



Lecture 7

The Bond Market

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Agenda

- Purpose of the Capital Market
- Capital Market Participants
- Capital Market Trading
- Types of Bonds
 - Treasury Notes and Bonds
 - Municipal Bonds
 - Corporate Bonds
- Financial Guarantees for Bonds
- Current Yield Calculation
- Finding the Value of Coupon Bonds
- Investing in Bonds



Bond Terminologies

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. <i>Face amount</i> is synonymous with <i>par value</i> .
Indenture	The contract that accompanies a bond and specifies the terms of the loan agreement. It includes management restrictions, called covenants.
Market rate	The interest rate currently in effect in the market for securities of like 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 <i>face amount</i> .
Yield to maturity	The yield an investor will earn if the bond is purchased at the current market price and held until maturity.



Types of Bonds

- *Bonds* are securities that represent debt owed by the issuer to the investor, and typically have specified payments on specific dates.
- Types of bonds we will examine include long-term government bonds (T-bonds), municipal bonds, and corporate bonds.





Treasury Notes and Bonds

- The U.S. Treasury issues notes and bonds to finance its operations.
- The maturity differences among the various Treasury securities:

Type	Maturity
<i>Treasury Bill</i>	Less than 1 year
<i>Treasury Note</i>	1 to 10 years
<i>Treasury Bond</i>	10-30 years



