Lecture

IAQS | INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

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Subject : Fixed Income Products

Subject Code:

Chapter: Unit 1 Chapter 1

Chapter Name: Fixed Income market: Overview

Today's Agenda

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Today's Agenda

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1 Introduction

- Fixed Income instruments – most prevalent form of raising money
- Used by governments, companies, municipalities
- Involves an entity borrowing money in exchange for promised payments
- Debt-holder obligations have priority over shareholders
- Safer investment than stocks
- Provide diversification benefits
- “Fixed-income”, “bonds”, “debt securities” are synonymous terms

1.1 Essential Elements of a Fixed Income Security

Bond Features	• The issuer, maturity, par value, coupon rate and frequency, and currency denomination
Legal, Regulatory & Tax Considerations	• Apply to the contractual agreement between the issuer and the bondholders.
Contingency Provisions	• Rights affecting disposal and redemption

2 Bond Features

- All bonds, whether they are “traditional” bonds (i.e., non-securitized bonds) or securitized bonds, are characterized by the same basic features.
- The bond’s features, including the issuer, maturity, par value, coupon rate and frequency, and currency denomination.
- These features determine the bond’s scheduled cash flows and, therefore, are key determinants of the investor’s expected and actual return.

2.1 Bond Features - Issuer

- Major categories of Bond Issuer
  1. Supranational Organization – e.g. - World Bank, IMF etc
  2. National (sovereign) Governments – e.g. - India, USA, Japan etc.
  3. Local (non-sovereign) Governments – e.g. - City of Ahmedabad, state of Maharashtra, state of California
  4. Quasi-government entities – e.g. - NHAI in India, Postal service in the US
  5. Companies (Corporate bonds) – e.g. - Reliance Industries, HDFC Bank, GE

- Credit-worthiness of Issuer decides if a bond is deemed investment grade or non-investment grade (junk)

- Credit-worthiness of issuer is decided by rating agencies (Moody's, S & P, Fitch etc.)

2.2 Bond Features – Par Value

- Principal is the amount that the bond issuer borrows and promises to return on maturity of the bond

- Other names
  1. par value, or par,
  2. face value,
  3. nominal value,
  4. redemption value, or
  5. maturity value

- Bond prices quoted as percentage of par
  1. A bond that pays Rs 100 on maturity, if trading for Rs 95, is called trading at 95% of par

2.3 Bond Features - Coupon Rate & Frequency

- Coupon rate is the rate of interest paid by issuer each year till the bond maturity
- Coupon is the total amount of interest paid by the bond in a year
- Coupon rate expressed as percentage of par value
  1. A par value of Rs 10,000 and a coupon rate of 5% means the bond pays an annual coupon of 0.05 x Rs 10,000= Rs 500.
- Coupons paid annually, six-monthly, quarterly or monthly.

2.4 Bond Features – Types of Bond

- **Plain-vanilla bonds** pay a fixed coupon rate during a bond's life.

- **Floating rate bonds or floaters** pay a floating coupon rate.
  1. Floating coupon rate is decided by the movement of a benchmark rate such as the Libor (London interbank rate) or Euribor.
  2. Bond-buyers demand a spread (premium) over the benchmark rate depending on creditworthiness. Lower the creditworthiness, higher the spread.
  3. Benchmark rate is reset periodically leading to change in coupon rate

- **Zero-coupon bonds** pay no coupon during the maturity.
  1. They are issued at a discount to par but redeemed at par.
  2. Interest earned is implicit and equal to difference between par value and purchase price

2.5 Bond Features – Currency Denomination

- Bonds can be issued in any currency
- Bonds issued in freely traded currencies (USD, EUR, GBP) are more attractive to investors
- Issuers in developing countries issue bonds in foreign currencies to attract foreign investors.
- Bond issues targeted at local investors are made in local currencies.
- Bond currency denomination is also decided by the need of the issuer to hedge currency cash flow.
- **Dual-currency Bonds** pay coupons in one currency and par value in another
- **Currency option bonds** give buyer the choice of one of two currencies in which to receive the interest payments and the payment options

