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

Lecture - 13 Case Study on Projection: Divya Aushadhi Ltd

[FL]. In last few sessions we are discussing about marginal costing CVP, BEP analysis and it is applications. We have also seen one of the case where we have discussed applications towards projections of next year or next period statement, we will continue with the same type of case.

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Profit & Loss account	Rs. Cr				
	P	Q			
	Mar '20	Mar '20			
Income					
Sales Turnover	1,878	1,746			
Other Income	41	4			
	1,919	1,750			
Expenditure					
Raw Materials	1,200	800			
Power & Fuel Cost	244	380			
Employee Cost	150	170			
Selling and Admin Expenses	122	219			
Interest	26	68			
Depreciation	36	106			
Tax	41	1			

This is a case of Divya Aushadhi Limited they are into two product lines P and Q information is given about incomes and expenses related to those lines even taxes.

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Expenditure					
Raw Materials	100%	100%			
Power & Fuel Cost	80%	60%			
Employee Cost	60%	30%			
Selling and Admin Expenses	75%	40%			
1					
Projections for 20-21					
Expected growth rates	0				
sale units	10%	10%	20%	20%	40%
sale price	12%	12%			
cost of RM	7%	7%			
other operating costs	10%	10%			
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They are actually two subsidiaries P and Q under that Divya Aushadhi group, now you are required to make projections about which data is available I hope you have the sheets please try to solve it along with me.

So, for these two companies P and Q we have got sales turnover, other income, then raw material, power, fuel, employee costs, selling, interest, depreciation, taxes, percentage of variable element is given. So, raw material is 100 percent variable in both the cases, power is 80 percent variable for P and 60 percent variable for Q and so on.

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Now, the projections are also given for coming period, sales units likely to increase by 10 percent, sale price 12 percent, RM cost 7 percent and other operating cost by 10 percent. This is the information for 19-20, based on these we are required to make calculation for next year that is 20-21, certain assumptions are already given that depreciation, interest and other income will not change, see these items are nothing to do with cost and management accounting. So, normally we do not take those projections here we will assume that they are same and tax rates are also not going to change.

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With this information we have to make projections. So, how we will you go ahead now? I think most of you are guessing it correct. First of all we will have to divide each cost into variable portion and fix portion, percentage of variability has been given. So, each cost please divide into variable portion, fix portion, then variable portion will change with change in number of units. Fix portion remains unchanged of course, when we say unchanged it does not mean it will not change at all, but it will not change because of change in units, it will change because of change in prices or costs ok.

So, for a hint to you this is the projected statement wherein if you observe carefully raw material being fully variable there are no 2 column; 2 column rows for it, but for power and fuel we have made 2 rows power broken into variable part, fix part, then employee cost broken into variable part fix part and so on. Now we will require this breakup for the

current year because accordingly we will be able to make projections for the next year ok. So, let us start let us try to solve please try to solve it along with me.

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5	Income						
5	Sales Turnover	1,878	1,746	1,878	1,746	1,878	1,746
7	Other Income	41	4	41	4	41	4
3	Expenditure						
)	Raw Materials	1,200	800	1,200	800	1,200	800
0	Power & Fuel Cost	244	380	244	380	244	380
1	Employee Cost	150	170	150	170	150	170
2	Selling and Admin Expenses	122	219	122	219	122	219
3	Interest	26	68	26	68	26	68
4	Depreciation	36	106	36	106	36	106
5	Tax	41	1	41	1	41	1

So, I have just copied first of all the figures as it is.

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2 Selling and Admin Expenses	122	219	122	219	122	219	
3 Interest	26	68	26	68	26	68	
4 Depreciation	36	106	36	106	36	106	
5 Tax	41	1	41	1	41	1	
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7 Variable element							
8 Expenditure							
9 Raw Materials	100%	100%	100%	100%	100%	100%	
0 Power & Fuel Cost	80%	60%	80%	60%	80%	60%	
Employee Cost	60%	30%	60%	30%	60%	30%	
2 Selling and Admin Expenses	75%	40%	75%	40%	75%	40%	
3							
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Variable element is also writ over here 100, 80, 60 and 75 respectively.