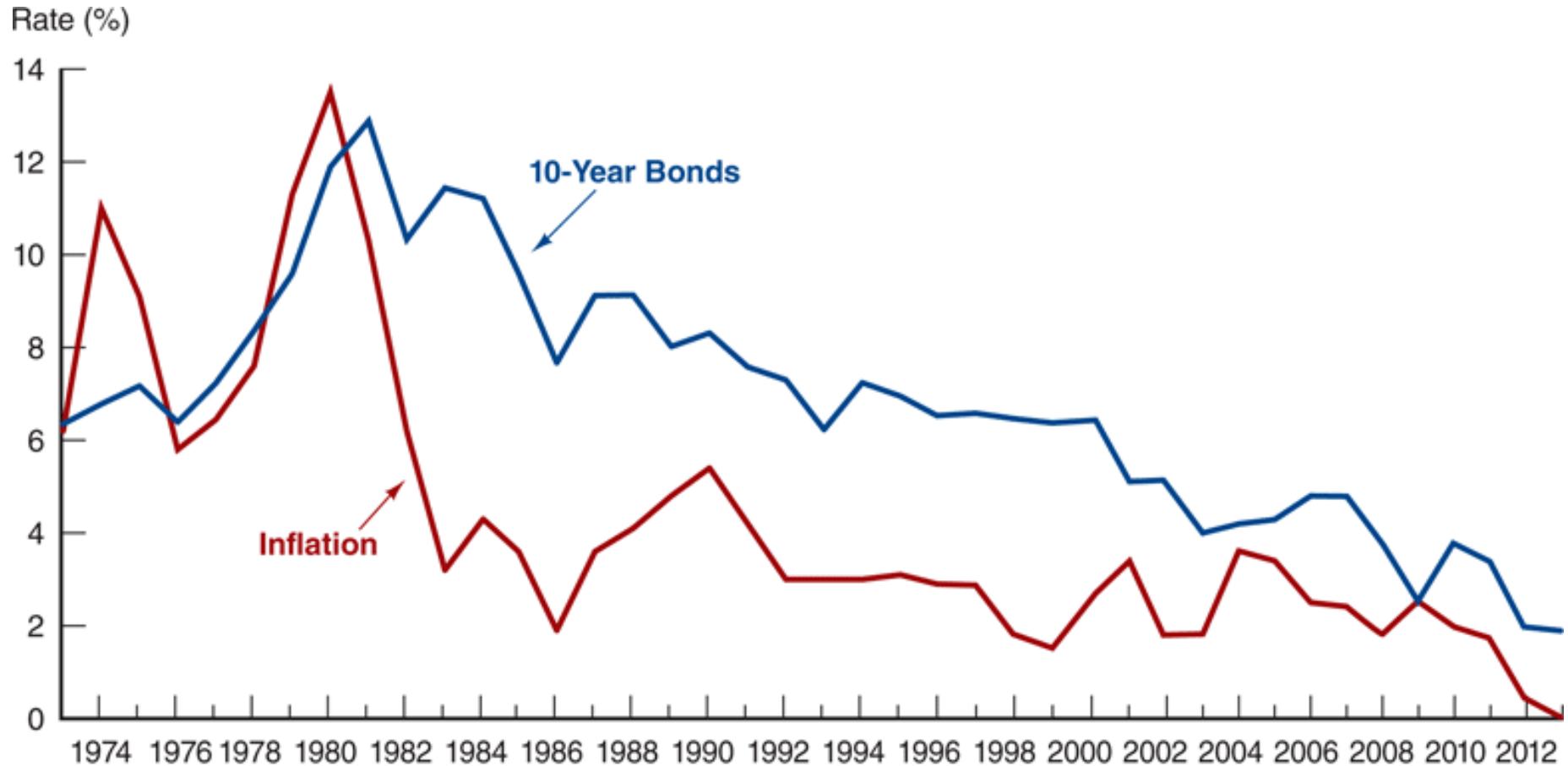
Treasury Bond Interest Rates

- No default risk since the Treasury can print money to payoff the debt
- Very low interest rates, often considered the risk-free rate (although inflation risk is still present)



Treasury Bond Interest Rates

Interest Rate on Treasury Bonds and the Inflation Rate, 1973–2013 (January of each year)

