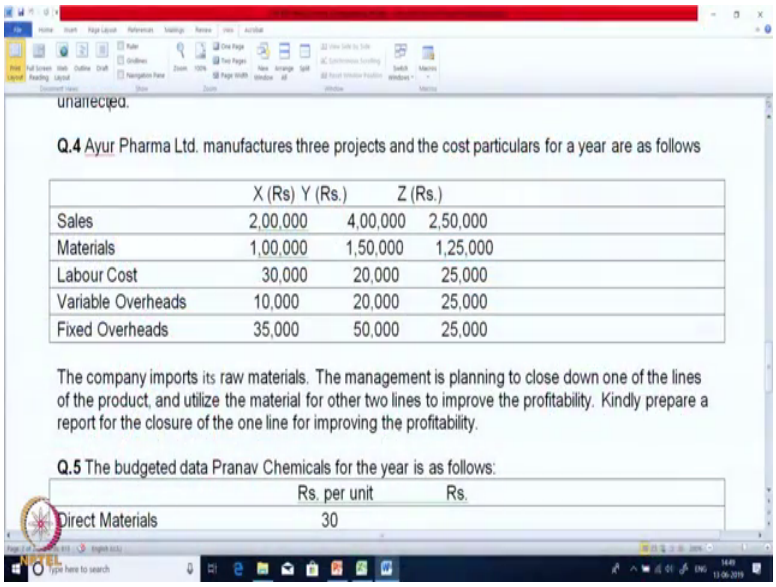
Cost Accounting
Prof. Varadraj Bapat
School of Management
Indian Institute of Technology, Bombay

Lecture - 08
Case of Ayur Pharma

[FL]. In last few sessions we are discussing about CVP analysis, BEP analysis, and it is applications in various type of decision making scenarios. If, you remember we have already done a few cases which involved calculation of BEP, calculation of PV ratio, then calculation of margin of safety, not only for one product, but also for various types of product mix, then choosing which product mix is more suitable. We also seen that if a pay and productivity deal is to be offered to employees is it advisable to go for it and so on.

Today, we will continue with the cases and we will go for the fourth case right away. I hope you have got the printout of this cases please take it with you, if you do not have it take the printout right now and try to solve the case along with me. So, that you really get the feel of finding the solution yourself. So now, question 4 case 4 Ayur Pharma, it is manufacturing 3 products.

(Refer Slide Time: 01:35)


unaffected.

Q.4 Ayur Pharma Ltd. manufactures three projects and the cost particulars for a year are as follows

	X (Rs)	Y (Rs.)	Z (Rs.)
Sales	2,00,000	4,00,000	2,50,000
Materials	1,00,000	1,50,000	1,25,000
Labour Cost	30,000	20,000	25,000
Variable Overheads	10,000	20,000	25,000
Fixed Overheads	35,000	50,000	25,000

The company imports its raw materials. The management is planning to close down one of the lines of the product, and utilize the material for other two lines to improve the profitability. Kindly prepare a report for the closure of the one line for improving the profitability.

Q.5 The budgeted data Pranav Chemicals for the year is as follows:

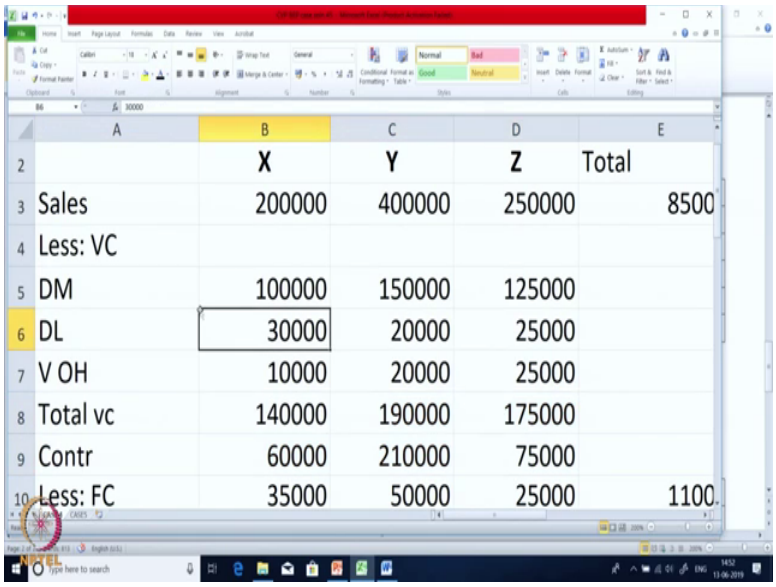
	Rs. per unit	Rs.
Direct Materials	30	

And, the cost details are given for all the 3 product lines like, sales, material, labour cost, variable overheads, fixed overheads and so on. Now, the company imports its raw