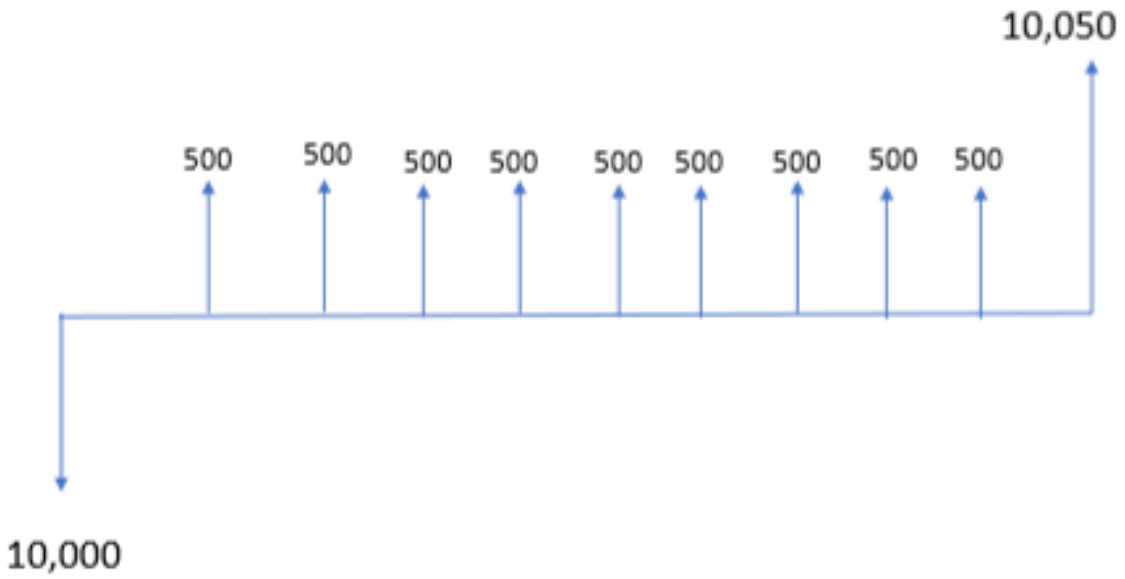
2.6 Cash flows of a Plain vanilla Bond

Par Value: Rs 10,000

Coupon rate: 10%

Coupon Frequency: Bi-annual

Maturity: 5 years



2.7 Yield Measures

- Current Yield = $\frac{Annualcoupon}{Bondprice}$

- Yield to Maturity: The IRR on a bond's expected cashflows
  1. The discount rate that equates the present value of the bond's expected cash flows until maturity with the bond's price
  2. Has an inverse relationship with the price of the bond

3 Bond Indentures/Trust Deed

- Legal contract that describes
  1. the form of the bond
  2. the obligations of the issuer, and
  3. the rights of the bondholders.

- Includes
  1. the principal value
  2. the interest rate or coupon rate
  3. the dates when the interest payments will be made,
  4. the maturity date
  5. any contingency provisions.

3 Bond Indentures/Trust Deed

- Also includes information regarding the funding sources for the interest payment and principal repayments.

- Also specifies any collaterals, credit enhancements, or covenants.
  1. Collaterals are assets or financial guarantees underlying the debt obligation above and beyond the issuer's promise to pay.
  2. Credit enhancements are provisions that may be used to reduce the credit risk of the bond issue.
  3. Covenants are clauses that specify the rights of the bondholders and any actions that the issuer is obligated to perform or prohibited from performing.

- For a plain vanilla bond, the indenture is often a standard template

- For exotic bonds, the document is tailored and can often be several hundred pages.

3.1 Trustees

- The trustee monitors that the issuer complies with the obligations specified in the indenture and to take action on behalf of the bondholders when necessary.
- The trustee's duties tend to be administrative and usually include maintaining required documentation and records.
- In the event of default, the discretionary powers of the trustee increase considerably.
- Responsible for calling meetings of bondholders to discuss the actions to take.
- Can also bring legal action against the issuer on behalf of the bondholders.

