Working Capital Management
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Lecture-51
Miller and Orr Model contd. and Cash Management Techniques

Welcome, so we are in the process of learning about the implementation of the uncertainty model and how to calculate the z point and the h point. So, in the previous class I gave you this problem that we have say if 7 days in the daily balance is we have positive some balances are positive some balances are negatives, sometime we have surplus sometime we have deficit and then we have the minimum cash balance which will be required to maintain this 10,000 fix cost is 1600 rupees.

And return on the marketable securities 10% per annum, then how to calculate the z point so, for that now we as I told you in the previous class we have the 2 values that is b and i is available with us. But s here is not there that is the various we have to calculate., So we have to calculate the variance of the daily cash flows or the daily cash balance is which will capture the your fluctuations.

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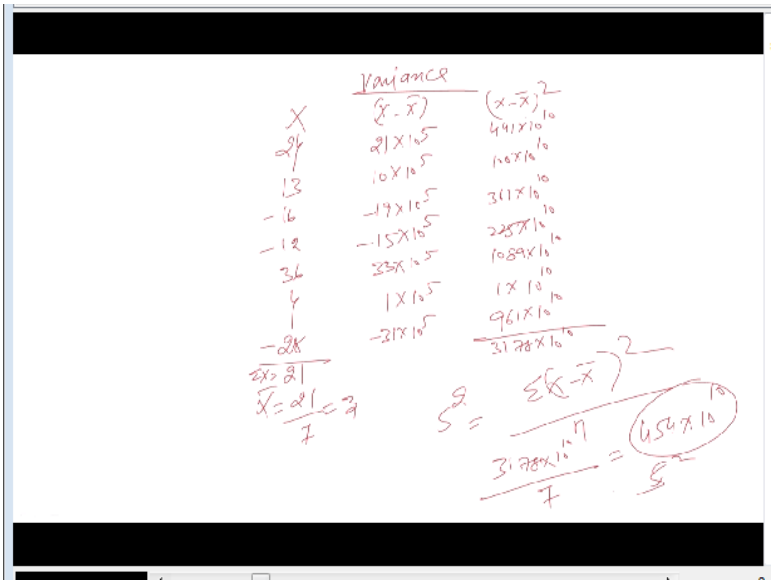

So, in this case we will be and let us write all these balance is again it is 24 access 24 then it is 13 it is -16 then it is -12 then it is 36 and then it is 4 and it is 28. I think these are the balance is let

me cheque the balance is again 24, 13, -16, -12, 36, 4 and -28 this is -28 right. Now you have to take the sum of this to calculate the variance we have to calculate so, this is the x and if you take the sum of this, this works out is how much this will be something like this say 21 I think the sum is 21.

So, you can say that is sigma x is equal to sigma x is equal to 21 so for calculating now the bar you can call it is x bar you have to calculate the x bar so, for calculating this you divided by 7 number of n means that is the x divided by sigma x divided by the n. And that is x bar is 3. So, if you calculate this you means you are able to find out the x bar is 3. And means now we have to take is the x-x bar.

We have to calculate the variance x-x bar is equal to simple variance is nothing new about that. So, but you have to take is but this is in the lakhs of rupees. This is in the lakhs of rupees 240000, this is in the lakhs of rupees I think I have written here that is in the lakhs of rupees so, it is lakhs.

