Management of Commercial Banking
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Lecture 45
Managing Investment Portfolios - V

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Good morning. So, in the previous class we discussed about the different passive strategies what the commercial banks use to manage their portfolio, particularly that what are those different kind of strategies they adopt to maximize the return or as well as they want to maintain the profitability of this particular bank.

Apart from this passive strategy we have some other strategies also what the commercial banks use. Within this framework of this passive strategy we can say that this is the extension of the passive strategy that is basically, or you can name it as a semi-active strategy. That is called the immunization strategy and the basic objective of the immunization strategy is to minimize the interest rate risk in the market.

So, if there is a fluctuation in the interest rates in the market then the commercial banks will hold the portfolio in such a way by that any kind of fluctuations in the interest rate which has the impact on the price of the bond and other things that basically can be hedged out in that particular context by that the total value of this particular portfolio is not going to be affected. So, that is called the immunization strategy.

Then we have some of the active strategy and already we have discussed about what do we mean by the active strategy. In the context of active strategy always we can say that the investors or in this context, the commercial banks always try to bid the market and always they want to get the more return what the market is giving. So, today we will be discussing these two different strategies what the commercial banks generally use to manage their portfolio or to maximize their return.

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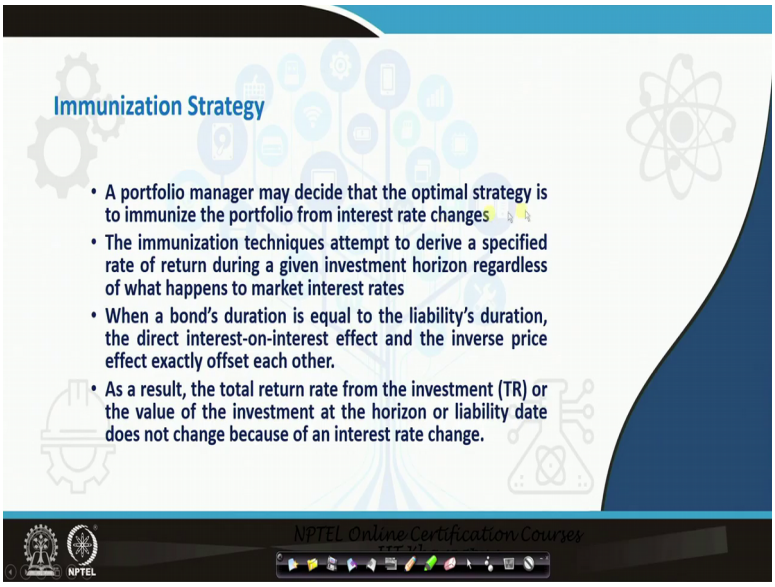

So, coming back to this immunization strategy if you see that already we have discussed this that the basic objective of the immunization is to hedge this interest rate risk in the market. So, that is why this, the particular portfolio manager will decide the portfolio in such a way that the portfolio can be immunized from the interest rate changes in the market. So, that is why that is called the immunization strategy. Then the immunization strategy is basically attempt to derive a specific rate of return during a given investment horizon regardless of what happens to the market interest rate.

So, if you remember the total return is nothing but ending value divided by the beginning value to the power 1 by the horizon period minus 1, so if you want to see that if your ending value will be targeted and at any kind of fluctuation in interest rate is not going to affect the ending value of the particular portfolio then the total return can be achieved.

So, in this context the technique should be devised in such a way or it should be formulated in such a way that the total return on the portfolio is not going to be affected or the ending

value of the total portfolio is not going to be affected due to the change in the interest rate fluctuations.

So, the basic logic or basic concept of immunization is whenever we go for the immunization strategy we always want to ensure that the total duration of the total liability should be equal to the duration of the total assets. So, if in this context if you talk about, so if your bonds duration is equal to the liabilities duration what basically we can call it then in that context.

We can say that the fluctuation in the interest rate which has the impact on the price of the bond and as well as it has also the impact on the rate of interest from the coupons what they are receiving that means the interest-on-interest or the reinvestment rate what we can call it, because if the interest rate is going to increase then the price of the bond is going to decline.

So, in that context we are exposed to more price risk but in that particular point of time whatever proceedings the investor will get in terms of the coupons that can be reinvested in the market in higher rate. So, whatever loss they can make in terms of the decline in the price that may be compensated with the increase in the return from the reinvestment of the coupons in the market, in that particular time period.

So, if that can be possible if your duration of the total bond or the duration of the assets will be equal to the duration of the liabilities. So, in that context the direct interest-on-interest effect and the inverse price effect will exactly offset to each other. By that your total return or the total ending value of the portfolio can be maintained.

So, the total rate of return from the investment or the value of the investment at the horizon or the liability rate does not change because of the interest rate changes if this particular concept is followed. That means the duration of the bond is equal to the duration of the liabilities.

