

Corporate finance module 8: Weighted average cost of capital (WACC)

A firm has the following capital structure:

Long-term debt: par value	953,000
Long-term debt: market value	926,414
Coupon rate	7.00%
Yield to maturity	7.29%
Shares of common stock	14,100
Par value per share	65
Market value per share	64
Expected return on common stock	10.10%
Tax rate	30%

Interest on corporate debt is deductible from taxable income.

- A. What is the value of the firm's debt?
- B. What is the value of the firm's equity?
- C. What is the value of the firm?
- D. What is the firm's debt to value ratio?
- E. What is the firm's equity to value ratio?
- F. What is the firm's cost of debt capital?
- G. What is the firm's cost of equity capital?
- H. What is the firm's after-tax weighted average cost of capital (WACC)?

Part A: The *market* value of the firm's debt is 926,414.

Part B: The *market* value of the firm's equity is $14,100 \times 64 = 902,400$.

Part C: The total *market* value of the firm is $926,414 + 902,400 = 1,828,814$.

Part D: The firm's debt to value ratio is $926,414 / 1,828,814 = 50.66\%$.

Part E: The firm's equity to value ratio is $902,400 / 1,828,814 = 49.34\%$.

Part F: The firm's cost of debt capital is the yield to maturity of 7.29%.

Part G: The firm's cost of equity capital is the expected return on common stock of 10.10%.

Part H: The firm's after-tax weighted average cost of capital (WACC) =

$$\text{WACC} = r_D (1 - T_c) (D/V) + r_E (E/V) \text{ or}$$

$$\begin{aligned} \text{Weighted average cost of capital} &= \text{return on debt capital} \\ &\times (1 - \text{corporate tax rate}) \\ &\times \text{debt to value ratio} \\ &+ \text{return on equity capital} \\ &\times \text{equity to value ratio} \end{aligned}$$

$$= 7.29\% \times (1 - 30\%) \times 50.66\% + 10.10\% \times 49.34\% = 7.57\%.$$