

BOND MARKETS—TREASURY, MUNICIPALS, CORPORATE

Course: Impact of COVID-19 to
financial markets

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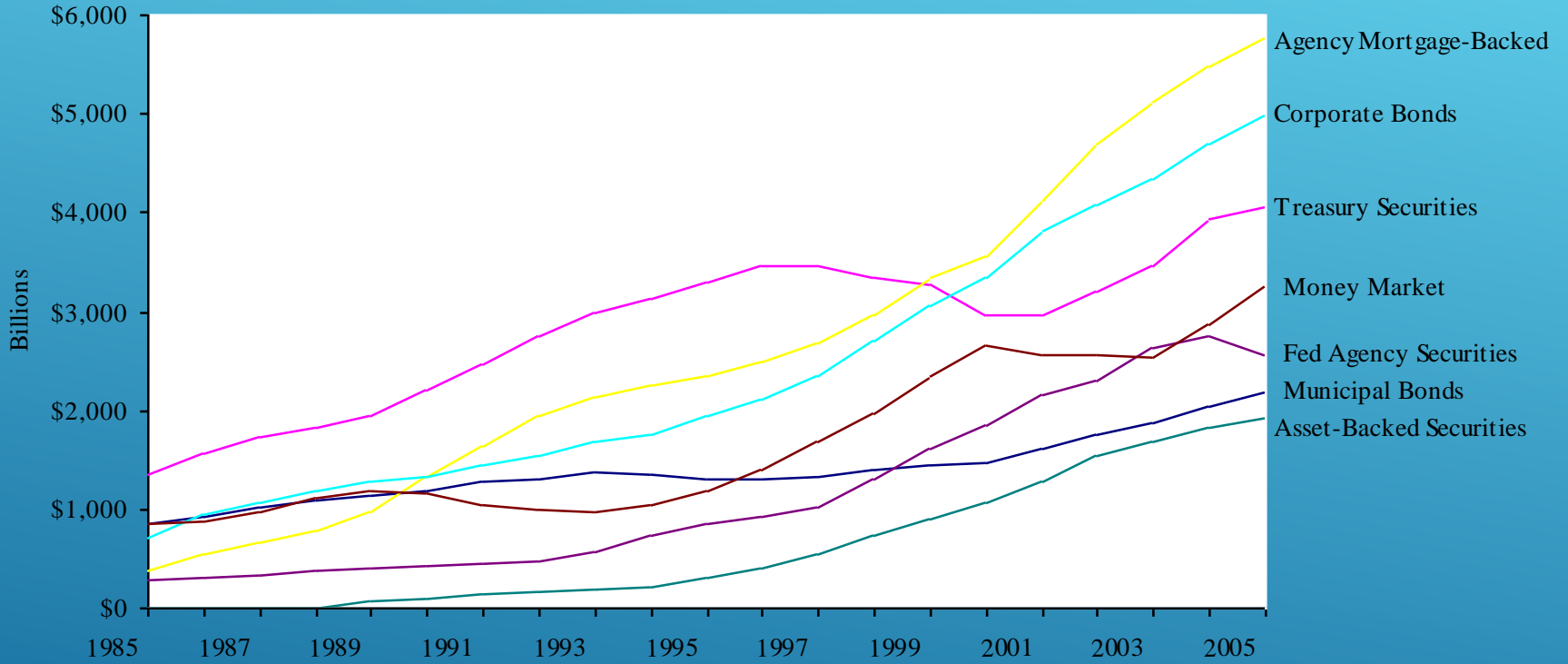
- ▶ Read bond quotes
- ▶ Learn the characteristics of corporate bonds
- ▶ Identify bonds with low credit risk
- ▶ Understand Treasury, Agency, and asset-backed instruments
- ▶ Compute the tax advantages of municipal bonds

