Corporate finance module 8: Weighted average cost of capital formula

The risk-free rate is 8.97% per annum, the market risk premium is 6.59%, and the tax rate is 27%.

- A firm's equity has a CAPM β of 0.99
- The firm's debt yields 11.06% *per annum*.
- The firm's debt-to-value ratio is 0.436

A. What is the firm's cost of equity capital?
B. What is the value of the firm's debt tax shield (as a percent of the firm's value)?
C. What is the firm's after-tax weighted average cost of capital (WACC)?

Part A: The cost of equity capital is the risk-free rate + CAPM β × the market risk premium =

8.97% *per annum* + 0.99 × 6.59% *per annum* = 15.49% *per annum*

Part B: The value of the firm's debt tax shield is the market value of the debt × the cost of debt capital × the corporate tax rate.

As a percent of the firm's value, this is the debt to value ratio × the cost of debt capital × the corporate tax rate

= 0.436 × 11.06% *per annum* × 27% = 1.30%

Part C: WACC = r_D (1 – T_c) (D/V) + r_E (E/V) or

Weighted average cost of capital = return on debt capital
× (1 – corporate tax rate)
× debt to value ratio
+ return on equity capital
× equity to value ratio

= 11.06% × (1 – 27%) × 0.436 + 15.49% × (1 – 0.436) = 12.26%