Working Capital Management
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Lecture - 06
Trade-off between Profitability and Risk - I

Welcome students. So in the last part of discussion we were talking about the effect of change in the level of current assets. As we have seen that if we increase the level of current assets your profitability goes down and if you say decrease the level of current assets profitability of the firm increases. Similarly, there is a change in the net working capital and the risk profile of the firm but we can see that less current assets are less productive.

So we should try to keep the extent of current assets as low as possible in the firm as compared to the long term assets or the fixed assets because real profit of the firm comes from the fixed assets or the long term assets. Similarly, now we talk about the other side of the balance sheet that is the liability side of the balance sheet. As we have been say discussing and I told you many times that in India we follow the term structure of interest rates.

So in this situation, the term structure of interest rates, shorter the duration or the short term sources of the funds which are borrowed for the shorter duration we have to pay the lesser cost or the lesser rate of interest. If you are borrowing the funds for the long term or for the longer duration we have to pay the higher rate of interest. So it means if we are using the long term funds for the short term purposes for funding the current assets our cost of funds is increasing which is not advisable.

So we should do is as I have told you earlier also that most of the funds to finance the current asset or to fund the current asset should come from the spontaneous sources and the short term sources. In the very rarest amongst rare situations we should use the long term sources of the funds for funding the current assets because if you have the more say the larger magnitude of the short term funds the funds coming from the current liabilities to fund the current assets your cost of funds will be under control.

But if you are increasing the extent of the long term funds to fund the current assets then the cost will go up. Now let us see how it happens. We are going to I am referring you to the same balance sheet what we discussed in the previous case and case of the to understand the change in the current assets. Same balance sheet we are talking about and here is the same balance sheet. Earlier we were focusing upon the asset side of the balance sheet where we had the total asset that is the fixed assets and the current assets.

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How?

Balance Sheet of ABC Ltd.

Liabilities	Amount ($ millions)	Assets	Amount ($ millions)
Share Capital	6,000	Fixed Assets	8,600
L.T. Debt	4,800		
Current Liabilities	3,200	Current Assets	5,400
	14,000		14,000

(Company earns 2 p.c. on Current Assets and 12 p.c. on Fixed Assets)

Now I will take you to the liability side. Here you look at the total liabilities that is again the 14000. So 6000 million dollars is coming from the share capital. Long term loans are contributing 4800 million dollars and the remaining that is 3200 million dollars is coming from the current liabilities right. Now in this situation the extent of current liabilities is 3200. So how to say understand this situation.

Again you have to say work out a ratio. As we worked out a ratio earlier that ratio was the current asset to total assets. Now to understand the change in the current liabilities we will have to start with the ratio.

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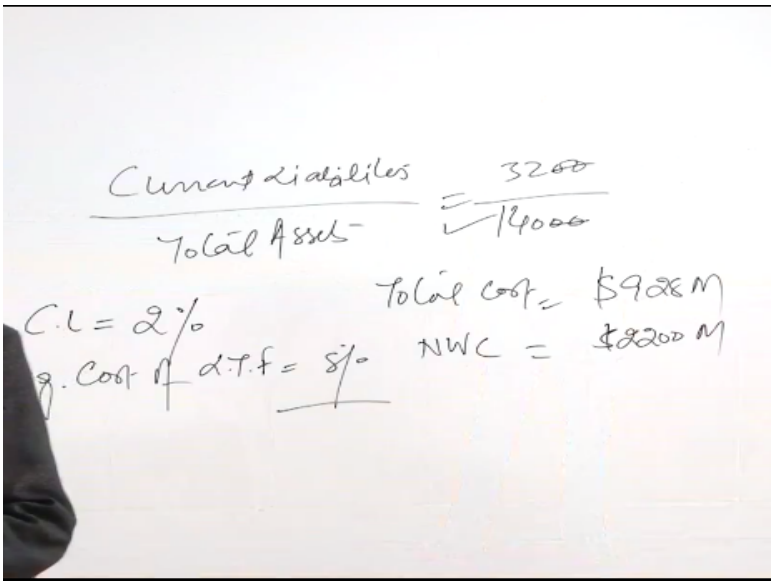

