FN211
Money Markets and Bond Markets

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Preview

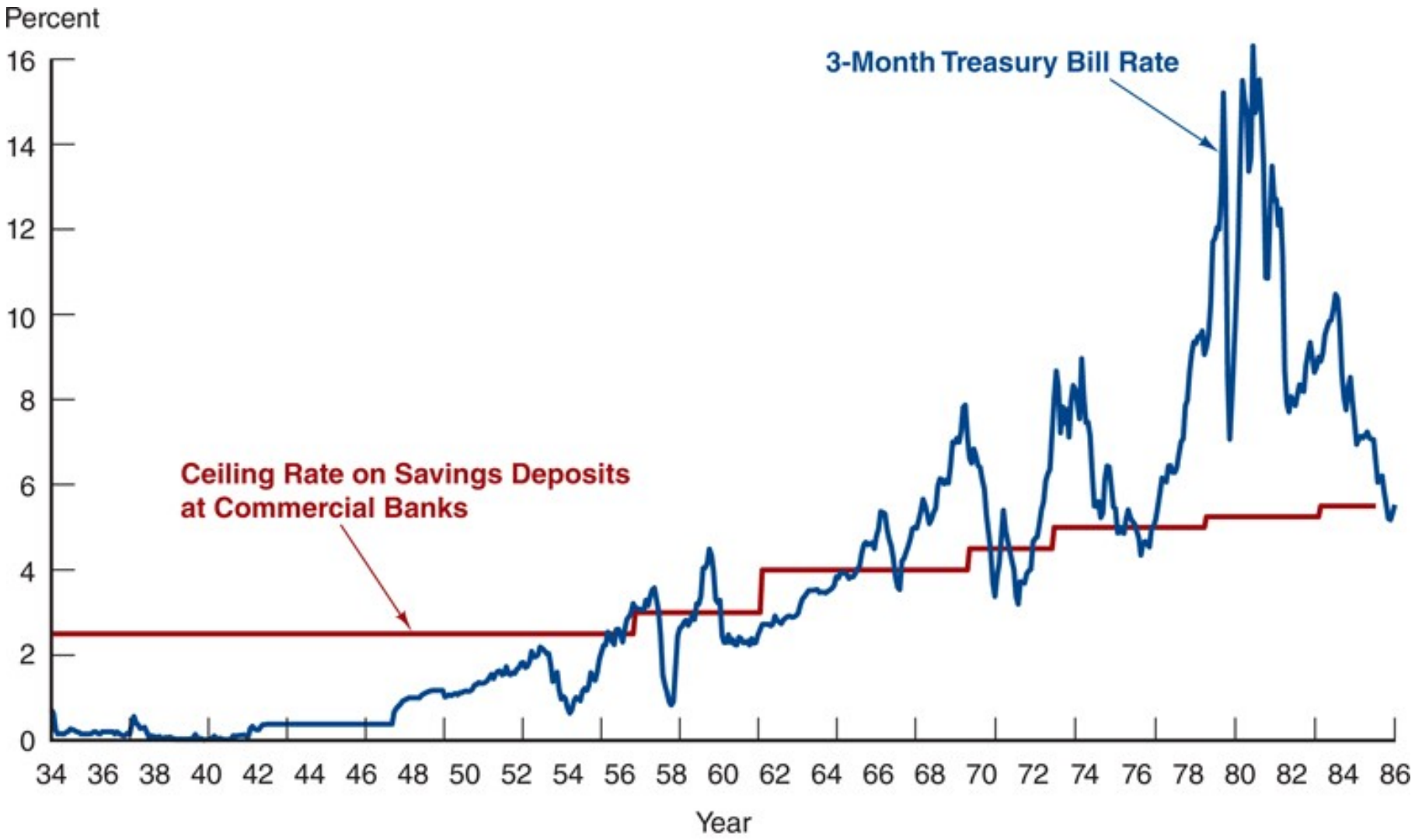
- Definitions and purposes of money markets and bond markets
- Who participates in money and bond markets?
- Instruments traded in money and bond markets
- Product comparison

Money Markets Defined

1. Usually sold in large denominations ($1MB or more)
2. Low default risk
3. Mature in one year or less from their issue date, although most mature in less than 120 days

- Banks are heavily regulated by reserve requirements when accepting deposits
- Also, regulations on the level of interest banks lead to a significant growth in money markets, especially in the 1970s and 1980s

3-month T-bill rates and Interest Rate Ceilings



Source: http://www.stlouisfed.org/default.cfm.

