Working Capital Management
Dr. Anil K. Sharma
Department of Management Studies
Indian Institute of Technology-Roorkee

Lecture - 23
Rationing of Working Capital -1

Welcome students. So in the process of inventory management now we come to the question of funding the inventory; whatever the level of inventory we have decided to build up. Million dollar question is how to fund the inventory, from where the funds will come which will be used to fund the inventory or the funds to be investment for building a given level of or optimum level of inventory.

See when we talk about the different sources of the finance I will discuss with you later on after we finish the discussion on all the assets when we will come to the liability side then we will talk about all the sources of finance, sources of the short term finance or sources of the working capital management.

But in case of say manufacturing sector in India when there is a need of the working capital management for funding the different current assets maybe it is the inventory maybe it is the credit sales, maybe keeping the cash or paying in advance as a prepaid expenses, though we have 9, 10 sources around the globe 9, 10 sources are available for funding the say inventory requirements of the companies.

But in India the most prominent source which is used for funding the inventory or the funds which are inventory investment in the inventory they come from one single source or largely from the one single source that is the bank finance. See as I told you in the previous discussions or previous classes that when you talk about the sources of funds to fulfill the working capital requirements we have 3 sources.

Spontaneous finance, short term finance, and once these 2 sources are fully exhausted then we have to go for the or resort to the third source which is the long term sources of the finance and investing long term sources to fulfill the short term requirements. That is the third source but that

should be used as minimum as possible. Now spontaneous finance is the first thing which is used to fund the inventory.

Because when we buy the inventory when we buy the raw material, we buy it from the suppliers and suppliers are asked by the companies by the manufacturers that they should supply it on credit because this is symbiosis. Manufacturer gets the credit from the supplier and he gives the credit to the buyer. So once he is expecting the credit from the supplier he is bound to give the credit to the buyer.

And if he is bound to give the credit to the buyer he is also have he also has the right to expect the credit from the supplier. So supplier agrees because they have a long term supply arrangements with the buyer and the between the buyer and the sellers. So seller also gets the long term agreement, long term opportunity that yes if I am having the acceptable terms of in this agreement.

And if I get the long term supply orders from this particular company it is good for me also and I would be giving some credit period to the company but if my payment is safe and company is ready to pay some interest also for the credit period how say bad it is for me. But his capacity is also limited. So part of the funding of the inventory comes from the supplier. But the supplier's funding is largely about the raw material.

After that when the raw material comes and it goes to the manufacturing process you have the inventory of WIP also and you have the inventory of the finished goods also. That inventory of the finished goods who will fund that inventory of finished goods. So after the spontaneous finance is over or the credit available from the supplier is over, that source is fully exhausted then we have to resort to the short term sources of the finance.

And as I told you there are 9, 10 sources of finance around the globe, around the world which firms use in the different countries in the different parts of the world. In India also largely now after liberalization most of these sources are available. But only one source is used to the

maximum possible extent and that source is the bank finance. Reason for that is that it is easily available as compared to other sources.

It is cheap also, easily available also, more regular, more secure, and comparatively cheaper source of finance. So companies resort to this source of finance. Other sources even the bank finance in detail I will discuss with you later on but here in the passing reference I can tell you that funding of inventory once that source spontaneous finance is over second important source is the bank finance.

Now when the banks fund the inventory banks not only funding the inventory, bank funds the all working capital requirements of the companies, the manufacturers. They fund the inventory also. They fund the credit sales means accounts receivables also. People can withdraw cash also from the bank account or from the sanctioned amount and they fund the prepayments also to the extent it is possible.

The total amount sanctioned by the banks for fulfilling the short term requirements of the of the manufacturers, bank is supposed to divide that total amount sanctioned into the different assets that this much amount out of the for example bank sanctions the say total working capital help or assistance. I do not call the name or the mode of delivery of those funds that can be any. There are the 3 modes of providing the funds.

One is the cash credit limit. Second is the working capital loan, and third is the discounting of the credit sale bills. I have talked to you something about the credit sale bills in the previous class also but I will discuss it again. So one is the CC limit, second is the working capital loan and third one is the discounting of the credit sale bills. Now most prominent, most light preferred source for the manufacturer or for the borrower is the CC limit.