LEARNING OBJECTIVES

BOND MARKET

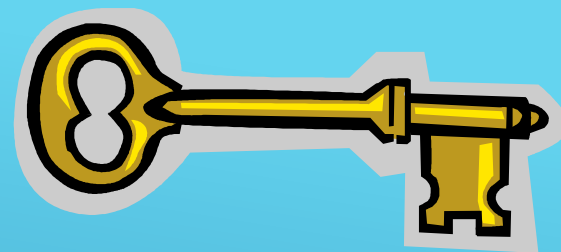
- ▶ Bond dealers act as intermediaries between bond issuers and investors
- ▶ Issuers sell new bonds in the primary market, dealers resell them to investors in the secondary market
- ▶ Size Roughly twice the equity market!
 - ▶ 2006 US bond market value, \$24.7 trillion
 - ▶ 2006 US stock market value, \$12.7 trillion
- ▶ Relatively illiquid for small investors because of high transaction cost

Figure 14.1 Outstanding Level of Public & Private Debt



Data Source: The Bond Market Association

KEY TERMS



- **Maturity:** time when bond principal and all interest will be paid in full
 - **Term-to-Maturity:** years remaining until maturity
- **Par Value:** face amount, or principle of bond
 - **Discount and Premium** to par
- **Coupon Rate:** rate promised based on par value of bond principal—determines interest paid
- **Current Yield:** rate based on interest paid divided by current bond price

HOW TO READ BOND TABLES

▶ Corporate Bond Listing

Bond	Cur. Yield	Vol.	Close	Net Chg.
Lucent 6.45s 29	7.46	170	86 1/2	+1 1/8

- ▶ Percent of par value, with fraction
- ▶ The Lucent bond pays 6.45% interest (coupon), \$64.50 per year or \$32.25 semiannually and matures in 2029. Its current yield is 7.46% based on closing price of \$865.00 ($\$1,000 \times 86.5\%$). The bond was up \$11.25.

▶ Treasury Bond Listing

Rate	Maturity	Bid	Ask	Chg.	Ask Yield
3.785	Jan.09	105:30	105:31	+1	3.66

- ▶ Percent of par value, with 32nds
- ▶ 3.785% coupon rate, matures in January 2009. A buyer willing to pay \$1059.375 ($=1,000 * 105.9375 (=30/32)\%$) and seller's lowest asking price \$1059.6875 ($=1,000 * 105.9688 (=31/32)\%$), a difference of 31.25cents.

▶ Municipal Bond listing

Issue	Coupon	Maturity	Price	Yield to Maturity
Port of Seattle	5.00	9-01-24	104	4.48

- ▶ Coupon rate 5.00% and matures in September of 2024. Price 104% of par value (usually \$5,000 for muni bond, in which case, current price of this bond would be \$5,200). Yield to maturity is 4.48, therefore sold at a premium. (YTM is smaller than coupon rate)

CORPORATE BOND CHARACTERISTICS

- ▶ **Indenture:** legal terms of bond agreement
 - ▶ trustee duties, collateral/security, steps bondholders can take in case of default
- ▶ **Senior Bond:** debt with prior claim to other securities in event of default
 - ▶ Mortgage bond—backed by property lien
 - ▶ Equipment trust certificates—backed by equipment lien, often serial bonds retired in sequence
- ▶ **Debentures/Subordinated Debentures:** not backed by any real property
 - ▶ Risk depends on firm's reputation, credit history, and financial stability
- ▶ **Bankruptcy:** chapter 11 reorganization
 - ▶ Equity holders lose claims on the firm
 - ▶ Bond holders become new owners



- ▶ Bond credit quality ranges from the highest-quality US Treasury securities to below-investment grade bonds (or junk bonds)
- ▶ Bond rating agencies include Moody's Investors Service, Standard & Poor's Corporation, Fitch IBCA Inc., and Duff & Phelps Credit Rating Co.
- ▶ BBB or higher are considered investment-grade, and BB and below are considered junk bonds, or high-yield bonds.

