Working Capital Management
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Lecture - 24
Rationing of Working Capital -II

Welcome students. So in the previous class we were discussing about the restriction of working capital by the banks or restrictions imposed on the working capital provided by the banks so if there is a shortage of the working capital from the bank's side and if any restriction is imposed by the bank. So were learning with the help of a problem or an example that how to deal with that in the practical situation or in the practical life, how the companies deal with that.

And that kind of the rationing of the capital or restrictions of the working capital normally takes place and it is regular say phenomena in the market because when there is a squeeze of the credit or there is a shortage of the credit or the funds available for the credit with the banks then sometime banks go for the rationing of the even say their loans including the working capital loans or the working capital limits.

So we have to deal with this problem on the say very on the very regular basis. So we should be clear about. So were learning with the help of an example that how to deal with this kind of situation. There we saw that how much investment the company was making earlier in the inventory because as I told you that investment in the different current assets is done with the permission of the bank.

And bank say categorizes clearly that this much of our funds you can invest in inventory, this much in the receivables and this much in the say other current assets. So were dealing with that if there is a restriction imposed by the bank and the restriction is effective on the inventory also so how to deal with that and how to say carry on the business and say all production process in a very smooth manner.

So were trying to learn about that. So we in the in the problem we were talking about or the example we were discussing so we worked out with the help of certain say parameters that the

investment which was company making in the working capital to fund the inventory how to create the current asset as an inventory that investment we worked out by following certain parameters and certain process and that we worked out was how much that is 13,000 Rs.

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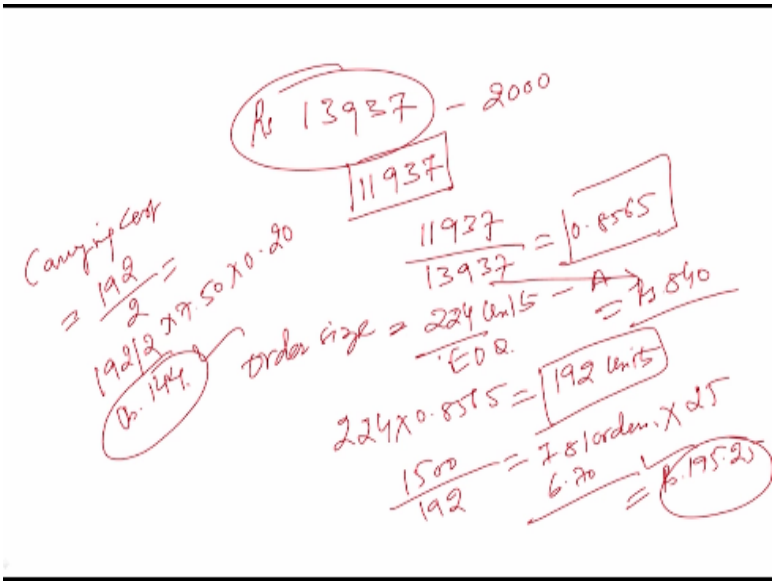

That was Rs. 13,937 right. So this investment we worked out. You know the process how we have arrived at on this figure by drawing the say information from the company's record and then say knowing how much material is required for different products. So we found out that this much of the investment is required or the company is making currently making in the inventory so now we knew that the restriction imposed was 2000.

So it means now the capital working capital available from the bank side to fund the inventory will be say reduced to 11,937 and not as 13,937. So how we have to run the show with this particular figure? So what we have to do is now that we have to now calculate the ratio of the of the say restricted capital to the unrestricted capital. So restricted capital will be now this much and the unrestricted capital was this much.

So it means because of the reduction of the say working capital limit on inventory. So if you calculate this, this works out as 85 sorry 0.8565 or now it has come down to 85.65%. So now we have to rework the whole process in the ratio of this restricted capital to unrestricted capital

which is 0.8565 and if you work this so what will happen? What was our order size earlier? Our order size earlier was how much 224 units.

That was the 224 units that we called it as the economic order quantity for the product A or the raw material A. That was 224 units which we had worked out as and we were calling it as EOQ economic order quantity 224. So order size was 224. When we had unrestricted working capital available so were keeping or we were buying in 1 lot that is 224 units and half of that we were keeping as the average inventory with us right.

So investment in this component was rupees how much? Rs. 840. This much amount was invested. Out of this particular amount this much, out of 13,937, 840 was invested in the say inventory of or maintaining the inventory of item A or the material A. Now if there is a restriction it means we have to see that this 224 is a economic order when there is a no restriction on the capital. But if there is a restriction you have to work this order again.

