Management of Commercial Banking
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Lecture 22
Dollar Gap Analysis

Good morning. So, in the previous class we started the discussion on the asset liability management and mostly the basic objective of asset liability management is to manage the interest rate risk, although the asset liability management is also used to manage the other type of risk what the commercial bank faces. But the basic nature of asset liability management is to take care of the interest rate risk in the market. So, in this context today we will be discussing about a concept called the dollar gap analysis.

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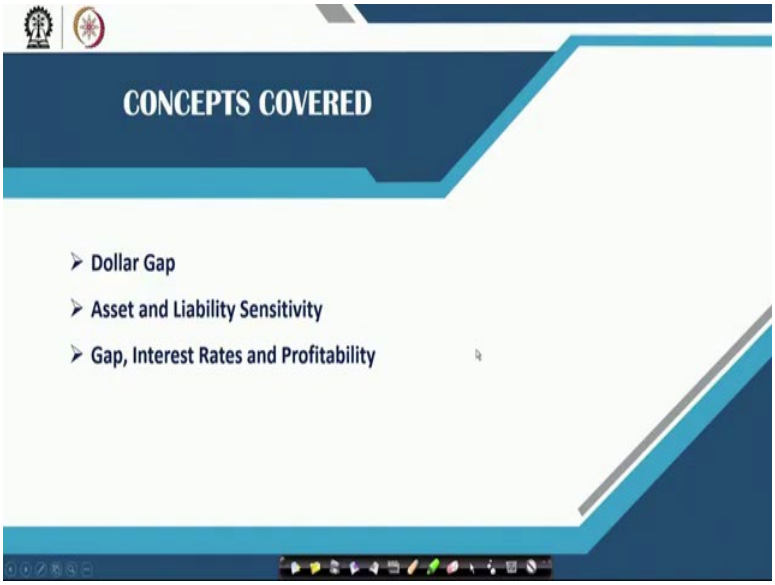

So, today what mostly we are going to cover up, that is basically the concept of the dollar gap and how the dollar gap is used for managing the interest rate risk in the commercial banking. And then we will be discussing about the asset and liability sensitivity with respect to change in interest rates depending upon the dollar gap, how the interest rates or the net interest income or the profitability are going to be changed by the commercial bank. That basically is the major focus of the today's discussion.

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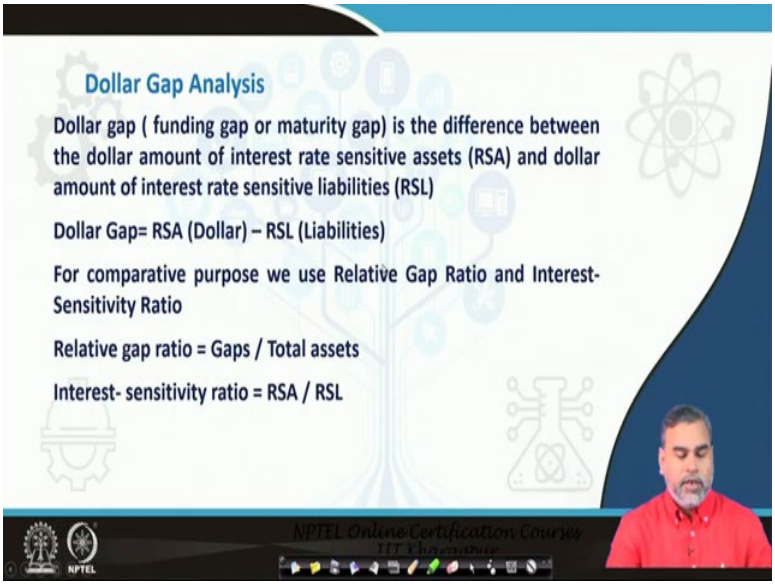

If you see that what exactly the dollar gap analysis is? In the previous class we discussed about the asset liability management. In the asset liability management, we are trying to manage the assets and liabilities in such a way by that we can maximize the net interest income, even if there is a change in interest rate in the market. So, whenever, we talk about this, then in this context we have to define that how this particular interest rate changes is going to affect the net interest income or the profitability.

In this context, there are many issues always we tried to discuss. The first of all that all the assets and liabilities of a commercial bank are not interest sensitive, some of the assets are interest sensitive, some of the assets are not interest sensitive. So, we have to first define that, what are those interest sensitive asset and what are those interest sensitive liabilities that are already we have discussed in the previous class. So, considering this interest sensitive assets and interest sensitive liabilities, our objective is to find out a dollar gap.

So, if you know the dollar gap, then looking at the dollar gap, we can say that how this particular interest rate is going to affect the net interest income of the commercial bank. So, in this context, the dollar gap is basically nothing but the difference between the dollar amount of interest rate sensitive assets and the dollar amount of interest rate sensitive liabilities.

