

# CHAPTER 25:

# ACQUISITIONS AND

# TAKEOVERS

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## 25-1

- a. True. Synergy should increase the combined firm value.
- b. False. Earnings volatility is generally firm specific. Even if it is not, investors can do this themselves at a much lower cost.
- c. True. The combined firm will be safer making existing bonds more valuable.
- d. True.
- e. False.

## 25-2

- a. True. The value of control accrues from the changes that can be made in the firm after taking control of it.
- b. False. Even if there is no imminent threat of a takeover, the probability of a takeover will keep the voting rights shares more valuable.
- c. False. The evidence is mixed.
- d. False. All stocks can go down in value.
- e. False. The empirical evidence does not support this statement, though some firms may do so.

## 25-3

It is not necessary true that mergers occur most frequently in an industry when that industry is undergoing rapid changes because none of the often-mentioned motives for mergers is associated with a rapidly-changing industry.

## 25-4

There is no much synergy for a conglomerate merger.  
There would be quite significant synergy for both the horizontal and vertical synergy.

## 25-5

A horizontal synergy is most likely to spark government intervention because of this kind of mergers might reduce competition.

**25-6**

The joint venture may reduce the risk by sharing the R&D costs and increase efficiency.

**25-7**

The maximum price to be offered =  $(55 + 370 - 120) / 5 = \$61.00$  per share.

**25-8**

They would be willing to pay the maximum price of \$61 because the undervaluation can only be eliminated by the management of American Hostels.

**25-9**

They would be willing to pay between \$60 and \$61 per share because that is the ongoing price for the stock.

**25-10**

Since there is disadvantage of receiving cash for the shareholders of the target firm, the acquiring firm would naturally try to offer stock if possible.

**25-11**

a. I probably would sell my shares at \$75.00 per share. It is at premium of 50% over the market price.

b. If everyone makes the same decision, the company will be sold.

c. The bid price is high enough to encourage the stockholders of the target firm to sell their shares.

**25-12**

a to d: see below:

	<i>Grumman Independent</i>	<i>Northrop Independent</i>	<i>Combined No synergy</i>	<i>Combined With Synergy</i>
<b>Revenues</b>	\$3,281	\$4,620	\$7,901	\$7,901
<b>- COGS</b>	\$2,920	\$4,043	\$6,963	\$6,795
<b>- Depreciation</b>	\$74	\$200	\$274	\$274
<b>= EBIT</b>	\$287	\$378	\$664	\$832
<b>EBIT (1-t)</b>	\$187	\$245	\$432	\$541
<b>- £GWC</b>	\$16	\$22	\$38	\$38
<b>= FCFF</b>	\$171	\$223	\$394	\$503
<b>Cost of Equity</b>	12.50%	12.50%	12.50%	12.50%
<b>Cost of Debt</b>	5.53%	5.53%	5.53%	5.53%
<b>WACC</b>	11.38%	11.98%	11.73%	11.73%

<b>Firm Value</b>	\$2,681	\$3,199	\$5,879	\$7,479
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e. Synergy Gain = \$7,479 - \$5,879 = \$1,600

Note: Firm Value =  $FCFF_1 / (WACC - g)$

### 25-13

a & b.

	<i>Without Added Debt</i>	<i>With Added Debt</i>
<b>Revenues</b>	\$7,901	\$7,901
<b>- COGS</b>	\$6,795	\$6,795
<b>- Depreciation</b>	\$274	\$274
<b>= EBIT</b>	\$832	\$832
<b>EBIT (1-t)</b>	\$541	\$541
<b>- £GWC</b>	\$38	\$38
<b>= FCFF</b>	\$503	\$503
<b>Beta</b>	1.00	1.08
<b>Cost of Equity</b>	12.50%	12.92%
<b>Cost of Debt</b>	5.04%	5.20%
<b>WACC</b>	11.68%	11.37%
<b>Firm Value</b>	\$7,540	\$7,897

Beta with Added Debt = Unlevered Beta (1 + (1 - t) (Debt/Equity))  
= 0.93 ( 1 + (1 - 0.4) (0.25)) = 1.08

c. The equity investors should gain the additional value of \$357 million.

