Management of Fixed Income Securities
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Lecture - 47
Bond Investment Strategies - II

So, in the previous class we discussed about the bond investment strategy and largely we started the discussion about the active bond investment strategy. There we discussed about the concepts related to the interest rate anticipation strategy. So, we will continue with that particular discussion in today's session also.

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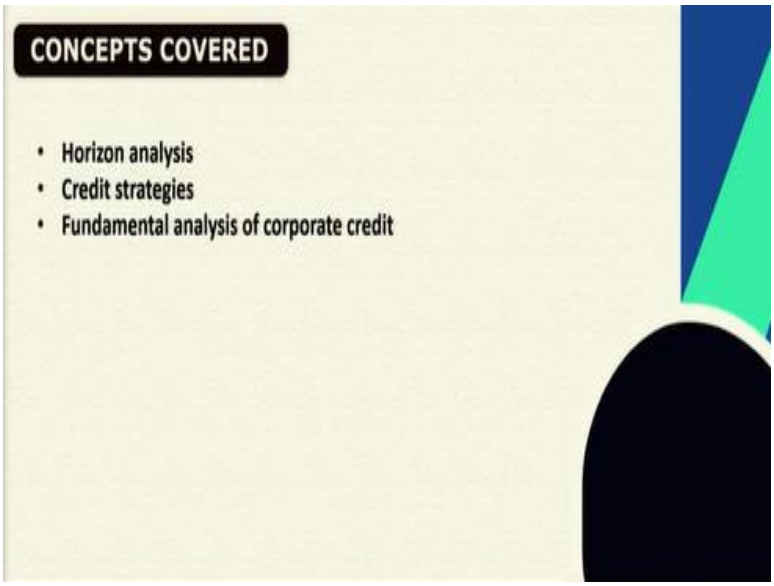

So, in this particular session we will come across the different concept like your horizon analysis, the credit strategies, fundamental analysis of corporate credit. Although, extensively, we will not discuss that part, we will just introduce that concept then largely it will be discussed in the next session.

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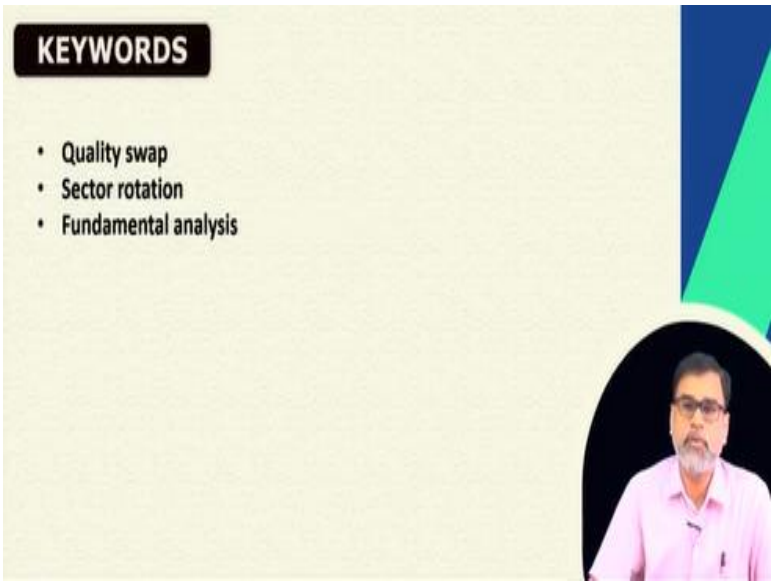

Then we have the keywords what basically you will be finding in this particular session like quality swap, sector rotation, fundamental analysis and all these things. So, here if you see in the previous class, we discussed about the interest rate expectations or the rate anticipation swaps. There are different types of strategies we have discussed like bullet strategy, barbell strategy then we have the bond laddering and all these things.

And those things basically will depend upon whatever way the yield curve is shifting. How the yield curve is shifting accordingly these particular strategies can be adopted to manage the risk.