If you take a difference between all the interest sensitive assets and interest incentive liabilities, then the dollar gap of that particular commercial bank can be measured. So, first of all we have to categorize all those assets and liabilities what the commercial banks has, then

once we know the what are those assets and liabilities which are interest sensitive, then we basically try to find out the monetary value of that and you take the difference between them, then we can find out the dollar gap.

Generally, whenever, we compare that particular dollar, because you know that the bank to bank the size varies the particular assets and liabilities also varies. So, whenever we are comparing between the two different banks in that particular point of time we need a common size statement. Some common size measures has to be defined. Already all of you know that whenever you go for the common size statements, we always divide that particular variable with respect to total sales or the total assets.

In this context, whenever we talk about these same concept or we are trying to use the same concept in the context of the dollar gap, we basically find out a relative gap ratio, the relative gap is nothing but the total dollar gap divided by the total assets. So, once it is normalized or maybe standardized with respect to a particular common size measure, then the comparison is relatively possible.

So, there are 2 things or 2 ratio what we use whenever we compare among the banks that how much dollar gap the particular commercial bank has. In this context we are using the relative gap ratio, which is measured as the gaps divided by the total assets and another one is interest sensitivity ratio, which is your total interest rate sensitive assets divided by the rate sensitive liabilities. Once this ratios are considered then comparison is relatively possible, even if the total size and total assets and total liabilities of the banks vary.

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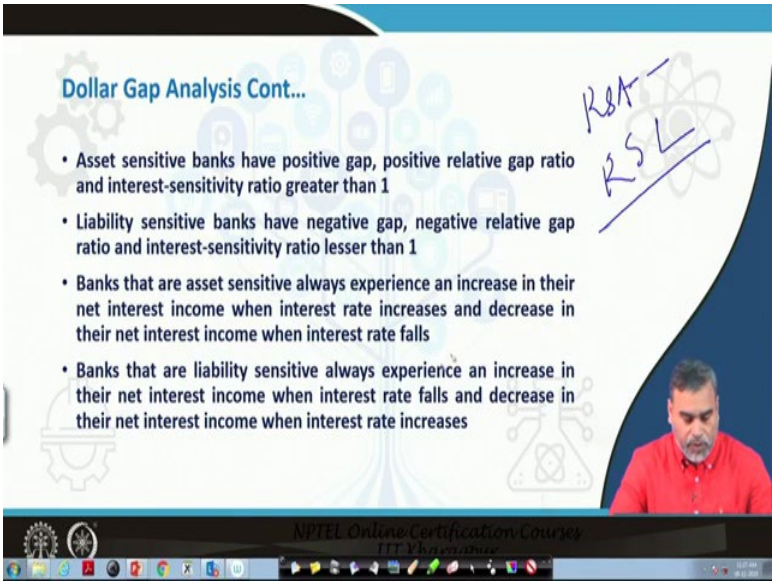

So, then we will see that whenever we talk about this the asset sensitive, for example, your dollar gap is nothing but the rate sensitive assets minus the rate sensitive liabilities. So, that already we have seen in the previous slide, what we have seen that your dollar gap is equal to your RSA rate sensitive assets minus the rate sensitive liabilities. So, if you have rate sensitive assets minus rate sensitive liabilities that will give you the dollar gap, then from there what we can basically find out or what basically it implies?

That means the particular banks which are asset sensitive then probability of dollar gap if you talk about, if the particular banks are assets sensitive than their dollar gap will be positive. So, there will be a positive dollar gap for them and obviously if it is positive then obviously the gap ratio also will be positive which is nothing but the dollar gap divided by the total assets that also will be positive, then your RSA by RSL that rate sensitive assets divided by rate sensitive liabilities that will be greater than one, because your numerator is more than the denominator.

So, looking at the dollar gap we can say that, this particular bank is more assets sensitive banks than the other banks which are existing in the system. Then we have a liability sensitive banks. The liability sensitive banks generally have negative dollar gap because already your rate sensitive liabilities will be more than the rate sensitive assets. Then obviously the same way if you see, the negative gap means the relative gap also will be negative and your interest sensitive ratio that basically will be less than one because your denominator will be more than the numerator.

So, in this context, you can find that your interest sensitive ratio will be lesser than one. So, here another implications we can draw from this. The banks that are asset sensitive, always experience an increase in the net interest income when the interest rate increases and decrease in their net interest income when the interest rate falls. Obviously, whenever your interest rate is increasing or decreasing, and already we know that, that will have the impact on interest sensitive assets and interest sensitive liabilities.

If your total amount of rate sensitive assets are more than the rate sensitive liabilities, if the interest rate is going up then obviously, the return generation or the income generation through this interest will be more if this particular commercial bank is dominated by the rate sensitive assets or their dollar gap is positive. The reverse will be happening if the particular bank is rate sensitive liabilities, so whenever we have the banks, we have the liability sensitive, they experience basically an increase in the net interest income, their profit

whenever the interest rate falls and they experienced a decrease in the net interest income, when the interest rate increases.

