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

Lecture - 06 Application of Breakeven Point Analysis

[FL]. In last 3 sections we have been discussing about CVP analysis, we have also done 2 illustrations and then we started on calculating a particular sum or solving a particular case.

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Q.1 Ganesh Ltd is selling cost and selling prices ar	three product e as under:	s in the brand r	names A, B a	and C. The details regarding unit	0
	A (Rs.)	B (Rs.)	C (Rs.)		
Direct Materials	8	14	20		
Direct Labour	8	8	20		
Variable Overheads	9	20	14		
Selling Price	36	54	58		
The monthly fixed cost is	Rs.480000. S	ales volume to	r the month o	of July and August are as follows:	
	A	В	С		
July	20000	20000	20000		
August	35000	16000	5000		
(A) Find out the month	ly profits and if	your computa	tion brings ou	ut that higher profit was earned in	
the month having lower s	ales volume, k	indly justify the	finding with	reasons.	
(B) If the sales mix of	each month is	considered as	Mix X1 and X	X2, compute Break Even point	
units for each Mix. Which	n Mix do you re	commend?			
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The first case was on Ganesh limited having three brand names or three products, I hope you are with me and you have solved it up to the point where we stop, if not try to solve it just now.

So, there are three products of Ganesh limited they are given as variable cost as well as the selling price, then monthly fixed cost which is 4, 80,000 and they have also given us two sales mixes in the month of July it is 20,000, 20,000, 20,000 and in the month of August 35, 16 and 5. . In A part of the question we were asked to calculate the monthly profits and comment if a month with lower sales can have higher profits. So, what is the profit figure for month of July?

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This is the solution so far we have done we always start with calculation of contribution and PV ratio. So, on product A we have contribution of 11, B it is 12 and C it is 14 and these are the PV ratios, then we calculated monthly profit for July.

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For that first of all we should know the contribution in July which is 5,40,000 minus 480 so, you get profit of 60,000, for month of August the contribution has improved to 597 minus 480 you get profit of 117.

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And dramatically you can see that profit has nearly doubled from 60,000 to 1,17,000, if you look at number of units it is surprising because number of units were 60,000 in July total units and the total units have fallen normally you will expect that fall in number of units would automatically lead to fall in the profits, but what is surprising is profits have infact gone up, are you getting me how it is possible, what will happen, so what was the explanation?

The explanation was that the sales mix of August is much better than that of July getting it why it is better? Because, a product A which is having more contribution than products C has been now emphasized. There is no much change in the sale of B, but C sales has gone down from 20 to 5 whereas, the sales have a has gone up that is why overall contribution has increased leading to more contribution and more say more profits in the month of August.

So, as far as the first part of question was concerned these were our calculations and there what we had stop, but today we can do one more calculation try to compute the total sales.

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So, if you go for total sales you will realize that even total sales have fallen from 29,60,000 to 24,14,000. So, not only units even number of even the amount of sales have fallen, because you can see that C is actually a product having highest sales value whereas, A is having the lowest sales value. So, in terms of total revenue company will be unhappy because it is revenue has fallen, but profitability has improved.

Now, let us dig further into how it is possible. So, in B part of question what they have asked is, if you consider the sale mix of July and August as two sales mixes that is mix X 1 and X 2 compute the breakeven point for both and suggest which mix do you recommend? So, in July we have call this plan 1 or say let us say we can call it as plan X 1.

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Contr per basket	385	192	20	597													
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And in august it is plan X 2, now for each of these plans you have to calculate the breakeven points ok.

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So, try to calculate the breakeven point for both the plans? So, you know the sale prices A B C you know the contribution, you know the number of units, please compute BEP? How will you go ahead, I think this much part is known to you so, you can see it. We have already calculated the profit for month July which is a plan X 1, you even know the

BEP's only difference now is instead of calculating the PV ratio of A B C we had done it earlier.

Now, we are trying to calculate the PV ratio for the month as a whole treating it as a sales mix. So, if you calculate the average PV ratio weighted average PV ratio what we have done is, contribution upon sales is a PV ratio. So, you can get the weighted average PV ratio for A B C together for the month of July or plan X 1. There is also another way of doing it which is also equally interesting you can treat all these as a particular basket. So, you sell one basket which has 1 unit of a, 1 unit of b and 1 unit of c, 1 1 1 because total sales are in the ratio of 1 is to 1, 20 is to 20 is to 20.

