EduTap

MIND MAP

for Instant Revision

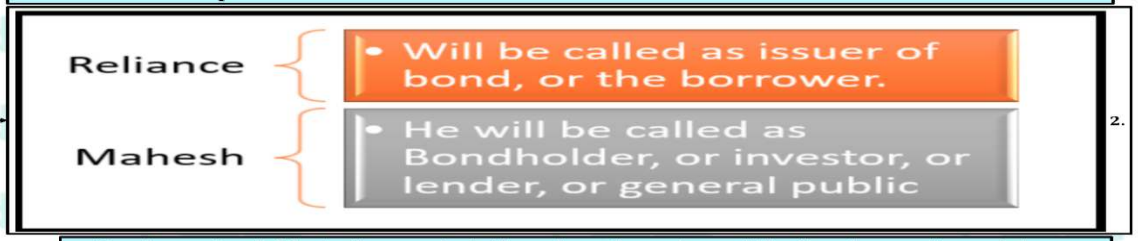
Bonds Market

Bond

1. Definition

Bonds are like debt instruments that investors give to companies or governments and in return companies promise to pay you back your money on a certain date, and in the meantime, companies give the investors regular interest payments on the amount lent.

2. Characteristics

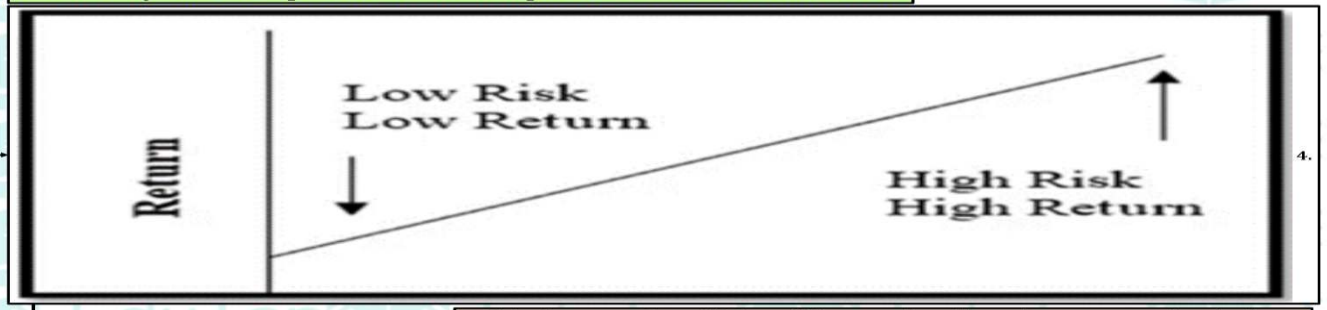
1. Two Parties
   1. – One party is the issuer and other party will be investors or the general public
2. Face Value/Par Value
   1. The face value (also known as the par value or principal) is the amount of money a holder will get back once a bond matures.
3. Coupon (The Interest Rate)
   1. The coupon is the amount the bondholder will receive as interest payments.
4. Nature of bonds
   1. Bonds by nature is debt instrument, Debt refers to sum of money owed by one person and due to another person.
   2. 

5. Bonds are tradeable
   1. Bonds are tradable in the market, therefore the prices of the bonds as a financial product can go up and go down as well.
   2. The price at which, the bond is available in the market is known as Current Market Price (CMP).

3. Concept of Credit rating Agencies

1. Credit rating agencies (CRAs) are companies that assess the creditworthiness of entities,
2. They issue credit ratings, which are letter grades that represent the likelihood of an entity defaulting on itsdebt obligations.
3. Prominent credit rating agencies in India include CRISIL, ICRA, CARE Ratings, India Ratings (Fitch India),
4. Benefits of Credit rating agencies
   - It help investors make informed decisions about where to invest
5. Credit Rating in High-Risk, High-Return Investments
   - credit rating agencies believe that supose XYZ Company has a high risk of defaulting on its debt obligations.
   - to counter that XYZ Company may offer a higher interest rate of which is significantly higher than the market interest rate to compensate investors
6. Credit Rating in Low-Risk, Low-Return Investments
   - Say, Reliance Industries would likely have a very high credit rating. This means that credit rating agencies believe that Reliance Industries has an extremely low risk of defaulting on its debt obligations
   - Taking advantage of that rating, Reliance industries will offer a lower interest rate

4. Risk and return associated with bonds.

1. Risk is the possibility of losing money on an investment or business venture
2. Return is the profit or loss an investor makes on an investment over a period.
3. Generally, there is a positive relationship between the risk and return,
4. 