The reason is that whenever the liabilities are more, the interest rate is increasing, and that particular point of time, this income what they are generating that will be lesser than the cost of what they will be incurring through the payment of this interest payments and all these things towards the deposits and other type of liabilities for the commercial bank has. So, in this context what we can say that these kind of implications we can draw whenever we are trying to use the dollar gap with respect to the net interest income of the company.

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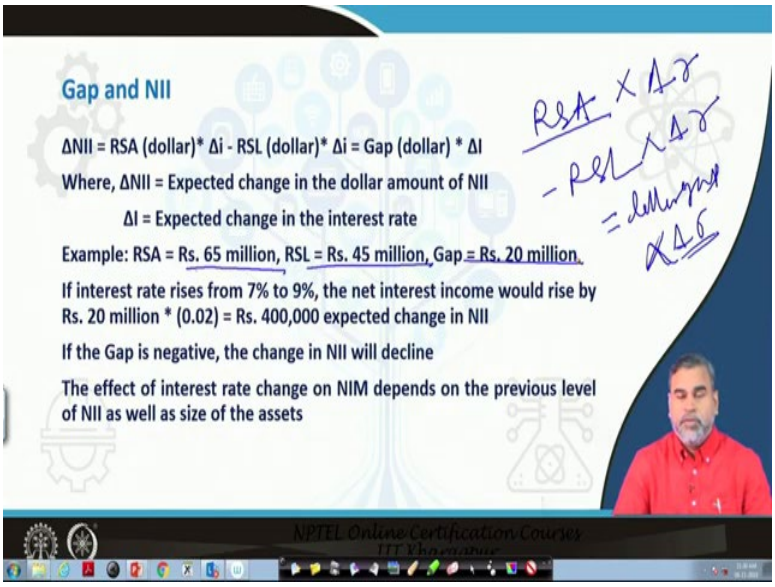

Then if you want to have a relationship between gap and the net interest income, then how basically we can find out that? That means the basic objective is if you know the dollar gap, and if you know the change in the interest rates in the market, then what is the impact of that change in interest on the total net interest income of the commercial bank? So, that is basically our objective. So. which basically can be established by establishing a relationship between the dollar gap and the net interest income of the bank.

So, here if you see that how basically it is done? So in this context we have the rate sensitive assets so whatever the rate sensitive assets we have, if you multiply your change in interest rate here and minus your RSL multiplied by the interest rate which is prevailing in the market then which is nothing but the dollar gap multiplied by the delta "r" or here we have taken delta "i". So, here basically what we are trying to find out that if there is a change in interest rate, how the net interest income is going to be changed?

For example, if you see your rate sensitive assets are 65 million and rate sensitive liabilities are 40 million. So obviously your gap will be or dollar gap will be 20 million, 65 million minus 45 million that is 20 million. If the interest rate rises from let existing interest rate was 7 percent, if the interest rate has increased from 7 percent to 9 percent then how this net interest income is going to be changed?

So obviously here from the example it is very much clear, when it is a positive dollar gap so if there is a positive dollar gap, then obviously the increase in interest rate will have a positive impact on the net interest income. So your net interest income should increase then how much it will increase? So, if you want to try to find out then your total dollar gap that is 20 million, 20 million multiplied by 0.02, 0.02 means that is a two percent which has changed in the interest rate that means around 4 lakh, which is basically the expected change in NII for that particular bank.

So, now, if for example, it is reverse, let your rate sensitive asset was 45 and rate sensitive liabilities were 65, then your net interest income will be changed or will decline by 4 thousand rupees. So that means, if the gap is negative the change in NII will decline, so, but the effect of interest rate change on an NIM, the net interest margin that basically depends upon the previous level of net interest income and as well as the size of assets.

So, because of that, instead of comparing it with net interest margin, we are comparing it with the absolute value of the net interest income. So net interest income that means, we are trying to find out relationship between the gap and the net interest income and that particular relationship established because to explain that, if there is a change in interest rate, how your net interest income is going to be changed? That mean general indirectly we are establishing the relationship between the interest rate and the net interest income of the bank. So, this is what basically the relationship what we are talking about.

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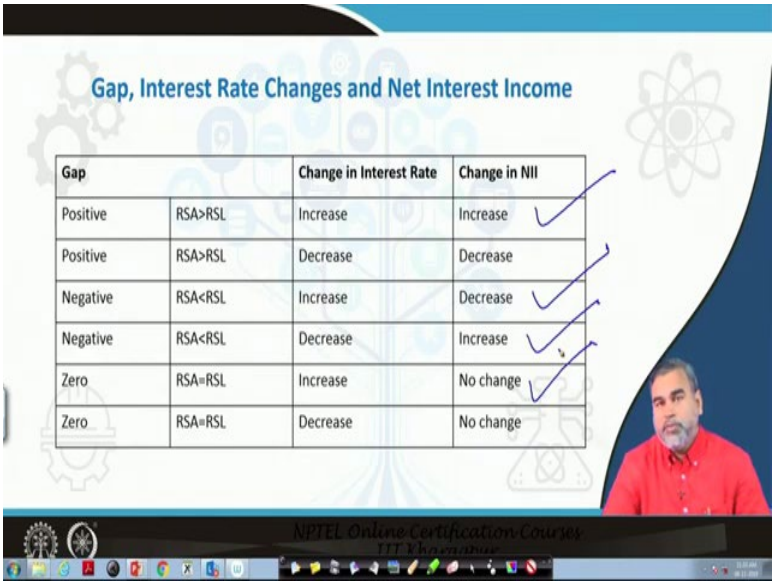

