Working Capital Management

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

Lecture-33
Limitations of Credit Time Period

Welcome students so we are in the process of learning about the extension of the credit period but there are certain limitations. And we have discussed in the previous class the first limitation that is of the marginal cost consideration. And this limitation is from the perspective of buyer not from the perspective of seller. Because buyer would not like to buy at interest rate when his say a borrowing cost from the bank is lesser than the borrowing cost which is used by the seller to load the credit sales is more.

So, in that case he would like to borrow from the bank and then pay directly to the seller. So, it means he would like to borrow for a period where the marginal cost of getting more credit longer credit is equal to the opportunity cost. If the opportunity cost for his borrowing cost from the bank is lesser than the borrowing cost from the seller in that case it is better for him to buy for that much credit period we are both the costs are equal opportunity cost or the loading factor or the selling cost or maybe the interest which is being charged by the seller from the buyer is equal to the borrowing cost from the banks.

In that case it is indifferent if the buyer is indifferent at that point and because whether he borrow money from the bank and paid in cash to the seller or whether he borrows from the seller on a credit period and allowing him to allow load the credit sales with the interest both the interest rates are equal the costs are equal. But you would be more comfortable with the seller borrowing from the seller or buyer on credit for that much period from the seller because he has to not to go for any further documents when is borrowing from the bank.

So, that is the only period is the maximum period for which the borrower or the buyer would like to buy on the credits from the seller after that if the credit period is extended in that case what will happen the borrowing cost for the buyer from the seller will be much higher as compared to the borrowing cost from the bank. And in that case for him it is advisable to borrow money from the bank and then to pay to the seller after that credit period.

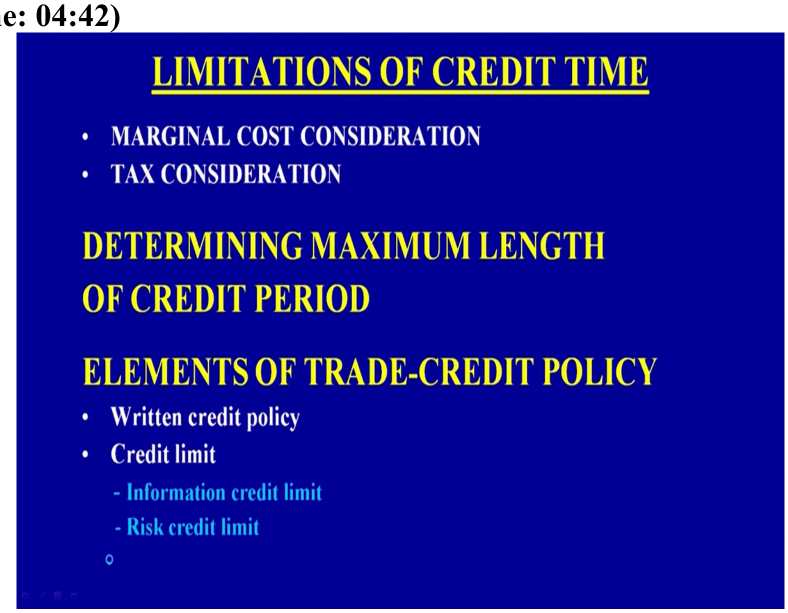
So, it means the credit period limitation is there and this is the first limitation from the perspective of the buyer not from the perspective of the seller. Seller is ready to sell for any period because buyer is of a good credit worthy is enjoys a good credit worthy position and he is having a good reputation in the market is well off, he is financial well off buyer is there is no problem to him. But there is a problem to the; he is a very good credit worthy buyers there is no problem to the seller.

But the problem is to the buyer, that the buyer will not be able to save up from the cost of the borrowing cost and buying on credit from the seller beyond a particular period of time with the opportunity cost is less than the cost of paying the interest or buying on credit from the seller is higher so, this is the first limitation. Second limitation we will learn about is that is because of the tax part or the say tax consideration.

What is that let us see that part with the help of an example say for example we have these this information is available with us and we considered the 4 credit period 3 months credit period, 6 months credit period, 9 months credit period and the 12 months credit period means is there any limitation because of the tax factor to decide the length of the credit period. Yes there is a problem because of that tax factor and how that promise comes up in the way.

