Homework – I, Adv. Financial Management

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February 4,2014

1) Cojoe Couriers has perpetual EBIT of $4 million per year. The all-equity discount rate R0 for Cojoe Couriers is 15 percent. The company's tax rate is 35 percent. The cost of debt capital is 10 percent, and the company has $10 million of debt in its capital structure.

a) What is Cojoe Courier's firm value?

b) What is Cojoe Courier's cost of equity (Rs)?

c) What is Cojoe Courier's R_{WACC}?

Ans.

Here, it is given that

EBIT = $4 million Per year (perpetuity)

R_0 = 15%, Tax rate Tc = 35%, R_B = 10%, B = $10 million

a) $V_L = V_U + (B * T_c)$

V_U = EBIT * $(1-T_c)/R_0$
= $4 million * (1-.35)/.15
= $17.3 million
So, V_L = $17.3 million + ($10 million * .35)
= $20.8 million

b) $R_S = R_0 + (R_0 - R_B) * (B/S) * (1 - T_c)$
As, $V_L = B + S$
S = $10.8 million
R_s = .15 + (.15 - .10) * (10/10.8) * (1-.35)
= .18 or 18%

c) $R_{WACC} = R_S * (S/V) + R_B * (B/V) * (1 - T_c)$
= .18 * (10.8/20.8) + 0.10 * (10/20.8) * (1-.35)
= 0.12 or 12%

2) A.J. Electronics currently has 700,000 shares of stock outstanding. The total firm value of A.J. is $3 million and it has $750,000 of debt. This debt is a perpetuity. The company is in the 34% tax bracket. If A.J. were fully unlevered, the equity holders would require a 15% return (i.e., R0 = 15%). The cost of borrowing is 10%.

a) What is the required rate of return on equity for A.J.'s shareholders?

b) What is A.J.'s WACC?

c) What would the value of the firm be had it been financed entirely with equity?

d) What would the value of the firm be had it been financed with $1 million debt instead?

Ans.

Here, it is given that

V_L = $3 million

R_0 = 15%, Tax rate Tc = 34%, R_B = 10%, B = $.75 million

a) $R_S = R_0 + (R_0 - R_B)\ (B/S)\ (1 - T_c)$
As, $V_L = B + S$
S = $2.25 million
Rs = .15 + (.15 - .10) * (.75/2.25) * (1-.34)
= .16 or 16%

b) $R_{WACC} = R_S * (S/V) + R_B * (B/V) * (1 - T_c)$
= .16 * (2.25/3) + 0.10 * (.75/3) * (1-.34)
= 0.14 or 14%

c) Had the firm been financed entirely with equity , its value be
$V_U = S$ = $2.25 million

d) As, $V_L = B + S$ and B = $1 million
V_L = 1 + 2.25 = $3.25 million

3) Multicare Corporation an all-equity firm has perpetual EBIT of $2.5 million per year. The all- equity discount rate R_0 is 20%. The company's tax rate is 34%. Although the firm does not have any debt now, if it decides to borrow then it's (before-tax) cost of debt capital would be 12%.

a) What is Multicare's firm value now?

b) What is Multicare's R_{WACC} if it decides to use debt financing to cover 30% of its firm value?

c) What is Multicare's cost of equity (R_S), if the firm issues $5 mil. of debt and repurchases $5 mil. of equity, i.e., Multicare simply alters its capital structure without altering its business operations or its EBIT. Assume that the debt is a perpetuity.

{Note that in part (c) the change in capital structure alters the firm value.}

Ans.

Here it is given that EBIT = $2.5 million per year (perpetuity)

R_0 = 20%, T_c = 34%

a)

Firm value $V_L = V_U + (B * T_c)$

Since B = 0, $V_L = V_U$

$V_U = EBIT * (1-T_c)/R_0$

= $2.5 million * (1-.34) / 0.2

= \$8.25 million = V_L

b) Now, B = 0.3 * V_L = \$2.475 million

And S = V_L – B = \$5.775 million

R_B = 12% given

We need to first find out R_S

$R_S = R_0 + (R_0 - R_B) * (B/S) * (1-T_C)$

$= 0.2 + (0.2 - 0.12) * (2.475/5.775) * (1 - 0.34)$

$= 0.2226$ or 22.26%

Now, $R_{WACC} = R_S * (S/V) + R_B * (B/V) * (1 - T_c)$

$= .2226 * (5.775/8.25) + .12 * (2.475/8.25) * (1 - .34)$

$= 0.1796$ or 17.96%

c) $R_S = R_0 + (R_0 - R_B) (B/S) (1-T_C)$

B = 5 million

The firm now has 5 million of debt. So the firm value is higher than in part (a) due to the debt tax shields.

$V_L = V_U + B * T_C$

$= 8.25$ million + 5 million * (0.34)

= 9.95 million

So now, S = 9.95 - 5 = 4.95 million and

$R_S = (0.2) + (0.2 - 0.12) * (5/4.95) * (1 - 0.34)$

$=$ **0.2533**

4) Zack's Inc., an all-equity firm, is subject to a 30% corporate tax rate. Its equity holders require a 20% return. The firm's market value now is \$3,500,000, and there are 175,000 shares outstanding. Suppose the firm issues \$1 million of bonds at 10% and uses the proceeds to repurchase common stock. What is the market value of equity of the firm after the debt issue?

Ans.

$V_L = V_U$ = \$3.5 million

T_c = 30%

Now, B = \$1 million

So, $V_L = V_U + B * T_C$

$= 3.5 + 1 * 0.30$

= \$3.8 million

So, S (Market value of Equity) = 3.8 – 1 = \$2.8 million

5) Weston Industries has a debt–equity ratio of 1.5. Its WACC is 11 percent, and its cost of debt is 7 percent. The corporate tax rate is 35 percent.

a. What is Weston's cost of equity capital?

b. What is Weston's unlevered cost of equity capital?

c. What would the cost of equity be if the debt–equity ratio were 2? What if it were 1.0? What if it were zero?