The Purpose of Money Markets

- Investors in money market: Provides a place for warehousing surplus funds for short periods of time
- Borrowers from money market provide low-cost source of temporary funds
- Corporations and U.S. government use these markets because the timing of cash inflows and outflows are not well synchronized
  - Money markets provide a way to solve these cash-timing problems

The Purpose of Money Markets

Instrument	Interest Rate (%)
Prime rate	3.25
Federal funds	0.12
Commercial paper	0.15
1-month CDs (secondary market)	0.17
London interbank offer rate	0.20
Eurodollar	0.23
Treasury bills (4 week)	0.01

Source: Federal Reserve Statistical Bulletin, http://www.federalreserve.gov/releases/h15/data.htm and Libor: http://www.fedprimerate.com/libor/libor_rates_history.htm.

Who Participates in the Money Markets?

Participant	Role
U.S. Treasury Department	Sells U.S. Treasury securities to fund the national debt
Federal Reserve System	Buys and sells U.S. Treasury securities as its primary method of controlling the money supply
Commercial banks	Buy U.S. Treasury securities; sell certificates of deposit and make short-term loans; offer individual investors accounts that invest in money market securities
Businesses	Buy and sell various short-term securities as a regular part of their cash management
Investment companies (brokerage firms)	Trade on behalf of commercial accounts
Finance companies (commercial leasing companies)	Lend funds to individuals
Insurance companies (property and casualty insurance companies)	Maintain liquidity needed to meet unexpected demands
Pension funds	Maintain funds in money market instruments in readiness for investment in stocks and bonds
Individuals	Buy money market mutual funds
Money market mutual funds	Allow small investors to participate in the money market by aggregating their funds to invest in large-denomination money market securities

MM Instruments: T-Bills

- T-bills have 28-day maturities through 12- month maturities.
- **Discounting:**
  - When an investor pays less for the security than it will be worth when it matures, and the increase in price provides a return
  - This is common to short-term securities because they often mature before the issuer can mail out interest checks

MM Instruments: T-Bills

- You pay $996.73 for a 28-day T-bill. It is worth $1,000 at maturity. What is its discount rate?

$$i_{discount} = \frac{F - P}{F} \times \frac{360}{n}$$

$$i_{discount} = \frac{1{,}000 - 996.73}{1{,}000} \times \frac{360}{28} = 4.665\%$$

MM Instruments: T-Bills

- You pay $996.73 for a 28-day T-bill. It is worth $1,000 at maturity. What is its annualized yield?

