

**Dr.SNS RAJALAKSHMI COLLEGE OF ARTS AND SCIENCE
(Autonomous)**

Accredited by NAAC – UGC with 'A+ Grade (Cycle IV)
(Recognised by UGC, Approved by AICTE & Affiliated to Bharathiar University)
Coimbatore- 49

**DEPARTMENT OF COMMERCE WITH
INFORMATION TECHNOLOGY**

**MANAGERIAL ECONOMICS
Cost- Output- Relationship**

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The Functional Relationship

| Cost Function

The cost-output relationship is mathematically expressed as a cost function:

$$C = f (Q)$$

Where **C** represents the total cost and **Q** represents the quantity of output produced. It shows the least cost combination of inputs for a given output.

| Economic Significance

Understanding this relationship is vital for:

- Determining the optimum level of production.
- Setting prices in competitive markets.
- Analyzing profit maximization where Marginal Cost equals Marginal Revenue (MC = MR).

Time Perspectives

Short Run

A period where at least one factor of production is **fixed** (e.g., plant capacity, machinery).

Output can only be increased by adding variable inputs (labor, raw materials).

Costs are split into Fixed Costs and Variable Costs.

Long Run

A period sufficient to vary **all** factors of production.

There are no fixed costs; all costs are variable.

Firms can expand plant size or exit the industry.

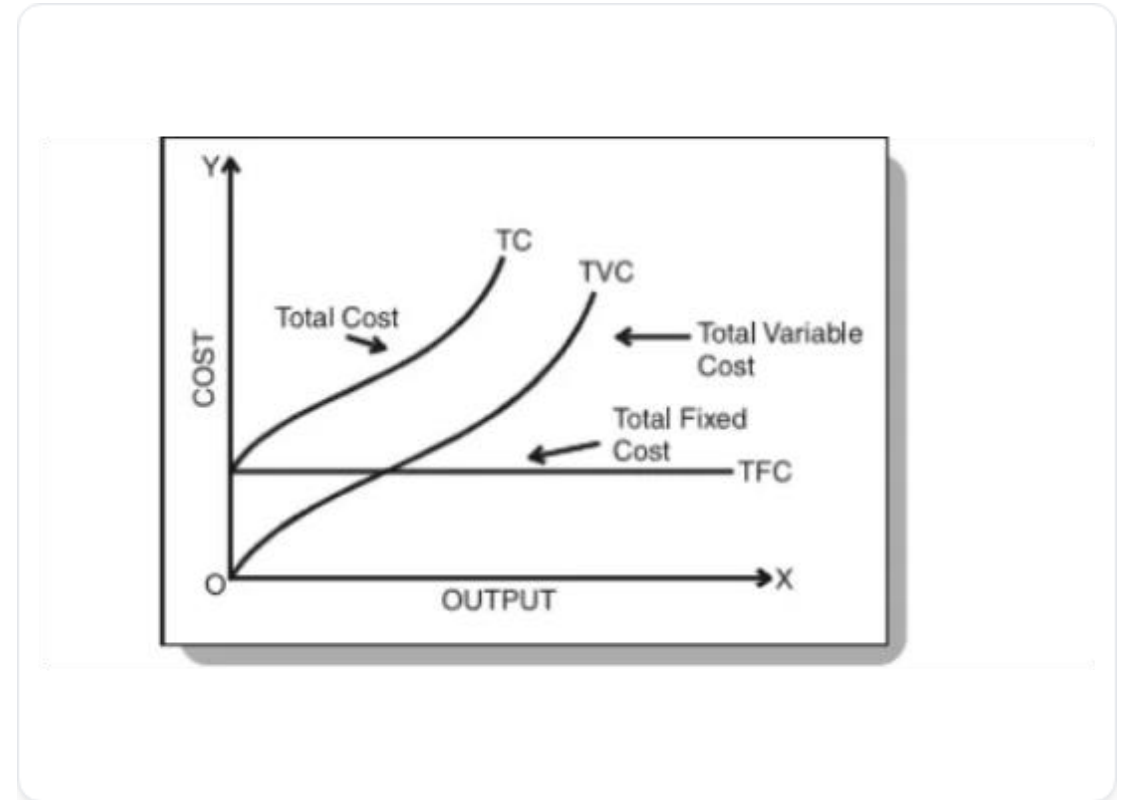
Often called the "Planning Horizon."

Short Run Total Costs

Total Fixed Cost (TFC): A horizontal line. Costs incurred even at zero output (Rent, Insurance).

Total Variable Cost (TVC): Starts from origin. Increases with output. Inverse S-shape due to Law of Variable Proportions.

Total Cost (TC): The sum of TFC and TVC. It runs parallel to the TVC curve, starting from the TFC level.

