Financial Accounting
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Lecture – 115
8.9 Tutorial – Break Even Analysis

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Let us do a quick tutorial to understand the impact of each of the components of Break Even Analysis on the break even point. On the screen, you have various information points given, for example, increase in selling price. What we have to do is to answer how is this increase in selling price going to affect, going to impact the break even point in quantity.

All we have to do is write out the formula for break even point which is:

$Q_{BEP} = FC/(P-VC)$

Where, Q_{BEP} = Quantity of break even point

      FC= Fixed Cost

      P= Selling Price

      VC= Variable Cost

Now, if the selling price is increasing which means P goes up, then is the quantity of break even going to go up or going to go down or stay the same? These are three possible options. So, if P goes up, then the result of this equation is going to go up.

If the denominator goes up, that means, the outcome of this equation is going to go down, right. So, which means this is going to lead to reduction in the break even point, it reduces the break even point, the quantity at the break even point. Now, intuitively thinking, the selling price is going up. So, if you increase the P, now P minus VC is equal to contribution per unit which is going up. This contribution per unit is the contribution towards covering the fixed cost of the business. Now, if you have more contribution that means you can cover the fixed cost quickly, and therefore, the break even point is going to reduce or going to go down. You can achieve the break even point earlier is what I mean to say.

Next is a decrease in the fixed cost. So, fixed cost divided by P minus VC, and you have to figure out what happens to the quantity of the break even. If the fixed cost goes down, everything else remains the same. Well, now there is less fixed cost to be recovered, so you can recover the fixed cost earlier. I use an intuitive example. But if mathematically speaking you have a fixed cost which is going down, it means the numerator is going down denominator remains the same. So, the result of the equation is going to go down because the numerator is smaller now. Therefore, the break even point, the quantity of break even point is going to reduce, so the break even point comes down is another way of saying it. You can recover this fixed cost earlier.
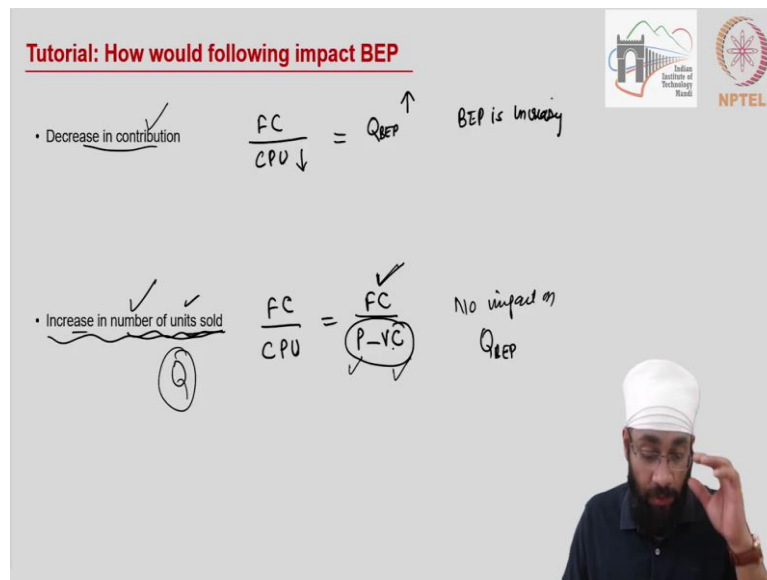
Increase in the variable cost. Now, fixed cost divided by P minus VC. If variable cost goes up, the contribution goes down. If contribution goes down, then this number as a whole comes down. When the denominator is smaller, the outcome of the equation is going to be higher. So, the quantity of break even point is going up. So, the break even point, the quantity that is required for breaking even is going to go up.

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Next step is decrease in contribution. Now, we are saying fixed cost divided by contribution per unit. If the contribution goes down, the contribution per unit goes down. If the denominator of this equation goes down, then the resulting number, which is the quantity of break even point, is going to go up. Therefore, the break even point is increasing as a result of decrease in the contribution.

And then you have an increase in the number of units sold. So, if the number of units that are being sold goes up, how is that affecting your break even point? So, you have a fixed cost divided by contribution per unit. Now, let me break this down to P minus VC.

