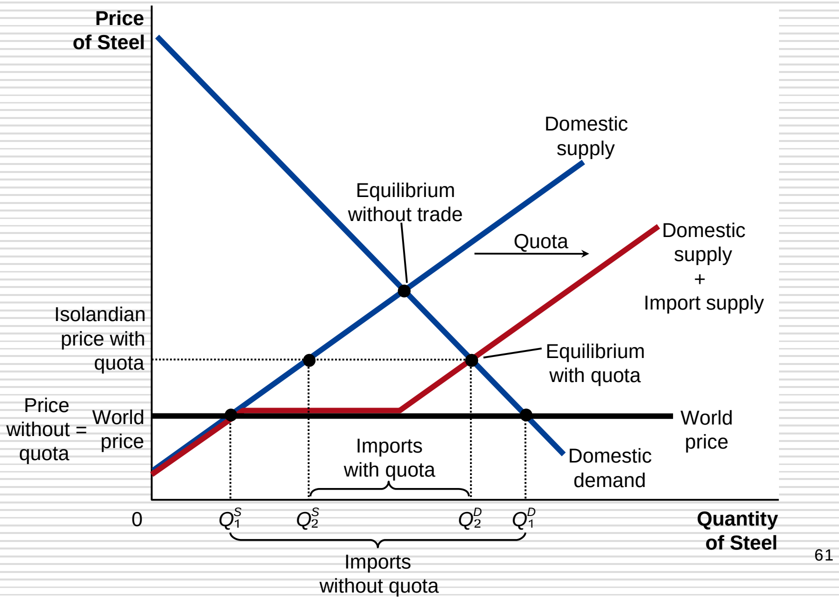
- The Winners and Losers from Trade
- Case Study: Cheap clothes from China
- China's Adaptation and Transformation under Globalization
- The effect of a Tariff
- The effect of a Import Quotas
- Comparative advantage and its relation to globalization



# The Effects of an Import Quota

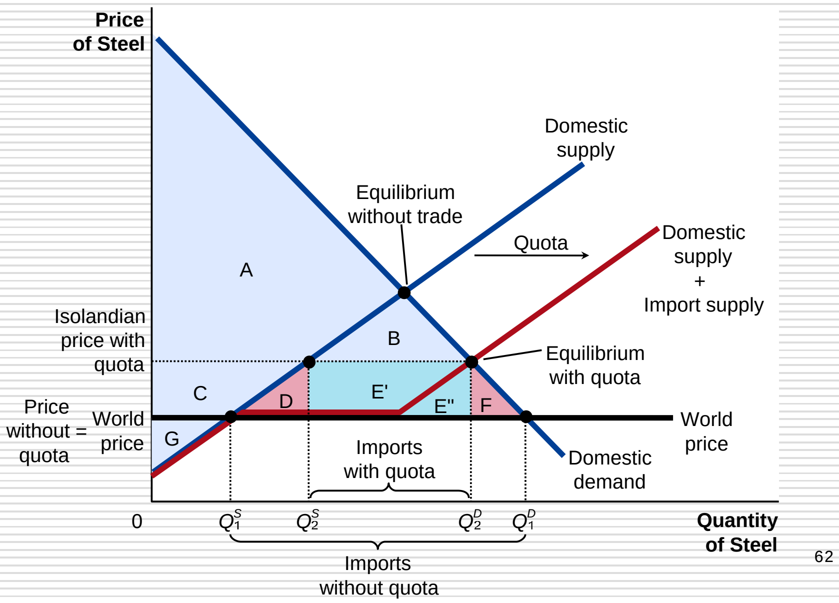
- The Effects of an Import Quota
  - Definition of **<u>import quota</u>: a limit on the quantity of a good that can be produced abroad and sold domestically.**
  - An import quota alters the supply of steel available. The supply is no longer perfectly elastic at the world price, but is equal to the domestic supply plus the quota amount.
  - The domestic price will rise, the domestic quantity of steel demanded will fall and the domestic quantity of steel supplied will rise. The quantity of imports will fall and the market will move closer to the domestic market equilibrium that occurred before trade.

## Figure 18 The Effects of an Import Quota






## Figure 19 The Effects of an Import Quota



## The Effects of an Import Quota

- The Effects of an Import Quota

| | Before Quota | After Quota | Change |
|---|---|---|---|
| Consumer Surplus | A + B + C + D + E' + E'' + F | A + B | −(C + D + E' + E'' + F) |
| Producer Surplus | G | C + G | +C |
| License-Holder Surplus | None | E' + E'' | +(E' + E'') |
| Total Surplus | A + B + C + D + E' + E'' + F + G | A + B + C + E' + E'' + G | −(D + F) |

The area D + F shows the fall in total surplus and represents the deadweight loss of the quota.

- Because the quota raises the domestic price above the world price, domestic buyers of the good are worse off, and domestic sellers of the good are better off.
- License holders are better off because they make a profit from buying at the lower world price and selling at the higher domestic price.



## Comparison of Quota with Tariff

- Comparison of Quota with Tariff
  - Both tariffs and quotas raise the domestic price of the good, reduce the welfare of domestic consumers, increase the welfare of domestic producers, and cause deadweight losses.
  - A tariff raises revenue for the government, whereas a quota creates profits for license holders.
  - A quota can potentially cause a larger deadweight loss than a tariff, depending on the mechanism used to allocate the import licenses.

2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand)

## Teaching advice

- This section provides a good opportunity to review what the students have learned thus far about trade.
- You should reinforce the idea that total surplus rises when trade is introduced, but falls once trade restrictions are imposed.



# The Lessons for Trade

- The Lessons for Trade
  - If trade is allowed, the price of steel will be driven to the world price.
  - If the domestic price is higher than the world price, the country will import and the domestic price will fall.
  - If the domestic price is lower than the world price, the country will export and the domestic price will rise.

## The Lessons for Trade

- The Lessons for Trade
  - If a country imports a product, domestic producers are made worse off, domestic consumers are made better off, and the gains of consumers outweigh the losses of producers.
  - If a country exports a product, domestic producers are made better off, domestic consumers are made worse off, and the gains of producers outweigh the losses of consumers.
  - Both a tariff and an import quota would create a deadweight loss because total surplus would fall.



## 2. Comparative advantage and its relation to globalization (analysis of the effects of trade protection on efficiency using supply and demand, using China as example)

- The Winners and Losers from Trade
- Case Study: Cheap clothes from China
- The effect of a Tariff
- The effect of a Import Quotas
- Comparative advantage and its relation to globalization

## GLOBALIZATION

- **Globalization** The process of increasing interdependence among countries and their citizens.

- **Economic globalization** The process of increasing economic interdependence among countries and their citizens.



## THE BENEFITS AND COSTS OF GLOBALIZATION

### THE FREE-TRADE DEBATE REVISITED

- **comparative advantage** A country enjoys a comparative advantage in the production of a good if the production of that good has a lower opportunity cost than it would have if produced in another country.

# THE BENEFITS AND COSTS OF GLOBALIZATION

- The argument for free trade
  - Voluntary exchange is efficient. Countries gain from trade.
  - Technology transfer: countries may gain technological knowhow through importing goods (e.g. China)



# THE BENEFITS AND COSTS OF GLOBALIZATION

- Arguments for Protectionism:
  - Protection save jobs
  - The dumping argument (exporters sell products at a price lower than production costs)
  - Infant-industry argument
  - Lax environment standards pose unfair competition
  - Free trade promotes child-labor and near-slave labor

# References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