And that ratio now is the current liabilities, current liabilities divided by the total assets. Not liabilities total assets. Current liabilities divided by the total assets and then we see that how this ratio works out. Whatever the ratio is there now for example we have seen that we had the current liabilities in the original balance sheet is 3200 and total assets are 14000. So we can calculate the ratio of this. Now in this case means what this ratio is indicating.

This ratio is indicating that if you calculate the ratio here then the ratio will be 32000 divided by this. So this ratio is 32:140 the total assets that is the current plus the long term asset or the fixed assets. So we will have to see that the total assets or the 14000, total assets or the 14000 to what extent they are financed from the current liabilities or from the short term sources of the funds, short term sources of the funds.

How much what part of the total assets has been financed from the current liabilities. This is we are going to work out with the help of the ratio and if you calculate the cost of total funds we are going to use to fund the total assets of the 14000. In this case let us take the assumptions like we took the assumptions in case of the current assets we will take the assumptions here in case of the current liabilities also.

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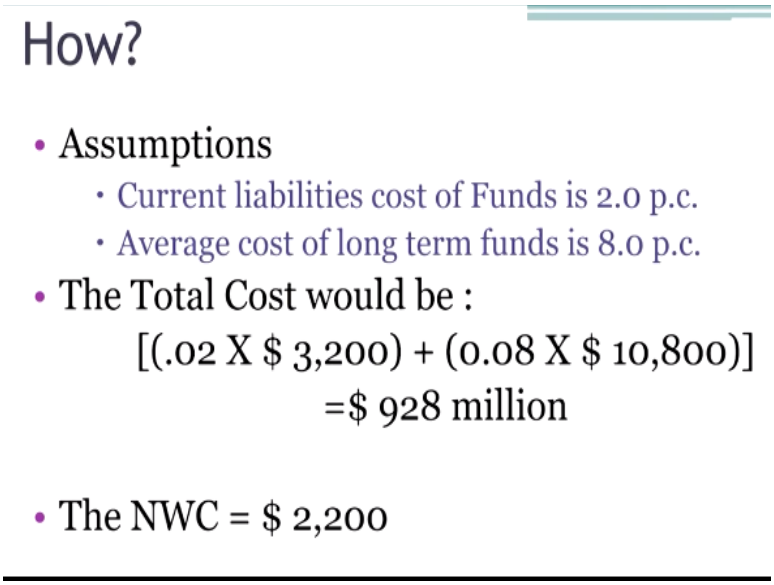

And we are saying that since short term funds are for the shorter durations under term structure of interest rates they are cheaper sources of the funds. So we are assuming that current liabilities or the short term sources of the funds that is current liabilities are having the cost of 2% that is the cost of funds is 2% and the average cost of the long term funds, average cost of the long term funds is 8%. Cost of long term funds or funds from the long term source is 8%.

We are assuming these 2 things. Short term funds are at the rate of 2% available at the rate of 2%. Long term funds are available at the rate of 8% right. Now in this case if we use the more amount of the short term funds to fund this total say magnitude of 14000 total assets your financial cost will go down. But the risk will increase because short term sources mature quickly. You have to repay these funds as early as possible or as quickly as possible so that risk would be there. But if you see here what will be the financial cost.

We have calculated here if you look at the presentation if you look at the say ppt we have calculated it there and we have seen that in the original balance sheet the total cost of the funds is, the total cost of the funds is equal to how much that is 928 million dollars, 928 million dollars we have calculated and the net working capital we have calculated is NWC we have calculated here is that is $2200 millions, $2200 millions that is the net working capital.

