



COSTS OF PRODUCTION



Explicit Costs

- The firm's production costs are made up of explicit and implicit costs.
- The actual, out-of-pocket expenditures incurred by the firm to purchase or hire the services of the factors of production it needs.
- Example: Material, fuel, transportation expenditures, wages of hired labor etc.



Implicit Costs

- The estimated values of the factors owned by the firm and used in its own production processes.
- It could be an asset that the owner contributes. For example, a firm using its own capital or a person might use the ground floor of his home as a retail outlet, i.e., a shop.



Economic Profit

- Profit is the excess of revenues over costs.
OR
- Profit equals total revenue minus total cost.

- **Total Revenue**

Total revenue is the amount of money that a company earns by selling its goods or services.

Total revenue can be calculated by multiplying the price per product by the total number of units of that product that were sold.

Economic Profit

Total Revenue = Price x Quantity

$$TR = P \times Q$$

- So profit can be calculated as

Profit = Total Revenue - Total Cost

$$\pi = TR - TC$$



Short Run & Law of Diminishing Returns

- **Short Run**

The time period when at least one factor of production is fixed in quantity (i.e., cannot be varied/changed) is referred to as the short run.

- **Law of Diminishing Returns**

Refers to the falling marginal product resulting from using more variable factors with some fixed factors.



Law of Diminishing Returns

- This law states that as we use more and more units of some factors of production to work with one or more fixed factors, after a point we get less and less extra or marginal output or product from each additional unit of the variable factors used.
- The law of diminishing returns is a short run law.



Short Run Total Costs

- In the short run, there are total fixed costs, total variable costs and total costs.
- **Total Fixed Costs (TFC)**

The costs which the firm incurs in the short run for all fixed inputs, regardless of the level of output.

Example: The rent which a producer must pay for the factory building over the life of a lease.



Short Run Total Costs

- **Total Variable Costs (TVC)**

The changing costs incurred by the firm for all variable inputs.

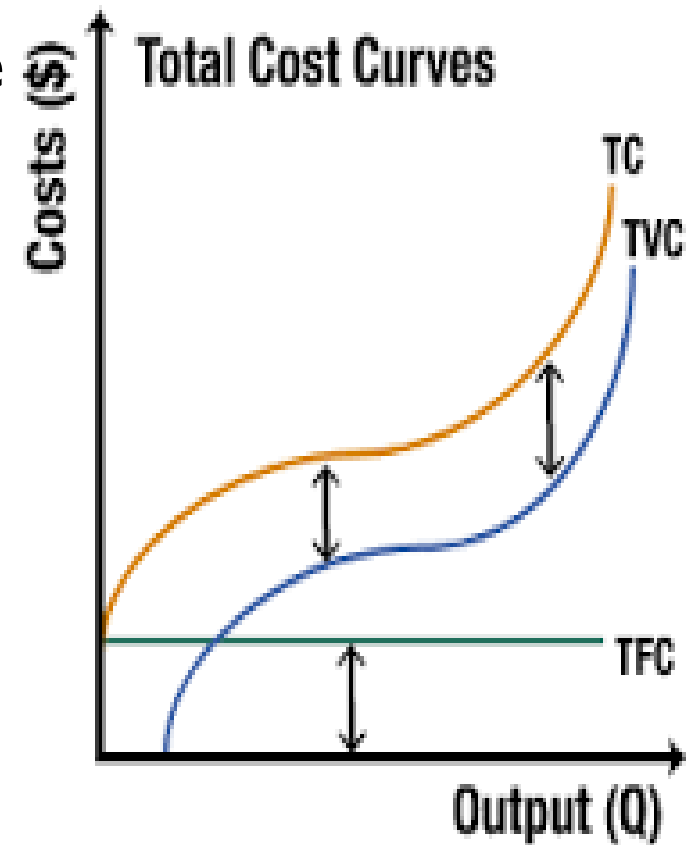
Example: Raw material costs and some labor costs.

- **Total Costs (TC)**

The sum of total fixed costs and total variable costs.

