Management of Commercial Banking
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Lecture 29
Use of Derivatives in ALM - IV

In the previous class we discussed about the options and how the options are used to minimize the interest rate risks in the market or how the commercial banks can use it as a hedging instrument. In today's class we will be discussing about the another popular derivatives what the investors including commercial banks and other financial institutions in the market use, that is called the swaps and whenever you talk about the swaps the most popular swaps are basically the interest rate swap and we have the currency swap.

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So, as a part of the interest rate swap we can have another swap which is called the quality swap. It is not a separate swap. It is a, basically we can say that subsidiary to this interest rate swap. So, these are the different swaps which are used in the financial market or which is used by the commercial banks to hedge interest rate risks and the swaps are basically used for some specific reasons.

And in today's session we will be discussing about what exactly the swap is and how the cash flows are determined in the swap and how exactly the swap is helping the financial institutions including banks for hedging out the interest rate risk.

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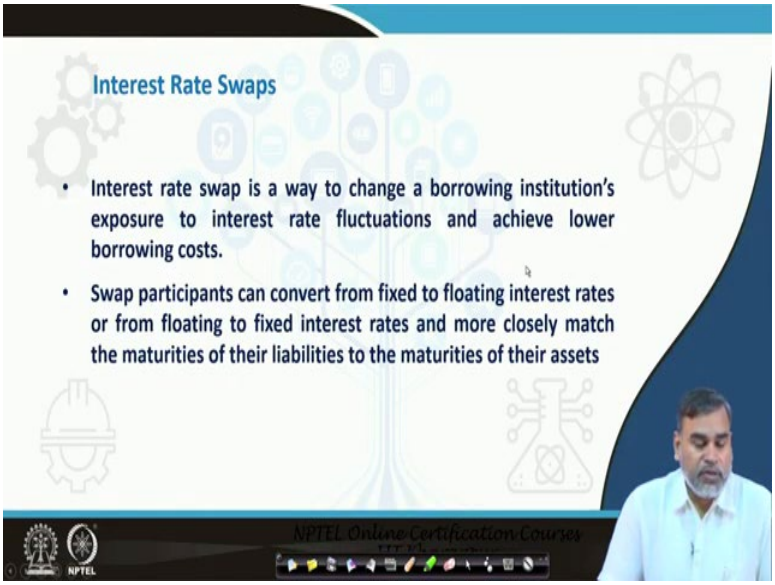

So, whenever we talk about the swap, let, we can start with interest rate swap which is much more popular than any other swaps which are existing in the financial system. So, when we talk about the interest rate swap, the interest rate swap is basically way to change the borrowing organization's exposure to interest rate fluctuations and achieve the lower borrowing cost because every organization wants to reduce their borrowing cost.

Depending upon their prediction in the interest rate, if they want to reduce their costs then accordingly if anybody has a floating, his borrowing is done with floating interest rate and they are predicting that the interest rate is going to be down in the future then how basically they are going to change their liabilities or the assets.

The same thing can be prevailed if somebody has a fixed exchange rate and the interest rate is going to be down or going to be up in the future then what basically kind of strategy this should adopt by that the borrowing cost will be low.

But for example somebody has a floating interest rate then obviously what will happen, that if the interest rate is going to be down then they are in the profit because when your interest rate is going to be down they are basically gaining out of this. But if the interest rate will be up, then obviously they have to pay more interest for that.

Like that in fixed exchange rate if the interest rate is going to be up then obviously there is no problem for them. They are the gainer. But the interest rate is going to be down because they are already in the fixed basis then nothing can happen for them or they cannot generate any kind of profit or any kind of return out of this.

Because of that sometimes depending upon the prediction of the interest rate by analyzing the yield curve if you are able to predict the interest rate in a better way, then it is possible basically, you can go into a swap contract. By that this kind of exchange you can make between the different parties, by that the less borrowing cost can be reduced.

So, that is why already I have explained this. The swap participants basically can convert from fixed to floating interest rates and from floating to fixed interest rates, and more closely match the maturities of their assets and liabilities in the particular system. So, that is the way the interest rate swap can be defined or can be understood.