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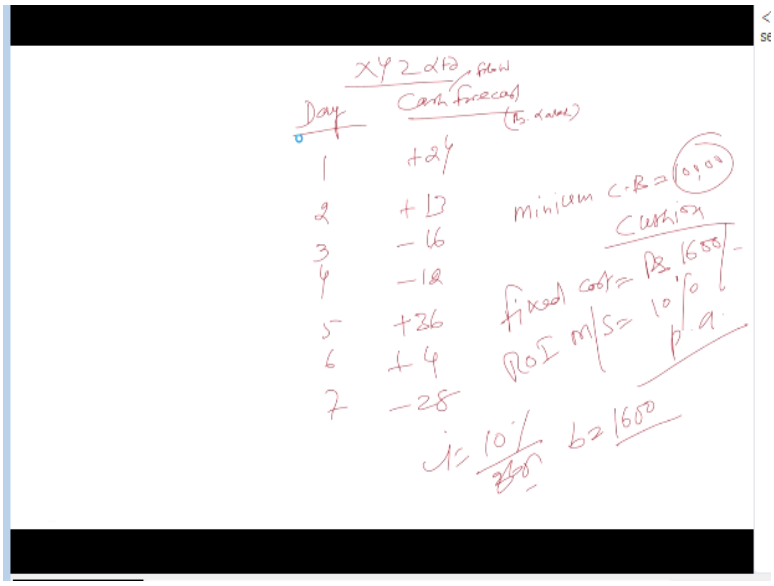

So, we are not signifying lakhs here we have to signify the lakhs so, x-x bar so, how we are taking it here that is x-x bar is 20 x is 24,-x bar is 3. So, it is 21 and has to be signified as lakhs so, 10 rise to power 5 here in this case it is 10 into 10 rise to power 5 here in this case it is going

to be how much it is 19 and again 10 rise power 5 signifying lakhs. Then it is 15, 10 rise to power 5 and then we have to take here is this is the 36 x-x bar is so it is not 36, but 33.

So, this is 33*10 power 5 and then we have 1 is here in this case you would take it is 1*10 power 5. And here in this case it is -31 10 rise to power 5 right. So, this is x-x bar, now you have to calculate the x-x bar square if you square it up then what would you do is you will have to square up everything. So, it means in this case will become how much 441 power 10 rise to power 10, here it is 100. So, it is again 10 by power 10 then it will become how much 361*10 power 10, this will become how much that is 225*10 power 10.

It is now the says square of the lakhs also and then it is 1089 10 power 10 and then we have 1*10 power 10 and then we take as the 961. This is the 961*10 rise to power 10, if you sum it up x-x bar square this works out as how much 3178*10 power 10 right. This is the total square you can call it as and for calculating the say s square but you have to do is that is sigma x-x bar whole square x-x bar square/n.

So, it means here if you take the n here so, what is this sigma this will be something like this 3178*10 rise to power 10, 3178 10 rise to power 10 n/7. So, this will work out as how much that is 454 10 rise to power 10 right, this will be 454 10 rise to power 10 this is the value of S square. This is the value of S square. So, this is the variance of the daily cash flows we have formed out here.

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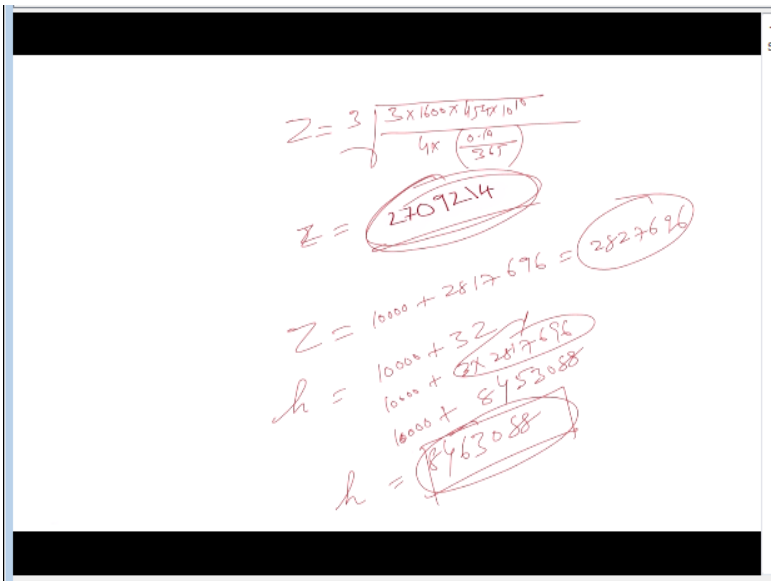

And now let us find out put these values in the model and the model is what for calculating the z the model is something like this that is the cube root of 3 b s square what is the b value of the b is 1600 and what is the value of s square, value of the s square is 454 10 rise to power 10 right. And then you divided by something 4 into daily opportunity cost that is 0.10 that is 10% and divided by 365 to find out the daily opportunity cost.