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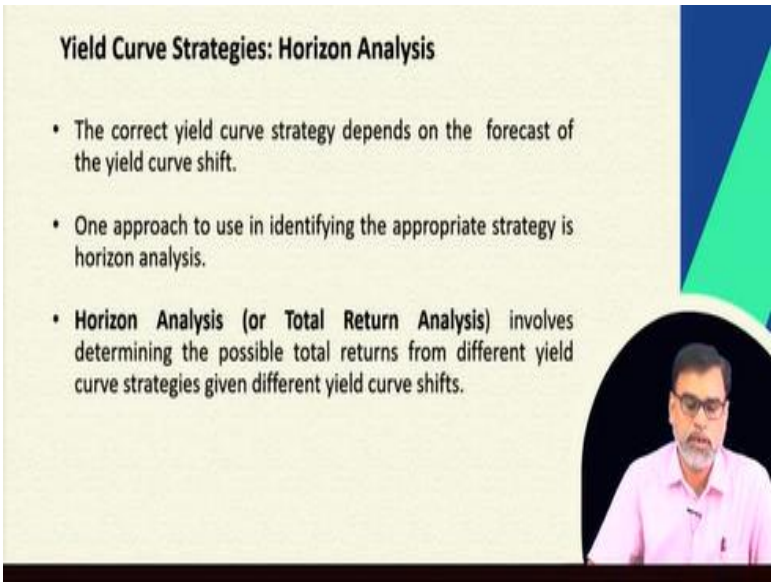

But what is the way, how to understand that how to find out the mechanism that how this particular strategy or which strategy is going to work better in that particular context. So, the correct yield curve strategies generally depend on the forecasting of the yield curve shifting. So, one approach to use in identifying the appropriate strategies basically is horizon analysis. If you recall the horizon analysis already, we have discussed in the one of the previous sessions whatever we have discussed.

I will just again go through that horizon analysis to understand that how this particular strategy or this particular analysis will help us to use a particular approach which would be beneficial for the investors to maximize their return. So, horizon analysis is nothing but a total return analysis. So, here it involves the determination of the possible total returns from different yield curve strategies given different yield curve shifts.

We have to make the different scenarios and accordingly we will see that if the interest rate will change then how the total return of the bonds are going to be changed. Then accordingly we can decide that which particular strategy will be beneficial for the investors on the basis of their objectives. So, that is basically what the horizon analysis is trying to help you.

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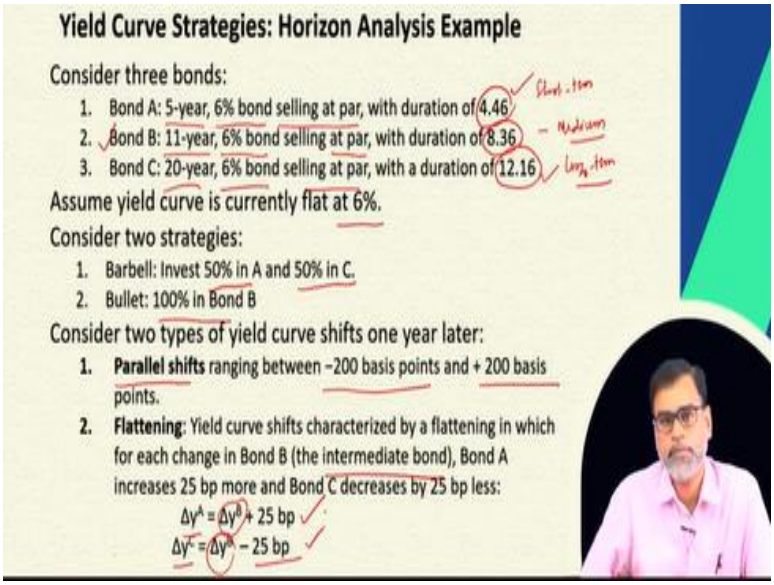

So, let us see that how this horizon analysis or on the basis of horizon analysis we can decide that what kind of strategies should be adopted.

Case1: Let we have taken three bonds in this case. We have assumed three bonds. So, one bond is let 5year maturity; coupon is 6%; bond is selling at par that means the yield is also 6%; and this bond has duration of 4.46.

Case-2: Then another bond which has 11 years maturity; 6% is the coupon it is also selling at par; and the duration is given 8.36.

Case-3: Another bond 20 years maturity; 6% selling at par; and duration is 12.16.

You assume that the yield curve is currently flat at 6%. So, in the previous session we have discussed about the two different strategies one is barbell another one is the bullet. In the barbell strategy what basically we are doing? We are investing one extreme some amounts of funds are allocated to one particular extreme that means in terms of the maturity. And another 50% is basically invested in another extreme and that is the bonds are decided on the basis of the term to maturity or the duration.

So, let here Case-1 is a short-term bond, Case-3 is a long-term bond and Case-2 is relatively long but we can consider this is a medium-term bond, you can assume that.

So, here let whenever you go for barbell strategy, we have invested 50% in bond A and 50% in the bond C; 50% in the short-term bond and 50% in the quite long-term bond. Then we have the bullet strategy where let you have invested all 100% in the bond B.