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22 Selling and Admin Expenses	75%	40%	75%	40%	75%	40%	
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24 Projections for 20-21							
25 Expected growth rates							
26 sale units	10%	10%	20%	20%	20%	20%	
27 sale price	12%	12%	12%	12%	12%	12%	
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Expected growth rates are also mentioned.

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Now, we are proceeding for making projections, now what will be the sales for next year. How will you work out anybody has a hint? So, for calculating sales we will take the current sales then look at the changes, now both sale units and sale prices are changing. So, give impact of sale units, sale units are increasing by 10 percent. So, we can multiply the original sales by 1.1 and for sale prices they are increasing by 8 percent. So, multiplied by 1.08 like that proceed for every item getting it. So, for the first company P the figure is 2314 more than the figure please note the way it is calculated look at it carefully B 6, B 6 refers to the original sales, this is B 6 1878 maybe you can write it down since it is a first time you are doing 1878 into 1.1 into 1.1 2, 1.1 because 10 percent increase and it says 12 percent increase in the selling price. So, you can see here there is a increase in sale unit by 10 percent and increase in the price by 12 percent, that is why into 1.1 into 1.12 getting it.

Now this is very important I hope you have noted it, now for raw material 1412 you can see raw material is a completely variable item so it changes with the level of activity. So, last year's figure into 1.1 into 1.07, 1.07 because prices of raw material are increasing by 7 percent are you getting it, being a completely variable item change because of two reasons; one is because of change in the sale units 10 percent, so, 1.1 change in the raw material prices 1.07 ok.

Now when it comes to power and fuel actually you have to do 2 things, first of all out of last year's power and fuel cost apply the percentage of variability. You can see 80 percent is a variable element and for the variable element there will be two changes 1.1 because of change in units and again 1.1 because other operating costs which include power have also increased by 10 percent getting it, I will just show it how it is done.

So, you can note how it has been done B 10 into B 20, B 20 refers to the percentage of variability that is last year's figure into 80 percent into 1.1 because of change of units and again into 1.1 because of change of cost.

Now, let us see for fixed costs, fixed cost you can see B 10 B 10 is last year's figure into 1.0 into 0.2 because as per the information given over here 80 percent is variable; that means, 20 percent is fixed and that 20 percent portion which is fixed will not change because of units, but it will change by 10 percent because of change in the operating cost. So, this fixed portion of power last year's figure into 0.2 into 1.1 are you getting it, please do it with me once you do for one or two items then it is very simple you can extend the same logic for other items ok.

Now let us look at employee cost variable portion, now variable portion we have taken B 11 into B 21 into 1.1 into 1.1 we will just go up, B 11 is referring to last year's cost which is 150 into the variable portion which is B 21 60 percent. So, 150 into 60 percent is a variable portion of employee cost in the last year.

Now, variable portion will change because of units 10 percent so, 1.1 it will also change because of change of cost again 10 percent so, into 1.1 into 1.1, are you getting it how we got 109 ok? Now let us do it for fixed, fixed what will happen first of all we will take B 11 that is last year's figure into 0.4 because 60 percent is variable; that means, 40 percent is fixed, this fixed portion will not change because of change of units, but it will change because of change of operating costs, that is why B 11 into 0.4 into 1.1 getting it, now it is very simple same way we are going to do for selling also 111.

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	A	В	С	D	E	F	G	Н
Sellin	g n admn							
variat	ble	111	106	121	116	141	135	
fixed		34	145	34	145	34	145	
		2021	1829	2191	1954	2531	2206	
EBID	TA/ Operating cash profit	292	323	333	393	414	532	
less d	epreciation	36	106	36	106	36	106	
Opera	ating profit	256	217	297	287	378	426	
Add o	ther income	41	4	41	4	41	4	
less in	nterest	26	68	26	68	26	68	
PBT		271	153	312	223	393	362	
LESS	Tax	79	22	91	32	115	51	
PAT		192	131	221	191	278	o311	
1								

So, B 12 into 0.75 because 75 percent is a variable component B 12 into 0.75 into 1.1 into 1.1 because this is variable it will change by units as well as by operating costs. Now for fixed, fixed what will happen B 12 into 0.25 fixed portion into 1.1 no change by units just change because of change in other operating costs.