Because the beauty of the CC limit is that when the CC limit is sanctioned by the bank to the borrower or to any manufacturer, in that case a certain sum mutually agreed by both the sides is sanctioned by the bank say for example 1 million, 10 lakh rupees are sanctioned as a CC limit

and an account of the borrower is opened by the bank in the said branch and an amount of 10 lakhs, 1 million is credited or provided in that account.

Now that amount 10 lakhs should be used for the different purposes means for financing different assets in the different components like part of the 10 lakhs can be used for funding the inventory. Part of the 10 lakhs can be used for funding the credit sales. Part of the 10 lakhs can be used for the prepayments. Part of the 10 lakh can be used for making the payments as a cash. Now when it is a divided sum for example out of 10 lakh rupees bank says that half of the amount, 5 lakh rupees, half a million can be used for funding the inventory.

Half a million can be used for funding the inventory as and when you want to buy the inventory you can withdraw money from this account and then you can make the payment. But that is true to the suppliers. So it means 50% of the funds are available out of CC limit. Half of that 1 million rupees that is available for paying the making the payment to the suppliers and that can be used for supporting the inventories.

Now in this case, this is the normal situation. Banks when sanction these limits this is the normal situation. But sometimes when the credit flow squeezes with the banks when the credit supply with the banks gets affected then the funds available with the banks to be provided as a loans or the working capital limits or working capital loans the people gets restricted. Then those restrictions, shortage of the funds also affects the working capital funds to be provided by the banks to the manufacturers.

So what the banks do, that for example bank has for example 50 crores normally but because of some credit restrictions maybe from the different sources because normally the funds come to the banks from the deposits maybe under the different say regulations of RBI that fund which is available with the banks to be invested in the market as loans that keeps on say fluctuating.

So because of some changes in the economic or in the monetary policy by RBI or some changes in the CRR or some other say monetary changes, monetary policy changes by the RBI if there is a there is a reduction of the funds available with the bank. There is a restriction on the funds or

surplus funds or the funds investible funds available with the banks then the impact of that restriction comes on the different CC limits also.

Banks also say pass on those restrictions to the different CC limits also and they start rationing the loans or the working capital funds or the funds provided through the cash credit limits to the different manufacturers. So that is called as restrictions of working capital by the banks or rationing of the working capital by the banks whatever the name you call it as but for example earlier it was 1 million.

Now the banks can say that we are reducing your limit for the time being. It will not be now 1 lakh you can only withdraw up to 8 lakh rupees. Now what is CC limit, how it works, I will discuss with you later on but see this is the limit that up to earlier up to 10 lakh rupees somebody can withdraw and use the funds for fulfilling their working capital requirements but now the restrictions are imposed.

And because of that restrictions on the availability of the funds with the banks, banks have further passed on those restrictions to the borrowers and CC limits are restricted from the or brought down, CC limit is brought down from the 1 million, 10 lakh to the 8 lakh rupees. It means there is a restriction of 2 lakh rupees. The CC limit account has gone down by 2 lakh rupees and now only 8 lakh of the funds will be available.

So it means when 8 lakhs will be available it will have the impact upon all the assets. Inventory will also inventory funding will also be affected. Credit sales funding will also be affected. Prepayments say financing will also be affected. Similarly, the cash position will also be affected. So that situation is called as the say rationing or restrictions of the working capital imposed by the banks on the different manufacturers.

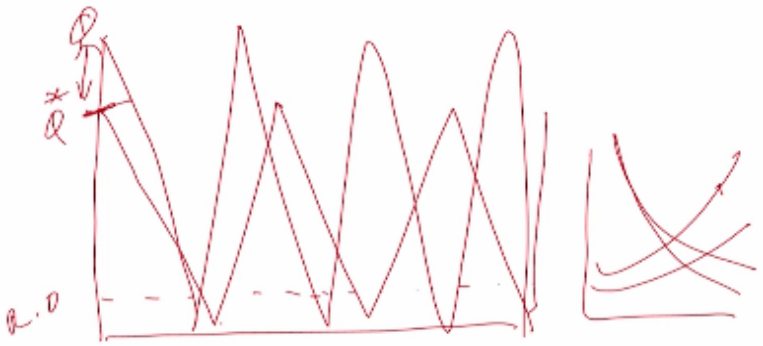
So now we will discuss here that if this kind of the situation arises and any kind of the restrictions are imposed by the banks on funding of the inventory maybe of the raw material, maybe of the WIP, or maybe of the finished goods then how the company can deal with that situation.