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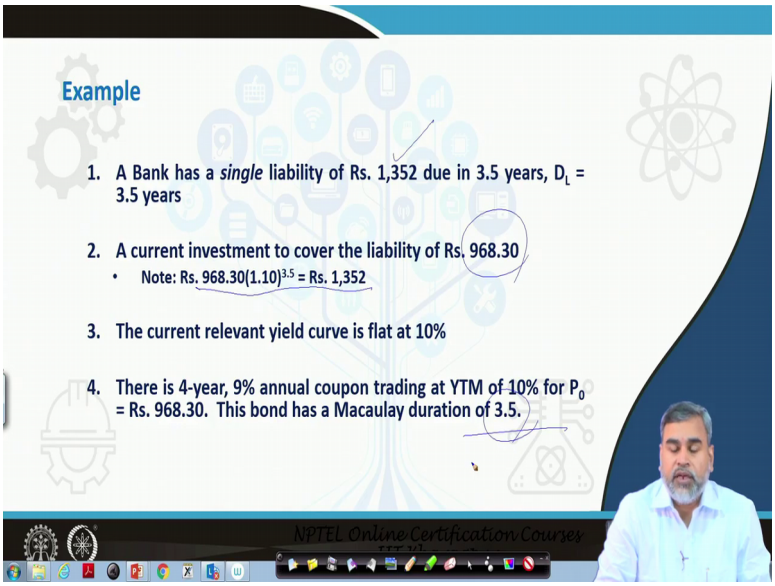

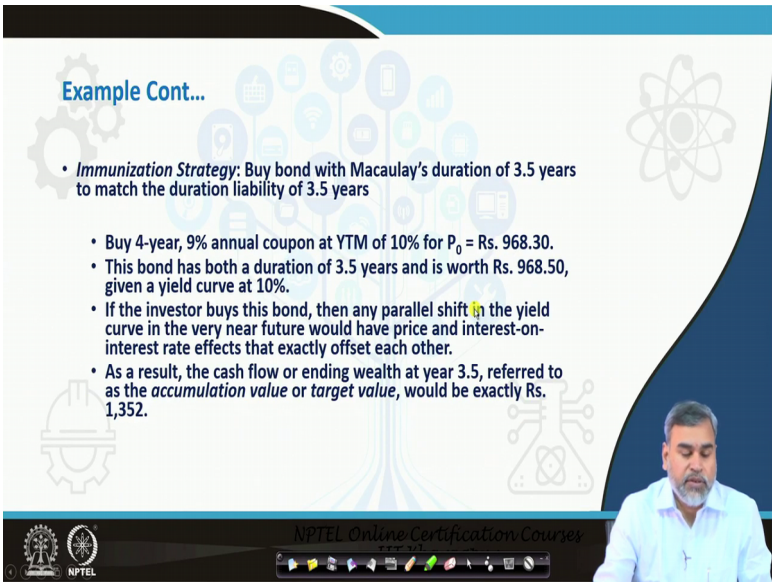

We can see one example that how this concept of duration basically works. For example a bank has a single liability of 1,352. Let us assume that all these figures are in terms of the crores. So, then let this due is 3.5 years. That means the horizon date is known, that this is the money what the bank needs at the year of 3.5 and that means the duration of liability is 3.5 years. That is basically known.

So, how much money the particular commercial bank should invest? So, if you see that it can be invested, it can be basically, we can find out that how much money he should, or the commercial bank should invest by that after 3.5 years they can receive a total value of 1,352. So, here in this context what we find that is 968.30.

So, that means your future value of that 968.30 will be equal to 1,352. $968.30 \times 1.1^{3.5}$. So, that basically, that is why this much money the commercial bank has to invest to get this much return after 3.5 years provided this interest rate here we are assuming that is 10 percent that is not going to be changed.

So, if there is a change in the interest rate then this particular 1,352 which this particular bank is expected to get after 3.5 years that may not be realized. That may be more than that, that may be less than that, depending upon the change in the interest rate. So, in this context what this commercial bank can do?

The commercial bank can go for a 4 years 9 percent coupon which is trading at yield to maturity of 10 percent and price is 968.30. So, in this formula or this particular data if you, already you know that how to calculate duration that already we have discussed. So, then your duration will be 3.5. So, here we have see that the duration should be perfectly matched then this 1,352 can be achieved. So, we have to see that how this 1,352 is really achieved in this particular context.

Then what is the strategy the commercial bank should adopt in that particular point of time? The commercial bank can buy a bond with a Macaulay duration of 3.5 years to match the duration liability of 3.5 years what they need that the 1,352 after 3.5 years. So, buy this 4 years 9 percent annual coupon of YTM 10 percent where the price of the bond is 968.30.

Then if the investor buys this bond then there is, if there is any parallel shift in the yield curve in the very near future then what will happen that, that will have impact on the price of the bond and as well as the interest-on-interest of that particular coupons what they were receiving.

So, in this context what we have to see that the ending value, we have to ensure that the ending value of that particular bond should be 3.5 years, after 3.5 years should be 1,352. So, the accumulation value or the target value should be exactly 1,352. How it can be achieved?

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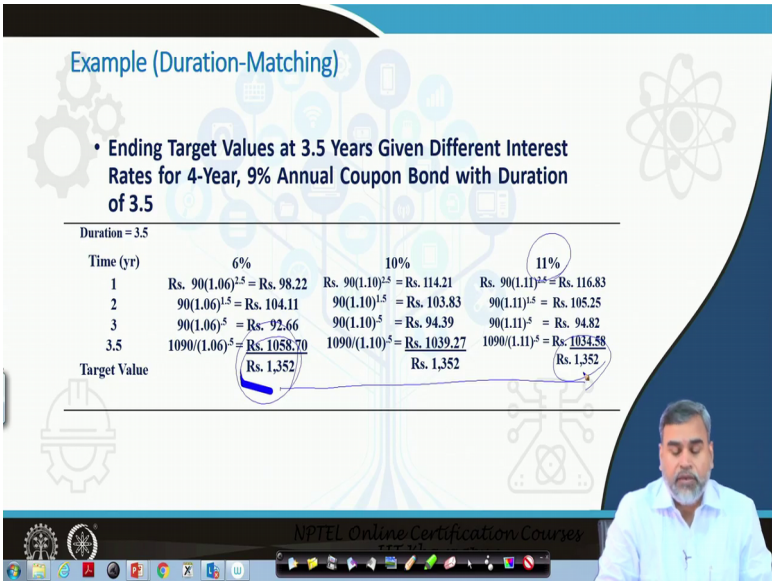

If you see this particular calculations then it will be clear for you that 1352 how we can achieve it if you are holding a bond of 4 years maturity and the duration is 3.5 years? So, your duration is 3.5 so if you see that, that 9 percent is the coupons every year we are getting the coupon of 90 Rupees. Then let this interest rate has come down to 6 percent.