Short Run Total Costs

- Figure shows a firm's total cost curves.
- Total fixed cost is the same at each output level.
- Total variable cost increases as output increases.
- Total cost, which is the sum of TFC and TVC also increases as output increases.



Short Run Per-Unit Costs

- **Average Fixed Costs (AFC)**

It equals total fixed costs divided by output.

$$AFC = \frac{TFC}{Q}$$

- **Average Variable Costs (AVC)**

It equals total variable costs divided by output.

$$AVC = \frac{TVC}{Q}$$

Short Run Per-Unit Costs

- **Average Costs (AC)**

It equals total costs divided by output or it also equals average fixed costs plus average variable costs.

$$AC = \frac{TC}{Q} \quad \text{OR} \quad AC = AFC + AVC$$

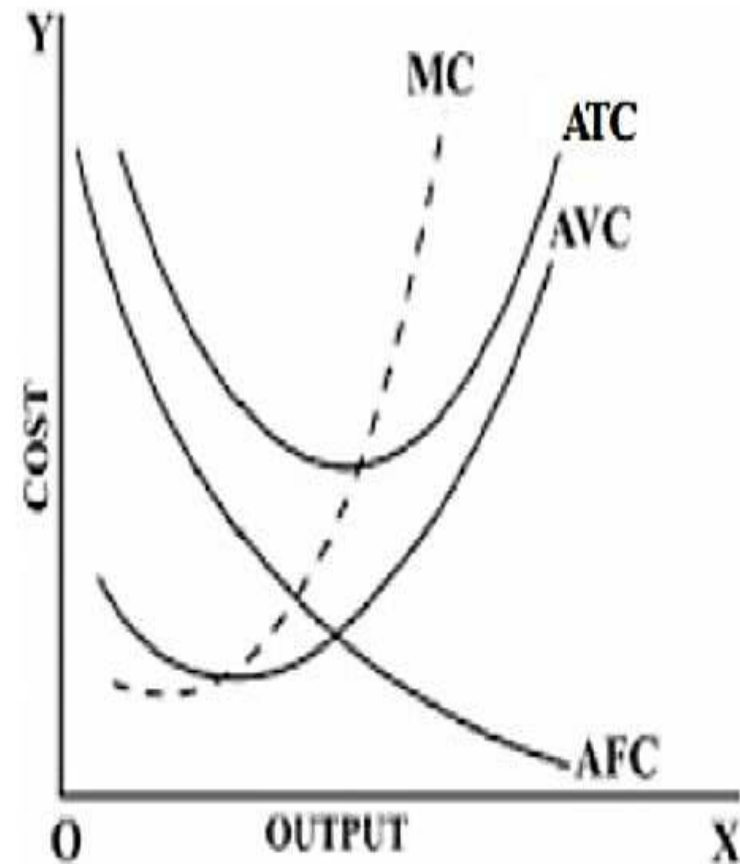
- **Marginal Costs (MC)**

The change in total costs or total variable costs per unit change in output.

$$MC = \frac{\Delta TC}{\Delta Q} \quad \text{OR} \quad MC = \frac{\Delta TVC}{\Delta Q}$$

Short Run Per-Unit Costs

- Figure shows a firm's per-unit cost curves.
- Average fixed cost curve falls as output expands.
- AVC, AC and MC curves are U-shaped.
- MC curve reaches its lowest point at a lower level of output than either AVC or AC curve.
- The rising portion of MC curve intersects the AVC and AC curves at their lowest points.



FIGURE



Long Run Production Costs

- **Long Run**

The time period when all factors of production are variable.

