

BUSN3049 Corporate Finance

Tutorial 7

1. Jiminy's Cricket Farm issued a 30 year, 6.3 percent semi-annual bond eight years ago. The bond currently sells for 110 percent of its face value. The company's tax rate is 22 percent.
 - a. What is the pre-tax cost of debt?
 - b. What is the after-tax cost of debt?
 - c. Which is more relevant, the pre-tax or the after-tax cost of debt? Why?

Answer

- a. The pre-tax cost of debt is the YTM of the company's bonds¹, so
Excel Solution:

NPER	(30-8)*2	44	
PMT	1000*0.063*	31.5	
PV	1000*110%	-1,100	
FV		1,000	
Rate			RATE(NPER,PMT,PV,FV)
			RATE=44,31.50,-1100,1000)
			2.76%
Pre-Tax Cost of Debt			2.755%*2
Pre-Tax Cost of Debt			5.51%
After-Tax Cost of Debt			Pre-Tax Cost of Debt*(1-Tax Rate)
			0.0551*(1-0.22)
			0.04297858
			4.30%

Figure 1: Excel Solution to 1(a)

¹One can find approximate $YTM = 2 \times R$, directly, using the following formula:

$$R = \frac{C + \frac{(FV - PV)}{\text{Number of Years to Maturity}}}{\frac{(FV + PV)}{2}}$$

b. The after-tax cost of debt is

$$R_D = 0.055(1 - 0.22) = 0.0430 = 4.30\%$$

c. The after-tax rate is more relevant because that is the actual cost to the company.

2. Caddie Manufacturing has a target debt-equity ratio of 0.45. Its cost of equity is 10.3 percent, and its pre-tax cost of debt is 6.4 percent. If the tax rate is 21 percent, what is the company's WACC?

Answer

Here, we need to use the debt-equity ratio to calculate the WACC. A debt-equity ratio of 0.45 implies a weight of debt of $0.45/1.45$ and an equity weight of $1/1.45$. Using this relationship, we find

$$\begin{aligned} WACC &= 0.103(1/1.45) + 0.064(0.45/1.45)(1 - 0.21) \\ &= 0.0867 = 8.67\% \end{aligned}$$

3. Masterson Inc., has 4.1 million shares of common stock outstanding. The current share price is \$84, and the book value per share is \$11. The company also has two bond issues outstanding. The first bond has a face value of \$70 million, has a coupon rate of 5.1 percent, and sells for 98 percent of par. The second issue has a face value of \$50 million, has a coupon rate of 5.60 percent, and sells for 108 percent of par. The first issue matures in 20 years and the second in 12 years.

- What are the company's capital structure weights on a book value basis?
- What are the company's capital structure weights on a market value basis?
- Which is more relevant? Why?

Answer

- a. The book value of equity is the book value per share times the number of shares, and the book value of debt is the face value of the company's debt, so

$$\begin{aligned} BV_E &= 4,100,000(11) = 45,100,000 \\ BV_D &= 70,000,000 + 50,000,000 = 120,000,000 \end{aligned}$$

So, the total value of the company is

$$V = 45,100,000 + 120,000,000 = 165,100,000$$

And the book value weights of equity and debt are

$$\begin{aligned} E/V &= \frac{45,100,000}{165,100,000} = 0.2732 \\ D/V &= 1 - \frac{E}{V} = 0.7268 \end{aligned}$$

- b. The market value of equity is the share price multiplied by the number of shares, so

$$MV_E = 4,100,000(84) = 344,400,000$$

Using the relationship that the total market value of debt is the price quote times the par value of the bond, we find the market value of debt is

$$MVD = 0.98(70,000,000) + 1.08(50,000,000) = 122,600,000$$

This makes the total market value of the company

$$V = 344,400,000 + 122,600,000 = 467,000,000$$

And the market value weights of equity and debt are

$$E/V = \frac{344,400,000}{467,000,000} = 0.7375$$

$$D/V = 1 - \frac{E}{V} = 0.2625$$

- c. The market value weights are more relevant because they represent a more current valuation of the debt and equity.