

Chapter 12 – Risk, Cost of Capital, and Capital Budgeting

Weighted Average Cost of Capital (WACC)

Given the following information, what is the WACC for the following firm?

Debt: 9,000 bonds with a par value of \$1,000 and a quoted price of 112.65. The bonds have coupon rate of 7 percent and 28 years to maturity.

Preferred Stock: 20,000 shares of 3.5 percent preferred selling at a price of \$65.

Common Stock: 400,000 shares of stock selling at a market price of \$48. The beta of the stock is 0.9. The stock just paid a dividend of \$2.10 per share and the dividends are expected to grow at 6 percent per year indefinitely.

Market: The expected return on the market is 14 percent and the risk-free rate is 3.5 percent. The company is in the 38 percent tax bracket.

Debt

Bond :

Enter	56		-\$1,126.50	\$35	\$1,000
	N	I/Y	PV	PMT	FV

Solve for 3.028%

$$3.028 \times 2 = 6.06\%$$

$$R_D = 6.06 (1 - .38) = 3.75\%$$

Preferred Stock

$$R_P = \frac{D_1}{P_0} = \frac{3.50}{65} = .0538 \text{ or } 5.38\%$$

Equity

$$R_E = R_f + \beta[E(R_M) - R_f] = 3.5 + 0.9[14 - 3.5] = 12.95\%$$

$$R_E = \frac{D_1}{P_0} + g = \frac{2.10(1.06)}{48} + .06 = .1064 \text{ or } 10.64\%$$

$$R_E = \frac{12.95\% + 10.64\%}{2} = 11.80\%$$

Debt:	9,000 × \$1,126.50 =	\$10,138,500	
PS:	20,000 × \$65 =	\$1,300,000	$w_d = .331$
E:	400,000 × \$48 =	<u>\$19,200,000</u>	$w_p = .042$
		\$30,638,500	$w_e = .627$

$$\text{WACC} = (.331 \times 3.75) + (.042 \times 5.38) + (.627 \times 11.80) = 8.86\%$$

Adjusting the cost of capital

Beta: Should you use an industry beta?

Subjective Approach

Pure Play Approach

Adjusting for Floatation Costs

$$f_A = w_D f_D + w_E f_E$$

Suppose the cost of raising debt is 5% and the cost of raising equity is 8%. A project costs \$25 million and the debt-equity ratio is 0.75. What is the true initial cost if the company raises all equity externally?

$$f = (.75/1.75)5\% + (1/1.75)8\% = 6.71\%$$

$$ICO = \text{Amount needed} / (1 - f_A)$$

$$ICO = \$25,000,000 / (1 - .0671) = \$26,799,387$$

Suppose we have the following information, what is the true cost of the project?

Projected cost	\$ 125,000,000
Debt-to-equity ratio	0.50
Equity floatation costs	8%
Debt floatation costs	3.50%
Percentage equity raised internally	0%

$$f = (.50/1.50)3.5\% + (1/1.50)(8\%)(1 - 0) = 6.50\%$$

$$ICO = \$125,000,000 / (1 - .0650) = \$133,689,840$$

Suppose the company typically raises 40% of new equity externally, what is the cost now?

$$f = (.50/1.50)3.5\% + (1/1.50)(8\%)(1 - .60) = 3.30\%$$

$$ICO = \$125,000,000 / (1 - .033) = \$129,265,770$$