Management Accounting
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Lecture- 46
Tools of Marginal Costing

Welcome students, so in the previous class we are talking about the P/V ratio, Profit to Volume ratio. I discussed with you the different formulas or the ways, how we can calculate the P/V ratio. But first now let us understand, what is the meaning of P/V ratio? P/V ratio is basically the profit to volume ratio, profit to volume ratio. See, it depends upon the volume of production to a larger extend.

If we go for the higher volume, increased volume of production, cost of production per unit comes down and if it is a lesser volume of the production, cost of the production per unit goes up, right. So, if the profit to volume potential that it is a relationship between the profit to volume, that is it possible to increase the profit if you increase the volume of the production? Or if it is not possible then we will take other decisions.

If it is possible to increase the volume by increasing the production for example, we are manufacturing three products A, B and C and you calculate the P/V ratio of the three products and one out of the three gives you the highest P/V ratio, right. For example, let us take 33 percent, it means the profit to volume relationship is very high in this case and the profit potential is up to 33 percent if you increase the volume of the production, why did it happens?

I told you many times in the past also that we have the two cost which we subtract from the selling price, one is the variable cost, second is the fixed cost, right variable cost per unit has the direct relationship with the total cost or maybe the, say whatever the total variable cost is or the cost of production is. If the production is goes up, variable cost also increases, per unit variable cost also increases.

So, it means total cost also increases and per unit variable cost also increases because if you are manufacturing 10 units requirement of material will be as per the 10 units, if you are manufacturing thousand units, requirement of material will be as per the thousand units. So, if you increase the production your material requirement is proportionately increasing but in case of the fixed cost per unit cost (it is a) it is a inverse relationship with the volume.

So, what happens that when you increase the production or the volume of the production? Your variable cost goes means consistently goes up consistently with the (total cost) total production but the fixed cost start behaving inversely, as the volume increases per unit fixed cost comes down, per unit fixed cost come down and the total cost is that when you increase the volume of the production only one component goes up proportionately but the other component starts decreasing and total cost start coming down.

When the total cost is start coming down up to a certain volume of production your total cost is given to us when you increase this and a point where you all fixed cost is already met after that if you go for the production only you are meeting the variable cost whereas you are getting the total selling price, so in that case what is happening? Selling price minus variable cost, because fixed cost has already been met.

So, this ratio helps us to find out the relationship between the profit to volume that any product if you strengthen that product or sales of that product through advertising or through another means then whether the profitability is possible to increase or not and that depends upon the profit to volume ratio that by means it indicates, this ratio indicates that if you increase the volume of the production is there any possibility of increasing the profit or not, right.

So, we are calculating this P/V ratio, in this three methods contribution by sales, other two methods are only the definitions of the contribution which I showed you in, in this slide. So, C is can be calculated as fixed expenses plus profit, C can be calculated as sales minus variable cost and the denominator is common that is sales and if either of these three things are not given to us then you can use the fourth formula, if you are given the information about the contribution or profit for the two periods and the information about the sales for the two periods.

Now, a question interesting question which comes up here is, that how we can improve the P/V ratio of any product of any company? Right, how we can improve the P/V ratio, profit to volume ratio of a company if they are manufacturing a single product or of a product if the company is manufacturing the multiple products. They are the different face, first simple method is, you increase the sailing price, if you are in the competitive situation in the market, we can increase the selling price and your cost remaining the same because your variable cost will increase, fixed cost will start behaving inversely, so your profit will start going up.

So, as the moment your volume goes up your profit goes up but if your means the selling a certain amount of the production in the market, volume of the production in the market at a increased price, so what will happen? Your variable and the fixed cost remaining same, selling price is increased, so profit to volume ratio will improve. This is the one way of improving this ratio.

Second thing is, by reducing the cost that is the variable cost because you cannot change the fixed cost, fixed cost has happened, there is a sunk cost, you cannot change, if you want to increase the profit to volume potential of a product you can keep a check on the variable cost and there you have to apply a check on the man, material and machine, everything if the cost we are able to control, that is why we go for the standard costing, so that we are able to find out what is the expected cost of material, what is the expected cost of labour, what is the expected cost of other overheads.