So, if we solve this if you take the cube root of this if you solve this that is 3*1600*454*10 rise to power 10 divided 4*0.10/365. So, it works out as how much this will be come out as z will be something like this. So what was our distribution whether it is nearer to the distribution or not. It must be nearer to our distribution because we have the highest value of 36 and the lowest value of 4.

So, it means the variance which we have found out and some of the balances are negative some of the balances are positive. So, once we have calculated the value of z here that is 281796 that is seems to be correct. But now to find out the value of z here finally we have a question also, we have assumed that we will have a question. So question means 10,000+2817696 this total will become the value of z that will be 2827696 this is the value of z right.

Now when you calculate the value of h it will be again something like this 10,000+3z. So, you have to take the multiplication of this 3. So, it is 10,000+3*2817696. So it will becomes

something like 10,000+ how much is the product of this, the product of this will be something like 8453088 right. And into this if you added it up so value of the h will be finally 8463088 rupees.

This is the total the upper control limit this is the value of the h. So, it means here we have all the things now we found out the z first of all for that we have to find out the variance of the daily cash flows, once we found out the variance of the daily cash flows transaction cash flows with us then in similarly your opportunity cost of the daily cash balance is was with us. So we put all these values in this model.

And finally we found out that s, what is the value of z the value of z came here that is without maintaining the minimum balance. And here when we put the value minimum balance of the left hand side it was 10,000+2817696 should be came 2827696 and if you want to calculate z I was questioning you that z sorry h for calculating h you have to take again the minimum balance out 10.000+3z and that 10,000+3z is that is 2817696 multiplied by 3. So, this works out as 8453088.

And again 10,000+we have to do is it is a 10,000 so, do it + so, it becomes 8463088 so, this is how we can calculate these limits which were there in this model.

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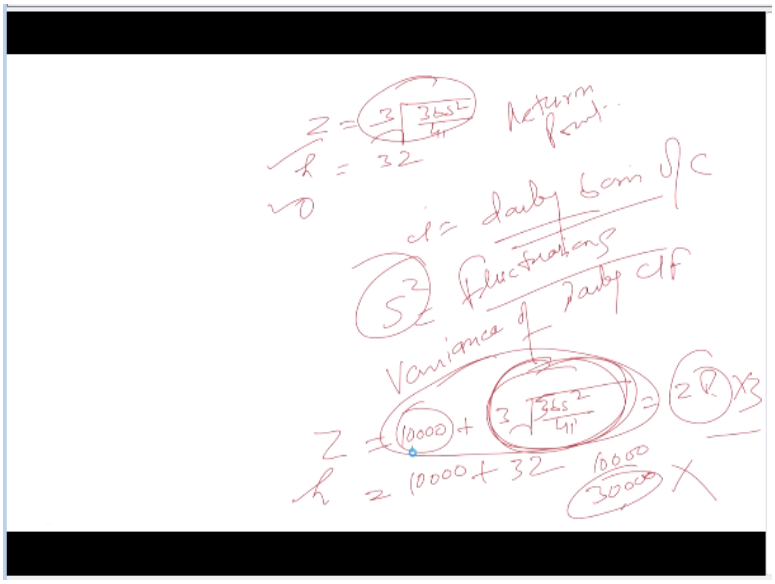