You assume two types of yield curve shift one year later that is the assumption what we are taking.

- One is there is a parallel shift and this shift can take place from -200 basis point to +200 basis point that means minus 2% to plus 2%.
- Second condition we are assuming a flattening shift here the yield curve shifts basically characterized by flattening in which each change in bond B that means the intermediate bond; the bond A increases 25 basis point more and bond C decreases by 25 basis point less.

  Mathematically, this can be written as:

  $\Delta Y^A = \Delta Y^B + 25$basis points

And $\Delta Y^C = \Delta Y^B$ - 25basis points

That's why we are assuming a flattening shifting of the yield curve. Then we will see in the different scenarios how the total return of this particular portfolio is going to be changed.

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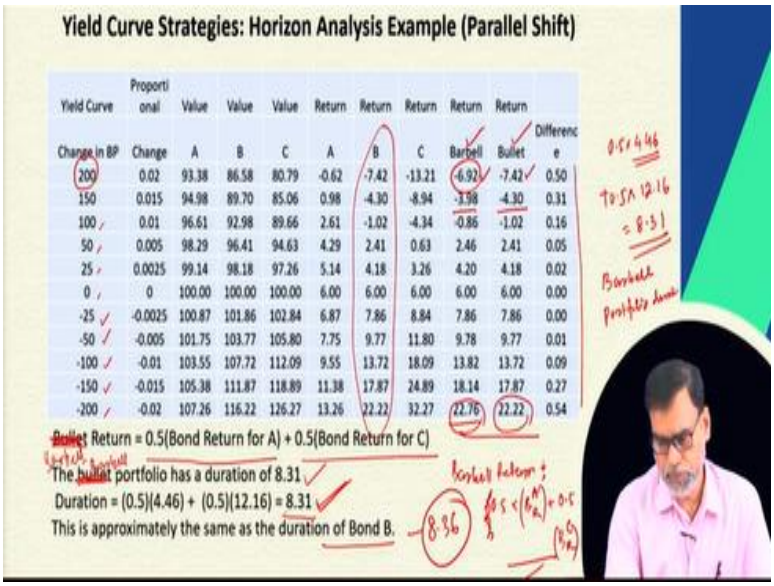

Yield Curve Change in BP	Proportional Change	Value A	Value B	Value C	Return A	Return B	Return C	Return Barbell	Return Bullet	Difference
200	0.02	93.38	86.58	80.79	-0.62	-7.42	-13.21	-6.92	-7.42	0.50
150	0.015	94.98	89.70	85.06	0.98	-4.30	-8.94	-3.98	-4.30	0.31
100	0.01	96.61	92.98	89.66	2.61	-1.02	-4.34	-0.86	-1.02	0.16
50	0.005	98.29	96.41	94.63	4.29	2.41	0.63	2.46	2.41	0.05
25	0.0025	99.14	98.18	97.26	5.14	4.18	3.26	4.20	4.18	0.02
0	0	100.00	100.00	100.00	6.00	6.00	6.00	6.00	6.00	0.00
-25	-0.0025	100.87	101.86	102.84	6.87	7.86	8.84	7.86	7.86	0.00
-50	-0.005	101.75	103.77	105.80	7.75	9.77	11.80	9.78	9.77	0.01
-100	-0.01	103.55	107.72	112.09	9.55	13.72	18.09	13.82	13.72	0.09
-150	-0.015	105.38	111.87	118.89	11.38	17.87	24.89	18.14	17.87	0.27
-200	-0.02	107.26	116.22	126.27	13.26	22.22	32.27	22.76	22.22	0.54

So, now you come to this particular condition where we are assuming the first case, we are assuming a parallel shift.

Change in basis points: We have started with the 200-basis point change that means plus 2% then 1.5%,1% 0.5, 0.25, 0 then it is again -25 basis point,-50 basis point that means - 0.5,-0.25,-1, -1.5and – 2%.

So, if you are calculating the value of A, value of B, value of C as well as return of A, return of B and return of C.

And you have two types of strategy one is barbell strategy and we have the bullet strategy.

Situation 1: whenever the interest rate will change by 200 basis point or 2% if you are going by the barbell strategy then you are getting your return is basically declined by - 6.92%. But in case of bullet strategy, it is -7.42%.

Situation 2: like that if it is 150 basis points, if you are going by the barbell strategy then you are getting your return is -3.98. But in case of bullet strategy, the return is -4.30.

So, like that if you look at Case-11 when change in basis point is -200 basis points; the interest rate will decline by 2% in terms of barbell strategy, your return is 22.76 and in terms of bullet strategy it is 22.22.

