

Chapter 25

Questions

- A merger is an absorption of a firm, the acquiree, by another firm, the acquiror.
 - A consolidation is the combination of two or more firms into an entirely new entity.
 - A horizontal merger is a merger of two firms in the same line of business.
 - A vertical merger is a merger of two firms involved in the same industry but operating at different points in the supply chain.
 - A conglomerate merger is a merger of two firms in unrelated businesses.
- Valid reasons for firms merging are to achieve operating efficiencies, to achieve economies of scale, to realize tax benefits, to capture surplus cash, and to grow quickly and cheaply.
- Diversification is a questionable motive for merging because shareholders of the acquiror can usually achieve diversification more cheaply on their own.
- A merger can create financial synergy because a larger firm may be able to raise capital more cheaply than two smaller firms. A merger can create business synergy because a larger firm may be able to operate more efficiently than two smaller firms. The difference between the two is that financial synergy describes advantages in raising capital while business synergy describes advantages in operations.
- The shareholders of the acquirees usually receive a premium for their shares that is nearly equal to the net advantage of merging. The shareholders of the acquirors usually receive very little of the benefit of the net advantage of merging.
- The three basic ways of accomplishing a corporate acquisition are a merger or consolidation, a purchase of stock, and a purchase of assets. The distinguishing feature of a merger or consolidation is that it is a flexible way of achieving a tax-free acquisition. The distinguishing feature of a purchase of stock is that the acquiror can bypass the management of the acquiree with a tender offer. The distinguishing feature of a purchase of assets is that the seller retains responsibility for servicing its liabilities.
- The main difference between a tax-free acquisition and a taxable acquisition is that in a tax-free acquisition the selling shareholders are treated as if they have exchanged their shares whereas in a taxable acquisition the selling shareholders are treated as if they have sold their shares. Sellers may prefer a tax-free acquisition because it may defer their taxes. Buyers may also prefer a tax-free acquisition because the acquiror may be able to use the acquiree's tax loss carryforwards.
- A tender offer is an offer made by the acquiror to purchase stock from the shareholders of the acquiree. The acquiror can gain control of the acquiree by purchasing enough of the outstanding shares. The main advantages are that it is fast, flexible, simple and allows the original acquiror to profit even if another bidder emerges.
- A proxy contest is an effort by one or more individuals to oppose incumbent management by obtaining sufficient shareholder votes to elect a new board of directors. Control of a firm can be gained if the opposing board of directors is elected. The disadvantage of a proxy contest relative to a tender offer is that few succeed, as shareholders prefer to receive cash for their shares instead of a new management team.
- Some of the defensive tactics employed by firms to fight off unwanted suitors are asset purchases or sales, leveraged recapitalization, litigation, counter tender offers, share repurchases or sales, and standstill agreements. These tactics may have a negative effect on shareholder wealth if they allow inefficient management to remain in power. The agency problem that arises with defensive tactics is that managers want to keep their positions and salaries even though it may not be in the shareholders best interest.

11. A leveraged buyout is distinguished from other types of acquisitions in that it is financed principally with secured borrowings.

Challenging Questions

12. A flexible exchange ratio is less risky for the selling firm because if the acquiror's shares fall in price, the acquiree can still receive the same dollar amount for its shares.
13. Acquiring a firm with past losses can be beneficial because the tax loss carryforwards can be used to offset future income and can reduce the acquiree's tax liability.
14. A merger can expropriate wealth from the shareholders to the bondholders because the earnings of each firm can effectively insure the debt of the other firm, thus making the debt less risky. Since shareholders now have to service the debt of both companies, the value of their equity may decrease.
15. Shareholders should structure a taxable acquisition if they have losses on their equity. Because of the time value of money, it is beneficial for the shareholders to use their tax credit as soon as possible. They would not want to defer their tax credit with a tax-free acquisition.
16. The advantages of the comparison approach over the liquidation approach are that it is faster, simpler, and that all information is readily available. The disadvantage is that sometimes a group of comparable firms cannot be found.
17. An accurate estimate of the terminal value is extremely important when using the DCF technique because it is usually a significant proportion of the amount of the cash flow stream. If it is overestimated, a negative NPV project may be accepted. If it is underestimated, a positive NPV project may be rejected.
18. A merger that dilutes EPS is not necessarily negative for the acquiror. What is important is the difference in cash flows between acquiring and not acquiring the firm.
19. The agency cost of managers blocking mergers is resolved with golden parachutes. The firm pays the managers significant amounts of money to leave their positions so that the merger can go through. A new agency cost may result if the manager accepts a merger that hurts the shareholders in order to receive the golden parachute.
20. The APV approach is a good method for evaluating an LBO because the benefits of the tax shield are known. Since these benefits are known, they are not as risky and should be discounted at a lower cost of capital than the unknown cash flows.
21. a. Time's actions reveal that agency costs exist. In order for the managers to fulfill their plan, they prevented the shareholders from realizing an immediate large gain.
b. The board's argument can be reconciled with the fact that its strategy has a value greater than \$200 because the board may have inside information that the public does not have.

