

MGT 104

Microeconomics

Production

Production means creating goods and services by combining inputs such as land, labor, and capital.

Example: A bakery uses flour, ovens, and workers to make bread.

Production Function

Relationship between inputs and output.

$$Q = f(L, K)$$

- Q = Output
- L = Labor
- K = Capital

If 5 workers and 2 machines produce 100 chairs, production function tells how output changes when we add more workers or machines.

Short Run vs Long Run

- ✓ **Short Run:** At least one input (like capital) is fixed.
- ✓ **Long Run:** All inputs can be changed.

A restaurant can hire more cooks (short run), but to expand seating, it must build a bigger space (long run).

Law of Diminishing Returns

When more and more units of a variable factor are added to a fixed factor, total output increases at a decreasing rate after a certain point.

Adding more workers to a small kitchen-initially helps, later causes overcrowding, and efficiency drops.

Labor (Units)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)
1	10	10	10
2	25	15	12.5
3	45	20	15
4	60	15	15
5	70	10	14
6	75	5	12.5

- **Interpretation:** MP increases up to 3 workers (Stage I), then starts decreasing (Stage II). After 6 workers, MP nears zero (Stage III).

Cost of Production

Cost of production refers to the total expenditure incurred by a firm in producing a given level of output. It includes the money value of all inputs used such as labor, raw materials, capital, energy, rent, and managerial effort.

Short-run vs Long-run Costs

Short-run Costs

In the short run, at least one factor is fixed (usually capital).

Costs are divided into:

- Fixed Cost (TFC) – does not change with output (e.g., rent, salaries).
- Variable Cost (TVC) – changes with output (e.g., raw materials, fuel).
- Total Cost (TC) = $TFC + TVC$.

Output (Units)	TFC (Tk)	TVC (Tk)	TC (Tk)
0	200	0	200
1	200	100	300
2	200	180	380
3	200	240	440

Compute AFC, AVC, and ATC

Output (Q)	TFC	TVC	TC	MC
0	100	0	100	–
1	100	60	160	60
2	100	100	200	40
3	100	150	250	50
4	100	220	320	70
5	100	310	410	90

Formulas:

$$AFC = \frac{TFC}{Q}, \quad AVC = \frac{TVC}{Q}, \quad ATC = \frac{TC}{Q}$$

Q	TFC	TVC	TC	MC	AFC	AVC	ATC
0	100	0	100	–	–	–	–
1	100	60	160	60	100.0	60.0	160.0
2	100	100	200	40	50.0	50.0	100.0
3	100	150	250	50	33.3	50.0	83.3
4	100	220	320	70	25.0	55.0	80.0
5	100	310	410	90	20.0	62.0	82.0

Step 3: Identify the Point of Minimum Cost

Looking at the **ATC** column:

Q	ATC
1	160.0
2	100.0
3	83.3
4	80.0
5	82.0

- ◆ **Minimum ATC = 80.0 at Q = 4 units**

That's the point of minimum cost.

Opportunity Cost

Opportunity cost refers to the value of the next best alternative foregone. It measures trade-offs.

Spending Tk. 500 on a book means missing a concert you could attend.

A worker can earn Tk. 500/day as a teacher or Tk. 600/day as a shop manager.

Opportunity cost of teaching = TK. 600 (income forgone).

Importance of Measuring Opportunity Cost

- ✓ Helps efficient resource allocation**
- ✓ Aids rational decision-making**
- ✓ Enables cost-benefit analysis**
- ✓ Guides business and policy decisions**

Methods of Measuring Opportunity Cost

Monetary Measurement – measured in money value

Real Measurement – measured in goods or time

PPC Approach – slope shows trade-off between goods

Monetary Measurement

A worker can earn Tk. 500/day as a teacher or Tk. 600/day as a shop manager.

Opportunity cost of teaching = TK. 600 (income forgone).

Real Measurement

A farmer can produce 100 kg of rice or 50 kg of wheat.

Opportunity cost of 1 kg wheat = 2 kg rice foregone.

Opportunity Cost on PPC

- PPC (Production Possibility Curve) shows combinations of two goods that can be produced with limited resources.

Production Option	Food (Units)	Clothes (Units)	Opportunity Cost of 10 Clothes
A	100	0	-
B	90	10	10 Food
C	70	20	20 Food
D	40	30	30 Food

- Increasing opportunity cost: As more clothes are produced, more food must be sacrificed.

A country can produce either 200 units of computers or 400 units of phones.

What is the opportunity cost of producing 1 computer?

Opportunity cost = Phones forgone / Computers produced = $400 / 200 = 2$ phones per computer.

- ✓ **Opportunity cost = value of next best alternative foregone.**
- ✓ **Measured in money, real terms, or PPC.**
- ✓ **Crucial for rational economic decisions.**