Corporate Finance, Final Exam, Practice Problems: Tax Shields

(The attached PDF file has better formatting.)

*Question 1.1: Debt Tax Shields

A firm has $100,000 (par value) of 6% annual coupon perpetual debt. The yield to maturity of the debt is 5% and its market value is $120,000. The corporate tax rate is 35%. What is the present value of all future debt tax shields, assuming the amount of debt is fixed and does not vary with the value of the firm? (The $120,000 market value is $100,000 × 6% / 5%.)

A. $100,000 × 35% / (1 – 35%) = $53,846
B. $120,000 × 35% / (1 – 35%) = $64,615
C. $120,000 × 5% / 35% = $171,429
D. $100,000 × 35% = $35,000
E. $120,000 × 35% = $42,000

Answer 1.1: E

With perpetual debt that does not vary, the present value of the tax shields is the corporate tax rate times the market value of the debt.

*Question 1.2: Tax Shields

A firm has perpetual debt at a fixed coupon rate, and it does not intend to vary the amount of the debt. If the corporate tax rate is 35% and the present value of the tax shields from the debt is $77,000, what is market value of the perpetual debt?

A. $77,000
B. $77,000 / (1 – 35%) = $118,462
C. $77,000 / 35% = $220,000
D. $77,000 × 35% = $26,950
E. $77,000 × (1 – 35%) = $50,050

Answer 1.2: C

The tax shield of perpetual debt is the market value of the debt times the tax rate, so the market value is the tax shield divided by the tax rate: $77,000 / 35% = $220,000.

*Question 1.3: Debt Tax Shields and Corporate Tax Rate

A firm has $100,000 (par value) of 8% annual coupon perpetual debt. Because of hostilities in South-East Asia, the yield to maturity of the debt rises to 10% per annum, and its market value falls to $80,000. (The $80,000 market value is $100,000 × 8% / 10%.)

To pay for higher military spending, the government raises the corporate tax rate from 35% to 40%. What is the *change* in the present value of all future debt tax shields, assuming the amount of debt is fixed and does not vary with the value of the firm?

A. An increase of $8,000
B. An increase of $4,000
C. No change
D. A decrease of $4,000

E. A decrease of $8,000

Answer 1.3: B

- The old present value of the tax shields is 35% × $80,000 = $28,000.
- The new present value of the tax shields is 40% × $80,000 = $32,000.

The increase is $32,000 – $28,000 = $4,000.