SOLUTIONS TO PRACTICE EXERCISES LECTURE 6

Solution Q1:

a. Office building—there are many alternate users who would be likely to value the property similarly.

b. Raw materials—they are easier to reuse.

c. Patent rights—they would be easier to sell to another firm.

Solution Q2:

a. Equity (unlevered) $= 0.25 \times \frac{147+136+91+82}{1.05} = \$108.57$ million

b. Debt $= 0.25 \times \frac{100+100+91\times0.74+82\times0.74}{1.05} = \$78.10$ million

	Value of debt and equity with leverage ($ million)			
	Outcome 1	Outcome 2	Outcome 3	Outcome 4
Debt ($100M face value due)	100	100	67.34 (=91×0.74)	60.68 (=82×0.74)
Equity	47 (=147-100)	36 (=136-100)	0	0
Total to all investors	147	136	67.34	60.68
Financial Distress costs	0	0	23.66 (=91×0.26)	21.32 (=82×0.26)
Total outcome (=total to all investors + financial distress costs)	147	136	91	82

Note: In outcome 3 and outcome 4 since Gladstone cannot pay the $100M due, it faces 26% financial distress costs and here Gladstone will have the possibility to fail (so equity in outcome 3 and outcome 4 will be zero)

c. Equity (levered)= equity $= 0.25 \times \frac{47+36+0+0}{1.05} = \$19.76$ million total value

d. Total value with leverage $= 0.25 \times \frac{147+136+91\times0.74+82\times0.74}{1.05} = \$97.86$ million

(or 78.10 + 19.76 = $97.86 million)

e. PV (Financial distress costs) $= 0.25 \times \frac{0+0+9 \times 0.26+82\times0.26}{1.05} = \$10.71$ million

(Or the difference between answer a and answer d = $108.57 million - $97.86 million = $10.71 million).

Solution Q3:

From the table, the optimal leverage is when the gain is at the highest, i.e. at the debt level equals $60 million.

With $r_f = 5\%$, PV(distress cost) of each debt level is calculated as $\frac{probability \times distress\ cost}{1.05}$

	Debt level ($million)						
	0	40	50	60	70	80	90
PV(Interest tax shield)	0	0.76	0.95	1.14	1.33	1.52	1.71
Prob.(Financial distress)	0%	0%	1%	2%	7%	16%	31%
Distress cost	5	5	5	5	5	5	5
PV(Distress cost)	0	0	0.048	0.095	0.333	0.762	1.476
Gain	0	0.760	0.902	1.045	0.997	0.758	0.234
Optimal Debt	60						

Solution Q4:

a. $1.3 billion/10 million shares = $130 per share.

b. $120 million/$130 per share = 923,077 shares.

Solution Q5:

The one-time dividend payoff (due to excess cash) is $150 million/250 million = $0.60 on a per share basis. In a perfect capital market the price of the shares will drop by this amount to $10.40 (ex-dividend price).

Solution Q6:

a. Invest (i.e. lend) the $3.91 special dividend, and earn a 10%-interest of $0.391 per year (home-made dividend).

b. Borrow $4.30 today in which one year after the shareholder needs to pay an interest of 10% ×$4.30 =$0.43→ PV (interest payment) = $0.43/1.1 = $0.39. The shareholder can use the increase in the regular dividend ($0.39) to pay the interest today. After paying interest in today's value, the shareholder will end up having $4.30 - $0.39 = $3.91 (same as the amount of the special dividend).

Solution Q7:

a. $\tau_d^* = \left(\frac{\tau_d - \tau_g}{1 - \tau_g}\right)$ → $t^*\_d = (38\% - 24\%)/(1 - 24\%) = 18.42\%$,

$$P_{cum} - P_{ex} = Div \times \left(\frac{1 - \tau_d}{1 - \tau_g}\right) = Div \times \left(1 - \frac{\tau_d - \tau_g}{1 - \tau_g}\right) = Div \times \left(1 - \tau_d^*\right)$$

P_{cum} = \$32; special dividend =\$4; hence: P_ex = 32 – 4(1 – 0.1842) = \$28.74

b. With dividend, tax would be 4 × 38% = \$1.52 for dividend, with a tax savings of 4 × 24% = \$0.96 for capital loss, for a net tax from the dividend of (\$1.52 - \$0.96=) \$0.56 per share. This amount would be saved if Arbuckle does a share repurchase instead.

c. Stock price rises to by \$0.56 to \$32.56 to reflect the tax savings.