Long Run Cost

Making Long-Run Production Decisions
• To make their long-run decisions:
  – Firms look at costs of various inputs and the technologies available for combining these inputs.
  – Then decide which combination offers the lowest cost.

Making Long-Run Production Decisions
• The firm makes long-run decisions on the basis of the expected costs and expected usefulness of inputs.

Technical Efficiency and Economic Efficiency
• Technical efficiency – as few inputs as possible are used to produce a given output.
• Technical efficiency is efficiency that does not consider cost of inputs.
Technical Efficiency and Economic Efficiency

- **Economically efficient** – the method that produces a given level of output at the lowest possible cost.

- It is the least-cost technically efficient process.

Determinants of the Shape of the Long-Run Cost Curve

- The law of diminishing marginal productivity does not hold in the long run.
- All inputs are variable in the long run.

Determinants of the Shape of the Long-Run Cost Curve

- The shape of the long-run cost curve is due to the existence of economies and diseconomies of scale.

A Typical Long-Run Average Total Cost Table

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total Costs of Labor</th>
<th>Total Cost of Machines</th>
<th>Total Costs</th>
<th>Average Total Costs = TC/Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>$381</td>
<td>$254</td>
<td>$635</td>
<td>$58</td>
</tr>
<tr>
<td>12</td>
<td>390</td>
<td>260</td>
<td>650</td>
<td>54</td>
</tr>
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<td>13</td>
<td>402</td>
<td>268</td>
<td>670</td>
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</tr>
<tr>
<td>14</td>
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<td>280</td>
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<td>17</td>
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<td>915</td>
<td>51</td>
</tr>
<tr>
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<td>400</td>
<td>1,000</td>
<td>53</td>
</tr>
<tr>
<td>20</td>
<td>666</td>
<td>444</td>
<td>1,110</td>
<td>56</td>
</tr>
</tbody>
</table>
Economies of Scale

- **Economies of scale** – long run average total costs decrease as output increases.
- In real-world production processes, economies of scale are extremely important at low levels of production.

Economies of Scale

- An *indivisible setup cost* is the cost of an indivisible input for which a certain minimum amount of production must be undertaken before the input becomes economically feasible to use.

Economies of Scale

- Indivisible setup costs create many real-world economies of scale.
- The cost of a blast furnace or an oil refinery is an example of an indivisible setup cost.
Economies of Scale

- In the longer run all inputs are variable, so only economies of scale can influence the shape of the long-run cost curve.

Economies of Scale

- Because of the importance of economies of scale, business people often talk of a minimum efficient level of production.

Economies of Scale

- The minimum efficient level of production is the amount of production that spreads setup costs out sufficiently for firms to undertake production profitably.

Economies of Scale

- The minimum efficient level of production is reached once the size of the market expands to a size large enough so that firms can take advantage of all economies of scale.
Diseconomies of Scale

- *Diminishing marginal productivity* refers to the decline in productivity caused by increasing units of a variable input being added to a fixed input.

Diseconomies of Scale

- Diseconomies of scale refer to decreases in productivity which occur when there are equal increases of all inputs (no input is fixed).
  
  – Diseconomies of scale occur on the right side of the long-run average cost curve where it is upward sloping, meaning that average cost is increasing.

Diseconomies of Scale

- As the size of the firm increases, monitoring costs generally increase.

- *Monitoring costs* are those incurred by the organizer of production in seeing to it that the employees do what they are supposed to do.

Diseconomies of Scale

- As the size of the firm increases, team spirit or morale generally decreases.

- *Team spirit* is the feelings of friendship and being part of a team that brings out peoples’ best effort.
Constant Returns to Scale

- *Constant returns to scale* is where long-run average total costs do not change as output increases.
- It is shown by the flat portion of the LRATC curve.

Economies and Diseconomies of Scale

Importance of Economies and Diseconomies of Scale

- Economies and diseconomies of scale play important roles in real-world long-run production decisions.

Importance of Economies and Diseconomies of Scale

- The long-run and the short-run average cost curves have the same U-shape, but the underlying causes of these shapes differ.
Importance of Economies and Diseconomies of Scale

- Economies and diseconomies of scale account for the shape of the long-run total cost curve.

- Initially increasing and then eventually diminishing marginal productivity (as a variable input is added to a fixed input) accounts for the shape of the short-run cost curve.