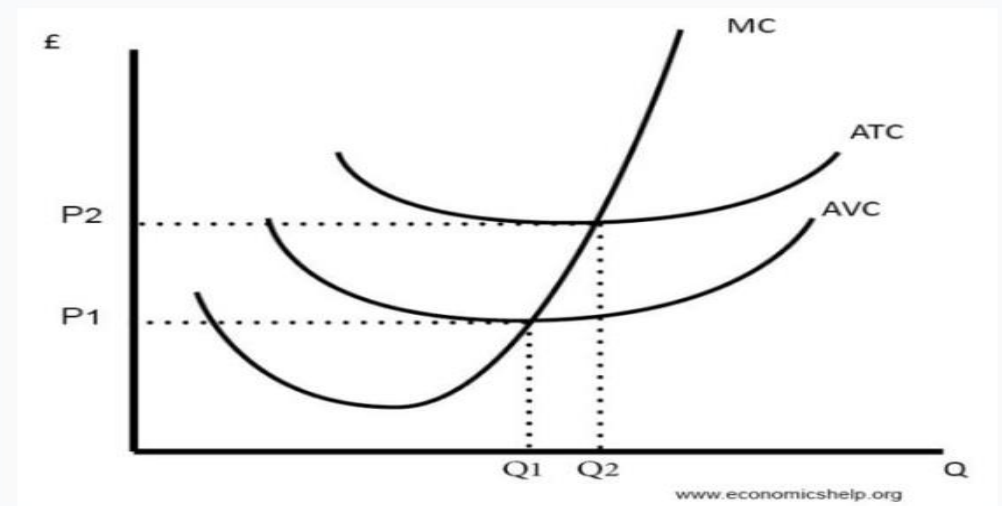


Short Run Unit Costs

Average Total Cost (ATC): U-shaped. Falls initially as fixed costs are spread, then rises due to diminishing returns.

Average Fixed Cost (AFC): Continuously falls (rectangular hyperbola) but never touches the X-axis.

Marginal Cost (MC): Cuts both AVC and ATC at their minimum points. It reflects the cost of the last unit produced.



Law of Variable Proportions



Increasing Returns

Initially, adding variable inputs to a fixed factor leads to increasing efficiency and falling average costs.



Constant Returns

The optimal combination of fixed and variable factors is reached. Costs are at their minimum.



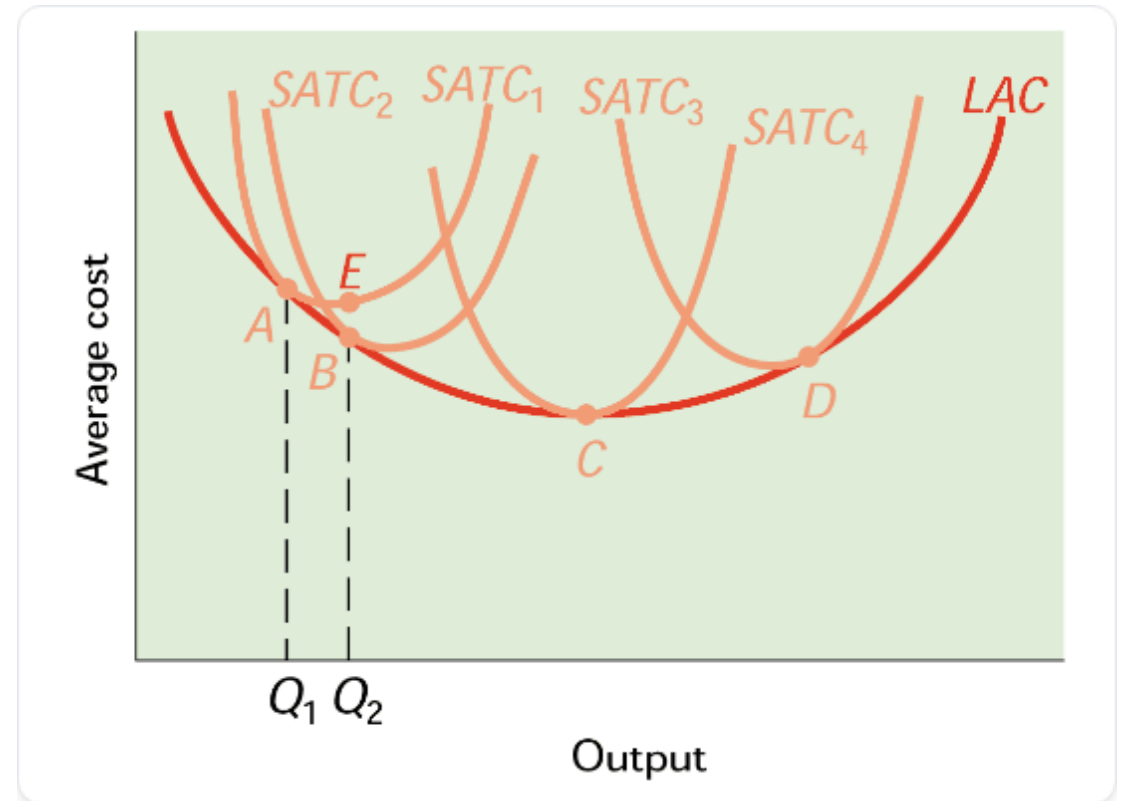
Diminishing Returns

Eventually, the fixed factor becomes overcrowded. Efficiency drops, and marginal costs rise sharply.

Long Run

The Long Run Average Cost (LAC) curve is the envelope of various Short Run Average Cost (SAC) curves.

- It represents the lowest possible cost per unit for any given level of output in the long run.
- It is U-shaped but flatter than SAC curves.
- It assumes the firm can choose the optimal plant size for the desired output.



Economies of Scale



Technical Economies

Larger machines and specialized equipment operate more efficiently, lowering per-unit costs.



Purchasing Economies

Bulk buying discounts on raw materials reduce the variable cost component significantly.



Financial Economies

Large firms have better access to capital markets and can borrow funds at lower interest rates.

Diseconomies of Scale



Managerial Inefficiencies: As organizations grow too large, communication flows break down, leading to delayed decision-making.



Coordination Problems: Monitoring a massive workforce becomes difficult, leading to potential drops in productivity.



Bureaucracy: Excessive layers of management increase administrative costs without adding direct value to production.



Result: These factors cause the LAC curve to eventually slope upwards.