So, one component of the cost which is variable it can it will go up proportionally up but it can be controlled also for example we are buying the raw material of our production, which we are using for the finish production is from the local market and it is available at the higher prices which is expensive in the local markets, so why not too? Buy it from your place where it is easily available at the lesser price and buy in the bulk.

Similarly, when you have the labour, you are hiring the labor locally available labor that may be sometime expensive labor but if you bring the labor from some other states or some other parts of the country, there may be ready to come to you to work on the long term durations at a lesser price. So, we can control the variable cost and by efficiently using the man material and machines you can control the variable cost.

Third option can be by shifting from the less profitable products through the more profitable products and moving towards the products showing the higher P/V ratios, moving towards the products showing the higher P/V ratios. So, we have to evaluate our all total product line should keep on evaluating, try to find out the profit potential of those different products and the products which are having the potential of giving you the higher amount of incomes or the profit to volumes, we should go for those.

So, either by selling increasing the selling price or by reducing the variable cost or by shifting from the less profitable products to the more profitable products, you can improve the P/V ratio but calculating this ratio you know the profit potential which is there into the different

products and the product which has the higher P/V ratio that should be strengthen, supported and maximum production of that product should be done and the product which has a lesser P/V ratio that should be done after that total capacity utilization with regard to that product which has the highest P/V ratio is fully exhausted.

Now, we will learn about certain other concepts and means these concepts are with regard to the P/V ratio only and these concepts are uses of P/V ratio.

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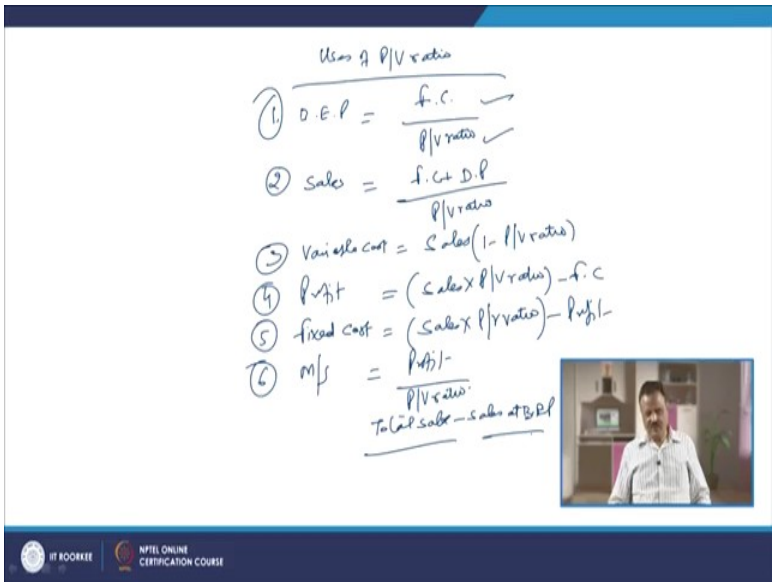

You can call it as uses of P/V ratio, where the P/V ratio is helpful? It is only that you can calculate the simple P/V ratio and that you get to know the profit potential of the firm. P/V ratio is very helpful in taking many, many important decisions. For example, P/V ratio is very, very helpful in calculating the breakeven point, I will discuss with you the concept of the breakeven point later, after this but just in nutshell I will tell you breakeven point is a point for the firms where their total cost of production is equal to the total sales means basically, it is a point of no profit no loss, breakeven point.

Now, how to calculate the breakeven point, what are the different ways and parameters, how to show it graphically all these things I will discuss with you in the later part but the breakeven points simply if you want to calculate the breakeven point of the firm and the information require to calculate the breakeven point is not available and if you can calculate the P/V ratio, so you can make use of the P/V ratio for calculating the breakeven point and the formula is fixed cost divided by the P/V ratio, P/V ratio, fixed cost divided by the P/V ratio.