Problem Set A

- A1. a. $(\$55 - \$40) / \$40 = 37.5\%$
b. $(1.40 \times \$48 - \$40) / \$40 = 68\%$
- A2. a. $(\$87 - \$80) / \$80 = 8.75\%$
b. $(1.50 \times \$85 - \$80) / \$80 = 59.38\%$
- A3. a. $(2.0 \times \$30 - \$45) / \$45 = 33.33\%$
b. $(2.0 \times \$28 - \$45) / \$45 = 24.44\%$

- A4. a. $(2.0 \times \$52 - \$68) / \$68 = 52.94\%$
 b. $(2.0 \times \$47 - \$68) / \$68 = 38.24\%$
- A5. a. $NAM = [V_{AB} - (V_A + V_B)] - P_B - \text{Expenses}$
 $NAM = \$500 - (\$340 + \$120) - \$40 - \$6 = -\6 million
 b. Synergy = $\$500 - (\$340 + \$120) = \40 million
 The synergy is \$6 million below the premium and other acquisition costs.
- A6. a. $NAM = [V_{AB} - (V_A + V_B)] - P_B - \text{Expenses}$
 $NAM = \$900 - (\$600 + \$220) - \$100 - \$3 = -\23 million
 b. Synergy = $\$900 - (\$600 + \$220) = \80 million
 The synergy is \$23 million below the premium and other acquisition costs.
- A7. a. $V_{AB} = \$50 + \$75 + \$10 = \135 million
 b. $NAM = [V_{AB} - (V_A + V_B)] - P_B - \text{Expenses}$
 $NAM = [\$135 - (\$50 + \$75)] - \$5 = \$5 \text{ million}$
 Yes, there is a net advantage to merging.
 c. $NAM = [\$135 - (\$50 + \$75)] - \$3 - \$5 = \2 million
 Yes, the acquisition is advantageous to Ace's shareholders.
 Ace receives $\$2 \text{ million} / \$5 \text{ million} = 40\%$ of the net advantage to merging.
 Brace receives $\$3 \text{ million} / \$5 \text{ million} = 60\%$ of the net advantage to merging.
- A8. a. $V_{AB} = \$100 + \$145 + \$25 = \270 million
 b. $NAM = [V_{AB} - (V_A + V_B)] - P_B - \text{Expenses}$
 $NAM = [\$270 - (\$100 + \$145)] - \$12 = \$13 \text{ million}$
 Yes, there is a net advantage to merging.
 c. $NAM = [\$270 - (\$100 + \$145)] - \$7 - \$12 = \6 million
 Yes, the acquisition is advantageous to Case's shareholders.
 Case receives $\$6 \text{ million} / \$13 \text{ million} = 46.15\%$ of the net advantage to merging.
 Byman receives $\$7 \text{ million} / \$13 \text{ million} = 53.85\%$ of the net advantage to merging.
- A9. a. $NAM = [V_{AB} - (V_A + V_B)] - P_B - \text{Expenses}$
 $NAM = \$260 - (\$170 + \$60) - \$20 - \$3 = \7 million
 b. Synergy = $\$260 - (\$170 + \$60) = \30 million
 The synergy is \$7 million above the premium and other acquisition costs.
- A10. a. Youhall P/E = $\$25 / \$2 = 12.50$
 Z-Rocks P/E = $\$20 / \$2.50 = 8$
 b. $[\$20 / \text{Z-Rock share}] / [\$25 / \text{Youhall share}] = 0.80 \text{ Youhall shares per Z-Rock share.}$
 Youhall earnings = $4,000,000 \times \$2.00 + 2,000,000 \times \$2.50 = \$13 \text{ million}$
 Outstanding shares = $4,000,000 + 2,000,000 \times 0.80 = 5.6 \text{ million}$
 EPS = $\$13 \text{ million} / 5.6 \text{ million} = \2.32
 c. EPS = $\$2.00 = \$13 \text{ million} / \text{Outstanding shares}$
 Outstanding shares = $\$13 \text{ million} / \$2.00 = 6.5 \text{ million}$
 Shares offered to Z-Rocks = $6.5 \text{ million} - 4 \text{ million} = 2.5 \text{ million}$
 Exchange ratio = $2.5 \text{ million Youhall shares} / 2 \text{ million Z-Rocks shares} = 1.25$

