CHAPTER 6

# ECONOMIES OF SCALE, IMPERFECT COMPETITION AND INTERNATIONAL TRADE

## Preview

- Types of economies of scale
- The theory of imperfect competition
    - Oligopoly and monopoly
    - Monopolistic competition
- Monopolistic competition and trade
- Dumping
- External economies of scale and trade

## Introduction

- Reasons for trade in the Ricardian model and Heckscher Ohlin model:
    - Labor productivity
    - Factor endowment
    => Trade is based on comparative advantage - differences between nations
- Both models assume **constant returns to scale**
- But a firm or industry may have **increasing returns to scale** or **economies of scale.**

=> Economies of scale as a reason for trade

## Introduction (cont.)

- The Ricardian and Heckscher-Ohlin models: perfect competition
  - no "excess" or monopoly profits exist.
- When economies of scale exists => markets become imperfectly competitive
  - Large firms may be more efficient than small firms
  - The industry may consist of a monopoly or a few large firms.
  - Excess or monopoly profits are captured by large firms.
  - $\Rightarrow$ Investigate trade in the context of imperfect competition and economies of scale

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## TYPES OF ECONOMIES OF SCALE

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## Concept of economies of scale

| TABLE 6-1 Relationship of Input to Output for a Hypothetical Industry | | |
|---|---|---|
| **Output** | **Total Labor Input** | **Average Labor Input** |
| 5 | 10 | 2 |
| 10 | 15 | 1.5 |
| 15 | 20 | 1.333333 |
| 20 | 25 | 1.25 |
| 25 | 30 | 1.2 |
| 30 | 35 | 1.166667 |

## Concept of economies of scale (cont.)

- Importance of economies of scale to international trade

**TABLE 6-1   Relationship of Input to Output for a Hypothetical Industry**

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|--------|-------------------|---------------------|
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| 15 | 20 | 1.333333 |
| 20 | 25 | 1.25 |
| 25 | 30 | 1.2 |
| 30 | 35 | 1.166667 |

- Two countries: US and UK, producing cars
- In the absence of trade:
  - each nation produces 10 cars  =>
  - need 15 labors each nation

  Totally: the whole world can produce 20 cars with 30 labors.

- With trade: Assume the world concentrates production of cars in US
  - US employs 30 labors, it can produce 25 cars (20 cars above)

## Concept of economies of scale (cont.)

- Economies of scale:
  - Make it possible for each country to produce a restricted range of goods to take advantage of economies of scale
  - Trade with other nations
  - Without scarifying variety in consumption

## Types of Economies of Scale

- Economies of scale could mean either that larger firms or that a larger industry (e.g., one made of more firms) is more efficient.
- Types of economies of scale
  - **External economies of scale**
    - Occur when cost per unit of output depends on the *size of the industry,* not necessarily on the size of any one firm.
    - Larger industry: number of firms increases
  - **Internal economies of scale**
    - Occur when the cost per unit of output depends on the *size of a firm,* not necessarily on the size of the industry.
    - Larger firms: existing firms produce more

## Example - Types of Economies of Scale

- An industry: initially consist of 10 firms, each producing 100 cars => a total industry production: 1000 cars.
- Suppose the industry were to double in size
  - 20 firms
  - Each one: still produces100 cars
  - ⇒ The costs of each firm fall
  - ⇒ Exhibits external economies of scale.
  - ⇒ The efficiency of firms is increased by having a larger industry, even though each firm is the same size as before.

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## Example - Types of Economies of Scale (cont.)

- An industry: initially consist of 10 firms, each producing 100 cars => a total industry production: 1000 cars.
- Suppose the industry's output were held constant at 1000 cars, but that the number of firms is cut in half
  - Each firm: produces 200 cars.
  - If the costs of productions fall
  - => Internal economic of scale: A firm is more efficient if its output is larger.