How we have calculated it is that is the say the balance sheet original balance sheet here we have seen in the original balance sheet your current liabilities are 3200 and current assets are 5400. So 5400 minus 3200 is the 2200 as the net working capital from the original balance sheet and there the magnitude of the current liabilities was 3200 and the total assets are 14000 and we have on the basis of that we have seen the cost of the funds is 928 million dollars and the NWC is 2200 million dollars.

Now we make a change like we change the ratio by adding up more amount that is plus 600 million dollars coming from the short term sources.

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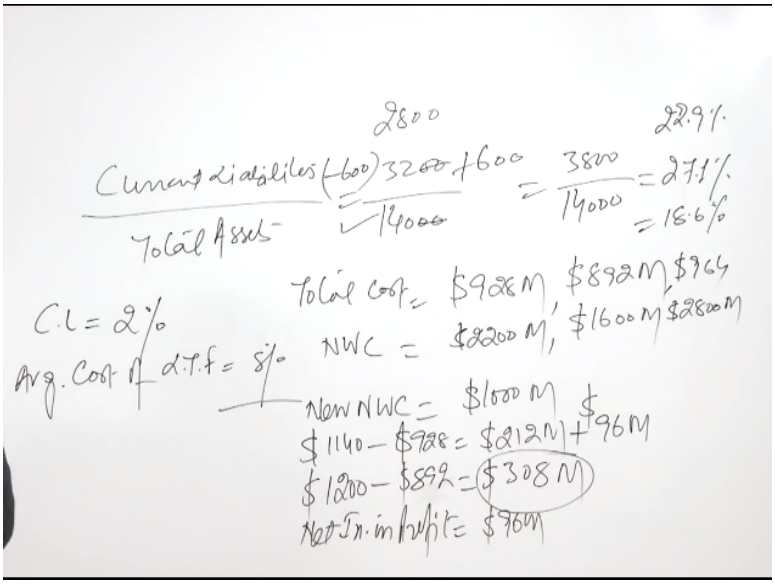

So it means now the short term sources will become how much 3800 and total assets are 14000. What is the new ratio if you calculate the new ratio here that is 27.1%. This is 27.1%. So this is the new ratio now 27.1%. We have increased the magnitude of the funds coming from the short term sources or the level of current liabilities which was earlier 3200, now it is 3800. Total assets remaining the same that is 14000. Again, now if you calculate the total cost.

On the basis of the cost of short term funds 2% and the long term funds 8% your total cost here is how much in this case that has come out as $892 millions. This is your cost now. Cost has decreased because you have increased the proportion of the cheaper funds to the to fund the total

assets that is the level of 14000 and if you see the net working capital but the negative effect of that is net working capital has come down to 1600 million dollars.

So it means your liquidity has been affected. Your liquidity has been affected. That net working capital is that is 1600 million dollars. It means when the liquidity goes down when the net working goes down your risk increases. So we are increasing the risk by reducing the cost. And now take the next case if you change the ratio again you now rather than adding up 600 here you minus do that is you subtract the - 600 right. That is - 600.

So how much will be left here. That is 2800. You are left with not 3200 but 2800 or 2800 and if you have brought it down to 2800 so it means now the ratio is 18.6%. The ratio is 18.6%. This is 18.6%. This ratio is 18.6%. Earlier the ratio was original ratio was how much 22.9%. Then when we increased the contribution from the short term sources the ratio went up to 27.1% and when we say increase the or sorry decrease the extent of the current assets or the funds coming from the short term sources then the ratio has come down.

We have decreased here so now that is not 3200, 2800 and the ratio has come down to 18.6%. it means when the funds from the short term sources are being decreased the funds from the long term sources are automatically increasing because you have to fund the level of 14000 as the total assets. So now what will be the impact of it if you are reducing it. Short term sources of the funds are being reduced so what will happen?

