

Using ROIC, WACC and g ¹ In-Class Problem²

The subject firm in this problem set is National Media Management, a Utah based LLC from 1994 through 1999. The Income Statement, Balance Sheet, and Other Financial Information used herein are also used in other In-Class Problems in support of building a body of Corporate Finance In-Class Problems.

Suppose that you're the CFO of a small media management firm, National Media Management (NMM)³, with the attached balance sheet, income statement, and other financial data. You know that your CEO has been in talks with a major competitor regarding purchasing your firm and you've been asked to provide some important cash flow figures. The firm considering acquiring NMM will be backed by a private equity firm and you need to be as clear as possible with respect to what values should be reported based on traditional finance practices.

You're now being asked to calculate the weighted average cost of capital (WACC) and return on invested capital (ROIC) for the firm. To do so you've researched the markets, found some of the following data, and concluded certain equational forms to aid you in making these calculations:

- The growth rate of your firm's common stock dividend has mirrored expected growth rates of income in the open market and is equal to 1.5%
- Market rates of return (R_M): 2.5%
- Risk free rates (R_F) in the current market: 0.5%
- Cost of debt (R_D) is equal to $\frac{\text{interest paid on long term debt}}{\text{book value of long term debt}}$
- Cost of preferred (R_P) is equal to the dividend rate on the current preferred shares
- Your firm's cost of equity (R_E) can be calculated based on the dividend growth model (DGM) using growth rate of the dividend (g), the year-end price of the stock, and the dividend rate implied for 2014.
- Alternately, the firm's cost of equity can be calculated using the CAPM model.
- Your firm's Beta is stated at 1.3.

a. What is the equation for calculating WACC?

$$\text{WACC} = (E/V \times R_E) + (P/V \times R_P) + (D/V \times R_D)(1-T_C) \quad (1)$$

b. What is the cost of equity capital for the firm using the Dividend Growth Model?

¹ This problem and solution set is intended to present an abbreviated discussion of the included finance concepts and is not intended to be a full or complete representation of them or the underlying foundations from which they are built.

² This problem set was developed by Richard Haskell, PhD (rhaskell@westminstercollege.edu), Gore School of Business, Westminster College, Salt Lake City, Utah (2015).

³ While National Media Management is the name of an actual firm incorporated in the State of Utah from 1994-1999, the values presented are not representative of actual firm values.

Using the dividend growth model $\left(P_0 = \frac{D_1}{R_E - g}\right)$ we can rearrange the equation to normalize and solve for cost of equity (R_E) based on values we already have.

$$P_0 = \frac{D_1}{R_E - g} \quad (2)$$

Rearrange to normalized on R_E

$$R_E = \frac{D_1}{P_0} - g \quad (3)$$

Substitute known values and solve for R_E

$$R_E = \frac{\frac{25,317}{319,465} \times (1 + 0.015)}{14} - 0.015 = .0208 \text{ or } 2.08\%$$

c. What is the firm's cost of equity (R_E) using the CAPM model?

Using the CAPM approach we can calculate the firm's cost of equity (R_E):

$$R_E = R_F + (R_M - R_F)\beta \quad (4)$$

Substitute known values

$$R_E = 0.005 + (0.025 - 0.005)(1.3)$$

$$R_E = 0.031 \text{ or } 3.1\% \quad (5)$$

d. What is the relevance of the firm's Beta factor?

Beta is a calculated or derived value representing a firm's level of risk in the market in relation to the risk level of other firms of its type, with a value of 1 representing the average risk reflective of the industry segment in which the firm is identified. In this case, a Beta factor of $1.3 > 1$ suggests this firm has a greater risk component than does the industry segment or market in which it operates.

e. What is WACC for this firm using the cost of equity you calculated through the CAPM Model?