So, if you want to calculate at the 6 percent interest rate, if this cash flow if you will observe you are getting that 1,352 in the end, if this interest rate has come, is increasing up to 11 percent there also we are getting 1,352 after 3.5 years. So, in this context we are considering both reinvestment of the coupons and as well as the price fluctuations due to the change in the interest rate.

So, here what basically here we are trying to say that whenever we are holding a bond whose maturity period is 4 years but the duration is 3.5 years and our liability period duration is 3.5 years then we can ensure that if you consider both interest-on-interest concept and as well as the price of the bond concept then the total value of the bond is not going to be changed.

So, instead of holding a bond whose maturity period is 3.5 years the bank should hold a bond whose maturity is 4 years or the maturity is more than the duration liability period and exactly this duration of the particular bond should be exactly matching with the duration of liability. In this context do not hold the bond up to 3.5 years maturity, hold the bond whose duration is 3.5 years. So, in that context we can see that the total return can be achieved.

So, that is one strategy what the commercial banks can adopt where the price of the bond even if it is fluctuated due to the change in interest rate then the interest-on-interest effect is really going to offset the price effect in that particular point of time then end of the day the total return can be equal to the expected return what they are basically expecting from the beginning.

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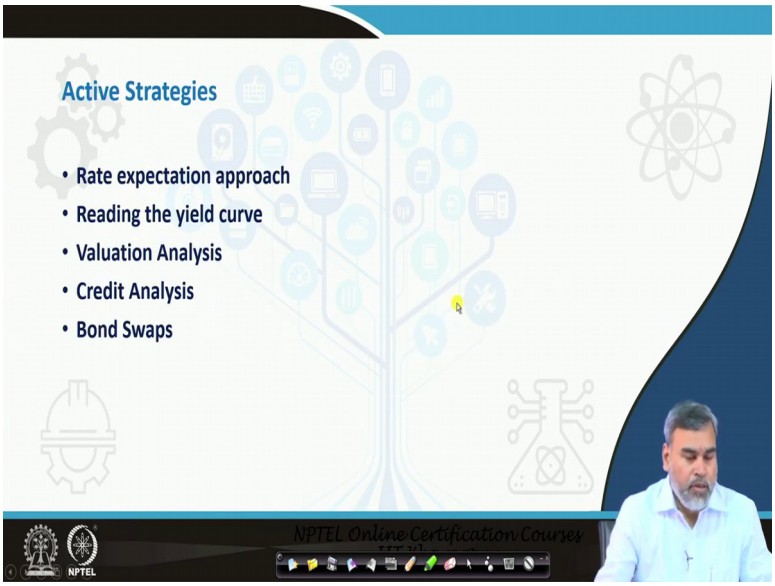

Then we have the active strategies. We have many active strategies what the commercial banks can adopt whenever they go for this investment strategy or making their investment strategy for maximizing the return in the market. We have Rate expectation approach that means you can predict the interest rate by using the different methods. By that you can say that how this interest rate is going to behave in the future. Accordingly you can formulate your strategy.

Then you can, because yield curve is a public good. Anybody can use the yield curve to predict the interest rate in the market. So, that is why you can read the yield curve and you can make your strategy that what kind of investment you should hold for maximizing the return.

You can use the simple Valuation Analysis that you can calculate this you can use any kind of discount flow models or any other model. Find out the intrinsic value of this particular asset. Then you see that whether the market value is going to be more than the intrinsic value or will be less than the intrinsic value. Accordingly the positions can be taken.

You can go for a Credit Analysis of the different type of bonds which are available. You can find out the probability of default by using Altman Z-score and other kind of models which are available in the market. Or you can also go for the swap. You can also swap the bonds. By that the return can be always ensured that how much return this particular commercial bank needs and whether really this particular return can be realized by them in this particular market conditions.

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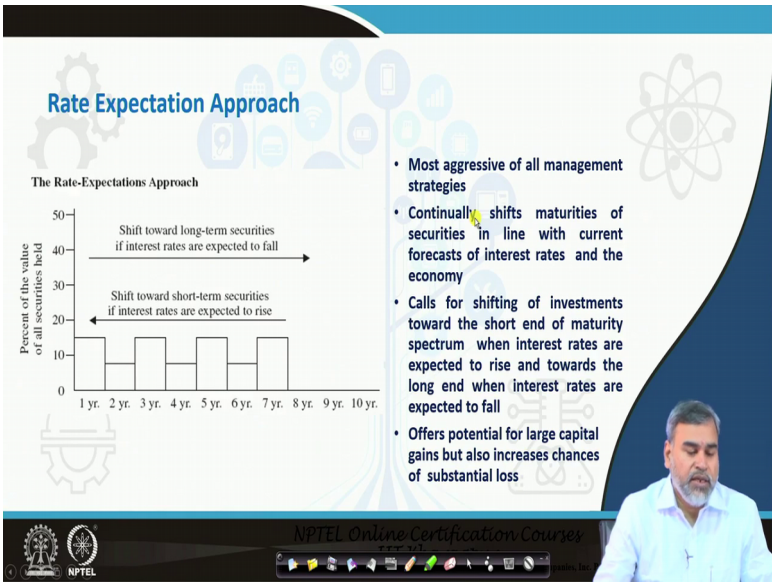

One by one if you see that the first one, the Rate Expectation approach, so in the Rate Expectation approach this is the one of the most aggressive strategy in the market because, it is the most riskiest strategy also. The reason is basically the prediction of the interest rate, the future interest rate is really difficult but still this particular strategy also can be used by the commercial banks to maximize their return in the market with a given amount of risk.

