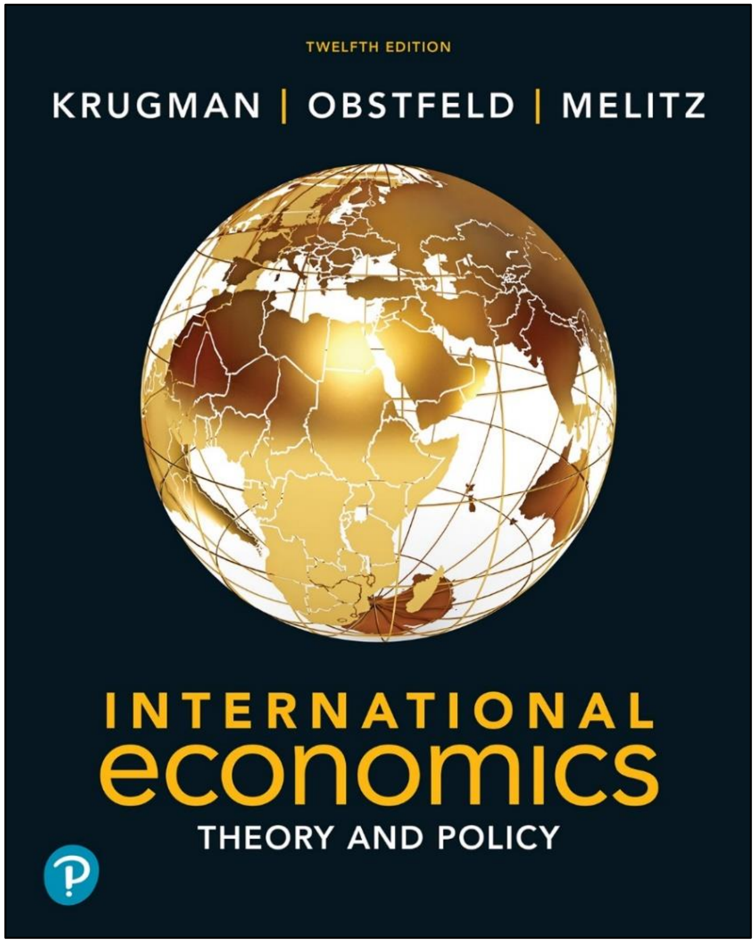
International Economics: Theory and Policy

Twelfth Edition



Chapter 7

External Economies of Scale and the International Location of Production

Introduction (1 of 4)

- The models of comparative advantage thus far assumed **constant returns to scale**:
  - When inputs to an industry increase at a certain rate, output increases at the same rate.

Introduction (2 of 4)

- But there may be **increasing returns to scale** or **economies of scale:**
  - This means that when inputs to an industry increase at a certain rate, output increases at a faster rate.
  - A **larger scale** is more efficient: the **cost per unit of output** falls as a firm or industry increases output.

Introduction (3 of 4)

Example

- Suppose an industry produces widgets using only one input, labor.
- The presence of economies of scale may be seen from the fact that
  - doubling the input of labor more than doubles the industry’s output.
  - the **average amount of labor** used to produce each widget is less when the industry produces more.

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	1.16667

Introduction (4 of 4)

- **Mutually beneficial trade** can arise as a result of economies of scale.
- International trade permits each country to produce a limited range of goods without sacrificing variety in consumption.
- With trade, a country can take advantage of economies of scale to produce more efficiently than if it tried to produce everything for itself.

Economies of Scale and Market Structure (1 of 2)

- Economies of scale could mean either that larger firms or a larger industry would be more efficient.
- **External economies of scale** occur when cost per unit of output depends on the **size of the industry.**
- **Internal economies of scale** occur when the cost per unit of output depends on the **size of a firm.**

Economies of Scale and Market Structure (2 of 2)

- Both external and internal economies of scale are important causes of international trade.
- They have different implications for the structure of industries:
  - An industry where economies of scale are purely external will typically consist of many small firms and be perfectly competitive.
  - Internal economies of scale result when large firms have a cost advantage over small firms, causing the industry to become imperfectly competitive.

External & Internal Economies of Scale

The Theory of External Economies (1 of 6)

- This chapter deals with a model of external economies; the next chapter will cover internal economies.
- Many modern examples of the **U.S.** industries:
  - The entertainment industry in Hollywood.