Now roughly without going further into detail you can easily make out that we discussed in the previous class that we decide the level of inventory to be maintained at one particular point of time that is by following a technique of inventory management which is called as EOQ, economic order quantity and that economic order quantity we find out by taking into consideration different cost. Largely the costs are two.

One is the carrying cost, the investment made to fund the inventory and other is the ordering cost or the setup cost. Now what will happen? We have decided this EOQ and EOQ is that the EOQ level of that we have seen the saw tooth picture and the Q level we are deciding that is the economic order quantity or that is the economic quantity we wanted to buy where both the cost are equal. But now because the restriction of the funds available so what will happen?

That Q level will go down. Now for example if you see here. Our Q level will go down and in this case when you talk about the Q level this is the level we decided here.

(Refer Slide Time: 13:11)



Here it is our Q level in the normal course and this where this structure was going on as we have seen in the previous classes this was working like this. This is our Q level. But when the restriction is imposed by the banks and the funds are not available so what will happen? This Q

will come down to this place. So now our structure will come up something like this, this one and this is now earlier structure. This structure we have to follow.

So this level of the Q, so it means from this level to this level the funds have been say restricted by the banks. So now you have to bring it down and if it happens so what will happen? In the next case we have decided the structure on the basis of these 2 costs. This is your carrying cost. This is your ordering cost. So what will happen? Your carrying cost will go down because we have we were investing say for example into our inventory we were investing earlier 4 lakh rupees. Now only or we were investing 5 lakh rupees. Now the 4 lakhs are available.

So what will happen? Our carrying cost will come down. If the carrying cost comes down like this so what will happen? It will increase your ordering cost. Why it is increasing the ordering cost because our requirement is Q. But now it has been revised to Q* so now we have to buy smaller amounts of the quantity whatever production process is continuous.

So when the production process is continuous but you are buying in the smaller quantities so what will happen? Frequently you have to place the orders. Frequently you have to place the orders. So it means we are keeping a small stock of inventory not that huge amount of inventory or the EOQ level of inventory. We are keeping now inventory because of the non-availability of the funds as the result of the restrictions imposed by the banks.

We will have now the Q* level, not the Q level. So our inventory level will go down and we are regularly utilizing the inventory as you were utilizing it in the past when no restrictions were there. In that case your stock will be out of we will be in the situation of out of stock or our orders will be or our level of the stock will be exhausting at the faster rate because it is it has come down from the EOQ level so we have to place the orders time and again.

We have to means put the orders again and again so what will happen; though you have reduced the level of inventory to be kept as a stock so your carrying cost will go down. Investment to be made in the inventory has gone down from the 5 lakh to 4 lakhs. So you are paying the interest

on the 4 lakhs. That cost has gone down. But because you are ordering it again and again and again because the order size has become smaller so your ordering cost will go up.

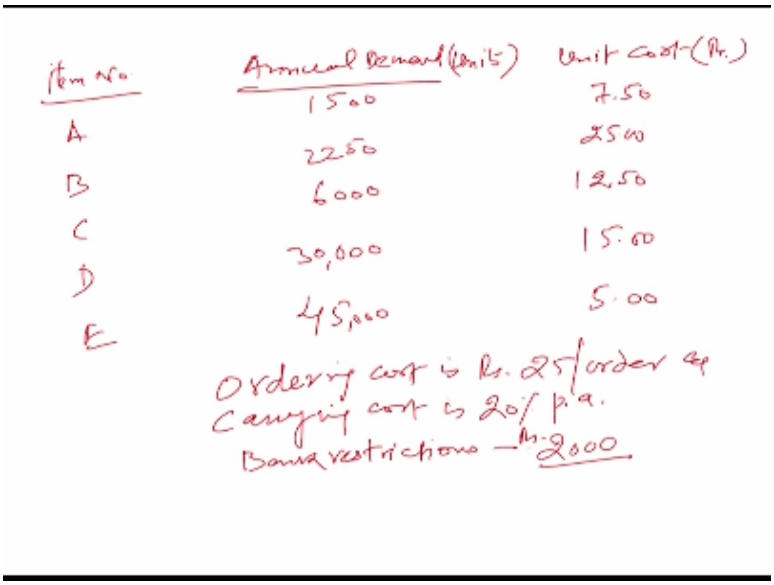
So what will happen, in that case your EOQ level will have to be changed. We have to now come down from the Q level to the Q* level and then we will have to see that not this level at this level we are and then we have we will come down for example when we will come here. So at this, this is the reordering level. So when we will come here, this is the reordering level. So when you come here you have to place the order.