1. Case 1- Low risk – Low return
   1. If the inventors have high confidence on bond issuning company then in that case the risk is low, and therefore the returns will also be low.
2. Case 2 – High risk – High return:
   1. If the inventors have low confidence on bond issuning company then in that case the risk is high and therefore the returns will also be high

Characteristics of Bonds

4. Types of bonds

1. Type 7 – Inverse Floaters:

1. Inverse floaters pay a variable coupon rate that changes in direction opposite to that of short-term interest rates.

2. Type 8 – Junk Bonds:

1. Junk bonds are a type of bond that carries a higher risk of default.

2.

3. Type 9 – Callable and Puttable Bonds :

1. Callable or redeemable bonds allow the issuer to repay them before maturity, but they must offer a premium to bondholders
2. Puttable bonds give bondholders the right but not the obligation to sell their bond back to the issuer at a predetermined price and date.

4. Type 10 – Convertible and Non-Convertible Bonds

1. Convertible Bonds can be converted into equity shares of the company. Whereas Nonconvertible bonds cannot be converted into equity shares of the company.

5. Type 11 – Serial and Term Bonds

1. Serial bonds are issued by an organization with different maturity dates.
2. Terms bonds mature at once rather in instalment.

3.

	Traditional Bond Issue	Serial Bond Issue
Year 1	$0	$0
Year 2	$0	$0
Year 3	$0	$0
Year 4	$0	$0
Year 5	$0	$0
Year 6	$0	$20,000,000
Year 7	$0	$20,000,000
Year 8	$0	$20,000,000
Year 9	$0	$20,000,000
Year 10	$100,000,000	$20,000,000

Term Bond - One Shot payment at maturity

Serial Bond - Retire the bonds in multiple maturities

6. Type 12 – Green Bonds

1. Green bonds, also called climate bonds, finance environmentally beneficial projects.
2. Blue bonds relate to water management and marine sector, while yellow bonds pertain to solar energy.
3. the Reserve Bank of India, Introduced the Sovereign Green Bonds (SGBs).

7. Type 13 – Other type of Bonds :

1. Registered Bonds and Bearer Bonds:

1. Registered bonds are bonds that are issued in the names & addresses of their holders.
2. Bonds payable to whoever holds them (the bearer) are called Bearer bonds (Unregistered bonds)

2. Elephant Bonds

1. Elephant bonds are used to raise funds for infrastructure projects.

3. Foreign Bonds:

1. "foreign bond'. Bonds raised in India by foreign companies but for Indian investor will be called a

1. Advantages of Bonds

1. **Steady Income** → 1. Bondholders receive regular interest payments, which makes them appealing to investors seeking a reliable source of income.
2. **Diversification** → 1. Bonds can diversify investment portfolios and stabilize returns by performing differently than stocks.
3. **Tax Advantages** → 1. Some bonds, like municipal bonds, offer tax advantages. Interest income from these bonds may be exempt from taxes

2. Dis-advantages of Bonds

1. **Fix return** → 1. Bonds provide a stable, fixed rate of return, but may not outperform other investments.
2. **Low Return** → 1. Bonds offer lower returns than riskier investments, but are safer and more reliable.
3. **Various risk** → 1. Bonds are risky, with interest rate, credit, and reinvestment risks. Understanding and managing these risks is key.

3. Different Types of Bonds

Government Bonds	Senior and Junior Bonds	Green bonds	Puttable bonds
Corporate Bonds	Straight, plain vanilla or fixed-rate bonds	Junk Bonds	Amortizing Bonds
Zero-Coupon Bonds	Floating rate debt instruments	Callable or a redeemable bond	Serial and Term Bonds
Perpetual Bonds	Inverse floaters	Convertible bonds	

1. Type 1 - Government Bonds

1. Government bonds are debt securities issued by a government, offering fixed interest payments and high safety due to government backing
2. government bonds can be divided into three different parts,
   1. • Bills - debt securities maturing in less than one year.
      • Notes - debt securities maturing in one to 10 years.
      • Bonds - debt securities maturing in more than 10 years.
3. Municipal Bonds (Muni Bonds)
   1. issued by Municipal Corporation are not called Government bonds.
4. Sovereign Bonds → 1. Bonds issued by Indian Government in foreign currency are called Sovereign bonds

2. Type 2 - Corporate Bonds:

1. Corporate bonds are debt securities issued by corporations to raise capital for various purposes, such as funding business operations and expansion

3. Type 3 - Zero Coupon Bonds:

1. Zero-coupon bonds don't make regular interest payments, but are issued at a discount and mature at face value, providing the return as the price appreciation over time.

