Security Analysis and Portfolio Management

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Lecture No. # 31
Introduction to Bond Analysis

In the previous class we discussed about the equity portfolio management strategy, which is the basic important concept, we use always in the investment literature in equity market. So, after that we have another concept, which is very important in the context of investment or important asset or important financial asset, what we basically use to maximize our return, some times in the financial market, that is, basically nothing but the bond.

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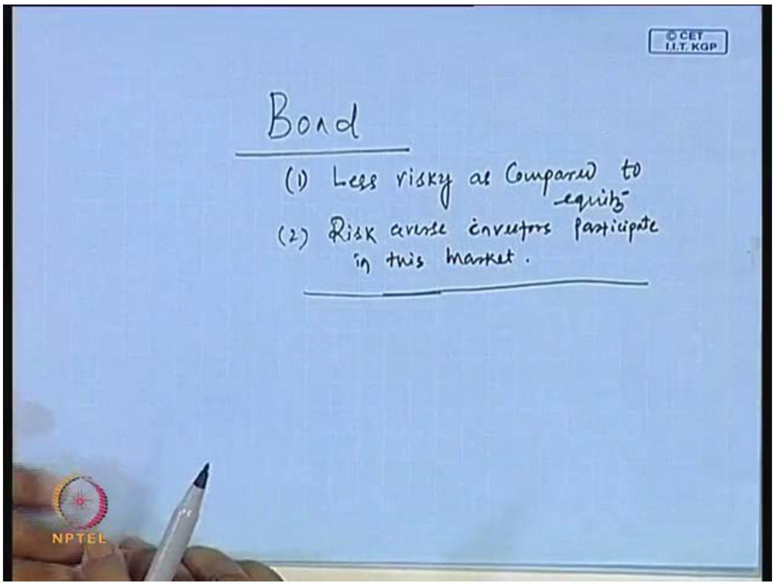

So, basically whenever we talk about the bond, bond is a financial instrument, which is little bit less risky as compared to equity, as compared to equity; therefore, certain investors who are basically the risk adverse investor, relatively less risk investor or the risk averse investors participate in this market for in this instruments. Therefore, the bond as an financial, as a financial asset has its own importance in the economic or the financial literature; therefore, after discussing about the different concepts, which are involved related to the equity; it is also very much desired to know about the different characteristics of the bond, and how this bond can be used as an profitable investment opportunity in the financial market.

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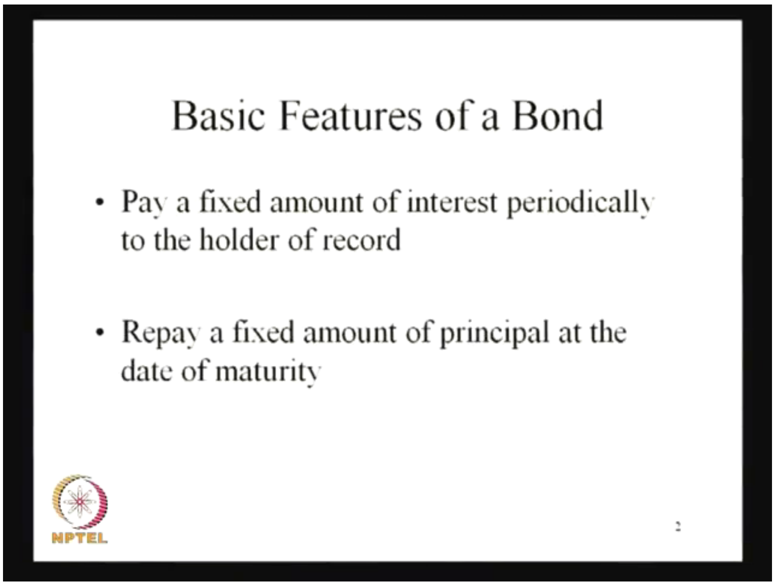

So, before discussing these things, let us see that what are those different features of a bond, like that whenever you talk about the equity, it gives them a return which giving amount of the risk, and the return is bad in nature, it depends on certain factors, So, which decide that how much return you are going to expect from that particular asset?

But whenever we talk about the features of a bond, bond as a special characteristics in this record, why because bond basically pay a fixed amount of the interest periodically to the holder of record, and the repay fixed amount of the principal at the date of maturity. So, whenever you talk about the bond, bond return is basically we get in two ways, one is your interest, and what basically the interest which is paid periodically; that means, if somebody has invested in a bond, then the return is the interest what the involved in this particular bond, that is basically fixed, that is basically fixed; that means, the particular same amount of the return, he has to get monthly or quarterly or yearly on the basis of the record, what already we have designed whenever the bond has been issued.

And another one is your final principle payment, how much money you have received at the end of the end of the maturity date. So, these are the two components of a return or two components or two types of characteristics or two different characteristics what the bond has in general. In general, whenever we talk about a bond, bond basically is defined as the two ways in terms of the return, what this bond is trying to give to the bond investor.

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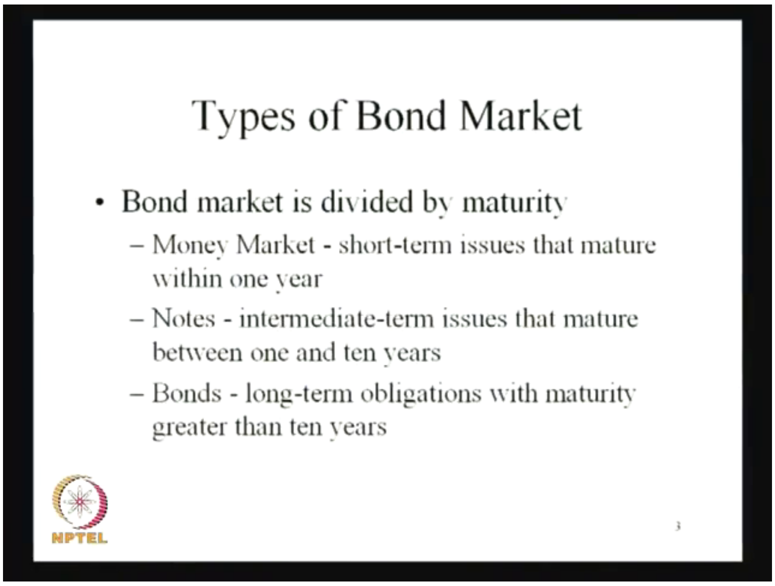

Then coming back to which are the different types of the bond market, whenever you talk about the different types of the bond market, and accordingly the characteristics of the particular bond also changes; so, how this particular bond market is categorized? Most of the bond market is basically, where the bond is available or where the bond is traded, because already what we have seen that, whenever we typically we talk about a bond, bond has a coupon, that means, which is talk about the interest, fixed in interest, and another one we have that, it has a term to maturity; that means, when this particular bond is going to be matured, then finally, what we have, we have also the, we should know the market interest rate or we can say that how this particular bond will be discounted over the period of time; these are three concepts which are related to the market.

So, whenever we have seen that, there is a coupon, there is a term to maturity, there is a market interest rate which are the different features which are involved in this bond, then the bond market is basically is defined on the basis of the term to maturity. The bond market is defined on the basis of the term to maturity; that means, if you see here, they basically talks about the money market, which is basically dealing with the short term issues, that mature within one year, then we have the notes what basically the intermediate term issued, that mature between 1 year to 10 years.

Then we have the bonds which is basically defined as the long term obligations with maturity greater than the ten years; that means, any in conclusion or in summery what we can say, that particularly this particular instruments the bond instruments or the dept instruments, which basically traded in a for his Saturn or basically the period within this one year, they are traded in the money market or they we call it the money market instruments, and this particular instruments which where the term to maturity is between one year to ten years, there sometimes or most of the times call the notes, and we have the typical bonds, where the term to maturity will be more than ten years.

This the way the bond market has been categorized in the various market in the world, and some cases also we can observe the bond market also can be defined on the basis of the ownership, and what is that ownership, if you observe here, that the bond can be issued by the government.

The bond can be issued by the corporate, the bond can be issued by the municipal, which is municipal bonds, which is basically is very popular in the in the developed country like USA, then we have also the educational bonds, which is again involved in the US market which is not that much popular in India.