material and the management is planning to close down one of the lines of products and utilize the material for the other two lines for improving the profitability.

Kindly prepare a report for closure of one of the lines for improving profitability ok. A simple very small case; now how will you go about it? So, management perhaps want to close one of the product lines. Temporarily it is not a permanent closure; it is a case of temporarily closing one of the products in the hope of improving the profitability. Now, how to go about? First is of course, the basic calculation try to take the sales and all the cost data and compute profit for each of the product lines as at today. Based on the current data and then decide which product line can be closed.

(Refer Slide Time: 03:03)



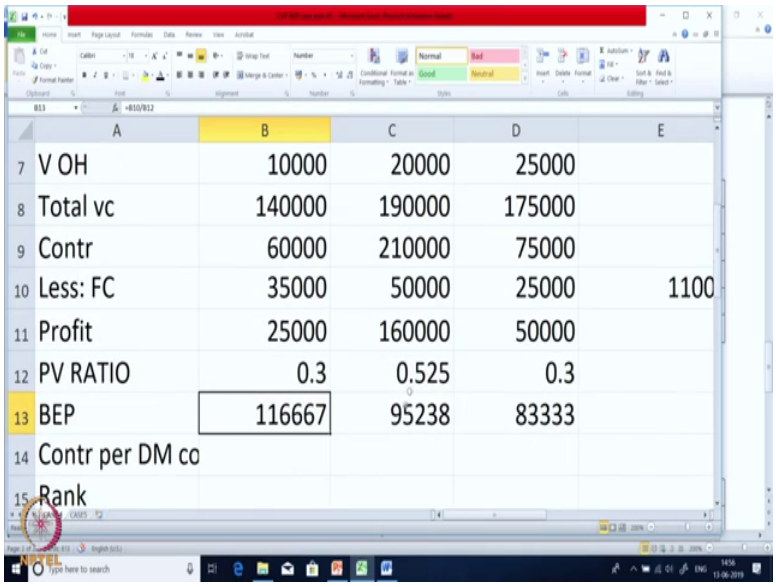
	A	B	C	D	E
2		X	Y	Z	Total
3	Sales	200000	400000	250000	8500
4	Less: VC				
5	DM	100000	150000	125000	
6	DL	30000	20000	25000	
7	V OH	10000	20000	25000	
8	Total vc	140000	190000	175000	
9	Contr	60000	210000	75000	
10	Less: FC	35000	50000	25000	1100

So, this is the current data please make three sheets giving XYZ, 3 product lines and the total. And, then we have to decide the first we let us calculate the profitability. Now, in order to take decision let us also calculate a few basic things like PV ratio contribution and so on. I will advise you to divide the cost into variable and fix separately.

So, that will know contribution and based on contribution we will also be able to calculate PV ratio. Now make the three columns and one by one start showing the calculating the profitability based on the current data. So, you know that the direct costs are variable costs. So, DM, DL, that is direct material, direct labour, and variable overheads are considered as variable costs.

So, for all the three products, please note the variable cost first, then take the total of variable costs and try to compute the contribution, please do it with me. So, for product X the variable cost is 140 200000s minus 140 gives you a contribution of 60,000, same way for why total is 190 and contribution is 210 for Z the contribution is 75. Now, from this 3 6 costs are also known try to reduce the fix costs and compute the profitability for all the three products.

(Refer Slide Time: 05:21)



So, it is 25 160 and 50 for the 3 products X Y Z. Now, the question is if one of the product lines is to be closed temporarily which product line should be closed. So, what is your suggestion? Shall we go for closure of X, because X has the lowest profitability and if you see the sales of X is also the lowest, is it better to close X, based on the sales or on profit or there is something else. Let us try to compute the PV ratio. So, you know the formula; do you remember contribution upon sales, write now it is 0.3.5 to 5 and 0.3.