And this you have to work that 224 multiplied by 0.8565. So this new order will be, so now it will be 85.65% of 224 and this will work out as how much 192 units. So your what will happen your order size has come down. Your economic order quantity which was 224 earlier when the sufficient capital was available but now the capital is not available or there is a restriction by 2000 so the economic order quantity has to be revised.

Because we have to store less and order many times or the number of orders will increase. So your now EOQ new EOQ if you call it as EOQ then it will become 192 units. If it is becoming 192 units so in that case what will be there? Let us now see how many orders. Total annual requirement is how much 1500 units. And now this is the per unit we will be buying or the one order we will be bringing in the material of A to the extent of 192 units.

So this will become that how many orders we will be having now, 7.81 orders, 7.81 orders. And earlier the number of orders were there how much 6.70. So now the number of orders have increased. Once the orders have increased so what will happen now, your ordering cost will go

up. So your ordering cost will be what is the ordering cost? Ordering cost here is say it is given to us ordering cost per order cost is Rs. 25.

So what will happen now? Your ordering cost will increase and your ordering cost will go up to 190 Rs, 195.25. This is the ordering cost, 195.25 this will be the ordering cost. So what is there we have to deal with this situation and to deal with this situation we have to run the show by placing more orders. So in that case we have to see here that total ordering cost for this item will become as something like 195.25.

But the effect of that will be the, the positive effect of that will be what the positive effect of this change will be that your carrying cost that is the carrying cost will go down. How much is the carrying cost because we are going to have the inventory of how much that is 192 units. This is going to be now new EOQ so you will divide it by 2 and so how much it will be? This will work out as say whatever it comes out as.

So it will be something you can say do like this that 192/2 into 7.5. This is the cost per unit and multiplied by the carrying cost. So that is 0.20. So this will come out as Rs. 144. This will come out as 144 for this unit. So it means in this case what will happen? The effect is that your carrying cost is going down, your ordering cost is increasing. So the things will change to some extent.

But net effect we will have to manage like that how much is the net effect we will have to find the net effect. So in this case we have got the revised ordering cost. The carrying cost is this much. We have got the ordering cost is this much and now we are seeing that we will have to calculate this all for all the say revised orders means for all the items we will have to calculate the revised EOQ.

And as we have done in case of the item A we have found it out in the ratio of the restricted working capital to the unrestricted working capital. We found out the ratio that is 0.8565. In this same ratio we revised the EOQ for the item number A and earlier it was 224 units. Now it is if

the revised is if it is multiplied by the ratio we have worked out this came up as 192 units. It came down so you have to keep the lesser inventory and you have to frequently order.

So what will happen your carrying cost will go down because we are storing less but your ordering cost will increase because you are ordering many times. So when we found out the number of orders new here the number of orders we have got here is that is 1500 is the total demand, annual demand and 192 is the size of now EOQ size of the new EOQ size of the item number A.

So number of orders will become 7.81 and if you multiply it by the ordering cost which is 25 because ordering cost we have seen earlier is that ordering cost is 25 per order. So your ordering cost will become now 195.25 but your carrying cost which is 20% of the inventory we are storing or the cost of the inventory we are storing. So it will be something like 192/2. So this will become 96 units. Average inventory will be 96 units.

Earlier how much was the average inventory, it was 112 units. So it will come down by certain number of units it will come down so it means roughly you can say that average inventory has come down by 16 units and if you are storing 16 units less so 16 into 7.5 is going to be the total amount which we need not to invest now and if you are saving that investment it means your carrying cost will also come down by 20%.

So we have seen that the carrying, new carrying cost is 144 and the ordering cost is increased a bit that is 195.25. So in this whole process we will have to revise the entire thing and we have to work out the new ordering cost, total ordering cost, new carrying cost and then we will have to compare that whether the overall cost total cost we have to actually find out the total cost. Ordering cost plus carrying cost.

So whether it has gone up or it has gone down or it has remained the same. We will have to check for that. So let us now work out the say rework the whole thing and then try to calculate the investment.

