Answer on Question #44062 – Economics – Microeconomics

Explain the relationship between average total cost, average variable cost and marginal cost. Use suitable diagrams

In the short run (which is what this question is about), as output increases, the average total cost decreases where the marginal cost is below it. First you have to realise that increasing and decreasing output will affect average fixed costs and average variable costs.

Consider the following (explanation to these specific points is at the bottom of the page): Average fixed costs (AFC) decrease as output increases. A fall in average fixed costs leads to a fall in marginal costs.. Let's call the decrease in AFC, and therefore a decrease in marginal costs, "X" Average variable costs (AVC) increase as output increases. It's the one most associated with marginal cost. A rise in average variable costs leads to a rise in marginal costs. Let's call the increase in AVC, and therefore an increase in marginal costs, "Y".

It is possible to deduce that " When X is greater than Y, the decrease is greater than the increase in marginal costs". Because it's going down more than it's going up, marginal cost is going to get pulled down and fall. When X is less than Y, the decrease is smaller than the increase in marginal costs. Because it's going up more than it's going down, marginal cost is going to get pulled up and rise.

You've just read about how marginal costs go up and down, according to the average variable & fixed costs. Now to pull in average total costs, as if it wasn't annoying enough. The average total cost (ATC) of the firm is equal to the sum: Average fixed costs + average variable costs.

Average total cost essentially changes depending on marginal costs (MC). If marginal cost is below average total cost, the average is going to get pulled down. It's important to remember that MC can rise even if it's below the average total cost... but eventually it will rise above it. If marginal cost is above average total cost, the average is going to get pulled up. Marginal cost always equals the average total cost when the average is at its lowest. This is when the two curves cross over each other, and is linked to the law of diminishing marginal returns.
So, the change from a decreasing ATC to an increasing one is caused by a rising MC.

Because AVC is the thing that really pulls MC up significantly, leading to the change, it is the most important factor when considering these types of costs... because AFC eventually flatterns out and doesn't really make a difference as output is increasing more and more.

Why does average fixed cost & average variable cost change?

If output is increasing, since fixed costs in the short run stay the same, average fixed costs will be lowered (average fixed costs = fixed cost divided by quantity of output). The cost is being spread out over the quantity. If output is increasing, average variable costs necessarily increase, because variable costs are things like raw materials that you really need for production. If production output is at 0, then the average variable cost will be 0 too!