Your net working capital will increase but when the net working capital increases liquidity increases, risk decreases but at the same time profit also decrease because the cost is going up, cost is going up. So if you see here now the total cost is here 928, it was earlier total cost and now this cost is going to be how much, originally it was 928 millions. Then it became 892 and now it is 964. Now it is becoming $964.

This is the cost 964 and then your net working capital is also increasing. It was 2200, 1600, and now it is 2800 million dollars. It is 2800 million dollars net working capital has increased. So it means you can see that the impact of this total cost it is something, gone down. It means profit

will increase. Here the cost has increased as compared to this level. So the profit will decrease. Net working capital is 2200. It went down.

Then we increased the extent of the short term finances. It further increased when we decrease the say contribution of the short term sources of the funds to fund the total assets. So it means there is a reverse relationship. If you increase the level of current assets your profitability will go down. But if you increase the level of current liabilities then your profitability will go up because the cost of the funds will go down.

So now we have to take a decision that we should have the optimum level of current assets. We should have the optimum level of current liabilities. I would not say that you maximize the funds coming from the short term sources or from the current liabilities because that will make the organization highly volatile, highly fragile you can say and when the fragility increases so what will happen?

Ultimately any time the firm may collapse or it may become technically insolvent and firm maybe unable to pay its obligations on the due date. So ultimately it will be called as a defeat, debacle and it will be the spoil spoiling the reputation of the firm, spoiling the name of the firm which should not be done. But we should try to find out that the level of current assets should also be at the acceptable level.

Liabilities, current liability should also be at the acceptable level. If both are at the optimum level your working capital is managed efficiently and properly. Now here we see that how the total impact of the situation is here.

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Combined effect of Changes in Current Assets and Current Liabilities on Profitability and Risk Trade-Off

	Change in profits	Change in NWC
Decrease in CAs to TAs ratio	$ 60	$ 600
Increase in CLs to TAs ratio	$ 36	$ 600
	$ 96	$ 1,200

- Trade-off is clear. Company has increased profits by increasing risk.
- New NWC = $ 2,200 - $1,200 = $ 1,000 millions
- Initial Profit of the company = $1,140 - $928 = $212
- Profit after decrease in CAs = $1,200 million
- Cost after increase in CLs = $ 892 millions
- Net effect = $ 308 millions
- Hence New NWC = $1,000 millions
- Increase in profits = $ 96 millions

Look at now the situation we have calculate here already if you look at the ppt you will be able to find out on this presentation on the slide that we have done 2 things. One is that we have decreased the level of current assets and second thing is we have increased the contribution of the short term funds or the current liabilities right?

And both the steps taken both the measures taken by the firm or by the finance department of the firm you see that they have contributed to the increased profitability, decreased net working capital and ultimately increase in the say risk of the firm and if it is manageable if the firm is going to take or taking the manageable risk then there is no harm in it.

Now you look at it that for example that when we say decrease the level of current assets or the ratio of the current asset to total asset was say down and we decreased the level of current assets by say 600 million dollars. Net working capital changed by the 600 million dollars but the increase in the profits we could find out is by the 60 million dollars.

And when you increase the level of current liabilities to fund the total assets by 600 million dollars your net working capital also chased by 600 million dollars and there is a contribution to the profit by 36 million dollars. So in total the profitability of the firm has increased by 96 million dollars; 60 million dollars because of the decrease in the level of current assets, 36 million dollars because of the increase in the funds coming from the current liabilities. So total

increase is 96 million dollars and in this case if you look at new net working capital is new net working capital is 1000 million dollars that is the 1000 million dollars and then if you look at the say initial profit of the company. Initial profit of the company was how much? We had 1140 and the cost was how much? This was the profit and then the initial profit was, cost of the funds was $928 so the initial profit of the company was $212 millions, $212 millions.

And when you profit after decrease in the current asset that was that we increased it by say 12 when you decrease the current assets the profit became 1200 and when you increased the current liabilities the cost after increase in the current liabilities has gone down to 892, 892 million dollars. So it means there is a total change in the cost by 36 million dollars and finally you can call it as if you look at the net effect.

