Lecture - 09
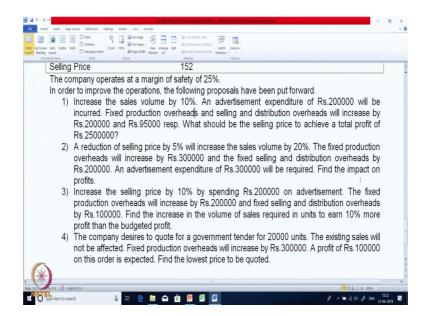**Different Decision Scenarios and Profit Planning**

[FL]. In our earlier sessions we have been discussing CVP and particularly its applications. So, we have seen variety of decision making cases involving let us say sales mix, involving product planning, we have also discussed in our last session about decision making in case of a key factor. Now let us do one more case where profit planning is involved so, different decision scenarios and how will you react to those decision scenarios. Please take the sheet which you have, read the problem with me and to try to solve it along with me, let us start.

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The budgeted data of Pranav Chemicals for the year is as follows, direct materials 30, direct wages 24 and production overhead variable 18, all these 3 is on per unit basis and fixed production overhead in total is given as 30,00,000, admin cost again are fixed there 18,00,000, selling and distribution 18,00,000, selling price is 152 per unit, now company operates at a margin of safety of 25 percent.

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In order to improve it is operations few proposals have been put forward. So, often different people in the company different levels of managers come out with suggestions and naturally management wants to improve profitability. So, for taking decision it becomes important to calculate the profitability PV ratio BEP and so on for each of the decision scenarios so, let us see, what are the different proposals.
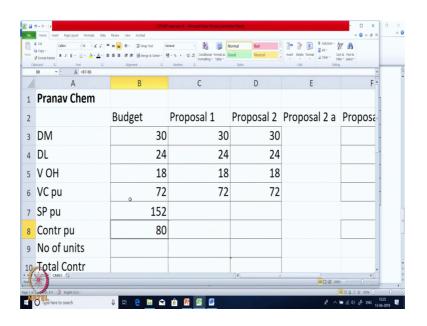
The first one increase the sales volume by 10 percent and advertising expenditure of 2,00,000 will be incurred, then fixed production and selling and distribution overheads also will increase by 2,00,000 and 95,000 respectively. What should be the selling price in order to achieve a total profit of 25, 00,000? Remember each proposal is separate.

The second proposal reduction of selling price by 5 percent that will increase the volume by 20 percent. Fixed production overheads will also increase by 3,00,000, fixed, selling and distribution overheads will increase by 2,00,000, advertising expenditure of 3,00,000 is required and find the impact on profit.

Third one, increase the selling price by 10 percent by spending 2,00,000 on advertising, fixed production overheads will increase by 2,00,000, fixed selling and distribution will also increase by 1,00,000. Find the increase in the volume of sales required in units to earn 10 percent more profit than budgeted and there is one more fourth proposal also; let us take first 3 proposals right now.

So, you already have a budget data let us first put it in a proper format and compute the profitability as per the budget and then make enough number of columns, first will start with the existing budget and then we will go for proposal 1, 2, 3 and so on. So, I will shift to excel sheet for you in your notebook please make the budget in the proper format. I hope you know the proper format now we start with selling, then reduce variable cost get contribution and then compute the profits. So, please it make it in that format. I hope you do not need my solution you can do it on your own.

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So, first of all starting with the budget, we have taken total of DM, then DL that is direct labor and variable overheads variable cost per unit is 72, take the selling price compute the contribution, selling price is 152. So, contribution is 80, SP minus VC.

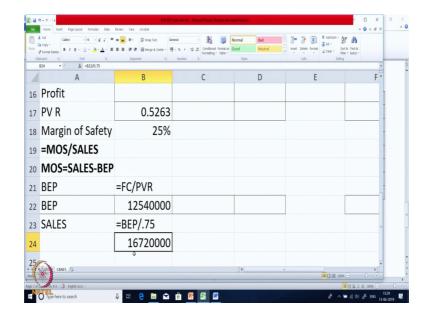What is the number of units, is it given? It is not given although they have given some fixed cost. So, we can write the fixed costs, we can even write the total fixed cost because we know the 3 fixed costs.

