

## 10.8: MCC Example

Calculate the Marginal Cost of Capital Based on the following information.

Price per share of Common Stock	\$45
Price per share of Preferred Stock	\$60
Price per Bond (\$1000 par value)	\$865
Number of shares of Common Stock Outstanding	2,300,000
Number of shares of Preferred Stock Outstanding	500,000
Number of Bonds Outstanding	60,000
Coupon Rate on Bonds	5%
Time Remaining Until Maturity for Bonds	15 years
Marginal Tax Rate	25%
Par Value of Preferred Stock	\$50
Dividend Rate on Preferred Stock	9%
Common Stock Dividend (D1)	\$3.00
Dividend Growth Rate (Common)	6%
Risk-Free Rate	5%
Beta	1.2
Expected Return on the Market	12%
Risk Premium on Stocks over Bonds	4.50%

### Step 1: Find the Weights

$$MV_{\text{debt}} = 60,000 * 865 = \$51,900,000$$

$$MV_{\text{preferred}} = 500,000 * \$60 = \$30,000,000$$

$$MV_{\text{common}} = 2,300,000 * 45 = \$103,500,000$$

$$MV_{\text{TOTAL}} = \$185,400,000$$

$$W_{\text{debt}} = 51,900,000 / 185,400,000 = 0.28$$

$$W_{\text{pref}} = 30,000,000 / 185,400,000 = 0.16$$

$$W_{\text{com}} = 103,500,000 / 185,400,000 = 0.56$$

### Step 2: Find the after-tax cost of debt

Find YTM

Set Financial Calculator to 2 Periods Per Year

30 N

-865 PV

25 PMT

1000 FV

Solve for I/Y = 6.41%

Convert to After-tax Cost  $k_i = \text{YTM} * (1 - T)$

$$k_i = 6.41\% * (1 - 0.25)$$

$$k_i = 4.81\%$$

### Step 3: Find the cost of preferred stock

$$\begin{aligned}k_p &= D/P \\k_p &= (\$50 \cdot .09)/\$60 \\k_p &= \$4.50/\$60 \\k_p &= 7.50\%\end{aligned}$$

### Step 4: Find the cost of common stock

Method One — Dividend Valuation Approach

$$\begin{aligned}k_s &= (D_1/P) + g \\k_s &= (\$3.00/\$45.00) + 0.06 \\k_s &= 0.0667 + 0.06 \\k_s &= 12.67\%\end{aligned}$$

Method Two – Security Market Line (SML)

*[Math Processing Error]*

$$\begin{aligned}k_s &= 5\% + 1.20(12\% - 5\%) \\k_s &= 5\% + 1.20(7\%) \\k_s &= 5\% + 8.4\% \\k_s &= 13.4\%\end{aligned}$$

Method Three — Bond Yield + Risk Premium

$$\begin{aligned}k_s &= \text{YTM} + \text{RP} \\k_s &= 6.41\% + 4.5\% \\k_s &= 10.91\%\end{aligned}$$

Take an average of the three methods to get cost of common stock financing

$$\begin{aligned}k_s &= (12.67\% + 13.40\% + 10.91\%)/3 \\k_s &= 36.98/3 \\k_s &= 12.33\%\end{aligned}$$

### Step 5: Calculate the MCC

$$\begin{aligned}\text{MCC} &= (W_{\text{debt}})(k_i) + (W_{\text{pref}})(k_p) + (W_{\text{com}})(k_s) \\ \text{MCC} &= (0.28 \cdot 4.81) + (0.16 \cdot 7.50) + (0.56 \cdot 12.33) \\ \text{MCC} &= 1.35 + 1.20 + 6.90 \\ \text{MCC} &= 9.45\%\end{aligned}$$

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