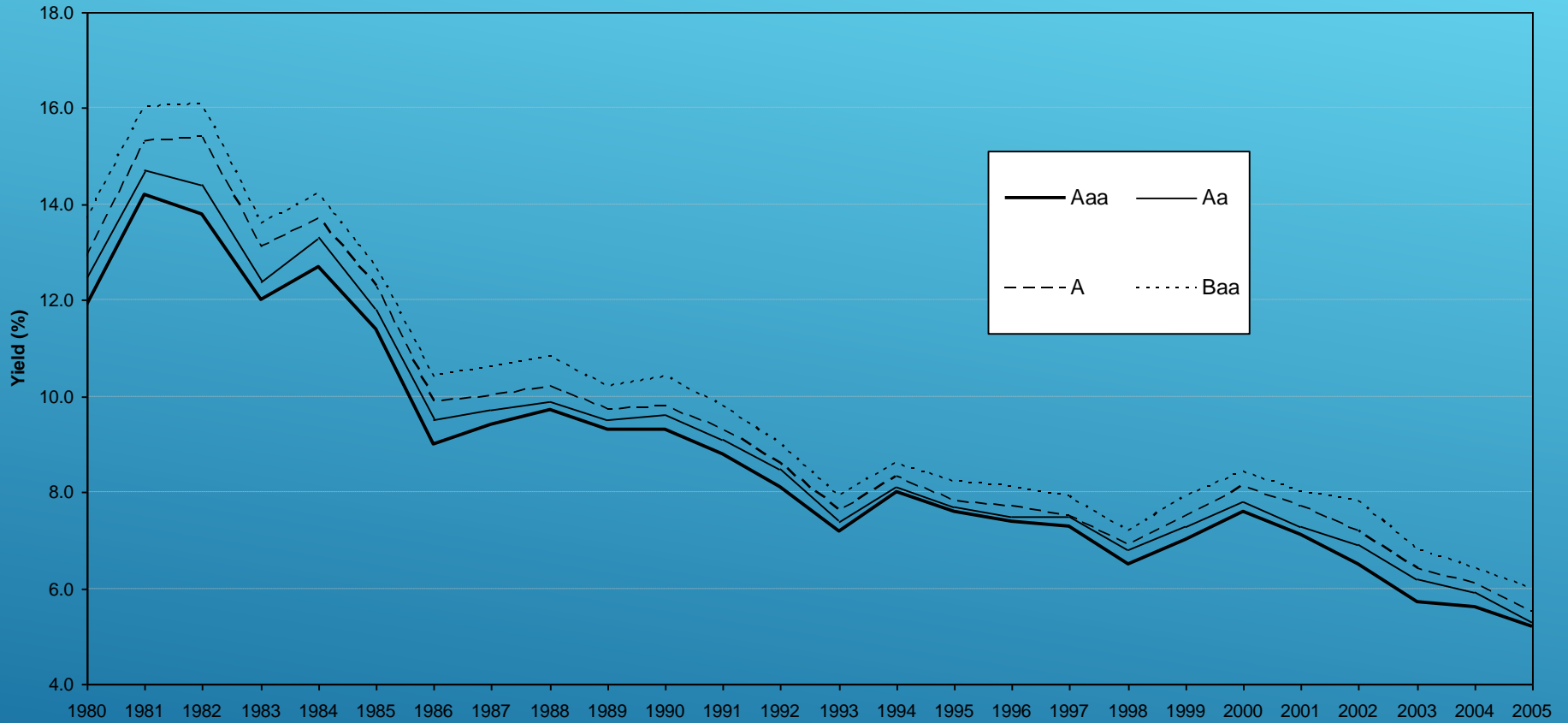
CREDIT QUALITY RISK

Table 14.2 Bond Credit Ratings Distinguish Investment Grade Bonds from High-Yield or “Junk” Bonds

Credit Risk	Moody's	Standard & Poor's	Fitch/IBCA	DCR
INVESTMENT GRADE				
Highest quality	Aaa	AAA	AAA	AAA
High quality (very strong)	Aa	AA	AA	AA
Upper medium grade (strong)	A	A	A	A
Medium grade	Baa	BBB	BBB	BBB
BELOW INVESTMENT GRADE				
Somewhat speculative	Ba	BB	BB	BB
Speculative	B	B	B	B
Highly speculative	Caa	CCC	CCC	CCC
Most speculative	Ca	CC	CC	CC
Imminent default	C	D	C	C
Default	C	D	D	D

Source: Bond Market Association.

