

ADM 3350 (Summer)

Solutions to Mid-term Exam

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Problem 1

a) $V_L = V_U + tD$ where $V_U = 600,000 \times \$30 = \$18m$
 $= \$18m + .40(\$9m) = \$21.6m$
 $E_L = V_L - D = \$21.6m - \$9m = \boxed{\$12.6m}$

b) # of shares retired = $\frac{\$9m}{\$30} = 300,000$ shares
 # of Remaining shares = $600,000 - 300,000 = 300,000$ shares
 Share Price = $\frac{\$12.6m}{300,000} = \boxed{\$42}$

c) $ROE^U = \frac{(1-.40)(\$3m)}{V_U} = \frac{1.8m}{18m} = 10\%$

$ROE^L = (1-.40) \left[\frac{\$3m - (.05)\$9m}{12.6m} \right] = 12.14\%$

Therefore, Fin. risk prem = $12.14\% - 10\% = 2.14\%$

d) $WACC = \frac{(1-.40)(\$3m)}{V_L} = \frac{\$1.8m}{\$21.6m} = 8.33\%$

Problem 2

$D/E = 2/3 \Rightarrow \frac{D}{V} = \frac{2}{5}$ and $\frac{E}{V} = \frac{3}{5}$

a) $\frac{3}{5}(V_{max}) = 24000 \Rightarrow V_{max} = \frac{5}{3} \times 24000 = \$40,000$

b) ~~new~~ New debt = $\frac{2}{5}$ of $40,000 = \$16,000$

Problem 3

Share Price = $\frac{\$600,000}{30,000} = \20

DPS = $\$150,000 / 30,000 = \5 . Thus: if the firm had

(a) given dividend, you would have received $\$5 \times 400 = \$2,000$ dividend. But the firm did not give dividend and instead purchased shares $\frac{\$150,000}{\$20} = 7,500$ shares.

Remaining shares = $30,000 - 7,500 = 22,500$. Remaining value = $\$450,000$. Therefore share price after repurchase = $\frac{\$450,000}{22,500} = \20 . So, to create home-made

dividend of $\$2,000$, you would sell $\frac{\$2,000}{\$20} = 100$ shares

(b) Before repurchase, your 400 shares were worth $400 \times \$20 = \$8,000$. After selling 100 shares to create home-made dividend, your wealth = $100 \times \$20 + 300 \times \$20 = \$8,000$. So, your wealth is not affected

10) Tax on \$2000 dividend on your 400 shares
= $\$2000 \times 30\% = \600

Cap. gain tax rate = 50% of 40% = 20%

Capital gain on selling 100 shares to create
horm-made dividend = $100 \times (\$20 - \$10) \times 20\%$
= $\$200$

So, with dividend income, you will pay $\$600 - \200
= $\$400$ more tax

Problems 4

a) Hedging strategy: Buy 150,000 puts (with one put for each pound). If the price is below \$10 per pound, exercise each put to generate minimum revenue of $150,000 \times \$10 = \$1,500,000$

b) Cost of buying 150,000 puts at \$1 per put
= $150,000 \times \$1 = \$150,000$

c) Here do not exercise puts to get \$10 per pound because exercise price is \$10 per pound. Sell 150,000 in the open market at \$16 per pound to generate revenue of $150,000 \times \$16 = \$2,400,000$

d) $C = S + P - E \cdot e^{-rt}$ where $S = \$12$, $P = \$1$, $E = \$10$
= $\cancel{\$12} + \$1 - \cancel{\$10} \cdot e^{-12(0.25)} = 12\%$, $t = 3 \text{ months} = 0.25 \text{ years}$
= $\$12 + \$1 - \$10(0.9704)$
= $\$13 - 9.704$
= $\$3.296$