If you make a difference between these two; the return what you are getting from the barbell strategy and return what you are getting from the bullet strategy this is basically the difference between these two i.e. the barbell strategy returns minus the bullet strategy return. So, here what we have observed, the bullet strategy return basically the return what we get it from the investment of the bond B because 100% investments are made on that.

If you look at this duration because this is a case of barbell strategy that is investment in 50% bond A and 50% in bond C.

So, here if you see that this is also your barbell portfolio.

The return, you are getting from the barbell strategy is:

Bullet return= 0.5 (Bond return for A) + 0.5 (Bond return for C)

The barbell portfolio also has duration of 8.31. How you got it?

Bullet duration= 0.5 (4.46) + (0.5) 12.16 = 8.31.

So, that is approximately equal to the duration of the bond B.

If you look at the bond B, that is the duration is 8.36 but here in this case what we get the bonds duration is basically 8.31. So, this is approximately same as the duration of the bond B.

So, you will not find much difference in terms of the return differences between these two types of strategy if you look in that case.

Because, all 100% investment is bond B in terms of the bullet strategy. This is also barbell portfolio these are the duration of 8.31 and the bullet strategies if you are adopting also there the duration is also 8.31.

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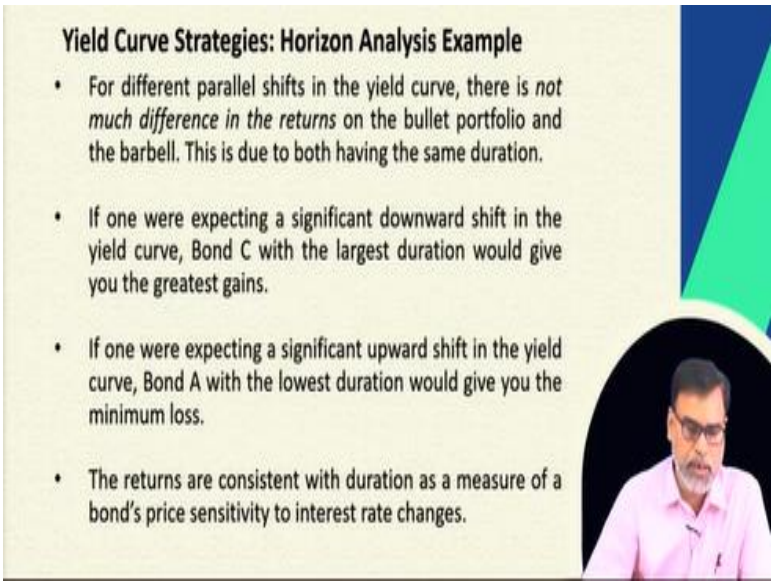

So, now what basically we can see that what we can observe in this case for different parallel shifts in the yield curve, there is not much difference in the returns on the bullet portfolio and the barbell portfolio. And why this happens? Because this is due to both having the same duration, one is 8.36 and whenever you go for the barbell strategy this is 8.31.

If one were expecting a significant downward shift in the yield curve then the bond C with the largest duration would give you the greatest gains. That already you know in the properties of the duration that part already we have discussed.

If one were expecting a significant downward shift in the yield curve then bond C with the largest duration would give you the greatest gains and if one were expecting a significant upward shift in the yield curve then the bond A with the lowest duration would give you the minimum loss. So, what basically we have observed in this particular example.

The returns basically are consistent with duration as a measure of the bond's price sensitivity to the interest rate changes. Duration generally is a measure of price sensitivity with respect to the interest rate change. So, here also we have seen not much difference we have observed between these two strategies because generally the duration of the bond B is your 8.36 and in barbell strategy, duration is 8.31. So, the barbell return is what? 50-50%.

So, your barbell return has been giving you, of 22.76 or (-6.92) depending upon the fluctuations of the interest rate.

Barbell return= (0.5) (bond return of A) + 0.5 (bond return of C). So, that is what basically we get the barbell return and this also you got your return of the bond or the duration of the bond A is 4.46.

So, duration of the bond= 0.5 (4.46) + (0.5) 12.16 = 8.31

That is basically your barbell portfolio duration, weighted average of the duration of all those bonds. So, therefore what basically just now we have seen that these returns are basically consistent with the duration as a measure of bond's price sensitivity to the interest rate changes.