So, here, who is issuing the bond, that means, on the basis of the ownership, on the basis of the ownership, the bond market has been categorized. So, on the basis of the ownership, the categorization of bond market takes place, this is another way, how the bond market can be also defined in a particular situation.

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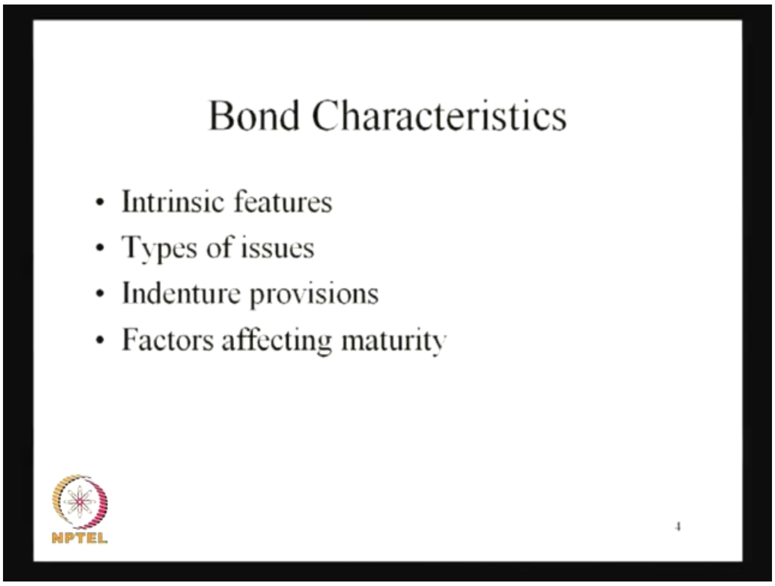

So, this is the overall view of a particular bond, but whenever in general we talk about the bond market or whenever you talk about the actual characteristics of a bond, the characteristics are defined as in four ways, one is our intrinsic features of the bond, then the types of issues what the bond is trying to do, then you have the indenture provisions, then the finally, the factors affecting the maturity or the term to maturity of the bond, these are the different ways through which the bond characteristics are defined or which are the different characteristics of a bond, that basically is defined in this way or one bond is different from another bond, that basically this particular characteristics will distinguish. So, let us see which those different characteristics.

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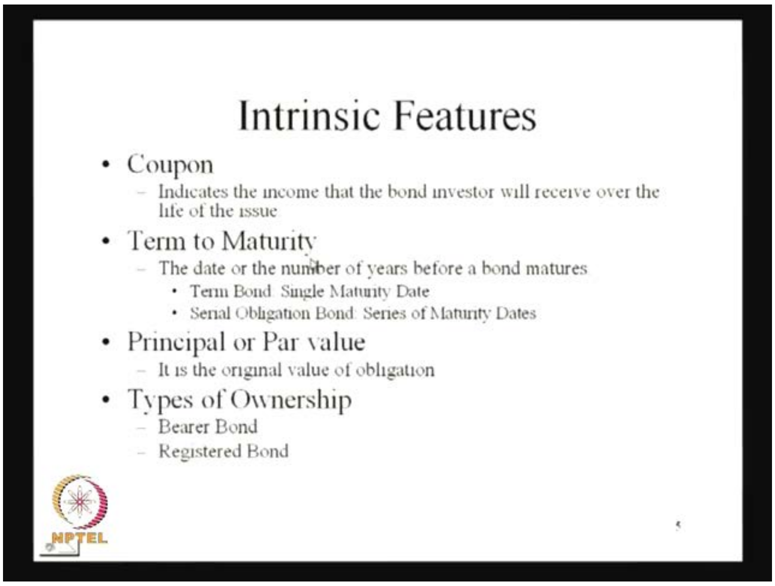

So, if you see that for characters first characteristics are what we have explain here, that is your intrinsic features, sometimes back I was just telling this issue in general, but if you talk about this things, what basically talks about one is your coupon, coupon is basically indicates that, it is the indication or the it indicates this income, that the bond investor will receive over the life of the issue.

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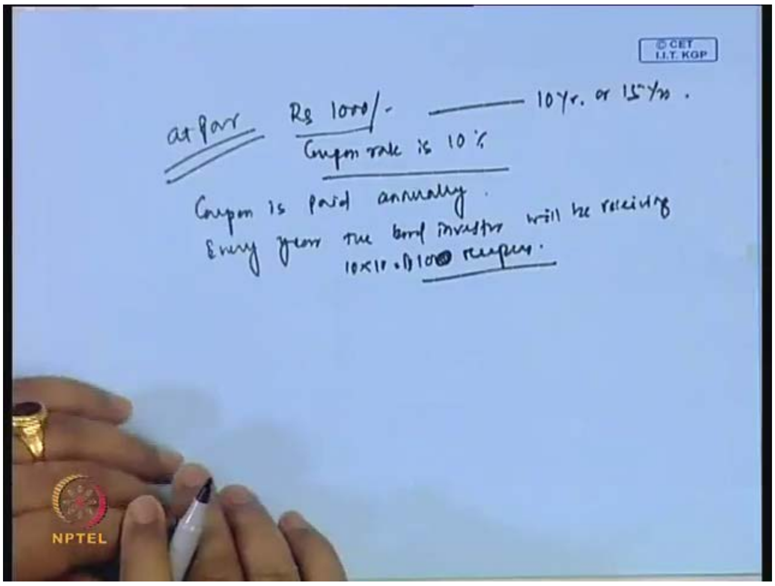

For example you have issued a bond, where the, let rupees of bond of 1000 and your coupon rate is 10 percent which is mentioned here, already in the record what you have received from the bond issuer, then if your coupon, let coupon is paid annually; that means, every year the bond investor will be receiving 10 into 10, that is your 100 rupees from this investment in the bond.

So, that is, that is why we call it periodically, that income has been received from the bond issuer, then you have the term to maturity, what do you mean by this term to maturity, it is basically the date or the number of years, before a bond matures, that means, when this particular bond is going to mature, so, that basically this term to maturity talks about term bond, that we have two types of the bonds in this context on the basis of their term to maturity, one we define is term bond, where the single maturity date will be mention, for example, let we say this bond will be matured after 10 years or this bond will be matured after 15 years. So, the term to maturity for this bond is either 10 years or 15 years.

And another bond is serial obligation bond, and in the context of serial obligation bond, what we have seen that the series of the maturity dates will be there, and on the basis of the different amounts, what this particular one document has been, on the basis of that the bond document has been returned, over the period of time, after may be two years this part of the bond will be matured; in after two years this part of the bond will be matured, this way the bonds characteristics has been defined.

So, therefore, we have two ways, the, we can define the term to maturity, one is your term bond, which has the single maturity date, then we have another way, we have serial obligation bond which talks about the series of the maturity dates. Then another feature already what I told you, that we call at the principal or the par value. So, always remember this bond has been issued at par; that means, we call that, there is par value of the bond. So, it is basically the original value of the obligation. So, it is the original value of the obligation; that means, this much money or this much rupees you have to get at after certain number of years or this much rupees or this much should be the value of the bond, after the certain number of years, and that certain number of years is basically defined as the term to maturity.

So, that is the way, that means, the particular value of the bond, you should receive that 1000 rupees after 5 years or after 10 years. So, that 5 years or 10 years or 15 years define the term to maturity, and the amount what you are going to receive after end of the 15 years or the 10 years or the 5 years, that basically is defined as the par value or the principle value of this particular bond. Then another feature we have that as bearer bond and the registered bond, the bond which is bear by somebody, which basically in anybody is issuing this particular bond, and anybody has investing this particular bond, may be sometimes what we have observed, somebody is bearing this particular bond, but it has to be registered by somebody else. So, therefore, we have categorized into two types of bond, one is only simple bearer bond and another one is the registered bond.