So, here in this strategy what the commercial banks do? They continuously shift the maturities of securities in line with the current forecast of the interest rate and the economy. How this interest rate is going to be in the future, accordingly they can shift the maturity period of the interest rate. They hold the different maturity bonds in their particular portfolio. By that any fluctuations in interest rate can be helpful or can be useful basically to achieve that total return of that particular portfolio.

So, whenever there is a call for shifting of investment towards the short end of maturity spectrum when interest rates are expected to rise and towards the long end when the interest rates are expected to fall. So, depending upon the fluctuations of the interest rate the

commercial banks can hold the long term and short term maturity bonds that how this interest rate is going to behave in the near future or how this, they are going to behave in the distant future, accordingly they decide that what kind of bond they should, they are going, they should hold in that particular portfolio.

So, whenever there is, interest rate is going to fall then you can go for in the future if the interest rate is going to fall then the shift towards the long term securities and if the interest rate is going to rise then you go for the short term securities because holding the, if the interest rate is continuously increasing then holding those kind of bonds is not helpful. Longer term maturity bond is not going to be helpful for the commercial banks because the price is again going to be declining.

So, in that context but the basic thing is, basic problem is that the accurate prediction of interest rate in the Rate Expectation hypothesis or Rate Expectation approach. So if we are really able to predict the interest rate accurately or there is some kind of accuracy for prediction of the interest rate then maybe it is easier or it is better for the commercial banks to go for the Rate Expectation approach for the investment strategy.

So, whenever this any commercial bank who follows this Rate Expectation approach, they basically offers the potential for this strategy basically offers the potential for large capital gains but also increases the chances of substantial loss if your interest rate is not going to behave in the way whatever way you have predicted.

So, if your expected direction of the interest rate is not going to be materialized with your expectations then what will happen that the substantial loss can be incurred in this particular strategy if any commercial banks follow this strategy in the market.

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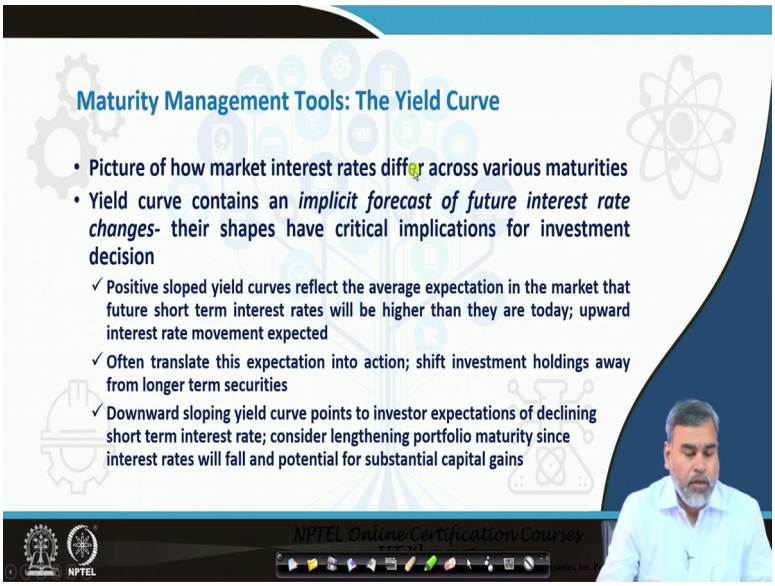

Then we have the another one is the Yield Curve, so here you know that what is Yield Curve. The Yield Curve shows the relationship between the yield and term to maturity. So, here in a normal Yield Curve scenario what we are expecting that the long term interest rate will be more than the short term interest rate. So, if it is inverted Yield Curve that means the short term interest rate is more than the long term interest rate.

So, if the Yield Curves are available for the different type of bonds which are traded in the market then it is also convenient for the portfolio manager of the commercial bank to take the position in such a way by that the return can be maximized. So, first of all you see that how the market interest rate differ across the various maturities, then because the, this Yield Curve basically contains this implicit forecast of the future interest rate changes and their shapes of critical implications of investment decisions that already I told you because the positive sloped Yield Curve reflect the average expectation in the market that future short term interest rate will be higher than whatever they are today.

That means the future rates will be more than, or the forward rates will be more than the spot rate and the upward interest rate moment is expected if you go by the momentum strategy. So, what is observed that often this, we can translate this expectation in the action and how we can translate this?

We can shift this investment holdings away from longer term securities. If the interest rate is going to up then what we can do, we can shift the investment holdings away from the longer

term securities and if a downward sloping Yield Curve is observed then the, that basically shows the investor's expectations of declining short term interest rate.

Then in that particular point of time we can consider for lengthening the portfolio maturity, that means maturity period of the different assets in that portfolio can be enhanced, can be increased since the interest rate is going to fall and there is a chance of substantial capital gain.

So, if there is a price appreciation then in the future you can generate more kind of revenue out of this because the price is going to be up if the interest rate is going to be down. So, depending on the shape of the Yield Curve the positions can be changed in the market.