4. Type 4 – Perpetual bond

1. Perpetual bonds are bonds with no maturity date, paying a steady stream of interest forever.

5. Type 5 – Senior and Junior Bonds (Based on priority of repayment)

1. Senior bonds are debt securities that hold a higher priority in the repayment hierarchy, whereas Junior or subordinated bonds are lower in the repayment hierarchy.
2. In financial troubles, junior bondholders are only paid after senior bondholders have received their due

6. Type 6 - Fixed Interest Rate Bonds and Floating Rate Debt Instruments

1. Fixed interest rate bonds are debt securities that pay a predetermined interest rate for the entire life of the bond.
2. Floating rate Bond instruments have interest rates that adjust periodically, often in accordance with a benchmark rate (e.g., Repo Rate).

Technicalities of Bonds

1. What is Bond Yield

1. A bond's yield is the return an investor expects to receive each year over its term to maturity
2. The formula to calculate yield is: Yield = Coupon amount/Current Market Price of the bond*100
3. Calculate the yield for a bond with a face value of Rs. 1,000, with an 8% interest p.a., and a current market price of Rs. 800.
4. Higher the market price of the bond (in comparison to face value of bond), lower will be the current yield on the bond and vice versa. This is because the bond's coupon payment is fixed.

Difference between Yield and Interest received on Bond

Basis of difference	Interest	Yield
Meaning	Interest on bonds, also known as the coupon payment, is the fixed and predetermined amount that the bond issuer pays to bondholders or to investors as a compensation for borrowing their money.	Bond yield is a measure of the total return an investor can expect from a bond. It considers the interest payments, the purchase price of the bond, and its current market value.
Changes	Interest Rate which borrower is paying to the investor remains **fixed.**	Bond Yields can go and up down based on the current market prices of the bond. **Therefore, its not fixed.**
Determined	Interest is determined by the **Face value**	Yield of the bond is determined by the Bond's **Current Market Prices**.
Relevance	Interest is essential but doesn't account for the bond's market value changes, making yield a better gauge of performance.	Yield provides a more comprehensive view of the bond's overall performance and return potential.

5.

2. Yield to Maturity

1. Yield to Maturity is the total return an investor can expect from a bond if held until maturity, considering its current price, coupon payments, and the par value.
2. In YTM, there are two assumptions-
   The investor will hold the bond till maturity. That's the first assumption.
   YTM also assumes that the coupon payments received from the bond will be reinvested in the same bond at the prevailing Interest Rates.

The formula to calculate YTM is:

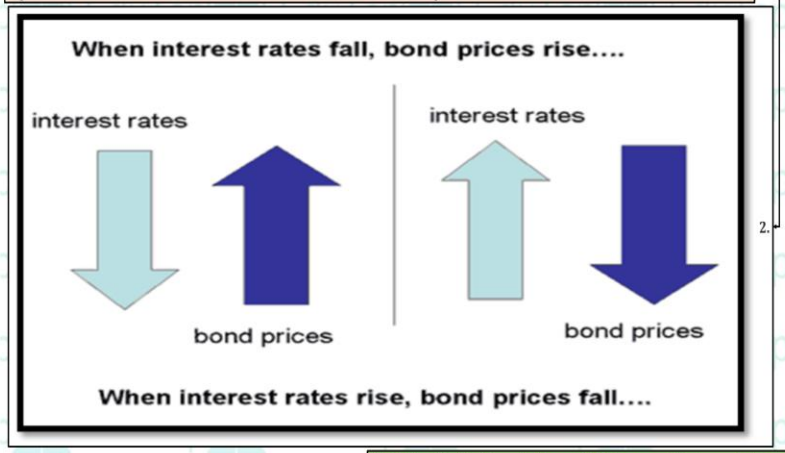
$$\text{Yield to Maturity} = \frac{\text{Annual Interest} + \frac{\text{Par Value} - \text{Market Price}}{\text{Number of Years to Maturity}}}{\frac{\text{Par Value} + \text{Market Price}}{2}}$$

3.