If you look at the net effect of this you can say that the net effect is that is 308. Now this is the net effect that is 308 million dollars and this 308 is why because we had how much? 212 million dollars already the profit was this much and how much you added into this that is 96 million dollars and this plus this is equal to this figure. This is $308 million dollars. So it means net increase in the profit is how much?

Net increase in profit if you see that is $96 millions and thus has been simply done not by doing anything not by increasing the production or decreasing the production or anything. By simply changing the composition of current assets and current liabilities we have added up 96 million dollars more and your profit which was 212 million dollars earlier in the original balance sheet when we changed the composition of the balance sheet from both the sides we have added up 96 more million dollars and then the profit has gone up from the 212 million dollars to 308 million dollars.

But you see here is one you can call it as say one limitation of this approach or one serious limitation I would say of this approach and that limitation is that we are following here the extreme approach. We have taken the extreme step. We have disturbed the balance sheet from both the sides. From the asset side we have reduced the level of current assets and in the liability

side we have increased the level of current liabilities and in a way you can call it as this is the aggressive approach.

This is the extremism or the extreme approach which I think to some extent may not be viable in the real life situation because either you can decrease the level of current assets keeping the current liability same. Or you can increase the extent of current liabilities by keeping the level of current asset same. But if you are changing both the sides it means you are fully say squeezing the **the** sources which are increasing the cost.

But if you are managing the cost and you want to maximize the profitability for that there are so many other things to be taken care of because by doing so the firm's insolvency can be affected. So it means I would say it is a extreme situation. So what we can do is rather than going up to the extreme situation or following the aggressive approach to minimize the cost and maximize the profits and revenues and profits let us have a trade-off between the two.

Means not to follow the say conservative approach. Not to follow the aggressive approach. We should have something in between and that two we call it as the trade-off between the say the two sources or the two approaches that is the conservative as well as the aggressive approach and once you go for the trade-off what results we can expect that we will be able to balance the profitability. We will be able to balance the cost.

We will be able to balance the risk because net working capital will be balanced. Now how to do that? Let us consider another example or the another situation.

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Estimated Total S.F. Funds Requirements of Hypothetical Ltd

Month	Total funds required	Permanent requirements	Seasonal Requirements
(1)	(2)	(3)	(4)
January	Rs. 8,500	Rs. 6,900	Rs. 1,600
February	8,000	6,900	1,100
March	7,500	6,900	600
April	7,000	6,900	100
May	6,900	6,900	0
June	7,150	6,900	250
July	8,000	6,900	1,100
August	8,350	6,900	1,450
September	8,500	6,900	1,600
October	9,000	6,900	2,100
November	8,000	6,900	1,100
December	7,500	6,900	600
			11,600

We have here in this slide in this presentation we have the case of a company called as Hypothetical Limited right and we have worked out the total short term funds requirement of this company and if you see the total short term funds requirements of this company it is given to us here. Look at the slide and look at the total requirement of the funds. Look at the permanent requirement of the funds we have given that is the total funds required, permanent requirement of the funds, and the seasonal requirement of the funds.

So if we have this situation should we follow conservative approach, should we follow aggressive approach or should we follow the approach in between. On the basis of these 3 approaches which we discussed in the say previous lectures let us apply those approaches here and try to find out the answer to the question that whether extremism is good, to go for the conservatism, towards conservatism or towards the aggression or we should have something in between.

Now look at his company. If you look at this company the total finance requirement of this company over a period of 12 months is given to us and if you look at this requirement you would be able to find out that maximum requirement of the company is in the month of October that is to the extent of 9000 Rs and the minimum requirement of the company is in May that is to the extent of 6900 Rs right. This is the minimum and maximum requirement.

Out of that we have means when you say the permanent requirement is other way around you can call it as the minimum requirement. Minimum requirement is in the month of May that is 6900 Rs and we have assumed that, that is the permanent requirement. Short term funds requirement of this company is not going to decrease at all lesser than or lower than this level of 6900 Rs, dollars or whatever it is you call it as.

