

Marketing Management II
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Lecture No. W5-L4
Cost Estimation and Break-Even Analysis

Hello Friends, Welcome to our course marketing management part II. And I am Shashi Shekar Mishra and I'm jointly offering this course along with my senior colleague Professor Jayantha Chatterjee. We are discussing about our this pricing module and we are discussing about how to set prices. And before that we are looked in to the different aspects of this concepts or the module are one of the elements of the Marketing Mix which is pricing.

So, I will give you a quick recap of what we have discussed till now. We started discussing about the strategic role of the pricing and this Marketing Mix or in the entire marketing strategy. And then we started discussing about how we set the prices. So, we have looked in to the different steps of the pricing a thing then we have already discussed about when we start setting the price the first thing is that setting the objectives or understanding the objectives of the pricing and then you looking in the demand function.

And then we look in to the third thing is that we are discussing currently is that estimate the cost. And once we estimate the cost then we look in to this competitors pricing mix. Then we basically choose the pricing method and then finally we fix the price so these are basically the 6 steps in the pricing method or setting the prices. Now we have discussed about the different pricing objectives.

Then we have also looked into the last session estimating the demand we have their we have looked in to in depth about this demand function which is demand in the price pricing relationship. How the demand changes with the price and that is where we have also understood this concept of price elasticity of the demand that how the changes in the price will lead to the changes in the demand.

So, wherever the changes in the price lead to sharp change in the demand that is the proportion of the change in the price lead to a greater change in the demand we called that the demand is basically elastic or if you can recall the formula the value of E that elasticity is

greater than the 1. On the other side wherever your demand does not change with the price. The price change we call it an inelastic demand.

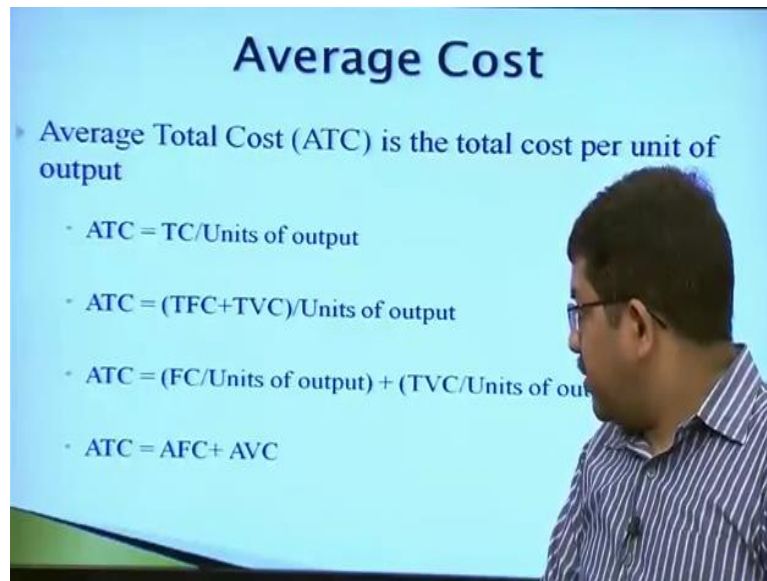
And we have also looked into the fact that equals to one presents the unitary elasticity which is like the change in the price will lead to an equal amount of change in the demand. So that the revenues will remain constant. If you increase the price demand will reduce by the similar proportion and overall revenue will remain constant in that case. So, with these we have started looking into the fact that marketers will be interested in the situation where customer will exhibit less price sensitivity towards their offerings.

So, the fact that which are the products or which are the situation where the customer will exhibit less price sensitivity. You can recall I have discussed about wherever this product is distinctive. The customer will exhibit less price sensitivity. Because they will have a very clear and distinctive likeable image of the product. And that is why this price sensitivity is less or the other cases are like you don't have a substitute of that product. In that case also you will find out the price sensitivity is less or the cases where a product is seen as a basically a product of a luxury or social status.

