Chapter

19

Government Bonds

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Government Bonds

- Our goal in this chapter is to examine the securities issued by federal, state, and local governments.
- Together, these securities represent more than $6 trillion of outstanding debt.

Government Bond Basics, I.

- In 2007, the gross public debt of the U.S. government was more than $5 trillion, making it the largest single borrower in the world.
- The U.S. Treasury finances government debt by issuing **marketable** as well as **non-marketable** securities.
- Municipal government debt is also a large debt market.
  - In the U.S., there are more than 85,000 state and local governments.
  - Together, they contribute about $2 trillion of outstanding debt.

Government Bond Basics, II.

- **Marketable** securities can be traded among investors.
- **Marketable** securities issued by the U.S. Government include T-bills, T-notes, and T-bonds.
- **Non-marketable** securities must be **redeemed** by the issuer.
- **Non-marketable** securities include U.S. Savings Bonds, Government Account Series, and State and Local Government Series.

U.S. Treasury Bills (T-bills)

- T-bills are Short-term obligations with maturities of 13, 26, or 52 weeks (when issued).
- T-bills pay only their *face value* (or redemption value) at maturity.
- Face value denominations for T-bills are as small as $1,000.
- T-bills are sold on a *discount basis* (the discount represents the *imputed interest* on the bill).

U.S. Treasury Notes (T-notes)

- T-notes are medium-term obligations, usually with maturities of 2, 5, or 10 years (when issued).
- T-notes pay semiannual coupons (at a fixed coupon rate) in addition to their face value (at maturity).
- T-notes have face value denominations as small as $1,000.

U.S. Treasury Bonds (T-bonds)

- T-bonds are long-term obligations with maturities of more than 10 years (when issued).
- T-bonds pay semiannual coupons (at a fixed coupon rate) in addition to their face value (at maturity).
- T-bonds have face value denominations as small as $1,000.

U.S. Treasury STRIPS

- *STRIPS: Separate Trading of Registered Interest and Principal of Securities*
- STRIPS were originally derived from 10-year T-notes and 30-year T-bonds
  - A 30-year T-bond can be separated into 61 strips - 60 semiannual coupons + a single face value payment
- STRIPS are effectively zero coupon bonds (zeroes).
- The YTM of a STRIP is the interest rates the investors will receive if the STRIP is held until maturity.

Example: Calculating the Price of a STRIPS

- What is the price of a STRIPS maturing in 20 years with a face value of $10,000 and a semiannual YTM of 7.5%?
- The STRIPS price is calculated as the present value of a single cash flow. That is,

$$\text{STRIPS PRICE} = \frac{\$10{,}000}{(1+.075/2)^{40}} = \$2{,}293.38$$

Treasury Bond and Note Prices

- When a callable T-bond has a price above par, the reported yield is a *yield to call (YTC)*. Since 1985 however, the Treasury has issued only non-callable bonds.
- Because T-bonds and notes pay semiannual coupons, bond yields are stated on a semiannual basis.
- The relationship between the price of a note or bond and its YTM was discussed in a previous Chapter (Bond Prices and Yields).

Inflation-Indexed Treasury Securities, I.

- In recent years, the U.S. Treasury has issued securities that guarantee a fixed rate of return in excess of realized inflation rates.
- These **inflation-indexed** U.S. Treasury securities:
  - Pay a fixed coupon rate on their current principal, and
  - Adjust their principal semiannually according to the most recent inflation rate

U.S. Treasury, General Auction Pattern

- The Federal Reserve Bank conducts regularly scheduled auctions for T-bills, notes, and bonds.
- 4-week, 13-week, and 26-week T-bills are auctioned weekly.
- 2-year T-notes are auctioned monthly.
- 5-year and 10-year T-note auctions occur about four times per year for each maturity.
- The U.S. Treasury posts auction FAQs, results, and other details at: www.treasurydirect.gov

U.S. Treasury Auctions, Details

- At each Treasury auction, the Federal Reserve accepts sealed bids of two types.
  1. **Competitive** bids specify a bid price/yield and a bid quantity. Such bids can only be submitted by Treasury securities dealers.
  2. **Noncompetitive bids** specify only a bid quantity, and may be submitted by individual investors.
- The price and yield of the issue is determined by the results of the competitive auction process.

U.S. Treasury Auctions, More Details

- All noncompetitive bids are accepted automatically and are subtracted from the total issue amount.
- Then, a ***stop-out bid*** is determined. This is the price at which all competitive bids are sufficient to finance the remaining amount.
- Since 1998, all U.S. Treasury auctions have been single-price auctions in which all accepted bids pay the stop-out bid.

U.S. Savings Bonds, I.

- The U.S. Treasury offers an investment opportunity for individual investors by issuing two types of Savings Bonds:
- ***Series EE Savings Bonds:***
  - Have face value denominations ranging from $50 to $10,000,
  - **Are sold at exactly half the face value**.
  - Treasury guarantees the bond will double in value in no more than twenty years
    - Fixed interest rate (known at time of purchase)
    - Earn interest for up to thirty years
    - Accrue interest semiannually
    - Must be held at least one year
    - 3-month interest penalty if held for less than 5 years

U.S. Savings Bonds, II.

