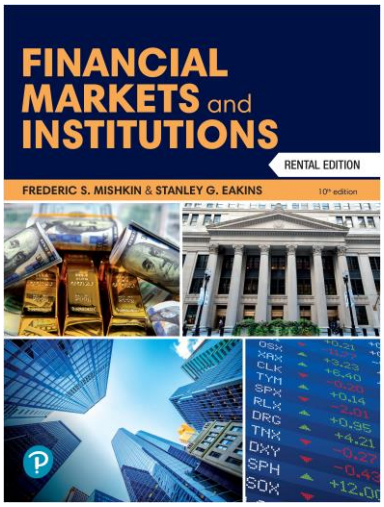
Financial Markets and Institutions

Tenth Edition



Chapter 12

The Bond Market

Chapter Preview (1 of 2)

In this chapter, we focus on longer-term securities: bonds. Bonds are like money market instruments, but they have maturities that exceed one year. These include Treasury bonds, corporate bonds, mortgages, and the like.

Chapter Preview (2 of 2)

- 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
- Oversight of the Bond Markets
- Current Yield Calculation
- Finding the Value of Coupon Bonds
- Investing in Bonds

Purpose of the Capital Market

- Original maturity is **greater** than one year, typically for long-term financing or investments
- Best known capital market securities:
  - Stocks and bonds

Capital Market Participants

- Primary issuers of securities:
  - Federal and local governments: debt issuers
  - Corporations: equity and debt issuers
- Largest purchasers of securities:
  - You and me

Capital Market Trading

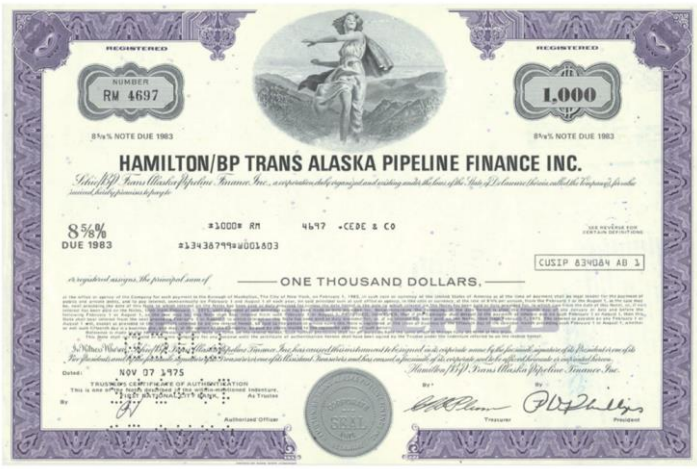
1. Primary market for initial sale (IPO)
2. Secondary market
   - Over-the-counter
   - Organized exchanges (i.e., NYSE)

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.

Figure 12.1

Hamilton/BP Corporate Bond



Treasury Notes and Bonds

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

Table 12.1

Treasury Securities

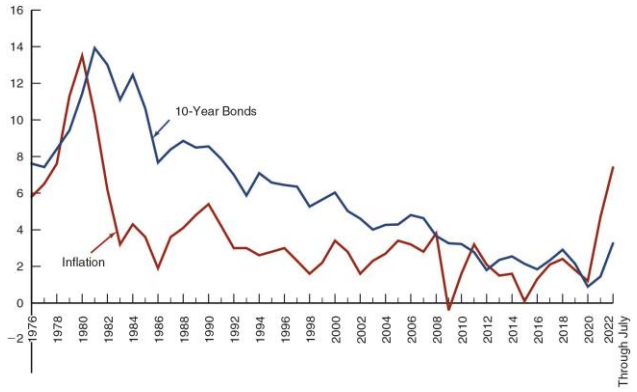
Type	Maturity
Treasury bill	Less than 1 year
Treasury note	1 to 10 years
Treasury bond	10 to 30 years

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)

Figure 12.2

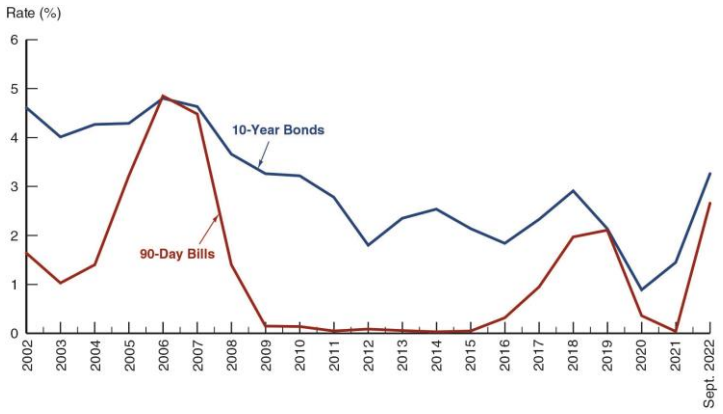
Interest Rate on Treasury Bonds and the Inflation Rate, 1973–2022 (January of Each Year)



Source: http://www.federalreserve.gov/releases and https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=reallongtermrate .