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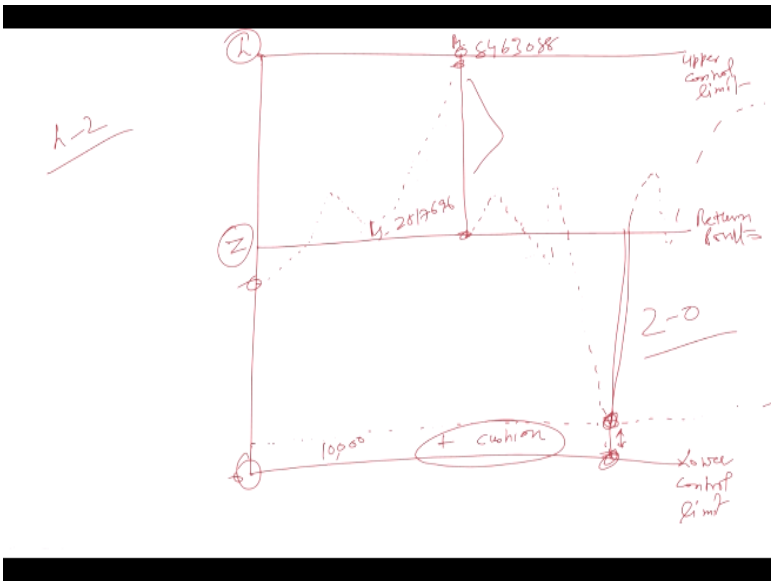

And these limits you can find out in this case you can say that is the your final limit is that z is the sorry h is the 8463088 this is the upper limit this is rupees in terms of the rupees you call it as this is here z point is how much z point we have found out here is that is the 2817696 this is rupees and this is the minimum cash balance we are keeping here is that is 10,000 right. So, if the cash goes up to 840000 or 846300 roughly or 17000 roughly.

You will not take any action you will allow the cash to go on and on this side when the cash reaches down to up to 10,000 rupees means only then the action will be taken, on the upper limit when the cash reaches 840000 then the action will be taken and here the z-h amount or h-z amount of the securities will be purchased. And in this case when the cash balance reaches not 0 but 10,000.

Then we will take the action and we will purchase the sell the securities that is to replenish the level of the cash to the return point to the z point. So, in this case finally this model works out how this model works out we have seen it here and it addresses the element of uncertainty and it helps to understand that in the genuine case when there is a fluctuation in the daily cash balance and it is not possible to find out the daily requirement of the cash.

Then how to work out the level of the cash or that optimum level of the cash. So, the optimum level of the cash and in this case we have found out is that is 2817696 and but it will not be the

only one level, we will allow the cash to fluctuate that is between 10,000 and 840000 or 84 or 850000 even up to 850000 and after 850000 we will become active and take action and on the lower level means the 4 cash drops below 10,000.

We will take action and we will say either by the securities or sell the securities and bring down the level of cash back to the level of 2817696 right. So, this is how this model works and to the difference between the 2 models that how the certainty model works, how the uncertainty model works and the limitation of the certainty model given to as by WJ. Baumol have been done away in the second model given to as by Miller and Orr that is the uncertainty model and we have seen it that here we are not only calculating the one level of the cash to be maintained.

We are fixing up the limit that is the minimum and the maximum limit of the cash and if it is up to maximum limit or above minimum limit no action will be taken. But if it is crossing the limits going up or going further below then action will be taken. And normally the return point will be that every time we will try to maintain the level of the cash around 280000. So, that we are clear about that looking at the other transaction at the value for daily transactions.

And the fluctuation in the daily transactions how much is the requirement of the cash balance to be maintained and where we are safe. So that firm is able to maintain the liquidity also and firm is not say keeping extra amount of the cash also. So, cash is also optimum and the liquidity is also at the acceptable level, cash balances are also the acceptable level. And the firm is safe in terms of the technical in solvency also and in terms of the return on the investment of the surplus cash also right.