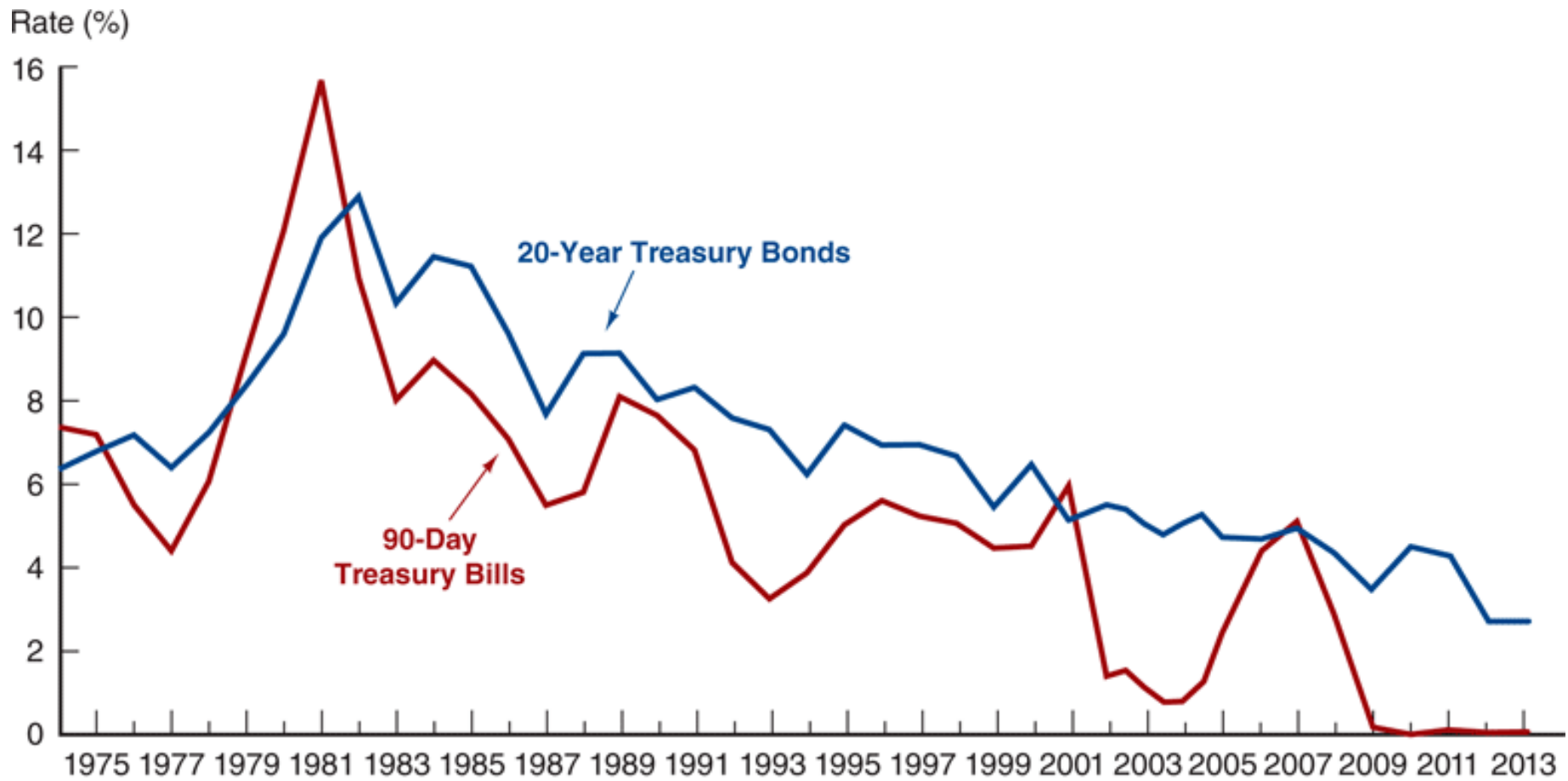


Sources: <http://www.federalreserve.gov/releases> and <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt>.



Treasury Bond Interest Rates: T-Bills vs. T-Bonds

Interest Rate on Treasury Bills and Treasury Bonds, 1974–2013 (January of each year)



Source: <http://www.federalreserve.gov/releases>.



Treasury Bonds: Recent Innovation

- 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.



Treasury Bonds: Agency Debt

- Although not technically Treasury securities, agency bonds are issued by government-sponsored entities, such as Government National Mortgage Association (GNMA), Federal National Mortgage Association (FNMA), and Federal Home Loan Mortgage Corporation (FHLMC).
- The debt has an “implicit” guarantee that the U.S. government will not let the debt default.



Municipal Bonds

- Issued by local, county, and state governments
- Used to finance public interest projects
- Interests are tax free
- Tax-free municipal interest rate = taxable interest rate $\times$ (1 – marginal tax rate)



Municipal Bonds: Example

Suppose the rate on a corporate bond is 9% and the rate on a municipal bond is 6.75%. Which should you choose?

Answer: Find the marginal tax rate:

$$6.75\% = 9\% \times (1 - \text{MTR}), \text{ or } \text{MTR} = 25\%$$

If you are in a marginal tax rate above 25%, the municipal bond offers a higher after-tax cash flow.



