

What is Your Company's Cost of Capital?

In completing various advisory assignments for real estate and corporate clients, I find it amazing that many companies do not know what their cost of capital is. Cost of capital is the cost to the company of various components of its capital structure including debt, preferred stock and common stock. The weighted cost of all these components is the weighted average cost of capital (WACC). The cost to the company is the expected return to the various investors or owners who invest in each tranche of the capital structure. Apple as an example has delivered an average annual return on its common stock of 68% over the last ten years. This is the return that investors expect in owning the common stock and is a component of Apple's cost of capital. Cost of capital is important because it is the minimum rate of return a company must achieve on its growth investments to increase shareholder value. The WACC is calculated as follows; the percentage cost of each component in the capital structure is calculated, the weighted average cost of each component is then determined and the sum of all the weighted costs is the WACC.

The first item in the capital structure is long term debt or bonds. The cost of debt is the current yield (not the coupon rate) on the debt, based on its market price, as most public company debt fluctuates in price, times one minus the tax rate. The after tax cost of debt is used because interest on the debt is deductible for tax purposes and provides a tax shield. If D is the cost of debt, Y is the yield on the debt and T is the tax rate, then the formula for the cost of debt is:

$$D=Y(1-T)$$

The next item in the capital structure is preferred stock. If a company does not have preferred stock, this calculation would not be applicable. The cost of preferred stock is the dividend per share on the stock divided by the stock price. If PS is the cost of preferred stock, D is the dividend per share and P is the price per share, then the formula is:

$$PS=D/P$$

Calculating the cost of debt and preferred stock are fairly straightforward, however, the cost of common stock requires some financial formulas. There are two famous formulas or models that are used to calculate the cost of common stock, the Dividend Discount Model (DDM) and the Capital Asset Pricing Model (CAPM). Per Wikipedia, The DDM is named after Myron J. Gordon, who originally published it in 1959, although the theoretical underpinning was provided

by John Burr Williams in his 1938 text "The Theory of Investment Value" and the CAPM model was introduced by Jack Treynor, William Sharpe, John Lintner and Jan Mossin independently, building on the earlier work of Harry Markowitz on diversification and modern portfolio theory. The DDM model formula is the dividend per share divided by the stock price plus the dividend growth rate. If C is the cost of common stock, D is the dividend, P is the stock price and G the growth rate, then the cost of common stock using the DDM is:

$$C = D/P + G$$

A company's dividend growth rate is the expected growth in dividends over the next few years. If a company does not pay dividends then it must use the CAPM to determine the cost of common equity. The other and more popular model is the CAPM, which is the risk free rate plus Beta times the market return less the risk free rate. If C is the cost of common stock, R_{rf} the risk free rate, B is Beta and R_m the market return, then the cost of common stock is:

$$C = R_{rf} + B(R_m - R_{rf})$$

The Risk Free Rate is the rate on government Treasury securities and for this article we will use the current 10 Year Treasury Note rate of approximately 2.5%. Beta is a statistical measure of the volatility of a company's common stock in relation to the market. For example, if a company's Beta is 1.5, then its stock is 50% more volatile than the market and if the market goes up 10%, this stock would go up 1.5 times or 15%. The market return is the expected return on the stock market and for this analysis we will use the expected return on the S&P 500 of approximately 10%. The term in the parentheses, the market return less the risk free rate (R_m - R_{rf}) is also known as the equity risk premium or the additional return required by equity holders above the risk free rate Treasury note rate to hold risky equity securities. There is a tremendous amount of data and analysis on the equity risk premium going back to the early 1900's by Ibbotson and others and historically it has been in the range of 4% to 8%.

The following table contains data to calculate the WACC for our hypothetical company, ACME Manufacturing, Inc., a Midwest based manufacture of forklifts and other equipment, traded on the NASDAQ.

<u>Capitalization</u>	<u>Type</u>	<u>Description</u>	<u>Yield/Dividend</u>	<u>Amount at Market Value</u>	<u>Weight</u>
Debt	Senior bonds	10 yr. Senior Debt	7%	\$50,000,000	33%
Preferred Stock	Cumulative	\$25 Par Value	\$2/share	\$25,000,000	17%
Common Stock	Par Value \$1 & Trading at \$25/share	3,000,000 Shares Outstanding	No Dividend	<u>\$75,000,000</u>	<u>50%</u>

			Totals	\$100,000,000	100%
Other Information:					
1. Tax Rate-35%					
2. Beta-1.25					
3. Rrf-2.5%					
4. Rm-10%					

Using the data on ACME above, the WACC is calculated as follows

1. Cost of Debt is $7\%(1-35\%) = 4.6\%$
2. Cost of Preferred Stock is $\$2/\$25 = 8\%$
3. Cost of Common Stock is $2.5\%+1.25(10\%-2.5\%) = 11.875\%$

Using the above costs and weights in the capital structure, the WACC is:

$$4.6\% \times 33\% + 8\% \times 17\% + 11.875\% \times 50\% = 8.8\%$$

ACME Manufacturing, Inc's WACC is 8.8% and this is the rate that should be used to evaluate all of the firm's investment programs. The company should only undertake corporate investments that earn a return that is greater than the WACC. All of the firm's capital budgeting and corporate investments that yield a return in excess of the WACC or a positive net present value using 8.8% as the discount rate; will increase the value of the firm and stock price and the total return to its shareholders.

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