Then, for example, now if you see that if you summarize in the different scenarios, let this gap is positive just now we have seen if the gap is positive that means your rate sensitive assets are more than the rate sensitive liabilities, so if the interest rate will increase, then your NIA will increase that already just now we have checked it. So if again it is positive but the interest rate will decline.

For example, the interest rate has come down from 7.7 percent to 5 percent then your change will basically be decline or the net interest income will decline. That means how much it will decline? The same that 20 million multiplied by the 0.02 but which is minus 40, basically what we get because that will be declining. Then now we are talking about the, if it is a negative gap then your RSA is less than RSL then if there is a change in interest rate what the interest rate is increasing, then your net interest income will decline.

And if it is reverse, if it is negative, for the interest rate is decreasing then the net interest income will increase. So, if it is zero that means your rate sensitive assets and rate sensitive liabilities are equal that means your dollar gap is equal to zero. So, the dollar gap is zero then if there is any interest rates in the market, then it will have no impact on NIA. So that means this particular an NII is perfectly immunized or perfectly hedged towards the change in the interest rate fluctuation in the market.

So, both the cases whether the interest rate will increase or whether interest rate will decline that is not going to affect the total net interest income of the particular bank because whatever loss they will incur in one side that loss can be compensated by the gain in the other side. So

effectively you will not observe any kind of changes in terms of the net interest income of that particular bank. So this is way in the different scenarios, how the dollar gap is related to the change in NIA that is the objective of this particular discussion.

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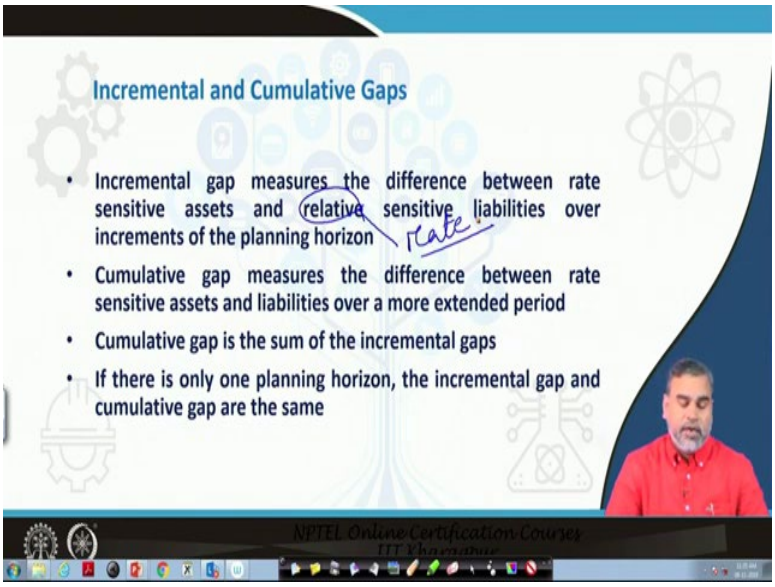

Then if you see in this particular context, we are using basically two types of gaps. One is incremental, another one is cumulative. Whenever we talk about the incremental gap, in this context how this increment incremental gap works and how the cumulative gap basically works? The incremental gap is basically what? It measures the difference between the rate sensitive assets and the rate sensitive liabilities over the implements of the planning horizon.

So whenever we talk about this, then in this case basically what is happening over the different maturity buckets, how this particular gap is sensing that basically we are talking about the incremental gap. But whenever the incremental gap basically with difference between the rate sensitive assets are relative sensitive liabilities or what are the influence of the planning horizon?

So, one thing you remember here you read it not relative, so this is basically rate, rate sensitive liabilities over the increments of the planning horizon that basically you can keep in mind. But whenever we talk about the cumulative gap, the cumulative gap basically measures the difference between the sensitive assets and the sensitive liabilities over a more extended period. Over the period cumulatively what is the different gap?

Because the particular dollar gap is calculated in the different maturity buckets and the different maturity buckets whenever we talk about on that is on the basis of the maturity of

the instruments or maturity of assets and maturity of the liabilities. So, that is why the cumulative gap is nothing but it is the sum of the incremental gaps the cumulative gap is nothing but the sum of the incremental gaps. So, if that is one planning horizon, then the incremental gap and cumulative gap will be same. If you see one example, then it will be clear for you that how this cumulative and the incremental gap basically works.