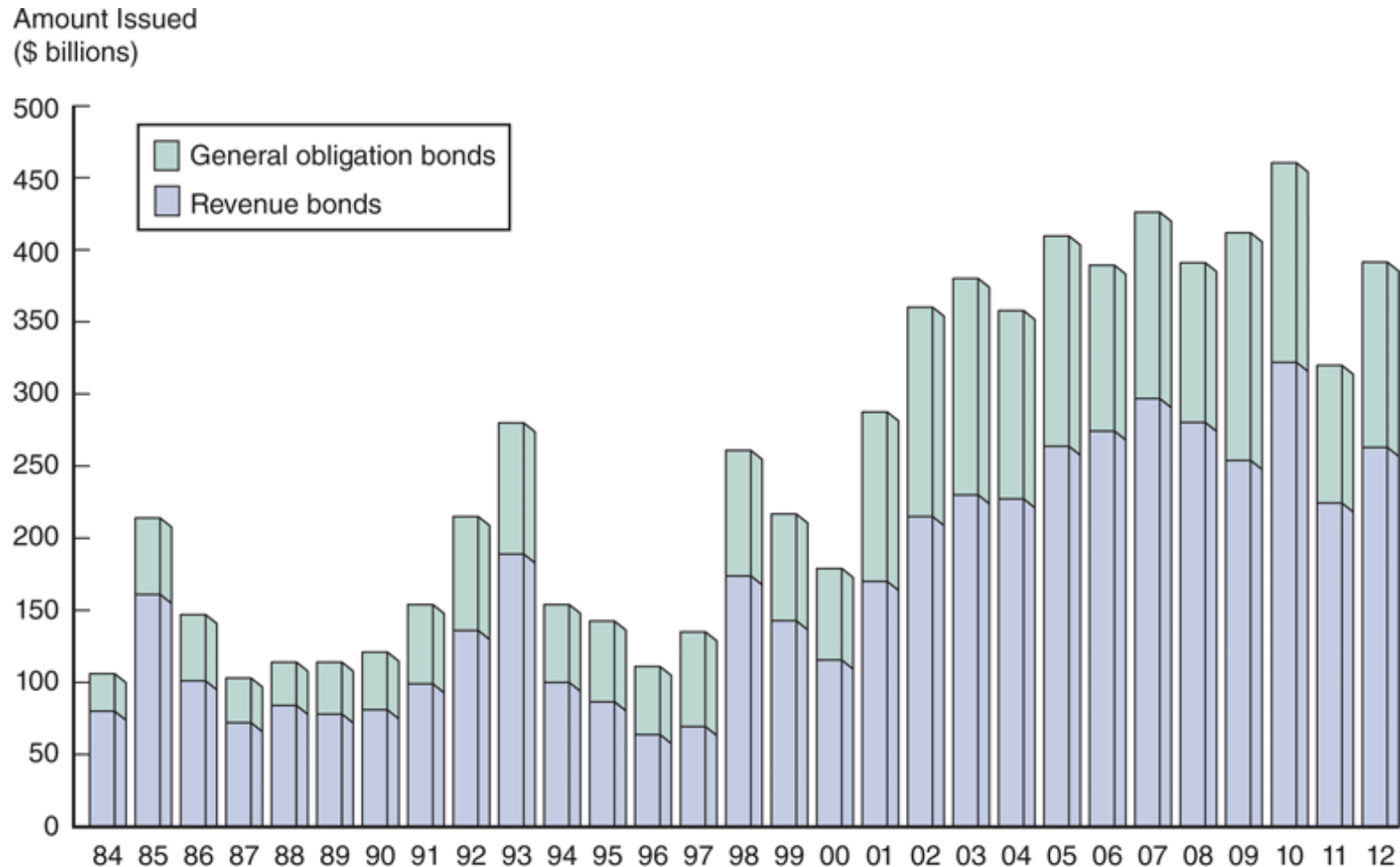
Municipal Bonds

- Two types
 - General obligation bonds
 - Revenue bonds
- NOT default-free (e.g., Orange County California)
 - Defaults in 1990 amounted to \$1.4 billion in this market



Municipal Bonds: Comparing Revenue and General Obligation Bonds

Issuance of Revenue and General Obligation Bonds, 1984–2012 (End of year)



Source: <http://www.federalreserve.gov/econresdata/releases/govsecure/current.htm>.

