

Bond Ratings and the Cost of Debt

Objective: The purpose of this assignment is to introduce you to how to calculate a synthetic bond rating and also the cost of debt. We will look at two companies in helping you to understand the interrelationship between the financial statements, financial ratios, bond ratings, the term structure of interest rates, and the cost of debt.

Companies:

Kodak (EK): The first company we will look at is Eastman Kodak (<http://www.kodak.com/>), the world's #1 maker of photographic film (ahead of Fuji Photo Film). The company is engaged primarily in developing, manufacturing and marketing imaging products and services. The Company operates in four segments: 1) Consumer Imaging, 2) Professional segment, 3) Health Imaging, and 4) Other



Imaging - motion picture film and microfilm equipment and media, printers, scanners, document imaging software and consumer digital cameras and media. Kodak has been cutting jobs and expenses, and selling noncore businesses (such as copiers) as a result of a slowdown in the consumer film market.

AMF (AMBW): The second firm that we will focus on is AMF Bowling, the largest operator of bowling centers in the world (<http://www.amf.com/>). Rapid expansion to become the biggest has resulted in massive debt and forced AMF into Chapter 11. In



addition to operating bowling alleys, AMF sells bowling center equipment to other bowling centers. The company also makes billiard tables and owns Michael Jordan Golf Company. Investment firm Goldman Sachs owns 53% of AMF. In July 2001, AMF Bowling, Inc. and its United States subsidiaries filed for reorganization under Chapter 11 of the United States Bankruptcy Code. On August 31, 2001, AMF announced that If confirmed, the plan of reorganization would provide the senior secured lenders with recovery of their approximately \$620 million in claims through a combination of equity, debt, and cash. Unsecured creditors would receive warrants to acquire 12% of the equity in the reorganized company. It is unlikely that holders of the common stock or the zero coupon convertible debentures of AMF Bowling, Inc. will receive any recovery in that proceeding.



Assignment: Download the fm_EK2002.xls data file from my website and use it to answer the following questions. Please do all calculations on the downloaded spreadsheet in the templates provided (fill in the **yellow** boxes).

1. Calculate the z-scores for Eastman Kodak for the trailing twelve months using the two versions of the Altman z-score model located in the Appendix to this handout (use the EK_10Q worksheet). Next, do the same calculations for each of the years in the 10K (use the EK_10K worksheet). (**Note:** If there is an “NA” for depreciation and amortization, assume that the cost of goods sold figure for Kodak includes depreciation and amortization). Graph your results. What is the bond rating for the most recent (6/30/2001) quarter using the first model (EM model)? If it is between two bond ratings, please give the range that it is between. What is the condition of Kodak’s financial health according to the Altman's original model (model 2)?

2. Calculate the interest coverage ratio (EBIT/Interest Expense) for Kodak for the trailing twelve months and also for each of the years in the 10K. Graph your results. What is the bond rating for the trailing twelve months using the information on your data worksheet?

3. Calculate the before tax and after tax cost of debt of Kodak for the trailing twelve months (TTM) using the implied bond rating from the EM model, the interest coverage approach, and the actual bond rating. The actual bond rating for Kodak as of September 6, 2001 is A2/A. Assume that Kodak's marginal tax rate is 35%. Use the 5-year and also the 10-year Treasury bonds as the benchmarks in calculating the cost of debt¹.

		5 Year Maturity		10 Year Maturity	
		Cost (k _D)	Cost (k _D)	Cost (k _D)	Cost (k _D)
		B4 Tax	After Tax	B4 Tax	After Tax
		TTM	TTM	TTM	TTM
Altman EM model					
Interest Coverage					
Actual bond rating (Moody's)	A2/A				

Please discuss how the actual bond rating compares to the imputed bond rating from using the Altman model and also the interest coverage approximation. Your discussion should include how the cost of debt varies with the bond rating and also the maturity. Be specific.

4. Calculate the z-score for AMF for the most recent 10K (12/31/2000) as well as the 1996 through 1999 periods using Altman’s EM model. When did AMF’s imputed credit rating change from speculative to default status?

Please turn in a hard copy of your work together with your disk. This is an individual project. Anyone caught cheating will be given an F on this project.

¹To see the rationale for using a 5-10 year time span please refer to the last page of this handout.

Appendix A: Altman Z-Score Model

There are several versions of the Altman z-score model. We will use two versions of his model. Professor Edward Altman of NYU developed these models using multiple discriminant analysis in conjunction with financial ratios to predict the probability of business failure leading to bankruptcy.

Model 1: The EM-score (emerging markets) model is defined as

$$\text{EM Score} = 3.25 + 6.56(X_1) + 3.26(X_2) + 6.72(X_3) + 1.05(X_4)$$

where X_1 = Working Capital/Total Assets = (Current Assets - Current Liabilities)/TA
 X_2 = Retained Earnings/Total Assets
 X_3 = EBIT/Total Assets
 X_4 = Book Value of Equity/Total Liabilities

Bond Rating	Altman Z-Score	Bond Rating	Altman Z-Score
AAA	8.15	BB+	5.25
AA+	7.60	BB	4.95
AA	7.30	BB-	4.75
AA-	7.00	B+	4.50
A+	6.85	B	4.15
A	6.65	B-	3.75
A-	6.40	CCC+	3.20
BBB+	6.25	CCC	2.50
BBB	5.85	CCC-	1.75
BBB-	5.65	D	0.00



Ed Altman, NYU

Model 2: This is the original version of Altman's model that is on the Bloomberg machine and websites such as <http://www.jaxworks.com/calc2.htm> as a worksheet.

$$Z = 1.21(Y_1) + 1.4(Y_2) + 3.3(Y_3) + .6(Y_4) + 1.0(Y_5)$$

where Y_1 = Working Capital/Total Assets
 Y_2 = Retained Earnings/Total Assets
 Y_3 = EBIT/Total Assets
 Y_4 = Book Value of Equity/Total Liabilities
 Y_5 = Sales/Total Assets

A Z-Score ≥ 2.99 indicates that the firm is solvent (e.g., is in good shape)

$1.81 \leq \text{Z-Score} \leq 2.99$ indicates a warning

Z-Score < 1.81 indicates that the firm could be heading towards bankruptcy

Note: The z-score represents a point in time. As such, the z-scores should be examined over time. Consistently low scores each year are more of a concern than a one time low score. The model is applicable to *manufacturing* firms.

Appendix B: Kodak's Debt Schedule from 10K

NOTE 6: LONG-TERM BORROWINGS

(in millions)

Description and Interest Rates of 2000 Borrowings	Maturity Dates of 2000 Borrowings	2000	1999
Notes:			
5.85% - 8.25%	2001 – 2005	\$473	\$272
9.20% - 9.95%	2003 – 2021	\$191	\$191
Debtentures:			
1.98% - 3.16%	2002 – 2004	\$ 61	\$122
Other:			
2.00% - 17.00%	2001 – 2010	\$591	\$353
		-----	-----
		1,316	938
Current maturities		(150)	(2)
		-----	-----
Total		\$1,166	\$936

Annual maturities (in millions) of long-term borrowings outstanding at December 31, 2000 are as follows: 2001: \$150; 2002: \$73; 2003: \$419; 2004: \$366; 2005: \$260; and 2006 and beyond: \$48.

The Company has a shelf registration statement for debt securities with an available balance of \$1.9 billion.