



## Week 12(b) Bond markets

Bond Markets (Lancaster University)



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# Week 12(b): Bond markets

## Purpose of the capital market

- original maturity is greater than one year (for long-term financing or investments)
- best known capital market securities (stocks and bonds)

## Capital market participants

→ primary issuer of securities

- federal and local governments (debt issuers)
- corporations (equity and debt issuers)

→ largest purchasers of securities

## Capital market trading

1. primary market for initial sale (IPO)
2. Secondary market

→ over-the-counter

→ organized exchanges

## Types of bonds

Bonds are securities that present debt owned by the issuer to the investor, and typically have specified payments on specific dates.

## Treasury notes and bonds

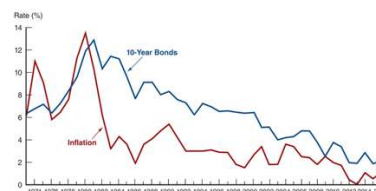
the US treasury issues notes and bonds to finance its operations.

### Treasury bond interest rates

- no default risk since the treasury can print money to payoff the debt
- very low interest rates, often considered the risk-free rate

Type	Maturity
Treasury bill	Less than 1 year
Treasury note	1 to 10 years
Treasury bond	10 to 30 years

Interest Rate on Treasury Bonds and the Inflation Rate, 1973–2016 (January of Each Year)



## Recent innovation

- TIPS (Treasury Inflation-Indexed Securities): the principal amount is tied to the current rate of inflation to protect investor purchasing power
- Treasury STRIPS: the coupon and principal payments are “stripped” from a T-bond and sold as individual zero-coupon bonds.

## Agency debt

- agency bonds are issued by government-sponsored entities (such as student loan marketing assoc.)
- the debt has an “implicit” guarantee that the US gov. will not let the debt default.

## Municipal bonds

- issued by local, county, and state government
- used to finance public interest projects

### **Two types:**

→ general obligation bonds

→ revenue bonds

- not default-free

Suppose the rate on a corporate bond is 5% and the rate on a municipal bond is 3.5%. Which should you choose? Your marginal tax rate is 28%.

Find the equivalent tax-free rate (ETFR):

$$\begin{aligned} &\text{Equivalent tax-free interest rate} \\ &= \text{taxable interest rate} \times (1 - \text{marginal tax rate}) \end{aligned}$$

$$\text{ETFR} = 5\% \times (1 - \text{MTR}) = 5\% \times (1 - 0.28)$$

The ETFR = 3.36%. If the actual muni-rate is above this (it is), choose the muni.

## Corporate bonds

- typically have a face value of \$1,000 (although some have FV of \$5,000 or \$10,000)
- most pay interest semi-annually
- cannot be redeemed anytime the issuer wants, unless a specific clause states it
- degree of risk varies with each bond, even from the same issuer.
- the required interest rate varies with the level of risk.

→ the degree of risk ranges from low-risk (AAA) to higher risk (BBB).

→ any bonds rated below BBB are considered *sub-investment grade debt*.

## Characteristics of corporate bonds

### 1. Registered bonds

- replaced "bearer" bonds
- IRS can track interest income this way

### 2. Restrictive covenants

- mitigates conflicts with shareholder interests
- may limit dividends, new debt, ratios, etc

- interest rate is lower the more restrictions are placed on management through covenants

### 3. **Call provisions**

- higher required yield
- mechanism to adhere to a sinking fund provision
- interest of the stockholders
- altering capital structure

### 4. **Conversion**

- some debt may be converted to equity
- this feature permits bondholders to share in the firm's good fortunes if the stock price rises

### 5. **Secured bonds**

- bonds with collateral attached

→ mortgage bonds (used to finance a specific project)

→ equipment trust certificated (bonds secured by tangible non-real-estate property)

### 6. **Unsecured bonds**

- debentures: long-term unsecured bonds that are backed only by the general creditworthiness of the issuer.

→ no specific collateral is pledged to repay the debt

- subordinated debentures: similar to debentures except that they have a lower priority claim.
- variable-rate bonds

### 7. **Junk bonds**

- debt that is rated below BBB
- poor liquidity
- trusts and insurance companies are not permitted to invest in junk debt

## **Oversight of the bond markets**

bond trades are not available to the public, making trading less transparent. Bonds typically trade over the counter.

- make some bond transactions reported to the public
- develop a trading platform to make transaction data available to the public

### **Finding the value of coupon bonds**

bond pricing is no different than pricing any set of known cash flows.

- once the cash flows have been identified, they should be discounted to time zero at an appropriate discount rate.

### **Bond terminology**

Term	Definition
Coupon interest rate	the stated annual interest rate on the bond. It is usually fixed for the life of the bond.
Current yield	the coupon interest payment divided by the current market price of the bond.
Face amount	the maturity value of the bond. the holder of the bond will receive the face amount from the issuer when the bond matures; face amount $\Rightarrow$ par value
Indenture	the contract that accompanies a bond and specifies the terms of the loan agreement; it includes management restrictions (covenants)
Market rate	the interest rate currently in effect in the market for securities of similar risk and maturity; the market rate is used to value bonds.
Maturity	the number of years or periods until the bond matures and the holder is paid the face amount.
Par value	the same as face amount, the maturity value of the bond.
Yield to maturity	the yield an investor will earn if the bond is purchased at the current market price and held until maturity.

### **Finding the value of coupon bonds**

What is the price of two-year, 10% coupon bond (semi-annual coupon payments) with a face value of \$1,000 and a required rate of 12%?

$$P_{\text{semi}} = \frac{C/2}{1+i/2} + \frac{C/2}{(1+i/2)^2} + \frac{C/2}{(1+i/2)^3} + \dots + \frac{C/2}{(1+i/2)^{2n}} + \frac{F}{(1+i/2)^{2n}}$$

where  $P_{\text{semi}}$  = price of semiannual coupon bond  
 $C$  = yearly coupon payment  
 $F$  = face value of the bond  
 $n$  = years to maturity date  
 $i$  = annual market interest rate

Solution:

1. Identify the cash flows:
  - \$50 is received every six months in interest
  - \$1000 is received in two years as principal repayment
2. Find the present value of the cash flows (calculator solution):
  - N = 4, FV = 1000, PMT = 50, I = 6
  - Computer the PV. PV = 965.35

## Current yield calculations

the current yield is an approximation of the yield to maturity on coupon bonds that is often reported because it is easily calculated.



**Definition: yearly coupon payment divided by the price of the security**

What is the current yield for a bond with a face value of \$1,000, a current price of \$921.01, and a coupon rate of 10.95%?

Answer:

$$i_c = C/P = \$109.50/\$921.01 = 11.89\%$$

$$\begin{aligned} \text{Note: } C (\text{coupon}) &= 10.95\% \times \$1,000 \\ &= \$109.50 \end{aligned}$$

## Investing in bonds

⇒ bonds are lower risk than stocks because they have a higher priority of payment.

⇒ bonds are the most popular alternative to stocks for long-term investing.

⇒ they offer relative security and dependable cash payments, making them ideal for retired investors and those who want to live off their investments.

⇒ bond investors face fluctuations in price due to market interest-rate movements in the economy; even though the bonds of a corporation are less risky than its equity, investors still have risk.

⇒ the possibility of suffering a loss because of interest-rate changes is called **interest-rate risk**.