And how the tax factor creates a problem in extending the credit from the seller side and how it is again a problem to the buyer also means the seller is not able to sell beyond period in that case there will be a problem to both the sides.

(Refer Slide Time: 04:42)



So, see when we talk about these limitations you were talking about the two limitations marginal cost consideration this is a limitation to the buyer because he cannot buy beyond the given period of time or a particular period of time is a tax consideration is a limitation to the seller because seller also cannot sell beyond the certain period of time. So, how it is a limitation we have seen already that is marginal cost consideration.

We have already seen that how it is a problem to the buyer and in this case we will say how is the problem to the seller. And this is coming up because of the tax factor and selling on credit for the period or other time period and then how the tax factor creates a problem that we will be considering here now which is a limitation serious limitation for the seller that he cannot extend the credit beyond the period because of this important factor which is called as tax. Let us see when you talk about the selling on credit.

Here we will have to see that being in that case seller is selling today and he is going to receive the funds after a certain period of time and that is it in period of time is the credit period allowed by the seller to the buyer the funds are going to be back with him the end of the credit period. But in India we follow the advance tax payment system it means it is assumed and it normally happens also in the market that when any sales are made by the seller in the market whether it is on the cash or it is on the credit seller is supposed to pay the advance tax on those sales to the government.

So it means the Indian corporate tax system is the advance tax payment system and that is paid quarterly after every 3 months. So, for the ensuing quarter the taxes to be paid in the beginning that for the next quarter the taxes to be paid in the beginning of the quarter this way for all the 4 quarter the tax is paid in advance by the sellers in India and at the end of the year then the total calculation is made that how much actual sales the seller has made? How much tax has in advance when paid by the seller?

And how much tax was due to be paid if yes paid less tax will pay the balance tax to the government. If he has paid more tax then the; say he is supposed to pay that he will get the refund of the tax. So, because of this advance tax payment system there comes a problem in extending the credit to the buyers. Because here the problem is that you see that when the seller is selling he has to pay at the point of sales to the government one component that is called as a tax.

So, if somebody is selling today he is selling to the buyer but he is not getting anything in return to that because those sales are for a credit period of stay 3 months 90 days it means sale proceeds will be realised to the seller back after 90 days around the 90th day earliest is the 90th day not before that. So, on the point of sale but he is but he is making the payments to first payment he is making is that is the cost of production.

He has already made the payment to suppliers of raw material, he has already made the payment to the workers has already made the payment to all these utilities, power, water and other overhead. So, that is the cost of production has already paid right. Second thing is because of the advance tax payment system he supposed to pay the advance tax on those sales. At the point of sale however the sales will be realise by him 3 months down the line.

In that case he is paying the tax on those sales also which he has not yet collected. Those sales will be collected at the end of the quarter means after 3 months but he is supposed to pay the tax today. If it is the system like in India if the seller is allowed by the government that after the collection of the sales of 3 months he should be asked to pay the tax on those sales collected then there is no problem any period can be extended by the seller to the buyer.
It is up to the buyer whether you also enjoy any unlimited period or not but because of the advance tax payment system he is paying that tax on the point of sales on those sales also which he has not collected in cash it means when we are selling on credit it is assumed that the sales are made when the sale are made sales are always made on profit, profit is also earned and the part of that profit has to be paid to the government as a tax.

So, on the point of sales, sales are made, profit is an tax is paid where as in the in the real sense nothing has happened means only sales have taken place but neither the revenue has come not the profit has been earned in cash only say nominal profit nothing not it has been out in cash and if sales are made no cash received, no profit is received in cash but if the seller is supposed to pay the tax on that in cash he has to deposit the advance tax to the government.