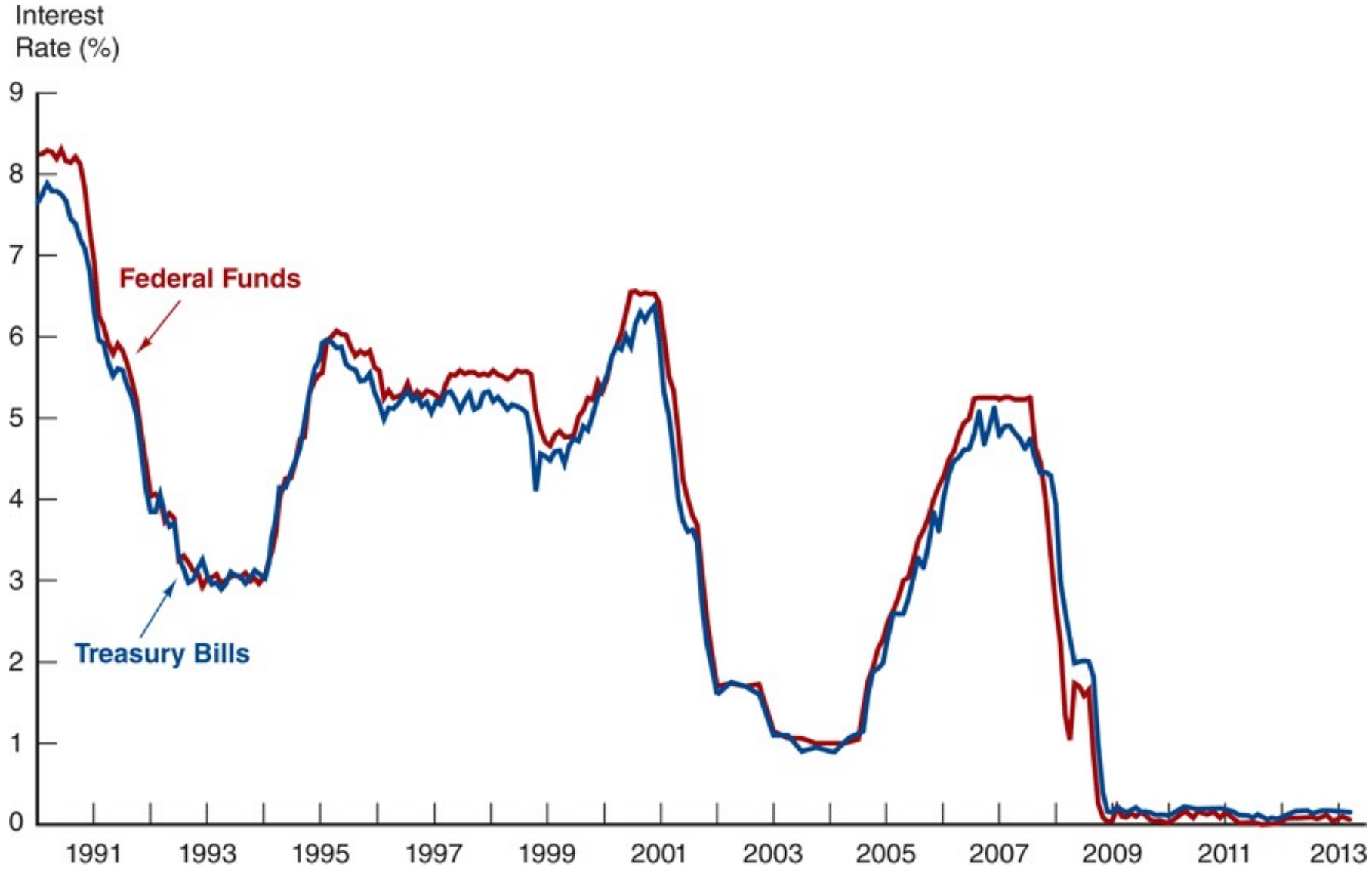
$$i_{yt} = \frac{F - P}{P} \times \frac{365}{n}$$

$$i_{yt} = \frac{1{,}000 - 996.73}{996.73} \times \frac{366}{28} = 4.76\%$$

MM Instruments: Fed Funds

- Short-term funds transferred (loaned or borrowed) between financial institutions, usually for a period of one day
- Used by banks to meet short-term needs to meet reserve requirements
- Repurchase agreements (Repo) work similar the market for fed funds, but nonbanks can participate

MM Instruments: Fed Funds



Source: http://www.federalreserve.gov/.

MM Instruments: NCD

- Negotiable certificates of deposit (NCD) 0 A bank-issued security that documents a deposit and specifies the interest rate and the maturity date
- Denominations range from $100,000 to $10 million

MM Instruments: NCD

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

MM Instruments: Commercial Paper

- Unsecured promissory notes, issued by corporations, that mature in no more than 270 days
- The use of commercial paper increased significantly in the early 1980s because of the rising cost of bank loans
- Commercial paper volume fell significantly during the recent economic recession

