

Corporate Finance, Final Exam, Practice Problems, Leveraged Refinancing

(The attached PDF file has better formatting.)

\*Exercise 1.1: Leveraged Refinancing

The corporate tax rate is 35%, and the personal tax rate is the same for equity income as for interest income. If the firm is financed with equity only, the its value is \$250 million.

The firm issues \$60 million of *perpetual* debt (trading at par) with an effective annual yield of 9.5%. The debt is fixed; it is *not* re-balanced as the firm's value changes. The firm uses the cash from the issue of debt to pay a one-time dividend to shareholders.

What is the present value of the debt tax shields?

- A. \$20 million
- B. \$21 million
- C. \$22 million
- D. \$23 million
- E. \$24 million

Answer 1.1: B

The debt trades at par, so its market value is its par value. The debt payment each year is \$60 million  $\times$  9.5%. The tax shield each year is \$60 million  $\times$  9.5%  $\times$  35%.

The present value of a perpetuity is the annual payment divided by the capitalization rate, which is the yield to maturity on the debt: \$60 million  $\times$  9.5%  $\times$  35% / 9.5%. This is the market value times the corporate tax rate: \$60 million  $\times$  35% = \$21.00 million

\*Exercise 1.2: Leveraged Refinancing

The corporate tax rate is 35%, and the personal tax rate is the same for equity income as for interest income. If the firm is financed with equity only, the its value is \$250 million.

The firm issues \$60 million of *perpetual* debt with an effective annual yield of 9.5%. The debt is fixed; it is *not* re-balanced as the firm's value changes. The firm uses the cash from the issue of debt to pay a one-time dividend to shareholders.

What is the value of the *equity* after the one-time dividend?

- A. \$210 million
- B. \$211 million
- C. \$270 million
- D. \$271 million
- E. \$310 million

Answer 1.2: B

These are the standard assumptions in the Brealey and Myers textbook for the adjusted present value method. We ignore the effects of personal tax rates and focus on corporate taxes only.

The exercise says the debt is perpetual. In general, we assume the debt is refinanced when it matures, so it is perpetual.

The value of the firm increases by the present value of the tax shields, which equals the corporate tax rate times the market value of the debt for *perpetual* debt. This is the increase in the value of the equity before the one-time dividend. The value of the equity then decreases by the amount of the one-time dividend. The one-time dividend is the market value of the debt. The yield on the debt does not affect the solution.

$$\text{\$250 million} + \text{\$21 million} - \text{\$60 million} = \text{\$211 million}$$