Substitute known values into (1) $WACC = (E/V \times R_E) + (P/V \times R_P) + (D/V \times R_D)(1 - T_C)$

$$\begin{aligned} WACC &= \left(\frac{319,465}{1,504,780} \times 0.031\right) + \left(\frac{200,000}{1,504,780} \times 0.10\right) + \left(\frac{985,315}{1,504,780} \times 0.0471\right)(1 - 0.35) \\ &= 0.03992 \text{ or } 3.99\% \end{aligned}$$

f. What is the formula for calculating return on invested capital (ROIC)?

$ROIC = NOPAT / \text{Invested Capital}$

g. What is the ROIC for this firm?

To find ROIC we first need to calculate NOPAT (Net Operating Income Less Taxes) and Invested Capital. In this case Net Operating Income is the same as EBIT as the firm has no assets or liabilities that are not directly related to operations, so $NOPLAT = EBIT \times (1 - T_c)$, where T_c is the corporate tax rate

$$NOPAT = EBIT \times (1 - T_c) \quad (6)$$

Substitute known values

$$NOPAT = 633,876 \times (1 - 0.35) = 412,019.40$$

Invested Capital is the total amount of long term debt plus the total amount of equity, whether it is from common or preferred. In this case this will be the same as Total Assets which is the same as Total Liabilities and Owner's Equity. This is true because all assets and liabilities are related to operations.

$$\text{Invested Capital} = 3,271,807$$

$$\text{Finally ROIC} = \frac{NOPAT}{\text{Invested Capital}} = 0.1259 \text{ or } 12.59\% \quad (7)$$

h. In layman's terms, what is ROIC, WACC and what does the difference between the two, if any, represent?

ROIC is the return the firm's investors receive based on the book value or invested funds and the firm's operating profits less taxes. It is the essentially a generalized return on investment.

WACC is the average cost of investments made in the firm. It can be thought of as an opportunity cost against which potential investors might reasonably be expected to gauge investment outcomes.

The difference between ROIC and WACC then is the return investors receive over and above the cost of investing in the firm. In this case $ROIC - WACC = 12.59\% - 3.99\% = 8.60\%$, which if you think about it is to be expected for a firm with a Beta factor higher than the market average for its industry!

National Media Management						National Media Management		
Balance Sheet						Income Statement		
December 31, 2013 and 2014						January 1 - December 31, 2014		
	2013	2014		2013	2014			
Current Assets			Liabilities			Sales		
Cash	213,960	243,850	Accounts Payable	214,414	192,480	Products	7,535,221	
Accounts Receivable	651,552	858,318	Credit Line	99,022	134,508	Services	2,152,025	
Inventory	621,807	712,296	Total	313,436	326,988	Total Sales	9,687,246	
Total	1,487,319	1,814,464						
			Long Term Debt			Expenses - COGS		
Fixed Assets			Mortgages (interest only)	271,700	285,300	Admin and Mgt	852,873	
Buildings	722,862	757,328	Bonds	628,522	700,015	Production	1,529,884	
Equipment	378,522	425,015	Total	900,222	985,315	Materials	6,524,879	
Technology	250,000	275,000				Total Expenses - COGS	8,907,636	
Total	1,351,384	1,457,343	Owner's Equity					
			Common Stock	292,564	319,465	Expenses - Non-COGS		
Total Assets	2,838,703	3,271,807	Preferred Stock	200,000	200,000	Depreciation	145,734	
			Accumulated Retained Earnings	1,132,481	1,440,039	Operating Interest Expense	44,579	
	-	-	Total	1,625,045	1,959,504	Mortgage Interest Expense	11,412	
						Bond Interest Expense	35,001	
			Total Liabilities and Owner's Equity	2,838,703	3,271,807	Total Expense - Non-COGS	236,726	
			Additional Financial Information					
			Stock Value			Taxable Income	542,884	
			Shares Outstanding	292,564	319,465	Tax (35%)	190,009	
			12/31 Price per Share	10	14	Net Income	352,875	
			Market Value (Market Cap)	2,925,640	4,392,644	Distribution of Earnings		
						Dividends (Common)	25,317	
			Book Value / Liabilities	1,213,658	1,312,303	Dividends (preferred)	20,000	
						Addition to Retained Earnings	307,558	