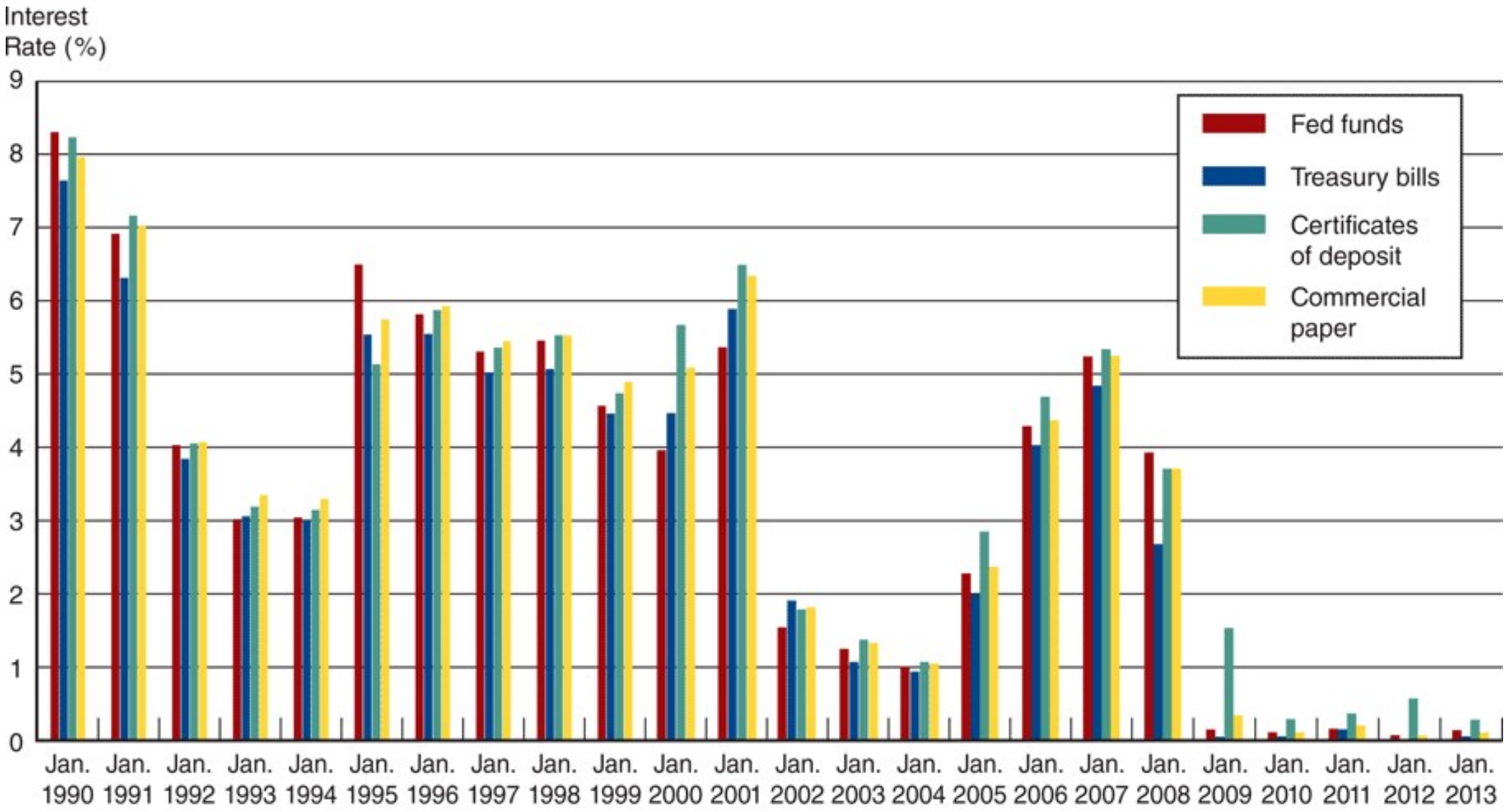
MM Instruments: Commercial Paper

Source: http://www.federalreserve.gov/releases/h15/current/default.htm.

MM Instruments: Eurodollars

- Eurodollars represent Dollar denominated deposits held in foreign banks
- The market is essential since many foreign contracts call for payment is U.S. dollars due to the stability of the dollar, relative to other currencies
- The Eurodollar market has continued to grow rapidly because depositors receive a higher rate of return on a dollar deposit in the Eurodollar market than in some domestic markets

MM Instruments: Comparison



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

MM Instruments: Comparison

Money Market Security	Issuer	Buyer	Usual Maturity	Secondary Market
Treasury bills	U.S. government	Consumers and companies	4, 13, and 26 weeks	Excellent
Federal funds	Banks	Banks	1 to 7 days	None
Repurchase agreements	Businesses and banks	Businesses and banks	1 to 15 days	Good
Negotiable certificates of deposit	Large money center banks	Businesses	14 to 120 days	Good
Commercial paper	Finance companies and businesses	Businesses	1 to 270 days	Poor
Banker's acceptance	Banks	Businesses	30 to 180 days	Good
Eurodollar deposits	Non-U.S. banks	Businesses, governments, and banks	1 day to 1 year	Poor

Capital market

- Original maturity is *greater* than one year, typically for long-term financing or investments
- Best known capital market securities: Stocks and bonds
- Primary issuers of securities:
  - Governments: debt issuers
  - Corporations: equity and debt issuers
- Largest purchasers of securities: Household
- Traded in primary and secondary markets

Bond Terminology

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* is synonymous with *par value*.
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 *face amount*.
Yield to maturity	The yield an investor will earn if the bond is purchased at the current market price and held until maturity.