Figure 12.3

Interest Rate on Treasury Bills and Treasury Bonds, 1974–2022 (January of Each Year)



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

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 GNMA, FNMA, and FHLMC.
- The debt has an “implicit” guarantee that the U.S. government will not let the debt default. This “guarantee” was clear during the 2008 bailout...

The 2007–2009 Financial Crisis: Bailout of Fannie and Freddie (1 of 2)

- Both Fannie and Freddie managed their political situation effectively, allowing them to engage in risky activities, despite concerns raised.
- By 2008, the two had purchased or guaranteed over $5 trillion in mortgages or mortgage-backed securities.

The 2007–2009 Financial Crisis: Bailout of Fannie and Freddie (2 of 2)

- Part of this growth was driven by their Congressional mission to support affordable housing. They did this by purchasing subprime and Alt-A mortgages.
- As these mortgages defaults, large losses mounted for both agencies.
- By October of 2016, the two agencies had paid $250 billion in dividends to the treasury.

Municipal Bonds (1 of 2)

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

Municipal Bonds: Example (1 of 2)

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%.

Municipal Bonds: Example (2 of 2)

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):

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

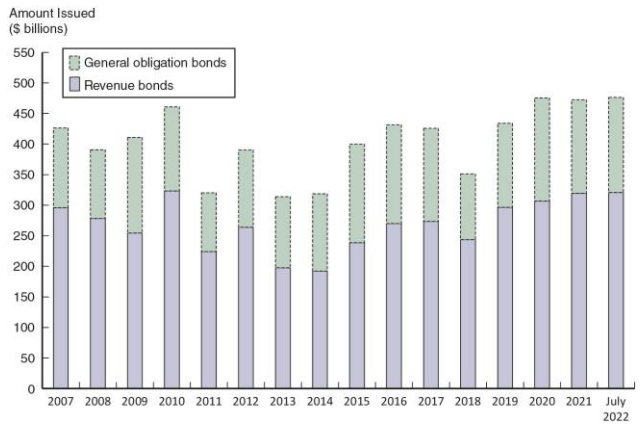
The ETFR = 3.36%. If the actual municipal-rate is above this (it is), choose the municipal.

Municipal Bonds (2 of 2)

- 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

Figure 12.4

Issuance of Revenue and General Obligation Bonds, 1984–2022 (End of Year)



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

Corporate Bonds (1 of 3)

- Typically have a face value of $1,000, although some have a face value of $5,000 or $10,000
- Pay interest semi-annually

Corporate Bonds (2 of 3)

- 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 (3 of 3)

- The degree of risk ranges from low-risk (AAA) to higher risk (BBB). Any bonds rated below BBB are considered sub-investment grade debt.

Figure 12.5

Corporate Bond Interest Rates, 1973–2022 (End of Year)

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

Characteristics of Corporate Bonds (1 of 2)

- Registered Bonds
  - Replaced “bearer” bonds
  - IRS 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

Characteristics of Corporate Bonds (2 of 2)

- Call Provisions
  - Higher required yield
  - Mechanism to adhere to a sinking fund provision
  - 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 (1 of 2)

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

Corporate Bonds: Characteristics of Corporate Bonds (2 of 2)

- 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

Table 12.2 (1 of 4)

Debt Rating Descriptions

Standard & Poor's	Moody's	Definition
AAA	Aaa	Best quality and highest rating. Capacity to pay interest and repay principal is extremely strong. Smallest degree of investment risk.
AA	Aa	High quality. Very strong capacity to pay interest and repay principal and differs from AAA/Aaa in a small degree.
A	A	Strong capacity to pay interest and repay principal. Possess many favorable investment attributes and are considered upper-medium-grade obligations. Somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions.

Table 12.2 (2 of 4)

Debt Rating Descriptions

Standard & Poor's	Moody's	Definition
BBB	Baa	Medium-grade obligations. Neither highly protected nor poorly secured. Adequate capacity to pay interest and repay principal. May lack long-term reliability and protective elements to secure interest and principal payments.
BB	Ba	Moderate ability to pay interest and repay principal. Have speculative elements and future cannot be considered well assured. Adverse business, economic, and financial conditions could lead to inability to meet financial obligations.
B	B	Lack characteristics of desirable investment. Assurance of interest and principal payments over long period of time may be small. Adverse conditions likely to impair ability to meet financial obligations.

Table 12.2 (3 of 4)

Debt Rating Descriptions

Standard & Poor's	Moody's	Definition
CCC	Caa	Poor standing. Identifiable vulnerability to default and dependent on favorable business, economic, and financial conditions to meet timely payment of interest and repayment of principal.
CC	Ca	Represent obligations that are speculative to a high degree. Issues often default and have other marked shortcomings.
C	C	Lowest-rated class of bonds. Have extremely poor prospects of attaining any real investment standard. May be used to cover a situation where bankruptcy petition has been filed, but debt service payments are continued.