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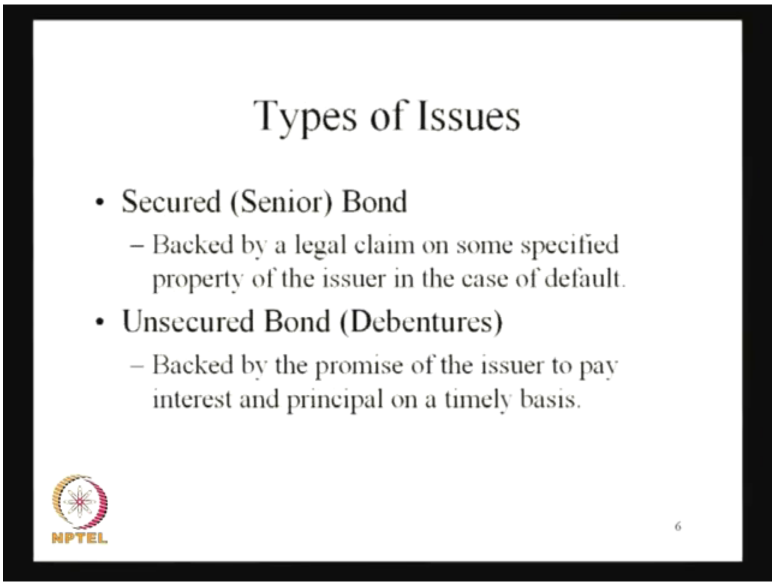

So, these are the different intrinsic features of the bond, then another way it has been defined, that is the types of the issues; that means, how this particular bond has been issued, how this particular bond has been issued, and on that basis also the categorization of the bond can takes place.

How this can take place, that whenever we talk about issuing a bond or we have deriving a bond, from we have, we have invested some money in into the bond, then how this particular bond has been defined on the basis of the issuer, that if you see that you have a secured bond, which we call at the senior bond secured or the senior bond, and another one is the unsecured bond. What do you mean by the secured bond? The secured bond is basically backed by a legal claim on some specified property of the issuer in the case of the default. That means, the secured bond has a mortgage, but basically whenever we issue this particular bond, we invest this particular bond, and if there is a default, then the collateral or the mortgage will help to liquid it, and after this liquation, you can realize that particular value, what value you are going to be the defaulter or what value you are going to be the defaulter, that basically is talking means discusses about the secured bond, that way the secured bond is defined, but whenever you talk about the unsecured bond, basically sometimes, we also we call it debentures, it is basically baked by the promise of the issuer to pay interest, and principal on a timely basis; that means, there is no mortgage is required for this, and basically it is issued by the corporate, the debentures is the long term bond. So, which is issued by the corporate, and the term to maturity is more than 15 years, and the corporate basically whenever issuing this bond, basically there is no mortgage involved in this, that is why it is little bit riskier than the bonds which is issued by the government.

So, here what we have seen, that here only this agreement has been signed or the promise has been made to pay the interest and the principal on a timely basis, then the other things about the mortgage, and the collateral etcetera, etcetera is not mentioned, it is not required to issue this particular bonds, which is defined as the unsecured bond.

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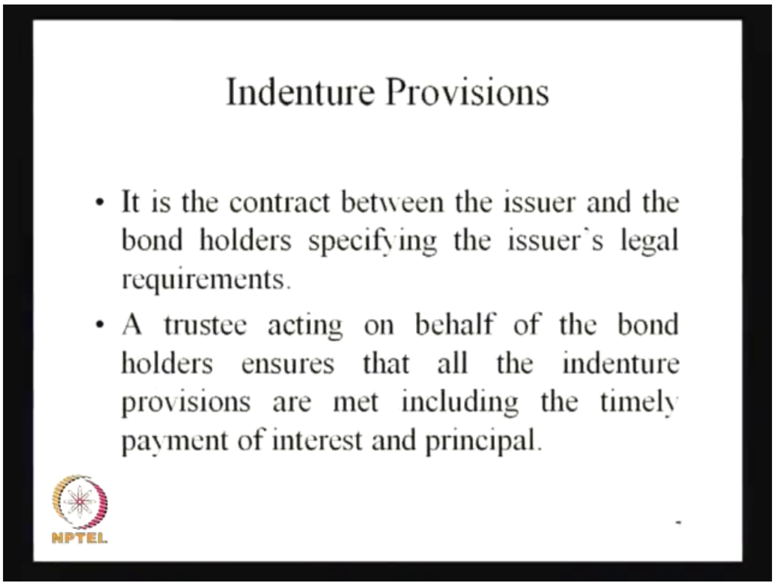

Then another type of characteristics whatever we have, that is basically your indenture provisions. What do mean by this indenture provisions? Indenture provisions are nothing but it is the contract between the issuer, it is the contract between the issuer, and the bond holders specifying the issuer legal requirements. So, indenture provision is basically the contract or the legal document, what basically we have always get or we have always receive this things, and the we have always written this things between the issuer and the bond holders.

It is the contract between the issuer and the bond holders specifying the issuers, legal requirements, and who basically write this indenture provisions, who basically decide this indenture provisions, and there is a trustee acting on behalf of the bond holders; ensures that all the indenture provisions are met including the timely payment of interest and the principal. That means, indenture provision is basically legal document, which is written between the bond issuer and the bond holders, and whenever we write this things, that indenture provision basically talks about, when the payment will be made, how the payment will be made, and what is the time means, what is the frequency on which this particular payment has been made.

So, these are the different things or whether the, if there is no payment in a timely basis, then what should be done, and what should be, when this particular interest should be paid, after what time the interest should be recovered from the bond investment, and after what time generally this principal should be received. So, these are the different issues always the indenture provisions basically highlight. So, any investor who takes the position in the bond market, who basically tries to invest in a bond, and basically they always ride this indenture provision document, which is a legal document written between the bond issuer and the bond holder. So, this is the also one of the important characteristics, always we observe in the bond investing part.

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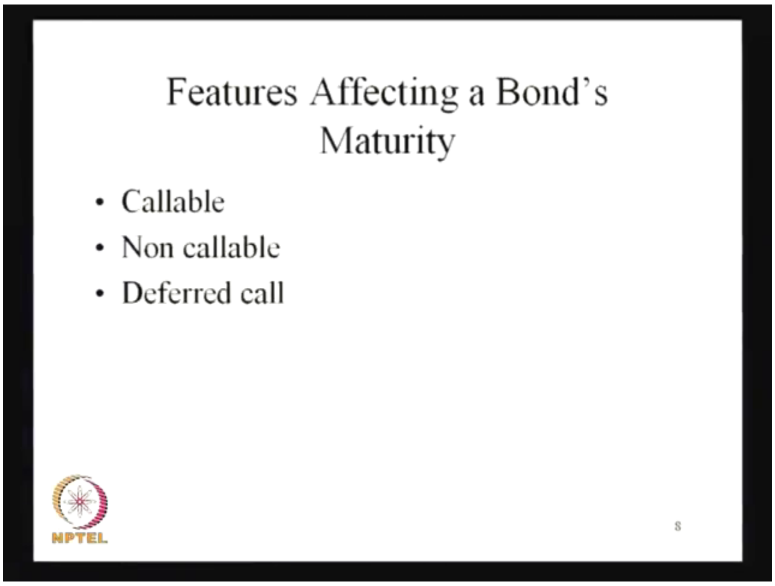

When, there are the factors or the features, which basically affecting the bonds maturity, why this term to maturity of this particular bond, and how this particular term to maturity will be different from bond to bond, one we have defined as a short term maturity, long term maturity etcetera, but on the basis of the characteristics of the bond, but sometimes also the maturity changes, and how this different characteristics of a bond basically changes the maturity; if you observe here, we have a callable bond, we have non callable bond, and we have a deferred call bond.

What do mean by this callable bond, non callable bond, and the deferred call, whenever we talk about the callable bond, it is basically what does it mean, that any time the bond can be called by the bond issuer; that means, that is a redemption of the particular bond will be possible at any time of the investment, but the non callable bond, this particular bond cannot be redeemed, it cannot be recalled back before the term to maturity; that means, once this particular bond has been issued by the issuer, then until this particular term to maturity is not arrived or we have not reach to certain years, then the bond cannot be redeemed, but whenever we talk about the callable bond, this bonds are highly risky or we can say this particular redemption of those bonds can be possible at any movement of time, at any time whenever the bond issuer wants. So, therefore, we have a distinction between this two.

Then another type of bond is deferred call, deferred call means, it is inter medially between the callable and the non callable, basically this is, it is the medium type of the bond which has some callable feature, and which has some non callable feature. How this dual characteristic is possible, for example, somebody has issued a bond, where the term to its maturity term to maturity is 10 years.