3.2 Legal Identity of Bond Issuer

- Legal obligation to make the payments lie with the bond issuer
- For sovereign bonds, the legal issuer is the Treasury or finance ministry
- Bonds also issued by
  1. a subsidiary of a legal parent entity
  2. a holding company.
- Special purpose entity (SPE) or Special purpose vehicles (SPV) are created for securitized bonds.
- SPVs generally created for bankruptcy protection for the parent entity.

3.3 Source of Repayment Proceeds

- Sovereign bonds backed by the “full faith and credit” of the national government and thus by that government’s ability to raise tax revenues and print money.
- Sovereign bonds denominated in local currency generally considered the safest of all investments
- Yields on sovereign bonds are typically lower than those for other local issuers.
- Major sources for repayment of non-sovereign government bond issues
  1. General taxing authority of the issuer.
  2. Cash flows of the project the bond issue is financing.
  3. Special taxes or fees established for the purpose of funding of payments.
- The source of payment for corporate bonds - the issuer’s ability to generate cash flows, primarily through its operations and so is dependent on the issuer’s financial strength and integrity.
- A higher level of credit risk, therefore corporate bonds typically offer a higher yield than sovereign bonds.

3.4 Securitized Bonds

- Securitizations typically rely on the cash flows generated by one or more underlying financial assets that serve as the primary source for the payments to bondholders

- Do not depend on the claims-paying ability of the operating entity.

- Securitized assets include
  1. residential and commercial mortgages,
  2. automobile loans,
  3. student loans,
  4. credit card receivables,
  5. equipment loans and leases, and
  6. business trade receivables.

- ▪ Unlike corporate bonds, most securitized bonds are amortized,

3.5 Asset or Collateral Backing

- Seniority Ranking
  1. Secured bonds backed by assets or financial guarantees
  2. Unsecured bonds have no collateral
  3. Collateral backing may be of the form ““general plant and infrastructure”
  4. Senior ranking decides relative hierarchy of creditors.

- Debentures are a type of bond that can be secured or unsecured depending on the country where they are issued

3.5.1 Types of Collateral Backing

- **Collateral trust bonds** secured by financial assets

- **Equipment trust certificates** secured by specific types of equipment or physical assets, such as aircraft, railroad cars etc.

- **Mortgage-backed securities (MBS)** are represent claims to the cash flows from pools of mortgage loans
  1. MBS purchased from banks, mortgage companies, and other originators and then assembled into pools (sliced and diced) by a governmental, quasigovernmental, or private entity.

- **Debentures** are a type of bond that can be secured or unsecured depending on the country where they are issued

3.6 Credit Enhancement

- Credit enhancement refers to a variety of provisions that can be used to reduce the credit risk of a bond issue and is very often used in securitized bonds.

- Credit enhancement provides additional collateral, insurance, and/or a third-party guarantee that the issuer will meet its obligations. Thus, it reduces credit risk, which increases the issue's credit quality and decreases the bond's yield

3.6.1 Credit Enhancement - Internal

- **Subordination**
  1. Subordination orders claim priorities for ownership or interest in an asset
  2. The subordinated or junior tranches function as credit protection for the more senior tranches,
  3. Class of highest seniority has the first claim on available cash flows.
  4. Called waterfall structure because in the event of default, the proceeds from liquidating assets will first be used to repay the most senior creditors.
  5. Losses are allocated from the bottom up (from the most junior to the most senior tranche).
  6. Most senior tranche is typically unaffected unless losses exceed the amount of the subordinated tranches

- **Overcollateralization** – posting more collateral than is needed to obtain or secure financing.

3.6.2 Credit Enhancement - External

- Surety Bond/Bank Guarantee
  1. Reimburse investors for any losses incurred if the issuer defaults.
  2. Usually a maximum amount that is guaranteed, called the penal sum.
  3. A surety bond is issued by a rated and regulated insurance company, whereas a bank guarantee is issued by a bank.

- A letter of credit
  1. The financial institution provides the issuer with a credit line to reimburse any cash flow shortfalls from the assets backing the issue.

3.7 Covenants

- Bond covenants are legally enforceable rules that borrowers and lenders agree on at the time of a new bond issue.
- An indenture will frequently include affirmative (or positive) and negative covenants.
- Affirmative covenants enumerate what issuers are required to do, whereas negative covenants enumerate what issuers are prohibited from doing.