Now this is the permanent requirement. So if it is a permanent requirement every month require 6900 Rs as minimum so what is the fluctuating requirement. Fluctuating requirement we have worked out over the different months. Say for example we have seen that sometime it is 1600 Rs, sometime it is 1100 Rs, sometime it is 600 Rs, then it is 100 Rs. In the month of May there is a 0 seasonal requirement or fluctuating requirement and in some month in October if you see the seasonal requirement is 2100 which is maximum right.

Now let us apply 3 approaches to this particular company in this company's case and try to work out the cost of the funds under the 3 approaches. If you follow the 3 approaches let us follow first of all the conservative approach.

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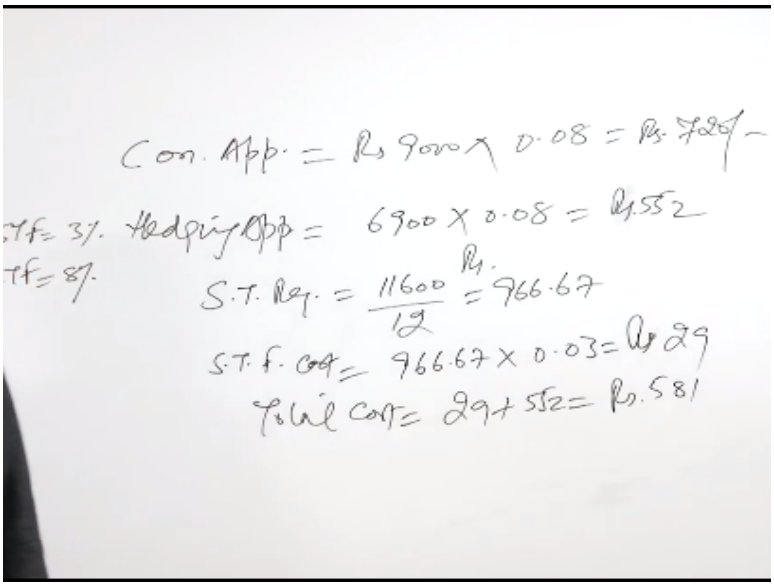

Under the conservative approach say we assume that the total requirement of the funds of the company is, what is the maximum requirement? Conservative requirement means more funds will come from the long term sources. Maximum funds will come from the long term sources.

Somewhere fraction of the funds will come from the short term sources. We assume that the total maximum requirement of this company is how much that is 9000 Rs in the month of October.

And this is the maximum and we may take here 2 assumptions. The assumptions are that the cost of the short term funds is 3%, cost of short term funds is 3% and the cost of long term funds is 8% right. Cost of short term funds is 3%, cost of long term funds is 8%. If this is the situation, under the conservative approach we assume that total requirement which is a permanent requirement of the company, means the maximum requirement of the company that is 9000 Rs or the 9000 dollars that is coming from long term sources.

So how much cost is going to be there, 0.08. If you see that zero point so 9000 is 0.08 that is rupees how much 720 is the total cost of the funds under the conservative approach. We are assuming that the all the total funds are coming from the long term sources and nothing is coming from the short term sources because the approach is conservative. Now we follow the approach that is the hedging approach.

We go for the hedging approach. We follow a we talk about the hedging approach and if follow the hedging or matching approach, hedging or matching approach in this approach we assume that there are 2 sources of the funds. Partly the funds are coming from long term sources. Partly the funds are coming from the short term sources and in this case how you have to work out is that you have to see here that what is the long term requirement of the company.

It is clear that is the permanent sources of the funds and that is 6900 multiplied by 0.08. This much is coming from the long term sources plus you have to calculate here something that is the this is the cost of the long term funds and if you calculate the cost of long term funds it is how much that is $500 or Rs 500 we say that Rs 552. This is coming, this is the cost of the long term funds. Now the cost of the short term funds.