So, 1 basket consists of 1 a, 1 b, plus 1 c now try to calculate contribution per basket. So, you can take 1 a that is 11, 1 b 12, 1 c 4 so, total contribution of the basket is 27. Now we have to generate fix cost of 480 by way of contribution. So, FC upon contribution per unit is a formula. So, 480,000 divided by 27 will give you breakeven in terms of number of baskets, are you getting me?

So, your answer is 17,777.77. These many baskets one needs to sell to breakeven if you want to convert it in terms of units it is equal 1 is to 1. So, every basket has 1 a, 1 b, 1 c so, breakeven point is also 17,777.77 of course, you can round it off or round it up making it 17778 as units of A and B and C ok.

So, you can either calculate it in terms of units or you can also calculate it as rupees, now how will you calculate it in terms of rupees? You know the formula FC divided by PV ratio getting it? Only one thing is earlier we used to do it for individual product now we are taking it a weighted average PV ratio. So, for the whole basket the PV ratio is 0.18; you can see individual PV ratios are like this, but as a basket it is 0.18 it is a equal weightage 1 is to 1 is to 1. So, giving me a BEP of this quantum which is I think 26,31,111 getting it, either you can do it in rupees or you can do it in units both ways is possible.

Now, please do it for plan X 2 that is for the month of August, apply the same methodology as we have done here, please do it along with me. Now we already knew that our profit is 117 for plan X 2, now what will be the basket? Suppose we have to go for a basket the proportion is not 1 is to 1 is to 1, now proportion is 35 to 16 to 5. So, you can assume the basket to consist of 35 a's, 16 b's and 5 c's; now based on this, compute

the contribution per basket and compute the BEP in terms of number of baskets, I hope you are able to do it with me.

So, for 35 baskets it is 35 into 11 sorry for 1 basket of 35 a's it is 35 into 11; that means, 385 rupees from A, 16 into 12 that is 192 from B and 5 into 4 that is 20 from C it is a big basket giving me a total contribution of 597.

Now, you can get BEP in terms of number of baskets, because we know that our target is to recover 4,80,000 and from 1 basket I get 597. So, FC upon contribution per unit gives me 804.02 so, you need to sell 804.02 baskets and in 1 basket we have got 35 a b and c whatever is the mix. So, compute now the units of A B C.

So, you will get 28,140 units of A, 12864.3 units of B and 4020.1 units of C getting it? So, like earlier, but earlier the quantity was same because it was 1 is to 1 is to 1 basket now different quantities of A B and C in the given mix that is 35, 16 and 5. This is the minimum sales to be achieved or break even sales, how will you do it in terms of rupees? I think you know we have done it here, first of all calculate weighted average PV ratio for this basket and then compute the BEP.

So, how to get PV ratio? Contribution divided by sales so, 0.24 is a PVR and BEP; BEP is FC that is 480 divided by 0.24 you get 19,40,904. Now try to compare the 2 mixes X 1 and X 2 the question is if these 2 months sales are treated as 2 cells mix which mix is better do you prefer X 1 or do you prefer X 2? What is your answer? See X 1 your BEP is higher, X 2 your BEP is lower, what do you feel prefer? More BEP or less BEP? I think every company wants lower BEP.

So, naturally they will prefer X 2, but that is not the only reason you can also compare PV ratios what do you get? PV ratio is 0.18 and it has significantly improved to 0.24. So, you are able to have more margin in X 2 so, you will prefer X 2. If you look at individual products though they have not asked amongst A B C which product do you recommend? It will be very much obvious that since the contribution is high for A and B you will not like C, you would like to push for A or B, any mix which has more weightage for A B is better than any mix which has more weightage for C, but between A and B which is better?

This is a very tricky question because between A and B, B has more contribution per unit, but A has more PV ratio. So, which one will you prefer? If there is a restriction on the quantity sold actually you will prefer B, because on B every unit you get 12 rupees, but normally there is a restriction on total sales. If you see by total sale why is A is far better, because it gives you more percentage contribution or more PV ratio.