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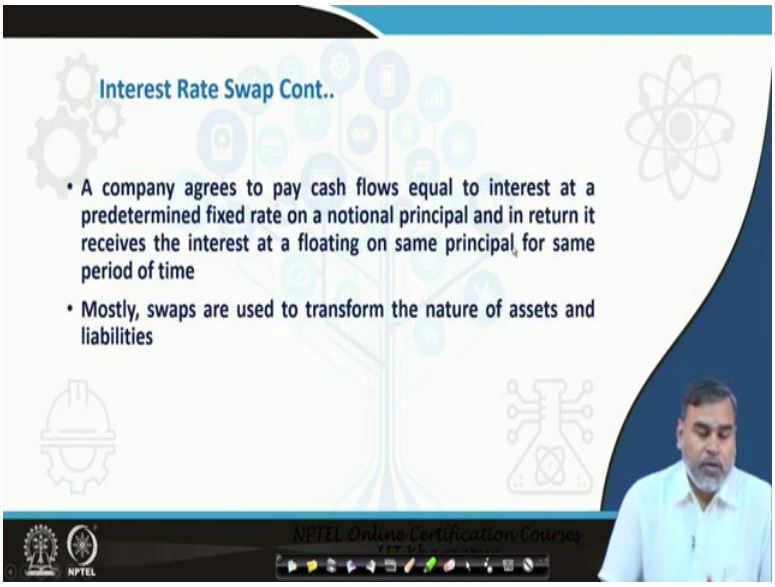

So, in this process, a company if agrees to pay the cash flows equal to the interest at a predetermined fixed rate on a notional principal, actually why you call notional principal because the principal is not at all used, only it is a notional amount on which the cash flows are basically transacted, and in return it receives the interest at a floating or on same principal for some period of time.

So, only the cash flow will be prevailed on the basis of the notional principal amount whatever you have decided from the beginning. So, mostly swaps are basically used to transform the nature of assets and liabilities of any kind of investors who are using this swap for minimizing the interest rate risk in the market.

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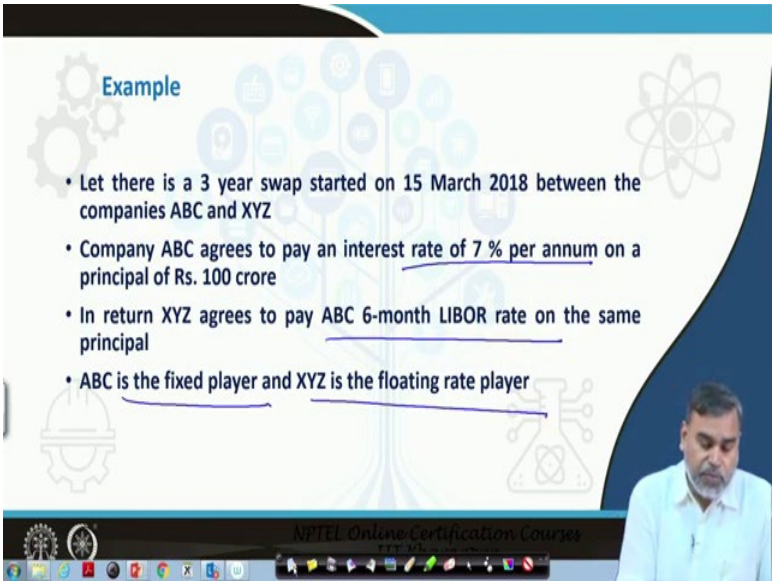

So, if you see that, let us take one example that how basically this swap is used in the market for minimizing the risk or converting from assets to liabilities or liabilities to the assets. Let there is a 3 year swap which is started on March 15, 2018 between the companies ABC and XYZ. So, company ABC agrees to pay an interest rate of 7 percent per annum on a principal of 100 crore.

100 crore is a notional principal amount. Company ABC agrees to pay an interest rate of 7 percent per annum on a principal of 100 crore and in return the XYZ agrees to pay ABC the 6 months LIBOR rate on the same principal.

So, here if you see this is basically on a fixed rate and this is basically your floating rate, because LIBOR rate is determined by the market forces. So, if the LIBOR rate will change then their interest rate will change. So, now already we know that the ABC is a fixed player and XYZ is a floating player.

Let now ABC wants to change from fixed to floating or XYZ wants to change from floating to fixed because of their own calculations, because of their own predictions about the interest rate movements in the market.

So, in that particular point of time, what basically they should do, they should enter into a swap contract between these two, ABC and XYZ. By that their liability which is on the fixed rate basis they can convert into the floating rate and this particular investor who has a floating rate basis they can convert into the fixed rate. So, that was the objective. So, in this context how it basically works?

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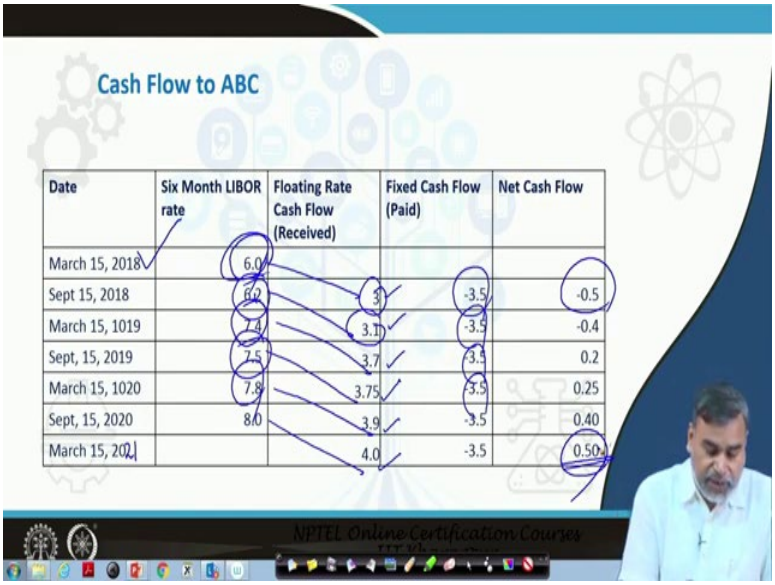