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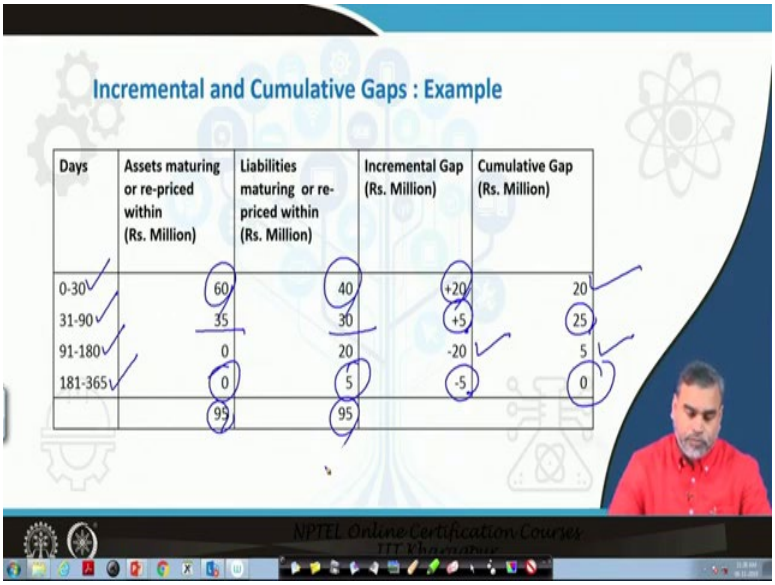

So, in this example if you see, let these are the different maturity, these days what 0 to 30, 31 to 90, 91 to 180, 181 to 365, these are the different maturity period of the assets and liabilities. So, whenever we talk about the 0 to 30 days maturity, we have 60 million assets and we have 40 million liabilities, then obviously your gap become 20. But whenever you go for the 31 days to 90 days maturity period, we find that the assets were 35 and the liabilities were 30.

The rate sensitive assets were 35 and the rate sensitive liabilities were 30 then obviously will gap become 5. So, cumulatively if you consider from 0 to 30 days and as well as 31 to 90 days, then your cumulative gap come from 25, previously it starting with 20 then it becomes 25. Then if you add more than 91 to 180 days, let there is no asset, but you have the liability of 20 million, then obviously your incremental gap, your incremental gap will be 0 minus 20 that will be minus 20, then obviously your cumulative gap will be 5.

And if further if you go, 181 to 365, obviously we have the asset is 0, then the liabilities basically become 5, then incremental gap will be minus 5, then finally your cumulative gap becomes 0. Then here the total rate sensitive assets and total rate sensitive liabilities, or do we

have consider this example that is basically the same. So here what we are trying to find out? We are trying to find out the incremental gap means across the different maturity buckets.

Whenever we are trying to find out the dollar gap that basically gives you the idea of the incremental gap. So, ones you add on the incremental gap over the different maturity buckets, then we can find out the cumulative gap across the different maturity of the different instrument what the commercial banks are holding. So, this is the way the incremental income and the community gaps are defined whenever we talk about the commercial banking perspective.

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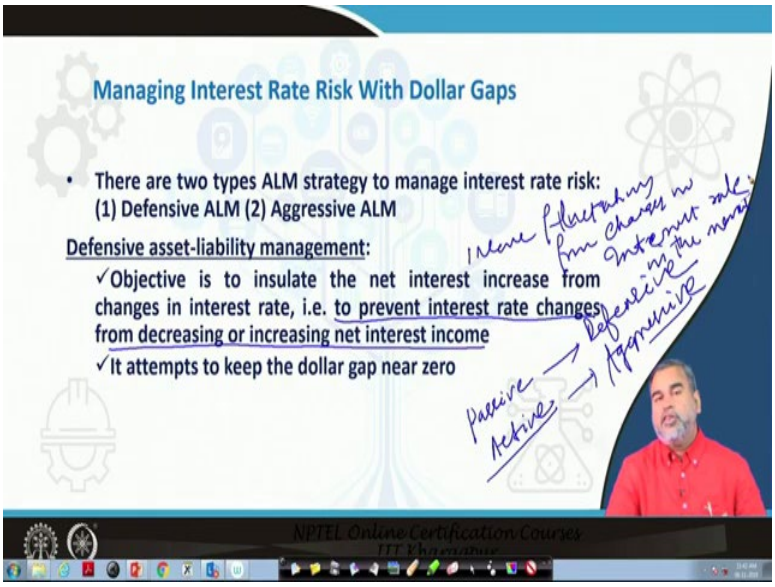

So then another thing if you see that whenever we talk about this, we have certain kind of ways, certain kind of methods through which the interest rate risk can be managed with the dollar gap. So if you talk about the management of the interest rate risk through the dollar gap, in general whenever you go for the management of portfolio or management of anything, then always in broadly we follow 2 types of strategy.

In general whenever you go for the investment, we are basically following a passive strategy or an active strategy in this context, we are talking about the passive strategy in the place of passive, we are basically following a defensive strategy. And in case of active, we are basically using this word, this aggressive strategy. So, here whenever you talk about the defensive strategy, what is the basic objective?

