

Chapter 2 – Economies of Scale and Scope

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ECO 610

Lecture 1

December 3, 2012

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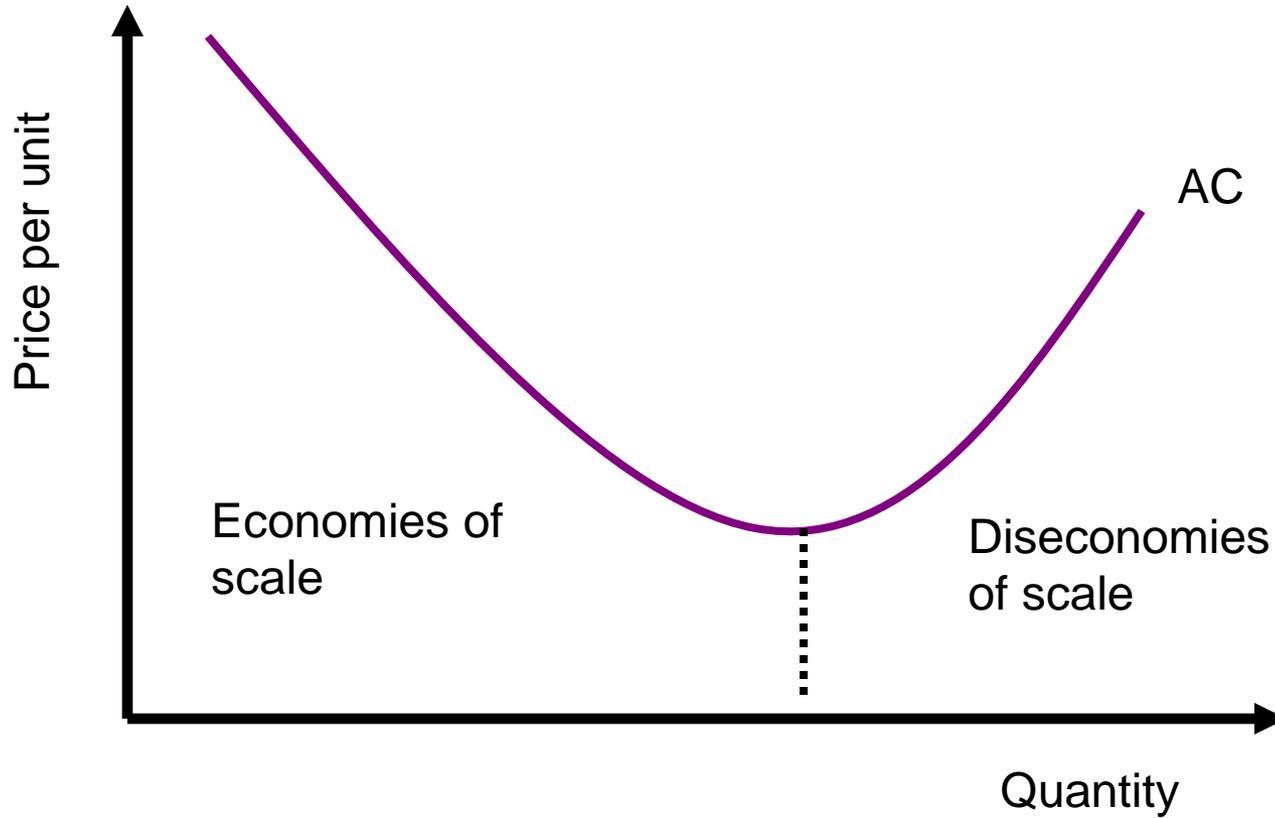
Outline

- Define economies of scale and scope
- Four major sources of economies of scale
- Special sources of economies of scale
- Diseconomies of scale and their sources
- Learning curve