3.7.1 Covenants – Positive

- Bond covenants are legally enforceable rules that borrowers and lenders agree on at the time of a new bond issue.

- Affirmative covenants enumerate what issuers are required to do, whereas negative covenants enumerate what issuers are prohibited from doing.

- Affirmative covenants include
  1. what the issuer will do with the proceeds from the bond issue
  2. promise of making the contractual payments.
  3. promise to comply with all laws and regulations, maintain its current lines of business, insure and maintain its assets, and pay taxes as they come due.

3.7.2 Covenants – Negative

- Negative covenants include (but not limited to)
  1. Restrictions on debt
  2. Negative pledges
  3. Restrictions on prior claims
  4. Restrictions on investments
  5. Restrictions on mergers and acquisitions

- Ensuring that the issuer will not take any actions that would significantly reduce its ability to make interest payments and repay the principal

3.8 Legal and Regulatory Considerations

- Fixed-income securities are subject to different legal and regulatory requirements depending on where they are issued and traded, as well as who holds them. Unfortunately, there are no unified legal and regulatory requirements that apply globally.

- An important consideration for investors is where the bonds are issued and traded because it affects the laws and regulation that apply. The global bond markets consist of national bond markets and the Eurobond market.
    1. A **national bond** market includes all the bonds that are issued and traded in a specific country, and denominated in the currency of that country. Bonds issued by entities that are incorporated in that country are called domestic bonds, whereas bonds issued by entities that are incorporated in another country are called foreign bonds.
    2. Bonds issued and traded on the Eurobond market are called **Eurobonds** , and they are named after the currency in which they are denominated.

3.9 Tax Considerations

- The income portion of a bond investment is taxed at the ordinary income tax rate, which is typically the same tax rate that an individual would pay on wage or salary income. Tax-exempt securities are the exception to this rule.

- The tax status of bond income may also depend on where the bond is issued and traded.

- A bond investment may also generate a capital gain or loss. If a bond is sold before its maturity date, the price is likely to have changed compared with the purchase price. This change will generate a capital gain if the bond price has increased or a capital loss if the bond price has decreased. From the stand point of taxes, a capital gain or loss is usually treated differently from taxable income. I

4 Structure of a Bond's Cash Flows

- The most common payment structure by far is that of a plain vanilla bond. These bonds make periodic, fixed coupon payments and a lump-sum payment of principal at maturity. But there are other structures regarding both the principal repayment and the interest payments.

- This section discusses the major schedules observed in the global fixed-income markets. Schedules for principal repayments and interest payments are typically similar for a particular type of bond, such as 10-year US Treasury bonds. However, payment schedules vary considerably between types of bonds, such as government bonds versus corporate bonds.

4.1 Structure of a Bond's Cash Flows - Principal

- **Bullet Bond** – Entire payment of principal at maturity
- **Amortizing Bond** – Periodic payments of interest and repayments of principal.
- **Fully amortized bond** – fixed periodic payment schedule that reduces the bond's outstanding principal amount to zero by the maturity date.
- **Partially amortized bond** – makes fixed periodic payments until maturity, but only a portion of the principal is repaid by the maturity date.
- A **sinking fund** arrangement refers to an issuer's plans to set aside funds over time to retire the bond.
  1. Originally, was a specified cash reserve that was segregated from the rest of the issuer's business for the purpose of repaying the principal.
  2. More generally today specifies the portion of the bond's principal outstanding, perhaps 5%, that must be repaid each year throughout the bond's life or after a specified date.
  3. Repayment occurs whether or not an actual segregated cash reserve has been created.

