

Chapter 7 Notes

The Bond Market

Treasury Bonds are issued by the government. They are considered the "safest investments", but their prices decline if interest rates increase. This decline in price in times of high interest is especially true for longterm Treasury bonds. They can do well and poorly, losing 15% in 2009 and gaining 27% in 2011.

Treasury Bonds

- Safest investment
- Issued and backed by US Govt
- Cannot be defaulted on, but typically have low yields

Corporate Bonds

- Callable bonds
- Issuers can default on them
- Typically have higher Yields
 - Stronger than treasuries during boom times
 - A rise in corporate defaults in bust times declines bond prices

Strategies for Bond Trading

1. **Watch out for Defaults** among low-rated bonds, especially in niche markets like municipal government bonds (often bought for their tax-exempt status when bought with taxable dollars), and growth company bonds
2. **Limit your Rate Risk**, in bad times (the cheapest times to buy bonds) interest rates are often low, however as interest rates increase during economic recovery, the value of the bonds decreases. The longer the maturity of the bond, the harder you're hit by this phenomena
3. **Consider a Passive Strategy** Don't trade with an active broker who's picking "winning" bonds, no one knows exactly what will go up and down so invest in bond ETF's
4. **Hedge Against Inflation** by investing in Treasury Securities which are tied directly to inflation
5. **Don't Try to Time the Market** Time in the market is better than 'timing' the market. Long term growth beats "record gains"... especially in the bond market.

Bonds

Bonds are long-term contracts where borrowers pay interest and principal on specific dates to the bond holder. They are issued by governments and corporations who are looking for long-term debt capital.

Bond Groups

- **Treasury Bonds** which are issued by the federal government
- **Corporate Bonds** are issued by business firms, and expose the bondholder to default risk, but compensate with higher returns
- **Municipal Bonds** are issued by state and local governments, which still have default risk, but the interest earned on the municipal bonds are exempt from federal taxes, and state taxes if the bondholder is a resident of that state. This gives investors a considerably lower market interest rate
- **Foreign Bonds** which are issued by a foreign government or corporation
 - If they are in another currency than that of the investors home country, the conversion rate also plays a factor in the bond valuations, adding another variable
 - This means investors can lose money even without a default if the currency of the foreign country declines in value

Bond Terms

- **Par Value** the face value of a bond (arbitrary, usually \$1000)
- **Coupon Payment** is the amount of money the issuer needs to pay each year
- **Coupon Interest Rate** $\text{Coupon Payment} / \text{Par Value}$
- **Fixed Rate Bonds** have steady Coupon Payments throughout their lifetimes
- **Floating-rate Bonds** set an initial rate for a period which is adjusted every 6 months based on some open market rate (Adjusted to equal Treasury bond rate + x%)
- **Zero Coupon Bonds** pay no coupons but are able to be bought below their par value
- **Original Issue Discount (OID) Bond** a bond originally offered at a price significantly below its par value
- **Maturity date** is the time when the par value must be repaid
- **Original Maturity** the maturity at the time the bond is issued
- **Call Provisions** give the issuer the right to call the bonds and pay them at some amount greater than the par value
 - **Call Premium** the extra amount over par value an issuer needs to pay to make a call
 - **Deferred call** is a bond which cannot be called immediately at issue, and is said to have *call protection*
 - Companies Typically only Recall Bonds if interest rates have declined significantly since their issue
 - **Refunding Operation** a move after interest rates drop where a company issues new current bonds (taking advantage of the low interest rate) and then uses that money to buy off the old bondholders with a call
 - **Sinking Fund Provision** is a provision that requires a partial call of the issue each year, making sure that the company actually can afford to have outstanding bonds

- **Call for redemption** would be exercising the Sinking Fund Provision by buying back the bonds at par value from their bondholders, typically chosen if interest rates have fallen since the bond was issued
- A company can also choose to buy these bonds on the open market if they are cheaper there, typically chosen if interest rates have risen
- Provision is bad for investors if coupon rate is higher than current market rate (interest rates have fallen)
- Bonds that have sinking funds are regarded as safer, so have lower coupon rates at issue
- **Convertible Bond** bonds *exchangeable* into shares of common stock at a fixed price at the option of the bondholder
 - Good for investors if stock price increases
 - Lower coupon rate than similar non-convertible bonds
- **Warrants** bonds which give the bondholder the option to *buy* stock for a stated price
 - Good for investors if stock price increases
 - Lower coupon rate than similar non-warrant bonds
- **Puttable Bonds** Allow Bondholders to require a company to pay off their debts in advance (inverse calls)
 - If interest rates increase, investors will put their low interest bonds to the company, and buy new higher interest bonds
- **Income Bond** pays interest only if the issuer has earned enough money to pay the interest
 - makes it impossible for a bond to bankrupt a company
 - Considered riskier to investors
- **Indexed Bond** interest rate is based on an inflation index like the CPI and the interest paid rises automatically with inflation
 - Protects investors against inflation
 - U.S. Treasury is main issuer of these types of bonds