And then it will not be allowed to go up to this level. It will, replacement of the inventory will take you to this level. Quickly it will come down to this level and we will have to place the order. So many orders, the ordering cost will increase and the carrying cost will go down. So earlier we saw that EOQ was when both the costs were equal. Now both the costs are not equal. One cost has gone down, another cost has gone up so we will have to bear say bear the brunt of that.

But we will have to deal with the situation. So how to deal with that situation? We will again learn it with the help of an example that if this kind of restrictions are imposed by the banks because we are largely depending upon the banks for funding the working capital requirements in India so if this kind of restrictions sometime are imposed by the banks then how the manufacturers have to deal with this situation or how they have to solve this kind of the problem we will have to learn this today.

So we will see how it happens. So for example we take the example of a company who is using the 3 types of items. Or for example they are buying the in their inventory 5 type of the items they are using and these items are for example we take here as the item number.

(Refer Slide Time: 17:31)



And then we are talking about annual demand. This is the annual demand. Item number, annual demand, and then it is the unit cost. This is the unit cost in rupees. Items we have A, we have B, we have C, we have D, and we have E. We have the 5 types of the inventories we are using; 5 types of items are keeping in the inventory. And annual demand of these items is in terms of the units, this is in the units. This is in terms of units is this. This is 1500 units. This is 2250 units.

This is 6000 units. This is 30,000 units and this is 45,000 units right. We are using these units of 1500 units of A, 2250 units of B, 6000 units of C, 30,000 units of product D, and say 45,000 units of product E right. So let us see now what is the unit cost. Per unit cost of these raw material is how much. Say for example it is 7 Rs and 50 paise. It is in rupees. In this case it is 25 Rs. In this case it is 12.5 Rs. In this case it is 15 Rs. In this case it is 5 Rs.

This is the unit cost which is given to us or which is available with us. Now other costs are ordering cost is ordering cost is Rs. 25 per order and carrying cost is 20% per annum. Carrying cost is 20% per annum. These are the 2 costs right. Now if everything goes normal then we are means happy with this kind of the situation. We are using 5 kind of the materials. Units required are this much given here.

And the unit cost or the cost per unit of the different these 5 types of the materials is like this. Now bank imposes the restrictions. You call it as bank restrictions and these are up to the amount

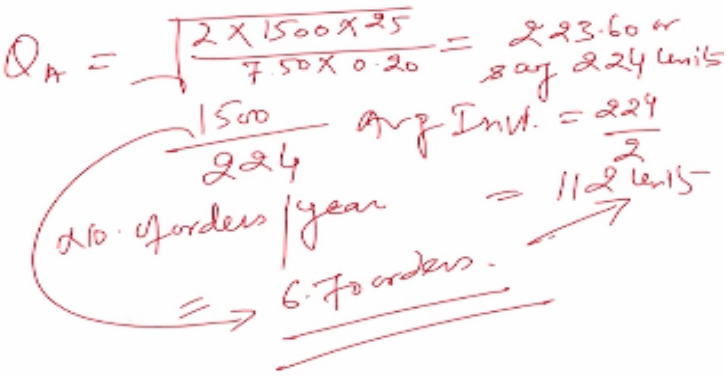
of 2000 Rs, up to the amount of 2000 Rs. Say whatever the capital was or the CC limit was sanctioned by the bank to fund the inventory to buy the inventory and to use the inventory bank was providing certain sum out of the total sum sanctioned in the CC limit.