Now, you will see that the number of units that are being sold is not mentioned in this formula. It actually depends upon what is the fixed cost, and what is price per unit, and the variable cost. It does not mention the number of units, Q, that is something that needs to be figured out. So, how many are you selling, how many are you able to sell, all of that is not affecting the break even point here. So, I will say it has no impact on break even point, on quantity of break even. Now, an increase in the number of units sold, of course, is going to increase profit that you will make, and also going to bring the break even point closer. It is helping you. Increasing the sales will help you achieve the break even point, but will it affect the break even point?

No, what is going to affect the break even point is the amount of fixed cost to be recovered, and the contribution available per unit to recover that fixed cost. So, I hope you see the difference between these two.
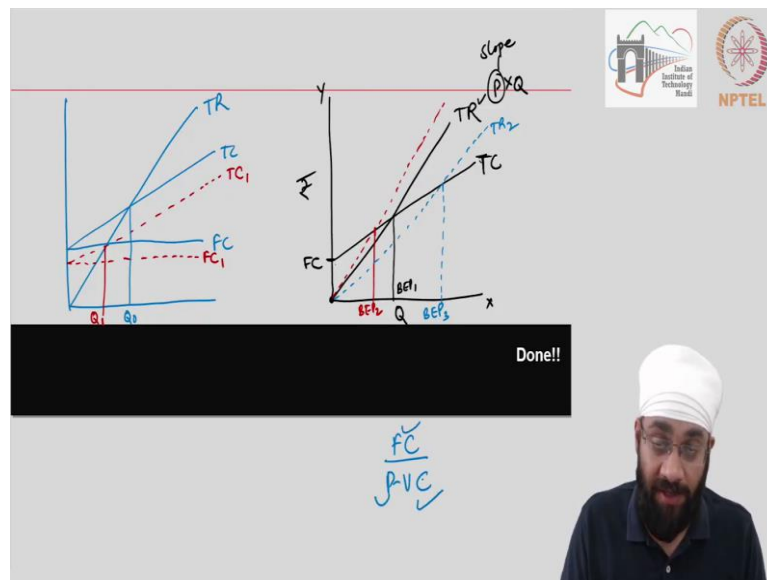
And if you want to graphically visualize this, let me just use this total cost and this total revenue. Total revenue starts at 0, because you will make no money if you sell nothing, and this is Q here on x-axis, and you have cost and revenue on the y-axis. And the total cost starts at a minimum level which is the fixed cost, as we know. Now, if I were to look at let us say one of these numbers, the first one was selling price P goes up. If P goes up, what is it affecting? If P goes up, then the total revenue will be affected because this is P times the Q.

Now, P really is the slope of the line right, the total revenue line. If P is going to go up, that means, the slope is going to become higher. So, like this. So, if slope is higher if steeper slope is what you get, then the break even point is going to come closer compared to the earlier break even point which was here. So, this was break even point 1. And now you have break even point after the P goes up, break even point 2. And likewise you can do the other scenario where you say if P goes down, the slope goes down. The slope goes down, it is going to look something like this. This is total revenue 2, new number. So, this is the quantity that you will have to do now. So, this is break even point 3. So, this is how you could graphically do it if you are more mathematically inclined to see things.

Decrease in fixed cost. If the fixed cost goes up, or goes down what happens then? So, let me draw it out again. So, right now you have a fixed cost, and this is the total cost, and this is the total revenue; fixed cost, total cost and total revenue. Now, the fixed cost is going down, let me show that change in a different colour. This is the new fixed cost, fixed cost 1. Due to

change in the fixed cost, this whole line of the earlier total cost is going to drop; the base is going to shift a little bit below. So, the new total cost is this. And therefore, this total revenue curve is now going to intersect with the total cost curve here, and this gives you the quantity of break even point which is quantity 1. And earlier this intersection was happening here this was the Q_0 let us say. So, if fixed cost comes down, the quantity of break even is also coming down. You need to sell less produce less in order to break even.

So, like this you could take the impact of different components of the equation. And the equation is fixed cost divided by P minus VC. Only these three items are going to affect the break even point, nothing else. That's it. I will see you in the next video.