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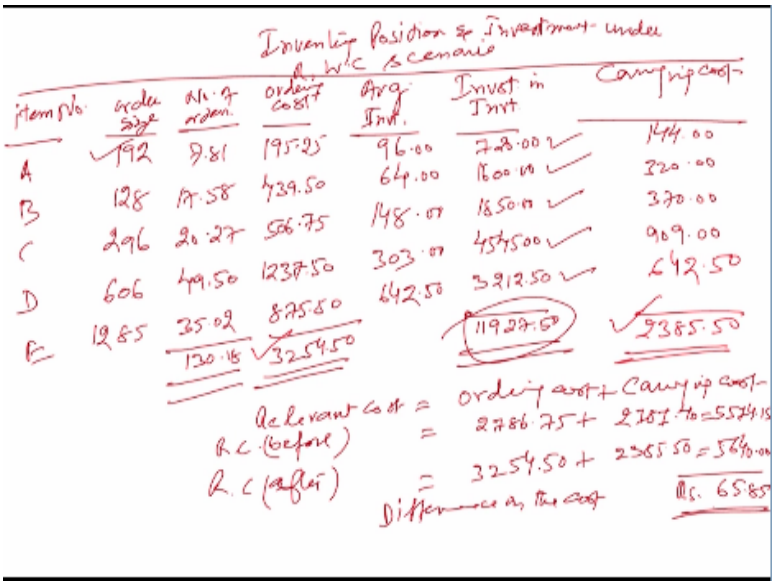

In this case, now we will have to say inventory position I would like to write here inventory position and investment under restricted working capital scenario, under restricted working capital scenario. So inventory position and the investment under restricted working capital scenario. So here we take again the item number right. This is the item number. Then we take the order size. Then we take the number of orders. We will have to calculate number of orders.

Number of orders and then we will have to go for the ordering cost, ordering cost and then we will have to calculate the average inventory, average inventory. This is the average inventory and then it is the investment in inventory, investment in inventory, investment in the inventory and then finally we will have to calculate the carrying cost. Finally, we will have to calculate the carrying cost. So these are the items we will have to do and this we will prepare a table again.

As we prepare the table under the under unrestricted regime. Now we will be preparing a table under the restricted regime. So again we have the items here that is A, B, then it is C, it is D and it is E. These are the items. Now the order size, revised order size. In first case we have calculated is 192. In case of the B it will come out as 128. In case of the item C it will come out as 296 and in the D case it will be 606 and in case of E it will be 1285.

So this is the revised order. Revised EOQ you can say, revised order you can say. So this is the revised situation. Earlier what was there? A was 224. B was 150. C was 346. D was 707, now it

has become 606. And E was 1500 and now it has come down to 1285. So number of units now we are going to order in one order is has come down. So it means we are going to say store lesser number of units.

When you are going to store lesser number of units your investment is also going to go down. Number of orders let us work out. In this first case we have worked out is 7.81. Here it will be 17.58. Here in this case will be 20.27. Here in this case will be 49.50. And here it will be 35.01. So total number of orders will be how much? 130.18. What was earlier, number of orders? 111.47. So it means now there is a difference in the in the orders.

So almost there is a 19 orders have increased and when 19 orders will increase multiplying it by 25 so it means your ordering cost will increase. Number of orders per year. So we have means this is the number of orders per year we have calculated. We have now calculated the order size. We have calculated the number of orders and now let us calculate the ordering cost. Here the ordering cost will be we have already calculated for A. That was 195, not 192, that is 195.

So 195. So if it is 195 in the revised case, 195.25 we had already calculated. In the previous slide we have calculated somewhere, ya 195.25 we have already calculated. So this is the one. Then it is 439.50. Then it is 506.75. And then it is 1237.5 and it is 875.50. So this is going to be the total ordering cost. 195.25, 439.5, and then it is going to be 506.75, 1237.50, and then it is 875.50. So total ordering cost becomes Rs. 3254.5, 3254.5. This is the total ordering cost.

Now let us calculate the carrying cost. For calculating the carrying cost we need the revised say average inventory. And revised average inventory is the half of this. So it is going to be how much, 96 units. In this case it is going to be how much 64 units. In this case it is going to be 148 units. In this case it is going to be how much 303 units. And in this case it is going to be how much 642.50 units.

So this is going to be the average inventory or the average number of units we are going to keep; 96 units, 64 units, 148 units, 303 units, and 642.5 units. This is going to be the new average inventory. So investment in the inventory is going to be how much? We will have to multiply by

the price. So what is the price of this per unit price is how much? Per unit price is somewhere that is per unit cost is going to be 7.5.

So if you calculate that with the help of that so investment in the inventory is going to be how much? 720 right? Then it is going to be 1600. Then it is 1850.00. Then it is how much 4545.00 and then it is 3512.50. This is going to be the total investment. This is 720 then 1600, 1850, 4545, 3512, sorry this is I think wrong. There is something wrong about it. So we will have to check it again. Here we will have to see that it is not 35 it will be something else.