So, now let every 6 months the cash flow is happening and here you have the 6 months LIBOR rate which are mentioned. On that basis if you see, every 6 months what is the cash flow what we are getting?

That the contract was designed or the contract was made in the March 15, 2018. March 15, 2018 we have made the contract and in the September 15, 2018 let the, whenever the contract was designed that in these 6 months LIBOR rate was 6 percent and in the September 15, it has increased to 6.2. Then again in the March 15, 2019 it has gone up to, let it has gone up to 7.4, then again they have predicted that has, in the September 15, 2019 it has gone to 7.5, then may it will go up to 7.8 in March 15, 2020 and so on.

So, this is the case, what basically we can see. Here if you see that it is March 15, 2021. So, here if you see what basically we are observing that how basically the floating rate cash flows somebody is receiving and what kind of, if you are talking about the cash flow to the ABC because ABC is basically a fixed rate player and XYZ is a floating rate player.

So, here in the context of the fixed rate if you see, how much basically they are receiving because they are receiving on the floating rate basis. So, they are receiving basically, obviously on this rate basis, after 6 months they will get this. On this basis they will get 3.1, the cash flows are like this.

So, accordingly, what basically you can find that 3, 3.1, 3.7, 3.75, 3.94 and what the fixed cash flow, what they are paying, because 7 percent interest what they are paying, that 7 percent interest means every 6 months they are paying 3.5. So, these are all minus 3.5. So, if

you see, if you observe that the net cash flow in the beginning it was negative but in the end the cash flow become positive.

So, simply what basically you have observed that whenever there is a swap between ABC and XYZ, if your interest rate, your floating interest rate is going up and up, what basically they have observed, they have observed that there is a positive cash flow, net cash flow what the ABC is basically, has observed at that particular point of time.

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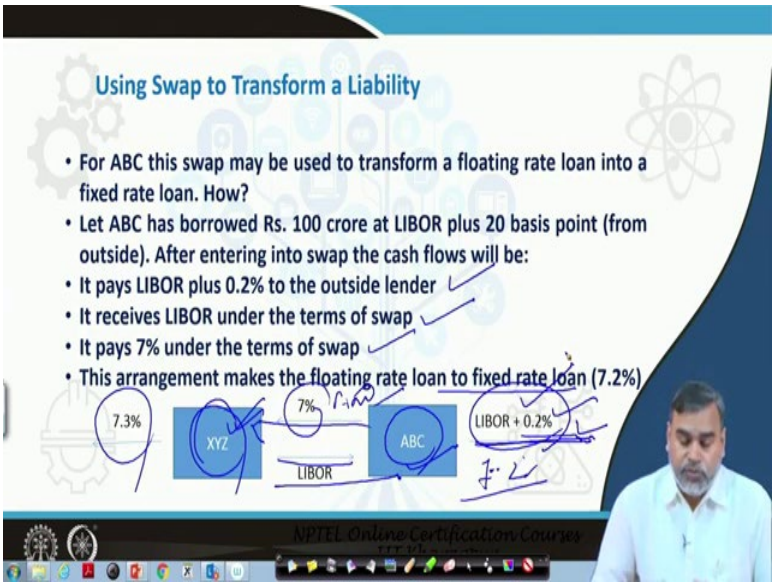

So, in this context if you see that how basically it works in terms of the transformation, from the assets and liabilities. So, now for ABC, this swap may be used to transfer a floating rate loan into a fixed rate loan. How? Let ABC has borrowed 100 crore at LIBOR plus 20 basis point from outside. ABC has borrowed 100 crore at LIBOR plus 20 basis point from outside. So, they have entered into the swap with this XYZ. So, once they will enter into the swap with the XYZ, then how the cash flow will look like?

So, here if you observe in this case, here your ABC is there, here your XYZ is there and now XYZ, ABC has borrowed certain money at a floating rate basis that is LIBOR plus 0.2 percent and he is paying 7 percent to XYZ which is fixed. And here what is happening the XYZ basically is paying at a LIBOR rate to ABC.