If you have these two information, if you have the information with regard to the fixed cost and the P/V ratio here we have already calculated, you can easily calculate the breakeven point. Then second application or the use of the P/V ratio is value of sales to earn a desire amount of the profit, how much value of the sales we have to attain to earn a desired amount of the profit? P/V ratio can help you there also means every times you do not need to calculate each and everything from scratch, you calculate the P/V ratio first and use this P/V ratio for taking the different management decisions and for earning a desired amount of profit.

How much sales we have to make or we require to make that question can also be answered with the help of the P/V ratio, so that amount of the sales can be calculated, that amount of the sales can be calculated with the help of the P/V ratio, so this is the amount of sales to earn a desired amount of the profit will be this will be fixed cost plus desired profit D P and again divided by the P/V ratio, again divided by the P/V ratio.

Because if you are only recovering the fixed cost or dividing the fixed cost with the P/V ratio, you are earn the profit of as situation of the no profit no loss. But, if you want to earn a desired amount of the profit also, so we have to move to the up to the third step. First, we will calculate the contribution and then from their contribution we subtract the fixed cost and then fixed cost after subtracting the fixed cost from the contribution we will get the desired amount of the profit.

So, we have to recover two things, we have to recover the fixed cost also, we have to earn the desired profit also and these two can be divided by the P/V ratio simply, so if you are able to do this you can make use of the P/V ratio to know the desired amount of the profit, desired amount of the sales to earn the desired amount of the profit. There is the third, number three here is variable cost.

We can easily calculate the variable cost with the help of the P/V ratio. Variable cost, we can calculate with the help of the P/V ratio and the formula here it is, the formula here it is, that is the sales multiply 1 minus P/V ratio, sales multiply 1 minus P/V ratio, you can make use of this formula for calculating the variable cost. Sometime it may be possible that you are not directly given the variable cost in the problem but you can calculate the, you are given the information about the contribution, you are given the information about the sales, but you are not given the information about the variable cost.

If you want to calculate the variable cost with the help of this formula you can calculate the variable cost also where the P/V ratio is very, very helpful. Fourth thing is that is the profit, for calculating the profit the P/V ratio is very, very helpful. So, how we can use this? This is by way of sales multiply P/V ratio, sales into P/V ratio minus fixed cost, you can calculate the profit directly with the help of this formula or by the help of this model.

And then next thing is, next application is number five application is, you can calculate the fixed cost also, you can calculate the fixed cost also with the help of this P/V ratio. So, calculation of the fixed cost and fixed cost can be calculated, how? That is the sales multiply P/V ratio, sales multiply P/V ratio minus profit. So, it is a interchange interchanging of the different components involved in the equation number four.

If you are, means subtracting the from this sales minus P/V ratio, if you are subtracting the fixed cost you are getting the profit and if you are subtracting the profit from this sales multiply P/V ratio then you are getting the fixed cost, so it can be easily calculated and last thing which can be calculated with the help of the P/V ratio is the margin of safety which is called as M S, margin of safety and margin of safety can be calculated with the help of this formula which is profit divided by P/V ratio.

So, P/V ratio can be used as a shortcut measure for calculating certain values if the detailed information in some situation is not given to us then if you are able to calculate the P/V ratio then we can make use of this P/V ratio for different things, different situations or at the different places, right. So, it can be for example, we can calculate the breakeven point directly with the help of P/V ratio, we can find out the sales to earn a desired amount of the profit, we can calculate the variable cost, we can calculate the profit, we can calculate the fixed cost and we can calculate the margin of safety.

What is the margin of safety now? Margin of safety in the simple terms is decided or defined as margin of safety in the simple terms is defined as total sales minus sales at breakeven point, total sales means? Total sales minus sales at B.E.P., total sales minus sales at breakeven point is known as the margin of safety. Because up till, breakeven point, we are not earning any profits after the breakeven point must we have arrived at the breakeven point then we can easily find out how to calculate means what is the margin of safety is available.