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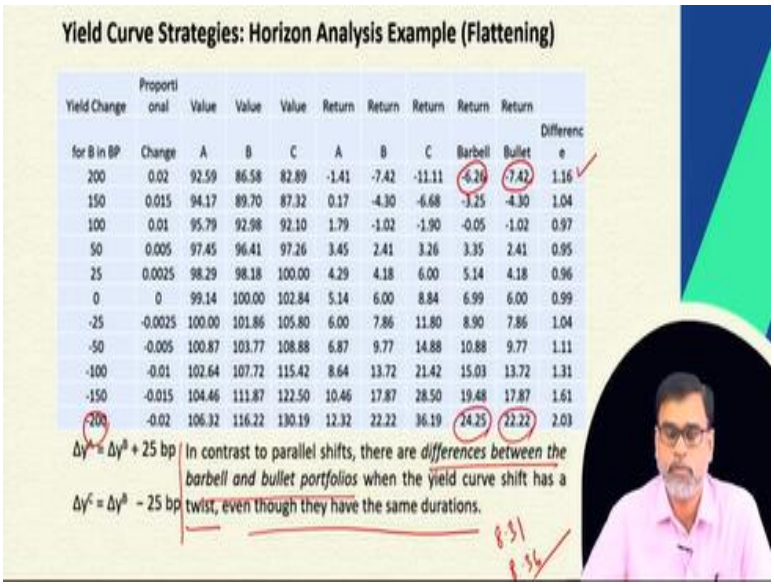

Then let us see about the case of the flattening shifting of the yield curve. If you look at here whenever there is a positive 2% change of the interest rate or 200 basis point. So, your barbell is giving minus 6.26, your bullet is giving minus 7.42, the difference is 1.16. In case of the minus 2% or minus 200 basis point, you will find the barbell is giving 24.25 and your bullet strategy is giving 22.22.

So, here your already we have seen that your $\Delta Y^A = \Delta Y^B + 25$basis points and $\Delta Y^C = \Delta Y^B - 25$basis points

So, what we have observed here? In contrast to the parallel shift, there are differences between the barbell and bullet portfolios. When the yield curve shift has a twist, it has a twist even though they have the same durations. Just now, we have seen, they have the same durations one is 8.31 barbell portfolio duration and other one is 8.36.

But in this case what we have seen that whenever there is a twist in terms of the shifting of the yield curve even if the durations are same we have observed that there is a huge return difference between these two. What basically it implies? What basically it basically shows? Even if the durations are same, if the portfolio shift is basically not parallel or portfolio shift has a twist then there is a possibility that you will find the huge differences in terms of the two different strategies.

The return differences you can observe and that return differences is coming because of the shifting of the yield curve.

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So, now in this case the different strategies are giving the different returns. Then we are coming back to the credit strategies. So, in the context of the credit strategy, the first one is the quality swap. So, what do you mean by this quality swap?

The quality swap is basically strategy of moving from one quality group to another in anticipation of a change in the economic conditions. Quality in the sense we are talking about the quality of the bonds.

One quality group means one particular rated bond to another rated bond on the basis of the economic fluctuations or change in the economic conditions.

Another one, the credit analysis so here we have to analyse the all type of bonds which are generally traded in the market like your corporate bonds, municipal bonds, foreign bonds to identify the potential changes in the default risk.

What are the potential changes in the default risk and that information can be used to identify the bonds to include or the exclude in a bond portfolio or the bond investment strategy. Basically, we have to analyse the all the aspects, all the features or the fundamental characteristics of the particular type of bonds on the basis of the different features and accordingly we can decide that whether that particular bond is suitable for the investment or not.

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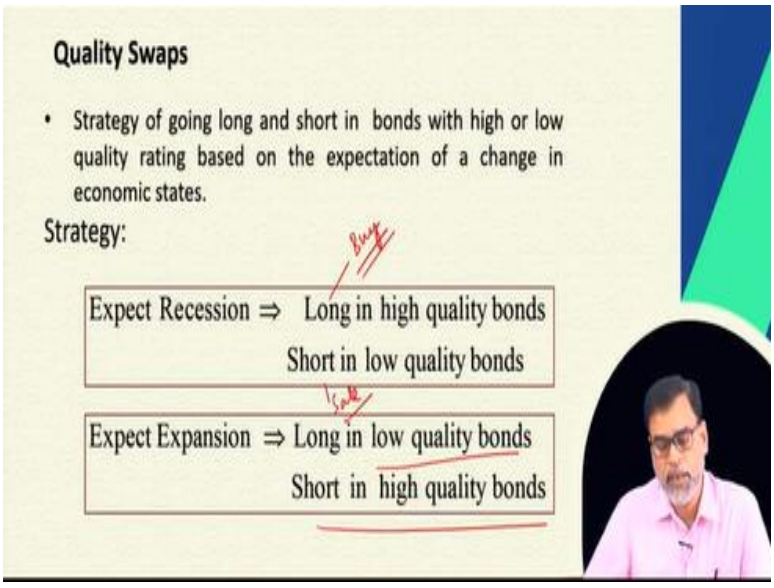