If the term to maturity 10 years, and if it is a deferred call bond, if is a, it is a deferred call bond what will happen, in that indenture provision of the document, it will be written, that this particular bond cannot be, cannot be called up to 5 years or the redemption is not possible up to 5 years, but after 5 years; that means, after 5 years, it is a non callable bond.

Up to 5 years, it is non callable bond, then 5 years to 10 years, it is basically a callable bond; that means, here what we are trying to do, after 5 years, once this 5 years is not completed, then the bond issuer cannot go for redemption, go for redemption of this particular bond, but once this 5 years is completed, the bond is issuer can go for culling the bond or the redeeming the bond at any point of time. So, those are the bonds, which have defined as the deferred calls.

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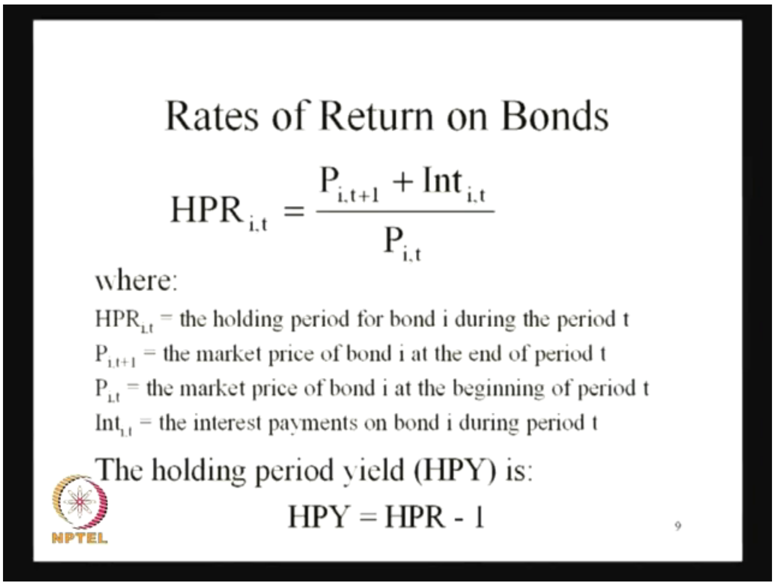

Here how generally we calculate the return of a bond, already I have told you that the holding period of return HPR, basically represents the holding period return of a bond which is nothing but the what particular money, what particular principle, whatever we have this is your the market price of the bond I, at the end of the period t, and what is your interest payment you are getting from here, that is your interest payment on the bond I, and divided by the market price of the bond or the beginning of the period t.

And here, what you, you should know that the price of the bond in the different t plus one period will be changed, because the market interest rate changes, and how the valuation of the bond in etcetera will be done, that we will see in the further sessions, but here if you see your h p r i t is nothing but the holding period for bond I, during the period t, then p i t plus one is equal to market price of the bond I at the end of the period t, and p i t is the market price of the bond I at the beginning of period t.

Then, interest i n t i t is basically the interest payments on the bond I during the period t. So, finally, if you calculate a holding period yield is nothing but your holding period return minus 1. So, the holding period yield of a bond is calculated as the holding period return minus1, and the holding period return is nothing but the market price of the bond at the time, whenever the bond is going to be redeemed or maybe we are calculating for that particular future period, and plus the interest, what we have received from this divided by the market beginning price of this particular bond, what on price on which price, we have basically, they save this particular bond at that point of time. So, this is the way the rates of return on the bonds can be calculated.

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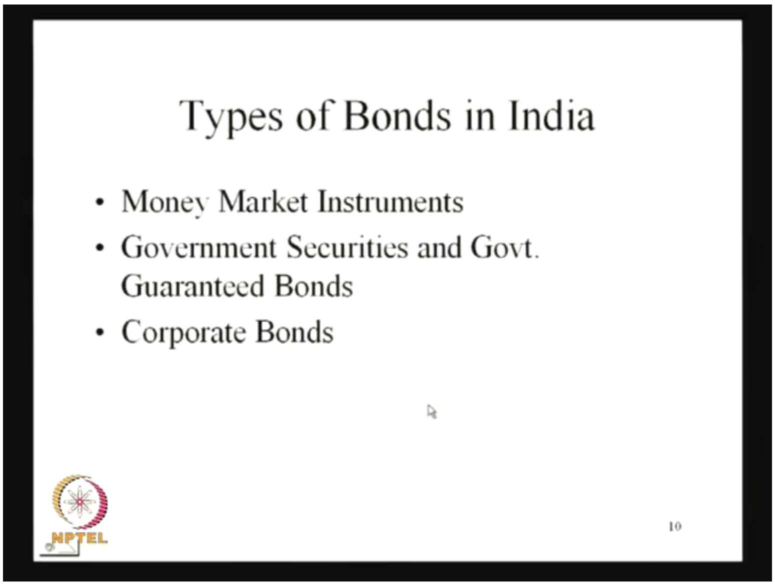

Then, if you coming back to India, what we have seen there are different bonds which are available we have the money market instruments, we already we have seen on the basis of the term to maturity the categorization of the bonds also the bond markets can be made. So, in the context if you see in terms of India, we have a money market instruments or we have a money market, where the short term bonds are available, then we have the government securities in the government guaranteed bonds, and as well as the corporate bonds, already what I told you on the basis of the ownership also the bond markets have been categorized, and the different instruments have been issued by the different markets on the basis of the requirement of the investor.

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If you see the money market instruments, which are the short term instruments, which are available in the money market in India, which will be use the major instruments for the investment in the bond market. these are basically the treasury bills, which talks about or which represent the short term obligations of the government, which issued by reserve bank of India on behalf of the government of India, and it is a very short term, there are various different maturity period available for this, and basically we always say that, the investment in this kind of instrument, like treasury bills are basically risk free investment; that means, once we have invested in those assets, the return will be assured, because there is a guarantor, that is the government of India central government of India is the guarantor for that and it is issued by their way on behalf of the government.

So, therefore, the maturity period can be varied from 91 days, 182 days and 365 days, and we have also these are have some 14 days instruments, but those 14 days instruments basically are use to finance the state requirements or state government requirements in the basis of ways and means.

So, therefore, we do not consider that particular 14 days treasury bills as real investment for the retail investor, which is regularly or which can be regularly use in the market for the investment.

They do not carry an explicit coupon rate, already what means you should remember this is a very important point, that they do not carry an explicit coupon rate, there is no coupon rate mention, this is basically sold at discount and redeemed at the par, and there is very active secondary market for this, because already you know what is the difference between secondary market, because the existing transactions which are available in the market in the primary market, that will be basically transected form one person one investor to another investor in the secondary market, and that way the liquidity of the secondary market will be more.

So, therefore, what we have seen that in India, we have a very good market for the treasury bills, which is highly liquid or we can say which is a successful market, by any of the investment prospective, then only I have another instruments which is called the certificate of deposits, what basically the certificate of deposits is it, it represents a negotiable receipt of the funds deposited in a bank for a fixed period, they are sold a discount and redeemed at par value, and there is very active secondary market for this also; that means, it is basically talking about a reset of the funds, what has been deposited in a bank, and you have given this note to somebody else or you have given this negotiable receipt to somebody else, which talks about that, this much money has been deposited in this bank for this particular period of time, for which the bank is going to provide you the interest, and as well as the other aspects, what we have discussed about the bond characteristics. So, therefore, we have the good certificate of deposits market in India, which is very active in terms of their secondary market prospective.

Then, we have another instrument, which you call it the commercial paper, it basically represent the short term unsecured promissory notes issued by the firms; remember the certificate of deposits can issued by the banks, but the commercial papers mostly issued by the companies also, they are sold a discount redeemed at par value, and there is not active secondary market for this; that means, the commercial papers are not actively traded in the market, and it is little bit riskier than the other instruments within the short term segment, because it is issued by the corporate, it cannot be issued by the government or it cannot be issued by the banks or any other financial institution, and it is again a short term instrument, which is used in this bond market in India.