4. You are considering the purchase of a corporate bond with a face value of ₹1,000 that matures in 5 years. The bond pays an annual coupon of ₹60, and it is currently trading in the market for ₹950. Calculate the YTM for this bond.
   1. YTM = 60 + 1000-950/5 1000+950/2, YTM = 7.18%

3. Relationship between bond price, Interest Rates and Yield.

1. Relationship 1 – Bond Prices and interest rate are negatively co-related.
   1. How does Decrease/increase in Interest Rate Results in Increase/descrease in Bond current Price
      1. Bond prices increase when interest rates decrease because older bonds with higher coupon rates become more attractive. Bond prices fall when interest rates increase because older bonds with lower coupon rates become less attractive.



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2. Relationship 2 – Interest Rates and Yields are positively co-related.
   1. Bond yields increase when interest rates increase.

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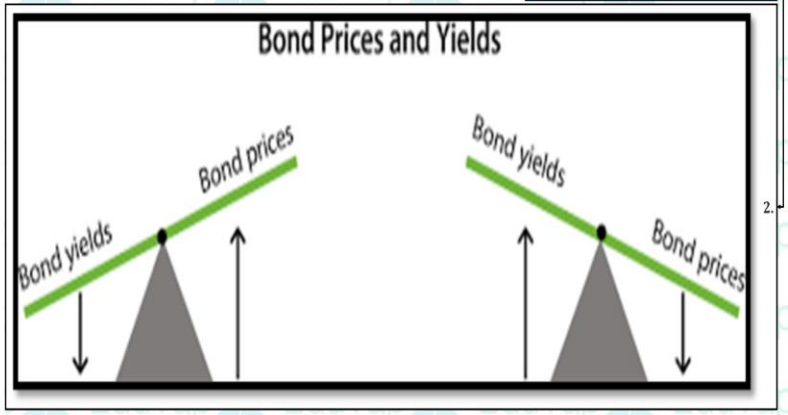
3. Relationship 3 – Bond Prices and Bond Yields are Negatively co-related
   1. As bond price increases, yield decreases



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Technicalities of Bonds

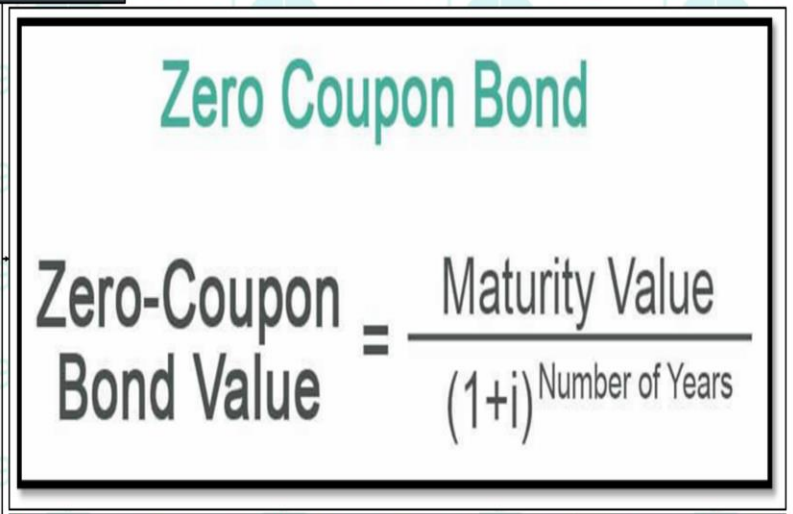
1. Bond Price

- A bond's price is what investors are willing to pay for an existing bond
- Bonds can be sold at three different prices:
  - Discount Price: If a bond's price is lower than its original value, it's sold at a discount.
  - Premium Price: If a bond's price is higher than its original value (what it will be worth when it matures), it's sold at a premium.
  - Par Price: When a bond's price is the same as its original value, it's sold at par.

$$\text{Bond Price} = C * \frac{\left[1 - \left[\frac{1}{(1+i)^n}\right]\right]}{i} + \frac{M}{(1+i)^n}$$

C = coupon payment
n = number of payments
i = interest rate, or required yield
M = value at maturity, or par value