Because, for example, we are going for manufacturing, we have the potential of manufacturing and selling 1,00,000 units of a product in the market but we know it that up to

50,000 units of sales we will be at the breakeven point at the state of no profit or not loss and after that, from the 50,000 means above 50,000 up to 1,00,000 units should be sell in the market, that amount will give us the profit.

So, it means in this case margin of safety starts after attaining the fifty percent of the sales in the market, after selling the first 50,000 units in the market you are at the situation of B.E.P., after that you will start earning the profits. So, if that gap is larger for example, now the two companies are there, total sales they can make is of the 1,00,000 units, once breakeven point comes after 30,000 units and second breakeven point comes after 50,000 units, so it means you can understand margin of safety is higher for the company A as compare to the company B.

It can be possible for the different products also, a company which is manufacturing different products they can calculate the margin of safety for the those different products for example, product X we are manufacturing and up to 30,000 units of that product you are reaching at the breakeven point whereas in case of the product buy you have to sale 50,000 units and then the breakeven point will be attained.

So, it means you can know the margin of safety with regard to the product one that is X is much higher as compare to the product number two. So, it means margin of safety is very, very useful and I will discuss with you the concept of margin of safety later also and I will show you that area in the breakeven point chart also but simply I wanted to tell you that with the help of P/V ratio here, with the help of P/V ratio how we can calculate the margin of safety, right.

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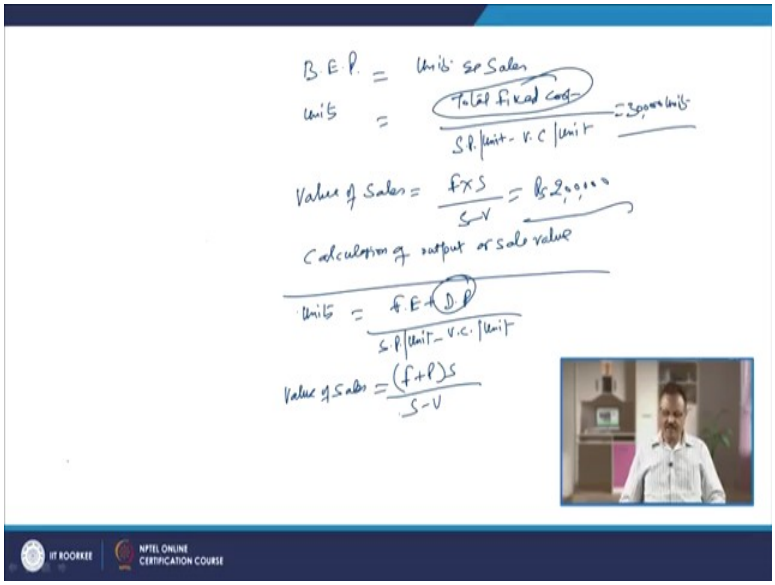

Now, we will move to the next part which is very, very important and interesting part to learn in the margin of costing is the concept of breakeven point, B.E.P. Breakeven point is as I told you just now, is a point of no profit or no loss, breakeven point both are evenly broken, both sides your sales and cost of the sales are evenly broken that is known as the breakeven point. In this breakeven point, now this breakeven point can be calculated in two ways, in terms of the units, breakeven point in terms of units and in terms of sales.

Now, what do we mean by this? Units means, how many units are required to be produced and sold in the market to arrive at the breakeven point by a firm. Other way around, in the value terms you can say here I am talking about the units, so it means you can say 30,000 units minimum sales are required to reach at the breakeven point, we are not talking about the sales value here, we are only talking about the number of units by keeping the cost and selling price in our mind, in the back of the mind.

We are focusing upon the number of units or other way around you can call it as how much amount of the total sales we have to attain to arrive at the breakeven point. So, here we are talking about the value of sales and in the first case we are talking about the number of units. So, both ways the breakeven point can be calculated for example, you asked as a being the CCF of the company or may be the see the cost Accountant of the company maybe asked a question by your management, that if you introduce this product in the market, of you introduce this product in the market at what number of units we will reach at the breakeven point.