Cost of short term funds is we have to calculate we have to find out now the average short term requirement and what is the average short term requirement? Total short term requirement is total short term requirement is 11600 divided by 12. So how much is long term requirement? This

works out as the average requirement here it is 966.67 Rs. This is the short term average monthly requirement and the short term funds cost is going to be how much?

Short term funds cost is 966.67 multiplied by 0.03. This works out as how much. This is the dollar or rupees we would say Rs. 29. So the total cost of the funds is going to be how much? Total cost is under the hedging approach is going to be 29 plus 552. This is going to be how much? That is Rs. 581. This is our total requirement that is 581 and here we assume that aggressive approach is not easy to be followed. So we have calculated the 2 cost.

One cost is say here that is 720 under the conservative approach if all the total funds come from the long term sources and if you are following the matching approach, in the matching approach say this is this part is coming from the long term sources. This part is coming from the short term sources. This is the cost of long term fund, this is the cost of the short term funds. So total cost is the 581 Rs, million rupees or whatever it is. So this is the cost.

So it means when you have increased the that the proportion of from 0 to some percent under the matching approach under the hedging approach your cost has come down as compared to this cost. Now we see again we are following here some kind of say you can call it as say extremes. So can we have a trade-off between the two? Let us have a trade-off between the two and we can have some plan.

That just to find out that what is the trade-off so that we remain more comfortable and any kind of the risk if we are going to take that can be avoided. So there is a we are talking about the trade-off between the say matching as well as the or the hedging as well as the conservative approach and to calculate the cost under this trade-off let us see here that how to work out this trade-off.

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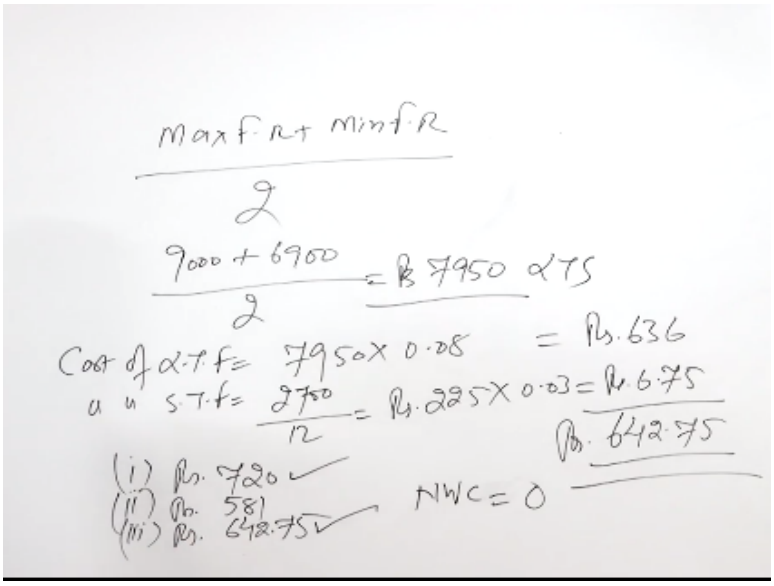

The trade-off will be worked out as say maximum funds requirement plus minimum funds requirement divided by 2. So what is the maximum funds requirement here, 9000 plus what is the minimum funds requirement 6900 and it is divided by 2. So what is now the new requirement? We have worked out is that is the trade-off, result of trade-off is result of trade-off of is we have worked out here that is 7950. This is 7950.

So if it is 7950 which is little more than the matching approach, hedging approach and less than the conservative approach. This is Rs 7950 right? Now we assume that under this approach, trade-off approach we will say that this much amount will come from long term sources LTS and the balance from the short term sources. Now let us calculate the total cost. So cost of long term funds that is 7950 multiplied by 0.081 and then this is the cost of short term funds.