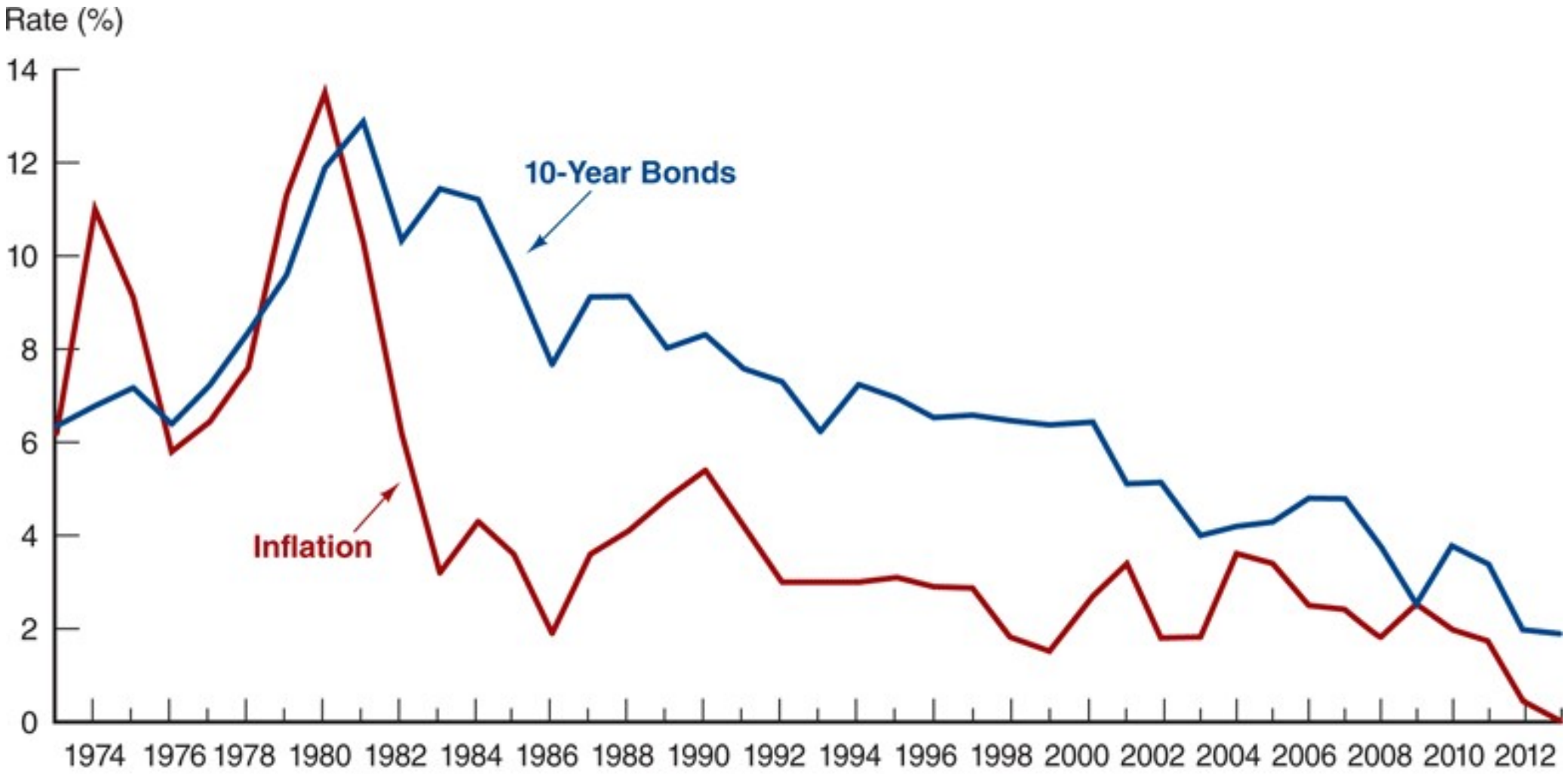
Types of Bonds – Treasury bonds

- The U.S. Treasury issues notes and bonds to finance its operations

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

- 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)

