

Homework and Suggested Example Problems
Investment Valuation – Damodaran

Lecture 2 – Estimating the Cost of Capital

Lecture 2 begins with a discussion of alternative discounted cash flow models, including the Free Cash Flow to Equity (FCFE) model and the Free Cash Flow to the Firm (FCFF) model. During the semester, we will cover both the estimation of model inputs, such as the cost of capital, future cash flows, and growth, and the practical application of each model to real world companies.

In this lecture, we will focus on the cost of capital and the inputs that are required to estimate it. We will begin by talking about the CAPM and alternative models for estimating the cost of equity financing. This discussion will include practical issues related to the estimation of the risk-free rate, the market risk premium, and the Beta for the firm. We will then discuss the weighted average cost of capital (WACC) and its practical application.

In-Class Discussion Problems:

Complete the problems on the attached pages and be prepared to discuss your solutions in class.

Additional Suggested Problems:

The following suggested problems will serve as additional examples related to our class material and should give you a basic idea of the topics that I want to emphasize from the text. The solutions to these problems are available on the class web site.

Chapter	Topic	Suggested Problems
7	Riskless Rates and Risk Premiums	1, 2, 7, 8, 9, 10
8	Estimating Risk Parameters and Costs of Financing	3, 6, 10, 19, 22, 24

5. Cost of Capital for Nike:

In this problem, you will calculate the cost of equity and weighted average cost of capital for Nike as of May 31, 2009. Be sure to explain any assumptions you make to arrive at your answers.

- a. Collect monthly return data for both Nike and the S&P 500 Index for the 60-month period ending in May 2009. Using this data, estimate the Beta for Nike based on a market model (CAPM) regression. Using this Beta estimate, calculate the cost of equity (K_e) for Nike based on the CAPM model. Note that you must choose an appropriate risk-free rate and market risk premium to use in the CAPM equation. Briefly explain your choice for each of these variables.

- b. Estimate the market value of debt and the market value of equity for Nike as of May 31, 2009. Use the firm's A+ rating and the default spreads provided in the course notes to estimate the firm's cost of debt (K_d). Using these estimates and your answer to (a), calculate the weighted average cost of capital (WACC) for Nike. Assume a marginal tax rate of 40%.

6. Synthetic Debt Ratings:

- a. The following information was taken from the income statement and balance sheet of a real firm. Use this information to calculate the EBITDA-to-interest ratio, the Debt-to-EBITDA ratio, the Debt-to-Capital ratio, and the Return on Capital. Based on the values you calculate, use the S&P Ratings Guide on the attached page to estimate a synthetic debt rating for this firm.

EBIT = \$7,242

EBITDA = \$8,944

Interest Expense = \$696

Total Debt = \$13,430

Stockholder's Equity = \$17,714

Tax Rate = 36.4%

- b. The firm described above has significant operating leases. The notes to the financial statements show that the firm's operating lease expenses during the period were \$958, of which \$340 is estimated to be interest expense. In addition, you calculate the debt value of operating leases to be \$5,919. Recalculate the ratios above incorporating this new information. Based on these corrected values, use the S&P Ratings Guide to estimate a revised synthetic debt rating for this firm.

Credit Rating Reference Guide

S&P Credit Statistics, S&P / Moody's Comparison, Short-Term Credit Ratings F:\Rewards Network\2005\09-09\DTDP\IRN - Convert Pricing.xls\Sheet1