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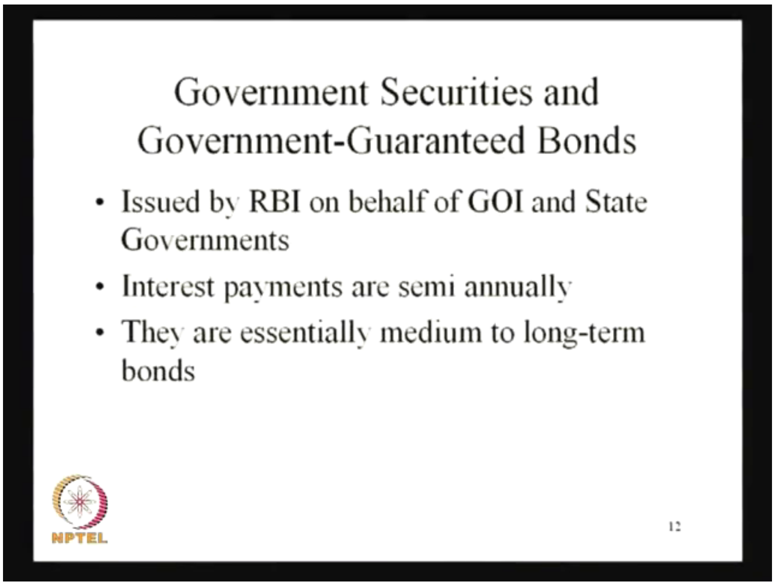

Then another type of issuer in the market, which are available, these are the government security than the government guaranteed bonds, what basically this government guaranteed or the government securities are already told you, it is issued by reserve bank of India on behalf of government of India, and the state governments, and you remember in India, we have the different type of government bonds which are available on the basis of their term to maturity, we have up to 10 years bond maturity, we have more than 10 years, and maximum term to maturity bonds which are available India is 30 years.

That means, we can issue a bond after 30 years, the reserve bank of India can issue a bond up to 30 years term to maturity, and it is basically issued by the reserve bank of India on behalf of the government of India, and the most of the government securities are long term in nature. So, the 10 years government securities, 15 years government securities, these are the government bonds, which are basically discussed again or which can be considered again as the risk investments in the market.

If you are talking about the longer prospective the investment in the government securities for a long period of time for 10 years, 15 years, 20 years, they are also consider is highly risk free in that particular situation in the market, and that is why, in the most of the cases the government securities, basically in the case of government securities the interest payments are semi annually, in every six monthly the interest payments are taken place, and they are essentially medium to long term bonds, and already I told you that basically they are term in nature, and sometimes if you define the 5 years to 10 years are the medium term, in sometimes also those type of characteristics it is possible, in case of the government securities or the government guaranteed bonds.

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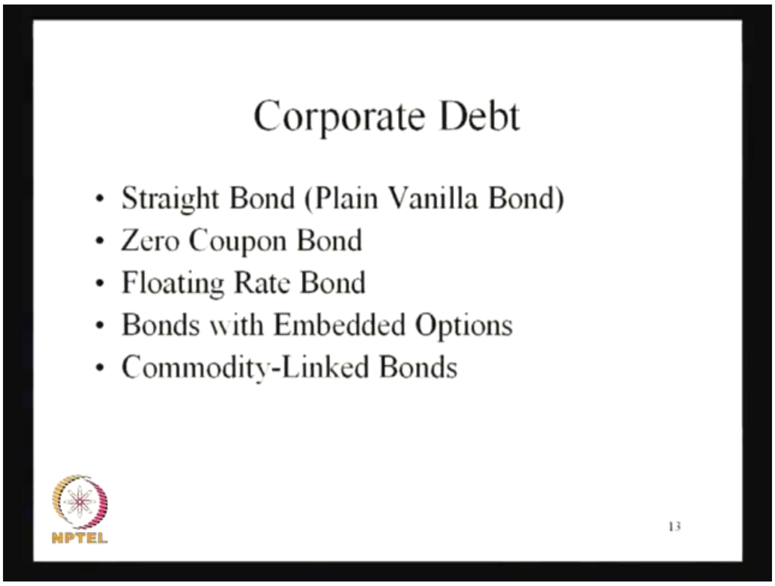

Then you have your corporate debt or corporate bonds there are different type of corporate debts, we have a straight bond, what we call it the plain vanilla bond, whatever characteristics we have talked about, and we have seen the same characteristics is, if plainly it is given, there is a indenture provision, there is coupon, there is a time to maturity, and there is par value etcetera, etcetera, and there is no such kind of callable or other kind of extra features for this particular bond, and for this issuing that particular bond, then that particular bond is basically defined as the corporate bond, sorry, plain vanilla bond or the straight bond, which can be also issued by the corporate or the different corporate bodies.

Then, in this context, we have another bond, we call the zero coupon bond, zero coupon bond from the name itself, you could have judge that, there is no coupon involved in this, that is basically issued at par and redeemed at par. So, there is no such kind of coupon is possible or timely interest payment is possible for this, only at the end of the maturity, the total amount can be received by the bond investor, instead of getting this coupons every periodical basis.

Then, we have a floating rate bond, what does it mean, this floating rate bond, there are, whenever we get this debts or the bonds are issued by the different agencies, we have different type of bonds, where we find, we find that the bonds which have a fix to interest rate; that means, even if there is some adverse situation in the market, this interest rate is not going to be changed; that means, the same amount of the interest we are going to pay. So, therefore, the people if they, they will feel that the interest rate expectation, the interest is going to be more in the future, then they generally take care of or they has their risk by investing in those bonds, where it is in the fixed rate basis or they issued the bond on the basis, the fixed rate basis, but on the basis of the floating rate, on the basis of the market, on the basis of the external factors, the floating rate interest rate changes, and if the floating rate interest rate changes, basically at little bit riskier, because on the basis of the market situation if the market dynamic changes if the market fluctuation forces this particular bond issuer to changes the interest, and basis on the basis of the timing of the market, on the basis of the requirements of the market, this particular interest is also changes.

So, therefore, we have two types of things here also, and what the corporate bodies generally issue, then we have the different type of options embedded with the bonds; so, that is why we correct the bonds with embedded options. A bound is embedded option means, whenever you talk about there are different other type of assets, which are available, that we will be discuss in further in a larger way, but if you see, there are the other bonds also we have warrants, we have convertible debts etcetera, etcetera. What basically they have, they are basically by nature they have the bonds, but otherwise they have the different special provisions, by which the characteristics of the bond of those bonds will be little bit different. So, therefore, we call it bonds with embedded options.

Then, we have the commodity link bonds which are nowadays also popular, and the price of the bond will be varied on basis of the price of the commodity, because in the derivatives market or the future market that kind of concept is highly used. So, therefore, corporate bodies can issue the player one will abound, they can issue a zero coupon bond, they can issue a floating rate bond or the fixed rate bond, they can also they issued some kind of other types of the bonds, which has different other features, on the basis of their basis of their feature, this categorization of bond has been changed, and as well as we have also the commodity linked bonds, because if the price of commodity changes the value of the bond also changes, that can possible in the future market or the derivative segments of any of the countries.

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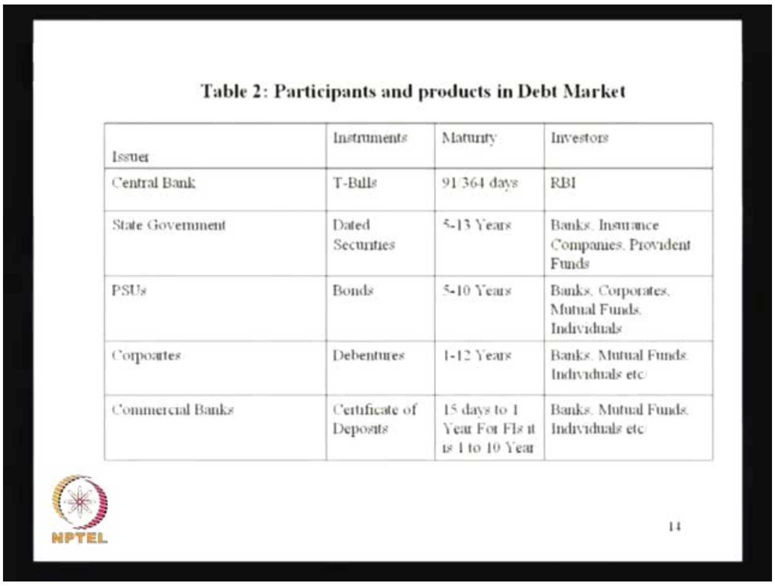

Table 2: Participants and products in Debt Market

Issuer	Instruments	Maturity	Investors
Central Bank	T-Bills	91-364 days	RBI
State Government	Dated Securities	5-13 Years	Banks, Insurance Companies, Provident Funds
PSUs	Bonds	5-10 Years	Banks, Corporates, Mutual Funds, Individuals
Corpoartes	Debentures	1-12 Years	Banks, Mutual Funds, Individuals etc
Commercial Banks	Certificate of Deposits	15 days to 1 Year For FIs it is 1 to 10 Year	Banks, Mutual Funds, Individuals etc

Then, these are the participant products of in products in the debt market, if you see these are the issuer, that is the central bank and the state government, then the public sector units, then the corporate in the commercial banks, if you see the instruments, the central bank basically gives this short term instruments, like treasury bills, like and where the maturity period varies between 91 days to 364 days, and the investors are basically the reserve bank of India.