So, it means you have to answer that question by keeping into consideration all those factors, what is the selling price, what is our variable cost, what is the contribution, what is the fixed cost and then what is the state of that B.E.P. in terms of the units or it can be asked as what value of the sales is required to be attained. So, then we are not talking about the units, we are keeping the units in mind multiplying it by the selling price taking into account the total cost and subtracting from those total sales value, the total cost variable and fixed, we will be arriving at the amount of the sales value to arrive at the breakeven point.

Now, how to calculate the breakeven point, if it has to be calculated in terms of units and that can be calculated as breakeven point in terms of units? It can be total fixed cost, total fixed cost to be divided by selling price per unit minus variable cost per unit, selling price per unit minus variable cost per unit means your total fixed cost is how much and the difference between the selling price per unit minus variable cost per unit is how much?

If you divide the total fixed cost by the difference of the selling price per unit minus the variable cost per unit the answer here will come up something is say for example, let comes up here is as the 30,000, so it means you can say that to arrive at the breakeven point for us we have to manufacture and sale 30,000 units. In terms of value now, how to calculate the breakeven point in terms of value, value of Sales?

We will have to now the go for a different method and this is the F multiply S divided by S minus V, F multiply S divided by the S minus V, fixed cost multiplied by the sales, fixed cost multiplied by the sales divided by the difference between the sales and the variable cost, here we are taking the total fixed cost, here we are taking the total sales value, total number of units multiplied by the selling price per unit that becomes the sales and in the denominator sales minus variable cost.

So, total number of the units and the variable cost per unit if you take it in the absolute value, you will be getting some figure for example, that figure comes out here is say you take any values and this figure comes out here is say rupees 2,00,000, right 2,00,000 it means by making the sales or attaining the sales levels of 2,00,000 rupees, we will be arriving at the breakeven point.

So, two different formulas are given to us here, that is the breakeven point in terms of units, breakeven point in terms of the values of sales, if you want to calculate in value of in terms of units, we have to divide the total fixed cost by the selling price per unit minus the variable

cost per unit. If you want to calculate in terms of the value then what you have to do here is? Then you have to use the other model and that other model is that is the F multiply S divided by the S minus V, right.

So, this is the concept of the breakeven point and next thing is the calculation of the sales value means calculation of the output or the sales value to earn a desired amount of the profit, calculation of sales or you can called as output in terms of units or sales value or the sales value to earn a desired amount of the profit, how can you calculated with the help of the say by applying the concept of the breakeven point, right.

If you want to now calculate the, say calculation of the output or the sales value to earn a desired amount of the profits, if it is the in terms of units if you want to calculate, that how much units we are required to sale in the market? In that case, in terms of units to know that value in terms of the units, so how you have to use this formula? You can use it fixed expenses plus desired profit divided by the same denominator selling price per unit minus variable cost per unit.

In terms of the units, you can find out number of units not only to arrive at the breakeven point but to go to the next step and that next step is the fixed expenses plus desired amount of the profit, here we are taken only the fixed cost but here we are adding into this the desired amount of the profit is. So, here the in case of the calculation of the desired amount of the output, we are dividing the fixed cost plus desire amount of the profit by the same thing, selling price per unit minus the variable cost per unit.

So, in this way by using the concept of breakeven point you can find out the value of the breakeven point in terms of units, that's not only helping us to arrive at the breakeven point but to earn a desired amount of the profit also and if it is in terms of the value of sales then, if it in terms of the value of sales then what is going to be there? The formula is going to be F plus P multiplied by S divided by S minus V, divided by S minus V.

So, this way also if you use this formula, so you will be doing one thing that, you are now recovering something that is a fixed cost plus profit both the things we have to recover, here in the upper part then we are at the breakeven point, we are multiplying fixed cost only by the value of sales, here we are multiplying fixed cost plus profit by the value of sales denominator is a same.