Then that is because of the present value of money there comes a problem in the way and how the problem comes in the way that we are going to learn here. So, because of their problem of that advance tax payment system seller cannot extend the credit beyond a particular period or be on a particular date.
(Refer Slide Time: 10:17)

Trade Credit Period

(Amount in rupees)

	3 *months*	6 *months*	9 *months*	12 *months*
1. Base price of the product(s)	10,000	10,000	10,000	10,000
2. Loading @ 24% p.a. (or 2% p.m.) (opportunity cost)	600	1200	1800	2400
3. Final price	10,600	11,200	11,800	12,400
4. Cost of sales	8000	8000	8000	8000
5. Net profit	2600	3200	3800	4400
6. Income tax @ 45%	1170	1440	1710	1980
7. Profit after tax	1430	1760	2090	2420
8. Amount payable at the point of sale (item no. 4 + 6)	9170	9440	9710	9980
9. Amount receivable after the credit period (item no. 3)	10,600	11,200	11,800	12,400
10. Discount factor @ 2% p.m. (opportunity cost)	0.9423	0.8880	0.8368	0.7885
11. Present value of amount receivables after the credit period (item no. 9 × 10)	9988	9946	9874	9777
12. Net present value (item no. 11 – 8)	818	506	164	– (203)

So, in this case we are taking the 4 time period first 3 month 2nd is 6 months third is 9 months fourth is 12 months right. You see this that these are the particulars we have taken here and the particulars the first particular is base price of the product, base price of the product means that this is total cost plus profit everything is that is the base price of the product that is 10000 rupees that is the selling price we call it as base price means the selling price of the product is 10000 rupees worth of the sales 10000 rupees worth of the sales if are to be made by a seller to the buyer and the credit period has to be any of the 4 this options.

Then what will happen base price is 10000 or 4 period 10000 loading factor is we are taking 2% per month 24 % per annum this is realistic factor. In the market when we make the credit sales seller load their credit sales with this much of the credit of the loading factor within trust factor that is 2% per month or 24% per annum. So, here we are loading those sales because we are going to make the sales on credit 10000 Rupees are being made on the credit.

So, the loading factor is two percent per month when you are loading the sales that the selling price of the sales we are going to make in the market that is 10000 rupees worth of the sales which include everything that is a cost as well as profit apart from that the third thing we are going to add up here is because sales are n credit our own credit that is the interest factor. If he is loading with 2% per month so the loading factor comes up as a causes the increase in the selling price from 10000 to 10600 because 600 is the interest which the buyer has to double up on a Credit period of 3 months.

In the second case if the credit period is extended by the seller to the buyer the loading factor becomes double because the credit period is also becoming double from 3 to 6 months. If it is becoming still further more by 3 months then the load factor become again 3 times that total loading amount of the total interest the seller will charge from the buyer will be 1800 and if it is to increase up to 12 months the loading factor will go up 4 times again 2% but 12 months it means for the whole of the year he is charging then interest at the rate of 24%.

So, it means final selling price in the column number 3 or the point number 3 final selling price is becoming has 10600 if the credit period is 3 months 11200 if the credit period its 6 months and 11800 if the credit period is 9 months and 12400 if the credit period is 12 months or the one year right. So, he is; this is the final price going to be decided but you see this final price is going to be received by him.

In the first case after 3 months in the second case after 6 months in the third case after 9 months and in the fourth case after 12 months or one year this amount is not going too received today. This is going to receive after the period of time which we are considering and these are 4 time periods. Now subtract from this cost of sales we assume that the cost of sales is 80% say in this case is 8000. So, that is same in all the 4 cases because cost will remain the same.

Cost of production we are talking about not the interest part and trust is different. So, cost of production of the cost of sales is 8000, 8000, 8000 and 8000 what is the net profit selling price is 10600 cost of sales is 8000 so net profit is 2600 first case, 3200 in the second case, 3800 in the third case and 4400 in the fourth case. Now I was talking to you the problem now it has come up here income tax we assuming here is for example the seller has to pay seller subject to pay a corporate tax or the income tax or the tax on his income is say 45% at the rate of 45%.

It is a assumed rate it can be anything it actually it is 30% but it is say for example let us assume there is 45%. So, see at the point of sales where is not getting anything in cash he has already paid 8000 rupees which is the cost of sales in terms of material in terms of labour in terms of power in terms of water and other things. And other think he is going to pay to the government bank in India the advance tax payment system that is 1170 that is 45% of his profit is going to be paid by him deposited by him in the Government treasury as the advance tax.

So, how much is the profit after tax left in the first case it is 1430, second case 1760, third case 2090 and fourth case 2420 that is the profit after tax right. Now amount payable at the point of sale how much is playing at the point of sales which is going out of his pocket. He is paying this first 8000 rupees which has ordered spent his already paid right. Second thing is that he is paying this 1170 in the first case 3 months credit period and this is going as advance tax to the government.