### 25-14

a., b., c., & d.

	<i>Novell</i>	<i>WordPerfect</i>	<i>No synergy</i>	<i>w/ Synergy</i>
<b>Revenues</b>	\$1500	\$690		\$2,232
<b>COGS</b>	\$855	\$518		\$1,406
<b>Depreciation</b>	\$53	\$29		\$83
<b>EBIT</b>	\$593	\$144		\$743
<b>EBIT (1-t)</b>	\$385	\$93		\$483
<b>- Cap Expenditure</b>	\$94	\$46		\$143
<b>+ Depreciation</b>	\$53	\$29		\$83
<b>- £GWorking Capital</b>	\$120	\$27		\$147
<b>= FCFF</b>	\$224	\$49		\$276
<b>Cost of Equity (Initial)</b>	14.98%	13.88%		14.85%
<b>Cost of Equity (Stable)</b>	13.05%	13.05%		13.05%
<b>Value of firm</b>	\$12,059	\$1,554	\$13,613	\$14,377

The cost of equity is also the weighted average cost of capital because neither firm has any debt.

The weights are based upon the estimated values.

(The free cash flow to the firm under synergy in year 1 is greater than the sum of the FCFF of the two individual firms because of the higher growth rate in cash flows. All the estimated numbers under synergy are based upon the new expected growth rate which is 24%.)

e. Value of Synergy = 14,377 - 13,613 = \$764 million

Maximum Price for Wordperfect = 1,554 + 764 = \$2,318 million

### 25-15

If the synergy takes 5 years to materialize,

PV of Synergy = \$764 million /  $(1.1485)^5$  = \$382.33 million

a.

The expected growth rates were assumed too high and for too long.

### 25-16

<i>a. Value of Synergy</i>	<b>Pre-merger</b>	<b>Post-merger</b>
<b>Value of Aetna</b>	22,800	21,800
<b>Value of US Healthcare</b>	1,550	1,875
<b>Total</b>	24,350	23,675

The total market value of the two firms declined by \$ 675 million after the merger was announced. This would suggest that the market does not believe that there is synergy.

b. Managers may be over optimistic about the potential for synergy, while markets might be much too pessimistic. I would tend to believe the markets.

### 25-17

a. Tax Savings Next Year = \$2 Billion \* 0.4 = \$800 million

PV of Tax Savings = 800/1.12 = \$714 million

b. PV of Tax Savings = \$200 (PVA, 12%, 4 years) = \$607.47 million

### 25-18

I would expect it to be shared between the two companies, if there are no competing bidders on the horizon. If there are, I would expect the target company's stockholders to get the benefits.

### 25-19

a. , b. & c.

	<i>PMT Corporation</i>	<i>Peer Group</i>	<i>Best Managed</i>
<b>Return On Assets</b>	8.00%	12.00%	18.00%
<b>Dividend Payout Ratio</b>	50.00%	30.00%	20.00%
<b>Debt Equity Ratio</b>	10.00%	50.00%	50.00%
<b>Interest Rate on Debt</b>	7.50%	8.00%	8.00%
<b>Beta</b>	1.06	1.30	1.30
<b>Growth Rate-First 5 Years</b>	4.18%	10.92%	19.68%
<b>Payout Ratio after Year 5</b>	28.14%	61.54%	75.61%

<b>Growth Rate After Year 5</b>	6.00%	6.00%	6.00%
<b>Cost of Equity</b>	12.83%	14.15%	14.15%
<b>Value of Equity Per Share</b>	\$12.65	\$25.18	\$41.94

Growth Rate-First 5 years =  $(1 - \text{Payout}) (\text{ROA} + \text{D/E} (\text{ROA} - i (1-t)))$

Payout After 5 Years =  $1 - g / (\text{ROA} + \text{D/E} (\text{ROA} - i (1-t)))$

## 25-20

a. While the overall evidence on stock price reaction to anti-takeover amendments is mixed, I would expect stockholders to react negatively in this case, because of PMT's history of poor performance.

b. It would not, but I would probably be even more aggressive in ensuring that the management does not adopt this clause.

## 25-21

a.