- A11. a. Share price = EPS x P/E
 Acquiror share price = \$10 x 20 = \$200
 Acquiree share price = \$4 x 10 = \$40
 $[\$40 / \text{Acquiree share}] / [\$200 / \text{Acquiror share}] = 0.20$ Acquiror shares per Acquiree share
- b. Acquiror's earnings = 10,000,000 x \$10.00 + 5,000,000 x \$4.00 = \$120 million
 Outstanding shares = 10,000,000 + 5,000,000 x 0.20 = 11 million
 EPS = \$120 million / 11 million = \$10.91
- c. P/E = \$200 / \$10.91 = 18.33
- d. Acquiring a firm with a higher P/E at current market rates will decrease the acquiror's P/E.
- A12. a. Loop P/E = \$65 / \$5 = 13
 PRT P/E = \$55 / \$3 = 18.33
- b. $[\$55 / \text{PRT share}] / [\$65 / \text{Loop share}] = 0.846$ Loop shares per PRT share.
 Loop earnings = 2,500 x \$5.00 + 500 x \$3.00 = \$14,000
 Outstanding shares = 2,500 + 500 x 0.846 = 2,923
 EPS = \$14,000 / 2,923 = \$4.79
- c. EPS = \$5.00 = \$14,000 / Outstanding shares
 Outstanding shares = \$14,000 / \$5.00 = 2,800
 Shares offered to PRT = 2,800 - 2,500 = 300
 Exchange ratio = 300 Loop shares / 500 PRT shares = 0.60
- A13. Based on the P/E ratio a reasonable range is 7 x \$35 to 12 x \$35 = \$245 to \$420 million.
 Based on the P/CF ratio a reasonable range is 4.5 x \$48 to 7.5 x \$48 = \$216 to \$360 million.
 Based on the P/Book ratio a reasonable range is 1.3 x \$175 to 2.4 x \$175 = \$227.5 to \$420 million.
 Overall a reasonable range is \$216 to \$420 million.
- A14. a. Share price = EPS x P/E
 Acquiror share price = \$5 x 20 = \$100
 Acquiree share price = \$2 x 10 = \$20
 $[\$20 / \text{Acquiree share}] / [\$100 / \text{Acquiror share}] = 0.20$ Acquiror shares per Acquiree share
- b. Acquiror's earnings = 10,000,000 x \$5.00 + 5,000,000 x \$2.00 = \$60 million
 Outstanding shares = 10,000,000 + 5,000,000 x 0.20 = 11 million
 EPS = \$60 million / 11 million = \$5.45
- c. P/E = \$100 / \$5.45 = 18.33
- d. Acquiring a firm with a higher P/E at current market rates will decrease the acquiror's P/E
- A15. a. Lux P/E = \$50 / \$4 = 12.5
 MCD P/E = \$40 / \$2 = 20
- b. $[\$40 / \text{MCD share}] / [\$50 / \text{Lux share}] = 0.80$ Lux shares per MCD share.
 Lux earnings = 1,000 x \$4.00 + 200 x \$2.00 = \$4,400
 Outstanding shares = 1,000 + 200 x 0.80 = 1,160
 EPS = \$4,400 / 1,160 = \$3.79
- c. EPS = \$4.00 = \$4,400 / Outstanding shares
 Outstanding shares = \$4,400 / \$4.00 = 1,100
 Shares offered to MCD = 1,100 - 1,000 = 100
 Exchange ratio = 100 Lux shares / 200 MCD shares = 0.50

