International Trade Theory and Policy

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External Economies of Scale and the Location of Production

Outline

- Types of economies of scale
- Economies of scale and market structure
- The theory of external economies
- External economies and international trade
- Dynamic increasing returns
- International trade and economic geography

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Introduction to Economies of Scale

Economies of scale occur under increasing returns to 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.
- Illustration: Two countries each produce 10 units with 15 units of labor. World output is 20 an world employment is 30. If only one country employed 30 units of labor, world output would be 25, a 25% increase.
- Gains from trade!

TABLE 7-1 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

Economies of Scale and Market Structure

- 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*. An industry where economies of scale are purely external will typically consist of many small firms and be perfectly competitive
- **Internal economies of scale** occur when the cost per unit of output depends on the *size of a firm*. Internal economies of scale result when large firms have a cost advantage over small firms, causing the industry to become imperfectly competitive.

This chapter deals with a model of external economies; the next chapter will cover internal economies.

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The Theory of External Economies

Example of industries in which external economies seem to play a role: Hollywood, Silicon Valley, NY banking, Bangalore IT industry, etc.

Reasons why external economies are important

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.
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.

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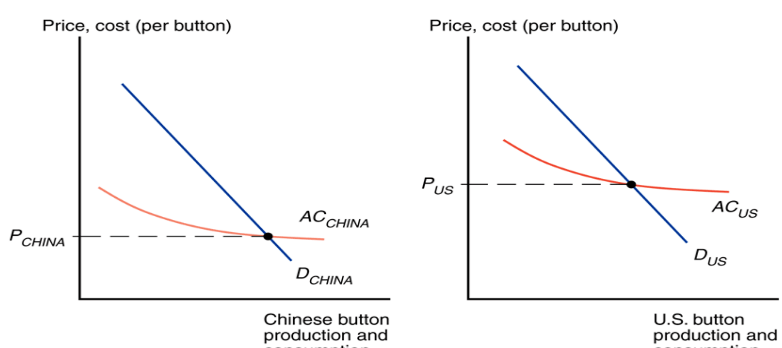
The Theory of External Economies: Price & Output

External economies are represented by a forward falling industry supply curve. The figure below illustrates a falling supply curve in button production in two countries, China and the U.S.. If they do not trade button prices will be different in the two countries, in this example higher in the US than in China.



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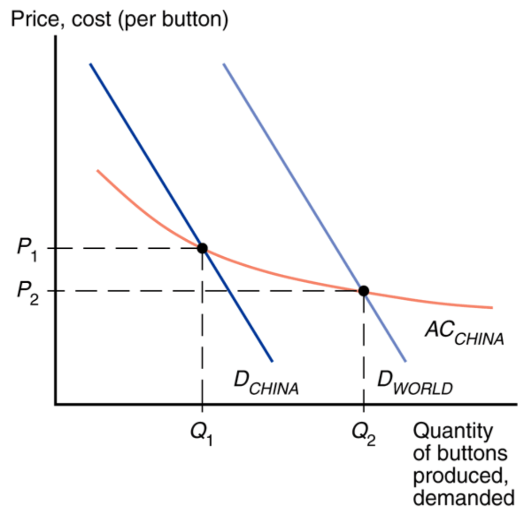
The Theory of External Economies

- When trade opens up, The Chinese button industry will expand, while the U.S. button industry will contract.
- As the Chinese industry's output rises, its costs will fall further; as the U.S. industry's output falls, its costs will rise.
- In the end, all button production will be in China.
- *In contrast to the case of constant returns to scale, trade leads to prices that are lower than the prices in either country before trade!*



External Economies and the Pattern of Trade

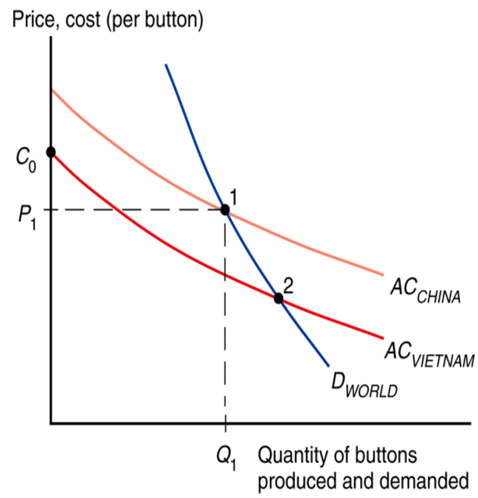
What might cause one country to have an initial advantage from having a lower price?