There also customers will exhibit less price sensitivity, because the product is attached with esteem and quality is also linked with the price and the more the price better the social status or the esteem that customer derives from that product. In those cases, you will see that the price sensitivity is less, we also discussed about some of the cases like in the purchase situation like where the consumer or the person who is consuming that product and services.

The third party is basically the agency which provides the payment for that offering in those cases also the price sensitivity will be less. Then after this determining the demand the next thing is that, we started taking about was the cost.

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So, the estimating the cost now estimating the cost is something which is very important in the pricing perspective in the sense like if you cannot accurately access the demand in a cost you pricing is more likely not to be correct in the sense your prices will not reflect the amount of cost. That is that you are incurring either you pricing will be very high or it will very less compared to your cost and your margins will be very thin.

And in those cases what will happen is that ultimately it is going to affect the revenues and profit of that organization. So, the accurate measurement of the cost is very important you will also understand that very accurate or very objective measure of the costs are also very difficult to together. So, you on the one side, it is very important and you will try to maximize the accuracy of your costing on the other side you will also understand that costing per unit basis is a difficult task for the marketeer or whomsoever in a pricing department is doing that job.

So, with that we have started looking into this fact that cost includes the fixed cost and the variable cost fixed cost is something which does not change with the unit or the volume of the production. It remains constant the cost like the cost the wages or the cost of the fixed cost of the plant in the machinery. They will remain constant with the volume of the production. So fixed cost is constant to a particular activity level and that is what in the last class I have shown that it indicates a kind of list of function.

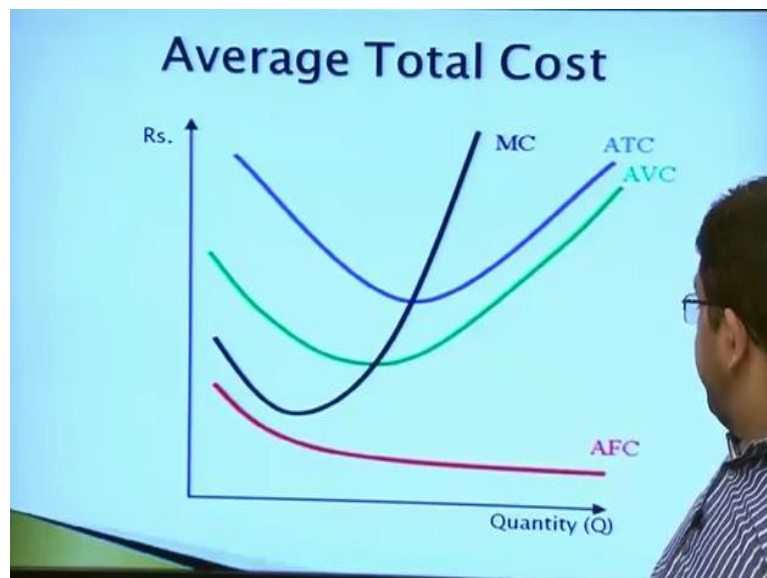
And then, we have also talked about this variable cost like raw material. The cost of the processing like the cost of the electricity or the cost of the water in atypical manufacturing

sector. So, these are the things which goes with every unit. So more the number of units you produce the more the unit cost you incurred those things. So those are the variable cost. Now we have also seen that unit fixed cost goes down very sharply as the number of the units that we produce increases.

Because that fixed cost get divided with more the number of units that we produce. So, we have started looking into the last class where we have end the ended was the average total cost. Now Average Total Cost is basically the total cost divided by the units of the output. And here you will see that in this equation I have bifurcated this total cost in this Total Fixed Cost + Total Variable Cost.

And you will see that again, the equation is solved out and you will get the Average Total Cost is the Average Fixed Cost + Average Variable Cost. Now you will see that the more the number of units you produced your average fixed cost will go down. So that will result in a lower total cost on the other side variable cost will remain same.

