Management of Fixed Income Securities

Prof. Jitendra Mahakud
Department of Humanities and Social Sciences
Indian Institute of Technology, Kharagpur

Module No # 01
Lecture No # 01

Introduction to Fixed Income Securities

Good morning. So, we can discuss a particular subject that is called the management of fixed income securities. Because, all of you know that whenever, we make investments in the market, we have different kinds of assets, we always look at. We have the stocks, we have the bonds, we have the derivatives instrument, and all these things. And the choosing of those securities depends upon the objectives of that particular investor.

So in that particular context, the investors who are very much inclined towards income maximization always concentrate on a particular type of security which is called fixed income securities. Mostly, it gives a constant flow of income over, relatively it is less risky than the other type of instruments that are available in the market particularly, the stocks and the derivatives instrument. **(Refer Slide Time: 01:16)**

CONCEPTS COVERED

- Types of fixed income securities
- Bond characteristics
- Preferred stock
- Structured products
- Fixed income derivatives

After going through this particular session, we will be covering the different types of fixed-income securities that are traded in the market. And mostly, the most important fixed income security is the bond.

So what are the characteristics of the bond and what are the different types of bonds which are traded in the market? Then another type of security, we have is a part of the debt and part of the equity which is called the preferred stock.

Although, in many of the cases, we have seen that is not considered a debt instrument but we will just briefly discuss what that preferred stock is and what are the different types of preferred stocks which are traded in the market. Then, we have certain kinds of products that we call, structured products. These are the mortgage-backed securities that comes from the process of securitization where the different pool of funds are considered and accordingly, the different type of assets are issued against that particular pool of funds or pool of the assets whatever we have. We have mortgage-backed securities, we have asset-backed securities and all these things come under the structured products then we have certain products which are fixed income securities, derivatives particularly.

Derivatives instruments or the price of those particular derivatives are based upon the different types of fixed income securities which are available in the cash market. So these are called fixed income derivatives mostly the derivatives are like interest derivatives, credit default stocks, and all these things that come under the part of the fixed income derivatives. So here is what basically we are going to do. We will be discussing the different types of derivatives which are designed on the basis of fixed income securities.

And as well as how the pricing of the securities is done and how the securities are traded in the market if you want to minimize the risk in this particular market then what are the different kinds of strategies or what are the different kinds of assets you have to consider? so that is the fixed income derivatives part.

(Refer Slide Time: 03:37)

KEYWORDS

- Coupon
- Debentures
- Mortgage backed securities
- Asset backed securities
- Interest rate derivatives

So, after this, certain things you will remember like what is coupon, what is debenture, what is mortgage-back securities, what is asset-backed securities, and what is interest derivative? These are the major things that basically we will be covering up some of the concepts that basically will be learning from this particular session. Okay.

(Refer Slide Time: 03:59)

What are Fixed Income Securities?

- Fixed income securities are the financial claims with regular cash-flow of fixed amount at fixed intervals /dates
- Broad categories of fixed income securities are:
  - Bonds
  - Preferred stock
  - Structured products
  - Fixed income derivatives

So, let us come to our discussion on fixed income securities. Already, what I told you is that by the name itself if you see that what do you mean by the fixed income securities? The fixed income means it gives a kind of fixed income or regular income over a period of time. So that is

why we call it, it is a kind of financial claim with regular cash flow of a fixed amount at fixed intervals or dates.

For example, if you take a bond, the bond has a coupon feature and the coupons are paid against the principal or the par value of the bond. Let the par value of the bond is 1000 rupees, if the coupon is 10% and the coupon is paid annually then every year on a particular date the investor will be receiving 100 rupees from the bond issuer. So periodically there is a fixed income that basically you would be receiving in a regular interval or the fixed interval at a particular date.

We call these fixed income securities which give a regular cash flow and the cash flow amount is also fixed and is paid in a particular interval or on a particular date. So already what I told you there are different types of fixed income securities what always we see and the whole particular subject will be dealing with mostly all types of fixed income securities that are traded.

And we will look at the different nitty-gritty, different investment aspects, the pricing aspects, and the strategic aspects whenever we will discuss all type of instruments which comes under fixed income securities. So the first instrument which comes under the fixed income security is the bond and already I told you about the preferred stock which is a hybrid instrument it has an equity feature as well as the bond feature.