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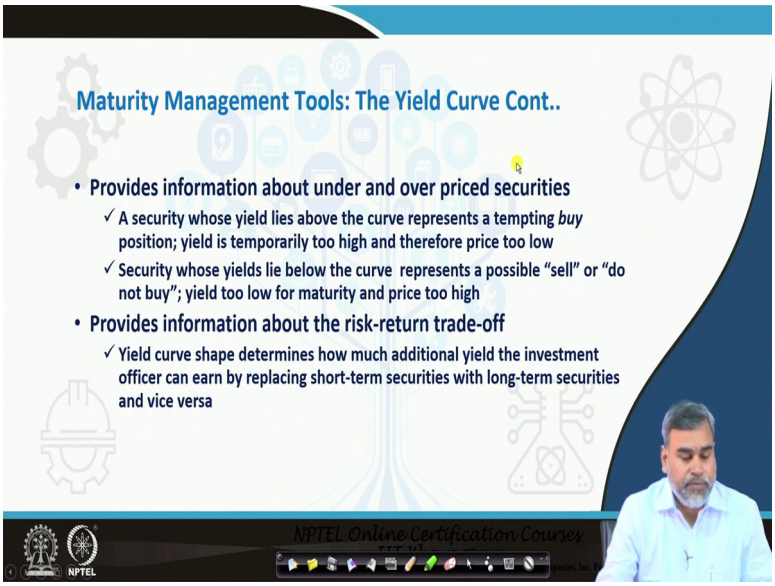

So, that also provides the information about under and overvalued securities. A security whose yield lies above the curve representing a tempting buy position so that means the yield is temporarily too high and therefore the price is too low, and the securities whose yields are below the yield curve represent the possible sell or do not buy. So, yield too low yield for maturity and price is too high.

That also provides the information about the risk return tradeoff. Yield Curve shape determines how much additional yield the investment offers, investment officer can earn by replacing the short-term securities with the long-term securities. So, overall the valuation concept of the bond as well as risk return tradeoff and as well as the relationship between the

short term and long term interest rates, all kind of information what we can achieve that basically through reading the Yield Curve.

So, reading the Yield Curve is a very good strategy in the market particularly whenever we try to invest in the bond markets. Or how it is, how interest rate is going to behave or what kind of scenario can we extracted from the existing Yield Curve which is available in the market that can be easily judged if you go for reading Yield Curve for a continuous period of time then accordingly you can predict that how the market basically is going to behave in terms of the fluctuations of the interest rate and accordingly the positions can be changed and the changing position will fetch this particular investor a better return in that particular point of time.

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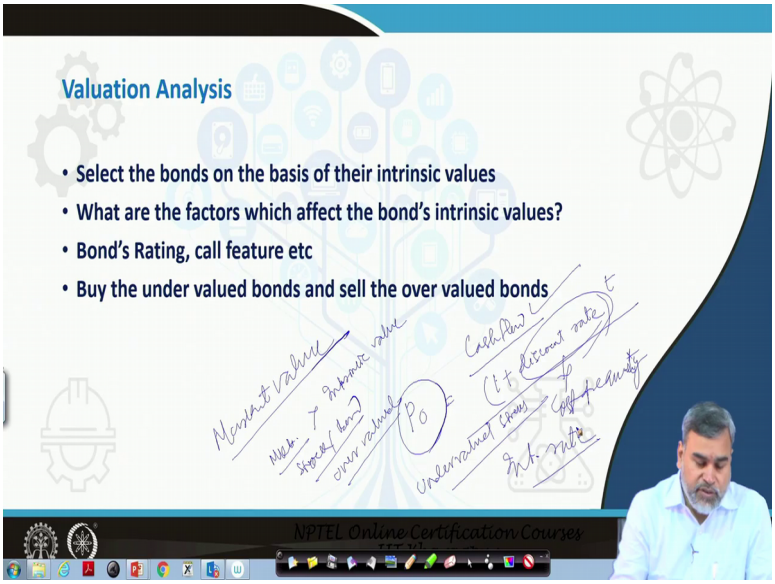

Then we have another concept that is called the Valuation Analysis and in the Valuation Analysis what basically we do? We try to calculate this intrinsic value of the asset and we try to find out, what do we mean by this intrinsic value of the asset? If you remember your intrinsic value is nothing but your, this is based upon, let you are going for any kind of discount model then your cash flow divided by your any kind of discount rate. So, this discount rate can be anything depending upon the cash flow.

So, here what we are trying to do that if you can find out this intrinsic value of the asset and already this historically the market value is available of this particular asset then what basically we can do, we can compare between the intrinsic value and the market value. If the market value is already more than the intrinsic value then what we can say? This particular

stock, this particular asset whether it is the stock or the bond, this is basically already overvalued. So, if it is already overvalued then the potential gain from this kind of investment is relatively less.

But for example if this intrinsic, this market value is less than the intrinsic value that we can call the undervalued stocks. That means the stock has the potential or the asset has the potential but the potential is not yet realized by the market at that particular point of time. So, what we can do? We can go for investing those assets which are basically undervalued in nature.

So, a major factor which is affecting the intrinsic value is your cash flow, what you are receiving or you are going to receive from this particular investment, for example for the stock case it is dividend, for the bond case it is the coupons, and we have to find out the discount rate, either it can be your cost of equity or it can be your market interest rate, it can be anything depending upon the asset the discount rates will vary and accordingly we can decide that what kind of discount rate we should use for valuation of that particular asset and then we compare it with the existing market price. Then you can say that whether it is overvalued stock or undervalued stock.

There are other factors which also affect the valuation like your rating of that particular bond and the bond has a call feature or not because if the bond has a call feature then it is more risky. Then price of those, call price of that particular bond will be reasonably higher than the face value or the maturity value of that particular bond.