Pearson

The Theory of External Economies (2 of 6)

- In developing countries such as **China**, external economies are pervasive in **manufacturing**.
  - One town in China produces most of the world's underwear, another nearly all cigarette lighters.

- External economies played a key role in **India**'s emergence as a major exporter of **information services**.

The Theory of External Economies (3 of 6)

- For a variety of reasons, concentrating production of an industry in **one or a few locations** can reduce the industry's costs, even if the individual firms in the industry remain small.

- External economies may exist for a few reasons:

The Theory of External Economies (4 of 6)

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 of silicon chip companies, which are serviced by companies that make special machines for manufacturing silicon chips.
   – These machines are cheaper and more easily available there than elsewhere.

The Theory of External Economies (5 of 6)

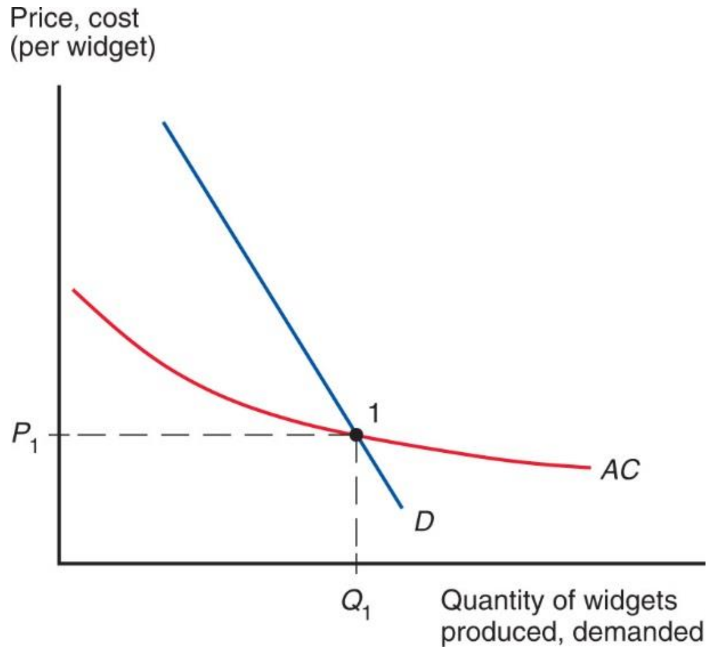
2. **Labor pooling**: a large and concentrated industry may attract a pool of workers, reducing employee search and hiring costs for each firm.

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

The Theory of External Economies (6 of 6)

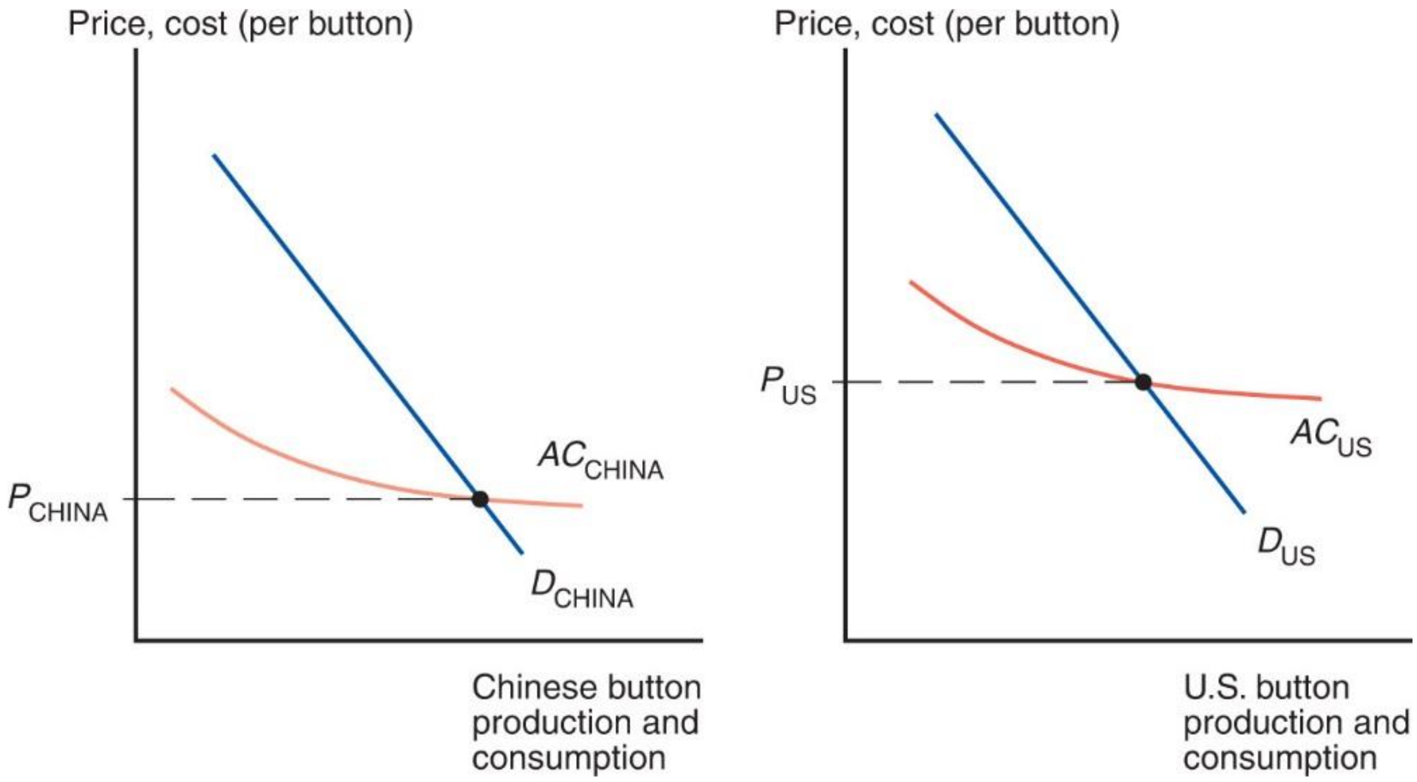
- Represent external economies simply by assuming that the larger the industry, the lower the industry’s costs.
- There is a **forward-falling supply curve:** the larger the industry’s output, the lower the price at which firms are willing to sell.
- Without international trade, the unusual slope of the supply curve doesn’t matter much.