Then we have the structured products then we have the fixed income derivatives. So one by one we will see and over the particular course, we will be discussing sequentially the different aspects of this particular instrument. Like the pricing aspect or the evaluation aspect, we will discuss the strategy aspect and we will discuss the trading aspects. And all these things which are basically a part of the investment process will be discussed in that particular case. And mostly how the risk basically the investor is going to minimize whenever they are using this instruments in their investment portfolio.

(Refer Slide Time: 07:00)

Bonds Defined

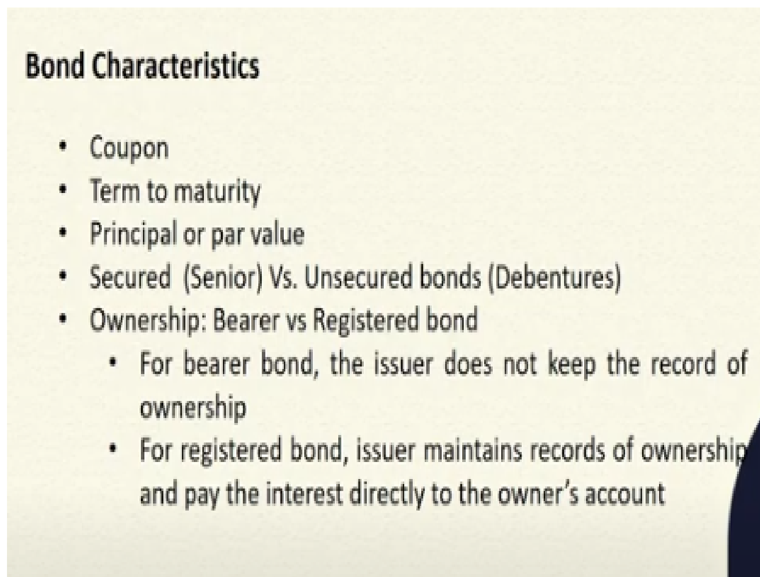
- Bonds impose fixed financial obligations on the bond issuers
- Owners of the bond are debt holders or creditors
- The fixed obligations are:
  - Payment of fixed amount of interest periodically to the bond holder
  - Repayment of fixed amount of principal at the end of maturity

Then what is a bond? Already all of you know what is bond; you have a fair idea about the bond. The bonds are basically a kind of instrument which imposes fixed financial obligations on the bond issuers. If any company or a government issues a bond then on a periodical basis they have to pay a certain amount to the bond investor or the bondholder. That is why the owner of the bonds generally is called the debt holders or the creditors.

So, on a periodical basis, a fixed amount of money or a fixed amount of return you will be receiving from the bond issuer. So this is a kind of financial obligation the bond issuer has and what are those fixed obligations: the fixed obligations are the fixed amount of interest which is nothing but the coupon and another one is the repayment of the fixed amount of the principal at the end of the maturity.

If you have invested in a bond and the bond is going to be matured after 5 years or after 10 years then after this maturity period generally your principal will be returned back to you. So that is why they have two fixed obligations: one is your payment of the fixed amount of interest which the bond issuer has to pay them periodically then the repayment of the principal at the end of the maturity.

So these are the two fixed obligations always the bond issuer has. And the bondholder will be receiving these two different financial claims whenever they are holding that bond with them. **(Refer Slide Time: 08:45)**



Then we have to look at certain characteristics of the bond whenever you define a bond, a bond has certain kinds of characteristics, there are some basic features always we look at whenever typically we define a bond. Already I told you the bond has a coupon, the coupon will be fixed in the beginning and how much, coupon the bond issuer will be giving. Then it will have a term to maturity up to what period the bond you can hold.

And or you can say that you maximum period, the bond has for redemption that is called the term to maturity then you have the principal or the par value of the bond. So these are the three different characteristics you will look at for the bond typical bond features basically we can say. But there are different types of bonds there are let zero coupon bonds so there is no such kind of coupons involved in that. But, the bond is always redeemed at the time of maturity and it is issued at a discount and redeemed at par. So that is a typical type of different type of bonds we can also see. But in general, if you see that whenever we picture or we look at a bond thing or we discuss about a bond then always we see that the bond should have a coupon, the bond should have a term to maturity and the bond should have a principal. So, these are the three things always involved with respect to the bond.

Then the bond can be a secured bond. A secured bond in the sense it should be backed by certain kinds of assets or certain kinds of mortgages. That means it is if there is any default then those assets can be liquidated and the money can be repaid back to that particular investor. So that is called the secured bond or we can also call it the senior bond. Then we have the unsecured bonds. Mostly, the corporate sectors generally whenever they issue these long term bonds which in our language we call debentures, are mostly unsecured bonds.

