

FIN 300

Bonds

Lecture 6

TOPICS COVERED

- Bonds
- Bond Valuation
- Yield to Maturity
- Current Yield
- Zero Coupon Bonds
- Additional Features of Bonds
- Term Structure of Interest Rates

BONDS

- Debt securities
- Large sums of money raised
- Promise to pay specified amounts at specified times
- Maturity describes the lifetime of the bond

- Asset that entitles the owner to specified cash flows at specified times
 - Coupon Payments
 - Face Value
- Coupon Rate

$$\text{Coupon Rate} = \frac{\text{Annual Coupon}}{\text{Face Value}}$$

BOND VALUATION

$$\text{Bond Value} = \text{Coupon} \times \left\{ \frac{1 - [1/(1 + r)^t]}{R} \right\} \\ + \frac{\text{Face Value}}{(1 + R)^t}$$

EXAMPLE

A bond matures in 8 years with annual payments of \$100. If the interest rate is 5%, how much is the bond worth?

$$\begin{aligned} \text{Bond Value} &= \$100 \times \left\{ \frac{1 - [1/(1 + 0.05)^8]}{0.05} \right\} \\ &\quad + \frac{1,000}{(1 + 0.05)^8} \\ &= \$1,323.16 \end{aligned}$$

YIELD TO MATURITY

- We can observe the bond's price
- The cash flows are predetermined
- We can infer a rate of return
Yield to Maturity (YTM)

$$\text{Price} = \text{Coupon} \times \left\{ \frac{1 - [1/(1 + YTM)^t]}{YTM} \right\} + \frac{\text{Face Value}}{(1 + YTM)^t}$$

We need a financial calculator to find YTM

CURRENT YIELD

- Not to be confused with YTM

- $$\text{Current Yield} = \frac{\text{Coupon Payment}}{\text{Current Price}}$$

- Example: $\text{Price} = \$980$ and $\text{Coupon} = \$50$
 $\text{Current Yield} = ?$

$$\text{Current Yield} = \frac{\$50}{\$980} = 5.1\%$$

ZERO COUPON BONDS

- Coupon payment size varies
- Some bonds even have adjustable rate coupons
- Zero Coupon Bonds have no coupon

$$Value_{Zero\ Coupon} = \frac{\text{Face Value}}{(1 + R)^t}$$

$$YTM = \left(\frac{\text{Face Value}}{Price_{Zero\ Coupon}} \right)^{1/t} - 1$$

ADDITIONAL FEATURES OF BONDS

Callable Bonds

- Can be redeemed before maturity [issuer's option]
Call Premium: $\text{Call Price} - \text{Stated Value}$
- Call provision not always active
- Deferred Call provision temporarily gives call protection

Debt Covenants

- There is an agency problem with debt
Who bears this cost?
- Covenants limit this problem
 - Explicitly prohibit activity
 - Leverage
 - Dividend Increases
- Not always good -- this could limit opportunities

Default Risk

- Default is a possibility with debt
- Ratings agencies monitor the quality of debt
 - S&P, Moody's
- A **Credit Default SWAP**
 - Traded asset in another market
 - Pays owner in event of a default

Other Factors

- Default risk premium
- Liquidity premium
- Taxability premium
 - Municipal bonds exempt [conditions apply]
- Term structure of interest rates

TERM STRUCTURE OF INTEREST RATES

- The relation between interest rates and debt maturity
- Real rate of interest
- Inflation premium
- Interest rate risk premium

See WSJ's "Understanding the Yield Curve"

RECAP:

DETERMINANTS BOND YIELDS AND INTEREST RATES

- Real rate of interest
- Inflation
- Interest rate risk
- Default risk
- Taxability
- Illiquidity

SUMMARY

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