Types of Bonds – Treasury bonds



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

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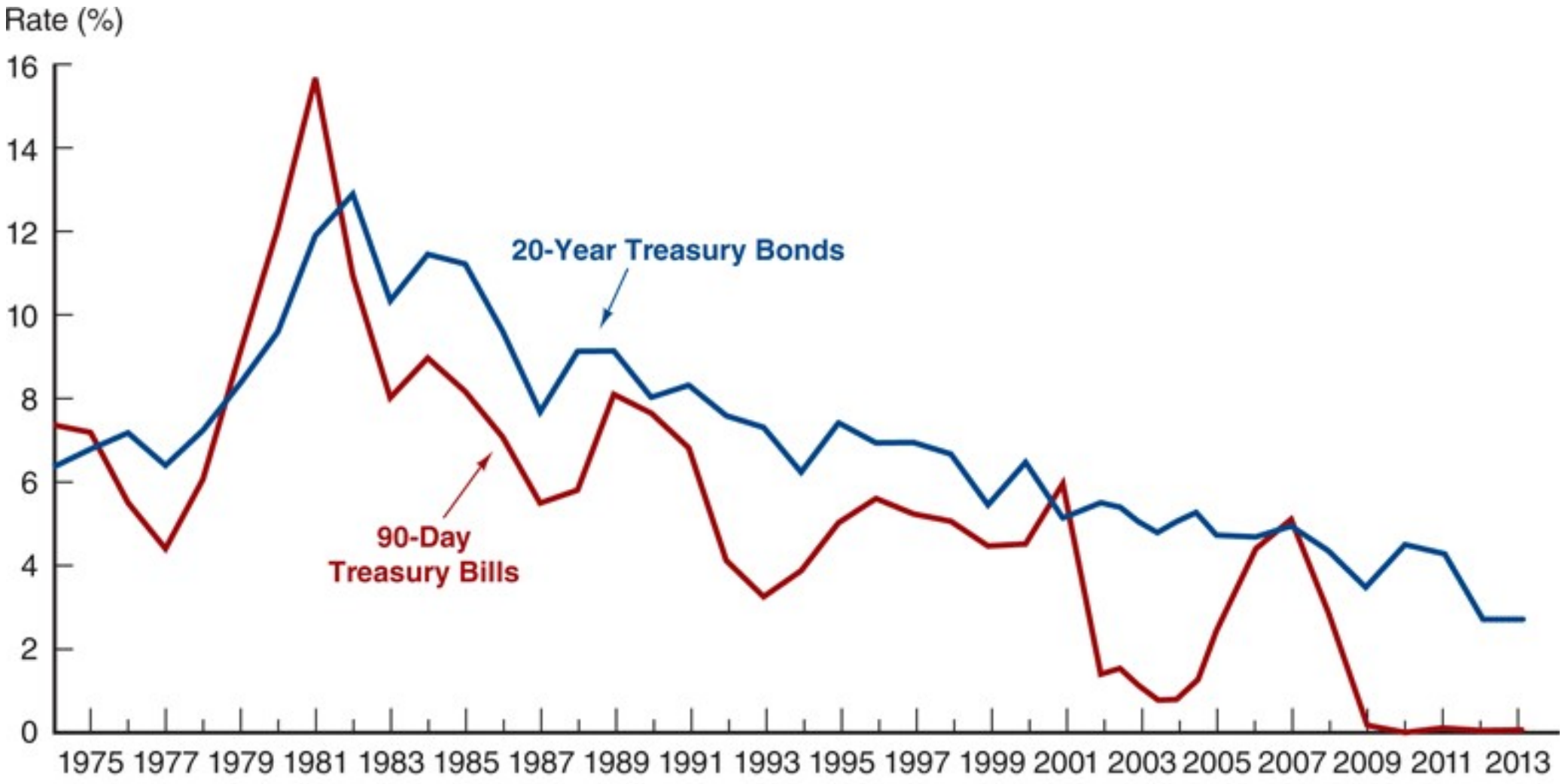