If any bank is following a defensive strategy to manage the interest rate risk using the dollar gap, then what basically they try to do? Because the assets or liabilities has to be changed, to

get rid of any kind of interest rate changes in the market, the restructurings of assets and liabilities have to be made. And by that, depending upon the interest rate moments, the commercial banks can maximize the net interest income or the net interest income in this can be positive.

So that is basically the basic notion or basic objective of the asset liability management whenever we talk about the interest rate risk management for a particular bank. So whenever we talk about the defensive strategy or defensive asset liability management strategy, what we call it, here the objective is to insulate the net interest increase from changes in interest rate or that means to prevent the interest rate changes from decreasing or increasing the net interest income.

So here basically, what we are talking about? In general the objective is we are not going to increase the interest due to the change in the interest rate, we are not going to increase our net interest income or we are not going to decrease our net interest income, so whatever way it is there that has to be kept to insulate the net interest increase from changes in interest rate. That means to prevent the interest rate changes from decreasing or increasing the net interest income, second line if you might not see, it is basically to prevent the interest rate changes from decreasing or increasing the net interest income.

So that means, even if there is a change in interest rate, my net interest income is not going to be changed. When it happens, it will be possible whenever your dollar gap of that particular bank is 0. So, if your rate sensitive assets is equal to the rate sensitive liabilities, then we can say that the dollar gap is 0. Basically, the basic objective of defensive strategy is not to increase the net interest income or not to maximize the return from the fluctuations of the interest rate.

The basic objective is to insulate the particular net interest income from any kind of fluctuations with respect to the change in the interest rates in the market. Then if you broadly provide inability the first line is little bit confusing, then you can write the objective is to insulate the net interest income fluctuations from changes in interest rate in the market. So any kind of changes, second line is clearer, that means to prevent the interest rate changes from decreasing or increasing net interest income.

That means interest rate is not in the hands of the commercial bank, but the fluctuations of the net interest income can be controlled by them. If they can make some kind of adjustment in

such a way by that their dollar gap will be equal to 0 then obviously, the total impact on the net interest interest income will be nullified or will be there and no change in terms of the same general rate interest income.

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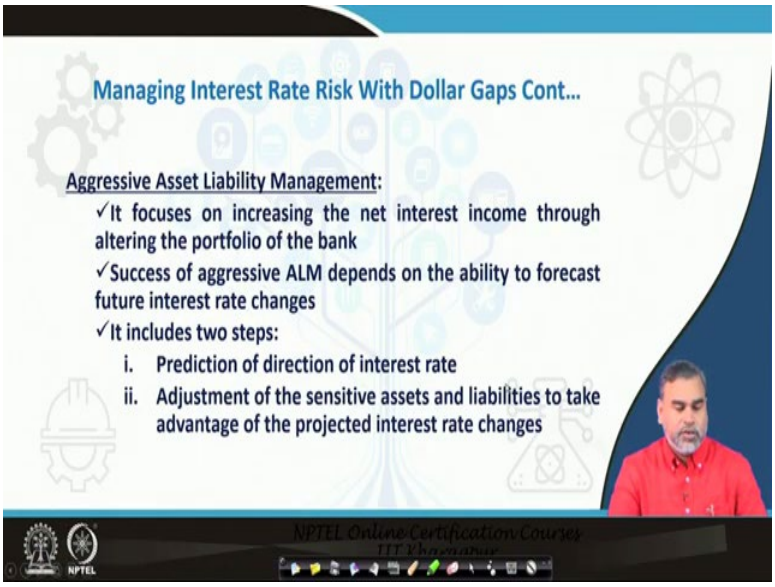

Then another strategy we have that is called the aggressive strategy or aggressive asset liability management. So, here the commercial banks always try to maximize their net interest income and how they basically do that? They can do basically, many ways first of all, the success of aggressive ALM depends on the ability to forecast the future interest rate changes.

If the banks are really able to forecast the interest rate in a better way, then by analyzing the direction of changes they can make the adjustments in their assets and liabilities by that the net interest income can be maximized or can be increased. So first of all, it has two steps, the prediction of direction of interest rate. Second one the adjustment of the sensitive assets and liabilities to take advantage of the projected interest rate changes.

If there is any kind of interest rate changes, then if they know the direction of change before then if the interest rate is going to be increasing, they can increase more number of rate sensitive assets, if the interest rate is going to decline, then they can increase the rate sensitive liabilities. This is the way basically they can think of to increase their net interest income, whenever there is a change in interest rate in the market, this is what basically the part of the aggressive asset liability management strategy.

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So, then if you see that what kind of strategies they follow? In practical sense, what kind of strategy the commercial banks follow whenever the two types of situation arise? Whether either the interest rate is increasing or the interest rate is declining. There are two situations what always we consider, so in this two particular situations if you observe, so if there are there is a rising interest rate, already I told you, then the banks always will be interested to keep their dollar gap value positive, that means your rate sensitive assets should be more than the rate sensitive liabilities.