External Economies and Market Equilibrium



When there are external economies of scale, the average cost of producing a good falls as the quantity produced rises. Given competition among many producers, the downward-sloping average cost curve *AC* can be interpreted as a **forward-falling supply curve.**

External Economies Before Trade

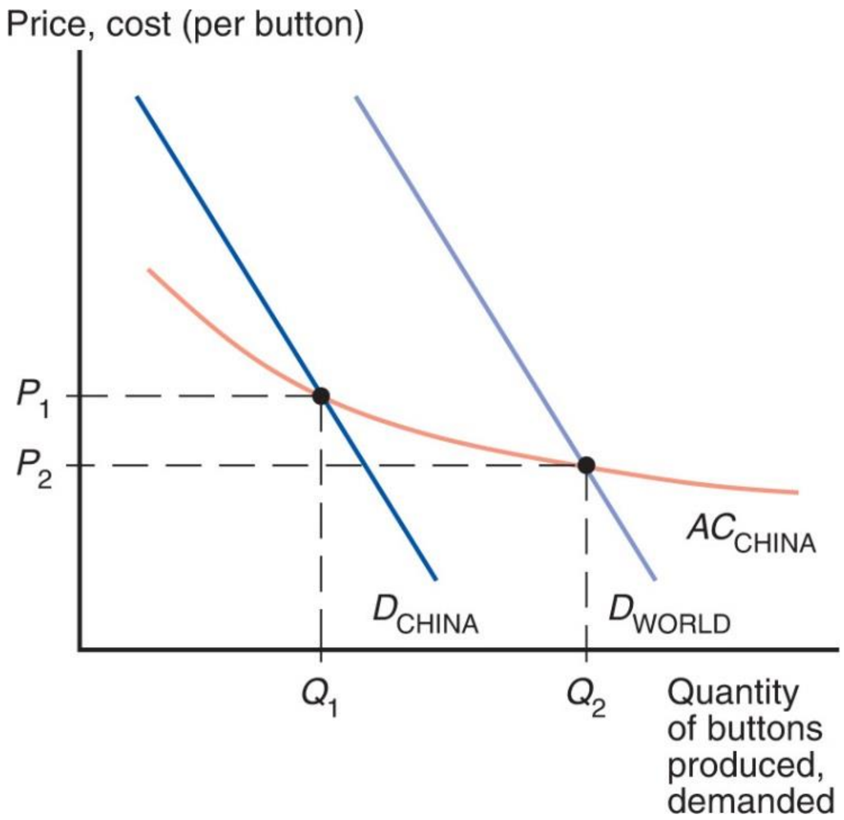


External Economies and International Trade

- What will happen when the countries open up the potential for trade in buttons?
- Which country expands the industry? Who contracts?
- Costs of production?