Then, the state government issued the dated securities, what basically maturity periodic securities means the term to maturity is mention there, where the term to maturity is 5 to 13 years, and the investors basically from the state government issued securities or the banks insurance companies, and the provident fund companies etcetera, they basically invest in the state government securities, it should to the different customers on the basis of the requirement of the term to the bond characteristics.

In the public sector units they basically issue the bonds which are the term to maturity this varies between 5 to 10 years. The investors are basically visited all the different banks, may be public sector or the private sector banks, when the corporate in the mutual funds and the individuals, they basically invest in those kind of assets, because then the basis of their necessity on the basis of their requirement, those kind of changes take place in the market.

Then, you have the commercial banks, which basically issue the certificate of deposits, and the term to maturity is quite low, where the 14 days to one year for f i (s) financial institutions for 1 year, and for financial institutions, it is 1 to 10 years, and the investment basically made by the banks, then the mutual funds, then individuals etcetera. The certificate of deposits is also one of the instrument which is very short term, but sometimes for finance for an institution for f i (s) financial institutions, this particular term to maturity can vary between 1 to 10 years.

So, overall if you want to conclude this table, what is trying to say, these are the different important issuers who basically issue the bond in India, and these are the different instruments, what they provide, and the time to maturity is mentioned, and finally, the investors can be identified, basically you talk about the bigger investors or the institutional investors, and the individuals also responsible, individuals also invest in these government securities, and the people who are little bit risk averse in nature, and they take different position in the market to get the return from those particular bonds by minimizing their risk in the market.

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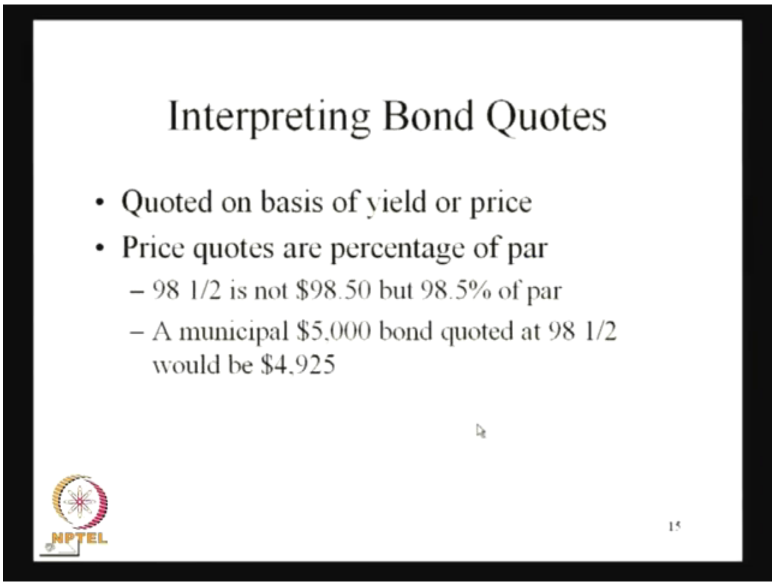

So, then coming back to whenever we do the investment in the bond, how this particular bond investment quotes are looking like, whenever you talk about the bond quotes, these are basically quoted on the basis of their yield or their price, and the price of the bond changes from the basis of the change in market interest rates.

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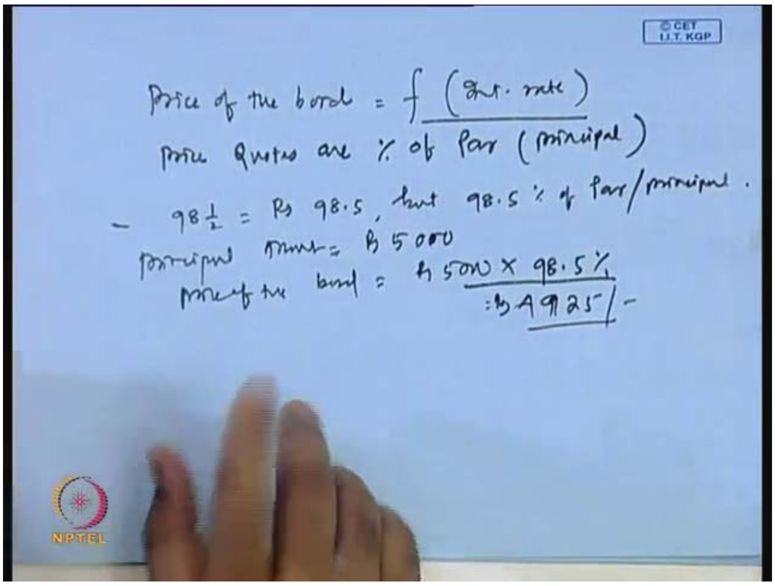

So, what generally how generally it quote the quotation is basically is mentioned by this way, for example, if you talk about the price quotes and the price quote, when the price of the bond price of the bond, already I told you, it is basically is a function of interest rate majorly. So, we will be discussing those things in detail in the next class, but here if you observe, then how this price quote is made, the price quotes are basically always are the percentage of the par value. Par means, we talk about the principal value, then what it look like, for example, it is written like this by 2, then sometimes we refer it, it is basically Rs 98.5, but which is not true, it is basically talking about the 98.5 percent of the principal or the par. So, whenever you write this, for example, the principal amount is, where the principal amount the example here, it is given RS 5000, then the bond quoted, then the price of the bond price of the bond, at that particular time will be Rs 5000 multiplied by the 98.5.

It is the zero point, it should be 98.5 percent, that will give you 4925; that means, in that particular time, the value of the bond or the price of the bond will be 4925, like that what basically we talked about that the a bond quotations, they return the bond quotation is very much important from the investors point of view, and always they should know that how the quotation can be made and what is the interpretation on that quotation.

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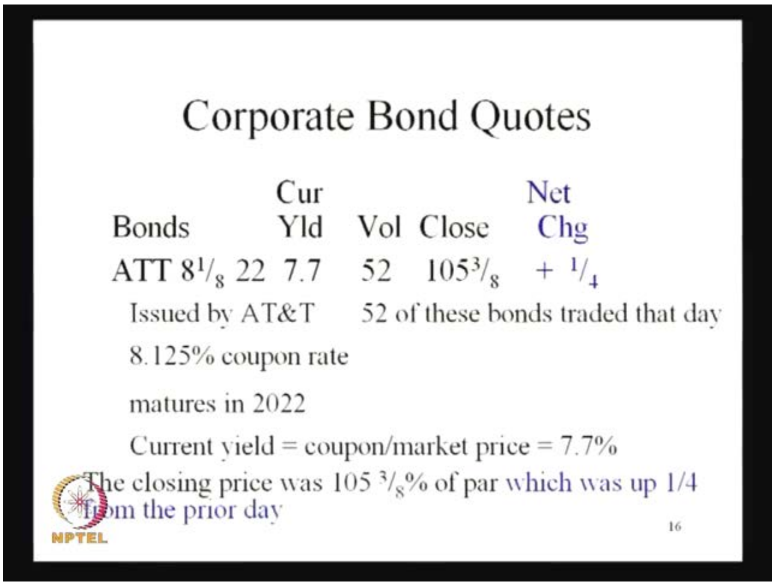

In general, this is the way the corporate bonds which quoted, how generally it is quoted in this way, this is your bond, this is your current yield, and this your volume, how much time number of transactions taken place here, that is your closing price, then your net change with respect to the previous year previous period.

