Everything You Wanted to Know About Bonds and Their Value

What are bonds?

- Yost Rocks, Inc. wants to borrow money, and it decides to issue bonds. Each bondholder lends the firm money today for 30 years at 12 percent interest. Yost Rocks pays each bondholder $120 per year and returns the principal ($1,000) back to the bondholder at the end of the 30 years.

Bond Terms

- *Coupon*: The stated interest payment made on a bond.
- *Face Value*: The principal amount of a bond that is repaid at the end of the term. Also called _____.
- *Coupon Rate*: The _____ coupon divided by the face value of a bond.

More Bond Terms

- *Maturity*: Specific date on which the principal amount of a bond (i.e., the face value) is repaid.
- *Yield to Maturity (YTM)*: The rate required in the **market** on the bond. Also called the yield. This will be the "r" we use to calculate price and is quoted as _____. This is often not the same as the coupon rate.

Calculating the Price of a Bond

- How do we calculate the price of a bond?
- The price of a bond is equal to the _____ _____ of the bond's _____ _____.

Pricing Coupon Bonds

- Tigers, Inc. decides to issue $1,000 bonds with 5 years to maturity. The coupon rate is 10 percent, paid annually. The yield to maturity is also 10%. What is the price of a Tigers, Inc. bond?

Pricing Coupon Bonds

Pricing Coupon Bonds

- Now, assume the yield to maturity (i.e., the market interest rates) rises to 12 percent. What is the price of the bond now?

Pricing Coupon Bonds

Pricing Coupon Bonds

- Now, assume the yield to maturity (i.e., the market interest rates) falls to 8 percent. What is the price of the bond now?

Pricing Coupon Bonds

Pricing Coupon Bonds

- Assume the yield to maturity is 10 percent. What is the price of the bond if the coupon payments were made semiannually?

Pricing Coupon Bonds

Calculating YTM

- You just purchased a DocYost, Inc. bond for $1,050. The bond has a $1,000 face value and an 8% coupon rate, paid semiannually. The bond matures in 10 ½ years. What is its yield to maturity?

Current Yield

- *Current Yield*: _____ coupon divided by current price.
- What it is:
- What it is not:

Another Example

- There are two $1,000 bonds identical in every way (i.e., same risk) except for their coupons and their prices. Both have 3 years to maturity and annual coupons. The first has an 8 percent coupon rate and sells for $974.69. What is its yield to maturity (YTM)?
- The second bond has a 10 percent coupon rate. If it has the same YTM as the first bond, what is its price?
- Which is better?

What about zero-coupon bonds?

- What are they?
- How do I calculate their price?
- What is the price of a zero-coupon bond that has a face value of $1,000 and matures in 10 years, if the YTM is 8%? Assume semiannual compounding.

Interest Rate Risk

- *Interest Rate Risk*: The risk of a change in the value of a bond because of a change in the interest rate.

1. Bond prices and market interest rates move in _____ directions.
2. All other things being equal, the longer the time to maturity, the _____ the interest rate risk.
3. All other things being equal, the lower the coupon rate, the _____ the interest rate risk.

Other Bond Pricing Truths

- When a bond's coupon rate is _____ than the YTM (market's required return), the bond's price (market value) will be greater than its par value.
- When a bond's coupon rate is _____ the YTM (market's required return), the bond's price (market value) will be equal to its par value.
- When a bond's coupon rate is _____ than the YTM (market's required return), the bond's price (market value) will be less than its par value.

The Term Structure of Interest Rates

- *Term Structure*: The relationship between interest rates and time-to-maturity of a debt security.

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- *Term Structure*: The relationship between interest rates and time-to-maturity of a debt security.
- Yield on Bonds
  - Real Interest Rate
  - Inflation Premium
  - Interest Rate Risk Premium
  - Default Risk Premium
  - Liquidity/Marketability Premium

Bond Features

- *Indenture*: The written agreement between the corporation and the lender detailing the terms of the debt issue.
- Terms of a Bond
- Security

Bond Features

- Seniority
- Repayment
  - Sinking Fund
- Call Provision
  - Call Premium
  - Yield-to-Call
- Protective Covenants

Bond Ratings

		Investment-Quality Bond Ratings				Low-Quality, Speculative, and/or "Junk" Bond Ratings					
		High Grade		Medium Grade		Low Grade		Very Low Grade			
Standard & Poor's		AAA	AA	A	BBB	BB	B	CCC	CC	C	D
Moody's		Aaa	Aa	A	Baa	Ba	B	Caa	Ca	C	
Moody's	**S&P**										
Aaa	AAA	Debt rated Aaa and AAA has the highest rating. Capacity to pay interest and principal is extremely strong.									
Aa	AA	Debt rated Aa and AA has a very strong capacity to pay interest and repay principal. Together with the highest rating, this group comprises the high-grade bond class.									
A	A	Debt rated A has a strong capacity to pay interest and repay principal, although it is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than debt in high-rated categories.									
Baa	BBB	Debt rated Baa and BBB is regarded as having an adequate capacity to pay interest and repay principal. Whereas it normally exhibits adequate protection parameters, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal for debt in this category than in higher-rated categories. These bonds are medium-grade obligations.									
Ba; B Caa Ca C	BB; B CCC CC C	Debt rated in these categories is regarded, on balance, as predominantly speculative with respect to capacity to pay interest and repay principal in accordance with the terms of the obligation. BB and Ba indicate the lowest degree of speculation, and Ca, CC, and C the highest degree of speculation. Although such debt is likely to have some quality and protective characteristics, these are outweighed by large uncertainties or major risk exposures to adverse conditions. Issues rated C by Moody's are typically in default.									
	D	Debt rated D is in default, and payment of interest and/or repayment of principal is in arrears.									