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## Economies of Scale and market structure

- External and internal economies of scale have different implications for market structure (structure of the industry)
- External economies of scale
  - May result when a larger industry allows for more efficient provision of services or equipment to firms in the industry
  - Consists of many small firms that are perfectly competitive.
  - => Leads to a perfectly competitive market
- Internal economies of scale
  - Give large firms have a cost advantage over small firms
  - ⇒ Leads to an imperfectly competitive market structure.

## In-class exercise and discussion – Problem 1

- For each of the following examples, explain whether this is a case of external or internal economies of scale.
  a. Most musical wind instruments in the United States are produced by more than a dozen factories in Elkhart, India.
  b. All Hondas sold in the US are either imported or produced in Marysville, Ohio
  c. All airframes for Airbus, Europe's only producer of large aircraft, are assembled in Toulouse, France.
  d. Hartford, Connecticut, is the insurance capital of the Northeastern US.

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# THE THEORY OF IMPERFECT COMPETITION

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## A Review of Monopoly

- A **monopoly** is an industry with only one firm.
- A characteristic of a monopoly
  - Downward slopping demand curve
  - MR is lower than the price
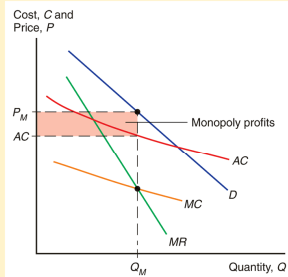  - MR curve lies below the demand curve.

## A Review of Monopoly (cont.)

**Figure 6-1**
**Monopolistic Pricing and Production Decisions**

- At profit maximizing output $MR = MC$
♦ an equilibrium price and quantity ($Q_M$ and $P_M$)
- When $P > AC$ => a monopoly profit between price and average cost times $Q_M$.

Cost, $C$ and Price, $P$

$P_M$
$AC$
Monopoly profits
$AC$
$D$
$MC$
$MR$
$Q_M$
Quantity, $Q$

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## A Review of Monopoly (cont.)

- The gap between the price and marginal revenue

$$P - MR = Q / B$$

- *P: price*
- *MR: marginal revenue*
- *Q: initial sales*
- *B: slope of the demand curve*

$$Q = A - BxP$$

$$MR = P - Q / B$$

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## A Review of Monopoly (cont.)

- **Average cost**
  ♦ $AC = C/Q$
- **Marginal cost**: the cost of producing an additional unit of output.
  ♦ MC always lies below AC

## A Review of Monopoly (cont.)

- Total costs: sum of fixed and variable costs
  - $C = F + cQ,$
  - where $F$: Fixed costs; $c$: a constant marginal cost.
- *Average cost:*
  - $AC = C/Q$
  - $AC = F/Q + c$
  - A larger firm is more efficient because average cost decreases as output $Q$ increases:
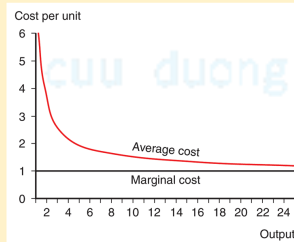  - A monopoly industry exhibits internal economies of scale.

## A Review of Monopoly (cont.)

**Figure 6-2**

**Average Versus Marginal Cost**

This figure illustrates the average and marginal costs corresponding to the total cost function $C = 5 + x$. Marginal cost is always 1; average cost declines as output rises.



## Monopolistic Competition

- Pure monopoly is rare in practice.
- An **oligopoly** is an industry with only a few large firms. E.g: cars industry, cell phone industry
- **Oligopoly:** complex and controversial
- **Monopolistic competition:**
  - A special case of oligopoly
  - Easily to analyze.

## Monopolistic Competition (cont.)

- Monopolistic competition: a model of an imperfectly competitive industry which assumes that
  1. Each firm can differentiate its product from the product of competitors.
  2. Each firm ignores the impact of its own price on the prices competitors.