Let your bound is X, here current yield is let 7.7, then your volume is let 52, the closing price is 1505, 3 by 8, then how it is denoted the, that means, the X is issued by, so and so, par here it is, let example it is written a t , then meant a t, and t has been has issued this bond, and 52 of this monster rate that, they because already number of transaction, what we talk about, and the coupon is basically, this is your, sorry, I did not write it here, this is your coupon, this will be your 8.8 by 1 by 8, which is talk about the coupon payments, which is a periodical n payment what you are going to receive, which is given in the percent term. So, 81 by 8 percent means it is 18. 125 percent.

Then, you are which will be maturing or this is your 22 is mention here, after this, this is your 22, that 22 is basically nothing but it is the term to maturity if the bond issued at 2003, then let it 22 means it is 2022, it will be mature.

Then, the current yield which is basically coupon, what you have receiving here divided by the market price, will be reading extensively those thing, afterwards the current yield of this particular bond is7.7 percent. So, the closing price was 1053 by 8 percent of par, so which was up 1 by 4 percent from the prior day, that is why the net change is also mention here, which is a plus 1 by 4, that means, the price of the bond has gone up.

So, what basically talks about, if the price of the bond has gone up, then we can realize that or we can expect or we can conclude or we can infer that interest rate in that particular day or interest rate in that particular period has gone down; therefore, the value of the bond has gone up.

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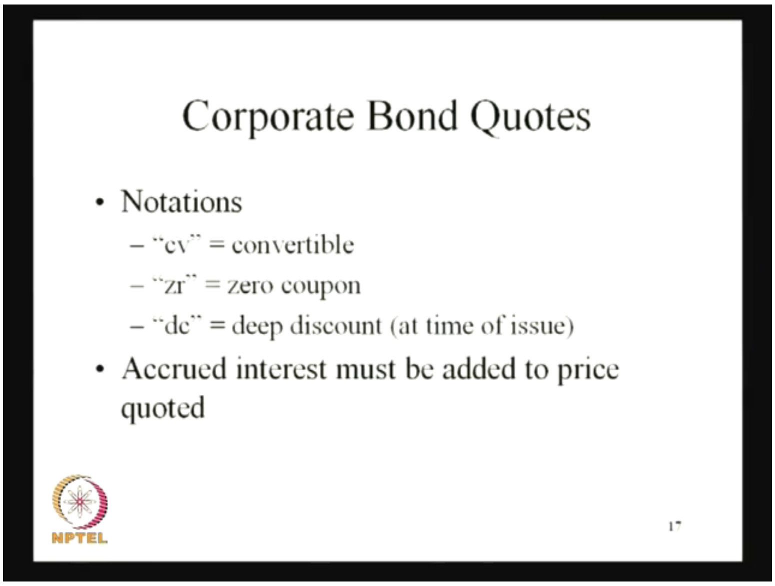

So, there is an inverse relationship between this two, sometime they people use this notations whenever they record this things, So, whenever they record it c v in short; that means, it is defined as convertible, if is they are writing the z r, we call it the 0 coupon bond; if they write d c, small d, small c, which we call the deep discount adventure the time of the issuance, and always the accrued interest must be added to the price, and they calculated interest what we have, what we are paying must be added to the price, what has been quoted there.

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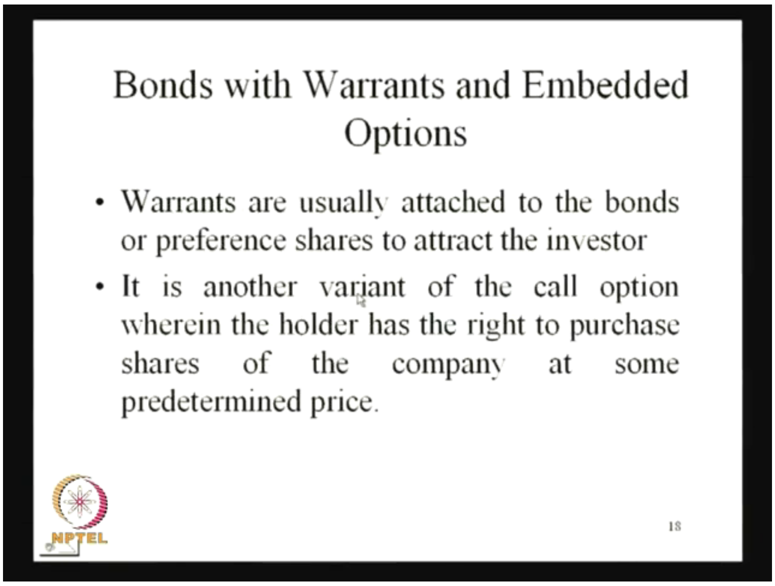

Then coming back to the other aspect, which talks about the bonds with other embedded options, then if you see that the, there are two, three features or two, three types of assets whatever we have, if you talk about one by one, then we have a warrants, then we have some convertible bonds, and etcetera, and what basically the warrants means, the warrants are basically attach to the bonds or preference share to attract the investor, and what basically the warrant is, it is another variant of call option, wherein the holder has the right to purchase shares of the company at some predetermined price.

That means, if there is a warrant is related to this particular bond, then the holder of the bond will be given to the right to the share holder of this particular company, because to means right has been given to that particular bond holder to repurchase the share at a particular time at some predetermined price; that means, price will be determined before hand, and there is a right has been give him, whether the right has been exercise or not that is a separate issue, but the issuance or the particular right has been given or the chance will be given to the share holder to buy a share from this particular company at a predetermined price level.

So, that is the, basically they defined always we have warrant, sometimes it is related to the bond, if there is a warrant feature involved with this in particular bond, then what we have to judge from there may that bond holder is almost very much inclined or very much invested to this particular bond in the company, because in the future, he can be the owner of the company or he could have some share holding pattern in the company, because that right has been given to him in a predetermined price, whenever the share will be issued by the company; so, that is why to attract the investor this kind of options will be created.

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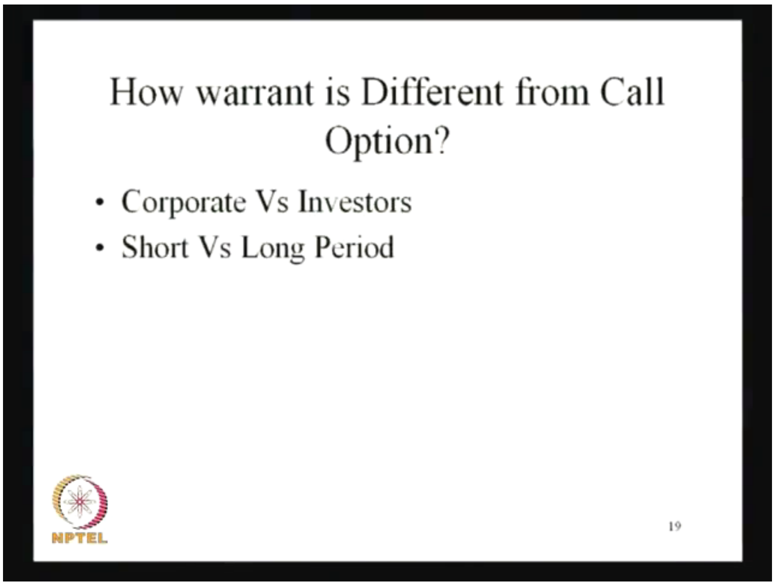

Then how the warrant is different from the call option, because this is basically the future market call option, which always we have given the right to the buyer to take the position in the market or to exercise the price in the market; So, it is different, because basically on the basis of the corporate versus the investor, short versus the long period, and in the basically in the market, if you observe that this particular things from the investor point of view, but here the corporate is giving that particular chance, whether there is a warrant or not, but the call option position basically taken by the investors to decide that or to get how much return is going to be realize after so and so date.

And another thing here is on the basis of the period also, sometimes we find that the warrants are basically we can say the short period basis, but in the long period or sometimes the call options also may not be exercise very shortly, it may take a longer period, but it is one of the additional points what we are going to discuss, but little bit there is a difference from the issuance point of view, and from the characteristics point of view, how this warrants can be different from the this call options.