So it will be this will be something I think 3212.5, 3212.5. So it is 720 then it is 1600, 1850, 4545, 3212.5. So this total will become how much? This will be something like say 11927.5, 11927.25. It will be something like 11927.5. So it means what was our ratio. We have already calculated the ratio and we have calculated the total amount that is the restricted. Now the working capital available was 11,937 which is we have worked out here is which is nearer to this figure and this difference of the 9.5 Rs is just because of the rounding off.

So it is exactly we have calculated the same way. So it means the new investment which is available to us, new capital, new funds available from the bank how we are going to make use of that is that we are dividing we are apportioning this way. So earlier if you talk about the investment in the inventory here was 840. Now it is 720. Earlier it was 1875. Now it is 1600. This was the investment in the inventory.

And if you talk about the next one then it was 18 sorry earlier was 2162. Now it is 1850 it is reduced. Earlier here was 5310. Now it is 4545 and it is earlier it was 3750 now it is 3212.5. So this is the reduction in the investment. If you total it up it works out as the same thing. But we have calculated as the ratio of the restricted working capital to the unrestricted working capital. Now let us finally calculate the carrying cost.

That is important for us for the analysis. So carrying cost here is we are multiplying the this investment by the say 0 sorry 0.20 or maybe by the 20%. So 20% of this 720 is 144. Then it is 320. Here it is 320, then it is 370, then it is 909, and then it is 642. It is 642. Then it is 642. It is 6

sorry this is 642. So 642.5 right. So this is going to be the carrying cost for all the 5 items; 144, 320, 370, 909, 642.5. So this total works out as 2385.5, 2385.5.

So now what is important for us? Out of this analysis something important to us is that if you call calculate the total cost one cost is important to us and this is another cost which is important to us. So we will have to take these 2 cost. Because sum of these 2 costs, this is the ordering cost which has increased, this is the carrying cost which has come down right. So we will sum it up and see what is the total cost.

And we will find out what is the cost what was the total investment cost earlier. So we have not calculated that cost, what was the total investment cost earlier. So we will try to find it out what is the ordering cost or what will be the what is the ordering cost earlier. So let us see here. We will make the analysis, here only we will make the analysis. So say we will call it as relevant cost. We will call it as relevant cost, relevant cost.

This is the say ordering cost plus carrying cost plus carrying cost. This will be the total cost for us. So relevant cost before. Relevant cost before I will call it as before means before the restriction was imposed. So that relevant cost before was how much. That is 2787.75 that was the ordering cost. Plus carrying cost was 2787. Earlier ordering cost was 2786.75 and then the carrying cost is 2787, 2787.40.

So the total cost becomes how much? That is 5574.15, 5574.15 is the cost of maintaining inventory or maybe the total cost of investment we are making in the inventory. Earlier cost was before the say imposition of the restriction of the working capital by the bank or say reducing the supply of the working capital by the bank our ordering cost was because your number of orders were less.

So ordering cost was less and carrying cost was high because we were investing more into the inventory because average inventory was high. So the total cost was ordering cost 2786.75 + Rs. 2787.40. So the total cost was 5574.15. Now the relevant cost after relevant cost after it is given

to you. Your ordering cost is how much, 3254.50 plus second is 2385.50. So this works out as how much 2385.50, this works out as how much 5640.00 right.

So here find out the difference. Difference in the cost of maintaining inventory, how much? Rs. 65.85. Rs 65.85. This is the cost. So it means, now you can make out, the entire analysis in front of you. If you look at this analysis you will find out what has happened, what is the result of reducing the working capital available or the investment of the working capital in the inventory and if you have reduced the investment what will happen?

This is the effect of reducing it from the EOQ level. The standard EOQ level was in case of the unrestricted working capital requirements that was say 224 units and now when we calculated it, it came down to 192 in case of the A and as a result of that we have found out that one cost has gone down, another cost had gone up. So they are not equal. They are not equal at both the levels and once they are not equal at both the levels because you see that if you find out here earlier what was the cost? Both the costs were equal.

If you look at these 2 costs, almost they are equal; 2786.75, 2787.40 they are equal. But in this case they are not equal. One cost is more, ordering cost has increased and carrying cost has gone down. So this disturbance in the symbiosis or this disturbance in the say you can call it as this the 2 lines that is the carrying cost and your when we find it out that when the carrying cost is something like this. So this has not remained now this at this level. This has been disturbed.