Problem Set B

- B1. a. $NPV = -\$100 + \$10 / 1.20 + \$20 / 1.20^2 + \$30 / 1.20^3 + \$40 / 1.20^4 + \$250 / 1.20^5 = \$59.34$ million
b. $CF_0 = -\$100$
 $CF_1 = \$10$
 $CF_2 = \$20$
 $CF_3 = \$30$
 $CF_4 = \$40$
 $CF_5 = \$250$
IRR = 34.45%
c. $-\$100 + \$10 + \$20 + \$30 + \$40 = 0$
Payback Period = 4 years
d. Yes. The firm should proceed with the acquisition because it has a positive NPV.
- B2. a. CALC: $n = 6$ $r = 15\%$ $PMT = \$40$ $FV = \$410$ **PV = -\$328.63**
 $NPV = \$328.63 - \$200 = \$128.63$
b. CALC: $n = 6$ $PV = -\$200$ $PMT = \$40$ $FV = \$410$ **$r = 28.54\%$**
c. $\$200 - \$40 - \$40 - \$40 - \$40 - \$40 = 0$
d. Yes. The firm should proceed with the acquisition because it has a positive NPV.
- B3. a. Firm A: $0.3 \times \$200 + 0.5 \times \$100 + 0.2 \times \$25 = \115 million
Firm B Debt: $0.3 \times \$50 + 0.5 \times \$50 + 0.2 \times \$25 = \45 million
Firm B Equity: $0.3 \times \$100 + 0.5 \times \$50 + 0.2 \times 0 = \$55$ million
Firm B Value: $\$45$ million + $\$55$ million = $\$100$ million
b. Merged Firm: $\$115$ million + $\$100$ million = $\$215$ million
Merged Firm Debt: $0.3 \times \$50 + 0.5 \times \$50 + 0.2 \times \$50 = \50 million
Merged Firm Equity: $\$215$ million - $\$50$ million = $\$165$ million
c. The firms should not merge because shareholder wealth decreases.
- B4. a. Merged Firm Debt: $0.3 \times \$50 + 0.5 \times \$50 + 0.2 \times \$50 = \50 million
b. Merged Firm Equity: $0.3 \times (\$200 + \$100 + \$30 - \$2) + 0.5 \times (\$100 + \$50 + \$30 - \$2) + 0.2 \times (\$30 - \$2) = \$193$ million
c. Yes, the firms should merge because shareholder wealth increases.
- B5. $\$275 - (\$180 - \$30) = \125 million
- B6. $\$100 - (\$90 - \$20) = \30 million
- B7. a. Multiple of Earnings = Price Paid for Equity / Earnings
1. $\$450 / \$30 = 15$
2. $\$600 / \$50 = 12$
3. $\$350 / \$25 = 14$
4. $\$375 / \$35 = 10.7$
5. $\$330 / \$30 = 11$
6. $\$450 / \$45 = 10$
Multiple of EBIT = (Price Paid for Equity + Market Value of Debt) / EBIT
1. $(\$450 + \$225) / \$80 = 8.4$
2. $(\$600 + \$150) / \$100 = 7.5$
3. $(\$350 + \$175) / \$85 = 6.2$
4. $(\$375 + \$25) / \$50 = 8.0$
5. $(\$330 + \$110) / \$55 = 8.0$
6. $(\$450 + \$50) / \$60 = 8.3$

Multiple of EBITDA = (Price Paid for Equity + Market Value of Debt) / EBITDA

1. $(\$450 + \$225) / \$110 = 6.1$
2. $(\$600 + \$150) / \$125 = 6.0$
3. $(\$350 + \$175) / \$85 = 6.2$
4. $(\$375 + \$25) / \$65 = 6.2$
5. $(\$330 + \$110) / \$70 = 6.3$
6. $(\$450 + \$50) / \$85 = 5.9$

b. Multiple of EBITDA

c. Multiple of Earnings

10 x \$50 = \$500 million

15 x \$50 = \$750 million

Multiple of EBIT

6.2 x \$75 = \$465 million

8.4 x \$75 = \$630 million

Multiple of EBITDA

5.9 x \$100 = \$590 million

6.3 x \$100 = \$630 million

The ranges are inconsistent because of differences in interest expenses and depreciation between the firms.