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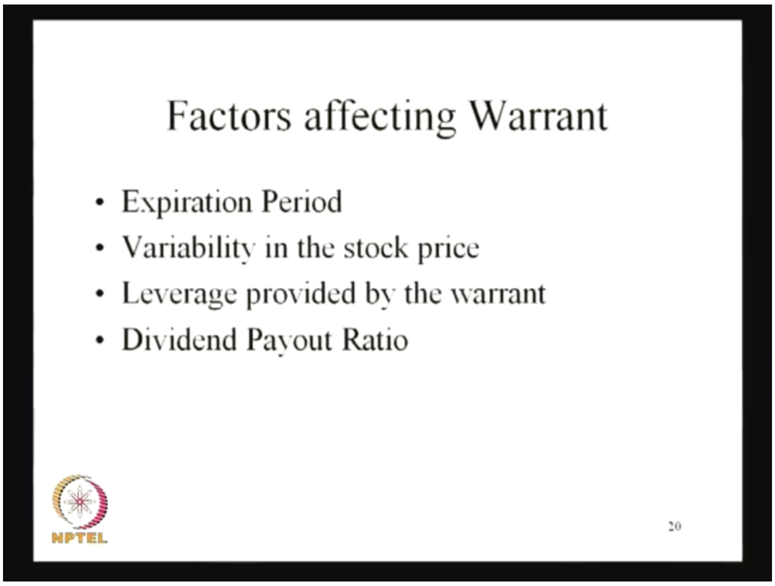

And particularly which are the dominating factors, which decide this warrant or which affect this warrant, one is your expiration period, when this particular call option is going to be expire, then the variability in the stock price leverage provided by the warrant, then the dividend payout ratio, you see that, what basically talks about, whether it is given the right to the bond holder or the bond investor to take a position in the market, in such a way or they can buy some shares from the market with a predetermined price, but how this bond holder or the investor is going to decide that, what should be the price level, whether the price is really a good price, what is going to pay for this particular bond or the price level of this particular stock is more fluctuating; therefore, it is very difficult to decide how much price I should give for this particular stock. So, therefore, what basically we can see that, when this particular warrant is going to be matured or the particular options is going to be expired, accordingly this investor or the bond investor basically sees that how the particular talk price is fluctuating.

If the variability will be more, he may not be interested, what he be can find out a range how this price, whether the how much price is going to pay for this holding the stock, and it is very much little bit assured in the his point of view, then maybe it is easy to decide that, whether he should go for exercising that warrant option or not, that is why, we can see that variability of the stock option is or the variability of the stock price is basically important feature or important concept, what this particular bond holders always try to see. Then, also we have seen that the factors like a dividend policy who decides this particular stock return or one of the factors who basically decide that how much return we are going to expect from the market, that also basically sometimes decide that whether we should exercise this option or not.

And another one is your leverage provided by the warrant, leverage means what we refer talking about that specialties or the benefits or the debts, what we are going to provide on the basis of the warrant, that is also another factors, which decides that how whether the warrant will be exercised or not.

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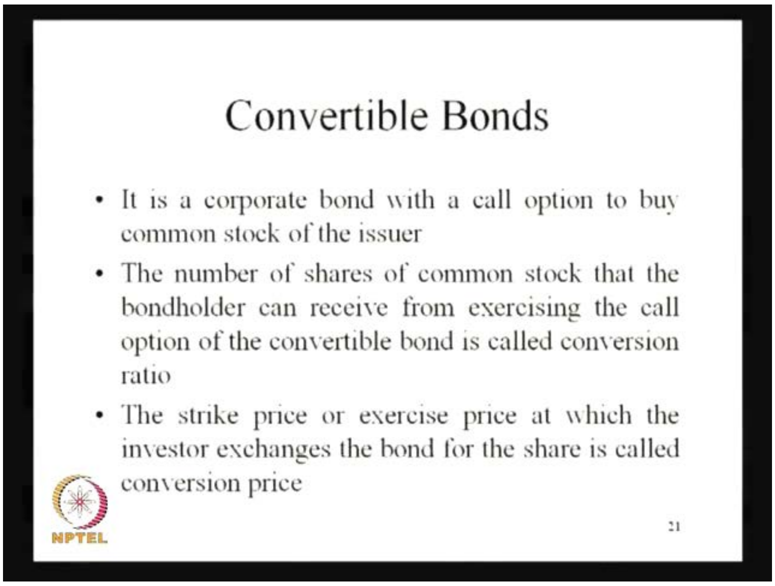

Then another type of bonds with some embedded options are basically convertible bonds and I hope most of you, most, we aware about this convertible bonds the convertible bonds is nothing but it is a corporate bond with a call option to buy a common stock of the receiver; that means, after stipulated point of time, this particular bonds can be converted into the shares or the common equity of the company; therefore, the particular investor who is investing in this particular bonds, may be consider as the owner of the company.

So, the number of shares of common stock that the bond holder can receive from existing, the call option from exercising, this call option of the convertible bond is called the conversion ratio, for example, you are issuing a bond of 20000 rupees, and the value of this particular bond you are holding a bond of 20000 rupees, and the value of the bond is sorry, value of the stock is 100 rupees, then accordingly this you have to convert those values of 20000 into the different number of stocks, how much you should own for that particular company in that particular time.

So, that particular exercise whenever we do, that basically we call at the conversion ratio, then the another concept related to this, which is call as the strike price or the exercise price at which the investor exchanges the bond for the shares is called the conversion price; that means, the price at which particularly the share price on which the conversion takes place between these two bond and the stock, and the bond can be converted into the stock, that particular thing we define as the whether we define as the conversion price that is defined as the conversion price.

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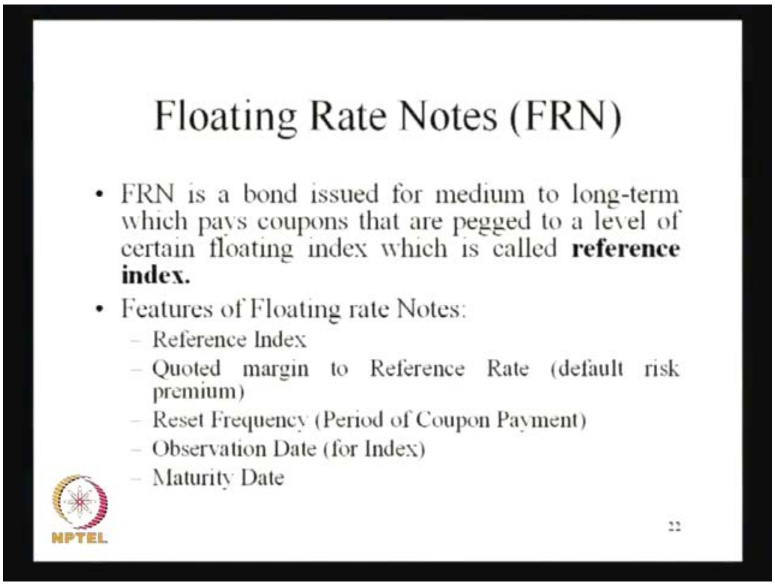

Then another concept is your floating rate notes; what do we mean by this floating rate? Note, this is basically a bond issued for medium to long term, which pays coupons that are pegged to a level of certain floating index which is called the reference index and what are those features? Features are there, this as a reference index, this as quoted margin to reference rate, which basically the default risk premium, it is reset frequency the period of coupon payment, and for observation, when you should know this, there is a, for index you have to give in, you have to be given also for that, you will, you will be getting that, then you have the maturity date.

So, the floating rate notes are little bit different from the bonds in this regard. So, what we have seen here, the, there is a plain vanilla bond, whatever we have, we have a term to maturity, we have a coupon, we have an also the market interest rate, but another way also, these are all certain embedded options, whatever we have, and if you have those options, there that is a call option, there is different kind of warrants and etcetera will be put, there the characteristics of the bond will be different, and the bond investor whenever invest this particular bond, and they always want to maximize the return, then how this bond price changes, and why it changes, and what are those different factors which affect the bond pricing, and how this valuation of the bond takes place, and in the different scenario, that and also the, for the embedded options, that we will be discussing in the next class. Thank you.