Whatever that sum was we will find that. 2000 is now reduced by the bank. There is a restriction of 2000 Rs. We have kept a small amount knowingly just for the sake of simplicity that there is a restriction by the bank that whatever the amount you have been using to fund your inventory by borrowing from us now you will be borrowing 2000 Rs less as compared to the amount we have been borrowing in the past. Now how to deal with this kind of situation?

This is a small situation, how to deal with this. So again what we have to do is now again we have to work out the EOQ level. Economic order quantity we have to work out. First we have to work out the adjusting EOQ level out of this and then we will see that if the restrictions are imposed by the bank how to work out the revised EOQ level that is the I just saw you in the in the structure that now we have to work out this Q* level.

So how to calculate this Q* level or the revised EOQ level we will have to look for it because now the one cost is going up and the another cost is going down so it means certainly it will change your economic order quantity also. Now let us see what happens? How we will do it? First of all from the existing situation, from the existing data you calculate what was our existing EOQ. Say for example what was the Q A? If we try to find out the Q A, what was from the existing without restrictions how much was the Q A?

(Refer Slide Time: 22:05)



That is 2 into demand is requirement is 1500 unit and then the cost per unit is say sorry ordering cost is multiplied by the ordering cost is 25 and then we have the unit cost which is 7 Rs and 50 paisa and your carrying cost is we have to take here as the carrying cost is just 20%. The carrying cost is 20%. If you solve this you will work out as that our EOQ is 223.6 or you can say it is 224 units. This is the level of the EOQ or the economic order quantity.

You call it as Q level in case of the unrestricted amount available which is say originally sanctioned by the bank our EOQ level or the Q A, in case of the A was 224 units. So what we will have to do is we will have to now find out the average inventory. It means average inventory is how much? Average inventory is just when you calculate this like this you take here when it goes like this you have to divide it half.

Because this much of the investment we assume always remains invested in the this much of the funds always remain invested in the inventory. So now we will have to find out the average inventory here and when you have to find out the average inventory in that case, what is average inventory here now? Average inventory is 224/2 so it will be 112 units. So earlier when we had say 224 is the total requirement.

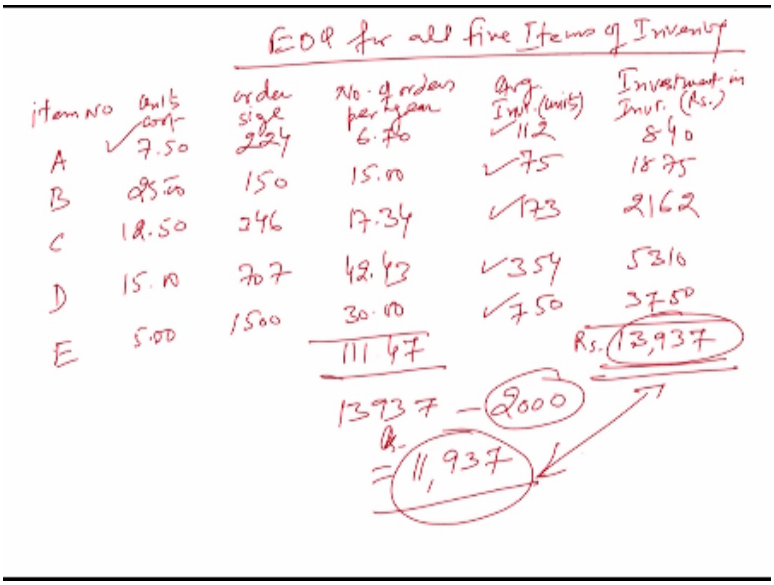
This was the total requirement 224 and what was the our cost, annual demand is how much, 1500 units. Annual demand is this much. Q level is EOQ level is 224. So number of orders we are

having, number of orders per year, number of orders per year are going to be how much? That is the same amount here and that will come out as 6.70 orders. This is the original case, this is the original situation. So we are annually placing 6.70 orders.

Our ordering cost is, cost per order is 25 per order and the carrying cost was 20% and our average inventory we are keeping here is that is 112 units. This is the original case. Now on the basis of this all calculations you first have to work out or the firm first has to work out the EOQ level for all the 5 items, number of orders.

And on the basis of the ordering cost and the total investment which is required to be made we will have to create a situation that to find out what is the existing situation with us and if there is no restriction by the bank then what will be the will be the case that how much funds are available to us and how we are utilizing these funds. Let us work out the EOQ level, EOQ for all 5 items of inventory, all 5 items of inventory.