And the unsecured bond means it is not backed by any kind of asset or any kind of collateral there is no such collateral involved against this unsecured bond. So, if there is any default then there is a, or the default risk of that particular type of bond is relatively higher in comparison to the secured bonds. Then the bonds can be also divided into two types, on the basis of the ownership, we can call a bond a bearer bond and we can also call a bond a registered bond.

So what do you mean by this bearer bond? The bearer bond means here there is no such record with the bond issuer that who is holding that bond. And always there is some kind of coupons are associated with that bond and on every periodical basis the bond investor has to send that to the bond issuer and against that the bond issuer will pay the coupons. So the bond issuer does not have to keep the record of the ownership of that particular bond. So these are called the bearer bond.

But whenever we are talking about the registered bond mostly most of the bonds which are traded in the market are registered bonds. So registered bonds mean here the issuer basically maintains the record of the ownership and the coupon or the interest which are directly paid to the owner's account. So there is no need to always send this claim to the bond issuer to get back your interest or to get back your money. So that is called the registered bond. So, most of the bonds in the market are called registered bonds.

(Refer Slide Time: 12:37)

Classification of Bond Markets

- On the basis of maturity (i) Short Term (ii) Long-term
- Short-term bonds (Money market instruments)
  - Treasury bills
  - Commercial papers
  - Certificate of deposits
- Long-term bonds (Capital market instruments)
  - Government dated securities
  - Corporate bonds (debentures)

Then if you define the bond market where the bonds are traded, the bonds can be defined on the basis of their maturity. That means there are some bonds which are short-term bonds and there are some bonds that are long-term bonds. And short-term bonds are mostly the money market instruments generally we refer like your treasury bills, commercial papers, certificates of deposits, and all these things.

The features of this kind of instruments and the details about their process or concepts related to this instrument will be discussed gradually. But these are the different short-term bonds which are available as a part of the money market instruments and they are basically traded in the market to fulfill certain requirements for the different types of investors. Then we have the long-term bonds these are the capital market instruments mostly if you see that the government dated security long-term government bonds. Then the corporate bonds, most of the corporate bonds are basically long-term bonds so these are basically a part of the long-term bonds. So you can also classify them in various ways on the basis of the issuer, the type of the issuer. So in that case the long-term bonds are the capital market instruments. And short-term bonds are money market instruments.

(Refer Slide Time: 14:09)

Classification of Bond Markets Cont…

- On the basis of issuer (India)
  - Government securities
  - Corporate bonds
  - Public sector unit bonds
- On the basis of issuer (USA)
  - Federal government and its agencies
  - Domestic corporations
  - Municipal bonds

Then if you are talking about the issuer's point of view, who is basically issuing the bond if you want to classify that that will have more popularity and more meaning in terms of defining the bonds across the globe. So in this case, if you talk about India, we have government securities, which is a highly developed market and a quite old market. And the reserve bank of India is responsible for issuing that bond on behalf of the government of India. So these are called government securities.

We have the corporate bonds then we have the public sector unit bonds. We have classified this is also a part is a part of the corporate bond but the PSU bonds have certain characteristics so that is why we have separated them from the normal corporate bonds. So we have on the basis of the issuer in India we have the three types of bonds which are available. One is your government securities, one is corporate bonds and the other one is the public sector unit bonds.

But, if you look at the US, it is more or less the same but they have a very popular bond we have called the municipal bonds. They have also government securities or government bonds which basically they call the federal government and its agencies who are eligible to issue these bonds on behalf of the government. Then we have the companies which are situated in the US are domestic corporations that operate in the US market and they are also eligible to issue this bond then we have the municipal bonds.

So these are the three different broad categories, there are various types of bonds but these are the major types of bonds which are available in the US market. And that is the way the classification of the bonds can be made with reference to the issuer's point of view.

(Refer Slide Time: 16:13)

Preferred Stock

- Fixed dividend payments
- No voting rights
- Different types of preferred stocks

Then we already told you about preferred stock, I will just give you a brief idea that preferred stock means it is a kind of instrument where the investor gets a fixed dividend on a periodical basis. So that is why it is a hybrid instrument, it is not a pure fixed income securities instrument. But still, we should have some basic idea about what exactly the preferred stock is! Preferred stock means that like other equity holders or shareholders we do not have any kind of ownership of the company.

But we will have this kind of right to get a certain amount of fixed dividend on a periodical basis. And that is why they do not have any voting rights. But if there is a chance of liquidation of the company then the company is going to be liquidated or the company has liquidated then in that case what happens is that after the bondholders the next financial claims always prefer stockholders have.