One cost has gone down, another cost has gone up. So we are not at this level now. We are at the disturbed level. We are at the lesser level where the one cost is more another cost is high. You will be wondering that how we have calculated the say before the carrying cost. So what was the investment earlier?

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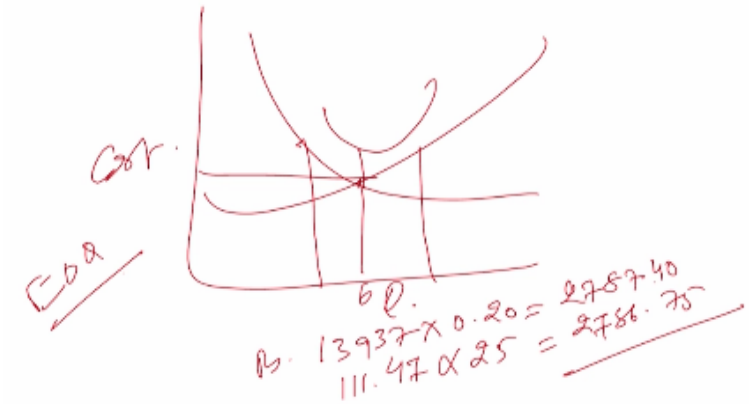

We were making Rs.13,930. So we have multiplied it by 20%. So this worked out as how much? This came up as 2787.4 and how much were the total number of orders. Number of orders we worked out were 111.47 and multiplied by the per order cost that is 25. So that was 2786.75 right. So this was the cost how we worked it out and we have used it in here we have calculated this cost. We have used this cost here. So you see both the costs are equal.

And that is the beauty of this model that both the costs where both the costs are equal when they intersect with each other. So we are able to find out that this quantity is going to be my EOQ level or this is going to be my quantity which is the standard quantity I am going to buy and sorry this is the amount of the this material I am going to buy this is the quantity we are going to buy. So it means what has happened? These are the costs.

This is not the quantity but this is the cost. So here it is the cost, not the quantity. So it means it is the cost. This is the cost, this is the quantity. So your quantity when you are at this level and your cost is this much. When you go up to this level your cost will increase. When you come out from this level to this level so what we have we have seen the structure earlier. At this level the costs are going up. At this level only this is the lowest, this is the minimum cost.

So that is the EOQ level that is the standard EOQ level but because we got the working capital supply restricted so we could not have the same amount that we had earlier from the bank. So

because of that reason we are unable to maintain the same level of EOQ and because of that what has been the result? The result was that your overall cost of maintaining the inventory has gone up, not very seriously, that is by Rs. 65.85.

But look this is a small example we have taken the figures, small figure, small case, small examples. But in the real life scenario you see when the when the firms are making investment worth thousands of the crores or maybe it is a very big company and if there is a restriction imposed by the bank. For example the existing say amount allowed in the investment of the inventory by the bank is say 100 crores.

And now they say that it will not be 100 crores you will be having now the 70 crores. So there is a reduction by 30 crores. So it means due to that reduction of 30 crores of the funds into maintaining the inventory what will happen? Your total cost will means will make a day night difference. So that is the problem. Here is not the problem. We have seen here total cost is going up. So when the total cost is going up so what will happen? Either, you have 2 ways.

Either you you go with the same thing what we have done here and you have increased the cost right? We have seen here the cost has gone up. This is the one outcome. If we want to avoid this kind of situation what we have to do is we have to use the working capital provided by the bank that is 11,937 and the remaining amount has to be arranged from the other sources so that the cost escalation here as we have seen in this case can be taken care of, can be checked or can be reduced.

So this is the outcome. So you think in terms of a multinational company or a very big company who works at the national level and serves the market like India. That is a market of say millions and billions of rupees. So in that case that makes a difference. So what we have to do is they have to be very careful that anytime if restriction is imposed by the bank because of certain unavoidable reasons what we will do, we will have some alternatives.

So from the internal funds or maybe from the funds borrowed from the other sources the investment can be made. Or the third alternative can be long term funds can be diverted for some

period of time for the short term needs so that if we are going to pay the increased cost of the long term funds we are going to save here because we are not going to allow the inventory management cost to go up.

So that way we can see that we have to strike a balance and if it is possible either way it should be done, it should be followed, it should be observed. So this is how we deal with the situation that if any restriction is imposed by the banks on the supply of working capital on a particular current asset then how to deal with that situation. Remaining some more other aspects with regard to management of inventory the first most important current asset we will be talking in the next class. Thank you very much.