So in that case how they can do that? They can reduce the maturity of the assets by selling the long term securities and use these particular fund to purchase this short term securities, because this particular fluctuations what we are considering that basically mostly affecting the short term valuation of assets and liabilities. And as well as that means, whatever long term maturity assets they are holding, they can reduce that particular maturity period. And accordingly whatever cash flow will be available, that particular fund can be utilized to purchase more short term securities from the market.

So, this is the first strategy what they can add up or they can make more variable rate loans, even the loan rate, basically the loans are relatively long term in nature. So if they will consider more variable rate loans, then what will happen that even if that whenever there is a change in interest rate, their asset value also is going to be changed. So, it will have an immediate impact on that particular income, whether they are generating through that loans, whatever they have dispersed.

If they are expecting that there is a fall in the interest rate, then obviously they want to maintain a negative gap, and here how basically they can do that? The maturity of the fixed assets should be increased or it should be relatively in the longer period of time they should go for making this fixed assets, the fixed maturity of the fixed rate assets, they can increase the maturity period and amount of variables rate assets will be reduced the whatever loans they have given which are based upon the variable rate loan.

They can reduce that one because anyway interest rates going down if interest rates going down and accordingly the loan rate will be changed. They can also shortening the maturity of the liabilities that is replacing the certificate of deposits with the government borrowings. So by that what will happen that they can make their particular gap negative, so if they will make the negative gap. Then they can take the advantage of the declining interest rate scenario in the market.

So, this is the way these are some of the basic strategy what the commercial banks can adopt in the different interest rate scenario provided, they are able to predict the direction of interest rate very accurately. If the prediction is physically perfect, or the prediction is really accurately done, then this kind of strategy may help the commercial bank to increase the net rate interest income in that particular point of time.

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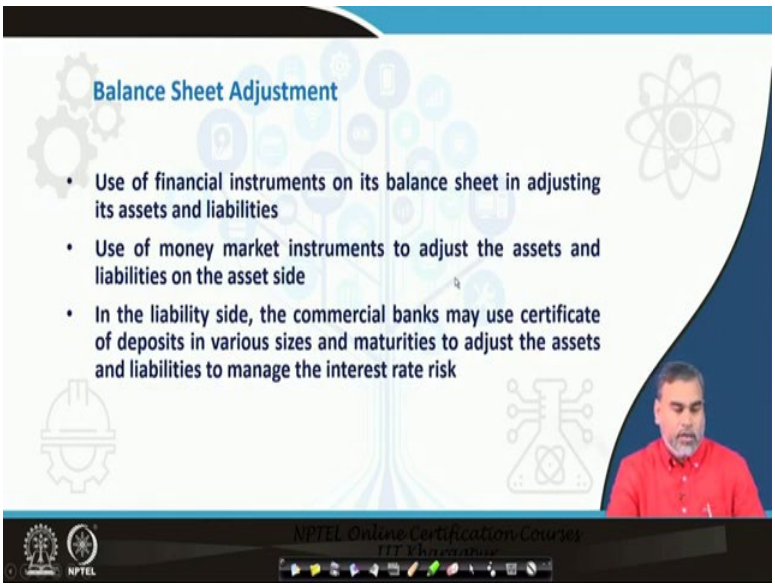

They can also make the balance sheet adjustment, they can use the money market instrument to adjust the assets and liabilities because these are very short term in nature. Or they can use the liability side, they can use the certificate of deposits on various sizes to adjust assets and

liabilities to manage the interest rate risk. This is what basically what we just now discussed, so that is called basically the balance sheet adjustments.

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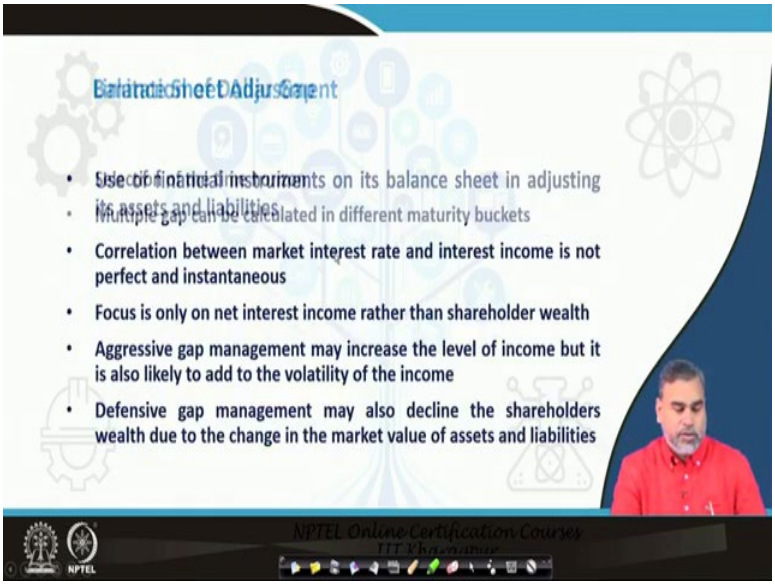

So there are many limitations, the limitations are the selection of the time horizon at what maturity bucket the dollar gap should be calculated. Accordingly we can decide which is rate sensitive asset, which is rate sensitive liabilities. Because of that, some of the banks can go for a multiple dollar gaps on the different maturity buckets. There is a possibility that the market interest rate and interest income is not perfect, the correlation between them is not perfect. And the changes also which is reflected through change in interest rate is not immediate.