Table 12.2 (4 of 4)

Debt Rating Descriptions

Standard & Poor's	Moody's	Definition
CI	Caa	Reserved for income bonds on which no interest is being paid.
D	Ca	Payment default.
NR		No public rating has been requested.
(+) or (–)	C	Ratings from AA to CCC may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories.

Financial Guarantees for Bonds (1 of 2)

- 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.

Financial Guarantees for Bonds (2 of 2)

- As it turns out, not all guarantees actually make sense!
  - In 1995, JPMorgan created the credit default swap (CDS), a type of insurance on bonds.
  - In 2000, Congress removed CDSs from any oversight.
  - By 2008, the CDS market was over $62 trillion!
  - 2008 losses on mortgages lead to huge payouts on this insurance.

Oversight of the Bond Markets

- Bond trades are not available to the public, making trading less transparent.
- TRACE, under FINRA, was developed to:
  - Make some bond transactions reported to the public
  - Develop a trading platform to make transaction data available to the public

Table 12.3 (1 of 4)

Sample Violations in the Bond Market

Violation	Fine
Excessive trading	$5,000 to $110,000
Excessive markups	$5,000 to $146,000
Failure to supervise	$5,000 to $73,000
Fraud/Misrepresentation	$2,500 to $146,000
Late reporting	$5,000 to $146,000
Net capital deficiencies	$1,000 to $73,000
Outside business activities	$2,500 to $73,000
Recordkeeping violations	$1,000 to $146,000
Sale of unregistered securities	$2,500 to $73,000
Unsuitable recommendations	$2,500 to $110,000

Current 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.

Table 12.3 (2 of 4)

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 is synonymous with par value.

Table 12.3 (3 of 4)

Bond Terminology

Term	Definition
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 similar risk and maturity. The market rate is used to value bonds.

Table 12.3 (4 of 4)

Bond Terminology

Term	Definition
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 (1 of 2)

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 (2 of 2)

Solution:

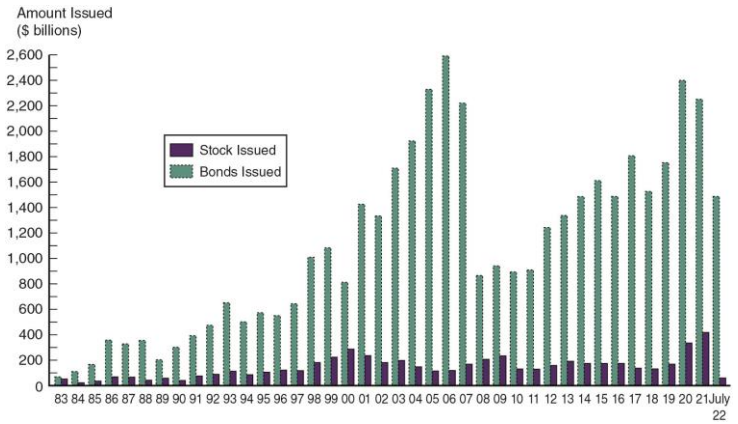
1. Identify the cash flows:
   - $50 is received every six months in interest
   - $1000 is received in two years as principal repayment
2. Find the present value of the cash flows (calculator solution):
   - $N = 4$, $FV = 1000$, $PMT = 50$, $I = 6$
   - Computer the PV. $PV = 965.35$

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: **price risk** and **interest rate risk**, which were covered in Chapter 3.

Figure 12.6

Bonds and Stocks Issued, 1983–2022



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

Chapter Summary (1 of 4)

- Purpose of the Capital Market: provide financing for long-term capital assets.
- Capital Market Participants: governments and corporations issue bond, and we buy them.
- Capital Market Trading: primary and secondary markets exist for most securities of governments and corporations.

Chapter Summary (2 of 4)

- Types of Bonds: includes Treasury, municipal, and corporate bonds.
- Treasury Notes and Bonds: issued and backed by the full faith and credit of the U.S. Federal government.
- Municipal Bonds: issued by state and local governments, tax-exempt, defaultable.

Chapter Summary (3 of 4)

- Corporate Bonds: issued by corporations and have a wide range of features and risk.
- Financial Guarantees for Bonds: bond “insurance” should the issuer default.
- Oversight of the Bond Markets: TRACE developed to add transparency to bond markets.

Chapter Summary (4 of 4)

- Bond Current Yield Calculation: how to calculate the current yield for a bond.
- Finding the Value of Coupon Bonds: determining the cash flows and discounting back to the present at an appropriate discount rate.
- Investing in Bonds: most popular alternative to investing in the stock market for long-term investments.

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