Capital structure and weighted average cost of capital practice exam questions

- With all-equity financing, a firm's opportunity cost of capital is 11.80%.
- The firm refinances to a debt-to-value ratio (D/V) of 45%, at a cost of debt capital r_D of 8.60%.
- The corporate tax rate is 27%.

Question 8.1: Cost of equity capital r_E after refinancing

What is the firm's cost of equity capital r_E after the refinancing?

Answer 8.1: If the corporate tax rate is zero, the capital structure does not affect the weighted average cost of capital, which equals the opportunity cost of capital with all-equity financing, which is

the debt-to-value ratio (D/V) × the cost of debt capital r_D × (1 – the corporate tax rate)
\+ the equity-to-value ratio (E/V) × the cost of equity capital r_E

For the figures in this practice exam question:

$r_E \times (1 - 45\%) + 45\% \times 8.60\% = 11.80\%$
$\Rightarrow r_E = (11.80\% - 45\% \times 8.60\%) / (1 - 45\%) = 14.42\%$

Question 8.2: Weighted average cost of capital after refinancing

What is the firm's weighted average cost of capital (WACC) after the refinancing?

A. 10.76%
B. 11.29%
C. 11.83%
D. 12.37%
E. 12.91%

Answer 8.2: For the weighted average cost of capital, we include the corporate tax rate of 27%:

$$WACC = (45\% \times 8.60\%) \times (1 - 27\%) + (1 - 45\%) \times 14.42\% = 10.76\%$$