There is no instantaneous change always we observed from that, focus always the banks give on the net interest income, not the value of the equity or the shareholders wealth. That is the basic objective of the dollar gap. The basic objective of the dollar gap is to link the dollar gap with the net interest income not with the shareholder's wealth. The aggressive management strategy that the gap management what we discussed, that can increase the level of income, but it is also likely to add the volatility of the income and everything if there is some income level is highly volatile, that is considered as a risk that means, there is some kind of fluctuations which is happening with respect to the income that gives a negative signal to the market.

And a defensive gap management also declined the shareholders' value because once we go for making your net interest income totally unaltered, then what happens that it basically

affects the investors mind towards that particular bank, bank stock. Then accordingly the market value of the assets also or the liabilities also chains in the adverse way. So these are the different limitations.

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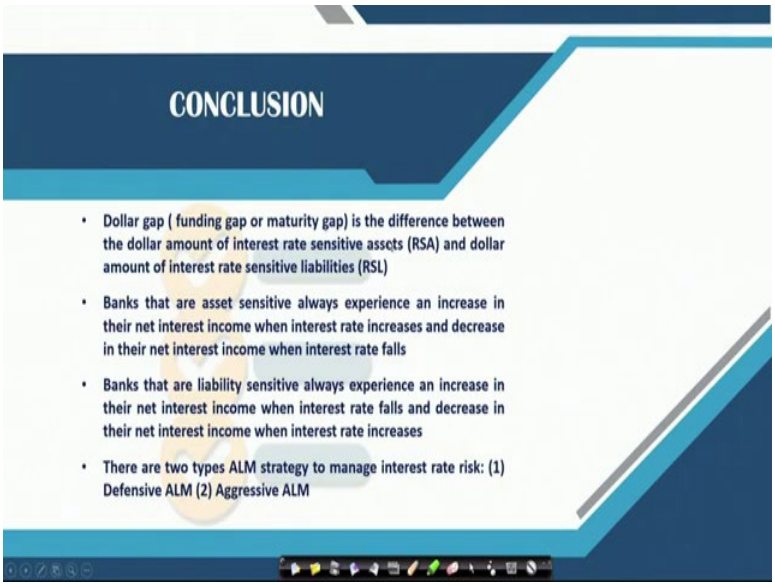

And coming to the conclusion already we have discussed about the dollar gap, which is important, the difference between rate sensitive assets and rate sensitive liabilities. And banks with our asset sensitive they always experience increase in the net interest income when interest rate increases and decrease in the net interest income when the net interest rate falls and banks which are liability sensitive the opposite situation can be observed from them. And there are 2 types of strategy always we adopt to manage this particular interest rate risk through this ALM process.

One is your defensive ALM and another one is the aggressive ALM, aggressive asset liability management and defensive asset liability management. In one case we are trying to keep our interest income unaltered or remain same, as the previous year before the change in interest rate. Another case we always try to increase the value of this net interest income due to the change in the interest rates in the market. So this is the basic difference between these 2.

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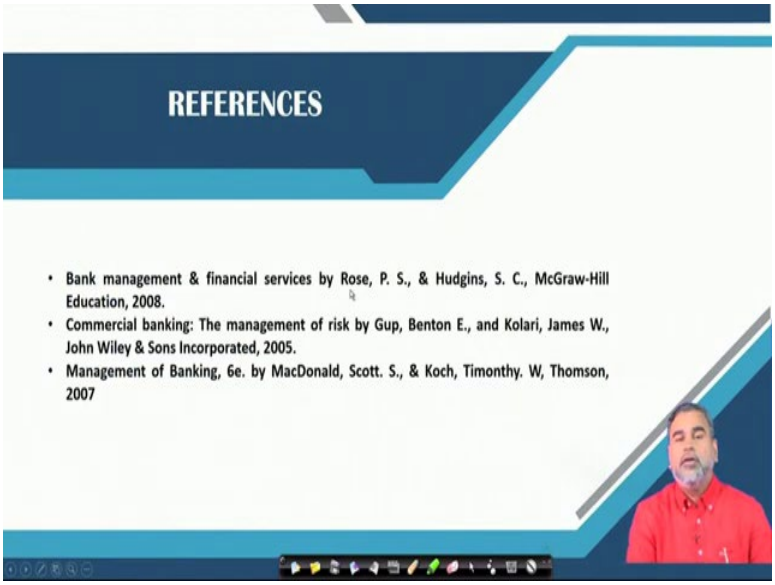

These are the references what you can go through for this particular analysis and thank you.