So the total amount which is going out of his pocket is 9170 he has already paid 9170 but not received any cash right. Now after 3 months after 3 months or 6 months or 9 months or 12 months he will receive the credit sales amount total amount right that is a cost + profit + loading factor. So, he will receive in the first phase 10600 which is the final price, in the second case 11200 which is the final price, third case 11800 which is the final price and fourth case 12400 price inclusive of all the inputs including profit. Now we calculate the present value of these sales proceeds which is going to receive after the credit period and let us discount because we have to calculate the NPV net present value. How much actually is getting that has to be calculated because say 11 10600 received after 3 months is not 10600.

Similarly 11000 after 6 months 11200 after 6 months is not 11200 certainly 11800 after 9 months is not the same amount and 12400 after 12 month was not the same amount. So, let us discount it we are discounting it at the load factor again it is the interest factor cost of capital and loading factor here is 2% we have loaded the credit sales when you are discounting it the sale proceeds we are receiving at the end of the credit period.

We are using the discount factor that is at rate of 2% per month which is again the opportunity cost of the seller. We are getting these factors and multiplying the sales proceeds we are receiving at the end of the credit period with the discount factor we are getting the present value of those sales we are receiving right. So, we receiving actually how much, we are receiving 10600.

But the value the real value present value of that is at discount factor of 2% is 9988, in the second case against the 11200 rupees received we have actually received 9946 in the third case against 11800 receive 9874 and in fourth case against 12000 we have received 9777. This is the present value of the amount we have received it means in this case how much amount was paid at the point of sale he has paid it is at 8000 is a cost and 1170 as the tax and how much is receiving now as the present value 9988.

So, 9988 - 9170 is the net present value of the total, that is how much is a cash outflow, how much is the cash inflow if you calculate the present value of both cash out flow and cash inflow we calculate the net present value that way. If you calculate the net present value that way for 3 months credit period and NPV is positive, six months credit period NPV again positive but coming down it was 818 for 3 months, 6 months it is 506 and 9 months it is 1647 further come down NPV and at 12 months credit period it has become negative -203.

Net present value requires that any project any investment proposal is acceptable to the investor if the NPV of that proposal is zero minimum if it is positive very good. But it should not at all be negative. So, in this case seller is investor here because he is going to invest his money in the credit sales. So, seller reinvesting here, he is investing 10000 + tax part on that so it means NPV is positive he is having no problem 818 is the NPV and his happy to sell, 6 months also no problem if is selling for 6 months credit period NPV is coming down but no problem still it is positive.

Even after 9 months is not at all having a problem NPV is coming out as 164 positive but when he extends the credit period from 9 to 12 months then NPV becomes negative. It means he cannot sell for a period of 12 months on credit because at this period NPV becomes negative. It means maximum length of the credit period in this case can be somewhere between 9 to12 is neither 12 months and if he want to extend it then it can increase beyond 9 months because we have a positive NPV at 9 months also.

But it can be say 10 months or 10.5 months or 11 months let see after the calculations but not at least 12 months, in 12 months NPV is becoming negative. Then in that case any project any investment proposal which is giving us a negative NPV with that we do not consider that proposal worthwhile for investment so, we will not make any investment here. Now why this problem has come as credit period is going out.

The NPV is coming down why this problem has come up here just a million dollar question now we have to see and this is creating the problem this is the limitation here. Why it is happening like say because you see that if you talk about that credit period here we are extending from 3 to

12 months at the important components which we have here are some of the profit and the other sales consideration is we have to recover first the selling price that is 10000.

Second thing is the loading factor that is the interest cost for which the credit is going to be extended up total this recovery has to be there but in this case why it is happening so because of the tax factor because he is asked or he is supposed to pay the tax on that amount which is say the profit is no problem. He can pay the tax but on the loading factor also he supposed to pay the tax loading factor is his interest cost.