B8. $(\$50 - \$35) / \$35 = 42.86\%$

B9. $(\$85 - \$78) / \$78 = 8.97\%$

B10. a. 60,000,000,000 cubic feet of gas x (1 barrel of oil / 6,000 cubic feet of gas) = 10,000,000 barrels of oil

25 million + 10 million = 35 million barrels of oil

b. $\$8.50 \times 35 \text{ million} + \$52.5 \text{ million} = \$350 \text{ million}$

B11. a. 45,000,000,000 cubic feet of gas x (1 barrel of oil / 4,500 cubic feet of gas) = 10,000,000 barrels of oil

15 million + 10 million = 25 million barrels of oil

b. $\$9.50 \times 25 \text{ million} + \$62.5 \text{ million} = \$300 \text{ million}$

B12. a. NAC: Cost of purchasing equity = $\$45 \times 5 \text{ million} = \225 million

Transaction costs = \$3 million

Cost of assuming debt = CALC: $n = 6$ $r = (1 - 0.40) \times 12\% = 7.2\%$

$PMT = (8\% \times \$50) \times (1 - 0.40) = \2.4 $FV = \$50$ **PV = -\$44.3 million**

NAC = $\$225 + \$3 + \$44.3 = \272.3 million

TVE: EBIT = \$125 million

Interest = \$4 million

EBT = $\$125 - \$4 = \$121 \text{ million}$

Earnings = $\$121 - (1 - 0.40) = \72.6 million

TVE = $\$72.6 \times (\$45 / \$3) = \1089 million

TVD = \$50 million

$NPV = -\$272.3 + \$25 / 1.165 + \$30 / 1.165^2 + \$35 / 1.165^3 + \$40 / 1.165^4 + \$45 / 1.165^5 +$
 $(\$50 + \$1089 + \$50) / 1.165^6 = \311.67 million

b. TVE = $\$1089 - (\$1089 - \$225 - \$3) \times 0.40 = \$882.36$

TVD = \$50

$NPV = -\$272.3 + \$25 / 1.165 + \$30 / 1.165^2 + \$35 / 1.165^3 + \$40 / 1.165^4 + \$45 / 1.165^5 +$
 $(\$50 + \$882.36 + \$50) / 1.165^6 = \229 million

c. Yes

d. $NPV = -NAC + PVCF = 0$
 $PVCF = \$25 / 1.165 + \$30 / 1.165^2 + \$35 / 1.165^3 + \$40 / 1.165^4 + \$45 / 1.165^5 +$
 $(\$50 + \$882.36 + \$50) / 1.165^6 = \501.37 million
 $NAC = \$501.37 \text{ million}$
 $\text{Cost of purchasing equity} = \$501.37 - \$3 - \$44.3 = \$454.07 \text{ million}$
 $\$454.07 \text{ million} / 5 \text{ million shares} = \90.81 per share

B13. a. $r_a = 6\% + 1.5 \times 8\% = 18\%$
 $WACC = 18\% - 0.25 \times 0.25 \times 0.12 \times (1 + 0.18) / (1 + 0.12) = 17.21\%$
 b. $NPV = -\$272.3 + \$25 / 1.1721 + \$30 / 1.1721^2 + \$35 / 1.165^3 + \$40 / 1.1721^4 + \$45 / 1.1721^5 +$
 $(\$50 + \$1089 + \$50) / 1.1721^6 = \292.69 million
 c. $NPV = -\$272.3 + \$25 / 1.1721 + \$30 / 1.1721^2 + \$35 / 1.165^3 + \$40 / 1.1721^4 + \$45 / 1.1721^5 +$
 $(\$50 + \$882.36 + \$50) / 1.1721^6 = \213 million

B14. a. Firm A: $P/E = \$25 / \$2.50 = 10$
 Firm B: $P/E = \$50 / \$4 = 12.5$
 b. Total market value = $1 \times \$25 + 2 \times \$50 = \$125 \text{ million}$
 Total earnings = $1 \times \$2.5 + 2 \times \$4 = \$10.5 \text{ million}$
 $P/E = \$125 / \$10.5 = 11.90$
 Assuming the firms have no synergy, the shareholders are not better off.

B15. a. Firm A: $P/E = \$35 / \$3.50 = 10$
 Firm B: $P/E = \$70 / \$5 = 14$
 b. Total market value = $1.5 \times \$35 + 2.5 \times \$70 = \$227.5 \text{ million}$
 Total earnings = $1.5 \times \$3.5 + 2.5 \times \$5 = \$17.75 \text{ million}$
 $P/E = \$227.5 / \$17.75 = 12.82$
 Assuming the firms have no synergy, the shareholders are not better off.

B16. a. CALC: $n = 10 \quad r = 13\% \quad PMT = 10 \quad FV = 100 \quad PV = -83.72$
 $\$83.72 \text{ million}$
 b. The acquisition would help Garden State's bondholders
 c. Changes in risk of the securities causes a transfer in wealth.