Bond Valuation

$$\text{Bond's Value} = V_B = \sum_{t=1}^N \frac{INT}{(1+r_d)^t} + \frac{M}{(1+r_d)^N}$$

- PV - Current Value
- N - Number of years
- r_d = I/YR- Market Interest Rate
- PMT - Coupon Value
- FV=M- Maturity Value

If interest rates rise and the going rate is above the coupon rate, a fixed rate bond's price will be below its par value. These bonds are called **Discount Bonds**

If interest rates fall and the going rate is below the coupon rate, a fixed rate bond's price will rise above its par value. These bonds are called **Premium Bonds**

Bond Yields

Yield to Maturity - Calculating the yield guaranteed by the bond until the maturity date

$$V_B = \sum_{t=1}^N \frac{INT}{(1+r_d)^t} + \frac{M}{(1+r_d)^N}$$

Solve this equation for r_d

This equals an investor's *promised rate of return* however, it only equals an investor's *expected rate of return* when the probability of default is 0 and the bond cannot be called

Yield to Call - Calculating the yield guaranteed by the bond until the end of the wait period (the first date the company can call)

$$V_B = \sum_{t=1}^N \frac{INT}{(1+r_d)^t} + \frac{CallPrice}{(1+r_d)^N}$$

Bond Values over time

New issues typically trade very close to market value, while *seasoned issues* can vary widely from par depending on their interest rates. They all eventually approach their par values over time.

Bonds with Semi-Annual Coupons

$$V_B = \sum_{t=1}^{2N} \frac{INT}{(1+(r_d/2))^t} + \frac{M}{(1+(r_d/2))^{2N}}$$

Riskiness of a Bond

The risk of a decline in bond values due to an increase in interest rates is called **price risk (or interest rate risk)**. Price risk is higher on bonds with *longer* maturities than bonds that mature sooner, since they have a risk associated with them for longer. The longer until a bond's maturity, the more its price changes in response to a change in interest rates.

If interest rates fall, it's possible for bond investors to be affected even if their portfolios increase in value. If the bonds mature or are called, the investor now must invest at the much lower interest rates. This difference between previous bond rates and potentially lower rates is called **reinvestment risk**.

A portfolio of bonds has a balance of reinvestment risk from bonds that mature very soon, to higher price risk for bonds that mature far in the future. How much risk you want to take, and what type of risk you will be more prepared for, is determined by your **investor horizon**. To measure and balance the maturity and coupon, analysts use **duration**, which is a weighted average of the time it takes to receive each of the bond's cashflows.

Default risk is the risk an investor faces of an issuer defaulting. Default risk on treasuries is 0, but higher for corporate and municipal bonds. Bonds with higher default risks have higher market rates.

Corporate Bonds

- **Mortgage Bonds** are bonds which are backed by some assets as collateral for the bond
- **Second Mortgage Bonds** are bonds in which the collateral for the bond was bought with funds that still have a mortgage on them
- **Indenture** is a legal document that details the rights of bondholders and the corporation
- **Debenture** is an unsecured bond with no collateral
- **Subordinated Debentures** are unsecured bonds which in the event of bankruptcy get paid after all other Senior Debt (usually bank loans, non-subordinated bond holders, etc)

Bond Rating Scale

- AAA - Extremely Safe
- AA - Extremely safe
- A - Investment Grade Bond
- BBB - Investment Grade Bond
- BB & Below - Speculative Grade Bonds (junk bonds)

How Agencies Rate Bonds

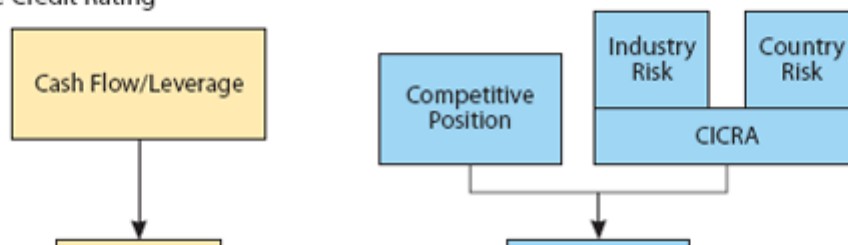
1. Financial Ratios - All ratios are important, but specifically those related to financial risk
2. Qualitative Factors: Bond Contract Terms - A bond can have any number of types of risk, each with different factors that affect this risk and different populations who are more susceptible to this type of risk. Bonds can be secured by mortgages, have cosigners, and have stipulations like a firm cannot increase a debt ratio or keep its times earned interest level above a certain threshold
3. Miscellaneous Qualitative Factors - Strength of the Economy, firms growth prospects, labor problems, CEO, mission and potential environmental or antitrust problems.