- ***Series I Savings Bonds:***
  - Have face value denominations ranging from $50 to $10,000.
  - **Are sold at face value.**
  - Earn interest for up to thirty years
  - Accrue interest semiannually (the interest rate is set at a fixed rate plus the recent inflation rate), and
  - Can be redeemed after 12 months
  - At redemption, the investor receives the original price plus interest earned
  - But, investors redeeming Series I bonds within the first 5 years of purchase incur a three-month earnings penalty

Federal Government Agency Securities

- Most U.S. government agencies consolidate their borrowing through the Federal Financing Bank, which obtains funds directly from the U.S. Treasury.
- However, several federal agencies are authorized to issue securities directly to the public. Examples include:
  - The Resolution Trust Funding Corporation
  - The World Bank
  - The Tennessee Valley Authority

Federal Government Agency Securities

- Bonds issued by U.S. government agencies share an almost equal credit quality with U.S. Treasury issues.
- They are attractive in that they offer higher yields than comparable U.S. Treasury securities.
- However, the market for agency debt is less active than the market for U.S. Treasury debt.
  - Compared to T-bonds, agency bonds have a wider bid-ask spread.

Municipal Bonds

- Municipal notes and bonds, or ***munis***, are intermediate- to long-term interest-bearing obligations of state and local governments, or agencies of those governments.
- Because their coupon interest is usually exempt from federal income tax, the market for municipal debt is commonly called the ***tax-exempt market***.

Municipal Bonds

- The federal income tax exemption makes municipal bonds attractive to investors in the highest income tax brackets.
- However, yields on municipal debt are less than yields on corporate debt with similar features and credit quality.
- The risk of default is also real despite their usually-high credit ratings.

Municipal Bond Features

- Municipal bonds:
  - Are typically callable.
  - Pay semiannual coupons.
  - Have a par value denomination of $5,000.
  - Have prices that are stated as a percentage of par value (though municipal bond dealers commonly use yield quotes in their trading procedures).
  - Are commonly issued with a serial maturity structure (hence the term *serial bonds,* versus *term bonds*).
  - May be putable, or have variable interest rates, or both (*variable-rate demand obligation, VRDO*), and
  - May be strippable (hence creating *muni-strips*).

Types of Municipal Bonds

- Bonds issued by a municipality that are secured by the full faith and credit (general taxing powers) of the issuer are known as *general obligation bonds (GOs)*.
- Municipal bonds secured by revenues collected from a specific project or projects are called *revenue bonds*.
  - Example: Airport and seaport development bonds that are secured by user fees and lease revenues.
- *Hybrid bonds* are municipal bonds secured by project revenues with some form of general obligation credit guarantees.
  - A common form of hybrid is the *moral obligation bond*.

Municipal Bond Credit Ratings

TABLE 19.3 Municipal Bond Credit Ratings

Rating Agency			
Standard & Poor's	**Moody's**	**Fitch**	**Credit Rating Description**
	Investment-Grade Bond Ratings		
AAA	Aaa	AAA	Highest credit quality
AA	Aa	AA	High credit quality
A	A	A	Good credit quality
BBB	Baa	BBB	Satisfactory credit quality
	Speculative-Grade Bond Ratings		
BB	Ba	BB	Speculative credit quality
B	B	B	Highly speculative quality
CCC	Caa	CCC	Poor credit quality
CC	Ca	CC	Probable default
	Extremely Speculative-Grade Bond Ratings		
C	C	C	Imminent default
D		DDD	In default
		DD, D	

Municipal Bond Insurance

- Insured municipal bonds, besides being secured by the issuer's resources, are also backed by an insurance policy written by a commercial insurance company.
- With bond insurance, the credit quality of the bond issue is additionally determined by the financial strength of the insurance company.

Equivalent Taxable Yield

- Suppose you are trying to decide whether to buy:
  - A corporate bond paying annual coupon interest of 8%, or
  - A municipal bond paying annual coupon interest of 5%
- How do you decide?
  - If the purchase was for a **tax-exempt** retirement account, the corporate bond is preferred because the coupon is higher.
  - But, if the purchase is not tax-exempt, the decision should be made on an **after-tax basis**.
  - That is, you must calculate an **equivalent taxable yield** **or** you must calculate an **aftertax yield**

$$\text{Equivalent Taxable Yield} = \frac{\text{Tax Exempt Yield}}{1 - \text{Marginal Tax Rate}}$$

$$\text{Aftertax yield} = \text{Taxable Yield} \times (1 - \text{Marginal Tax Rate})$$

Taxable Municipal Bonds

- The Tax Reform Act of 1986 imposed notable restrictions on the types of municipal bonds that qualify for federal tax exemption of interest payments.
- In particular, the act expanded the definition of *private activity bonds*, which are taxable municipal bonds used to finance facilities used by private businesses.
  - The yields on such bonds are often similar to the yields on corporate bonds.