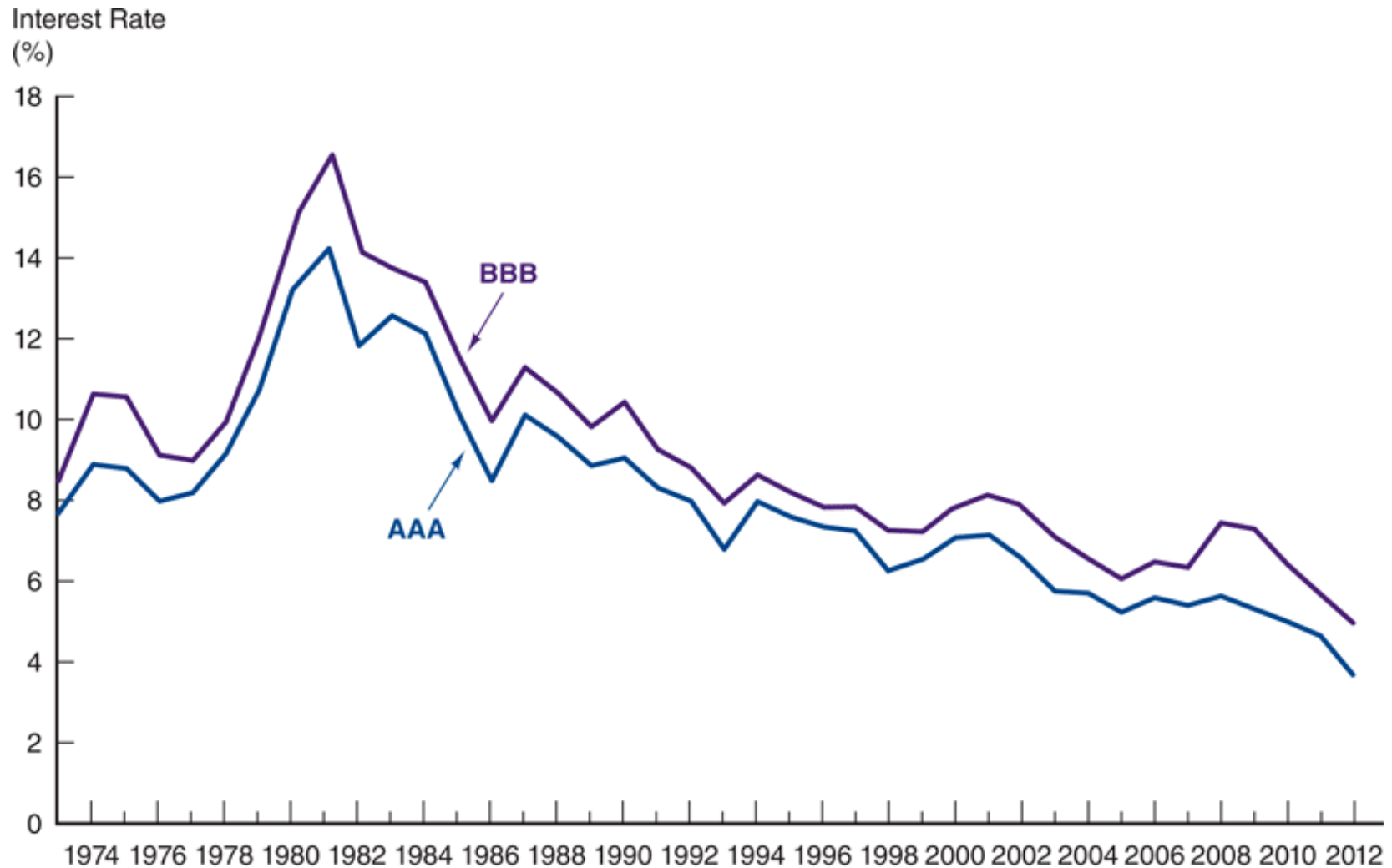


Corporate Bonds

- Typically have a face value of \$1,000, although some have a face value of \$5,000 or \$10,000
- Pay interest semi-annually
- Cannot be redeemed anytime the issuer wishes, unless a specific clause states this (call option).
- Degree of risk varies with each bond, even from the same issuer. Following suite, the required interest rate varies with level of risk.



Corporate Bonds: Interest Rates



Source: <http://www.federalreserve.gov/releases/h15/data.htm>.



Corporate Bonds:

Characteristics of Corporate Bonds

- Registered Bonds
 - Replaced “bearer” bonds
 - The tax authority can track interest income this way
- Restrictive Covenants
 - Mitigates conflicts with shareholder interests
 - May limit dividends, new debt, ratios, etc.
 - Usually includes a cross-default clause



Corporate Bonds:

Characteristics of Corporate Bonds

- Call Provisions
 - Higher yield
 - Sinking fund
 - Interest of the stockholders
 - Alternative opportunities
- Conversion
 - Some debt may be converted to equity
 - Similar to a stock option, but usually more limited



Corporate Bonds: Characteristics of Corporate Bonds

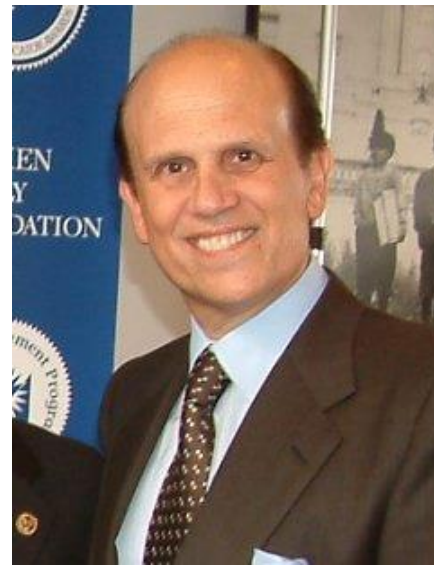
- Secured Bonds
 - Mortgage bonds
 - Equipment trust certificates
- Unsecured Bonds
 - Debentures
 - Subordinated debentures
 - Variable-rate bonds



Corporate Bonds:

Characteristics of Corporate Bonds

- Junk Bonds
 - Debt that is rated below BBB
 - Often, trusts and insurance companies are not permitted to invest in junk debt
 - Michael Milken developed this market in the mid-1980s, although he was convicted of insider trading





Financial Guarantees for Bonds

- Some debt issuers purchase *financial guarantees* to lower the risk of their debt.
- The guarantee provides for timely payment of interest and principal, and are usually backed by large insurance companies.



Bond Yield Calculations

- Bond yields are quoted using a variety of conventions, depending on both the type of issue and the market.
- We will examine the current yield calculation that is commonly used for long-term debt.



Bond Current Yield Calculation

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:

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

Note: C (coupon) = $10.95\% \times \$1,000 = \109.50



Finding the Value of Coupon Bonds

Bond pricing is, in theory, 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.



Finding the Value of Coupon Bonds

Let's use a simple example to illustrate the bond pricing idea.

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%?