Figure 14.5 Historical Yield of Corporate Bonds Rated Aaa to Baa



Source: The Bond Market Association

Note that riskier, low quality bonds, always offer a higher yield than higher quality bonds

TREASURY BILLS

- ▶ T- bills: maturities of three months and six months.
 - ▶ Face value from \$1,000 to \$ 5 million.
 - ▶ Actively traded and highly liquid.
 - ▶ No interest payment, sold at a discount.
- ▶ Example) T-bill with face value of \$10,000 is sold for \$9,877.28. When it matures, the investor receives \$10,000. \$9,877.28 represents repayment of principal and \$122.72 represents payment of taxable interest income.
- ▶ Sold at auction. Interest rates are determined by the auction process.

TREASURY NOTES AND BONDS

- T-notes : maturities of one year to 10 years. Pays interest on a semiannual basis. Par value ranging from \$1,000 to \$10,000 to \$5 million.
- US Treasury issued 30 year bonds but stopped in 2001. Longer term T bonds issued before then are still traded. Resumption of 30-year issue in February 2006.
- ▶ Treasury Inflation Protected Securities (TIPS)
 - ▶ T-bond that is indexed to inflation.
 - ▶ Par value increase with the rate of inflation, as measured by the adjusted Consumer Price Index.
 - ▶ As par value changes, interest payments change over time
 - ▶ Offers a lower return than similar maturity T-bonds because investors are not bearing the risk of inflation

AGENCY AND ASSET-BACKED SECURITIES MARKETS

- ▶ Agency securities
 - ▶ Certain government agencies and government sponsored enterprises issue debt securities to finance desirable private-sector activities.
 - ▶ Fannie Mae, Freddie Mac, Federal Farm Credit System, Federal Home Loan Banks, Student Loan Marketing Association (Sallie Mae), and the Small Business Administration are the examples of agencies.
- ▶ Fannie Mae and Freddie Mac started as government-owned enterprises but were converted into private held corporations
 - ▶ The purpose of each company is to help create a continuous flow of funds to mortgage lenders, such as commercial bankers, saving institutions, and credit unions.
 - ▶ They supply lenders with money by purchasing home mortgages in the secondary market. They assemble these mortgages into diversified packages or pools and issue securities that represent a proportionate share in the interest and principal payment derived on the pool. This is called “mortgage securitization”

Ginnie Mae: a government agency created by Congress to ensure adequate funds for government loans insured by the Federal Housing Administration (FHA) and guaranteed by the Department of Veteran Affairs (VA) and Veteran Administration

- ▶ It issues modified pass-through certificates that present interest in a given pool of FHA and VA mortgages.
- ▶ As homeowners make their mortgage payments, a proportional share passes through to the investor on a monthly basis.
- ▶ Each payment the investor receives is part interest rate and part repayment of principal.
- ▶ Ginnie Mae bonds are backed by the full faith and credit of the US government, but interest payments subject to state and local taxes.

Table 14.3 Comparison of Mortgage Security Characteristics

Comparison of Pass-Through Mortgage Securities Characteristics			
Security	Guarantee	Minimum Investment	Payment Date
Ginnie Mae I And II	Full and timely payment of principal and interest, backed by the full-faith-and-credit guarantee of the U.S. government	\$25,000 minimum; \$1 increments	15th or the 20th of the month for Ginnie Mae I and II pools, respectively, following the record date and every month thereafter
Ginnie Mae Platinum	Full and timely payment of principal and interest, backed by the full-faith-and-credit guarantee of the U.S. government	\$25,000 minimum; \$1 increments	15th or the 20th of the month for Ginnie Mae I and II pools, respectively, following the record date and every month thereafter
Fannie Mae MBS	Full and timely payment of principal and interest guaranteed by Fannie Mae	\$1,000 minimum; \$1 increments	25th of the month following the record date and every month thereafter
Freddie Mac PC (75-day PC)	Full and timely payment of interest and ultimate payment of principal guaranteed by Freddie Mac	\$1,000 minimum; \$1 increments	15th of the second month following the record date and every month thereafter
Freddie Mac Gold PC	Full and timely payment of interest and scheduled principal guaranteed by Freddie Mac	\$1,000 minimum; \$1 increments	15th of the month following the record date and every month thereafter