4.2 Structure of a Bond's Cash Flows – Coupon

- A **conventional bond** pays a fixed periodic coupon over a specified time to maturity (annually or semi-annually)

- **Floating rate note**
  1. Coupon rate is linked to an external reference rate (LIBOR or Euribor).
  2. Cap – prevents coupon rate from rising above a level (benefits issuer)
  3. Floor – prevents coupon rate from falling below a level (benefits buyer)
  4. Collared include both floor and cap
  5. Inverse FRN has coupon rate with inverse relationship to reference rate

- **Credit-linked coupon bond** – coupon changes with bond's credit rating

- **Payment-in-kind coupon bond** – pays interest in the form of additional bond issues instead of cash payment c

4.2 Structure of a Bond's Cash Flows – Coupon

- **Deferred coupon bond (split coupon bond)** - Pays no coupon for first few years followed by higher coupon in later years
  1. Trade at discount to par
  2. Useful for deferring tax
  3. Zero-coupon bond is a kind of deferred coupon bond

- **Index-linked bond** – coupon payments and/or principal repayment linked to a specified index
  1. Index can be reflecting prices, earnings, economic output, commodities, or foreign currencies (e.g. CPI is linked to prices)
  2. Generally issued by government

5 Contingency Provisions

- Clause in a legal document that allows for some action if the event or circumstance does occur
- Embedded option is a type of contingency provision
- Option gives the holder the right but not the obligation to take some action
- Embedded means option only comes with the bond, and is not traded independently (unlike equity options)

5.1 Callable Bond

- Gives the issuer the right to redeem all or part of the bond before the specified maturity date
- Protects issuer against a decline in interest rates.
- Issuer can call old expensive bond and replace with new lower interest bond
- Favours the issuer, therefore has to be sold at lower price or higher yield
- Call price, represents the price paid to bondholders when the bond is called.
- Call premium is the amount over par paid by the issuer if the bond is called.
- Call schedule specifies the dates and prices at which a bond may be called.
- Call protection period, also called lockout period, cushion, or deferment period. prohibits the issuer from calling a bond early in its life and is an incentive for investors to buy the bond.
- Call date – earliest time that a bond might be called

5.1.1 Callable Bond - Exercising

- **American call** (continuously callable) – issuer has the right to call a bond at any time starting on the first call date.
- **European call** – issuer has the right to call a bond only once on the call date.
- **Bermuda-style call** – issuer has the right to call bonds on specified dates following the call protection period. These dates frequently correspond to coupon payment.

5.2 Puttable Bond

- Gives the bondholder the right to sell the bond to issuer before maturity on specified dates at a pre-determined price
- Protects bondholder against a rise in interest rates.
- Bondholder can redeem old cheaper bond and replace with new higher interest bond
- Favours the bondholder, therefore is sold at higher price or lower yield
- Price for selling, is usually the par value of the bond.
- May allow buyers to force a sellback only once (one-time put bonds) or multiple times (multiple put bonds).
- Which one should be more expensive - one-time put or multiple put?
- Same exercise styles as Callable bond

5.3 Convertible Bond

- Allows bondholder to exchange bond for common shares in issuing company
- Convertible bond = Straight bond + Equity call option
- If stock price goes up, bondholder can convert bond to equity and enjoy upside
- If stock price is low, bondholder does not exercise option to convert and enjoys downside protection
- Favours the bondholder, therefore is sold at higher price or lower yield
- Why issue convertible bond?
  1. Low interest expenses
  2. Elimination of debt

5.3 Convertible Bond

- **Conversion price** – the price per share at which the convertible bond can be converted into shares.

- **Conversion ratio** – number of common shares that each bond can be converted into.
  1. $Conversion\ ratio = Par\ value\ /\ conversion\ price$
  2. If par value is Rs 5,000€ and the conversion price is Rs 100, the conversion ratio is Rs 5,000 ÷ Rs 100 = 50:1, or 50 common shares per bond.
  3. Indenture may mention either or both– the conversion price and the conversion ratio.

- **Conversion value** (parity value) is the current share price multiplied by the conversion ratio.
  1. If the current share price is Rs 30 and the conversion ratio is 50:1, the conversion value is Rs 30 × 50 = Rs 1650.

- **Conversion premium** is the difference between the convertible bond's price and its conversion value.
  1. If the convertible bond's price is Rs 5,150€ and the conversion value is Rs 5,050, the conversion premium is Rs 5,150 – Rs 5,050 = Rs 100.

- **Conversion parity** occurs if the conversion value is equal to the convertible bond's price.