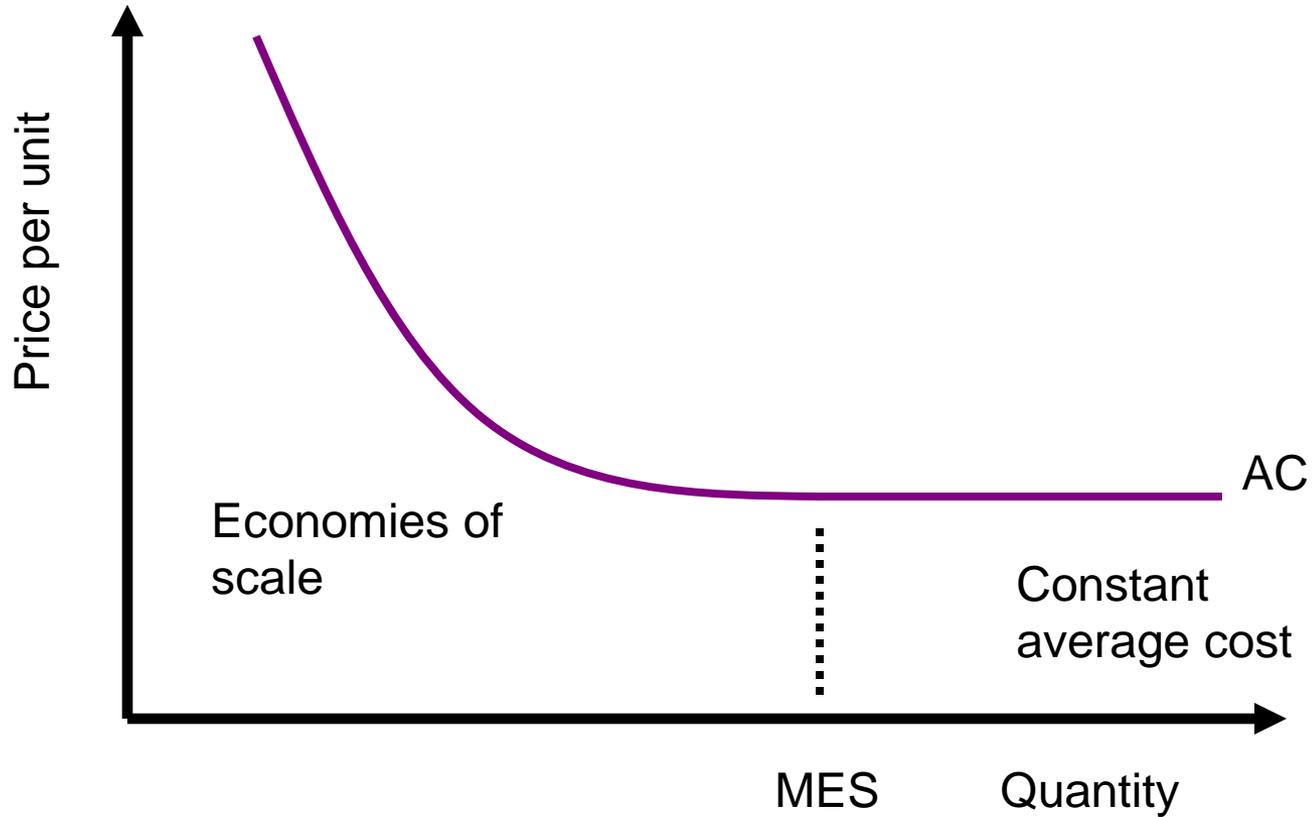
Defining Economies of Scale

- Economies of scale = average cost (i.e. cost per unit of output) declines
 - i.e. “bigger is better”
- If average cost is increasing, we call this diseconomies of scale
- We don't have a fancy name for constant average costs

Example



Another Example



What is MES?

- Minimum Efficient Scale
- MES is the smallest quantity where firm minimizes average cost
- Beyond MES, average costs are identical across firms

Defining Economies of Scope

- Economies of scope = cost savings when different goods/services are produced “under one roof”
 - $TC(Q_x, Q_y) < TC(Q_x, 0) + TC(0, Q_y)$
 - i.e. Firm’s total cost of producing X and Y together is lower than cost of producing X and Y separately
 - Difficult to illustrate graphically

Comparing Scale and Scope

- Economies of scale
 - Looks at production of one good
 - Focuses on average cost of that good
- Economies of scope
 - Looks at production of multiple goods
 - Focuses on total costs for multiple goods or “set” of goods

Four “Major” Sources of Scale and Scope Economies

- 1) Spreading of fixed costs
- 2) Specialization
- 3) Saving on inventories
- 4) Engineering principles associated with “cube-square rule”

(1) Spreading Fixed Costs

- Every company has fixed costs
- Example: firm has to pay the same costs of renting / owning the factory for operating factory 8 or 24 hours a day
- Choice of production volume affects economics of scale in short run
- Choice of technology affects economies of scale in the long run