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Term. Year</i>
<b>Revenues</b>	\$1,100,000	\$1,210,000	\$1,331,000	\$1,464,100	\$1,610,510	\$1,707,141
- Expenses	\$440,000	\$484,000	\$532,400	\$585,640	\$644,204	\$682,856
- Depreciation	\$100,000	\$110,000	\$121,000	\$133,100	\$146,410	\$155,195
= EBIT	\$560,000	\$616,000	\$677,600	\$745,360	\$819,896	\$869,090
- Interest Exp.	\$360,000	\$324,000	\$288,000	\$252,000	\$216,000	\$180,000
= Taxable Income	\$200,000	\$292,000	\$389,600	\$493,360	\$603,896	\$689,090
- Tax	\$80,000	\$116,800	\$155,840	\$197,344	\$241,558	\$275,636
= Net Income	\$120,000	\$175,200	\$233,760	\$296,016	\$362,338	\$413,454
+ Depreciation	\$100,000	\$110,000	\$121,000	\$133,100	\$146,410	\$155,195
- Capital Expenditure	\$120,000	\$132,000	\$145,200	\$159,720	\$175,692	\$186,234
- ΔGWC	\$20,000	\$22,000	\$24,200	\$26,620	\$29,282	\$19,326
- Principal Repaid	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$0
= FCFE	(\$220,000)	(\$168,800)	(\$114,640)	(\$57,224)	\$3,774	\$363,089
+ Interest (1-t)	\$216,000	\$194,400	\$172,800	\$151,200	\$129,600	\$108,000
+ Princ. Repaid	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$0
= FCFF	\$296,000	\$325,600	\$358,160	\$393,976	\$433,374	\$471,089

b.

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<b>Equity</b>	\$1,000,000	\$1,120,000	\$1,295,200	\$1,528,960	\$1,824,976	\$2,187,314
<b>Debt</b>	\$3,000,000	\$2,700,000	\$2,400,000	\$2,100,000	\$1,800,000	\$1,500,000
<b>D/E Ratio</b>	3.00	2.41	1.85	1.37	0.99	0.69
<b>Beta</b>	2.58	2.25	1.95	1.68	1.47	1.30
<b>Cost of Equity</b>	24.90%	23.11%	21.41%	19.95%	18.78%	17.86%
<b>Cum. COE</b>	1.25	1.54	1.87	2.24	2.66	3.14
<b>WACC</b>	11.63%	11.87%	12.18%	12.57%	13.03%	13.53%
<b>Cum WACC</b>	1.12	1.25	1.40	1.58	1.78	2.02

$$\begin{aligned} \text{Cost of Equity in Year 2} &= \text{Cost of Equity in Year 1} - (\text{Beta}_2 - \text{Beta}_1) * 5.5\% \\ &= 24.90\% - (2.58 - 2.25) * 5.5\% = 23.11\% \end{aligned}$$

$$\begin{aligned} \text{c. Terminal Value of Firm} &= \$363,089 / (.1786 - .06) = \$3,060,662 \\ \text{Terminal Value of Firm} &= \text{Terminal Value of Equity} + \text{Outstanding Debt} \\ &= 3,060,662 + 1,500,000 = 4,560,662 \end{aligned}$$

$$\begin{aligned} \text{d. PV to Equity Investors} &= -220,000 / 1.249 - 168,800 / (1.249)(1.2311) - 114,640 / (1.249)(1.2311)(1.2141) \\ &- 57,224 / (1.249)(1.2311)(1.2141)(1.1995) + (3774 \\ &+ 3,060,662) / (1.249)(1.2311)(1.2141)(1.1995)(1.1878) \\ &= \$779,220 < 1,000,000 \end{aligned}$$

Deal does not make sense from the viewpoint of equity investors.  
 PV to firm = Discount FCFF at WACC = 3,833,357 < 4,000,000  
 Overall, deal does not make sense.

## **25-22**

- a. No. The stockholders could do it themselves at far lower costs.
- b. Yes. Diversification may provide a benefit to the owner of a private firm, since much of his or her wealth is probably concentrated in the firm.
- c. If by doing this acquisition, the publicly traded firm was able to increase its debt capacity substantially and take better projects, it might make sense to do the acquisition.