If, you go by absolute contribution also you will find that X has 60 Y has 10 and Z has 75. So, PV ratio of X and Z both is same Y has better profitability, if you look in the relative terms. So, what is your opinion now shall we close X? Because, anyway PV ratio is same for X and Z or any other calculation you would like to do. I think one more thing what you can do is compute the breakeven point, what is the formula?

In breakeven point we want to recover fixed cost, you know the fixed costs. So, take fix costs divided by what is the formula for BEP? If you remember there are 2 formulas 1 is

FC upon contribution per unit, but nowhere is number of units given. That formula cannot be used, because number of units are not known or maybe it is not a homogeneous production, but we know PV ratio. So, another formula is contribute FC upon PV ratio. So, using that formula let us try to compute the BEP.

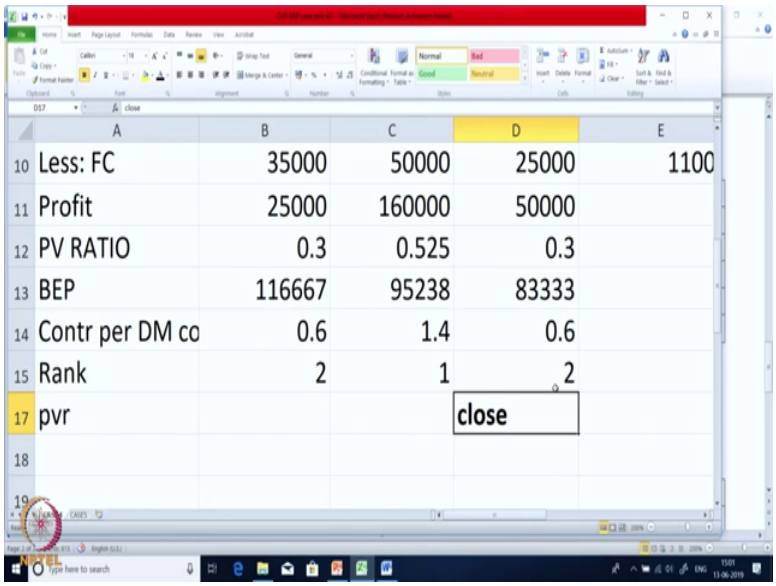
So, breakeven point is 116 95 and 833. So, based on breakeven point which product is the worse, I think again X because higher P, BEP is not advisable X has higher BEP. So, X appears to be a proper candidate for closure, do you agree? Let us go back to the problem and read it carefully, it is a very small case. Now, what is happening is companies importing it is raw material and management wants to close down one of the lines, what is objective of closure to utilize the material for the other two lines; that means, that imported raw material is in short supply.

They want to optimally use the raw material. So, instead of using it for less profitable product, it can be transferred for more profitable product. Now based on these what do you see now, what will be the criteria for decision making? About the ranking of the three products, we will go to the calculations many times our ranking depends on contribution per unit. That cannot be done here because we do not know number of instead of that sometimes we can rank based on PV ratio or on profitability or on BEP, but in this case none of this is useful, because the whole focus in on utilization of raw material.

So, we should find that product where our raw material utilization is more efficient or more profitable; that means, since you all know that fixed cost is not going to change; it is not worth being considered for decision making. So, our decision will be based on the contribution, but absolute contribution of 60 210 and 75 is also not of much use, because contribution is being generated by using raw material.

And, our main purpose is to use raw material more effectively. So, we will calculate contribution per rupee of raw material consumption, that is why let us calculate this formula contribution per raw material consumption. So, it will be B 9 upon B 5 got it.