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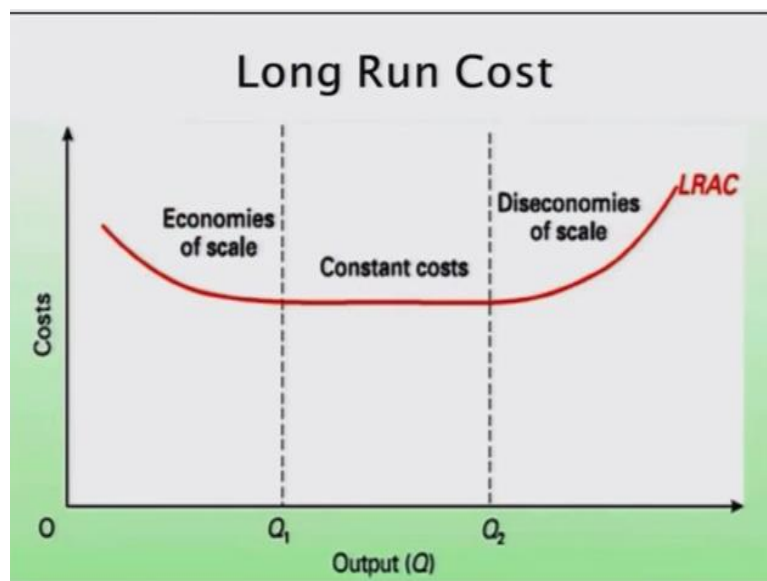


So, here this is the graphical representation of what happens with another of different types of costs that we incurred in the production of a product. So, you will see that on the Y-axis you have the cost or the rupees as I have indicated and X-axis you have the quantity. So as your quantity increases you will see that in the case of Fixed Cost it goes down to the initial decline in the fixed cost is sharp.

But after a particular point that inflection point you will see that the cost does not change that sharply. On the other side, your total variable cost is like is basically inverted U-shape. You will see that the average total cost difference where the difference between the average total cost and the average variable cost is equivalent to this average fixed cost.

So, this difference goes down as two approaches on the higher side of the quantity fixed cost difference goes down average fixed cost difference goes down what happens to cost in the long run is also exhibited here. So, you will see that there are three labels of output where the cost behavior changes.

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So, the first part of this graph is lies economies of scale. I am not going into much of the depth of some of these concept. Because you can refer to a good economics book economic subject book there you can learn more about them. But you will understand for our purpose. We just need a little bit about it. You will understand the first part of this Long Run Cost curve is Economies of Scale and the second part is the Constant Cost and the third part is basically Diseconomies of Scale.

So, in the first part Economies of Scale is basically the part where your fixed cost goes down very sharply as the more the number of unit that you produce the your fixed cost, the unit fixed cost goes down and that is where the economies of the scale is achieved. Then you have a level of constant cost and after that you have Diseconomies of the Scale, it is said that once you come in this region the cost of producing the large number of output.

And managing their different plants are managing the different operation. So, the cost of the coordination also increases in this proportionate proper level and that will basically result in the increase in the unit cost. In this way, another important aspect that we need to understand from a marketeers point of view is that cost and experience curve.

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So, this is something which is very critical that as a two player if you are someone who is staying in the market for a longer time or if your production labels on the higher side. So, you will understand that you will be in a more advantageous situation. Because as more the number of the unit that you produce in the longer the time you have. You are in this process of producing something you will start learning your learning curve will be very high. And in that case what will happen is that your unit cost will come down because of this learning curve.

Because you will understand better methods of the production you will understand the better ways of managing your inventory you will understand better way of basically logistics and the distribution you will understand in fact the better way of promoting the product. So, in that case what will happen is that your unit cost of this production will go down. Because of this experience and that is where it is said that in marketing that a new player should try to avoid to get into a this price war with the existing players.

Because an existing player will have more experience in terms of producing a particular product. So, they will be higher on the learning curve and their cost will be less. In fact, if you get in to the price war with a big player which already which is already there in that

particular market for a longer time you might be in a dangerous situation. Because they will have a lower unit cost compared to you.

Because of their learning curve and beard, because of the number of units being produced and in that case your margins will be less and your ability to sustain in the market will be a less or sometimes it will happen that such kind of place will prompt you to get into the price war and if you get in to the price war ultimately you will lose in the market.