So, by using these two formulas you can means if you use the two upper formulas you are at the breakeven point in terms of unit and in terms of the value of sales, if you use the lower formulas then you can go one step higher also that it is not only to calculate the breakeven point but to calculate the desired amount of the profit also and with the help of the concept of breakeven point we can calculate the desired amount of the sales to be done in terms of units or the value of the sales to earn a desired amount of the profit.

And last thing is the, margin of safety I am taking up again, margin of safety I told you that it is a difference between the total sales minus sales at the breakeven point, right.

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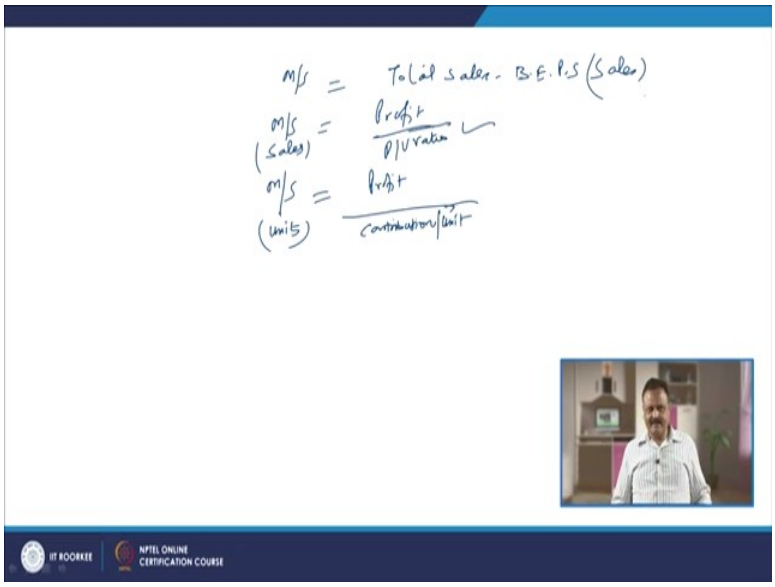

So, you can call it as the, this is called you can say here is the total sales minus breakeven point sales B.P.S. minus breakeven point sales, total sales minus breakeven point sales that is known as the margin of safety and margin of safety can be calculated by other way around also that is as I told you in the previous while knowing the applications of the P/V ratio that is by profit divided by the P/V ratio and it can be calculated in terms of units also, margin of safety it is in terms of.

If you want to calculate the margin of safety it is comes out the value but if you want to calculate in terms of the units then you can calculate in terms of say profit to be divided by contribution to be divided by contribution. So, it means contribution is basically, what is this? That is the contribution per unit, so contribution per unit means? Almost the same thing, that is the selling price per unit minus variable cost per unit that will give you the value of the contribution.

So, if you want to calculate the margin of safety in terms of units, if you want to calculate this in terms of units you can calculate with the help of this formula and if you want to calculate in terms of the sales, you can calculate this formula or you can use this formula also to calculate the margin of safety in terms of the sales that, how much is the margin of safety that will be the basic difference between the total sales minus sales at the breakeven point or the breakeven point sales and other way around you can calculate it dividing the profit by the P/V ratio or by dividing the profit by the contribution per unit you can calculate the margin of safety in units.

So, these are some of the concepts which can be made use of for taking the different decisions in the different situations by using the concept of marginal costing. So, before means going for actual decisions making and applying the concept of marginal costing we have to learn this concepts very clearly, carefully and after this we will be able to implement this means say, different decision making processes with the help of the marginal costing.

So, here in this class, I will stop here say after means discussing with you the basic concepts and in the next class first we will learn about, how to prepare the breakeven chart that how to calculate that this basically called as not breakeven chart but the (cost to) cost volume profit analysis. So, we will prepare that chart first of all, in that case we will show where is the breakeven point in that chart we will show, what is the total cost line, total sales line and the angle of incidents of profit and the margin of safety.

So, everything will be clear in that chart which is known as the this total chart of the profit volume analysis and with the help of that chart means first we will clarify all the basic concepts and then we will learn how to use this marginal costing concept for the management, different management decision making processes, thank you very much!