So, cost structure is available you know selling price, you know contribution, you know fixed costs, how do you know the level of activity? How do you know the number of units? Anyone has a suggestion, please read the problem once again carefully. What else is given to you for the current budget? They have given a hint to you that company operates at a margin of safety of 25 percent. Now, what is a formula of MOS? It is sales minus BEP sales divided by sales that is actual sales, you do not know actual sales you do not know BEP also.

Can you calculate BEP? I think you can, if you remember the formula it is fixed cost divided by contribution per unit, you know fixed cost, you know contribution. So, you can calculate BEP and you know that the companies operating at MOS of 25 percent. So, BEP is known to you, if existing sale is 100 the BEP is 75 so, you can also calculate the current sales.

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So, BEP is FC minus PVR number of units is non known to you, but you know the you can calculate the PV ratio because contribution upon sales is PVR, how much is a PVR 0.5263. FC upon PVR gives you this much of BEP which is 1, 25, 40,000 and we know that sales is equal to BEP upon 0.75, because margin of safety is 25 percent this is equal to MOS upon sales and MOS is also equal to sales minus BEP.

In other word sales is equal to BEP upon 0.75. So, you can calculate the sales which is 1,67,20,000. Are you able to get it? Now, based on this you can work back and compute the number of units and also compute the other things.

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So, if you compute number of units you will get 1,10,000, because selling price is known to you, total sales is known to you. So, total sales upon selling price gives you number of units as 1,10,000, total contribution is 8,80,000, because 80 in to 110.

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And 8 sorry 88,00,000 and 88,00,000 minus 66,00,000 gives me profit of 22,00,000, I hope you all getting it got it ok, now this is the starting point. Firstly, whatever is available with us is a current budget we have put it in proper format. Now let us go to each of the proposals now proposal 1, proposal 1 is a proposal which involves increase in

the sales volume and they are spending more on advertising and because of increase in the sales volume even other overheads are increasing.

And based on that we have to calculate the selling price which should be fixed to achieve a target profit of 25,00,000. So, management is not happy with the sales of 22,00,000 sorry profit of 22,00,000, they want more profit and change all other figures as per what is given ok. Selling price is not known to us so, we cannot calculate contribution, what we know is that the revised profits will be 25,00,000, we can also calculate new level of fixed overheads. So, please calculate that, production overheads will increase by 2,00,000, admin overheads is unchanged, selling overheads will increase.

We have included advertising plus other increases so, 2,95,000 increase of selling overheads making it 20,95,000, total fixed cost is 7095, so, 25,00,000 profit plus 70,95,000 is a fixed costs, we do not know the selling price in fact, selling price is required to be calculated. So, what we will do it, we will work back because we know profit and we know FC, we can calculate the total contribution first right by working back which comes to this 25 plus 7095 gives you 9595. Do you know number of units, yes because it is given that see here it is given that the increase in the sales volume by 10 percent.

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	A	B	C	D	E	F
1	Pranav Chem					
2		Budget	Proposal 1	Proposal 2	Proposal 2 a	Proposa
3	DM	30	30	30		
4	DL	24	24	24		
5	V OH	18	18	18		
6	VC pu	72	72	72		
7	SP pu	152	**151.30**	144.4	◊	
8	Contr pu	80	79.30	72.4	72.4	
9	No of units	110000	121000	132000	132596.685	
10	Total Contr	8800000	9595000	9556800	9600000	

So, if you add 10 percent you get 1,21,000 as number of units, now you can work back and compute the contribution right; that means, you must earn a contribution of 79.30 to

achieve this profit and take care of this costs, now you can work back the selling price. So, selling price comes to 151.30 are you getting, perhaps what management is time to test is, in this proposal does it need increase of the selling price, but you can see that selling price is almost same like in the budget.

So, now the management will be happy because they are getting extra profit extra fixed costs are taken care and there is no much need to increase the selling price, because the sales units have increased, our contribution is more and that is taken care taking care of extra fix cost we will also calculate PV ratio. So, you will get a PV ratio of 0.5241 which is almost same. So, management would not be much disturb with proposal 1 of course, this is not asked this is more of a discussion, the solution to proposal 1 is 151.30 that is why I how made it in bold, are you getting it.

