Class 9

Question 2

Executive Chalk is financed solely by common stock and has 25 million shares outstanding with a market price of $10 a share. It announces that it intends to issue $160 million of debt and use the proceeds to buy back common stock. Assume that the MM assumptions hold (i.e., no taxes, no costs of financial distress).

a) What is the value of the firm before and after the proposed capital structure change?

b) What is the debt-to-equity ratio after the capital structure change?

c) What is the stock price after the capital structure change?

d) Who (if anyone) gains or loses?

a) $M_v = P \cdot N_s$ (MARKET VALUE; P: PRICE of a SHARE; N_s: NUMBER of SHARES) IF 100% equity financed.

So $M_v = 10\$ \cdot 25M = 250M\$$

Since there is no TAX shield and no cost of distress, the value of the firm remains the same.

b) $E + D = 250M\$$. So $E = 90M\$$ and $\frac{D}{E} = \frac{160}{90} = 1.78$

c) Should remain the same. Let us see why.

If we use debt to buy back S shares at price P,

$$\begin{cases} S \cdot P = 160M\$ \\ (25 - S) \cdot P = 90M\$ \end{cases} \quad \text{and} \quad P = 10\$$$

d) Nothing changes.

Question 4

Compute the PV of the interest tax shields generated by the following three debt issues. In each case the debt is risk free while the corporate tax rate is 35%.

a) A $1,000 one-year loan at the risk-free rate of 8%.

b) A five-year loan of $1,000 at the risk-free rate of 8%. Assume interest is paid annually while the principal is paid back at maturity.

c) A $1,000 debt perpetuity at the risk-free rate of 7%.

a) The interest expense is $1000 \cdot 0.08 = 80\$$.

This generates a tax shield of $80\$ \cdot 35\% = 28\$$

one year in the future, so the answer is:

$$\frac{0.08 \cdot 1000 \cdot 0.35}{1.08} = 25.9$$

b) $$\sum_{t=1}^{5} \frac{0.08 \cdot 1000 \cdot 0.35}{1.08^t} = 111.80$$

c) $$\frac{0.7 \cdot 1000 \cdot 0.35}{0.07} = 350$$