Now you can see here PV ratio has substantially improved because the weightage of A has gone up; now situation to situation your answer as to especially between A and B it can change, but as of now what are what was asked was, if you treat 2 as 2 mixes which mix do you prefer. So, I think answer is very clear you would prefer X 2, because of 2 reasons it has lower BEP and it has more PV ratio getting it ok. Now let us go to the next one; next one is a case of Keshav limited.

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Please try to solve it with me it sells two products A and B, they have given the details like sale prices, variable cost and they also given common fixed cost for 6 months. Now based on this it is very simple you have to calculate the BEP in terms of rupees and the number of each product if they are to be sold in the ratio of 4 A is to 3 B.

So, they have mix in mind 4 A is to 3 B if that mix is to be maintained what will be the BEP in rupees and in numbers, again in the second part it is a similar question compute the BEP if the products are to be sold in the mix of 4 A is to 4 B and in the third part advise the sales manager as to which of the 2 mixes are better. So, it is very much similar

to our first case I hope you will be very easily able to solve it. So, please try to solve it along with me ok.

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How you will you proceed now? First step I think you all know we want to know the contribution per unit. So, make the columns for A and B compute the contribution, take the FC and try to compute the profit for both the sales mixes and from there on you will also be able to compute the BEP's.

So, you know 10 minus 5 contribution is 5 for A and only 2 for B fix causes already given 5,61,000, now to compute the BEP it will be easier if you make a basket. So, in sales mix 1 we have made a basket of 4 A's and 3 B's so, what is a sales per basket now? 4 into 10 that is 40, 3 into 12 that is 36, total sales price for the basket is 76, contribution 5 into 5 is a contribution for 1 unit of A 5 into 4 that is 20 and 6 because 3 into 2.

So, total contribution for the basket is 26, now how you will compute BEP? First of all we want to recover 561. So, FC upon contribution per unit, only thing is instead of taking 1 unit it is being sold in together as a mix as a basket. So, 5,61,600 upon 26 BEP in terms of number of baskets comes to 21,600. If we go unit wise, 21,600 into 4 that is 86,400 of A's and 64,800 of B's, how to get PV ratio now in rupees?

One easy way you just multiply that is 64,800 into 10 so, 8,64,000 and 7,77,600, also compute the PV ratio, as a weighted average we get 0.342, again we can compute the

BEP which is 16,41,000 I am just trying to give you a cross check, either you can do it from units multiply still you get 1641 or go for weighted average for the product mix and get BEP both will give you the same answer are you getting? So, for product mix 1. Now do it for mix 2 which is 4 is to 4 [FL] simple [FL] because it is like same 1 is to 1 ratio now.

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Now, what is the sales per basket? 40 and 48 because 4 into 10 and 12 contribution per basket 20 and 8. So, total contribution is 28, fixed cost remain same 561600 and from each basket now we earned a contribution of 21. So, BEP is 20,057 number of baskets, in units 20057 into 4. So, you get 80,228 and 80,228 both of A and B also calculated in rupees now.

So, multiplied by their respective sale prices 8,02,000 9,62,000 so, final answer is 17,65,000 same way it can be done using weighted average as well. Now for weighted average PV is 0.031 so, BEP is 17,65,000. Now the question was; firstly, to calculate the BEPs and then advice sales manager as to which of the 2 mix is better.

So, each of the 2 mix do you like now, there are two ways of looking at it first by BEP you can see the BEP is higher for sales mix 2. So, you would prefer sales mix 1 and by PV ratio PV ratio is higher for sales mix 1 so, you prefer sales mix 1. If you compare the 2 products A and B which product is better, you can clearly see that A is much superior than B both in terms of contribution as well as PV ratio, because this has the PV ratio of

50 percent, this has the PV ratio of only 16.6 percent. That is why in sales mix 1 since the weightage of A was higher that was a better sales mix are you getting me ok.

So, I hope you understood now the concept of sales mix and how you calculate BEP of the sales mix or PV ratio of sales mix and based on that how to take decision on which sales mix is superior. So, with this we will stop here [FL].