Comparison of CMO/REMIC Mortgage Securities Characteristics			
Security	Guarantee	Minimum Investment	Payment Date
Ginnie Mae REMIC	Full and timely payment of principal and interest, backed by the full-faith-and-credit guarantee of the U.S. government	\$1,000 minimum; \$1 increments	16th or the 20th of the month for Ginnie Mae I and II collateral, respectively, following the record date and every month thereafter
Freddie Mac Remic	Full and timely payment of interest and scheduled principal, guaranteed by Freddie Mac.	\$1; \$1 increments (most dealers, however, require a minimum investment of \$1,000 or more)	15th of the month following the record date and every month Thereafter
Fannie Mae REMIC	Full and timely payment of interest and scheduled principal guaranteed by Fannie Mae (collateral of Fannie Mae "G" series is also backed by the full faith and credit of the U.S. government)	\$1,000 minimum; \$1 increments	18th or the 25th of the month following the record date and every month thereafter
Agency-Backed, Private-Label CMO/REMIC	Collateral guaranteed by Ginnie Mae, Fannie Mae or Freddie Mac. Structure provides basis for AAA rating, but these securities carry no explicit government guarantee; they are the sole obligation of their Issuer	Varies	Varies; may be monthly, quarterly or semiannually; with or without payment delay
Whole-Loan Backed, Private-Label CMO/REMIC	Credit support provided by some combination of issuer or third-party guarantee, letter of credit, over collateralization, pool insurance, and/or subordination. Generally rated AA or AAA	Varies	Varies; may be monthly, quarterly or semiannually; with or without payment delay

Source: The Bond Market Association

MONEY MARKET

- ▶ **Money market:** the market used for buying and selling short term debt securities that can be quickly converted into cash.



- ▶ Maturity: one year or less
- ▶ Majority instruments are issued at a discount (like T-bill).
- ▶ Usually minimum face amount is \$100,000, therefore traded mainly by institutional investors.
- ▶ Small investors participate via money market mutual funds.
- ▶ Due to very short term maturities, free from interest rate risk.

- ▶ Dominated by trading in Treasury securities (T-bills, and T-bonds, and T- notes with one year or less to maturity)
- ▶ Highly liquid and low dealer bid-ask spreads and low customer trading cost (huge trading volume)
 - ▶ Dealer spreads in T-bill market is as low as 6 to 8 basis points, or 0.06% to 0.08%.
- ▶ Rising popularity of money market mutual funds has been a major factor in the growth of demand for money market instruments.

MONEY MARKETS

- ▶ **Commercial paper:** privately issued money market instruments
 - ▶ Slightly higher deal spreads
 - ▶ Include promissory notes issued by finance companies, such as General Motors Acceptance Corp.
- ▶ **Banks' acceptances:** time drafts drawn upon and accepted by banking institutions.
- ▶ **Negotiable certificates of deposit:** time deposits at commercial banks that range from \$100,000 to \$1,000,000 and feature an active secondary market.

OTHER MONEY MARKET INSTRUMENTS

MUNICIPAL BONDS

- ▶ State and local governments and their agencies borrow money by issuing municipal bonds
- ▶ General obligation bonds are repaid with tax revenues
- ▶ Revenue bonds are repaid with user fees
(Revenue bonds fund projects that benefit certain users, such as utilities and toll roads.)

EQUIVALENT TAXABLE YIELD

- ▶ Interest income received from muni bonds is free from federal income tax and state income tax in the same state as the bonds were issued.
- ▶ To appreciate the tax exempt advantages of muni bonds, compare with similar bond producing taxable income

▶ Equivalent taxable yield =
$$\frac{\text{Muni yield}}{1 - \text{tax rate}}$$

- ▶ Example : For an investor in a 30 % tax bracket, which is more attractive, a corporate bond with a 7.5 % coupon or a muni bond with a 5.5% coupon?