Now, let us go to second proposal, once again read it carefully now this is a proposal which involves reduction in selling price, because company wants to increase sales by 20 percent they have proposed to reduce selling price there will be some extra cost of advertising and so on and now management wants to know the impact on profit. So, go to one more column variable costs are not changed so, I have kept them constant, company has decided to decrease the selling price. So, they know the selling price now remember this decreases visa v is the budget not last column.

So, from budget that is from 152 you decrease the selling price by 5 percent so, it will become 144.4. What will be the new number of units, anyway first of all you can calculate new contribution, which is SP minus VC so, 72.4, what will be the revised number of units, from the current units there is a increase of 20 percent. So, 1,32,000 is the new units, you can also compute the new total contribution which is 9556. Now take each and every overhead and go on increasing the fixed overheads as per the given information.

So, production over it goes up by 3,00,000 it becomes 33,00,000, admin is same, selling overheads where increased by 2,00,000 plus advertising of 3,00,000 so, 23,00,000. So, what is the total overhead, 74,00,000 is a new total fixed overhead and profits are 21,56,000 and what is a revised PVR, it is 0.5014. So, how is proposal 2, now it looks like management may not be very happy because decrease in the selling price means you are PV ratio has gone down a bit many fixed overheads have increased.

So, the profits of the company have slightly decline instead of increasing to target of 25. In fact, profits and decline, but is this proposal 2 has any advantage, yes it has because company is able to substantially increase it is number of units. Now it depends on the management's priority if management wants to increase the market share perhaps they may also think of proposal 2. Now our main purpose is to make various calculations easy so, that management can take appropriate decision ok.

Now let us tweak the proposal a bit that is why how made column 2 a, now what is likely to happen is, company wants to at least maintain the current profit, because it is most unlikely that any company will accept a proposal with lesser profit. So, I have kept the same profit now 22,00,000 and then we can do other calculations. So, how to do other calculations, if you want to keep profit of 22,00,000 what will be the number of units company has to sell?
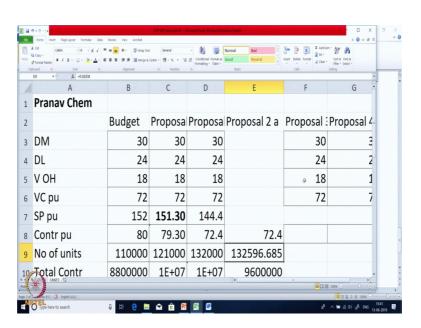
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So, please make column 2 a there will not be any change here because there is no difference in the earlier variable cost and this variable cost, even the contribution will remain unchanged. Number of units; however, will go up to 132596, how did you get this, because this part is also unchanged right there is no need to even write again total FC is same, contribution per unit I think I have not written here, but it yeah it is written here so, it will go to 72.4.

You if you want to achieve target profit of 22,00,000 check what contribution you must turn, 22 plus 74 so, you must achieve contribution of 96,00,000 divided by 72.4 you will get 132596. Though it was not asking the case have just made one more calculation, in case the proposal 2 is slightly tweaked and you are asked that to maintain the same profit how many units should be sold the answer will be 132596 getting it ok.

Let us go to proposal 3 now, now in proposal 3 there is a increase of selling price by 10 percent now this is a more aggressive strategy, companies willing to increase it is selling price there will be somewhat increase in the advertising and other expenditures and we want to know the increase in the volume of sales required in order to earn 10 percent more profits than budgeted. So, I hope you can do the calculations now I am just making these column slightly smaller.

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So, in proposal 3 again the variable cost is essentially same, fixed cost you can recalculate.