First, the money will be paid to the preferred shareholders or preferred stockholders then it will go to the common shareholders or the equity holders. So that is why it has a kind of fixed income

security characteristics but it is not purely fixed income security that basically we can say. So there are different types of preferred stocks which are available in the market.

(Refer Slide Time: 17:45)

Types of Preferred Stock

- Cumulative and non-cumulative: On cumulative preference shares, if dividend is skipped in any period/periods, it has to be paid subsequently
- Convertible and non-convertible: Convertible preference shares can be converted into ordinary shares on terms and conditions fixed at the time of issue of such shares
- Redeemable and non-redeemable: A redeemable preference share matures in a fixed period of time and for all practical purposes it is regarded as a debt security like a debenture
- Participating and non-participating: Participating preference shareholders can earn a higher dividend than the fixed one if the company makes good profits

If you see what are those different types of preferred stock we have the cumulative and non-cumulative preferred stocks. What do you mean by this cumulative preferred stock or preferences if it is a cumulative preference share if a dividend is skipped in any period then it has to be paid subsequently? For any reason, if the company was not able to pay that particular dividend then the dividend basically will be paid in the subsequent period.

But if it is non-cumulative then if for some reason some kind of unforeseen reason the company was not able to pay that particular kind of dividend then again the dividend will not be repaid. Then we have the convertible and non-convertible preferences convertible preference share means that it can be converted into an ordinary share or equity common equity with certain kind of terms and conditions which are fixed at the time of issue of such shares.

First, with some terms and conditions, after a point of time, this particular preferred shares can be converted into ordinary shares which are called convertible preferences. Then you have redeemable and non-redeemable, redeemable preferences basically mature in a fixed period of time and for all practical purposes, it is regarded as debt security like a debenture. So if you are holding it after a certain period of time this particular instrument will be matured.

So in that particular case further you will not be receiving any dividend from the company against that particular preference share because the maturity period is already over for that. So that case it is called the redeemable preferences and it is more or less a kind of debt equity or debt equity like the debentures. Then you have the participating and non-participating preferences, the participating preferences basically can always have a higher dividend than the fixed one if the company makes a good profit.

There is a provision, at the time of issuance, that it is defined whether it is a participating preference here or a non-particular participating preference share. If it is a participating preference share then what will happen is that, if the company for any reason makes a good profit then the participating preference shareholders can get a higher dividend. So the dividend payments are not fixed in this particular context.

So that is why we can say that there is a chance of getting high dividends in this particular context. That is why it may not be a fixed kind of security or fixed income security that basically we can conclude if it is a participating preference share. So these are the different types of preferences what we see.

(Refer Slide Time: 20:52)

Structured Products

- Residential mortgage backed securities: Cash-flow depends on the cash flow of an underlying pool of mortgages
- Types of mortgage-backed securities:
  - Mortgage pass-through securities
  - Collateralized mortgage obligations
  - Stripped mortgage-backed securities

Then we will come to the different kinds of structured products which are a part of the fixed-income securities market. Whenever you talk about structured products, there are certain

products which are part of the residential mortgage-backed securities and some of the instruments which are basically these non-residential mortgage-backed securities.

So whenever we come to discuss residential mortgage-backed securities, generally, in this case, the cash flow depends on the cash flow of an underlying pool of mortgages. For example; whenever the bank and other entities give a loan against any kind of residential purpose. In that case, many banks or many agencies can always come together and make a pool of mortgages.

And against this pull of mortgages whatever cash flow basically, they will be receiving from that cash flow they can basically issue certain kinds of financial assets. In the form of shares or in the form of, some of the participating certificates. So there are different types of mortgage-backed securities we can in detail about the pricing and all these things will be discussed further in future sessions. But I will just give you a brief idea of what exactly these mortgage back securities are.

So there are three types of mortgage-backed securities; we have collateralized mortgage obligation, we have mortgage-pass-through securities and we have stripped-mortgage-back securities. So broadly whenever we come to these mortgage-backed securities these are the three different types of mortgage-backed securities always we can find we can observe in the market.