One important thing from this point of this experience curve is that a customer from a customer's point of view is that they will eventually see that decline in the price for many product. Because the cost of the production of the product goes down as basically the more number of units are produced.

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Break-even Analysis

- ▶ At break-even (BE), revenue are equal to cost and thus Profit (Π) = 0

Profit (Π) = [(price-variable cost) x demand] - (fixed cost)

If we just broke even, profits would be zero, at a level of demand, that is called as BE

$0 = [(price-variable cost) \times BE] - (fixed cost)$
 $BE = Fixed Cost / (price-variable cost)$
 $BE = Fixed Cost / Contribution Margin$

So, another important concept that I'm going to talk about today is this Break-even Analysis. So Break-even Analysis is performed in most of the cases in most of this pricing design of the pricing is, because we need to understand that how many units we need to sell in the market to breakeven are to basically take out all the costs that we are incurring in the production or in the selling of the particular product.

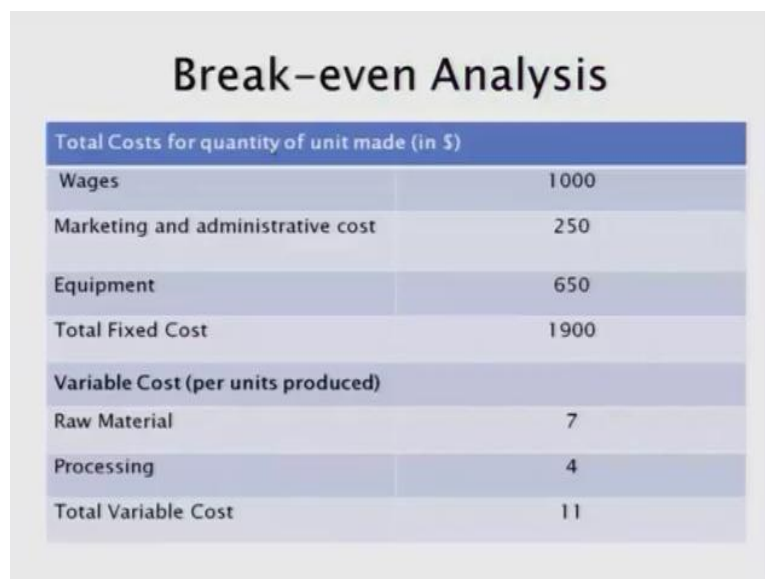
So breakeven is a are the is the point in terms of the number of units sold where your revenues are equal to cost and thus profit is equal to zero. So here in this equation I have shown that profit is equals to price many minus variable cost multiplied by Demand-Fixed Cost. Now you will see that as that as the breakeven as a point where you're your profit is

equals to 0 and that is what I have solved this equation here that if I put a price if this process equals to 0.

In this profit equation, you will get this demand is equivalent to breakeven point and your breakeven point is fixed costs divided by Price-Variable cost. This Price-Variable Cost, we also say the contribution margin. So, you will understand that the breakeven is fixed cost divided by contribution margin. You will see that now it is important to understand the utility of this equations in this sense that whatever our fixed cost is high you will that in those industries lot of players will try to increase your contribution margin.

Because this Price-Variable Cost will try to increase. So that they can recover their fixed cost as early as possible.

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Total Costs for quantity of unit made (in \$)	
Wages	1000
Marketing and administrative cost	250
Equipment	650
Total Fixed Cost	1900
Variable Cost (per units produced)	
Raw Material	7
Processing	4
Total Variable Cost	11

So, from that perspective, it is very important I have made a an example here for you to understand then I will come back to graph again that this break-even analysis I have tried to made for one is small unit which is a into manufacturing of something. Now you will see that components of the fixed cost that we have talks in and talked in the previous two session that Wages are equivalent to 1000 dollars Marketing and Administrative cost is to 50 dollars.