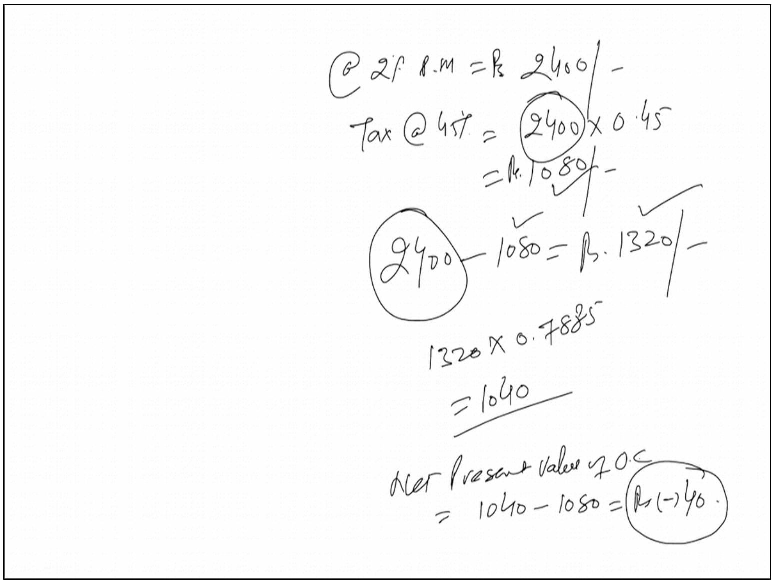
He should not be supposed to pay the tax on that but he is supposed to pay the tax on loading factor also so that is a bone of contention. One problem is that and the first problem is there is a second problem; first problem is that is because of the advance tax payment system. He is being asked to pay the tax in advance. So, it means here at the point of sale we are saying how much is paying he is paying at the point of sale is 9170.

He is not paying at the point of sale only 8000 if the if the system allows him if the tax system allows him that ok you sell on credit and on the date of collection or after the collection of the credit sales that means that is at the end of the credit period from the sale proceeds what are the profit you are earning you have to pay the tax and you pay the tax after your sales are realized then there is no problem at all.

That I can say that even after 12 months period also the NPV will be positive even after 12 months period also which is a very, very lengthy credit period 12 months credit period the NPV we will be positive but because of this issue that he is going to pay the advance tax to the government. So, he is going to shell out too important components he is going to shell out 8000 rupees which is his cost of sales.

Second thing is, he is going to pay the tax in advance on that profit which he is self as not received in cash on that day because of the net value net present value problems if you calculate NPV out of that the total transactions in that case will say that because of the service tax payment system NPV is becoming negative at the 12 months credit period, if he is allowed to pay the tax. On the collection of the credit scenes maybe after 3 month maybe after 6 months maybe after 9 months or maybe after 12 month in that case even after 12 months NPV will be positive.

(Refer Slide Time: 24:05)



How let see that that is how the NPV will be like we will assume here for example what is the gross realisation after 12 months is going to be how much is going to realise how much that is 12400 this is the amount which is going to realize 12400 going to realise that is 12400 at the point of not at the point of sale but gross validation after 12 months he will be getting 12400 so right.

In this case the when we talk about this total amount then less tax how much tax is going to pay less income tax. Income tax we have already calculated here what is income tax year that income tax in 1980. So, in this 1980 let subtract that let him pay his 1400 from the buyer then he will make the payment of the tax which he has to pay on the on the profit income taxes 1980 he will be paying this. So, it means net realization is how much net realisation is how much is getting that is 10420 he paid the tax after the realisation of the sales proceeds after 12 months which was 12400.