(Refer Slide Time: 10:29)

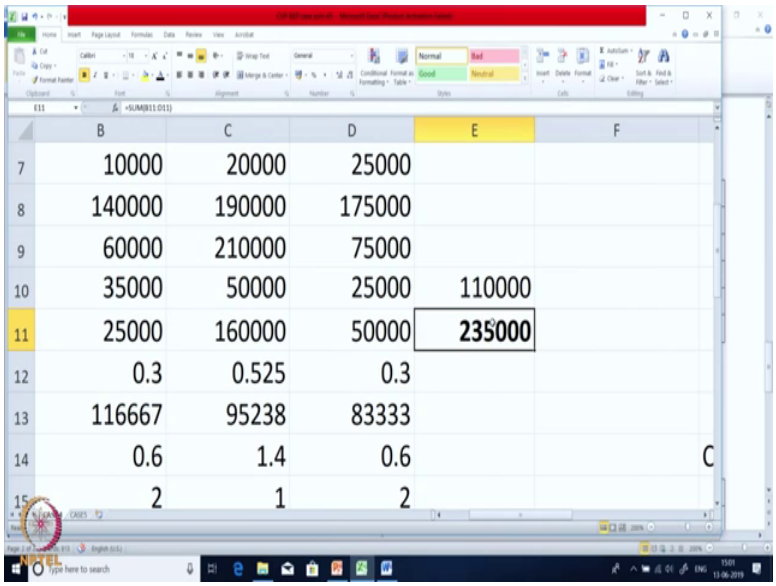


So, let us calculate it for X it is 0.6 much better for why, 1.4 and Z it is again 0.6. So, if you go for a rank based on this our rank will be 2 1 and 2. Because, again it is very clear that both X and Z have same contribution per direct material consumed, that is why their rank is 2, why is much superior.

So, why should not be close this very clear. Between X and Z which one we will look before to close is it better to close X, because less profit. So, you will realize that why is the best product should not be closed, between X and Z which one is preferred. Shall we go for closure of X, because it has a lesser profit actually that will be misleading. Because our main objective is to release raw material and use it for a more profitable product, more profitable product is Y.

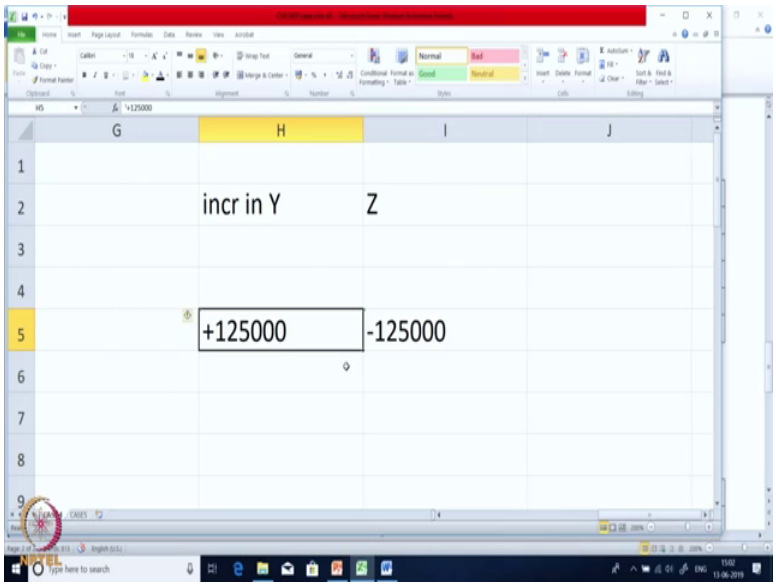
So, let us see which product amongs X and Z is using more raw material, you will realize that Z is using more raw material; that means, by closing Z. We can release 1, 25,000 of raw material which will be transferred to Y and can be used more profitably, that is why advice is it is better to close Z, do you all agree? Now, let us check what we have done, whether it gives more profitability, if yes how much more?

(Refer Slide Time: 12:35)



As of now the profit total profit is 2, 35,000 from the use of these three products.