Then Equipment cost is the Installation cost is like 650 dollars. So, the total fixed cost in this case is 1900 dollars. On the other side when we talk about the variable cost per unit produce then the raw material costs around 77 dollars. The processing cost is 4 dollars, So the Total Variable Cost is sum of the Raw Material + Processing Cost for the sake of simplicity. I have

just looked in to the few components of the cost inside the Fixed Cost as well as Variable Cost as Fixed Cost per unit is 11 dollars and the Total Fixed Cost is 1900 dollars.

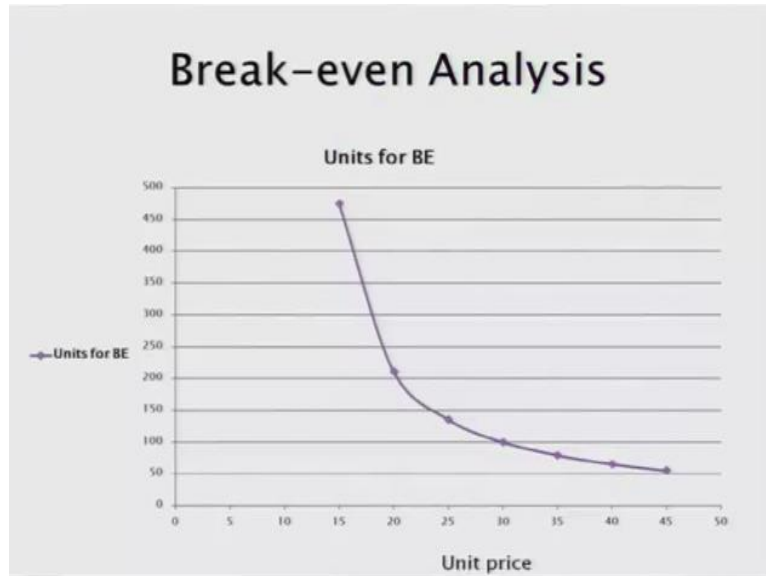
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Break-even for different Price Point		N
BE15	$1900/(15-11)$	475
BE20	$1900/(20-11)$	211
BE25	$1900/(25-11)$	136
BE30	$1900/(30-11)$	100
BE35	$1900/(35-11)$	79
BE40	$1900/(40-11)$	66
BE45	$1900/(45-11)$	56

Now you will see to break-even and so the 11 dollars was the variable cost. Now accordingly understanding that I my cost has to be at least 11 dollars to at least get some margins in some contribution margin to recover the fixed cost. I have calculated the break-even point for different price points. So supposedly if I price this product at 15 dollars per unit. Now what happens is I need to have 475 units to break-even in the case of 28dollars I will need basically the two 211 unit.

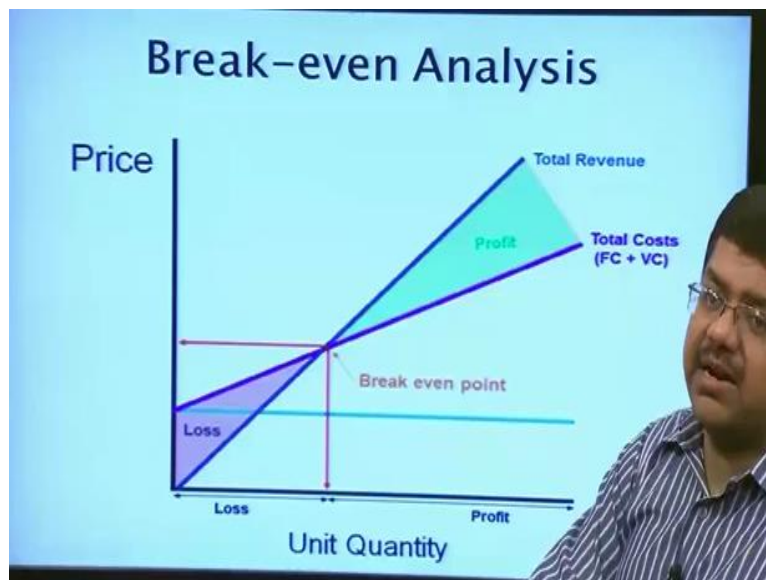
So, you see that the sharp decline then basically if I go from 20 to 25 again 5dollars that the decrease in this number of unit is not that sharp like what it was from 15 to 20.