I hope you have you are able to calculate for all the items, now same way we will go for the other product which is or the other company which is Q now sales. Now I think you can do it faster C 6 that is last year sales into 1.1 into 1.12 because 12 percent rise because of sale price, 10 percent rise because of sale units it is fully variable so, directly we are able to calculate.

RM cost, very simple now see 9 last year's RM cost into 1.1 due to units into 1.07 because of change in raw material prices. Now power and fuel I think you can do it now and just cross check with this figures fixed 167 fixed will only change because of change

of cost, variable will change because of two factors; change of units as well as change of costs. Employee cost; employee cost we know the variability is 30 percent and this is a variable one so, change the total cost into 30 percent into 1.1 into 1.1. For fixed we will just take one factor into account so, total cost into 70 percent because 70 percent is a fixed component into 1.1, selling variable [FL] factors [FL] 1.1 1.1 [FL]. Fixed will be simple it will directly be only coming once that is by 1.1 have you got it for all the items ok?

Now let us complete the income statement for P. Now we know all the costs you can observe here since they have not asked us to go for breakeven point etcetera, we have not taken total of VC and FC separately, but for each component we are breaking into variable and fixed because the way they change keeps on changing when it is variable and when it is fixed.

Now, we will calculate operating cash profit which is 292. So, we are taking B 37 minus B 49, 49 is a total this is a total cost not segregated into fixed and variable we are just taking the sum because [FL] fixed [FL] [FL] variable [FL] for projection it made a difference, but now we can just take a total cost which is 2021. Now 2314 minus 2021 so, you get operating cash profit of 292 we call it cash profit because we have not considered depreciation, we are also not considered other income. If you go up there was a clear assumption that depreciation, interest and other income will not change.

So, now, charge depreciation same as last year, now you get operating profit which is 256, take other income 41, less interest 26, profit before tax is 271, how does it compare with last year ok, last year's profit before tax is not given, but we can just calculate it for our own sake to understand, but a anyway we will do it later on. Now last year's tax is 41, how much tax I should charge here? See they have said that tax rates have not changed is, but how much is the tax rate.

Anybody is aware how much is the tax rate is it given anywhere? It is not given, but they have directly given us tax. So, we will have to calculate the tax rate, for that first of all we will have to calculate the profit of the last year and on that 41 percent tax is charged.

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So, please calculate last year's profit first and based on the profit we will be able to calculate the taxes fine. So, what we will do is. Firstly, take the total of all expenses then income I mean other than tax look at the total expense and the total income for last year that will give you PBT and we know that the tax is 41 using this data we will be able to calculate the tax rate.

So, based on last year's expenditure take total of all these items other than 41, because 41 is a tax it is not a expenditure. Now, if we take total remember this is sum of B 9 to B 14 you will get 1779, now how much is a income 1919 income is a total of sales plus other income ok. So, you are getting 1919 profit before tax is 140 and the tax charge on the company which was given was 41 so, calculate 41 as a percentage of 140.

So, you can see the formula B 15 upon B 70 that is 41 upon 40 you will get 0.29 or close to 30 percent, this is the tax rate applicable to the company in the last year they have mentioned that tax rate will not change. Now apply the same tax rate on the new profit that is 271 so, the tax will be 79 are you able to get, you can compare here the profit have all has almost from 140 was the profit of last year.

In the current year the profit has increased to 271 little less than double, the tax has also doubled and profit after tax is 192 ok. And how much was last year's tax last year's profit after tax? Just for the sake of calculation we will calculate it here 41 was the tax.

So, that profit after tax it is not asked, but just for our own information it is 99 in the last year and now you can say it is 192 so, nearly doubling of profit after tax.

Now calculate it for the other company which is Q. Can you just think which companies profit will increase more will P's profits increase more or Q's profits increase more? Because sales you need sale prices etcetera are changing in the same proportion for both the companies. Can you just make a guess work the expectation of change is same for both.