Solution: Equivalent taxable yield for the muni = $5.5\% / (1 - 0.3) = 7.86\%$, which is greater than 7.5% taxable bonds. Muni is more attractive for this investor.

- ▶ Corporations issue **corporate bonds** to borrow for long-term periods
- ▶ Corporate bonds have a minimum denomination of \$1,000
- ▶ Larger bonds offerings are achieved through public offerings registered with the SEC
- ▶ Secondary market activity varies
- ▶ Financial and nonfinancial institutions as well as individuals are common purchasers
- ▶ Most corporate bonds have maturities between 10 and 30 years
- ▶ Interest paid by corporations is tax-deductible, which reduces the corporate cost of financing with bonds

CORPORATE BONDS

- ▶ Corporate bond yields and risk
 - ▶ Interest income earned on corporate represents ordinary income
 - ▶ Yield curve
 - ▶ Affected by interest rate expectations, a liquidity premium, and maturity preferences of corporations
 - ▶ Similar shape as the municipal bond yield curve
 - ▶ Default rate
 - ▶ Depends on economic conditions
 - ▶ Less than 1 percent in the late 1990s
 - ▶ Exceeded 3 percent in 2002

CORPORATE BONDS (CONT'D)

- ▶ Corporate bond yields and risk (cont'd)
 - ▶ Investor assessment of risk
 - ▶ Investors may only consider purchasing corporate bonds after assessing the issuing firm's financial condition and ability to cover its debt payments
 - ▶ Investors may rely heavily on financial statements created by the issuing firm, which may be misleading
 - ▶ Bond ratings
 - ▶ Bonds with higher ratings have lower yields
 - ▶ Corporations seek investment-grade ratings, since commercial banks will only invest in bonds with that status
 - ▶ Rating agencies will not necessarily detect any misleading information contained in financial statements

CORPORATE BONDS (CONT'D)

- ▶ Private placement of corporate bonds
 - ▶ Often, insurance companies and pension funds purchase privately-placed bonds
 - ▶ Bonds can be placed with the help of a securities firm
 - ▶ Bonds do not have to be registered with the SEC

CORPORATE BONDS (CONT'D)

- ▶ Characteristics of corporate bonds
 - ▶ The **bond indenture** specifies the rights and obligations of the issuer and the bondholder
 - ▶ A **trustee** represents the bondholders in all matters concerning the bond issue
 - ▶ **Sinking-fund provision**
 - ▶ A requirement to retire a certain amount of the bond issue each year
 - ▶ Protective covenants:
 - ▶ Are restrictions placed on the issuing firm designed to protect the bondholders from being exposed to increasing risk during the investment period
 - ▶ Often limit the amount of dividends and corporate officers' salaries the firm can pay

CORPORATE BONDS (CONT'D)

- ▶ Characteristics of corporate bonds (cont'd)
 - ▶ **Call provisions:**
 - ▶ Require the firm to pay a price above par value when it calls its bonds
 - ▶ The difference between the call price and par value is the **call premium**
 - ▶ Are used to:
 - ▶ Issue bonds with a lower interest rate
 - ▶ Retire bonds as required by a sinking-fund provision
 - ▶ Are a disadvantage to bondholders

CORPORATE BONDS (CONT'D)

▶ Bond collateral

- ▶ Typically, collateral is a mortgage on real property
 - ▶ A **first mortgage bond** has first claim on the specified assets
 - ▶ A **chattel mortgage bond** is secured by personal property
- ▶ Unsecured bonds are **debentures**
- ▶ **Subordinated debentures** have claims against the firm's assets that are junior to the claims of mortgage bonds and regular debentures

CORPORATE BONDS (CONT'D)

