

Average Costs

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Average Costs

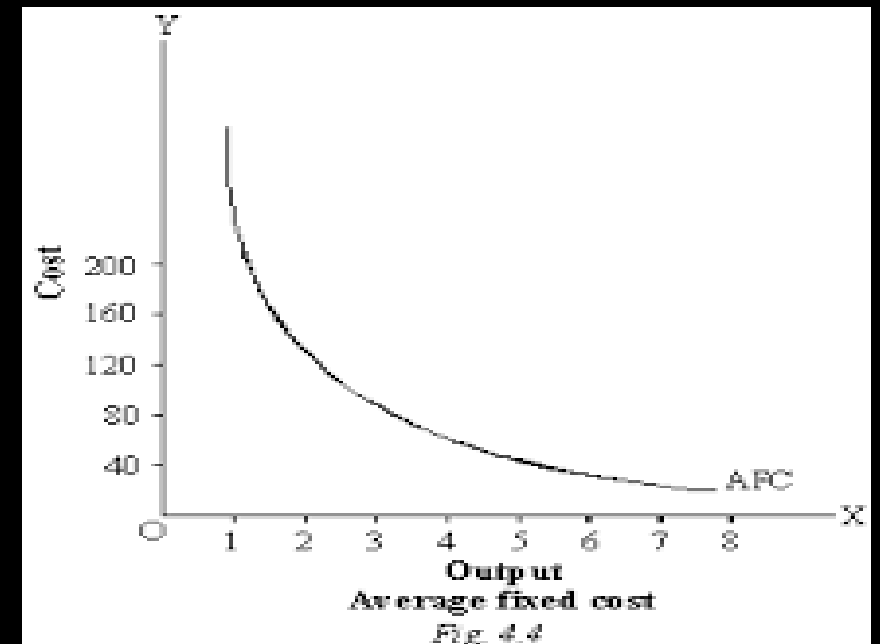
- The per unit costs
 - Average fixed costs (AFC)
 - Average variable costs (AVC)
 - Average total costs (ATC) or Average costs (AC)

Average Fixed Costs

- Refers to the per unit fixed cost of production
- Calculated by dividing TFC by total output
- $AFC = TFC / q$

Average Fixed Costs Schedule and Curve

Output	TFC	AFC
0	12	∞
1	12	12
2	12	6
3	12	4
4	12	3
5	12	2.40



Explanation of Average Fixed Costs and AFC curve

- Falls with rise in output because constant TFC is divided by increasing output
- A rectangular hyperbola (area under AFC curve remains same at different points)

Explanation of Average Fixed Costs and AFC curve

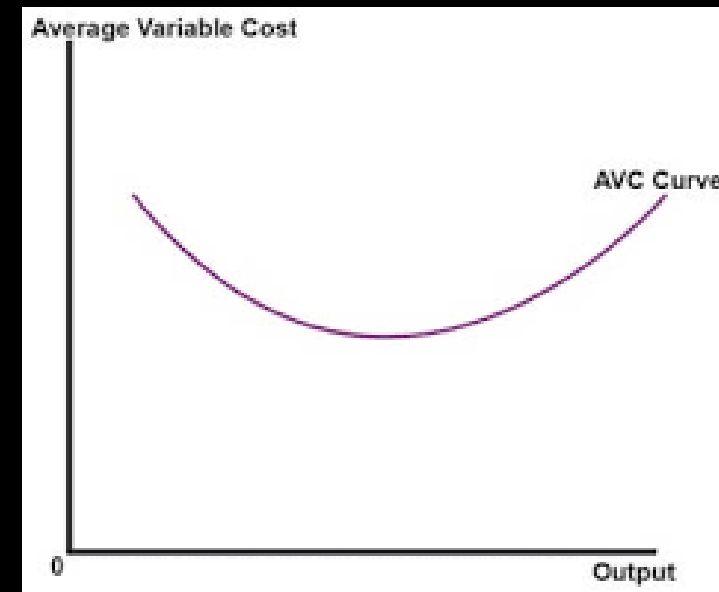
- AFC can never touch the X-axis as TFC can never be zero
- AFC can never touch the Y-axis because at zero level of output, TFC is having positive value

Average Variable Costs (AVC)

- Refers to the per unit variable cost of production
- $AVC = TVC / q$
- Initially falls with increase in output once the output rises till optimum level, AVC starts rising

AVC Schedule and AVC curve

Output	TVC	AVC
0	0	—
1	6	6
2	10	5
3	15	5
4	24	6
5	35	7

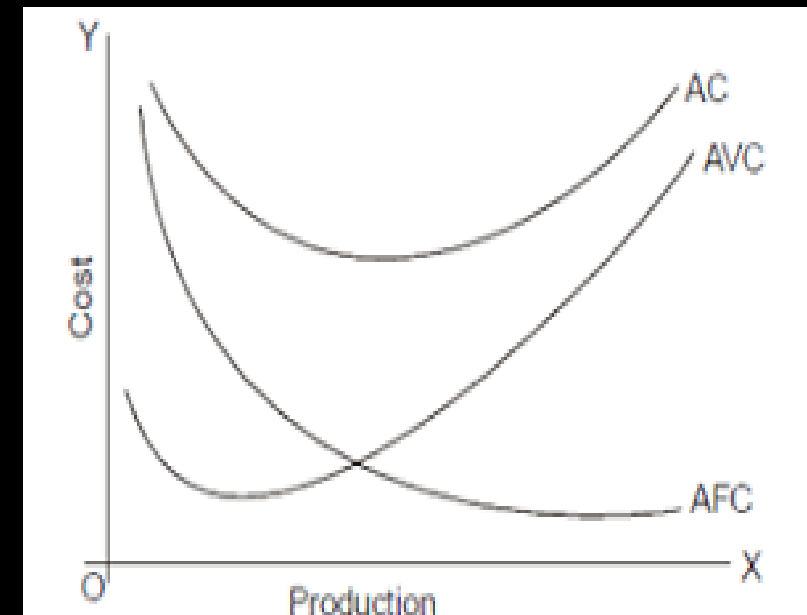


Average Total Cost (ATC) or Average Costs (AC)