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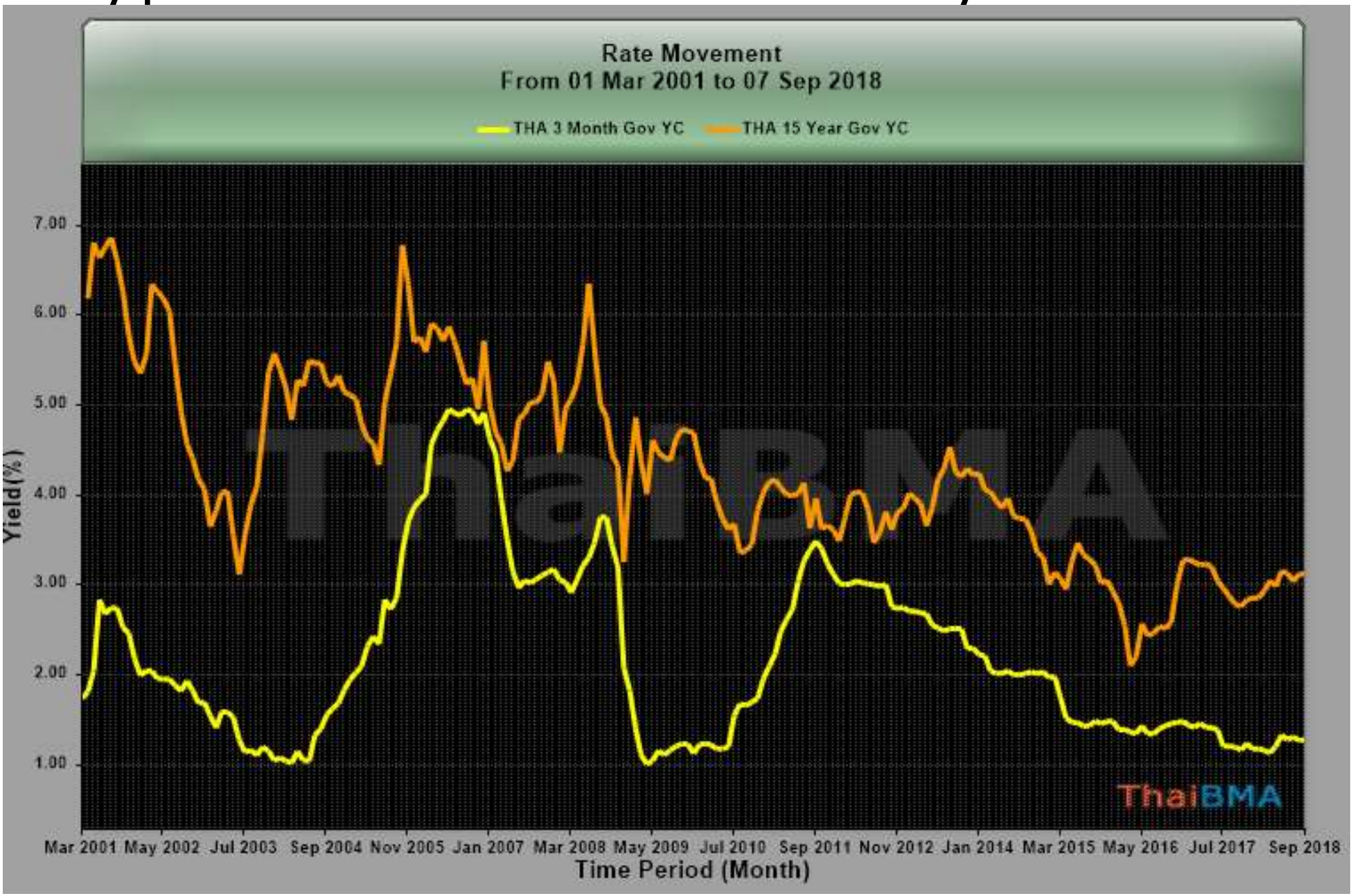


Types of Bonds – Municipal Bonds

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

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.

Types of Bonds – Municipal Bonds

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%.

Types of Bonds – 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.
- Any bonds rated below BBB are considered sub-investment grade debt

Types of Bonds – Corporate Bonds

- Restrictive Covenants
  - —Mitigates conflicts with shareholder interests
  - —May limit dividends, new debt, ratios, etc.
  - —Usually includes a cross-default clause
- Call Provisions
  - —Higher required yield
  - —Interest of the stockholders
  - —Alternative opportunities
- Conversion
  - —Some debt may be converted to equity
  - —Similar to a stock option, but usually more limited

Types of Bonds – Corporate Bonds

- Secured Bonds
  - —Mortgage bonds
  - —Equipment trust certificates
- Unsecured Bonds
  - —Debentures
  - —Subordinated debentures
  - —Variable-rate 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 subsequently convicted of insider trading