So, the basic principle is, the basic logic is buy the undervalued bonds and sell the overvalued bonds. So, this is the basic principle and some of the banks can follow this fundamental principle for this investment. That is the comparison between the market value and the intrinsic value of that particular asset and accordingly they can decide that whether this particular stock or particular bond should be bought in that particular point of time or it should be sold at that particular point of time. So, this is basically another kind of strategy the commercial banks can adopt.

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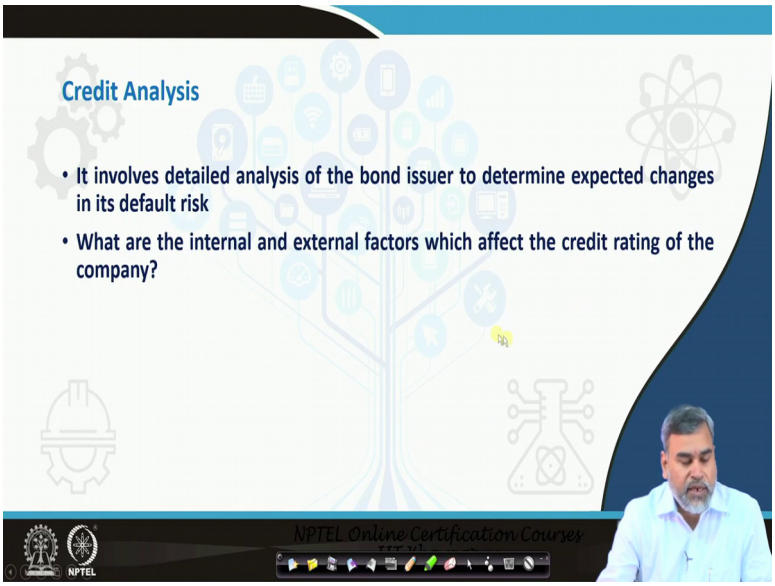

Then we have the Credit Analysis. The Credit Analysis basically involves the detailed analysis of the bond issuer to determine the expected changes in its default risk. So, there are many factors the bank can consider. There the factors can be the financial factors, this interest repayment capacity and as well as the other financial performance indicator like ROE, ROA.

Then the interest coverage ratio, liquidity of the company, the fundamental strength of the particular company, liquidity ratios, there are different kind of factors have to be considered whenever we are going to analyze that whether this particular company who is issuing this stock and bank is ready to invest in that particular stock whether it is good stock or good bond or not and accordingly they can decide that whether this particular asset is worthy investing in that particular point of time.

Then in that context what basically we do? There are, first of all we have to look at the financial factors which are internal to the company but they are going to play the role for the credit rating process. This is number 1, and number 2 we have the different models which basically used to find out the default risk or the probability of default of that particular company.

Then we have the Altman Z-score which is popularly used to ensure that what is the probability that the company is going to face the problem or the bankrupt, is going to be bankrupt, or there is what kind of probability of bankruptcy which is involved in that particular company? So, all kinds of analysis can be also carried out whenever the investment

positions will be taken in the market in that particular point of time; then apart from this the Credit Analysis.

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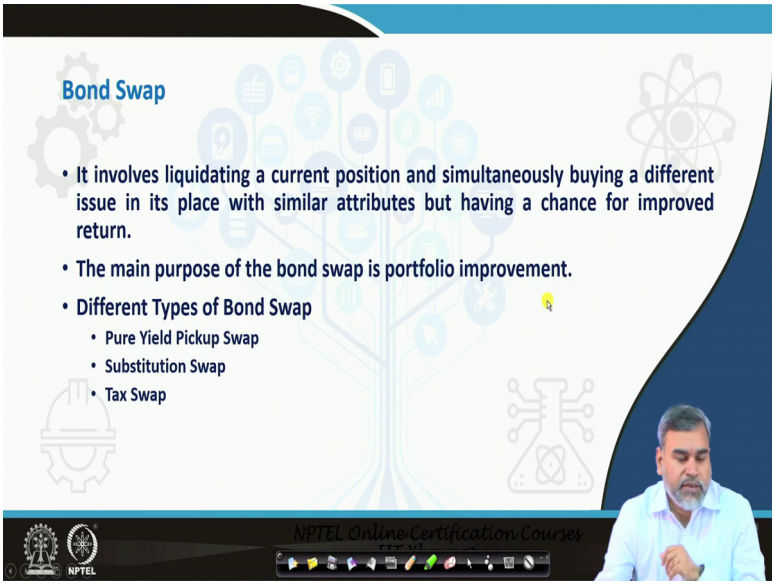

We have the Swap. So, what do we mean by the Swap? The Swap means it involves the liquidating a current position and simultaneously buying a different issue in its place with similar attributes but having a chance for improved return. So, already we know that what is the use of the Swap.

The Swaps are basically used to convert from floating rates to fixed rate or fixed rates to floating rate, conversion from different type of liabilities, fixed rate liabilities to the floating rate liabilities, floating rate assets to the fixed rate assets and all kind of concepts already you know.

So, in this particular context what we can do, the Bond Swapping can be used as an active investment strategy by that the return of that particular bond investments can be maximized at any point of time. So, the main purpose of the Bond Swap is improving the portfolio or the improvement of the performance of the particular portfolio.

There are different type of Bond Swaps what the investors always use or the banks always use to always get the, extract the return from them. They are the Pure Yield Pickup Swap, we have the Substitution Swap and we have the Tax Swap. To some extent the Tax Swap we have discussed before but these two, Pure Yield Pickup Swap and Substitution Swap these

particular kind of swaps are also used by the commercial banks to extract better return from the particular investments.