- Refers to the per unit total cost of production
- Calculated by dividing total cost by total output
 - $AC = TC/Q$ or
 - $AC = AFC + AVC$

Average Costs

Output	AFC	AVC	AC
0	∞	—	—
1	12	6	18
2	6	5	11
3	4	5	9
4	3	6	9
5	2.4	7	9.40



Different Phases

- 1st Phase- When both AFC and AVC fall till the level of 2 units of output, AC falls
- 2nd Phase- From 2nd unit to 3rd units, AFC continues to fall, but AVC remains constant. So, AC falls till it reaches its minimum point.
 - From 3rd units to 4th units, fall in AFC is equal to rise in AVC- so AC remains constant

Different Phases

- 3rd Phase- After 4th units of output, rise in AVC is more than fall in AFC- AC starts rising

Important Points....

- AC curve always lie above the AVC curve because AC at all levels of output includes both AVC and AFC
- AVC reaches its maximum points at a level of output lower than that of AC- when AVC is at its minimum point, AC is still falling because of falling AFC

Important Points....

- As the output increases, the gap between AC and AVC curve decreases, but they never intersect each other
- This is because the vertical distance between them is AFC, which can never be zero

Marginal Cost (MC)

- MC refers to addition to total cost when one more unit of output is produced
- $MC_n = TC_n - TC_{n-1}$
 - n – number of units produced
 - MC_n - Marginal cost of the nth unit
 - TC_n - Total cost of n units
 - TC_{n-1} - Total cost of (n-1) units

Marginal Cost (MC)

- MC is the change in TC when one more unit of output is produced
- If change in units produced is more than one, then MC

can be calculated as $MC = \frac{\text{Change in Total Cost}}{\text{Change in Units of Output}} = \Delta TC / \Delta Q$

Marginal Cost (MC)

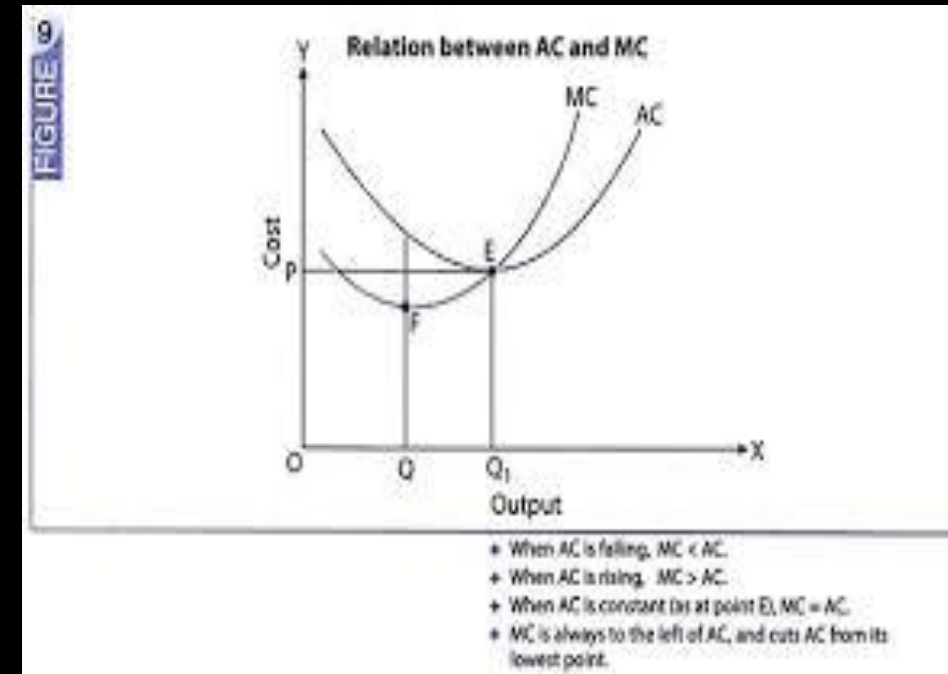
- MC is not affected by fixed costs
- $TC = TFC + TVC$
- As TFC does not change with change in output, MC is independent of TFC and is affected by change in TVC

Marginal Cost (MC)

- $MC_n = TC_n - TC_{n-1} \dots \dots \dots (\text{eq.1})$
- $TC = TFC + TVC$
- $MC_n = (TFC_n + TVC_n) - (TFC_{n-1} + TVC_{n-1})$
- $= TFC_n + TVC_n - TFC_{n-1} - TVC_{n-1}$
- $= TFC_n - TFC_{n-1} + TVC_n - TVC_{n-1}$
 - So $MC_n = TVC_n - TVC_{n-1}$

Relation between AC and MC

Output	TC	AC	MC
0	12	—	—
1	18	18	6
2	22	11	4
3	27	9	5
4	36	9	9
5	47	9.40	11



Explanation

- When MC is less than AC - AC falls with the increase in output
- When MC is equal to AC - AC is constant
- When MC is greater than AC - AC starts rising

Long run Average Cost Curve

- Long run- a period of time during which the firm can vary all its inputs
- Short run- Some inputs are fixed and others are varied to increase the level of output