     => even though each firm faces competition from other firms, it behaves as if it were a monopolist

## Monopolistic Competition (cont.)

- A firm in a monopolistically competitive industry is expected:
  - to sell more the larger the total sales of the industry and the higher the prices charged by its competitors.
  - to sell less the larger the number of firms in the industry and the higher its own price.
- These concepts are represented by the mathematical relationship:

## Monopolistic Competition (cont.)

*Demand curve facing a typical monopolistically competitive firm*

$$Q = S[1/n - b(P - \bar{P})]$$

- $Q$ is an individual firm's sales
- $S$ is the total sales of the industry
- $n$ is the number of firms in the industry
- $b$ is a constant term representing the responsiveness of a firm's sales to its price
- $P$ is the price charged by the firm itself
- $\bar{P}$ is the average price charged by its competitors

## Monopolistic Competition (cont.)

- Assume :
  - All firms in the industry is symmetric
  - All firms have identical demand functions and cost functions.
  - Relevant information: how many firms there are $n$ and what price a typical firm charges $P$
- Method to determining $n$ and $P$: 3 steps
1. the relationship between the number of firms and average cost of a typical firm
2. the relationship between the number of firms and the price each firm charges
3. The relationship between the average cost and price

## The number of firms and average cost

- Assume :
  - all firms have identical demand functions and cost functions.
  - Thus in equilibrium, all firms charge the same price: $\overline{P} = P$
- In equilibrium,
  - $Q = S[1/n - b(P - \overline{P})]$
  - $Q = S/n + 0$
  - $AC = C/Q = F/Q + c = F(n/S) + c$

## The number of firms and average cost

$$AC = F(n/S) + c$$

- The larger $n$ in the industry => the higher the average cost for each firm.
- The larger $S$ of the industry => the lower the average cost for each firm.
- Monopolistic competition exhibits the internal economies of scale.

## Monopolistic Competition (cont.)

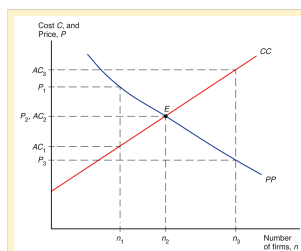Relationship between n and AC: CC

Cost *C*, and Price, *P*



**Figure 6-3**
**Equilibrium in a Monopolistically Competitive Market**
The number of firms in a monopolistically competitive market, and the prices they charge, are determined by two relationships. On one side, the more firms there are, the more intensely they compete, and hence the lower is the industry price. This relationship is represented by *PP*. On the other side, the more firms there are, the less each firm sells and therefore the higher is its average cost. This relationship is represented by *CC*. If price exceeds average cost (if the *PP* curve is above the *CC* curve), the industry will be making profits and additional firms will enter the industry; if price is less than average cost, the industry will be incurring losses and firms will leave the industry. The equilibrium price and number of firms occurs when price equals average cost, at the intersection of *PP* and *CC*.

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## The number of firms and the price

- If monopolistic firms have linear demand curves,
  - then the relationship between price and quantity may be represented as:
    $$Q = A - B \times P \qquad (1)$$
  - where *A* and *B* are constants and B: slope of demand curve
- $Q = S[1/n - b(P - \bar{P})]$
- $Q = S/n + Sb\bar{P} - SbP \qquad (2)$
- Compare (1) and (2)
  - Let $A \equiv S/n + Sb\bar{P}$ and $B \equiv Sb$

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## The number of firms and the price (cont.)

- $MR = P - Q/B$
- When firms maximize profits, they set MR = MC

  $$MR = P - Q/B = c$$
  $$MR = P - Q/Sb = c$$
  $$P = c + Q/Sb$$
  $$P = c + (S/n)/Sb$$

  *(All firms charge the same price)*

  $P = c + 1/(n \times b)$

- **The larger *n* in the industry, the lower P each firm charges.**

## Monopolistic Competition (cont.)

Relationship
between n and P:
PP



Cost *C*, and
Price, *P*

$AC_3$
$P_1$
$P_2$, $AC_2$
$AC_1$
$P_3$

CC
E
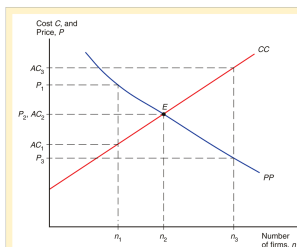PP

$n_1$  $n_2$  $n_3$  Number
of firms, *n*

**Figure 6-3**
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age cost, the industry will be incurring losses and firms will leave the industry. The equi-
librium price and number of firms occurs when price equals average cost, at the inter-
section of *PP* and *CC*.