(Refer Slide Time: 22:56)

Mortgage Cash Flows

- Mortgage is a pledge of real estate to secure the loan originated for the purchase of that real estate
- The mortgage provides the lender (mortgagee) the right to foreclose on the loan and seize the property in order to ensure that the loan is paid off if the borrower (mortgagor) fails to make the payments
- Categories of mortgages: Residential and non-residential
- Cash-flows: (i) interest (ii) scheduled repayment of principal (ii) prepayment of loan

So if you see that there is a cash flow already I told you there is a cash flow involved in the mortgages? So what are those cash flows? So what do you mean by a mortgage? All of you know that the mortgage is basically a pledge of real estate to secure the loan originated for the purchase of that particular real asset. That means if you are buying a house then the house is your mortgage.

So if at any point in time you are not able to repay the loan either in terms of interest or in terms of the principal. Then the particular loan giver or the lender has the authority to liquidate that particular asset and recover this particular amount whatever you have not repaid. So that is why we call, it a pledge. So the mortgage basically provides already I told you the mortgage basically provides you, the lender what we can call the mortgagee, the right to foreclose on the loan and seize the property in order to ensure that the loan is paid up, if the borrower fails to make the payments of any point of time if the borrowers failed to make the payments. Then they can seize the property and get the money back by selling those kinds of assets or by liquidating those kinds of assets which we call, mortgages.

If you look at the mortgages already told you there are two types of mortgages, one is residential mortgages and non-residential mortgages. And nonresidential mortgages I am talking about commercial or industrial mortgages. And what is that cash flow involved against this? One is your interest which basically you should pay on a periodical basis to the lender. Then the scheduled repayment of the principal because you have to pay; the principal amount also periodically. Then there is a possibility of the prepayment of the loan. If you have taken a loan, at any point in time, you are also eligible to prepay that particular loan. And there are various reasons either you are getting a better house so that is why you want to sell your house and buy the new one. Or you can get a better interest rate from another lender so there is a refinancing you want to make which is why you want to make prepay the loan. Or all of sudden you get back certain money and because of this, you want to always get rid of all those kinds of loans or the things whatever you have done. So that is why there is that possibility so that is why these are the different reasons but because of this the prepayment of the loan also can be possible. So these are the different cash flows.

(Refer Slide Time: 25:49)

Mortgage Pass-through Securities

- Mortgage pass through security is created when one or more holders of mortgages form a collection of mortgages and sell shares in the pool
- Cash flows from the pool are: interest, principal and prepayments
- Payments are made to security holders each month
- Agency pass-through securities: Securities associated with various specific agencies like Government National Mortgage Association, Federal Home Loan Mortgage Corporation and Federal National Mortgage Association
- Non-agency pass-through securities: Issued by thrifts, commercial banks and private channel

So what are mortgage-pass-through securities? It is basically created when one or more holders of mortgages form a collection of the mortgage and sell the shares in the pool. And the cash flow from the pool already told you, is interest, principal, and prepayments. And payments are made to the security holders each month. An agency pass-through securities are the securities with various specific agencies like the government national mortgage association, federal home loan Mortgage Corporation, and federal national mortgage association. All these are agencies particularly based in the US because; these markets are more developed in US markets. So they are the agencies who are involved in this particular process. But there are some non-agency pass-through securities these are issued by commercial banks, there are some private channels, or thrift institutions which are existing in the market, they can always go for or issue this kind of securities also.

(Refer Slide Time: 26:54)

Collateralized Mortgage Obligation (CMO)

- CMOs are structured so that there are several classes of bond holders with varying maturities
- The different bond classes are called *tranches*
- Different classes of bonds are created that have different degrees of repayment and interest rate risk
- Bonds include sequential pay bonds, floating rate bonds, accrual bonds etc.

Then, we have the collateralized mortgage obligations (the CMO). So these instruments are basically structured so that there are several classes of bondholders with varying maturities. And the different bond classes generally are called the tranches. So different classes of bonds are created which have different degrees of repayment and interest rate risk. And the bonds include sequential pay bonds, floating rate bonds, accrual bonds, etc.

So this is the way different classifications are made and those on that basis basically the bonds are issued or the securities are issued and accordingly the investments are made in the market. **(Refer Slide Time: 27:46)**

Stripped Mortgage-Backed Securities

- These are created by altering the distribution of principal and interest from a pro rata distribution to an unequal distribution
- Two types of stripped MBSs: Synthetic- coupon pass-through and interest-only (IO) or principal-only (PO) securities
- Synthetic coupon pass-through: unequal distribution of coupon and principal resulted in a synthetic coupon rate that was different from the underlying collateral
- PO class receives only the principal from the underlying mortgages and IO class receives only interest

Then we have the stripped mortgage-backed securities, so these are created by altering the distribution of the principal and interest from a pro-rata distribution to an unequal distribution. So we will explain the nitty-gritty or complexity of these instruments gradually. But if you see there are two types of stripped mortgage-backed securities we observe. One is synthetic coupon pass-through and interest-only or principal-only securities.

