Context and concepts

- Context: You’re running a business. What are the advantages of greater size? Disadvantages? What are the advantages of moving into other lines of business?
- Concepts: economies of scale, economies of scope.

Economies of scale

When average cost declines with output:

\[ AC(q_1) < AC(q_0) \]

Industry structure

- In most industries, there are economies of scale at low levels of output: AC is either U-shaped or L-shaped.
- The “minimum efficient scale” is the smallest quantity at which AC is minimized (\( q \), on previous page).
- If min eff scale is small relative to the size of the market, we tend to see many firms in an industry. If it’s large, we see few. If there’s room for only one efficient firm, the industry is a “natural monopoly.”
- An industry’s cost structure helps to determine the number of firms and hence the nature of competition.

Why scale economies?

- Fixed costs: book publishing, information goods
- Specialization: business school (Stern v Tuck), Southwest’s fleet
- The 2/3 rule: oil shipping, brewing
- Risk: insurance, inventories (Amazon?)
- Volume discounts: WalMart

Scale economies in what?

- Large multi-product firms
  - Size allows scale economies in product lines and support services (purchasing, accounting and control, legal services).
  - Also increases bureaucracy
- Southwest
  - Small airline, but very low costs
  - Specialized in particular activities (one plane)
  - Employees NOT specialized: flexibility lowers costs
Why diseconomies?

- Span of control: it's inherently more difficult to manage a large organization than a small one.
- Decentralization avoids these costs, but may fail to exploit scale economies in particular activities and synergies across business lines (GE, Citigroup).
- Transportation costs: in some old-line industries, transportation costs limit size (cement, beer?).
- Adam Smith: extent of scale economies is limited by the size of the market.
- Globalization: larger markets have led to larger firms.

Economies of scope

- The average cost of producing two (or more) products together is less than the average cost of them separately.
- Joint production of x and y by one firm is cheaper than separate production by two different firms:

\[ C(x, y) < C(x) + C(y) \]

Why economies of scope?

- Natural by-products
  - Oil refining, chicken farming
- Inputs that are fixed costs at the firm level (e.g., brand name)
  - Bic™, Canon™
- Production synergies
  - Flextronics
- Product-line synergies
  - DaimlerChrysler
  - Hewlett-Packard
  - Citigroup

Why diseconomies of scope?

- Span of control: it's hard to manage wildly different businesses
  - Virgin
  - AMEX and Shearson Lehman, GE and Kidder
  - Xerox PARC (cf. core competencies)
- Brand (over)stretching
  - Levi's
  - McDonald's photoprocessing
  - Heineken popcorn

Synergies?

“We also guarantee, 70 years from now, automatic acceptance into our Golden Age Care subsidiary.”
Learning economies

- Cost of producing a given level of output declines with past experience, e.g. cumulative output
- Encourages aggressive fight for market share
- Examples: semiconductors, aircraft, turbine generators

We are good partly because we build so many airplanes. We learn from our mistakes, and each of our airplanes absorbs everything we have learned from earlier models and from our other airplanes.

— Joseph Sutter, airplane designer, Boeing

Model T prices

<table>
<thead>
<tr>
<th>Price (p)</th>
<th>Output (q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p₁</td>
<td>q₁</td>
</tr>
<tr>
<td>p₂</td>
<td>q₂</td>
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</tbody>
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Economies of scale

Learning economies

Learning vs scale

Takeaways

- Economies of scale: lower cost at high levels of output.
- Economies of scope: lower cost from combining two different product lines.
- How is critical: economies typically depend on how work is organized.
- Limiting factors are often size of market and the difficulties of managing a large, complex organization.