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## The equilibrium numbers of firms

- The equilibrium number
of firms: the number at
which each firm has
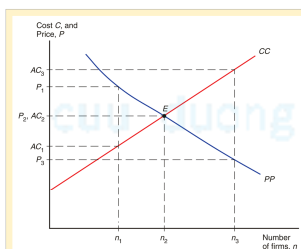*zero profits: price*
matches average cost
$P = AC$



Cost *C*, and
Price, *P*

$AC_3$
$P_1$
$P_2$, $AC_2$
$AC_1$
$P_3$

CC
E
PP

$n_1$  $n_2$  $n_3$  Number
of firms, *n*

**Figure 6-3**
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age cost, the industry will be incurring losses and firms will leave the industry. The equi-

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## The equilibrium numbers of firms (cont.)

- If the number of firms is greater than or less
than $n_2$ => not in equilibrium because of
presence of an incentive to exit or enter the
industry.
  - An incentive to enter the industry when profits are
greater than zero (P > AC).
  - An incentive to exit the industry when profits are
less than zero (P < AC).

# MONOPOLISTIC COMPETITION AND TRADE

## Monopolistic Competition and Trade

- In monopolistic competition: n and P are affected by market size.
- Trade increases market size => higher S.
- In monopolistic competition: $AC = F(n/S) + c$
  - Trade decreases AC in monopolistic competition
  - CC shift to the right
  - ⇒ Increase in number of firms (and variety of goods)
  - ⇒ Lower the price.
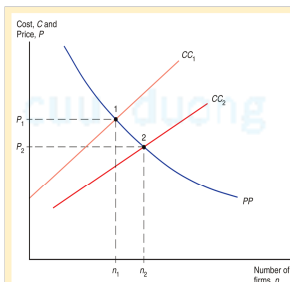
**Figure 6-4**

**Effects of a Larger Market**

An increase in the size of the market allows each firm, other things equal, to produce more and thus have lower average cost. This is represented by a downward shift from $CC_1$ to $CC_2$. The result is a simultaneous increase in the number of firms (and hence in

*[Graph: axes labeled "Cost, C and Price, P" (vertical) and "Number of firms, n" (horizontal). Curves labeled $CC_1$, $CC_2$, and PP. Points 1 and 2 marked with $P_1$, $P_2$ and $n_1$, $n_2$.]*

## Monopolistic Competition and Trade (cont.)

- As a result of trade, the number of firms in a new international industry is predicted to increase relative to each national market.
  - But it is unclear if firms will locate in the domestic country or foreign countries.

## A numerical example

- An monopolistically competitively automobile industries.
- Demand curve $Q = S \times [\frac{1}{n} - (\frac{1}{30000}) \times (P - \overline{P})]$
- Q: number of automobile sold per firm
- F = $750,000,000
- c = $5000
- C = 750,000,000 + 5000 x Q
- AC = 750,000,000/Q+ 5000
- Home: annual sale 900,000 automobiles
- Foreign: annual sale 1.6 million
- Compare number of firms, sales per firm and price before and after trade.