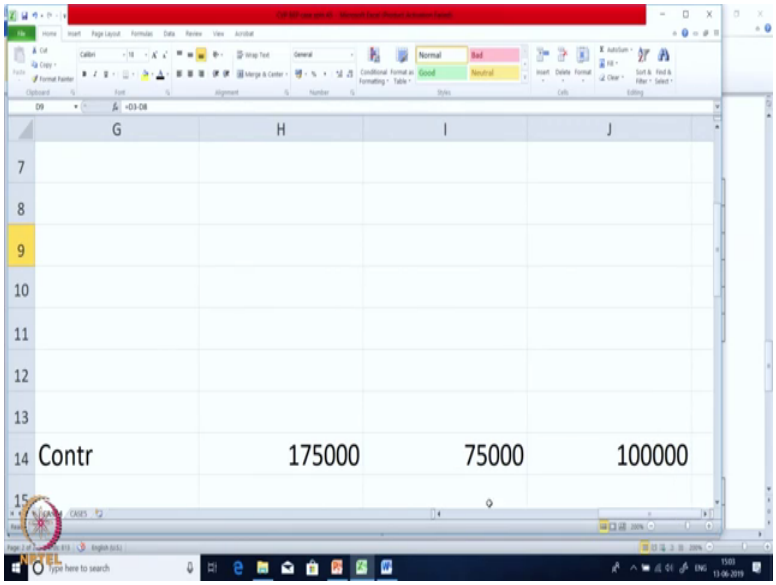
(Refer Slide Time: 12:45)



Now, as per our advice we are trying to closed Y sorry close Z and Z will release 1, 25, 000 rupees of raw material, which will be used for Y. That means as per as raw material is concerned, less of raw material for Z is 125 and increase of raw material in Y is 125 1, 25, 000. Now, how much extra contribution will be generated? We know the formula that for product Z contribution per raw material consumption is 0.6, but for Y it is 1.4; that

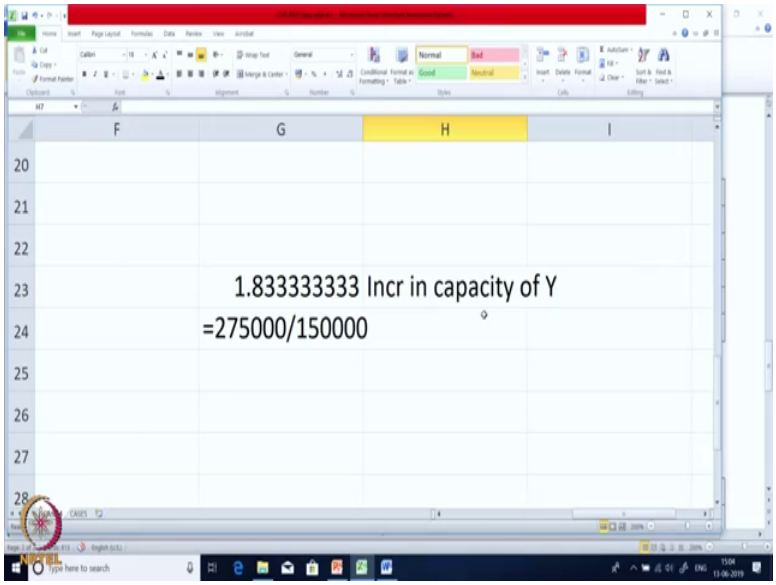
means, same 1, 25, 000 was generating a contribution of 75 in Z will be now 1.4 times the material which you use.

(Refer Slide Time: 13:53)



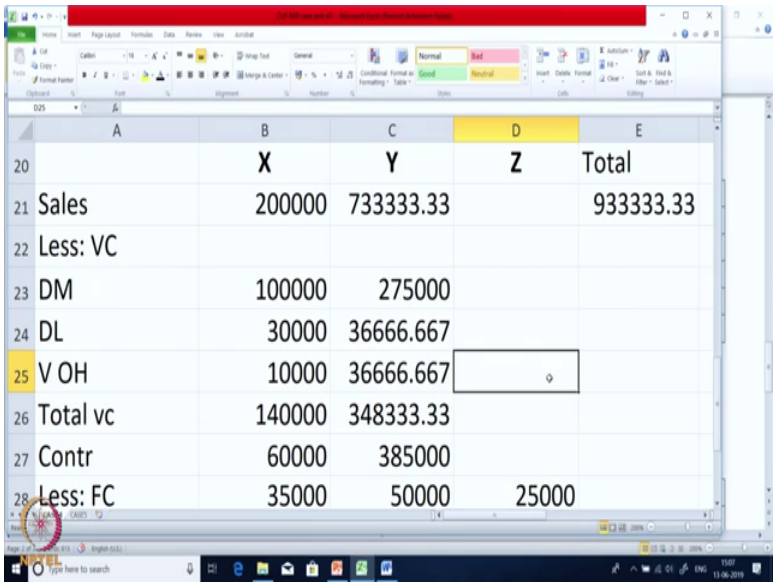
So, from Z reduction in contribution will be 75, whereas from Y how will you getting it 75, 1, 25, 000 into 0.6, but if you transfer the same raw material to Y, the extra raw material contribution generated will be 125 into 1.4; that means, 1, 75, 000 of additional contribution is generated, but contribution of 75 is lost. So, there is a incremental contribution of 1, 00000 are you getting me.