(1) Fixed Costs - Examples

- Now, we will discuss a couple of examples to illustrate this concept
- Book Example 1 – Webvan
- Book Example 2 – Aluminum cans
- Another example – Hellenic Seaways Ferries

(2) Specialization

- Book calls this “increased productivity of variable inputs”
- Economies of scale more likely when production is capital intensive
- As markets increase in size, economies of scale enable specialization
 - Larger markets lead to specialized firms
 - Firm may switch to “in house” production due to economies of scale

(2) Specialization – Examples

- Book example – pet store versus exotic bird store
- Another example – Greek food
 - Small village has one store with cheese, bread, and wine
 - Larger cities have separate cheese stores, bakeries, and wine shops

(3) Saving on Inventories

- Firms have inventories to meet unexpected increases in demand
- If a firm runs out of a product, we call it a “stock out”
- “Stock outs” result in lost sales and affect customer loyalty
- Bigger firms can have smaller inventories relative to sales volume

(3) Inventories – Examples

- Example 1 – Dia and Champion Marinopoulos
 - Both part of Carrefour group
 - They share inventories, reducing each store's inventory need
- Example 2 – Eurolines
 - Co-operation of 32 bus companies
 - If they share buses, they could reduce their inventory of extra buses

(4) Cube-Square Rule

- Based on following mathematical principle
 - Double diameter of hollow sphere and ...
 - Volume increases by factor of eight
 - Surface area increases by factor of four
- Best applied to manufacturing (especially liquids)

(4) Cube-Square Rule – Examples

- Example 1 – Mythos brewery
- Example 2 – natural gas pipelines (such as South Caucasus Pipeline)

Other Sources of Economies of Scale and Scope

- Purchasing
- Advertising
- Research and development (R&D)

Purchasing

- Large buyers receive volume discount
 - Reduced transaction costs
 - Cost of service (per unit) is lower for large buyers
 - Assured flow of business for the supplier
- Example: large brewery may be able to buy glass (for bottles) at lower prices than small micro-breweries

Advertising

- Larger firms may experience lower cost per potential customer when compared with small regional firms
 - Consider two advertising options for Mercedes-Benz: make same ads for all dealers or make dealer-specific ads
 - If two ads cost the same, then Mercedes would make same ads for all dealers to minimize cost per potential customer

Advertising (Continued)

- Large firms may convert larger share of potential customers into actual customers
 - Example: SPAR (or Starbucks in U.S.)
- Umbrella branding
 - New products easier to introduce when the brand name is already established
 - Example: Peugeot began as bicycle manufacturer, then expanded to autos in 1892 and motorcycles in 1903

Research and Development

- It is not clear whether small firms or large firms have advantage for R&D
 - Average cost of innovations is smaller at large firms
 - Smaller firms may be more suitable for motivated researchers

Diseconomies of Scale

- In some situations, larger firms may be more expensive (per unit) than smaller firms
- Sources of diseconomies of scale
 - Labor intensive firms
 - Bureaucracy
 - Scarcity of specialized resources
 - Conflicts of interest

(1) Labor Intensive Firms

- Firms that are labor-intensive are less likely to benefit from economies of scale
- Workers in large firms are paid more than “identical” workers in small firms
 - Larger firms more likely to be unionized
 - Workers may prefer smaller firms
- However, turnover is lower in larger firms

(2) Bureaucracy

- As firm size grows, managers have more difficulty:
 - Monitoring and communicating with workers
 - Evaluating and rewarding individual performance
- Larger firms may discourage creativity of workers

(3) Scarcity of Specialized Resources

- Some resources have limited availability, so larger firms will have less access to this resource
- Examples:
 - Talented chefs
 - Coastline (or desirable location more generally)

