

## Quadrant II - Transcript

Welcome to module #13, break-even chart and calculation of break-even quantity and break-even sales of Unit 2 profit analysis. I, Ms. Lizette D'Costa, Assistant Professor in Economics of VVM's Shree Damodar College of Commerce & Economics, Margao, Goa, will take you through this module.

In this model, we will be looking at break-even chart, calculation of break-even quantity and calculation of break-even sales. On completion of this module, you will be able to understand the meaning and uses of a break-even chart, you will be able to analyze and calculate break-even point in terms of physical units as well as analyze and calculate break-even point in terms of sales value.

So, let's look at the first subtopic that is break-even chart.

Now you have already studied what is break-even point break. Break-even point is basically the point where the total cost equates total revenue. That means we are earning, that is the firm is earning enough revenue to cover up the costs. So, TR is equal to TC.

We will be looking here diagrammatically how it is displayed. So, this break-even chart basically helps the management in visualizing profit or loss implications at different levels of sales. Diagrammatically we can see cost and revenue in rupees denoted on the Y axis and units of output denoted on the X axis. Our main curves over here are the TR curve and the TC curve. As you can see, the TC curve is combined of two costs. That is, total cost is combined of two costs, the variable cost as well as the fixed cost. Fixed cost being constant and variable cost. Both combined makes up the total cost.

Now over here we see that the point of intersection, that is where TR and TC equates and gives us the break-even BEP point, the black dot over here will symbolize the BEP point.

What does it indicate? It indicates that our TR is equal to our TC, so break-even point is nothing but a point at which the total cost is equal to the total revenue. Anything to the left of the break-even point would symbolize the loss zone. Because here, we can see that our total costs are much more than our total revenue and anything to the right of the break-even point would symbolize the profit zone, because what do we see? That our total revenue is much more than our total cost? And, another point to be noted is the margin of safety. The margin of safety is basically the difference between the actual output and that suggested by the break-even point. That means, how much you are actually making a little bit more that you're safe enough, beyond which I mean below, which you will undergo losses.

The different uses of the break-even chart. It is used for determining the break-even production volume. It is used for profit, appropriation, for given level of output for choice of optimum level of output as well as for determining the impact of rate of change in sales on costs and profits.

We move on next to check out the determination and calculation of break-even point. Now break-even point can be determined or calculated from 2 angles or two perspectives. For example, if you go to the market and you want to buy some tomatoes, you can either say that you want one kg of tomatoes or you can say that I want ₹50 worth tomatoes. So, if you say that you want one kg of tomatoes, you are looking at from the physical unit perspective and when you're looking, when you were asking for ₹50 worth tomatoes, then you are looking at the sales value. So, you can look in two angles to calculate break-even point from 2 angles, that is, physical units and sales value.

Looking at the first one that is the, break-even point in terms of physical unit. This method is very convenient for single platform. Maybe a sale joint that is producing only Donuts? So, here this is a firm

that is producing only one product. Here the break-even volume is equal to the number of units of product that must be sold to earn enough revenue just to cover all the expenses. That is our fixed and our variable expenses. So, you're earning enough revenue just to cover up your costs. So, break-even point is reached when sufficient number of units are sold, that the total contribution margin of units sold is equal to the fixed cost.

What is contribution margin? We calculate contribution margin by using the formula selling price minus variable cost per units. And this is very important because to find out break-even point we need to first know what is contribution margin. So here, let us take an example. Suppose fixed cost of a firm is rupees 20,000 per year and variable costs are rupees 4 per unit and selling price is rupees 8 per unit. So, break-even point will be calculated as fixed cost upon contribution margin per unit. So, as we have seen in a previous slide, contribution margin is nothing but your selling price minus variable costs. So, BEP is equal to 20,000 upon 8 minus 4. That gives us 5000 units. Hence, the firms will not be making any profit or loss at sales volume of 5000 unit. So here what do we see? We are looking at it from the volume wise. We know that if a firm produces 5000 units, it would not be making losses nor profits. Anything below 5000 units he would be incurring losses anything above 5000 units, he will be incurring or he would be attaining profits.

From the other angle, we see or we can calculate break-even point in terms of sales value. This method is very convenient for multi-product firms. Those who are not in a position to measure break-even point in terms of any common product. Say for e.g., Godrej Company. They produce a lot of products ranging from cooking range, to fridges, to washing machines, to hair dyes, to locks, to various other items. So, for such kind of firms, it's difficult to calculate in terms of unit of physical volume. So, here break-even point is calculated in terms of sales value. We determine break-even point in terms of rupee sales. Here break-even point is where the contribution margin again is equal to fixed costs as told in the previous slide. Contribution margin over here is slightly different from the previous one, calculated. There we had seen that contribution margin equates sales minus variable costs, but here we look at the ratio to sales also. So, your contribution margin will be sales minus variable costs upon sales. Taking an e.g., if sales are rupees 20,000 and variable costs are rupees 12,000 and fixed cost, say rupees 6000. Contribution margin has to be calculated first, to calculate break-even point. So, like I told you in my previous slide, how do we calculate contribution margin? Sales minus variable costs upon sales. So, 20,000 minus 12,000 upon 20,000 that gives us 0.4. Then we move on to calculate break-even point. Break-even point is nothing but our fixed costs upon contribution margin per unit. So, we have already calculated what is contribution margin per unit. That is 0.4. So, substituting the values 6000 upon 0.4, we get as rupees 15,000. Hence interpreting it, we would say that the firm could not make any profit or loss at sales value of ₹15000. That means when a firm sells goods worth ₹15000, it has covered up its cost. But it has not started making profits, it is just reach break-even any amount or any sales less than 15,000. The firm would be incurring losses and any sales. More than 15,000, then the firm would know that it has attained profits.

For references, I have referred to Managerial Economics by P.L. Mehta, I have referred to Managerial Economics by Varshney and Maheshwari and also some online resources like [corporatefinanceinstitute.com](http://corporatefinanceinstitute.com) and [freshbooks.com](http://freshbooks.com).

Thank you.