So, these are the 2 models of the cash management that is the certainty model and the uncertainty model. Now we talk about certain other things about the cash management and these are again important things. Cash management techniques we will be talking about here something about there will be throw the light on the cash management techniques and when we will throw the light on the cash management techniques.

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So, we have to learn 3 important points that is the cash flow synchronization, speeding up the cheque clearing process using float and acceleration of the receipt. So, cash flow synchronization is that we should create a situation in the firm that we are not required to borrow the cash on a very urgent basis**.** You should that is why I say that synchronization can be ensured by preparing the cash budgets.

If we are not able to prepare the cash budget for say normally what happens that if you want to achieve the accuracy and precision in the cash budget in terms of the cash flows then the time horizon of that cash budget should be as short as possible. So, normally we prepare for monthly budget then fortnightly budget and then weekly budgets. So, weekly is the ultimate time horizon which every firm should achieve.

But initially if it is not possible then we can start with a monthly budgets. So, if we are able to bring it down to weekly budgets. So, what will happen in that case we will able to know in advance that how much cash we are going to receive and how much cash we are going to pay and what is going to the net story that is the we are going to have the surplus of the cash or the say deficit of the cash.

So, there is complete synchronization and we should try to create a situation that inflows are sufficient to pay for the outflow of the cash and automatically we are creating a situation that we

are say how much we have to pay as a cash almost same the amount we are receiving or automatically the receipt and payment processes taking place and know some on the urgent basis nothing has to be done no urgent extend has to be taken.

So, we have to ensure that proper synchronization should be there and that is possible with the help of the cash budgets. Speed up the cheque clearing process was speeding up the cheque clearing process means as I told you sometime in the previous classes also that when the cheque comes or when the cheque is received by any firm from any payer.

When any payer makes a payment and the payment is received by the firm then sometime what happens be remain careless, we become careless and most of the days number of days the cheque is lying in the drawer of the cashier or may be the person or the clerk who has received that and who whose responsibility is to send it to the bank. So, most of the time it remains there and nobody bothers about, nobody cares for sending it to the bank.

So, in this case we are because of our own limitations and not understanding the importance of the cash we are not sending the cheques immediately to the bank. So, one cause of the delays at the level of the people who have received the cheque but not sent it to the bank, second thing could be that is I told you sometime back that there are the 2 firms 1 is in Delhi and another is in say Agra and Delhi firm is the buyer, Agra firm is a supplier of the material.

But the Delhi firm is powerful firm is a big buyer. And Agra firm does not want to spoil a relations with them. So, Delhi firm gets it means accepted from the Agra firm that we will make all your payments after say 45 days or 50 or 60 days of the credit period. And all the cheques will be issued buyers by the Delhi office but they will be payable against the Guwahati branch of other office right.

So, it means why they are doing so that the cheque will be issued and will be reaching in the Agra firm office of the due date. Then Agra firm will deposit their cash into the bank and bank will send it by post to Guwahati. So, they want to put it at a place which is the forecast. So for

example in this process say receiving the cheque and after depositing the cheque by the Agra firm in the bank.

If it goes to Guwahati and comes back for example in the courier it takes 15 days time. So, Delhi firm has made the payment also and payment has not been deducted or debited from their account for the next 15 days also. So, it means they are say creating a situation this kind of the situation to the Agra firm. But the Agra firm is not that say powerful economically or may be the customer wise they do no to lose such good customer.

So, they are agreeing for it. So, normally what should be done Agra firm should try to find out the ways and means way are they are able to Delhi firm agree that please make as the payment firm Delhi office only and on the say payment should also be against the Delhi branch. So, that when we deposit the cheque in Agra then immediately within 2-3 days the payment is transferred to our account this should be done.

So, that only can be done when both the sides are at the equal level or the equal footing otherwise that situation will be there and firms will be say dictating the terms and maximizing the disbursement float that is called as the disbursement float. So, now next thing we are coming up is the using floats, float means as I told you that when we have disbursement float as I am telling you that say when any firm has to make the payment or disburse.