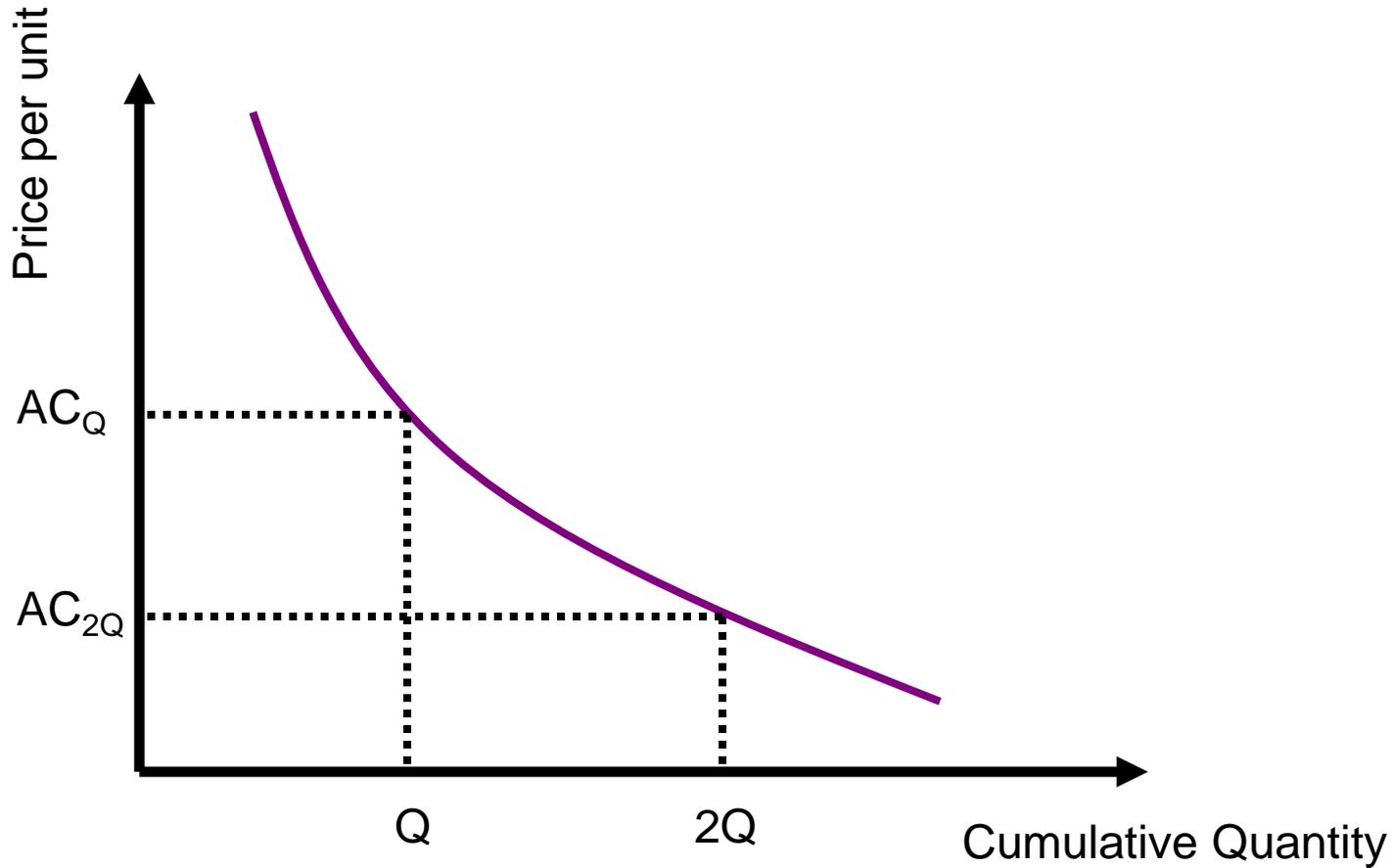
(4) Conflict of Interest

- Professional services firms may find it difficult to sign up a client if a competitor is already a client of the firm
- The need to share sensitive information may impose a limit to the growth of the firm
- Examples include advertising agencies, management consultants, and lawyers

Learning Curve

- Similar concept to economies of scale and scope, but not identical
- Idea is that firms learn by doing
- Firms become more efficient as they become more experienced
 - Learning economies depend on cumulative output rather than the rate of output

Learning Curve (Continued)



Learning Curve (Continued)

- If firms have learning curves, then they should expand output rapidly to benefit from the learning curve and achieve a cost advantage
- This strategy is not as profitable in the short run but will lead to larger profits in the long run

Learning Curve – Example

- Consider a successful business person who wants to “retire” and open a winery
- He thinks he knows a lot about the wine business but in fact he knows little
- But he is a shrewd business person and quickly learns how best to make and sell his wine
- Therefore, his per-bottle costs may decrease as he produces more wine

Summary

- Economies of scale and scope are similar concepts
 - Fixed costs, specialization, inventories, complex mathematical functions
- Some firms face diseconomies of scale
 - Labor intensity, bureaucracy, scarcity of resources, and conflicts of interest
- Some firms “learn” and experience cost savings based on cumulative output