This is how much, the balance? If we have to work out the balance, how to calculate out the balance? If we calculate the balance here so that balance over a period of time is to be worked out and we have already worked out the balance over the different months.

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Trade-off between Hedging and Conservative Approaches

Month	Total funds required	Permanent requirements	Seasonal Requirements
(1)	(2)	(3)	(4)
January	Rs. 8,500	Rs. 7,950	Rs. 550
February	8,000	7,950	50
March	7,500	7,950	0
April	7,000	7,950	0
May	6,900	7,950	0
June	7,150	7,950	0
July	8,000	7,950	50
August	8,350	7,950	400
September	8,500	7,950	550
October	9,000	7,950	1,050
November	8,000	7,950	50
December	7,500	7,950	0
			2,700

And if you look at the balance here the balance is 2700. Earlier the balance the total requirement was 11600, seasonal requirement. Now the seasonal requirement has come down to 2700 and 2700 if you divide by how much 2700 to be divided by 12 so this works out as how much that is rupees 225 is the monthly requirement multiplied by 0.03. So this will be one cost, this will be another cost.

And if you see the cost here this cost works out as Rs. 636 million rupees or maybe rupees itself and if you look at the second cost this works out as Rs. 6.75. So what is the total cost now? This is 642 Rs, 642.75. So we have now the 3 costs right. One cost is under the say conservative approach. This cost was how much, Rs. 720. Am I right, 720 or 720 millions or whatever it is.

Second approach we had and if you talk about the second approach under the second approach which was the matching approach and under the matching approach the cost had come down to Rs. 581. The cost has come down to Rs. 581 and if you talk about the third approach so under the third approach which is the trade-off approach cost is little more that is 642.75 but what is there? This cost is less than this but this cost is more than this, 581, it is more than 581 right.

But here we have many comforts. This is most comfortable. First approach, conservative approach is the most comfortable but the discomfort is cost is very high. Though liquidity is also very high risk is very low but at the same time profits will also be very low. Under this approach,

this is hedging approach. So it means short term sources will short term funds will come from the short term sources.

Long term funds will come from the long term sources and it means in that case net working capital level will be how much that is 0 is again a risky situation. Means keeping the net working capital situation 0 it means any time. If any short term source of fund becomes due to be paid and any current asset is not convertible into cash firm is bound to default. So we should have some cushion to have the net working capital. Maybe it is not very large amount.

But current assets should be literally more or something more than the current liabilities. So just looking at this risk of having the 0 net working capital we thought of moving to the third approach that is called as trade-off approach so we increase the level of say investment from the long term sources rather than investing only 6900 Rs we increase the level coming funds coming from the long term sources from 6900 to 7950 and remaining was coming from the short term funds.

So when we calculated the cost, cost had gone up more here but your net working capital level has increased. There is a cushion. The risk has gone down though the cost has little increased but it is much less as compared to the conservative approach. It is something more as compared to hedging approach but it is increased cost is giving you the another benefit that risk is under control.

It is manageable and because risk is controlled manageable because the liquidity of the firm is at the optimum level or at the acceptable level. So this is how, this is how the level of current assets and current liabilities impact the overall financial cost of the firm, liquidity of the firm and the profitability of the firm. And we have 3 approaches that is the conservative approach, aggressive approach and in between there is a hedging approach.

And finally we can have the trade-off. Out of these 3 approaches so you can call it as trade-off is the fourth approach. So sometime we say that aggressive approach normally is not possible to be followed by the majority of the firms so we are left with the 2 approaches, conservative approach

and hedging approach and in between these 2 approaches is the trade-off approach which we have seen in the case of the this company Hypothetical Limited.

And we have seen how the cost of the funds is changing, risk is also changing, profits are also changing. So we have to decide from where we want to have the funds, long term sources, short term sources, how much profitability we want to have, how much liquidity we want to have. So today I will stop here and the remaining part of discussion we will take up in the next class. Thank you very much.