	A	B	C	D	E	F	G
7	SP pu	152	**151.30**	144.4		167.2	
8	Contr pu	80	79.30	72.4	72.4	95.2	
9	No of units	110000	121000	132000	132596.685	**100000**	
10	Total Contr	8800000	1E+07	1E+07		9600000	9520000
11	Less FC						
12	Prod OH	3000000	3E+06	3E+06		3200000	
13	Admn OH	1800000	2E+06	2E+06		1800000	
14	SD OH	1800000	2E+06	2E+06		2100000	
15	Total FC	6600000	7E+06	7E+06	7400000	7100000	
16	Profit	2200000	3E+06	2E+06	2200000	2420000	

So, there will be a increase in production no change in admin increase in selling, giving you new fixed cost to be 71,00,000, have they given new selling price? Yes they have given that company will increase it is selling price, by what percent by 10 percent. That means new selling price is 167.2 compute new contribution which is 95.2, company wants to earn 10 percent more profit than budgeted; that means, from 22,00,000 the profits will go up to 24,20,000 plus fixed cost of 71.

So, the total contribution to be earned becomes 95,20,000, the question was about number of units. So, if you check number of units by total contribution upon contribution per unit will get answer as 1,00,000. So, the question was find the increase in the volume of sales required to earn 10 percent more profits, you find that no increases require in fact, even if volume drops by 10,000 companies able to earn higher profits.

	A	B	C	D	E	F	G
10	Total Contr	8800000	1E+07	1E+07	9600000	9520000	
11	Less FC						
12	Prod OH	3000000	3E+06	3E+06		3200000	
13	Admn OH	1800000	2E+06	2E+06		1800000	
14	SD OH	1800000	2E+06	2E+06		2100000	
15	Total FC	6600000	7E+06	7E+06	7400000	7100000	
16	Profit	2200000	3E+06	2E+06	2200000	2420000	
17	PV R	0.5263	0.5241	0.5014		0.5694	
18	Margin of Safety	25%					
19	MOS/SALES						

What will be the contribution, what will be the PVR? Now the PVR is also improved significantly in becomes 0.56, because since the price has gone up contribution per unit has also gone up. So, the profit volume ratio will also be better.

So, how do you compare a proposal 3, is it a good proposal prima facie years because company is getting more profit, it is also able to improve it is PVR, only problem with proposal 3 is number of units of come down; that means, the market size are the market share of the company will slightly shrink. So, see as a management accountants we will provide different type of information to various levels of management and then management has to take call.

Now, let us go to proposal 4, now company desires to court for government order for 20,000 units existing sales will not be affected and fixed production over heads will increase by 3,00,000 profit of 1,00,000 on the order is expected, find the lowest price which can be quoted, so, please do the calculations. Now let us go to proposal 4.

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I hope you can calculate on your own variable cost are again same, the question is how much price can be quoted? How much will be the fixed cost?

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They have given that company wants to earn a profit of 1,00,000 and there will be a increase in production overheads by 3,00,00. So, total fixed extra fixed cost will be only 3,00,000, profit expected is 1,00,000; that means, target contribution is 4,00,000. What is the number of units it is 20,000. So, contribution which you are supposed to earn is 20 rupees and the price which you can you quote is only 92. The question was what lowest

price can be offered you will be surprised that though our normal prices about 150, we are able to court it at as low as 92, this is possible because it is given that the existing sales are not affected, so you can afford to sell at much lower price, this is called as a penetration pricing.

That since you want to target and enter new market you are willing to offer at a much lesser price remember you are not covering any of the fixed cost, offering much lesser price just to ensure that you get enough of money for variable cost plus incremental fixed cost, this is a variable cost or marginal cost based pricing fine. So, overall if you see the problem once again you will realize that this is a very interesting problem for two- three things.

Firstly we have looked at different decisions scenarios, with tweaking of sales, with tweaking of number of units, with tweaking of selling prices, with tweaking of a fixed costs, what different prices can be offered or what different units are required for achieving certain target. These types of short term decisions are required to be made by management, many times it is known as profit planning.

One more thing you would you observed when we study the CVP analysis earlier we had made number of assumptions like, fixed cost is always constant, variable cost per unit is constant, sale price is constant. If you remember at that time I had told that some of the assumptions can be changed. You can give little longer rope, you allow the assumptions to be tweaked a bit. Now, you will see here that we have changed many assumption and still CVP analysis has a technique continues to be very much useful for decision making ok. So, I hope you got the whole case [FL].