## A numerical example (cont.)

- *The integrated market: each firm produces at a larger scale => selling at a lower price.*
- *Every one is better off as a result of integration.*
  - *Consumers have a wider range of choices*
  - *Each firm produce more and is therefore able to offer its products at a lower price.*
- *To realize gains from trade, the countries must engage in international trade.*
- *To achieve economies of scale, each firm must concentrate its production in one country – either H or F. Yet it must sell its output to consumers in both markets.*
- *However, the model does not allow to know where automobiles will be produced: in Home or Foreign (pattern of trade).*

## Homework

- Problem 5 at the end of the chapter 6
- Deadline: Next week
- A quiz next week

## INTER – INDUSTRY and
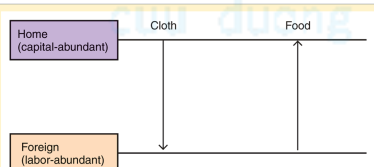## INTRA – INDUSTRY TRADE

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## Inter-industry Trade

- The Heckscher-Ohlin model or Ricardian model: countries specialize in production.
    - Trade occurs only *between* industries: **inter-industry trade**

- The Heckscher-Ohlin model supposes:
    - The capital abundant domestic economy specializes in the production of capital intensive cloth, which is imported by the foreign economy.
    - The labor abundant foreign economy specializes in the production of labor intensive food, which is imported by the domestic economy.
    - Home: labor abundant and Cloth is labor intensive => Home exports Cloth and import Food

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## Inter-industry Trade (cont.)

**Figure 6-6**
**Trade in a World Without Increasing Returns**
In a world without economies of scale, there would be a simple exchange of cloth for food.

Home (capital-abundant) — Cloth — Food

Foreign (labor-abundant)

+ Assume: - All cloth and food produced are homogenous
- Market are perfectly competitive
+ In a world without economies of scale, there would be a simple exchange of cloth for food

## Intra-industry Trade

- The food industry is described by perfectly competive model

- The global cloth industry is described by the monopolistic competition model.

- Each country produces different types of cloth.

- Because of economies of scale in cloth industry
  - Neither country is able to produce the full range of cloth products by itself.
  - Large markets are desirable: the foreign country exports some cloth and the domestic country exports some cloth.

- Trade occurs *within* the cloth industry: **intra-industry trade**

## Intra-industry Trade (cont.)

- If domestic country is capital abundant, it still has a comparative advantage in cloth.
  - Home: both exports and imports cloth
  - It should therefore export more cloth than it imports.

- Suppose that the trade in the food industry continues to be determined by comparative advantage.
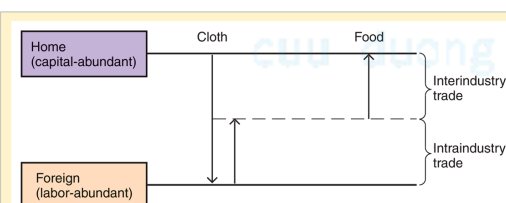  - Home imports food
  - Foreign exports food

## Intra-industry Trade (cont.)



**Figure 6-7**

**Trade with Increasing Returns and Monopolistic Competition**

If cloth is a monopolistically competitive industry, Home and Foreign will produce differentiated products. As a result, even if Home is a net exporter of cloth goods, it will import as well as export cloth, giving rise to intraindustry trade.

## Inter-industry and Intra-industry Trade

1. Gains from inter-industry trade reflect comparative advantage.
2. Gains from intra-industry trade reflect economies of scale (lower costs) and wider consumer choices.
3. The pattern of intra-industry trade is unpredictable.
4. The relative importance of intra-industry trade depend on how similar countries are.
   - Countries with *similar* relative amounts of factors of production are predicted to have *intra-industry trade*.
   - Countries with *different* relative amounts of factors of production are predicted to have *inter-industry trade*.

## Inter-industry and Intra-industry Trade (cont.)

- About 25% of world trade is intra-industry trade according to standard industrial classifications.
  - But some industries have more intra-industry trade than others
  - Countries with similar relative amounts of skilled labor, technology and physical capital engage in a large amount of intra-industry trade with the US.