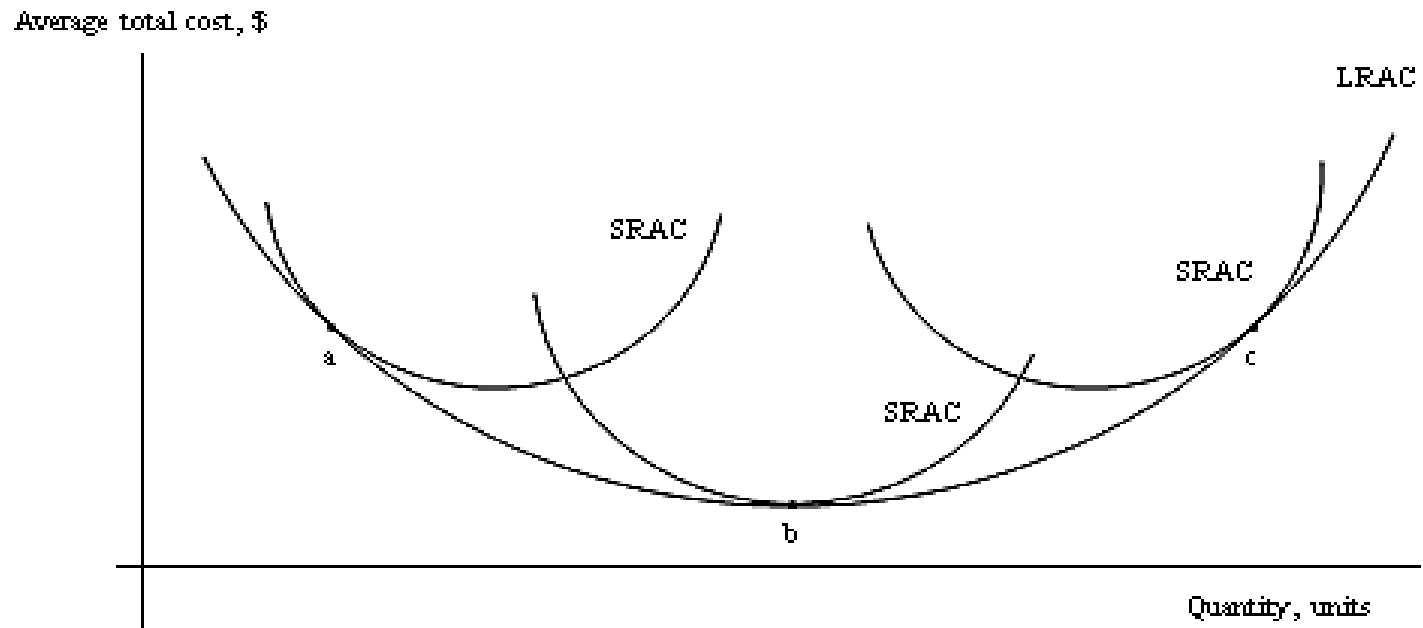
- **Long Run Average Cost (LAC)**

The minimum per-unit cost of producing a level of output when any desired scale of plant can be built.

- **Long Run Marginal Cost (LMC)**

The change in total costs per unit change in output when any desired scale of plant can be built.

Long Run Average Cost Curve



- Long-run average cost is the sum of short-run average costs.
- The long-run average cost (LRAC) curve is an envelope curve of the short-run average cost (SRAC) curves lying everywhere below or tangent to the short-run curves.



Constant, Increasing & Decreasing Returns to Scale

- If in the long run we increase all factors of production by a given proportion, there are three possible outcomes:

- **Constant Returns to Scale**

When all factors of production are increased in a given proportion and the output produced increases in the same proportion.

Example: The quantities of labor and capital used both increased by 10%, output will also increase by 10%.



Constant, Increasing & Decreasing Returns to Scale

- **Increasing Returns to Scale OR Economies of Scale**

When all factors of production are increased in a given proportion and the output produced increases in a greater proportion.

Example: If labor and capital are increased by 10%, output rises by more than 10%.



Constant, Increasing & Decreasing Returns to Scale

- **Decreasing Returns to Scale OR Diseconomies of Scale**

When all factors of production are increased in a given proportion and the output produced increases in a smaller proportion.

Example: If labor and capital are increased by 10%, output rises by less than 10%.



LINKS OF VIDEO LECTURES

- <https://www.youtube.com/watch?v=CJAwndSv5aA>
- <https://www.youtube.com/watch?v=zVOiQCOIQJs>
- <https://www.youtube.com/watch?v=lt6LpwBNSIM>
- <https://youtu.be/vh7SjS-tlwA>
- <https://youtu.be/aKpnaKROoYA>
- <https://youtu.be/4bJs6bKjPPA>