Bond Yield Calculations

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:

$$i_c = \text{C} / \text{P} = \$109.50 / \$921.01 = 11.89\%$$

Note: $\text{C (coupon)} = 10.95\% \times \$1{,}000$

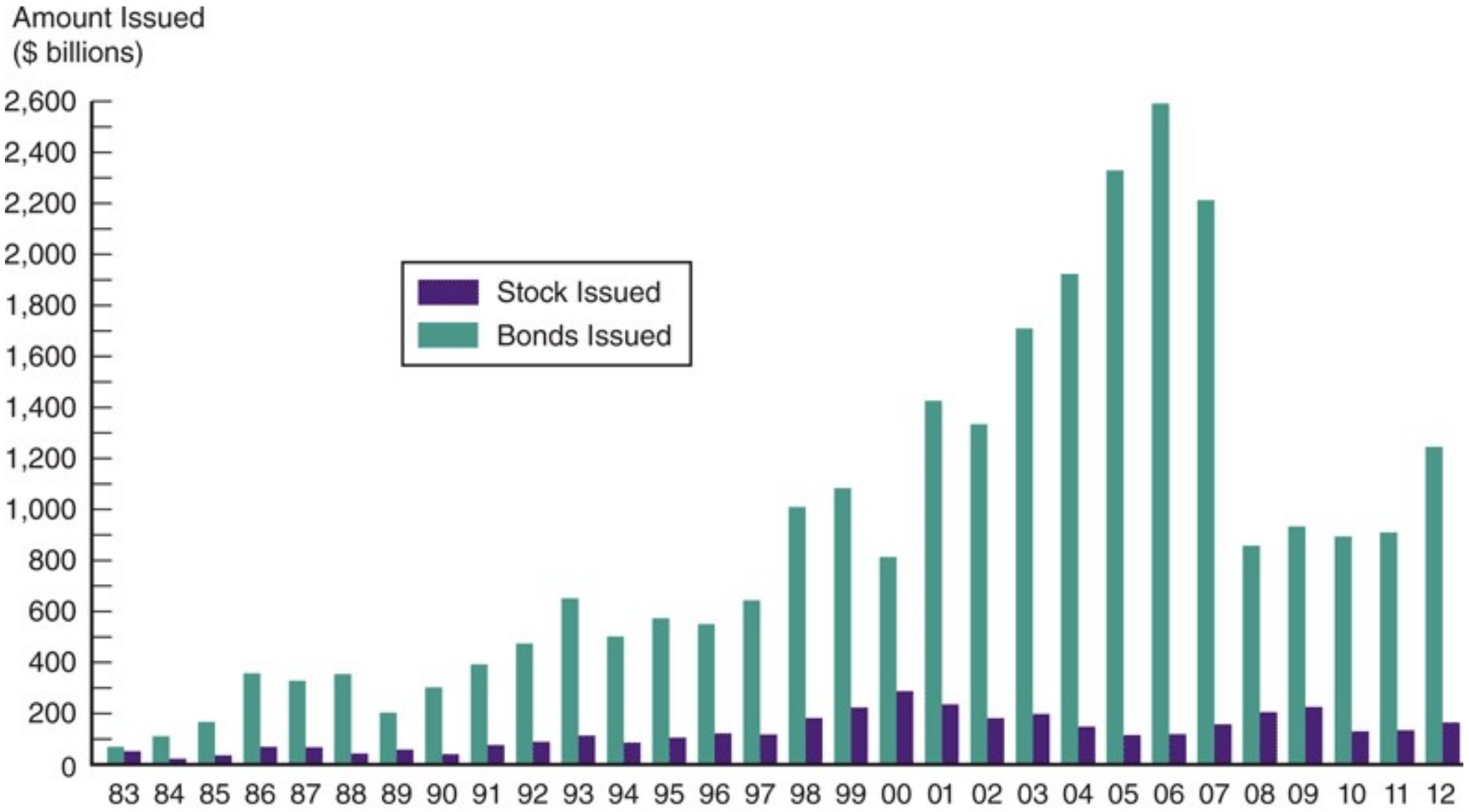
$$= \$109.50$$

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%?

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):
   - $N = 4$, $FV = 1000$, $PMT = 50$, $I = 6$
   - $PV = 965.35$

Investing in Bonds



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

Investing in Bonds