15-1. Pelamed Pharmaceuticals has EBIT of $325 million in 2006. In addition, Pelamed has interest expenses of $125 million and a corporate tax rate of 40%.

a. What is Pelamed's 2006 net income?

b. What is the total of Pelamed's 2006 net income and interest payments?

c. If Pelamed had no interest expenses, what would its 2006 net income be? How does it compare to your answer in part b?

d. What is the amount of Pelamed's interest tax shield in 2006?

a. Net Income $= \text{EBIT} - \text{Interest} - \text{Taxes} = (325 - 125) \times (1 - 0.40) = \$120$ million.

b. Net income + Interest = 120 + 125 = $245 million

c. Net income $= \text{EBIT} - \text{Taxes} = 325 \times (1 - 0.40) = \$195$ million. This is $245 - 195 = \$50$ million lower than part (b).

d. Interest tax shield $= 125 \times 40\% = \$50$ million

15-6. Arnell Industries has just issued $10 million in debt (at par). The firm will pay interest only on this debt. Arnell's marginal tax rate is expected to be 35% for the foreseeable future.

a. Suppose Arnell pays interest of 6% per year on its debt. What is its annual interest tax shield?

b. What is the present value of the interest tax shield, assuming its risk is the same as the loan?

c. Suppose instead that the interest rate on the debt is 5%. What is the present value of the interest tax shield in this case?

a. Interest tax shield $= \$10 \times 6\% \times 35\% = \$0.21$ million

b. PV(Interest tax shield) $= \dfrac{\$0.21}{0.06} = \$3.5$ million

c. Interest tax shield = $10 × 5% × 35% = $0.175 million. $PV = \dfrac{\$0.175}{0.05} = \$3.5 \text{million}.$

15-10. Rogot Instruments makes fine violins and cellos. It has $1 million in debt outstanding, equity valued at $2 million, and pays corporate income tax at a rate of 35%. Its cost of equity is 12% and its cost of debt is 7%.

a. What is Rogot's pretax WACC?

b. What is Rogot's (effective after-tax) WACC?

a. $r_{\text{wacc}} = \dfrac{E}{E+D} r_E + \dfrac{D}{E+D} r_D (1 - \tau_c) = \dfrac{2}{3} 12 + \dfrac{1}{3} 7 = 10.33\%$

b. $r_{wacc} = \dfrac{E}{E+D} r_E + \dfrac{D}{E+D} r_D (1 - \tau_c) = \dfrac{2}{3} 12 + \dfrac{1}{3} 7(0.65) = 9.52\%$

15-14. Restex maintains a debt-equity ratio of 0.85, and has an equity cost of capital of 12%, and a debt cost of capital of 7%. Restex's corporate tax rate is 40%, and its market capitalization is $220 million.

a. If Restex's free cash flow is expected to be $10 million in one year, what constant expected future growth rate is consistent with the firm's current market value?

b. Estimate the value of Restex's interest tax shield.

a. $WACC = \frac{1}{1.85}12\% + \frac{0.85}{1.85}7\%\left(1-0.40\right) = 8.42\%$

$V^L = E + D = 220 \times 1.85 = 407 = \frac{FCF}{WACC - g} = \frac{10}{0.0842 - g}$

$g = 0.0842 - \frac{10}{407} = 5.96\%$

b. $\text{pretax WACC} = \frac{1}{1.85}12\% + \frac{0.85}{1.85}7\% = 9.70\%$

$V^U = \frac{\text{FCF}}{\text{pretax WACC} - g} = \frac{10}{0.0970 - 0.0596} = \$267 \text{ million}$

$\text{PV}\left(\text{Interest Tax Shield}\right) = 407 - 267 = \$140 \text{ million}$

15-16. Milton Industries expects free cash flow of $5 million each year. Milton's corporate tax rate is 35%, and its unlevered cost of capital is 15%. The firm also has outstanding debt of $19.05 million, and it expects to maintain this level of debt permanently.

a. What is the value of Milton Industries without leverage?

b. What is the value of Milton Industries with leverage?

a. $V^U = \frac{5}{0.15} = \$33.33 \text{ million}$

b. $V^L = V^U + \tau_C D = 33.33 + 0.35 \times 19.05 = \$40 \text{ million}$