Here ABC is paying at a LIBOR plus 0.2 percent, the loan whatever they have borrowed from outside and they are paying 7 percent to XYZ and XYZ is paying the LIBOR rate to the ABC because as per the swap, the ABC will pay 7 percent to XYZ and XYZ will pay the LIBOR.

And another thing is, another 7.3 percent what basically we are talking about, that XYZ has borrowed the money at fixed rate basis that is 7.3 percent from the outside. So, then what is happening, if you observe, this particular cash flow, it pays LIBOR plus 0.20 percent to outside lender. It receives LIBOR under the terms of the swap.

So, it pays 7 percent under the terms of the swap to XYZ then what has happened in the end if you see, this arrangement makes the floating rate loan to a fixed rate loan. Previously they have make a loan of 7 point, LIBOR plus 0.2 percent. Now, whenever they have entered into the contract then what has happened that they got this LIBOR and they have paid this fixed rate loan.

So, end of the day what has happened, previous, end of the day they are basically paying 7.2 percent. This XYZ has become a fixed rate loan basis because LIBOR plus 0.2 they got the LIBOR and they are paying 7 percent and here extra 0.2 percent and that will become 7.2 percent. So, which was before LIBOR plus 0.2 percent that has become 7.2 percent for the ABC.

So, the floating rate loan which was there, LIBOR plus 0.2, that has been converted into the fixed rate loan percentage of the 7.2 percent. So, this is the way the ABC has transferred or transformed from the floating rate loans to the fixed rate loans.

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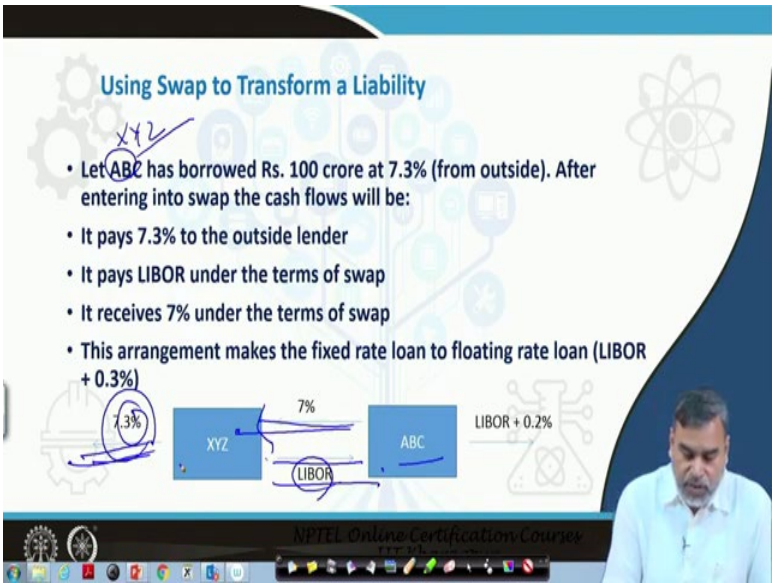

The same thing if you observe, another way basically how this particular transform is taking place. Let XYZ has borrowed 100 crore at 7.3 percent from outside, so after entering into the swap how the cash flow will look like?

The cash flow is it pays 7.3 percent to outsider, it pays LIBOR to ABC, and under the particular swap contract and it receives 7 percent under the terms of the swap. Outside it pays 7.3. It gives LIBOR to 7.3, and it is getting 7 percent from the ABC.

So, now effectively what is happening, this arrangement makes the fixed rate loan to the floating rate loan because 7.3 percent they were giving, 7 percent they got, effectively they are paying extra 0.3 percent and now what is happening? They are paying the LIBOR here to ABC. So, then effectively their fixed rate loan of 7.3 percent has been converted into LIBOR plus 0.3 percent.

So, because of that, now ABC was wanted to convert their floating rate loan into a fixed rate loan. For them it has been converted into LIBOR plus 0.2 percent to 7.2 percent. Now, for XYZ what has happened? They have a fixed rate loan of 7.3 percent. Now, it has been converted into LIBOR plus 0.3 percent.

So, from fixed to floating it has been changed and from floating to fixed it has been changed. So, depending upon the requirements, whenever these two parties have entered into this particular swap contract then what has happened? That this particular transactions can change their, transform their liability from fixed to floating and floating to fixed depending upon their objective or the requirements. This is what basically the use of the swap generally always we observe.