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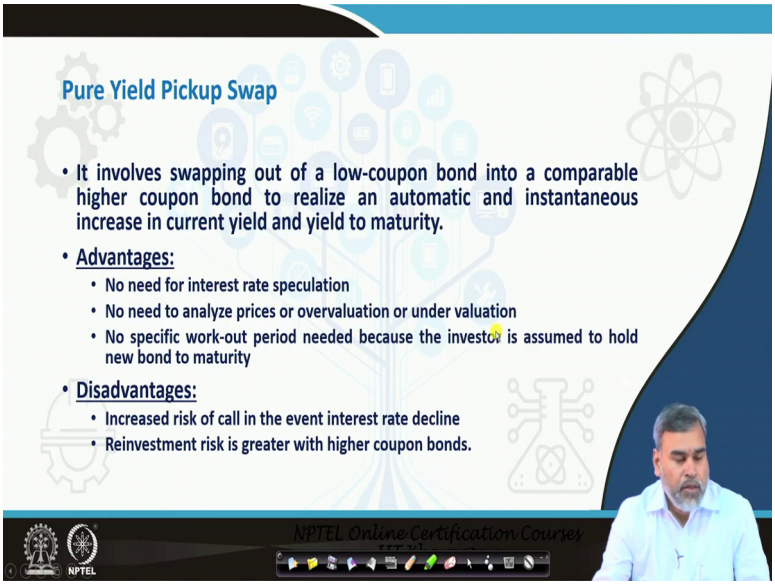

So, what do we mean by this Pure Yield Pickup Swap? Whenever you go for the Pure Yield Pickup Swap it basically involves swapping out of a low coupon bond into a comparable higher coupon bond to realize an automatic and instantaneous increase in current yield and yield to maturity.

So, depending upon the market interest rate we can decide that, or the long term and short term maturity interest rate we can decide that whether you should go for a low coupon bond or a high coupon bond and accordingly your total return of the particular bond will be changed.

So, depending upon the market fluctuations, interest rate fluctuations in particular there can be a shift, or prediction of the market interest rate in the future there can be, swap can take place between the two different bonds with respect to their coupons. So, what is the advantage? The advantage is no need for the interest rate speculation in this case, no need to analyze the prices or overvalued prices or overvaluation or undervaluation whether the particular asset is overvalued or undervalued. No specific workout period needed because the investor is assumed to hold the new bond up to the maturity.

Then increase, there are certain disadvantages in terms of this kind of strategy. There is increased risk of call in the event when the interest rate declines, and the reinvestment rate is

greater with the high coupon bonds. So, if you are going for high coupon bond, you are substituting your low coupon bond, if the interest rate is going to be down then the reinvestment return from that particular asset will be relatively lesser because the money what basically we are receiving against that, that is not going to give you the better return in the market at that particular point of time.

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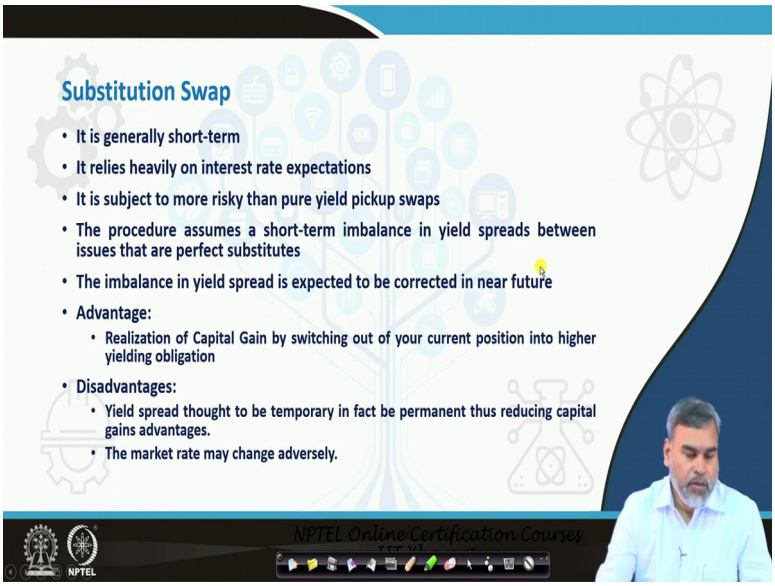

Then we have Substitution Swap. The Substitution Swap is generally short term in nature. It is heavily relying on the interest rate expectations. It is subject to more risky than the Pure Yield Pickup Swap. Here what is the procedure in the Substitution Swap? The procedure basically assumes a short term imbalance in the yield spread between issues that are perfect substitutes.

So, there are two different alternatives which are available and the substitution can take place between them whenever the yield spread of that particular asset is different. The yield spread is nothing but the difference between the short term yield and the long term yield. So, for a single asset, there are two assets if you consider. In one asset's yield spread is different than other asset yield spread then the Substitution Swap will be possible.

So, the imbalance in the yield spread is expected to be corrected in the near future if you are going for investing in these kind of assets in the market. So, what are those advantage? The advantage, realization of the capital gain by switching out of your current position in to higher yielding obligations and there are many disadvantages. Disadvantages are yield spread

thought to be temporary in fact be permanent thus reducing the capital gains advantages in this particular case and the market rate also may change adversely.

So, depending upon this the Substitution Swap will really work or not, that basically depends upon the expectations of the interest rate in the market again. So, that is basically another active strategy what the commercial banks can adopt.