So, it means cheque is issued on dates a for example on first of March right cheque is issued on that for cheque is finally going to be debited form the firms account is on 10th March. Because in this processes for example cheque is going to Guwahati, coming back which is going to 10th March. So, this is called as the disbursement float right. This is the disbursement float and second float is called as collection float that is for example of same firm. They received a cheque on 1st March it was in the nearby office within 2 days.

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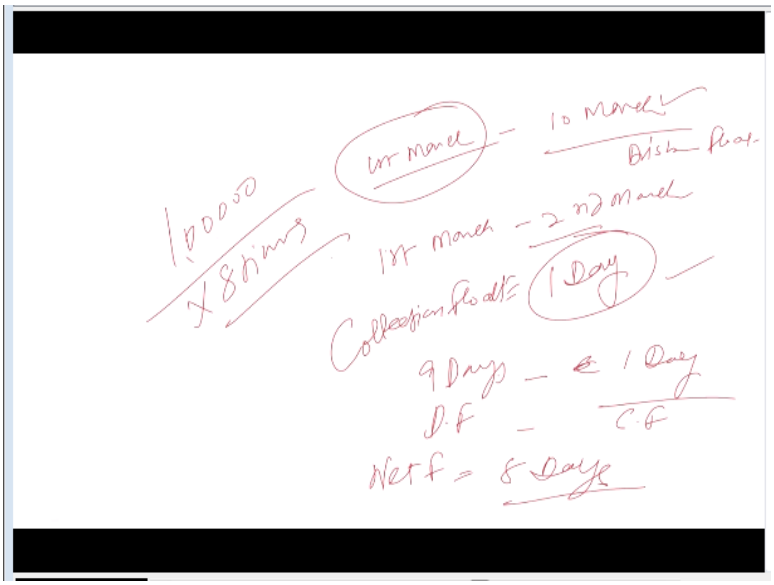

It is in the say 2nd March the cheque is collected by the firm who has received it so, it means in this case it has taken only one day in collecting the cash. So, it means collection float is how much this is called as collection float so, collection float is 1 day that we received a cheque today and we or the payer paid the cheque on 1st March and the firm sent into the bank immediately on the 2nd March payment was collected.

So, maximize the 1 day float is there where as for making their own payments that was debited from their account after 10 days. So, it means this is how much, this is 1st March and 10*9 days right. This is the disbursement float, we call it as DF-collection float or you can call it as this is 1 day and this is called as collection float CF. So, it means what is the net float, net float here is that is 8 days.

It means the firm the giving the cheque on 1st March for example that is for 100000 rupees and every day if the firm is issuing the cheque worth rupees 100000 right. So, it means the firm can do how much time 8 times more business by without keeping any cash in the bank account. Because a no that the cheque which we are issuing on 1st March that is being present it to the bank and the amount is being getting deducted or debited in our account on the 10th March.

So, it means the second day cheque issued will be presented on the 11th March, third day will be on the 12th March, then 4th date on the 13th March. So, this way they are issuing the cheques on

the different dates, they are not keeping balance in the bank. They are keeping only 100000 is the balance daily, they are not keeping. So, they are issuing the maybe you see that if you talk about the on the 10th of the March how many cheques have be issued.

They issued the 1 cheque on 1st March, 1 on the 2nd, 3rd, 4th, 5th, 6th, 7th 8th, 9th, they have issued 9 cheques of the 100000 rupees each by keeping only 100000 rupee in the cash account or in the current account in the bank they know it that it is not going to presented in the bank for the before 9 days on the 10th March. And on the 10th March also the cheque we have issued on the 1st march will be presented it means we have issued the other 8 cheques or 8 more cheques.