## Inter-industry and Intra-industry Trade (cont.)

**TABLE 6-3  Indexes of Intraindustry Trade for U.S. Industries, 1993**

| | |
|---|---|
| Inorganic chemicals | 0.99 |
| Power-generating machinery | 0.97 |
| Electrical machinery | 0.96 |
| Organic chemicals | 0.91 |
| Medical and pharmaceutical | 0.86 |
| Office machinery | 0.81 |
| Telecommunications equipment | 0.69 |
| Road vehicles | 0.65 |
| Iron and steel | 0.43 |
| Clothing and apparel | 0.27 |
| Footwear | 0.00 |

Note: an index of 1 means that all trade is intra-industry trade.
An index of 0 means that all trade is inter-industry trade.

## Inter-industry and Intra-industry Trade (cont.)

| TABLE 8-2 | Indexes of Intra-Industry Trade for U.S. Industries, 2009 |
|---|---|
| Metalworking Machinery | 0.97 |
| Inorganic Chemicals | 0.97 |
| Power-Generating Machines | 0.86 |
| Medical and Pharmaceutical Products | 0.85 |
| Scientific Equipment | 0.84 |
| Organic Chemicals | 0.79 |
| Iron and Steel | 0.76 |
| Road Vehicles | 0.70 |
| Office Machines | 0.58 |
| Telecommunications Equipment | 0.46 |
| Furniture | 0.30 |
| Clothing and Apparel | 0.11 |
| Footwear | 0.10 |

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# DUMPING

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## Consequences of imperfect competition

- The monopolistic competition :
  - Explains how increasing returns to scale promote international trade.
  - Recognizes that imperfect competition is a necessary consequence of economies of scale
  - Does not focus on consequences of imperfect competition for international trade.
  - Dumping: one important consequence

## Concept

- **Dumping:** charging a lower price for exported goods than for goods sold domestically.
- Dumping: price discrimination => controversial: unfair
- Price discrimination and dumping may occur only if
  - *imperfect competition*
  - *markets are segmented*

## Dumping – profit maximizing strategy

- Dumping may be a profit maximizing strategy because of differences in foreign and domestic markets.
- E.g:
  - a firm currently sells 1000 units of goods at home and 100 units abroad.
  - Selling the good at $20 per unit domestically and 15$ per unit on export sales.
  - Whether or not are additional domestic sales much more profitable than additional exports?
  - Given: expand sales by one unit, in either market, would require reducing the price by 0.01 $.
- Increase domestic sales by one unit of produce
  - Adding 19.99$ in revenue,
  - Reducing the receipts on the 1000 units that would have sold at 20$ by 10$.
  - MR from the extra unit sold is only 9.99 USD.

## Dumping – profit maximizing strategy (cont.)

- Increase foreign sales by one unit of produce
  - adding 14.99$ in revenue,
  - Reducing the receipts on the 100 units that would have sold in the foreign market at 15$ by 1$.
  - MR from the extra unit sold is only 13.99 USD.
  - => more profitable to expand exports rather than domestic sales, even though the price received on exports is lower.

## Dumping (cont.)

- Domestic firms usually have a larger share of the domestic market than they do of foreign markets.
- Firm is a monopolist in Home
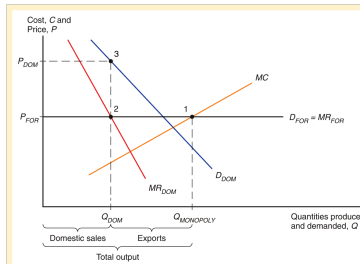- Firm is a small competitive firm in Foreign

**Figure 6-8**
**Dumping**

The figure shows a monopolist that faces a demand curve $D_{DOM}$ for domestic sales, but which can also sell as much as it likes at the export price $P_{FOR}$. Since an additional unit can always be sold at $P_{FOR}$, the firm increases output until the marginal cost equals $P_{FOR}$; this profit-maximizing output is shown as $Q_{MONOPOLY}$. Since the firm's marginal cost at $Q_{MONOPOLY}$ is $P_{FOR}$, it sells output on the domestic market up to the point where marginal revenue equals $P_{FOR}$; this profit-maximizing level of domestic sales is shown as $Q_{DOM}$. The rest of its output, $Q_{MONOPOLY} - Q_{DOM}$ is exported.