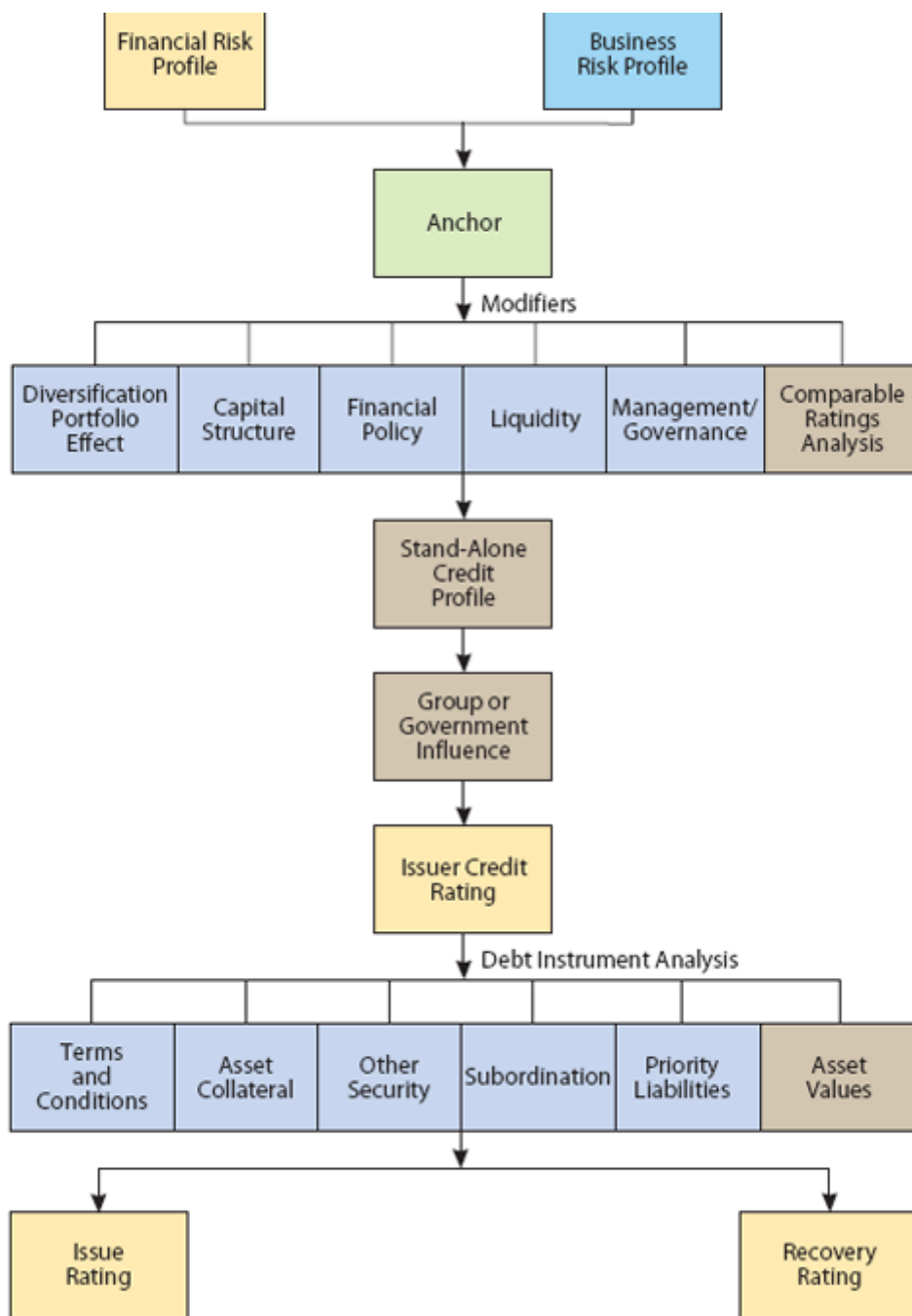
Panel a: Combining the Business and Financial Risk Profiles to Determine the Anchor

Business Risk Profile	Financial Risk Profile					
	Minimal	Modest	Intermediate	Significant	Aggressive	Highly Leveraged
Excellent	AAA/AA+	AA	A+/A	A-	BBB	BBB-/BB+
Strong	AA/AA-	A+/A	A-/BBB+	BBB	BB+	BB
Satisfactory	A/A-	BBB+	BBB/BBB-	BBB-/BB+	BB	B+
Fair	BBB/BBB-	BBB-	BB+	BB	BB-	B
Weak	BB+	BB+	BB	BB-	B+	B/B-
Vulnerable	BB-	BB-	BB-/B+	B+	B	B-

Panel b: Issuer and Issue Credit Rating

Issuer and Issue Credit Rating





The Higher a Bond is rated, the easier it will be for that company to gain access to capital and issue new bonds. If its bonds drop below BBB, then it is no longer open to institutional and individual investors, and has become a speculative bond, making it harder for the organization to raise money.

Accured Interste = Coupon Payment * (days since last coupon paymetn/number of days in coupon period)