Note: At times, both Moody's and S&P use adjustments (called notches) to these ratings. S&P uses plus and minus signs: A+ is the strongest A rating and A− the weakest. Moody's uses a 1, 2, or 3 designation, with 1 being the highest.

Corporate Bond Reporting

FIGURE 7.3 Sample TRACE Bond Quotations

http://finra-markets.morningstar.com/BondCenter/

Most Active Investment Grade Bonds

Issuer Name	Symbol	Coupon	Maturity	Moody's/S&P/Fitch	High	Low	Last	Change	Yield%
GENERAL ELEC CAP CORP MEDIUM TERM NTS BO	GE3814218	2.450%	03/15/2017	A1/AA+/	103.72800	103.52300	103.72700	103.727000	1.185204
SAFEWAY INC	SWY.HE	6.350%	08/15/2017	Baa3/BBB/BBB-	116.25000	111.81300	115.50000	4.232000	1.674056
SAFEWAY INC	SWY.HH	3.950%	08/15/2020	Baa3/BBB/BBB-	103.91000	97.69000	101.75000	1.250000	3.641660
SAFEWAY INC	SWY.GN	7.250%	02/01/2031	Baa3/BBB/BBB-	97.50000	92.00000	94.37500	-2.125000	7.855853
SAFEWAY INC	SWY.AB	4.750%	12/01/2021	Baa3/BBB/BBB-	103.99500	100.00000	102.20400	1.204000	4.409059
BP CAP MKTS P L C	BP.JH	3.875%	03/10/2015	A2//A	103.63600	103.23800	103.63600	0.120000	0.212859
COOPERATIEVE CENTRALE RAIFFEISEN BOERENL	RABO4076456	5.750%	12/01/2043	A2//A+	107.15000	105.50900	106.48500	-0.187000	5.312953
APPLE INC	AAPL4001810	3.850%	05/04/2043	Aa1/AA+/	87.23470	85.10100	85.33800	-0.406000	4.788015
MAY DEPT STORES CO	M.BG	5.750%	07/15/2014	Baa2/BBB+/BBB	101.81470	101.80100	101.81470	-0.029300	0.427045
COMCAST CORP NEW	CMCS.HA	6.950%	08/15/2037	A3/A-/A-	128.32900	127.36600	127.36600	-0.948000	4.961015

Government Bond Reporting

FIGURE 7.4

Sample *Wall Street Journal* U.S. Treasury Note and Bond Prices

SOURCE: Table recreated with data from wsj.com March 7, 2014.

http://www.wsj.com

Treasury Notes and Bonds

Maturity	Coupon	Bid	Asked	Chg	Asked Yield
8/31/2017	1.875	102.8828	102.9141	−0.1563	1.019
5/15/2018	3.875	110.3125	110.3750	−0.3125	1.317
2/28/2019	1.375	98.6953	98.7109	−0.3516	1.646
2/29/2020	1.250	95.7734	95.8203	−0.3750	1.996
8/15/2021	8.125	140.1328	140.1797	−0.5234	2.231
11/15/2022	1.625	92.1563	92.2031	−0.4063	2.635
8/15/2023	2.500	98.0703	98.1328	−0.4453	2.726
2/15/2024	2.750	99.6094	99.6719	−0.4844	2.788
2/15/2026	6.000	130.2813	130.3594	−0.6875	2.962
8/15/2026	6.750	138.7500	138.8281	−0.7266	2.989
2/15/2027	6.625	137.9219	138.0000	−0.7422	3.048
8/15/2027	6.375	135.6875	135.7656	−0.7422	3.100
8/15/2028	5.500	126.2891	126.3672	−0.7422	3.204
11/15/2028	5.250	123.3828	123.4609	−0.7031	3.230
2/15/2029	5.250	123.3594	123.4375	−0.7031	3.256
8/15/2029	6.125	134.5156	134.5938	−0.7500	3.256
5/15/2030	6.250	136.8359	136.9141	−0.7813	3.289
2/15/2031	5.375	125.8984	125.9766	−0.7266	3.352

Differences Between Debt and Equity

- **Debt**
  - Not an ownership interest
  - Creditors do not have voting rights
  - Interest is considered a cost of doing business and is tax deductible
  - Creditors have legal recourse if interest or principal payments are missed
  - Excess debt can lead to financial distress and bankruptcy
- **Equity**
  - Ownership interest
  - Common stockholders vote for the board of directors and other issues
  - Dividends are not considered a cost of doing business and are not tax deductible
  - Dividends are not a liability of the firm and stockholders have no legal recourse if dividends are not paid
  - An all equity firm can not go bankrupt

Chapter 7 Suggested Problems

- Concepts Review and Critical Thinking Questions:
  - 1, 3, 6, and 8
- Questions and Problems:
  - 2, 3, 4, 5, 6, 18, 20, 21 (effective annual yield is the EAR), 22, 26, 29 (only parts A and B), and 32.

Example #1

- I just purchased a $1,000 zero-coupon bond that matures in 8 years. If the yield-to-maturity is 6.5%, how much did I pay?

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Example #2

- You are considering purchasing a $1,000 Alpha Corp. bond at par. The bond has a 10% coupon rate, paid semiannually, and matures in 4 years. What is its YTM?

Example #3

- Beta Enterprises is issuing 10 year bonds with a face value of $1,000. The coupon rate is 10%, paid semiannually. What is the price of the bond if the YTM is 8%?

Example #4

- Gamma Corporation bonds are selling for $1,386.09. They have a face value of $1,000 and a current yield of 7.2145%. If the YTM is 5%, interest is paid annually, and the bond has 10 years to maturity, what is the coupon rate?