And they will be going to the bank over the next days. So, it means every day we will maintain a balance of 100000 rupee. So, that when the cheque comes it is past it is on and we are issuing the cheques but we are keeping the minimum balance. So, we are issuing the cheques for the next 9 days by keeping the balance equal to the 1 day. So, they are means they are managing the show very efficiently there they are considered is a good pay master also that they have made the payment on the due date where as in the realistic situation.

They have only keeping the minimum balance it is one 9th or one 10th of the balance in the of the total cheques value one 9th or 10th of that and with that they are running the show. So, it means it is a very clever way very smart way of managing the cash that by keeping minimum cash in the current account in the bank, you are issuing the maximum cheques and that you are able to do it because your net float is very high.

So, it means in this situation but may be possible you are not even say spending even say spending even a single money from your own pocket whatever the cash requirement is there that is being fulfilled from the cash receipts and nothing is coming out of the pocket of the company. So, they are not to borrow any cash from the bank, they have not to invest their own cash whatever they are receiving from their buyers.

They are part of that they are keeping in the bank account they are issuing the cheques to their suppliers and simply such beautiful synchronization of the cash that inflows are coming and

outflows are going out. So, you can see it is a true way of managing the cash spontaneously is a spontaneous way of the managing cash that without evidence in the investing even a single money.

You are managing the cash show and this no problem at all is we are issuing the cheques also on the due date cheque is reaching. Because responsibility of the payer is to make sure the cheque reach is in the office of supplier that is all, if the cheque has reached to the office of supplier after that it is his responsibility there forms the responsibility when to send that cheque to the bank when to get it collected and how much time will it take that is not the headache of the issuer of the cheque or making firm making the payment that is the responsibility of the firm who has to collect the payment.

So, here we talk about the 3 floats disbursement float, collection float and the net float. So, disbursement float is that maximizing the number of days that is the difference between the date of issuing the cheques and actually the cheques are being doubted on the account of payer collection float is minimizing the number of days that is between the receipt of the cheque and collecting the cheque by sending it to the bank.

Today you received the cheque today it has gone to the bank within 1 or 2 days cheque will be collected and the amount will be transferred into the receivers account and net float is that is the disbursement float that is in the previous case we have seeing 9 days collection float is 1 day. So, net float is of the 8 days. So, when maximizing the net float means if you are able to maximize the net float.

You are able to maximize your savings upon the cash and run the show without investing even a single money from your pocket, stop all the payments are being managed or being made from the receipts we are making from the our buyers. And payments are automatically going o the suppliers, then we have the other way one more thing to be talked about is acceleration of receipt, yes that we can use number of ways that lock box plan can also be used.

And payment buyer or automatic debit can also be there, this is a latest thing happening that we are using the online transfers, but in the business online transfers are not very popular. Because the payer also knows that payment will be immediately debited form his account and the receiver also knows that payment will be receipt. So, payer does not want to make the payment and receiver maybe insisting for it.

But online transfers are not encouraged very much in the business is most of the payments are through cheques and when the payments are through cheques it means float will be there. And the payer would like to maximize the net float where as in his case of collection he will try to minimize the collection float. Then we can have the lock box plan, lock box plan is basically a system of say putting the lock box in the different setting, if any form is working in Delhi.

And they are applying their material to the different places for example number of buyer of the firm are in Agra. So, for example there are 10 buyers of the same firm in Agra so, they are supplying them to on the credit and the payment terms are say 45 days. So, it means after 45 days all the 10 people on the different dates of purchase in at the end of the credit period. They will have to make the payment. So, if it is through the cheque system.

So, it means cheque reaching Delhi means first they will post the cheque it will reach the Delhi office. And then Delhi office will deposit in their own bank account it will go to Agra. So, it will increase the say collection float. So what they can do is they can open up their account in Agra in one branch. And they can put a box there. So that all the firms go to make to this firm payment to this firm which daily based they can deposit, they can drop the cheques on the due date.