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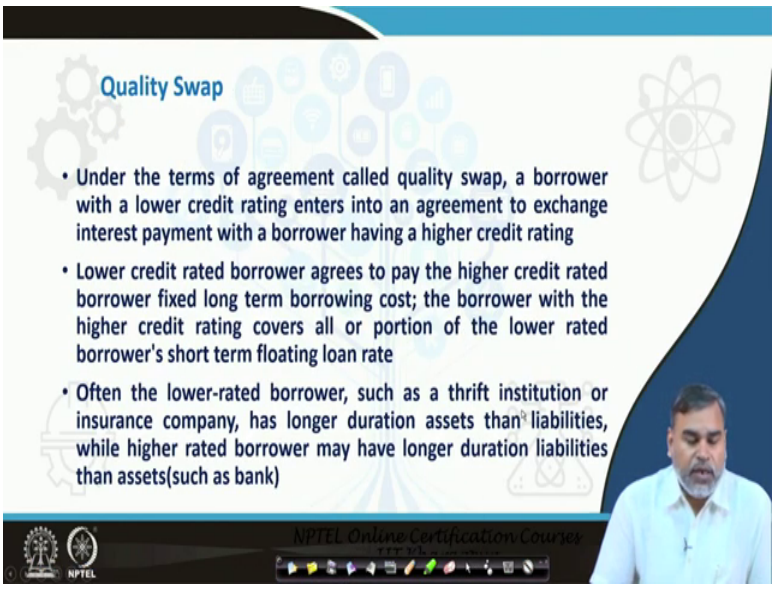

Then if you see that is another kind of swap we have, that is called the quality swap. So, what do we mean by the quality swap? Under this particular term of agreement a borrower with a

lower credit rating, there are different borrower are there, some of them got better rating, some of them have got the lower rating. So, here a borrower with a lower credit rating enter into an agreement to exchange the interest payment with a borrower having higher credit rating.

So, there are two borrowers, one has got a better rating may be triple A, another has got triple B. So, they have an agreement between these two, that how this particular transactions and may be agreement can work between the high rating borrower and the low rating borrower. And here exactly what happens.

The lower credit-rated borrower agrees to pay the higher credit-rated borrower a fixed long-term borrowing cost, fixed rate. They agrees to pay at a fixed rate and the borrower with a higher credit rating covers all or portion of the lower-rated borrower certain floating rate loan.

Generally what is observed, a lower rated borrower such as the thrift institutions or insurance company has longer duration of assets than the liabilities while the high rated borrowers have a longer duration of liabilities than the asset, like banks.

So, whenever we talk about this then if the particular swap can take place between these two parties then they can convert their assets into the liabilities depending upon the requirement or they can convert the fixed rate assets to the floating rate assets or the floating rate assets to the fixed rate assets. Depending upon that, depending upon the interest rate positions this particular swap can take place between the high rating borrower and the low rating borrowers. How basically it works?

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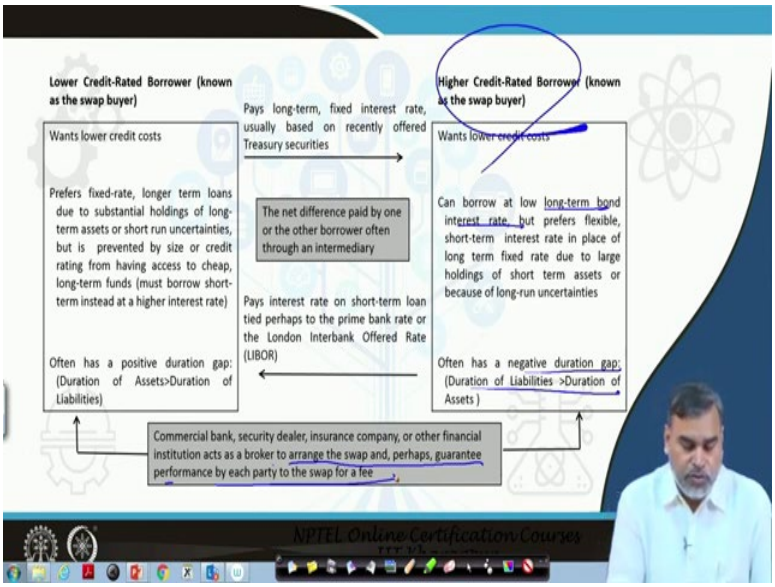

If you see there is a lower credit-rated borrower which is generally called as the swap buyer, they are buying the swaps. The objective is they want lower credit lost. So, in that particular point of time what happens?

They basically prefer fixed rate, long term loans due to substantial holding of long term assets or short term uncertainties, because the short term uncertainties are there in that particular borrower but is prevented by size or credit rating from having access to cheap long term funds because their rating is low then the cost of the funds from the market is relatively higher for them.

In that particular point of time what they do if they will have a swap between the higher credit-rated borrower like the swap, again banks or any other financial institutions, then here what happens they pay the long term fixed interest rate usually based on the recently offered treasury securities.

So it comes to here, so to the high credit-rated borrower. Then high credit rated-borrower, what they want they can borrow at low long term bond interest rate because the rating is high, that is why borrowing cost of them is relatively low but prefers flexible short term interest rate in the place of long term fixed rate due to large holding of short term assets or because of the long run uncertainties.