Finding the Value of Coupon Bonds

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):

$$N = 4, \quad FV = 1000, \quad PMT = 50, \quad I = 6$$

Computer the PV. $PV = 965.35$



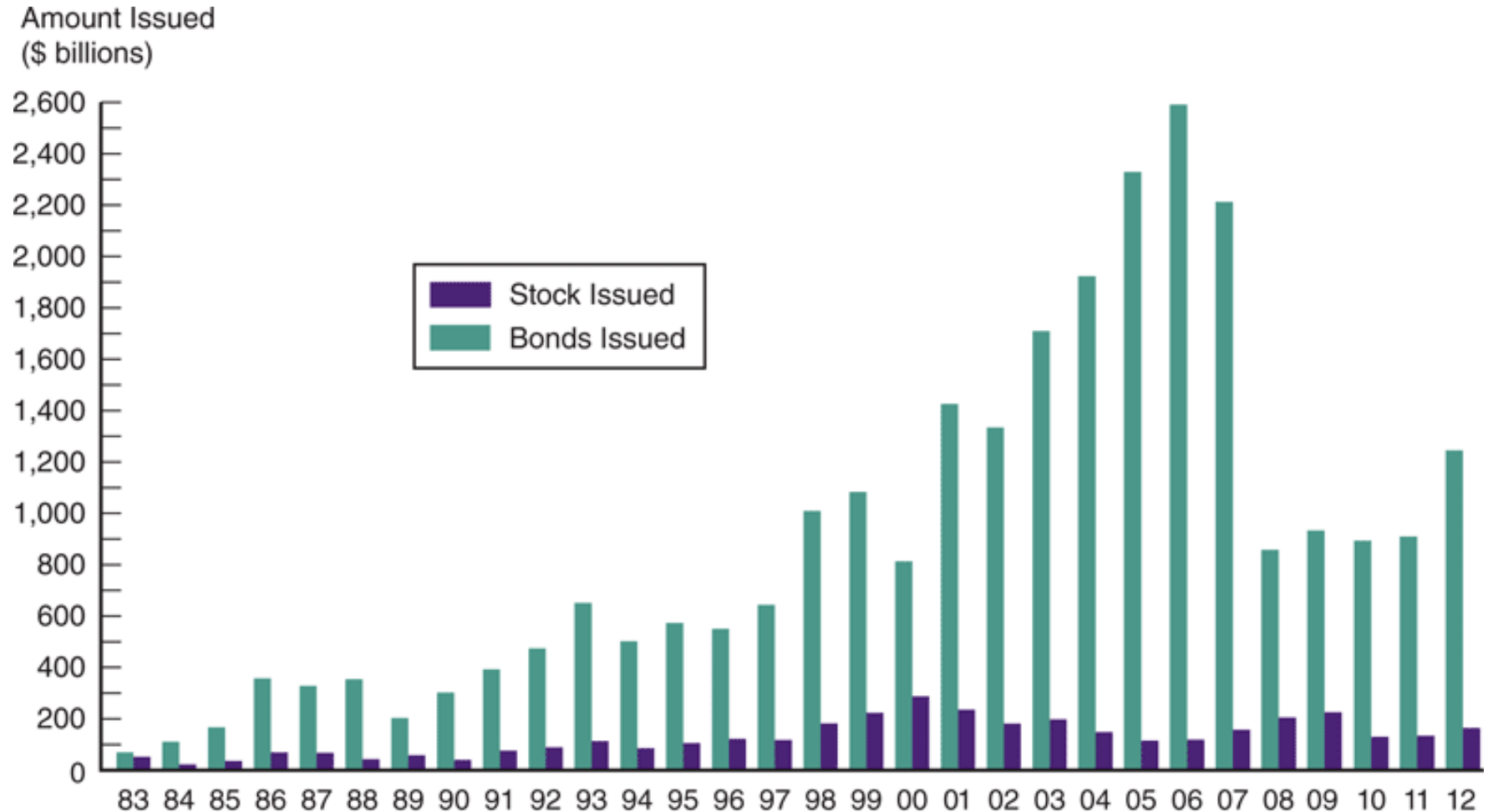
Investing in Bonds

- Bonds are the most popular alternative to stocks for long-term investing.
- Even though the bonds of a corporation are less risky than its equity, investors still have risk.



Investing in Bonds

Bonds and Stocks Issued, 1983–2012



Source: <http://www.federalreserve.gov/econresdata/releases/corpsecure/current.htm>.