Average and Marginal Cost Curves

In the short run, there are fixed inputs that create fixed costs. There are also variable inputs that create variable costs.

Total cost of production in the short run is the sum of fixed costs and variable costs.

$TC = VC + FC$

Marginal cost of production is the additional cost of producing the next unit of output.

$MC = \Delta TC / \Delta Q$

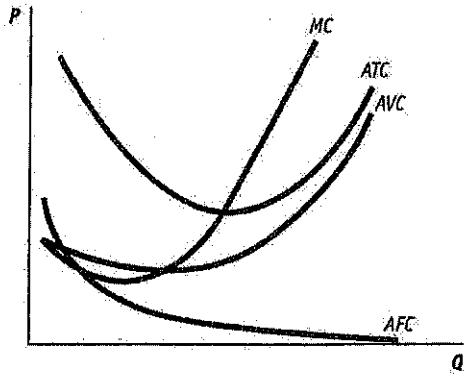
Marginal cost initially declines due to specialization but eventually diminishing returns to production cause marginal cost to increase.

Average, or per unit, costs are found by dividing total costs by the number of units produced.

$ATC = TC/Q$, $AVC = VC/Q$
$AFC = FC/Q$

AFC declines as more output is produced. *FC* is constant and we are dividing by more and more output.

The *ATC* and *AVC* curves have a U-shape.



The *AC* curves have a U-shape because of two effects:

The spreading effect. The larger the output, the greater the quantity over which fixed cost is spread, leading to lower average fixed cost.

The diminishing returns effect. The larger the output, the greater the variable input required to produce additional units, leading to higher average variable cost.

At low levels of output, the spreading effect is very powerful. As output rises, diminishing returns becomes the dominant effect.

The marginal cost curve intersects both *ATC* and *AVC*, two U-shaped curves, at their respective minimum points.

MC must cross *ATC* and *AVC* at their minimums because if the cost of the marginal (next) unit of output is below the average, it will pull the average down.

If the cost of the marginal (next) unit of output is above the average, it will pull the average up.

Initially, *ATC* and *AVC* are falling, so *MC* must be below them. When *ATC* and *AVC* increase, *MC* must be above them.