Because there is long term uncertainties, so in this context what the high-rating borrower wants, they do not have any problems in terms of getting the low-rated interest rate from the market because their rating is reasonably high. But already they have very, many short term assets they are holding.

So, because of that what basically they can do? It is mostly what basically they have observed they can basically go for the swap contract with the low-rated borrower and pays this interest rate on the short term loans perhaps at the rate of prime lending rate or the LIBOR rate or any other rate which is prevailed in that particular point of time. Rate goes to that.

So, already we have seen that whenever this kind of contract takes place the, always there is a transformation in terms of maturity and there is a transformation in terms of the nature of this particular liability what the particular stakeholder's half or the different party's half.

So, here what happens that generally it is observed those kind of, particularly for the banks they have negative duration gap that means duration of liability is greater than duration of assets and for the low rated borrowers it is reverse that is the positive duration gap.

So, here what happens, the commercial banks who are basically the high-rated borrowers, security dealers and other financial institutions act as a broker to arrange the swap and perhaps guarantee performance by each party to a swap for a fee.

Some of the banks directly enter into the swap and some of the banks can work as the intermediary or can work as a broker to make a swap or to arrange a swap between the low-rated borrower and the high-rated borrower because the nature of the assets for the low-rated borrower and high-rated borrower are different.

So, depending upon the interest rate movements, basically they want to have a position in such a way by that the total asset value of that particular organizations should not be changed. So, this is the way basically the quality swap works in the particular system.

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Then how the swaps are basically used? Firms basically with a negative gap can reduce the risk by making a fixed rate interest payment in exchange for a floating rate interest rate receipt, and firms with the positive gap take an opposite position by making a floating interest payments in exchange for a fixed rate receipt. So, if it is a negative gap means what? Negative gap means the interest sensitive liabilities are more than the interest sensitive assets.

So, if the interest rate is going to be up then again further they are going to lose in the market. So, because of that if they are going for already, floating rate basis loan system or they have made more loans in the floating rates basis then if they are predicting that the interest rate is going to be up further then they want to enter in a swap by such a way, they can convert their floating rate loans into the fixed rate loan.

By that the further loss they cannot incur due to the upward movement of the interest rate in the market in the future. And if there is a positive gap then that means interest sensitive assets are more than interest sensitive liabilities.

So, then basically what they do, they want that the floating rate loan should be there so they can go for the exchange between the floating rate interest payments to the fixed rate payments because they want to make these particular rates are the floating because already they have a fixed rate system and they are expecting that the interest rate will be up.

Then what will happen that if they will go for a contract which can make their rates floating then they can generate extra profit or extra return out of this. So, this is the way the swaps are

basically used depending upon the relative gap positions in the different banks whatever they have.

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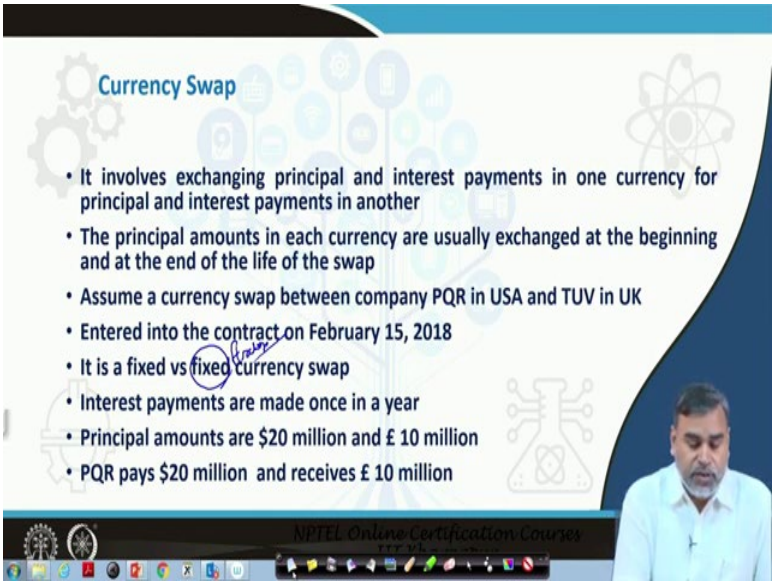

So, then we have another kind of swap which is the currency swap but in the context of interest rate swap the principals are not exchanged, already we have seen, only the cash flows are exchanged between the two parties but in the currency swap the principal is also exchanged in the end because that is the general characteristics of the currency swap.

That is why it involves the exchanging the principal as well as the interest payments in one currency for the principal and interest payments in the another currency. The principal amount of each currency is usually exchanged in the beginning and at the end of the life of the swap.

So, in the beginning actual exchange takes place of the particular principal amount on which the particular cash flow depends. So, if you assume for example a currency swap between USA and UK, there are two companies let PQR and TUV, so they have entered into the contract on February 15th, 2018.