- In the end, all button production will be in China.

Trade and Prices



External Economies and International Trade

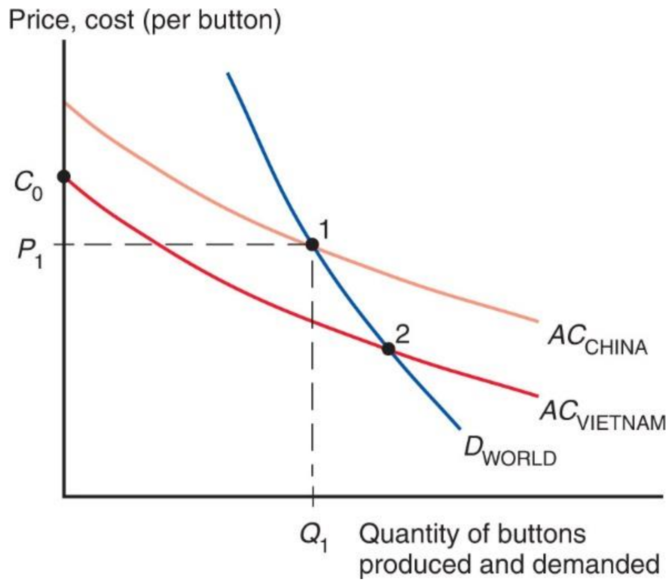
- Very different from the implications of models without increasing returns.
- In the standard trade model relative prices converge as a result of trade.

- **With external economies, by contrast, the effect of trade is to reduce prices everywhere.**

External Economies and International Trade

- What might cause one country to have an initial advantage from having a lower price?
- One possibility is **comparative advantage** due to underlying differences in **technology** and **resources**.
- If external economies exist, however, the pattern of trade could be due to **historical accidents**:
  - Countries that start as large producers in certain industries tend to remain large producers even if another country could potentially produce more cheaply.

The Importance of Established Advantage



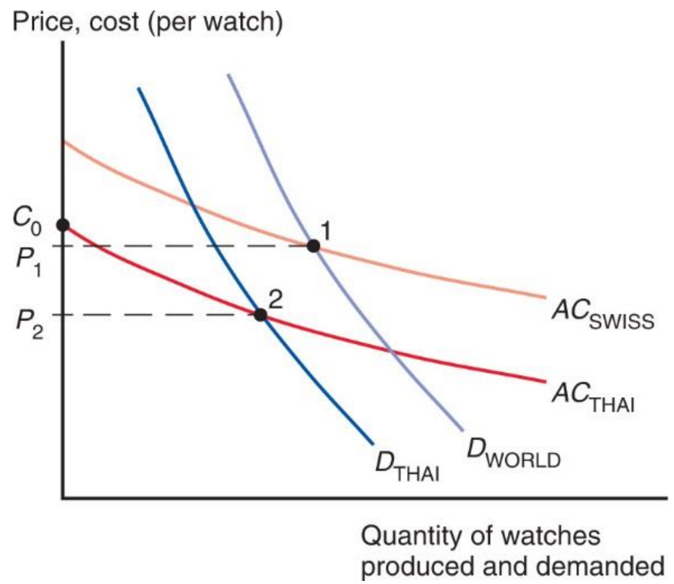
If the Chinese industry gets established first, it may be able to sell buttons at the price P_1, which is below the cost C_0 that an individual Vietnamese firm would face if it began production on its own.

- **No guarantee that the right country will produce a good that is subject to external economies.**

External Economies and International Trade

- **Trade based on external economies** has an ***ambiguous*** effect on national welfare.
  - There will be gains to the world economy by concentrating production of industries with external economies.
  - **It’s possible that a country is worse off with trade than it would have been without trade:** a country may be better off if it produces everything for its domestic market rather than pay for imports.

External Economies & Losses from Trade



Example

Thailand imports watches from Switzerland, which is able to supply the world market (D_{WORLD}) at a price (P_1) low enough to block entry by Thai producers, who must initially produce the watches at cost C_0. Yet if Thailand were to block all trade in watches, it would be able to supply its domestic market (D_{THAI}) at the lower price, P_2.