Let us first discuss about the quality swap then we can move towards the credit analysis. So, what do you mean by the quality swap? The quality swap is nothing but it is a strategy of going long and short in bonds with high or low quality rating based on the expectation of change in the economic states or economic conditions. What does it mean? It means that let you are expecting

that there is going to be recession. Then you long in high quality bonds that means you (long means you buy) buy the high-quality bonds and short means it is basically sell. You sell the locality bonds that mean you make a swap of the low-quality bonds with the high-quality bonds if you are expecting that there is going to be recession.

But if you are expecting there is an expansion in the future then you can buy the low-quality bonds and sell the high-quality bonds.

So, that is the strategy what basically we can adopt whenever you talk about the quality swap.

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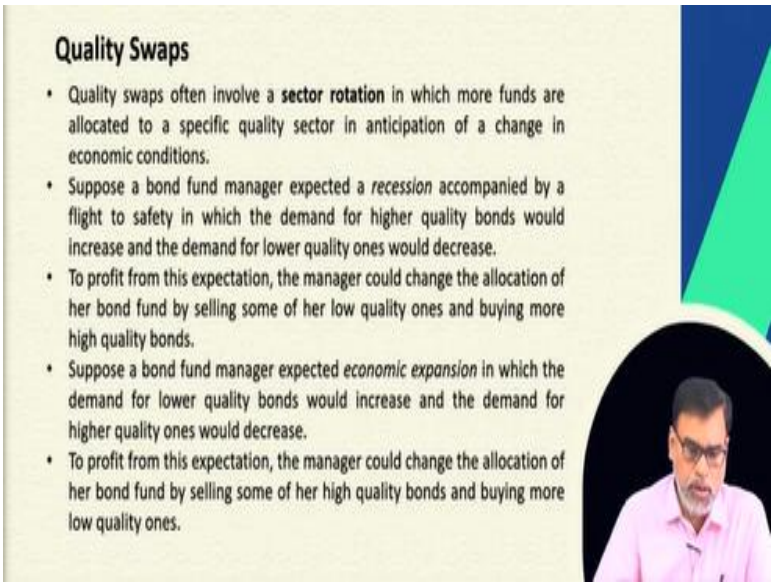

So, whenever we are adopting the quality swap, generally what we do? What is the process? what is the basic kind of mechanism we follow whenever the strategy is called the quality swap generally used by the investors. Quality swaps generally involve a sector rotation. What do you mean by the sector rotation? Generally, in case of sector rotation more funds are allotted to a specific quality sector in anticipation of a change in the economic conditions.

Expecting how the economic fluctuations are going to happen, how this condition is going to be prevailed, we generally follow a sector rotation strategy. Here more funds generally allotted to a specific sector or the bonds issued by the companies which belong to a particular sector.

For example, a fund manager generally expects a recession which is also accompanied by flight to safety in which the demand for high quality bonds will increase and the demand for low quality bonds should decline.

So, in that case if they want to generate some profit (some extra return). For this expectation, the manager could change the allocation of our bond fund by selling some of the low-quality bonds and buying more high-quality bonds. They can sell some of the low-quality bonds and buy some high-quality bonds where the ratings are relatively better.

Suppose reverse thing is happening, the fund manager is expecting that there is going to be economic expansion. Then in this case what they are going to do? In this case, the demand for the low-quality bonds will increase and the demand for high quality bonds will decline. So, to profit from or generate return from this particular expectation the manager could change the allocation of the bond by selling more high-quality bonds and buying more low-quality bonds in their portfolio.

In that particular process basically, they can generate certain profit out of this. So, that is called the quality swap. The quality swaps can also be constructed to profit from anticipated changes in the yield spread between the quality sectors. Spread means the yield difference between the different bonds in the different sectors. If the economy were at the trough of a recession that means in the lowest trend and was expected to grow in the future. Then the speculators basically might anticipate a narrowing in the spread between the lower and higher quality bonds. So, in that case to exploit this particular opportunity, they could form a quality swap by taking a long position in the lower quality bonds and a short position in the higher quality bonds with the similar durations of the similar term to maturity. Hence, in this case what will happen? Whether the rates increase or decrease the speculators would still profit from these positions provided the quality spread narrows, the quality spread will decline.

