Chapter 9: The Costs and Changes at Firms

"We could try a 'free offer' but it would cost us."
## The Costs and Changes at Firms

### Economics 200  Chapter 9

<table>
<thead>
<tr>
<th></th>
<th>Firms (% of total firms)</th>
<th>Number of Paid Employees (% of total employment)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>5,886,000 (100%)</td>
<td>115.1 million (100%)</td>
</tr>
<tr>
<td><strong>0–9 employees</strong></td>
<td>4,623,000 (78.5%)</td>
<td>12.7 million (11.0%)</td>
</tr>
<tr>
<td><strong>10–19 employees</strong></td>
<td>633,000 (10.8%)</td>
<td>8.5 million (7.3%)</td>
</tr>
<tr>
<td><strong>20–99 employees</strong></td>
<td>526,000 (8.9%)</td>
<td>20.6 million (17.8%)</td>
</tr>
<tr>
<td><strong>100–499 employees</strong></td>
<td>86,000 (1.5%)</td>
<td>16.8 million (14.5%)</td>
</tr>
<tr>
<td><strong>500–2,499 employees</strong></td>
<td>13,500 (2.3%)</td>
<td>13.6 million (12.0%)</td>
</tr>
<tr>
<td><strong>2,500–9,999 employees</strong></td>
<td>2,600 (.04%)</td>
<td>12.4 million (10.8%)</td>
</tr>
<tr>
<td><strong>10,000 or more employees</strong></td>
<td>890 (.02%)</td>
<td>30.4 million (26.4%)</td>
</tr>
</tbody>
</table>
The Costs and Changes at Firms

<table>
<thead>
<tr>
<th>Many firms</th>
<th>Many firms</th>
<th>Few firms</th>
<th>One firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical products</td>
<td>Similar but not identical products</td>
<td>Identical or similar products</td>
<td>No similar product</td>
</tr>
<tr>
<td>Perfect Competition</td>
<td>Monopolistic Competition</td>
<td>Oligopoly</td>
<td>Monopoly</td>
</tr>
</tbody>
</table>
The Costs and Changes at Firms

I) The Costs: “All costs are *caused* by decisions or actions”

A) Sunk Costs: Money already spent!
   1- The $ already spent on a project is irrelevant.
   2- The future $ to be spent is what counts.
      a- weigh future costs and future benefits.
The Costs and Changes at Firms

Example:
It costs a soybean farmer $1.00/bushel to grow his crop, and costs $1.00/bushel to ship to market.

(Total cost = $2.00/bushel)
The market price is currently $1.75/bushel.

Q: Should he ship the crop or plow it under?
**The Costs and Changes at Firms**

**Example:**
It costs a soybean farmer $1.00/bushel to grow his crop, and costs $1.00/bushel to ship to market. (Total cost = $2.00/bushel)

The market price is currently $1.75/bushel.

**Q:** Should he ship it or plow it under?

**A:** Ship it! Since the first $1.00 is a sunk cost. By harvests time, it costs $1.00 to earn $1.75.
The Costs and Changes at Firms

B) Short-run vs. the long-run

1- In the short-run, most production inputs do not change.
   a- only some inputs can change, such as labor.

2- In the long-run, all inputs can change.
C) Short-run costs:

*Refer to handout: “Pine Lumber Cost Chart.”

1- Total Costs (TC): (2 types of TC)

A- Fixed Costs (FC): includes a “normal profit”. (“normal profits” = amount of $ the firm could make if it invests in the next best alternative, i.e., the opportunity cost.)

B- Variable Costs (VC): costs that can change/vary in the short-run.

(TC = TFC + TVC)
The Costs and Changes at Firms

2- Average Costs:

A- Average Fixed Costs (AFC) = TFC/output
  *AFC ↓ as output ↑

B- Average Variable Costs (AVC) = TVC/output
  *AVC initially ↓ as output ↑, then ↑ as output ↑

C- Average Total Costs (ATC) = AFC + AVC
  *ATC initially ↓ as output ↑, then ATC ↑
3- Marginal costs (MC):

A- The cost of adding one additional unit of output

* MC initially ↓ as output ↑, then MC ↑

* Also explains why the S-curve slopes upward.

Producers will supply more goods only if P ↑ enough to cover ↑ MC.
The Costs and Changes at Firms

II) The cost curves:

<table>
<thead>
<tr>
<th>Labor</th>
<th>Quantity</th>
<th>Fixed Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Marginal Cost</th>
<th>Average Cost</th>
<th>Average Variable Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>160</td>
<td>80</td>
<td>240</td>
<td>5</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>160</td>
<td>160</td>
<td>320</td>
<td>3.3</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>160</td>
<td>240</td>
<td>400</td>
<td>4</td>
<td>6.6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>72</td>
<td>160</td>
<td>320</td>
<td>480</td>
<td>6.6</td>
<td>6.6</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>160</td>
<td>400</td>
<td>560</td>
<td>10</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>84</td>
<td>160</td>
<td>480</td>
<td>640</td>
<td>20</td>
<td>7.6</td>
<td>5.7</td>
</tr>
</tbody>
</table>
The Costs and Changes at Firms

Cost ($)

Output

Economies of scale
Constant returns to scale
Diseconomies of scale

$q_1, q_2, q_3, q_4, q_5$

SRAC$_1$, SRAC$_2$, SRAC$_3$, SRAC$_4$, SRAC$_5$, LRAC
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III) Profit Maximization - Short-run

B) Companies in competitive markets are “price-takers”.

1- the only way to control profits ($\pi$) is to vary the level of output.

$BUTT$, where is $\pi$- max.?
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B) Marginal Revenue

1- the additional $ gained from the sale of one more item.

* MR=P, since firm is a “price-taker” (in perfect competition.)

* A π- max. firm will ↑ production as long as MR > MC.
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- So set production where

\[ MR = MC! \]

Got it?
2- graphical representation:

\[ P_e \]

[Graph showing relationship between price and quantity with price \( P_e \) and quantity \( Q \) axes, and a line labeled \( D = mR = P \) with marginal cost (MC) curve.]
The Costs and Changes at Firms

It’s time to apply your knowledge!