So, it has floating currency swap, so interest payments are made once in a year and principal amounts are 20 million and 10 million, 20 million dollar and 10 million pound and PQR pays 20 million dollar and receives 10 million pound. So, in this context how the cash flow basically looks like, if you see.

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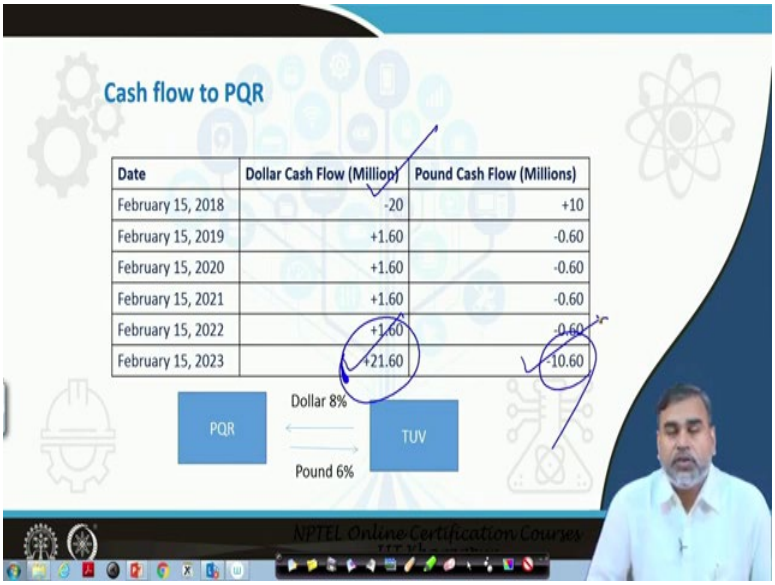

Let February 15, 2018, 20 million dollar is the cash flow what the company has made and in terms of pound it is 10 million. So, if you are talking about the cash flow to PQR so they have paid 20 million dollar and they have received the 10 million pound. So, February 15, 2019 because we are assuming that these are the yearly cash flow which is happening.

So, depending upon the interest rates, let we have assumed that for dollar it is 8 percent, for pound it is 6 percent. So, 1.6, 1.6, 1.6 they are getting and for the pound they are getting 0.6, 0.6, 0.6 and it will be minus because that basically they are paying. So, PQR is paying TUV and TUV is paying PQR. PQR basically is receiving at 8 percent and TUV but at the dollar and the pound it is basically 6 percent.

So, end of the day what basically we are getting, that cash flow to the PQR is basically your 21.6 which includes your principal amount or notional principal amount which is 20 million and here they have the outflow whatever they are making that is basically 10.6 pound. So, they are receiving 21.6 dollar and paying basically 10.6 dollar to TUV. So, that is what the cash flow to the PQR what we can observe.

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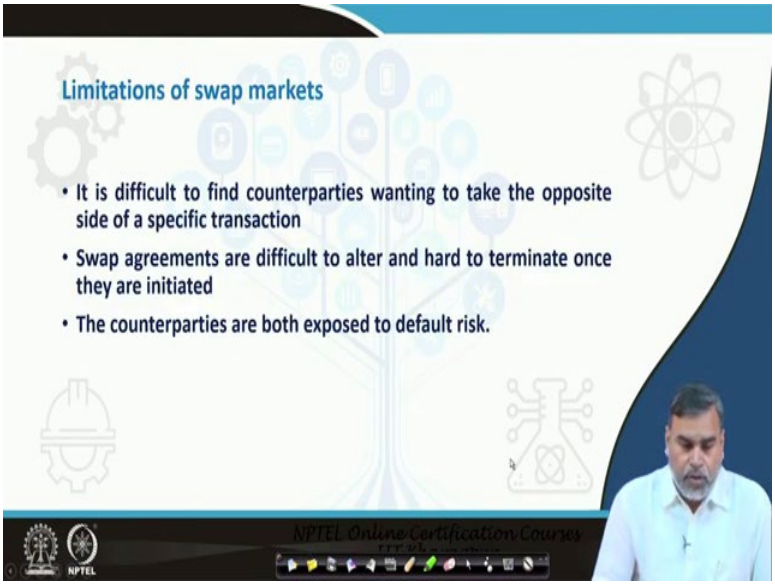

The same thing can also prevail for the other kind of players which are existing in the market in terms of the currency swaps but only difference between the currency swaps and the interest rate swap is that in the interest rate swap we do not exchange swap for the principals but in the currency swap we exchange that, and there may be some difference in terms of the time period.

But there are many limitations in the swap for use of the swap in the market because it is sometimes difficult to find the counter-parties who wants to take the opposite side of the specific transactions. Really if everybody is predicting that the exchange rate is going to be up or down, depending upon that it is very difficult to find out a counter-party who wants to take opposite positions in the market.