- ▶ **Low- and zero-coupon bonds:**
 - ▶ Are issued at a deep discount from par value
 - ▶ Require annual tax payments although the interest will not be received until maturity
 - ▶ Have the advantage to the issuer of requiring low or no cash outflow, , don't pay yearly interest, reduce tax => increase CF, don't need high issue cost. Co that not pay tax interested in this kind.
- ▶ **Variable-rate bonds:**
 - ▶ Allow investors to benefit from rising market interest rates over time
 - ▶ Allow issuers of bonds to benefit from declining rates over time
- ▶ **Convertibility**
 - ▶ **Convertible bonds** allow investors to exchange the bond for a stated number of shares of common stock
 - ▶ Investors are willing to accept a lower rate of interest on convertible bonds

CORPORATE BONDS (CONT'D)

- ▶ Corporate bond quotations
 - ▶ More than 2,000 bonds are traded on the NYSE with a market value of more than \$2 trillion
 - ▶ Corporate bond prices are reported in eighths
 - ▶ Corporate bond quotations normally include the volume of trading and the yield to maturity

CORPORATE BONDS (CONT'D)

- ▶ **Junk bonds** have a high degree of credit risk
- ▶ About two-thirds of junk bonds are used to finance takeovers
- ▶ Size of the junk bond market
 - ▶ Currently about 3,700 junk bond offerings exist with a market value of \$80 billion
- ▶ Participation in the junk bond market
 - ▶ 70 large issuers of junk bonds each have more than \$1 billion in debt outstanding
 - ▶ Primary investors in junk bonds are mutual funds, life insurance companies, and pension funds
 - ▶ The junk bond secondary market consists of 20 bond traders

CORPORATE BONDS (CONT'D)

- ▶ Junk bonds (cont'd)
 - ▶ Risk premium of junk bonds
 - ▶ The typical premium is between 3 and 7 percent above Treasury bonds with the same maturity
 - ▶ Performance of junk bonds
 - ▶ In the early 1990s, the popularity of junk bonds declined because of
 - ▶ Insider trading allegations
 - ▶ The financial problems of a few major issuers of junk bonds
 - ▶ The financial problems in the thrift industry
 - ▶ In the late-1990s, junk bonds performed well with few defaults

CORPORATE BONDS (CONT'D)

- ▶ Junk bonds (cont'd)
 - ▶ **Contagion effects** in the junk bond market
 - ▶ Specific adverse information may discourage investors from investment in junk bonds
 - ▶ Ivan Boesky admitting to insider trading violations
 - ▶ Drexel Burnham Lambert's bankruptcy filing

CORPORATE BONDS (CONT'D)

- ▶ How corporate bonds facilitate restructuring
 - ▶ Using bonds to finance a leveraged buyout
 - ▶ An LBO is typically financed with senior debt and subordinated debt
 - ▶ LBO activity increased dramatically in the later 1980s
 - ▶ Many firms with excessive financial leverage resulting from LBOs reissued stock in the 1990s

CORPORATE BONDS (CONT'D)

- ▶ How corporate bonds facilitate restructuring (cont'd)
 - ▶ Using bonds to revise the capital structure
 - ▶ Debt is perceived to be a cheaper source of capital than equity as long as the corporation can meet its debt payments
 - ▶ Sometimes, corporations issue bonds and use the proceeds for a debt-for-equity swap
 - ▶ Corporations with an excessive amount of debt can conduct an equity-for-debt swap

CORPORATE BONDS (CONT'D)

- ▶ All financial institutions participate in bond markets
 - ▶ On any given day, commercial banks, bond mutual funds, insurance companies, and pension funds are dominant participants
- ▶ A financial institution's investment decisions will often simultaneously affect bond market and other financial market activity

INSTITUTIONAL USE OF BOND MARKETS

- ▶ Bond markets have become increasingly integrated as a result of frequent cross-border investments in bonds
- ▶ Low-quality bonds issued globally by governments and large corporations are global junk bonds
- ▶ The global development of the bond market is primarily attributed to bond offerings by country governments (sovereign bonds)

GLOBALIZATION OF BOND MARKETS

- ▶ Eurobond market
 - ▶ Bonds denominated in various currencies are placed in the Eurobond market
 - ▶ Dollar-denominated bearer bonds are available in the Eurobond market
 - ▶ Underwriting syndicates help place Eurobond issues

GLOBALIZATION OF BOND MARKETS (CONT'D)