In that box in the branch of the same companies supplying branch in the say supplying branch account supplying companies account in the Agra branch. And then those cheques will be deposited by or will be dropped in to that box by the different payers on the due dates. And this is telling instruction to the branch that every day evening please open the lock box take out the cheques and credit those cheques in our account.

So, that pay you have minimize the collection float that say cheque is also drawn on Agra branch and it is being collected in the Agra is not means wasting any time say on cheque is coming and then going back. So, it means very quickly, very smartly the firm has collected the total cash. So all the payer is given the instruction that you go to that branch in Agra. There is a lock box we have put in place, you drop your cheque and the firm and the bank authorities or the bank branch authorities have the rights to open that to take out the cheques deposit in the Delhi based firm account.

And same day or maximum means the clearing time which is taken. So for example the cheque is deposited today in the or dropped in the lock box and it is a local drawn. So maximum within I think today if the cheque is dropped and taken out by the bank say people the same day then maybe not tomorrow but day after tomorrow the bank payment will be collected from the payer's account and we will be credited to the receivers account.

So, it means without wasting any time and by having minimum collection float the total collections are made by the firm based in Delhi and on the periodical basis firm itself can operated say account online and they can transfer their payment back to their Delhi account. So it means that is in their hands to transfer the payment firm the one account to other account online.

But if you want to make agree the buyers on credit that you make as the payment on online for sometime means for that particular thing there remain reluctant that why should be make the payment online. They want to make the payment through cheque and enjoy the floats disbursement float. So it means you put the lock box system in the every city where we have the number of buyers and then you ask them to deposit the cheques in that branch lock box.

Branch people will take it out every evening send it for the clearing if it is drawn on the same bank then the same bank will be immediately crediting it to the Delhi firms account. But it is drawn on the other firms then no problem it can be easily you can say that it can be easily collected and maximum on the third day the payment will be collected and transfer to the supplying firm account which is Delhi based.

So, this way we can improve the cash management these are some of the techniques of the cash management that is cash flow synchronization, speeding up the cheque clearing process using the floats and maximizing the net floats and acceleration of the receipts that is why insisting for the online payments or for the installation of the lock box systems. So, with this we say complete the discussion on the cash management.

And we have learnt something about the cash management is about that cash should be flowing in the firm not as I just talk there is difference between the cash profit and the cash stock or profit and cash. So, we should not means get satisfied with the profit. But with the cash profit and to deal with the say balance of the cash to be maintained or the amount of the cash should be maintained that is optimum amount of the cash should be maintained.

We have the different models we have seen 1 model is called as a certainty model, then the other model is called as the uncertainty model and the limitations of the certainty models are done away in the uncertainty and they are with the help of certainty model we can have the range of the cash which is economical to the firm that if that range of the cash falling within that range no action will be taken.

And if it is crossing that then immediately we will convert that surplus cash into securities and if it is below that then we will sell the securities and convert the securities into cash. So, this is how we can manage the entire cash in the firm and we can keep the optimum amount of the cash balance were the cost of funds is also not very high number 1 the cost of funds is also not very high to the firm or maintaining the cash is also not very high.

And second thing is that firm is also not technically insolvent. So firm is maintaining liquidity also and firm is managing it is financial cost also. So it means financial cost within control cash cost means cost maintaining cash is within control and the say your technical solvencies also not going to be there. Because firm is maintaining the sufficient liquidity also. So, I will stop here with the discussion on the cash management.

I think we have done the sufficient discussion on the cash management so, for we have had the detailed lengthier discussion on the management of 3 current asserts that is the inventory, then receivables, account receivables and then the cash. So, these are the 3 important assets, how they should be managed we have learnt till now and in next class onwards now I will stop talking to you about the management of the current liabilities.

And in the next class we will learn about something about the payables management which is the suppliers credit as well as the expense credit and how to manage those current liabilities that we will learn in the next class, thank you very much.