2. Pricing Zero-Coupon Bonds



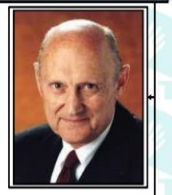
Determine the price of a zero-coupon bond that is maturing in five years, has a par value of $2000, and a required yield of 8%. The coupon payment is Annual

n = 5=> i = 8% or .08, M = 2000 => 2000 / (1+.08) 5 => Answer 1361

3. Pricing of Perpetual Bonds

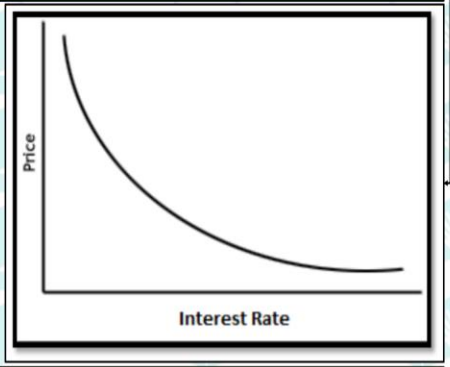
Present value (or prince) = C / r
Where: C = periodic coupon payment of the bond, r = discount rate applied to the bond
For example, if a perpetual bond pays $10,000 per year in perpetuity and the discount rate is assumed to be 4%, the present value would be: Present value = $10,000 / 0.04 = $250,000

4. Gordon Malkiel Properties of Bonds

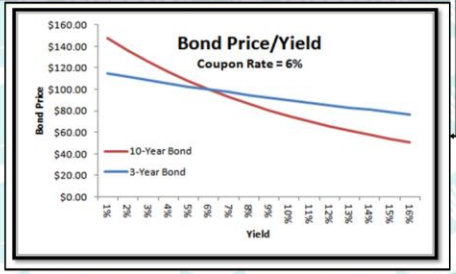


Malkiel's Property 1: Itstates that there is an inverse relationship between market interestrates and bond values. This means that as market interest rates increase, bond prices fall, and vice versa

Malkiel's Property 2 The relationship between interest rates and bond prices is inverse but is not a straight line but kind of convex-



Malkiel's Property 3 Longer the time to Maturity of the Bond, the greater is the change in its value in response to given change in required rate of return or interest rate



Malkiel's Property 4: The convexity of the relationship between interest rates and bond prices increases as maturity increases

Malkiel's Property 5: Prices of High Coupon Bonds are less sensitive to changes in interest rates than prices of low coupon bonds

Other important concepts

Yield to Call

Calculating the yield to call on a bond is important because it reveals what rate of return the investor will receive assuming that the bond is called on the earliest possible date, the bond is purchased at the current market price, and the bond is held until the call date.

$$YTC = \frac{Coupon\ Interest\ Payment + \frac{Call\ Price - Market\ Value}{Number\ of\ Years\ Until\ Call}}{\frac{Call\ Price + Market\ Value}{2}}$$

Consider a callable bond that has a face value of 1,000 and pays an annual coupon of 10%. The bond is currently priced at 1,175 and has the option to be called at 1,100 five years from now. Find the YTC

YTC = (100 + (1100-1175)/5) / (1100+1175)/2 = > Answer 7.43%

Holding Period Return or Rate of Return

An investor can also calculate the return from bond investment over the holding period.

$$\text{Holding Period Return} = \frac{\text{Income} + (\text{End of Period Value} - \text{Initial Value})}{\text{Initial Value}}$$

To calculate holding period return/yield over multiple years we calculate the annualized holding period return:

$$\text{Annualized HPR} = \left(\frac{\text{Income} + (\text{End of Period Value} - \text{Initial Value})}{\text{Initial Value}}\right)^{\frac{1}{\text{Years}}} - 1$$

Advance Concepts on Bonds

- **Balloon Repayment Loan** → A balloon repayment loan refers to a loan on which only interest is paid for the life of the loan and the entire principal is paid at the end of loan's life.
- **Sinking Fund:** → A sinking fund is a fund to which firms make annual contributions to have enough funds to meet a large financial liability in the future
- **Amortizing bonds -** → Amortizing bonds are bonds in which the principal is repaid over the life of the bond, along with interest.
- **Mortgage Bonds** → A mortgage bond is a promise by the bond issuing authority to pledge real property as additional security
- **Equipment Trust Bonds:** → Equipment Trust Bonds is the issue of bonds with equipment like machinery as security.

Risks associated with bonds-

- **Credit risk:** → The risk that the issuer of the bond will default on its debt obligations,meaning that it will be unable to make interest payments or repay the principal amount of the loan.
- **Interest rate risk** → The risk that the price of a bond will fall if interest rates rise.
- **Reinvestment risk:** → The risk that an investor will have to reinvest interest payments at a lower rate than the coupon rate of the bond