(Refer Slide Time: 26:38)



So we will take here the item number right. This is the item number. Then we take the unit cost. This is the unit cost. Then we have to take the order size. This is the order size. Then we have to take the number of orders; number of orders per year, number of orders per year. Then is the average inventory, average inventory in units. Average inventory in units and then we have to work out the investment in inventory rupees, investment in the inventory in rupees.

So let us take all the items here. A, then it is B, it is C, it is D, it is E. Cost per unit is given to us, 7 Rs 50 paisa; 25 Rs; then it is 12.5; then it is 15 and it is 5 right. Order size as we have seen how to calculate it? 224 it was in case of A we just saw, 150 in the second case, 346 in the third case, 707 in the fourth and in the fifth item the order size is 1500 units. Number of orders per year 6.7 sorry. Number of units 6.7, 6.70. here it is 15, number of orders 15. Then it is 17.34.

Then it is 42.43. And then it is 30. Average inventory you can easily find out by from this column 112. It is 75. It is 346. So it means we have 173. Here in this case it is 354. And in the last case we have 750 this is the number of average inventory the units which are there in the inventory. Now you can easily find out the investment in the inventory that is the number of units you have here is this, this, this and this right. 112, 75, 173, 354, 750 units are there.

And what is the per unit cost, we have here the per unit cost, cost per unit. You can multiply this. So it means 112 into this much. So how much it works out. This is the total investment is total investment we have to work out so 112 units and the cost per unit is 7.5. So it means this is the 840 Rs are investment in A generally. 1875 is investment in B. Then is the 173 into 12.5. This is 2162 here and then is the next part is 354 multiplied by 15.

So it is 5310 and then it is 3750 right. So this is the total investment we have to find out and if you total it up this works out as how much? 13,927. This is in rupees. This is the total investment which is made in the inventory in all the 5 items before say imposing the restrictions by the bank this much of the funds are invested by the company into the inventory by borrowing it from the bank and now see number of orders per year is how much?

This is if you total it up it works out as this is 7, this is 4, this is 11, and then it is 18 to 20. So it means 21. So it is say 1 and it is 1. So 111.47 are the number of orders. This is the invested which is blocked in the inventory all the times. So we are utilizing the bank finance or the funds provided by the banks through CC limit. From that total limit 13,927 are say blocked in the investment or in the form of investment in the funding of inventory so it is here.

Now, this money will not be available to us, 13,927 in total will not be available to us. What will be available to us is that is 13,927 - 2000 because this is a restriction imposed by the bank. So now the amount available to us will be 11,927 right? 11,927 will be available to us now because this much is going to be withdrawn by the bank so it is 11,927 amount is there. So if this amount we have to say it is not 27 this is the this amount is not 27 I think it is 37.

So here also it is 37. It is not 27 please correct it. So it is the amount of 37 because it is 527 then it is 11 and then it is this is 17, 18, 20 ya 3. It is 37, it is 37. Here it is 37. At all the places it is 37. So now we are available with the fund that is 11,937 because 2000 are withdrawn. So if this money is left with us, not this but this is available with us it means now we have to run the show with this 11,937 rather than the earlier amount we had 13,937.

So it means the production process should be smoothly going on. Availability of the material should also be sufficiently there in the firm. The overall operation should not get affected. We have to run the show also. We have to make sure that raw material is also available. Money has also gone down. The funds available have also gone down by 2000 Rs. Here we are taking 2000 but in the actual situation it can be in crores.

So if it is restriction is imposed out of say 100 crore for example the bank says that you run the show with 70 crores it means at the EOQ level, we had worked the EOQ level at the level of 100 crores. You have to now revise EOQ level with the 70 crores. So will have to see how much difference it makes. So in this case, now available investment with us is 11,937.

So how to use it, how to run the show with this 11,937 and how to say carry on the production process smoothly so that inventory level is also maintained production process is also smooth and there is no impact of this as such to the extent we are able to manage it we would manage it but how to manage it and how to say run the show with this reduced amount 11,937 where we have the restriction of 2000 we will learn in the next class. Thank you very much.