So, for Q also the profit will change in the same proportion or Q will be more profitable or less profitable, can you just think a bit. I think some of you would have got it I will give you a hint before telling you answer look at these, P has more variability, Q has less variability. So, expenses of Q have a more portion of fixed costs less variability means more portion of fixed cost, now the sales are increasing by 10 percent.

So, Q's profit will increase by more than P or less than P, I think Q's profits will increase more because they have a bigger portion of fixed costs, once the fixed costs are covered they would get larger profits we will just check it whether it is actually happening. Now take total of all expenses so, you get 1829 EBIDTA or operating cash profit is 323 charging the depreciation other income and interest etcetera, how much is the PBT?

It is 153 taxes like last time you will have to calculate the tax rate first. So, total of expenses is 1743 see both the figures are nearly same, total income is 1750 PBT was 7 tax rate was 0.14. If you go up in the last year there tax was only 1 so, 10n 7 so, it is 0.41 if we just write tax for our own information, how much is the profit after tax? It will be 6.

This is for last year now in the current year, please apply the same tax rate 14 percent. So, your tax is 22 and profit after tax is 131. So, which company has shown more improvement? Q has shown substantial improvement. (Refer Slide Time: 24:29)

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See last year Q's profit was just 6 for clarity I will just write down this, are you getting it. So, PAT for P was 99 it has increased to 192 we are happy it is almost double, but for Q it was only 6, from 6 it has become 131; that means, how many times it has increased? Almost 20 times increase. So, substantial increase has happened for Q, now we will just we are already done the projection I hope you have understood the process, we will just tweak slightly.

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25	Projections for 20-21					
26	Expected growth rates					
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28	sale price	12%	12%			
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If you go to problem sheet the sale unit change which was 10 percent what will happen if sale unit change is 20 percent or 40 percent for both the company is same so, 20, 20 or 40, 40. When the sale increases by more and more quantum actually Q will become more profitable or P will become more profitable, you will realize that since the variability is low for Q; that means, their fixed expenses are high, they are more automated company, they are more tech driven company. So, with more volumes that is with more sales actually their profits are likely to increase substantially.

I will just show you the calculations, I will request you to do it yourself, because that will give you more practice, but right now since the time is limited we will directly jump to the answer. If I make this visible now just observe how I have done same like last time for sales it is into 1.2 into 1.12 because 20 percent increase and 12 percent increase because of price, raw material into 1.2 into 1.07 1.2 because 20 percent increase in the units and 7 percent increase in the RM cost. Same way true for all variable costs as far as fixed costs are concerned, let us say power it will just increase by 10 percent.

So, figures of fixed costs are same, figures of variable cost have last time increase by 10 percent now they have increase by 20 percent. If you go down you will realize that now the profit of P has gone to 221, but profit of Q has increased substantially it is 191 it has become closer to the profit of P, but still P remains more profitable than Q, getting it.

Now let us try what will happen if there is a increase of 40 percent. Same methodology was used into 1.4 into 1.12. So, it is a 40 percent increase from last year, you will be surprise now the profit of Q is 311 it has surpassed P. If you remember our breakeven point chart, you will find that the profit area goes on increasing, at breakeven point you will have no profit no loss because you have just recovered your fixed costs, after breakeven point your profitability will increase more and more. In case of Q their PV ratio will be higher, I will request you to calculate PV ratio for P and Q.

So, you will realize what I am trying to tell, P has a lower PV ratio because they are having more variable cost, Q has a higher PV ratio. So, their profitability is increasing faster, though in the last year P's profits were high as the sales are rising you can see P's profits are increasing, but not at a very high rate. But Q's profits are increasing substantially. Some of you if you are interested in stock market you will realize that Q is a very interesting company their profits are very low, but it is a turn round company if there is a slight increase in the sales, they would become highly profitable.

So, actually those who want to invest in stock markets are many time looking for or searching for such companies. So, the analysis of cost which we have learned is extremely useful for making projections it can be used by the company for it is own work, it can also be used by investors, provided they are able to judge the percentage of variability ok. I it can also be used by other stakeholders like bankers, because they are also interested in projected profitability so, this is how the projections can be done. So, I hope it was a good learning case for you. So, we will stop here. [FL].