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Or you can see probably the better way in this to understand this is this through this graph you will see that initially you will see that there is a sharp decline. But after a particular point you don't get basically the similar level of advantage of in terms of the number of units that you have to produce. So, with this basically I go back here and you will see that the more that year he contribution margin you have the lesser the number of units that you have to sell or the produce to break-even.

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Now you will see that in this graph I have made and shown that until and unless you are not reaching to this break-even point you will be in a loss region. On the other side, once you cross this break-even point your profits will increase. And your profile will increase as your total revenue are the more the number units the you are selling after your break-even point

you will make more your contribution margin will directly contribute to the total profit. So, your profits will increase from their point onwards.

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So, the last point that I'm going to talk about in Today's session is that, we have talked about the pricing objective, we have talked about the determining the demand, and we also looked into a much more detail about estimating the cost of what are the different types of costs, what are their behaviors. So, all those things we looked into then basically one important thing that as a market here you need to understand in your designing of pricing program is that what will be the competitive reaction to your changes in the price.

So, wherever which ever point you are or whatever point of for your introduction in terms of the prices what will be the competitive reaction. And as I have already said in this beginning of this session and some of the previous session also that you will see that within the same industry sectors. The competitors will not price in a similar way. Everybody will not try to match you in terms of the price or their the pricing behavior will not be or their pricing strategies will not be same.

This is because mainly because an a competitor will be pricing according to his pricing objective. He will look into the various a large number of variables that will contribute to his pricing. So, he will look into his production facility, so he will look into his cost, he will look into his pricing objective, he will also look into the kind of brand that they are offering. So, within the same industry if two competitors are there and they are offering similar kind of

product. But one has a stronger brand compared to the other one, so in that case the one who holds the stronger brand will probably not like to get into the price war.

And they will probably come out with a different kind of pricing scheme. So, these are the important thing one needs to understand in terms of the competitive strategy or competitive pricing. And one of the examples I have tried to shown here is that basically a very simplified scenario where there are only two players in the market and in this kind of market it is your firm and your competitor is there. Now the current situation in this market is you and your competitor both have this 50-50 percent market share.

That both are selling 200 units and your current prices are like rupees 100 per unit for that particular product. So, now what happens is, if you are standing in this situation and you are thinking about different scenario. So, these are the possibility which might exists what will happen is that you can go upward or you can go on this backside of this horizontal 2 by 2 matrix. You will see that if you increase if you decrease the price that is the situation you cut the prices by 20 percent, you come to a price point of 80 rupees you may see that you are more attractive to your competitors offering.

In terms of the price if your product is not very inferior to your competitor or more or less it is same then you will see that lot of competitors. The customers might switch to you, so you are necessary where that you will be selling out of 400, 300 and 50 units while your competitors might be selling 50 units or for the say for that matter if we your competitor changes cuts the price basically this is an alarming situations you will see that here in this case the competitors will start selling 350 units and you will be in this situation where you will be selling 50 units.

Now what happens is whichever the player changes the price whichever player cuts the price. The other one will also think of changing the price point also. Now what happens if your competitor will also cut the price and you also cut the price and both of you reaches to rupees 80 and both of the in that case the total market is if the total market demand does not change with the changes or decrease in the price. You will see that both of you are in a worse situation.

So together you will both of you will be selling the similar number of units but your margins will go down drastically. So, assess assessing this customers reaction towards your price change is an important consideration in designing this pricing scheme of your organization so with this point, I will stop in this session and when we will meet in the next session and the last two session we will talk about setting choosing the pricing method.

And some of the other issues are what should be the exact price point and then we will also look in to the some kind of innovation in the pricing methods are the different time kinds of pricing which are existing in today's market. We will talk about that and we will conclude this pricing model through the last two sessions which are remaining in this model. Thank You very much!