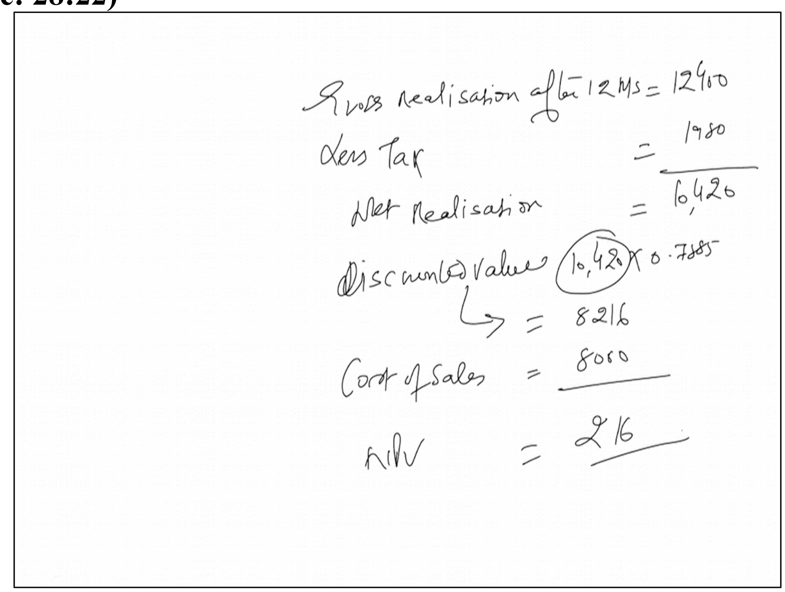
And on that he is paying that tax that is 1980 supposed to pay on the profit which he is earning anyway all the calculated this tax part and then net realisation to him is 10420. Now you discount this and discounted value if discount this so this will be somewhere 10420 into discount factor is what is the discount factor here discount factor is here that is 0.785 if you discount with this factor, this amount will come out as say something like this 8216 net realization we can call it as a discounted value of the realisation we have got is which is 10420.

And what is the cost of sales here is this is 8000. So, what is NPV now net present value this is 216 positive. So it means because of the advance tax payment system in India the credit period cannot be extended beyond a particular length because of advance tax payment system after certain period of time that net present value earned by the seller on that investment on credit sales becomes negative because of this particular effect of the advance tax payment.

Now you see that problem is structure more aggravated because of an important thing why that that important thing is the problem is furthermore aggravated when he has to pay the tax on this loading factor also this 2400 here. In this case that is the time in case of your say this loading factor 2400 is his interest cost that is not his profit. But he has to pay the tax on this loading factor also and that too in advance.

So, because of this reason he is ending up paying more tax even on the loading factor also he is ending up paying more tax as compared to what is earning from this interest income after loading the credit sales. Let us see how it is happening and how it will do something like we did not here that say for example we are talking about the opportunity cost for 12 months.

(Refer Slide Time: 28:22)



And how much is the load factor he has used at the rate of 2% per month he has total amount which the credit sales you have added with this rupees 24 100's that is 2400 right and on this is being the tax at the rate of 45% how much is paying? He his paying 2400 the 5% 45 of that is how much that works out as 1080 this is rupees 1080 he is paying. What is the total tax he is paying out of 2400 which is his interest cost 45 % taxes paid and that 1080 out of this loading factor has gone to the government test tax and that too in advance right.

After paying this check how much is realising? He is realising 2400-1080 so how much is come it is coming to him, amount coming to him is that is 1320 this amount is coming to him. And if you calculate this amount is coming to him when he is paying this 1080 at the point of sales. So it means there is no loss of present value to the government 1080 means 1080. But this amount is coming to him after to 2400 is coming to him after 12 months out of this has already paid 12 months back 1080 is a tax to the government.

So, in fact he is receiving from this which already is gone this amount is gone it mean is he in fact is receiving 1320 and now you calculate the present value of this 1320 into this 0.78 what is a factor here 7885. So, if you calculate this then this works out as 1040 what is the net present value of this opportunity cost NPV of net present value of opportunity cost is that is 1040. How much has gone to the government 1080 so, NPV of the opportunity cost is, if you see here the NPV of the opportunity cost is that is rupees -40.

So, this is because of this particular problem the net present value becomes negative and the problem is further more then he has to pay the tax on is opportunity cost then this NPV is negative after 9 months may be not after 9 months but at the exactly at the 12 months credit period. And we have seen already in the previous this calculation that if he is allowed to pay the tax after the realisation of the sales after 12 months.

Then even after 12 month maybe 3 months 6 months 9 months for 12 months even after say the period of 12 months NPV will be positive which we are seen here is 216 here and hear the reason for this problem which we are seeing here is the NPV which is negative that is of the opportunity cost that is a loading factor, loading factor is cost not his income and on that also he has to pay the tax, advance tax and because of that NPV becomes negative had the 12 months credit period. So, how much should be the real credit period? How to work it out and furthermore discussions will be talking in the next class, thank you very much.