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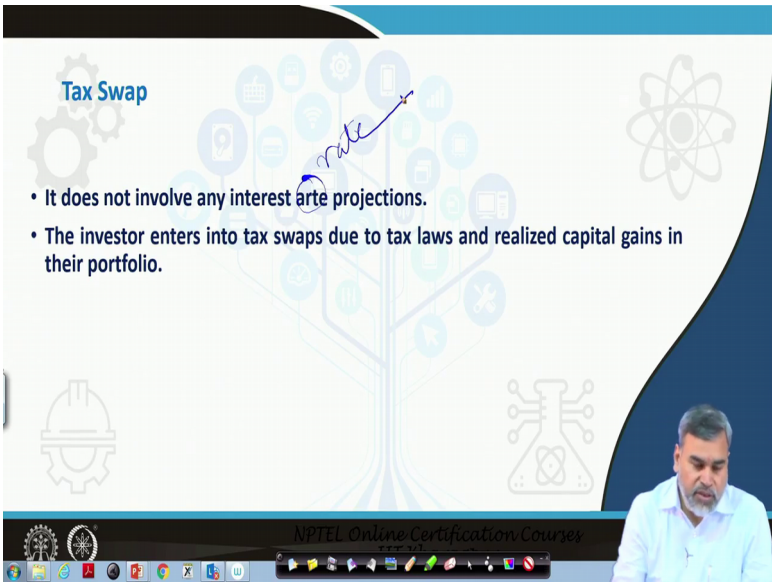

Tax Swap already we discussed to some extent. So, here it does not involve any interest rate projections. Here you remember this is again rate, and the investors enter into Tax Swaps basically due to tax laws and the realized capital gains in their portfolio in that particular country and in particular time. So, here to get some tax advantage the tax swapping generally takes place in the commercial banks bonds.

Or there is a, there are some bonds which are tax free there are some bonds which are highly taxable. So, depending upon the tax laws, tax policies and all these things the investor can go for tax swapping in the market to extract better return. So, these are, this is basically the another kind of strategy what can be adopted.

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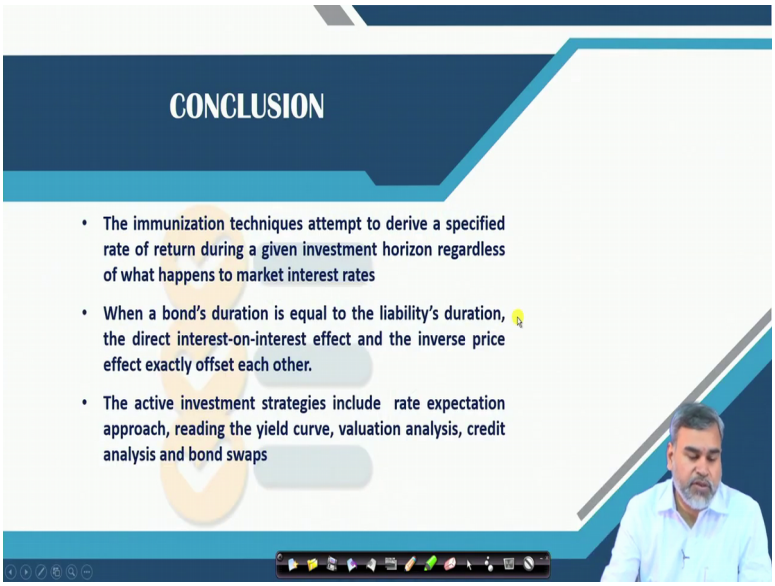

So, here what basically we have discussed that the immunization strategy which attempts to derive a specified rate of return with a given investment horizon regardless of the fluctuations in the interest rate and when a bond's duration is equal to the liabilities duration the interest-on-interest effect is going to offset the price effect.

So, because of that the total return can be achieved and that means the interest rate risk is perfectly hedged out. That means bond is already, the immunization is taking place with respect to the bond investment in that particular point and these, all these active strategies which these commercial banks can use, these are basically the interest rate prediction or the rate expectation.

You can, they can use the Yield Curve which is nothing but a public good. They can go for a Valuation Analysis. They can go for any kind of Credit Analysis. Then also they can go for the Bond Swap. So, these are the different kind of strategies which are used to manage the portfolio by the commercial banks in terms of the active strategies.

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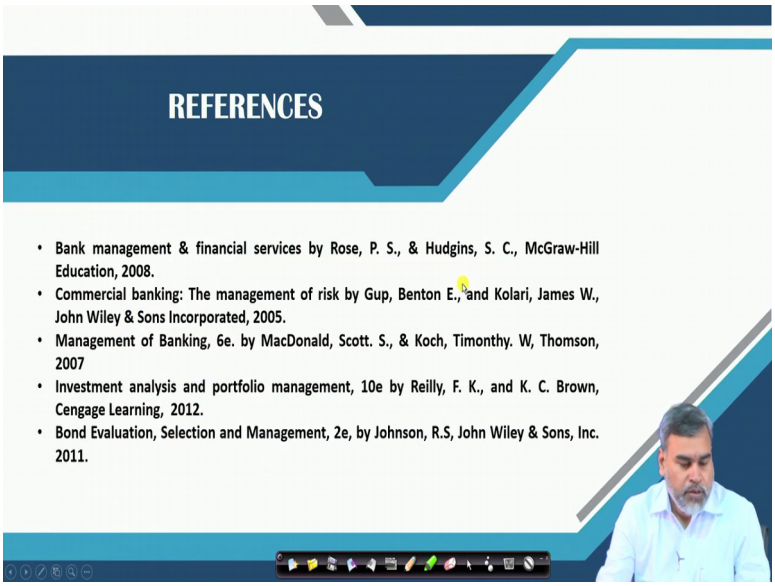

So, these are the references you can go through for the detailed discussion on the different type of strategy. Thank you.