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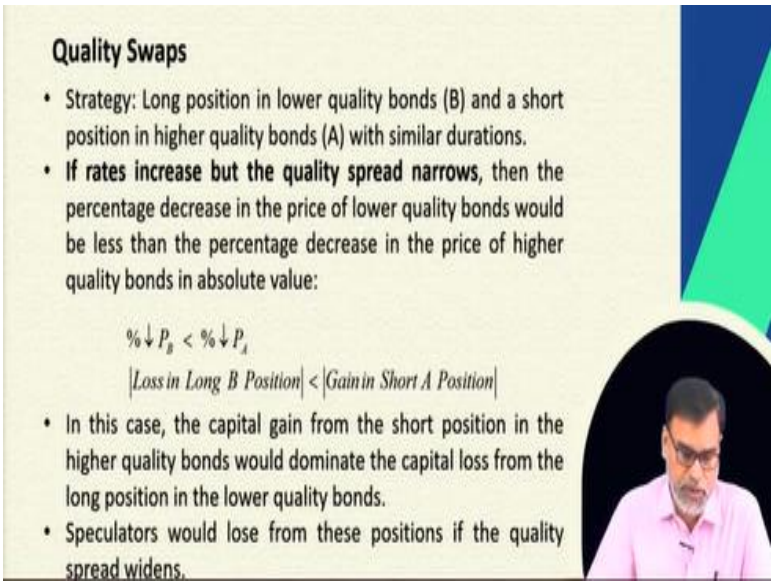

So, what basically we have seen here? What is the strategy here? Long positions in the lower quality bonds and the short position in the higher quality bonds with the similar durations are preferable. So, if the rates decrease but the quality spread narrows, then what will happen? The percentage increase in the price for the lower quality bonds would be greater than obviously the percentage increase for the higher quality bonds in the absolute term.

That means the gain in buying the B position will be greater than the loss in selling the A position, B means I am talking about the lower quality bonds, A means l am referring to the higher quality bonds. The percentage change in the price will increase of the low-quality bonds more than the percentage increase of the high-quality bonds. So, what will happen? The capital gain from the long position in lower quality bonds would dominate the capital loss from the short position in the higher quality bonds. When the interest rates are declining but the quality spread basically is narrowing down.

But let the rates increase but the quality spread narrows and we are taking a long position in the lower quality bonds let B and a short position in the higher quality bonds let A with the similar durations. Then what will happen? Then the percentage decrease in the price of the lower quality bond would be less than the percentage decrease in the price of the higher quality bonds.

So, the loss in buying this B position that means the lower quality bonds is less than the gain in the selling A position that means the higher quality bonds. So, the capital gain from the short

position in the higher quality bonds would dominate the capital loss from the long position in the lower quality bonds.

So, then the speculator would loss from these positions if the quality spread widens.

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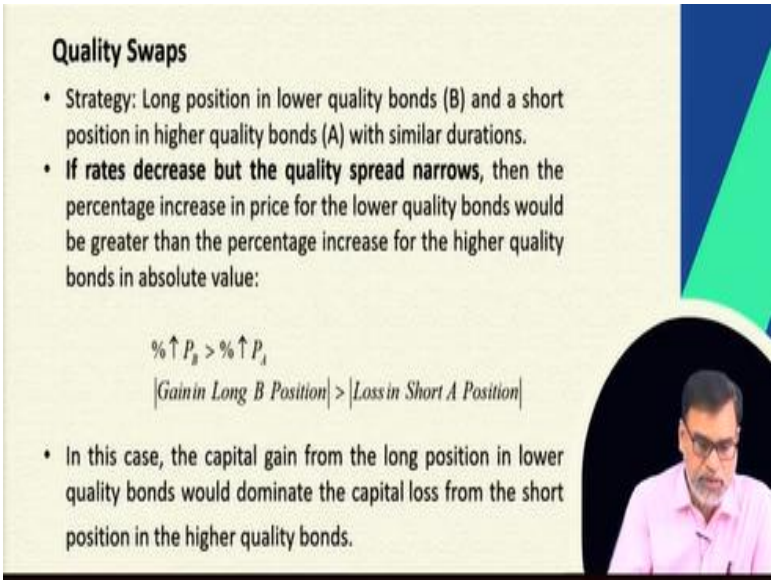

Here basically what you see in two conditions we have checked?

One is the interest rates are decreasing what the quality spread narrows; second case the interest rates are increasing but the quality spread narrows.