- 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.

If a country's dominance in an industry is due to "historical accident," it is possible that the pattern of international trade is less than optimal.

External Economies and International Trade: Illustration

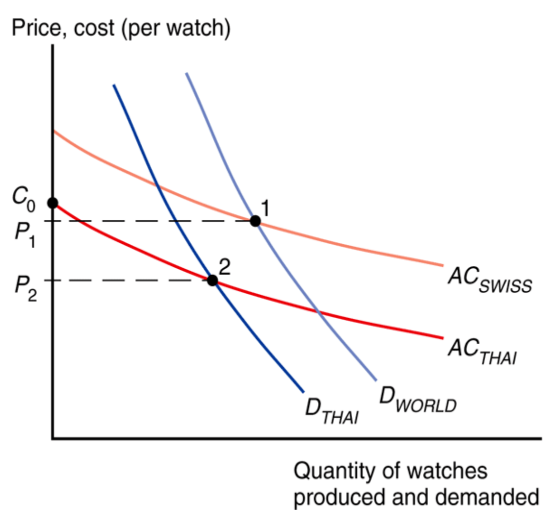
- Assume that the Vietnamese cost curve lies below the Chinese curve because Vietnamese wages are lower than Chinese wages. At any given level of production, Vietnam could manufacture buttons more cheaply than China.
- One might hope that this would always imply that Vietnam will in fact supply the world market. But this need not always be the case if China has enough of a head start.
- *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. It is possible a country could be better off without trade.

- Imagine that Thailand could make watches more cheaply, but Switzerland got there first.
- The price of watches could be lower in Thailand with no trade.
- Trade could make Thailand worse off, creating an incentive to protect its potential watch industry from foreign competition.
- What if Thailand reverts to autarky?



Dynamic Increasing Returns

- So far, 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 increasing returns to scale** exist if average costs fall as cumulative output over time rises. Dynamic increasing returns to scale imply dynamic external economies of scale.
- 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.
- Dynamic increasing returns are represented graphically by the learning curve.

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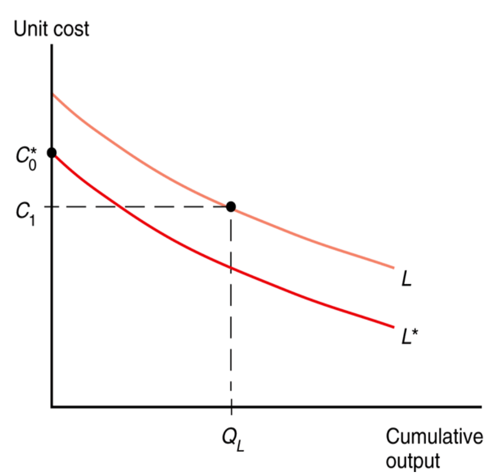
Dynamic Increasing Returns: Learning Curve

- Like external economies of scale at a point in time, dynamic increasing returns to scale can lock in an initial advantage or a head start in an industry.
- Can also 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.



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Summary

1. Trade need not be the result of comparative advantage. Instead, it can result from increasing returns or economies of scale, that is, from a tendency of unit costs to be lower with larger output.

2. Economies of scale give countries an incentive to specialize and trade even in the absence of differences in resources or technology between countries.

3. Economies of scale can be internal (depending on the size of the firm) or external (depending on the size of the industry).

4. Economies of scale can lead to a breakdown of perfect competition, unless they take the form of external economies, which occur at the level of the industry instead of the firm.

Summary (cont.)

5. External economies give an important role to history and accident in determining the pattern of international trade. When external economies are important, a country starting with a large advantage may retain that advantage even if another country could potentially produce the same goods more cheaply.
6. When external economies are important, countries can conceivably lose from trade. Also the free trade price can fall below the price before trade in both countries.
7. Economic geography refers to how humans transact with each other across space, including through international trade and interregional trade.
8. 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.

Questions for discussion

1. Under external economies of scale free trade may not be the optimal policy. Why?

2. External economies of scale seem to justify "infant industry protection," but the record of successful infant industry protection is very poor. Why?

3. What is the main weakness of the argument for government intervention when external economies are present?