The price at which domestic consumers demand $Q_{DOM}$ is $P_{DOM}$. Since $P_{DOM} > P_{FOR}$ the firm sells exports at a lower price than it charges domestic consumers.

## Dumping (cont.)

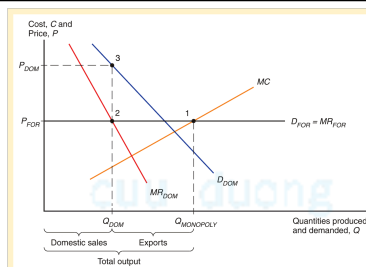- To maximize profits: MR = MC in each market.
- MR is equal across markets.

**Figure 6-8**
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The price at which domestic consumers demand $Q_{DOM}$ is $P_{DOM}$. Since $P_{DOM} > P_{FOR}$ the firm sells exports at a lower price than it charges domestic consumers.

## Dumping (cont.)

- The nation will sell a low amount in the domestic market at a high price $P_{DOM}$ , but sell in foreign markets at a low price $P_{FOR}$.
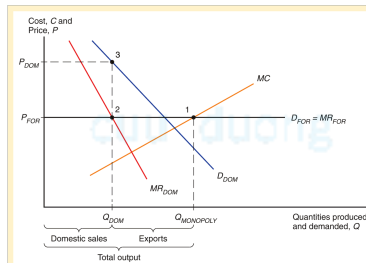
=> dumping is a profit-maximizing strategy.

**Figure 6-8**
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## Protectionism and Dumping

- Dumping (as well as price discrimination in domestic markets) is widely regarded as unfair.
- A US firm may appeal to the Commerce Department to investigate if dumping by foreign firms has injured the US firm.
  - The Commerce Department may impose an "anti-dumping duty", or tax, as a precaution against possible injury.
  - This tax equals the difference between the actual and "fair" price of imports, where "fair" means "price the product is normally sold at in the manufacturer's domestic market ".

## EXTERNAL ECONOMCIS OF SCALES

## Examples

- In the monopolistic competition model: economies of scale that give rise to trade occur at the level of individual firms => imperfect competition => dumping.
- Not all economies of scale apply at the level of the individual firms.
- Concentrating production of an industry in one or a few location reduces the industry's costs, even if individual firms remain small.

=> external economies of scale.

- Industries exhibiting external economies of scale
  - The semiconductor industry, concentrated in California's famous Silicon Valley
  - Investment banking industry concentrated in New York
  - Entertainment industry concentrated in Hollywood

## External Economies of Scale

- If external economies exist, a country that has a large industry will have low costs of producing that industry's good or service.

- External economies may exist for a few reasons:

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## Reasons for external economies of scale

- Why a cluster of firms may be more efficient that individual firms in isolation
  - Specialized suppliers
  - Labor – market pooling
  - Knowledge spillover

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## Reasons for external economies of scale (cont.)

1. **Specialized equipment or services** may be needed for the industry, but are only supplied by other firms if the industry is large and concentrated.
   - For example, Silicon Valley in California has a large concentration silicon chip companies, which are serviced by companies that make special machines for manufacturing silicon chips.
   - These machines are cheaper and more easily available for Silicon Valley firms than for firms elsewhere.

## External Economies of Scale (cont.)

2. **Labor pooling**: a large and concentrated industry may attract a pool of workers, reducing employee search and hiring costs for each firm.

3. **Knowledge spillovers**: workers from different firms may more easily share ideas that benefit each firm when a large and concentrated industry exists.