So, here it is decrease and second condition basically we have talked about the increase. But, if the particular spread is widening that means the quality spread basically is widening then speculators in both the cases basically will lose in the market. They will incur certain losses in the market that actually you have to keep in the mind.

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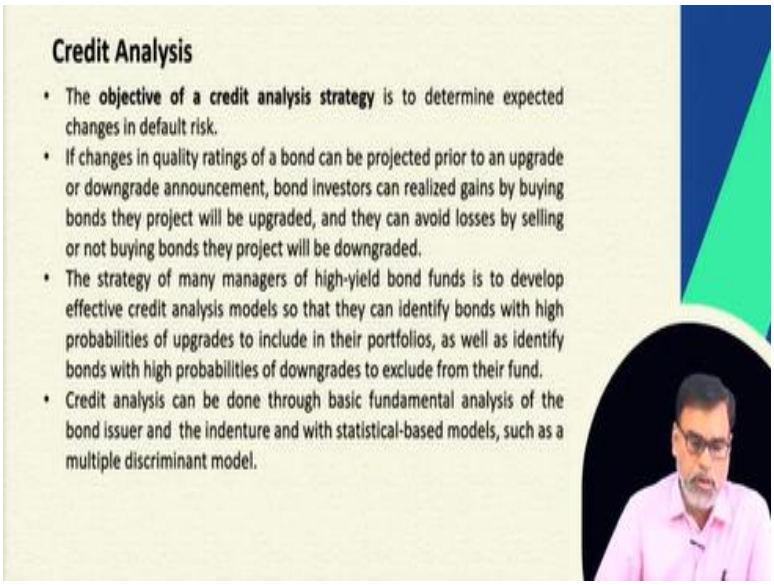

So, the credit analysis what we are talking about is a strategy to determine the expected change in the default risk. If changes in the quality ratings of the bond can be projected prior to the upgrade or downgrade announcement then the bond investor can realize the gains by buying the bonds the project would be upgraded and they can avoid the losses by selling the bonds but the project will be downgraded.

So, the strategy of many managers of high bond funds to develop the effective credit analysis models. So, they can identify this kind of bonds: which bond is going to be upgraded and which bond should be downgraded, which bond should be included in their portfolio and which bonds should be deleted from their portfolio. So, this can be done through basic fundamental analysis of the bond issuer or it can be also analysed through some statistical based models like your multiple discriminant analysis. We will discuss those things.

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So, if you look at the fundamental analysis largely, they go for four types of analysis. They look at the industry characteristics or the industry analysis; they can go for the company fundamental analysis; or the asset and liability analysis; or the indentured provisions of that particular bond. Such analysis also can be made to understand the credit score of that particular company or credit position of the company; mostly it is linked to the default risk. So, we will discuss these things in the next session in detail.

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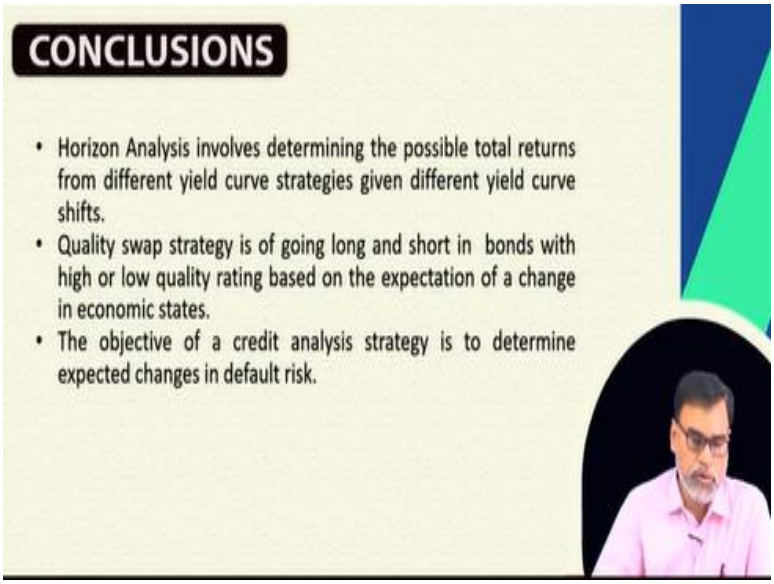

So, what we have discussed the horizon analysis generally involves determining the possible total returns from the different yield curve strategies given the different yield curve shift. And quality swap strategy is nothing but going long and short in bonds with high or low quality ratings based on the expectations of the change in the economic conditions. The objective of a credit analysis strategy is generally to determine the expected changes in the default risk.

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So, these are the references what you can see. Thank you.