Swap agreements are difficult to alter and hard to terminate once they are initiated. Once it is initiated you cannot terminate that particular contract and both the counter parties; both fixed rate and floating rate, both the parties, they are exposed to the default risk or the credit risk. So, that kind of provisions are there, that kind of issues are there whenever we talk about the limitations of the swap market.

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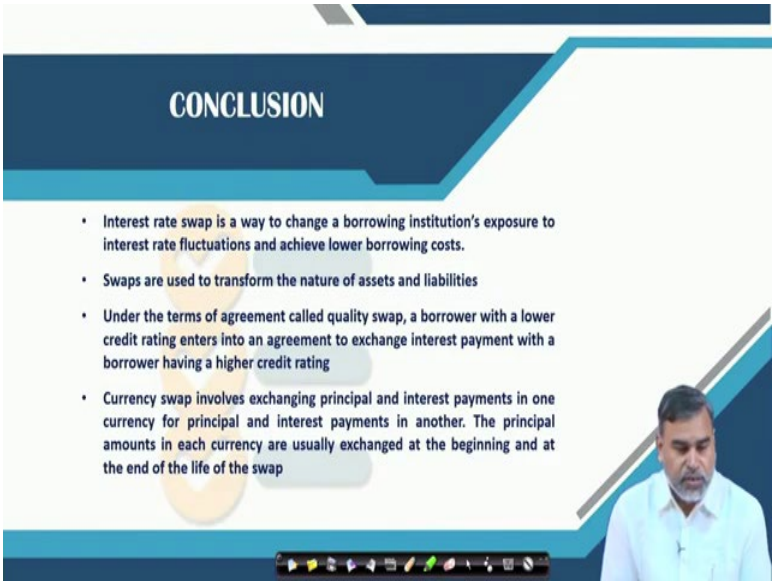

But there are many advantages of the swap market because it helps, basically to transform the liability on the basis of the requirement of that particular organization from fixed to floating or floating to fixed by that, if really they are accurately predicting the interest rate then it is easy for them to generate the profit out of this.

So, coming to the conclusion what we have seen that the interest rate swap is the way to change the borrowing institution's exposure to interest rate fluctuations and basically achieve the lower borrowing cost. Swaps mostly are used to transform the nature of assets and liabilities.

Under the credit quality swap the borrower with a lower credit rating enters into the agreement of the exchange of interest payments with the borrower having higher credit rating, and the currency swap basically involves in exchanging the principal and interest payments both in one currency for principal and interest payments in another. The principal amount of each currency are usually exchanged in the beginning and as well as in the end of this particular life of the contract.

So, there are many other complex products which are available in the market which are used basically or we can call them the exotic products which are based upon the options, futures and as well as derivatives. Mostly the swaps also are used, credit default swap and other swaps which are used also in the market to minimize the risk.

So, almost all the derivatives instrument which includes the futures, options and swaps in a different form are used to hedge the risk in the market or to reduce the interest rate risk in the

market or to make this particular asset and liabilities perfectly matched in the end to get rid of any kind of interest rate fluctuations in the system. So, this is what about the use of the swap and the other products which are used to minimize that particular interest rate risk that we will be discussing in the next class.

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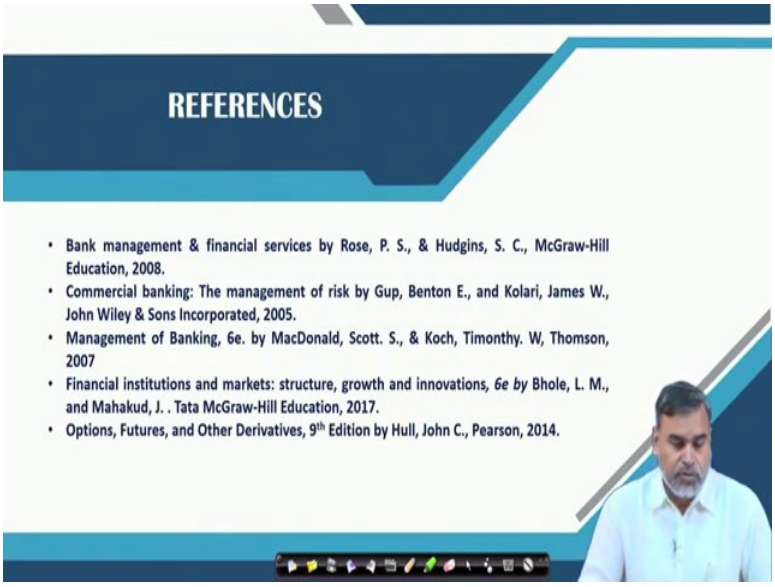

So, these are the references what you can go through for the understanding of the different concepts related to swap and all. Thank you.