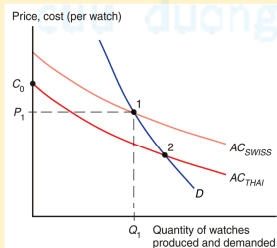## External Economies of Scale and Pattern of Trade

- If external economies of scale exists, the pattern of trade may be due to historical accidents:
  - ♦ countries that start out as large producers in certain industries tend to remain large producers even if some other country could potentially produce the goods more cheaply.

## External Economies of Scale and Pattern of Trade (cont.)

**Figure 6-9**
**External Economics and Specialization**

The average cost curve for Thailand, $AC_{THAI}$, lies below the average cost curve for Switzerland, $AC_{SWISS}$. Thus Thailand could potentially supply the world market more cheaply than Switzerland. If the Swiss industry gets established first, however, it may be able to sell watches at the price $P_1$, which is below the cost $C_0$ that an individual Thai firm would face if it began production on its own. So a pattern of specialization established by historical accident may persist even when new producers could potentially have lower costs.

## Trade and Welfare with external Economies of Scale

- Trade based on external economies has an ambiguous effect on national welfare.
  - There may be gains to the *world* economy by concentrating production of industries with external economies.
  - But there is no guarantee that the right country will produce a good subject to external economies (Thailand and Switzerland in watch).
  - It is even possible that a country is worse off with trade than it would have been without trade: a country may better off if it produces everything for its domestic market rather than pay for imports (Thailand and Switzerland in watch).

## Dynamic external economies of scale

- We have considered cases where external economies depend on the amount of *current output* at a point in time.
- But external economies may also depend on the amount of *cumulative output over time*.
- **Dynamic external economies of scale** (dynamic increasing returns to scale) exist if average costs fall as cumulative output over time rises.

## Dynamic external economies of scale (cont.)

- Dynamic increasing returns to scale could arise if the cost of production depends on the **accumulation of knowledge and experience, which depend on the production process over time.**
- A graphical representation of dynamic increasing returns to scale is called a **learning curve**.

## External Economies of Scale and Trade (cont.)

**Figure 6-11**

**The Learning Curve**

The learning curve shows that unit cost is lower the greater the cumulative output of a country's industry to date. A country that has extensive experience in an industry ($L$) may have lower unit cost than another country with little or no experience, even if the second country's learning curve ($L^*$) is lower, for example, because of lower wages.
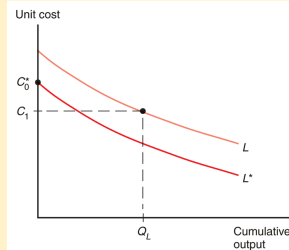


## External Economies of Scale and Trade (cont.)

- Like external economies of scale at a point in time, dynamic increasing returns to scale can lock in an initial advantage or head start in an industry.
- Like external economies of scale at a point in time, dynamic increasing returns to scale **can be used to justify protectionism.**
  - Temporary protection of industries enables them to gain experience: infant industry argument.
  - But temporary is often for a long time, and it is hard to identify when external economies of scale really exist.

## Summary

1. Economies of scale imply that more output at the firm or industry level causes average cost to fall.
   - External economies of scale refer to the amount of output by an industry.
   - Internal economies of scale refer to the amount of output by a firm.
2. With monopolistic competition, each firm has some monopoly power due to product differentiation but must compete with other firms whose prices are believed to be unaffected by each firm's actions.

## Summary (cont.)

3. Monopolistic competition allows for gains from trade through lower costs and prices, as well as through wider consumer choice.

4. Monopolistic competition predicts intra-industry trade, and does not predict changes in income distribution within a country.

5. Location of firms under monopolistic competition is unpredictable, but countries with similar relative factors are predicted to engage in intra-industry trade.

## Summary (cont.)

6. Dumping may be a profitable strategy when a firm faces little competition in its domestic market and faces heavy competition in foreign markets.

7. Trade based on external economies of scale may increase or decrease national welfare, and countries may benefit from temporary protectionism if their industries exhibit external economies of scale either at a point in time or over time.

## END OF CHAPTER 6