(Refer Slide Time: 14:41)



I hope it is getting clear to you. So, there is no other need of any calculation. So, what is happening is 1 point will go here and we will try to do the calculation also in a complete way, what we did here was also correct, but it was a shortcut, which shows that contribution will increase by 100000. Since fixed cost is unchanged the profit will also increased by 100000 so, profit will go from 235 to 335, but I will also show you the full calculation please do it with me let us do the profitability statement once again.

(Refer Slide Time: 15:29)



	A	B	C	D	E
20		X	Y	Z	Total
21	Sales	200000	733333.33		933333.33
22	Less: VC				
23	DM	100000	275000		
24	DL	30000	36666.667		
25	V OH	10000	36666.667		
26	Total vc	140000	348333.33		
27	Contr	60000	385000		
28	Less: FC	35000	50000	25000	

Compute the new sales of X and Z and Y; Y there is no question of new sales because now Y sorry Z is completely closed for Y how much will be the new sales; the new sales will be 733333. How are you able to calculate it? Because, now earlier you were allowing 275, now you are getting some extra raw material for Y and they are having enough capacity? So, it is 1.833 times more production of Y, which is possible, which is the ratio of 275 to 150, I hope you are getting it. If, you are not getting it clear I will once again show, you see the raw material consumption for Y was only 1, 50,000.

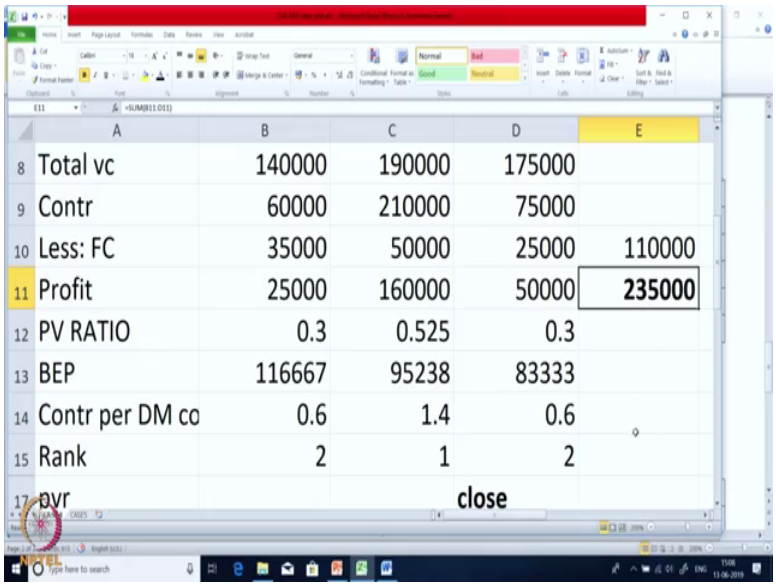
Now they are getting extra raw material of 125; that means, new raw material consumption will be 275, 275 upon 150 will be the new level of production. You know that the raw material is a variable cost any increase in the raw material gives same increase in the other variable cost and also same increase in the sales, that is why this is 1.83333 times increase of capacity of Y. Now, I will go back each of the costs in Y will also increase by 1.83 times write. Raw material I think we do not have to calculate we

already knew that it is 150 plus 125, but still we have just cross check it becomes 275 direct labour and variable overheads is recalculated.