Whenever you call the synthetic coupon pass through kind of stripped mortgage back security, this is nothing but the unequal distribution of coupon and principal, resulting in a synthetic coupon rate that was different from the underlying collateral. And this principal-only class security receives only the principle from the underlying mortgage. And the interest-only class of security receives only the interest from that particular underlying mortgage. So this is the way the stripped mortgage-backed securities are classified.

(Refer Slide Time: 29:01)

Commercial Mortgage-Backed Securities

- Backed by pool of commercial mortgage loans on income producing property e.g. Shopping centers, hotels, warehouses, health care facilities etc.
- These loans are unsecured loans. The lender can only look to the income producing property backing the loan and principal payments
- Two Types: multi-property single borrowers and multi-property conduits
- Conduits are commercial lending entities that are established for the sole purpose of generating collateral to securitize

Then we have the commercial mortgage-backed securities. Here, it is backed by the pool of mortgage commercial mortgage loans on income-producing properties like shopping centers, hotels, warehouses, health care facilities, etc. So these loans are unsecured, the lender can only look to the income-producing property which is backing the loan and the principal payments. So we have two types of this commercial mortgage-backed securities, one is multi-property single borrowers and multi-property conduits. And the conduits are the commercial lending entities that

are established for the sole purpose of generating collateral to securitize; in the securitization process basically, they play the role.

(Refer Slide Time: 29:51)

Asset-Backed Securities

- Collateralized by assets that are not mortgage loans
- Asset backed securities have been structured as pass-throughs and as structures with multiple bond classes called *pay-throughs*, which are similar to CMOs
- Common types of asset-backed securities are: (i) credit card receivables, (ii) home equity loans and (iii) automobile loans. Other asset backed securities are supported by: student loans, equipment leases etc.
- Collateralized debt obligation (CDO) is an asset backed security backed by a diversified pool of one or more of the following types of debt obligations: high yield corporate bonds, emerging market bonds, residential mortgage backed securities, asset backed securities, commercial mortgage backed securities

Then we have asset-backed securities. So here, these are collateralized by the assets not the mortgage loans. So they have been structured as pass-through and as a structure with multiple bond classes called the pay-through which are similar to the CMOs. And the common types of asset-backed securities are credit card receivables, home loans, equity loans, and automobile loans, these are basically other assets also you can consider student loans, leasing, and equipment leasing. So, all these things can be considered only as asset-backed securities. And the collateralized debt obligation is basically an asset-backed security, it is backed by the diversified pool of one or more of the following types of debt obligations like high yield corporate bonds, emerging market bonds, residential mortgage-backed securities, asset-backed securities, commercial mortgage-backed securities, anything can be considered to construct this collateralized debt obligations which popularly we call it the CDO's.

Fixed Income Derivatives

- Interest rate futures
- Interest rate options
- Interest rate swaps
- Credit derivatives

Then we have the fixed income securities. Mostly, we look at the different types of securities which come under the fixed income derivatives. We have the interest rate futures, we have interest rate options, we have interest rate swaps, we have credit derivatives, and all. We will discuss the pricing, the valuation, the investment process of all those kinds of securities, the advantages, disadvantages of these instruments, and all these things over these particulars in different sessions that we will discuss in detail.

(Refer Slide Time: 31:34)

CONCLUSIONS

- Fixed income securities provide fixed cash flows in regular intervals
- These are more appropriate for the income maximization
- The broad types of fixed income securities include bonds, structured products and interest rate derivatives

So that is why basically we have seen that the fixed income securities provide the fixed cash flow in regular intervals. These are more appropriate for income maximization and the broad

types of fixed income securities include bonds, structured products, and interest rate derivatives. And this is the way basically the overall fixed income securities market can be classified or can be defined.

(Refer Slide Time: 32:01)

REFERENCES

- Fabozzi, J. Frank and Mann, V. Steven (2005): The Hand Book of Fixed Income Securities, Tata McGraw-Hill, 7th Edition.
- Johnson, S. R (2010): Bond Evaluation, Selection and Management, John Wiley & Sons, 2nd Edition.
- Veronesi, P (2010): Fixed Income Securities: Valuation, Risk and Risk Management, John Wiley & Sons.

So these are the references that basically you have to go through to know the details about this particular thing. And we will be using this particular book also for discussion of the different sessions of this particular course. Thank you.