		Primary Credit Statistics			Other Information			
		EBITDA/ Interest	Total Debt/ EBITDA	Total Debt/ Total Cap.	Return on Capital	FFO/ Total Debt	FOCF/ Total Debt	L-T Debt/ Total Cap.
AAA	Upper Quartile	35.1x	0.4x	13.1%	44.1%	204.3%	127.3%	13.1%
	Mean	27.5x	0.3x	6.7%	31.7%	169.3%	110.0%	6.7%
	Median	27.0x	0.2x	6.5%	27.9%	197.7%	111.4%	6.5%
	Lower Quartile	21.6x	--	--	22.7%	148.6%	93.4%	--
AA	Upper Quartile	31.7x	1.3x	51.7%	33.1%	102.2%	60.1%	51.7%
	Mean	46.7x	1.1x	34.0%	27.6%	174.9%	151.4%	34.0%
	Median	17.7x	0.9x	30.6%	27.6%	89.2%	52.9%	30.6%
	Lower Quartile	16.6x	0.6x	19.2%	21.4%	54.8%	42.3%	19.2%
A	Upper Quartile	15.9x	2.3x	48.2%	23.1%	65.5%	42.3%	48.2%
	Mean	16.4x	1.9x	40.1%	19.5%	76.7%	43.1%	40.1%
	Median	10.2x	1.7x	38.0%	16.9%	45.9%	26.3%	38.0%
	Lower Quartile	7.1x	1.2x	27.8%	11.8%	33.6%	14.2%	27.8%
BBB	Upper Quartile	9.1x	3.2x	53.9%	17.5%	50.4%	29.2%	53.9%
	Mean	8.1x	2.7x	44.3%	14.4%	49.8%	27.0%	44.3%
	Median	5.9x	2.3x	43.1%	13.1%	36.3%	17.4%	43.1%
	Lower Quartile	4.4x	1.7x	32.8%	9.1%	23.7%	8.9%	32.8%
BB	Upper Quartile	5.7x	4.9x	68.9%	15.6%	32.7%	16.6%	68.9%
	Mean	8.2x	4.1x	57.1%	11.6%	33.9%	15.8%	57.1%
	Median	3.3x	3.6x	55.4%	10.8%	21.1%	9.9%	55.4%
	Lower Quartile	2.5x	2.5x	43.6%	7.0%	13.9%	2.2%	43.6%
B	Upper Quartile	2.7x	7.3x	100.3%	12.9%	17.8%	8.9%	100.3%
	Mean	2.1x	7.9x	82.4%	7.7%	14.4%	(3.0%)	82.4%
	Median	1.9x	5.2x	77.5%	7.6%	10.9%	3.2%	77.5%
	Lower Quartile	1.3x	3.7x	57.0%	3.2%	5.1%	(4.7%)	57.0%
CCC	Upper Quartile	1.4x	11.0x	149.1%	13.3%	7.2%	3.1%	149.1%
	Mean	0.6x	10.6x	83.5%	4.9%	(0.5%)	(10.8%)	83.5%
	Median	1.0x	7.6x	108.6%	4.6%	3.4%	(0.4%)	108.6%
	Lower Quartile	0.5x	5.8x	85.2%	(2.9%)	0.3%	(4.9%)	85.2%

FOCF = Funds from operations - Capital Expenditures ± Change in Non-Cash, Non-Interest Bearing Working Capital

FFO = Net Income from Continuing Operations + Depreciation & Amortization and Other Non-Cash Items

S&P Industrials 3 Year Average Credit Statistics - Industrial Comparative Ratio Analysis; Publication Date: August 20, 2002

S&P	Moody's	Long-Term Ratings			Short-Term Ratings		
		S&P	Moody's	Fitch	S&P	Moody's	Fitch
AAA+	Aaa1	AAA	Aaa	AAA			
AAA	Aaa2	AA+	Aa1	AA+	A-1+	P-1	F1+
AAA-	Aaa3	AA	Aa2	AA			
AA+	Aa1	AA-	Aa3	AA-			
AA	Aa2	A+	A1	A+	A-1	P-1	F1
AA-	Aa3	A	A2	A			
A+	A1	A-	A3	A-			
A	A2	BBB+	Baa1	BBB+	A-2	P-2	F2
A-	A3	BBB	Baa2	BBB			
BBB+	Baa1	BBB-	Baa3	BBB-	A-3	P-3	F3
BBB	Baa2	BB+	Ba1	BB+	B	NP	B
BBB-	Baa3						
BB+	Ba1						
BB	Ba2						
BB-	Ba3						
B+	B1						
B	B2						
B-	B3						
CCC+	Caa1						
CCC	Caa2						
CCC-	Caa3						
CC+	Ca1						
CC	Ca2						
CC-	Ca3						
C+	C1						
C	C2						
C-	C3						