So, compute the new vc now. New variable cost is a total of this which is 348333. Now, 7333 minus 348333 will be the new contribution, which is 3, 85,000. You can just compare with old contribution which was 210. So, we have increased the contribution substantially, because of better utilization of sorry we have increased it from 210 to 385 this is the extra contribution generated. Now, let us go for X X there will be no change same figures as earlier there repeated.

What about Y? Y also there will be no change, but no change in a sense now it has become 0. Earlier there was some production in Y now the production of Y sorry production of Z becomes 0.

(Refer Slide Time: 18:39)

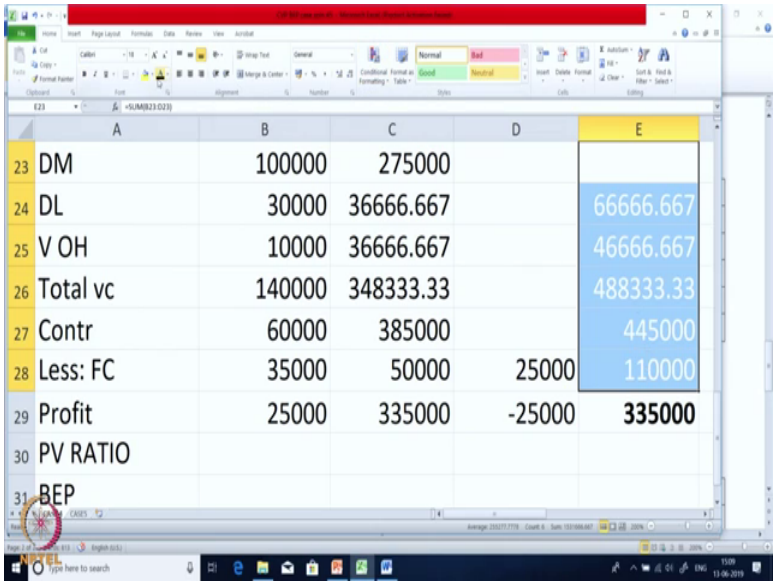


But keep in mind that fixed cost of Z will not go away, because it is not a permanent closure, it is a temporary closure of Z we will not do away with their machinery or maintenance of machinery etcetera. So, we will continue with the fixed costs now compute the new profit.

New profit for X is unchanged for Y there is a substantial increase in the profit; you can see here it was 160. Now, it has become 335 for Z, there is a loss of 25. Because, there fixed costs continue, but the sales and variable cost have become 0. So, now, you can

take the total profit which now becomes 335, earlier it was 235 we are already done this calculation that there will be a increase in the profit by 100000.

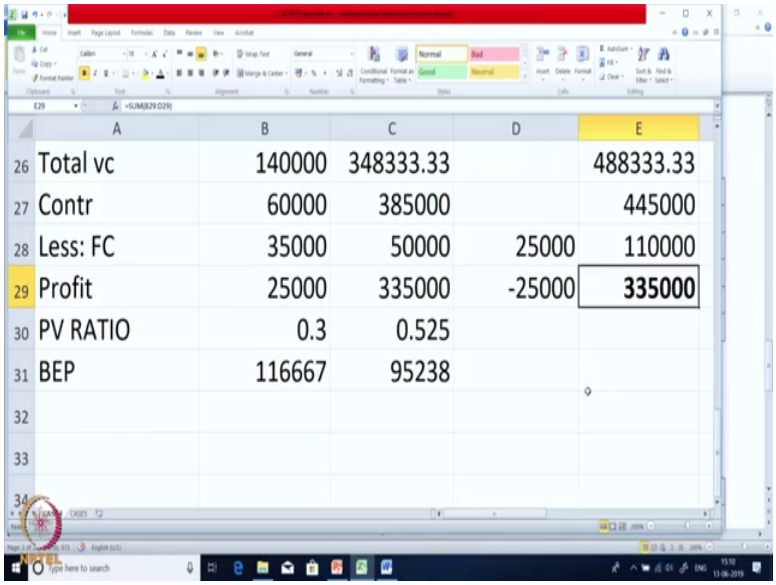
(Refer Slide Time: 19:45)



	A	B	C	D	E
23	DM	100000	275000		
24	DL	30000	36666.667		66666.667
25	V OH	10000	36666.667		46666.667
26	Total vc	140000	348333.33		488333.33
27	Contr	60000	385000		445000
28	Less: FC	35000	50000	25000	110000
29	Profit	25000	335000	-25000	**335000**
30	PV RATIO				
31	BEP				

You can of course, take all the totals for cross checking purposes, if you take totals you will realize that new contribution is 445 fixed cost is unchanged. So, profit is 335. What will be the new PV ratio and BEP?

(Refer Slide Time: 20:05)



	A	B	C	D	E
26	Total vc	140000	348333.33		488333.33
27	Contr	60000	385000		445000
28	Less: FC	35000	50000	25000	110000
29	Profit	25000	335000	-25000	**335000**
30	PV RATIO	0.3	0.525		
31	BEP	116667	95238		
32					
33					
34					

Compute the revised PV ratio and BEP. Till the PV ratio change actually no it is to P to calculate PV ratio again because whatever was PV ratio for X and Y will continue, Z we

have stop producing, but X and Y again has see just by changing the level of operation's does not change PV ratio. Neither does it change BEP ok. So, breakeven point is also not going to change, what has happened is we have increased the capacity utilization of Y, cut down Z and you can see there is a substantial increase in profit from 235 to 335, this is also a product mixed problem, where we have improved product mix.

Now do you have any other intelligent suggestion to offer, because in the case it stopped just by asking kindly prepare a report for closure of one of the product lines for improving profitability? So, this solution is correct we are our opinion was closed Z and the profitability is 335 revised profits any other suggestion will you want to make. I think you can make a suggestion company might as well close product X, because product X also as contribution of only 0.6 per raw material consumption whereas Y is much more profitable 1.4.

So, if you release this 1, 00000 of raw material and there is a better utilization by 0.8. In fact, it will increase profitability further by 80, 000. Though it is not asked just for better understanding, you may further comment that closure of X and transfer in that raw material to why will further improve the profitability. Of course, we have to consider, whether there is enough demand for Y, because now we are zooming of the sales of Y there should be demand for it. Secondly, company may not be wanting to close 2 products.

Because, then companies solely depend becomes dependent on one product. Right now they are having three products they have already decided to close Z, if they close X also they become dependent on Y only one product Y. So, risk of the company increases these are the qualitative issues of course, as far as the case is concerned, this is enough that closure of Z and transfer to Y.

Further there is a possibility of closure of X and transfer to Y provided other things are taken care, any other suggestion you want to make, there is also a possibility to permanently closed Z. Because, that will further reduced the cost by 25,000, but company has to check what will happen to long term customers.

Who were buying Z from us will it shrink our overall market share is there a risk involved in closing Z, all these qualitative factors will have to be considered by the company before taking decision of permanent closer. As we have already discussed the

technique of marginal costing or CVP is primarily useful for short term decisions. However, they may give you some hints for long term decision by making some extra study by making some extra market research company may or may not go for a long term decision based on these inputs.

So, in one of the earlier cases, we are discussed about product mix. This particular case of Ayur Pharma is also a product mix case where we are improving the product mix, but it has one more unique feature, that one of the raw material one of the items of production that is raw material is in short supply. That is why all over decision making revolves around better utilization of raw material. In such a scenario raw material is considered as a key factor or sometimes it is called as a principal budgetary factor.

Now, what other key factors can you think of just as in this case raw material was in short supply, sometimes labour is in short supply. If number of labour hours are in short supply the decision making will be based on contribution per labour hour. If total labour cost is in short supply it can be contribution per labour cost, like in this case it was on the raw material.

Sometimes power is in short supply, in which case it will be contribution per mega megahertz of power. Sometimes the total sales potential in terms of rupees of sales or the size of the market is limited. Then, how will be the decision taken, then the decision will be taken as per PV ratio. Because, PV ratio is contribution divided by sales, sometimes the market potential in terms of number of units is limited, then the decision is taken by contribution per unit getting it.

So, what we are discussing now those factors become very important. Normally, only one factor is in short supply that is called as a key factor, sometimes it is called as a limiting factor or a principal budgetary factor. So, the decision making will be given primarily based on key factor, in case a particular key factor is being given please keep this in mind.

With this will stop here [FL].