B17. a. CALC: $n = 10 \quad r = 14\% \quad PMT = 10 \quad FV = 100 \quad PV = -79.14$
 $\$79.14 \text{ million}$
 b. The acquisition would help Garden State's bondholders
 c. Changes in risk of the securities causes a transfer in wealth.

B18. Since the acquiree is in the rental business, multiples for firms in the rental business should be used.
 Multiple of Earnings
 $10 \times \$25 = \250 million
 $12 \times \$25 = \300 million
 Multiple of Cash Flow
 $5.8 \times \$40 = \232 million
 $7.8 \times \$40 = \312 million
 Multiple of EBITDA
 $7.9 \times \$30 = \237 million
 $8.9 \times \$30 = \267 million
 Price / Book Multiple
 $1.4 \times \$175 = \245 million
 $1.6 \times \$175 = \280 million
 The outside range is \$232 to \$312 million. The intersection that would satisfy all four methods provides a more focused range of acquisition values, which is \$250 million to \$267 million.

- B19. a. NAC: $\$24 \times (1 + 1/3) \times 2$ million shares + \$0.5million transaction cost = \$64.5 million
 TV: EBIT = \$75 EBT = \$75 - \$0 = \$75 Earnings = \$75 x (1 - 0.40) = \$45 million
 P/E = $\$24 \times (1 + 1/3) / \$4 = 8$
 $\$45 \times 8 = \360 million
 WACC = $0.1407 - 0.25 \times 0.42 \times 0.12 (1 + 0.1407) / (1 + 0.12) = 12.79\%$
 NPV = $-\$64.5 + \$6 / 1.1279 + \$10 / 1.1279^2 + \$12 / 1.1279^3 + \$14 / 1.1279^4 + \$18 / 1.1279^5 +$
 $\$22 / 1.1279^6 + \$25 / 1.1279^7 + (\$30 + \$360) / 1.1279^8 = \$145.91$
- b. TV = $\$360 - (\$360 - 64.5) \times 0.4 = \241.8 million
 NPV = $-\$64.5 + \$6 / 1.1279 + \$10 / 1.1279^2 + \$12 / 1.1279^3 + \$14 / 1.1279^4 + \$18 / 1.1279^5 +$
 $\$22 / 1.1279^6 + \$25 / 1.1279^7 + (\$30 + \$241.8) / 1.1279^8 = \$100.78$ million
- c. Yes because the acquisition has a positive NPV.
- B20. a. Ajax: 10 million shares at \$40 = \$400 million
 Central: 10 million shares at \$20 = \$200 million
 $\$200 \text{ million} / \$400 \text{ million} = 1/2$
 1 share of Ajax = 1/2 share of Central
- b. Ajax: 10 million shares at \$40 = \$400 million
 Central: 10 million shares at \$20 x 1.25 = \$250 million
 $\$250 \text{ million} / \$400 \text{ million} = 5/8$
 1 share of Ajax = 5/8 share of Central
- c. Since the exchange ratio is fixed, Central's share price should also fall by 10%.
- B22. WACC = $0.15 \times (1 - 0.32 \times 0.50) = 12.6\%$

Year	CFAT	PV@12.6%	New Debt	INT	T*INT	PV@10%
0	\$(100.00)	\$ (100.00)	\$ 90.00			
1	\$ 12.50	\$ 11.10	\$ 77.50	\$ 9.00	\$ 2.88	\$ 2.62
2	\$ 13.75	\$ 10.84	\$ 63.75	\$ 7.75	\$ 2.48	\$ 2.05
3	\$ 15.13	\$ 10.59	\$ 48.63	\$ 6.38	\$ 2.04	\$ 1.53
4	\$ 16.64	\$ 10.35	\$ 31.99	\$ 4.86	\$ 1.56	\$ 1.06
5	\$ 18.30	\$ 10.11	\$ 13.69	\$ 3.20	\$ 1.02	\$ 0.64
6	\$ 20.13	\$ 9.88	\$ -	\$ 1.37	\$ 0.44	\$ 0.25
Total:		\$ (37.12)				\$ 8.15
NPV =		\$ (28.98)				

Problem Set C

- C1. a. \$100 million + \$200 million = \$300 million
 b. $(\$100 \times 20\% + \$200 \times 25\%) / \$300 = 23.33\%$
 c. The merged firm should return $\$300 \times 23.33\% = \70 million
 Since it is returning only 23%, the value of the merged firm is $\$70 / 23\% = \304.35 million
 Short the merged firm and receive \$304.35 million
 Use 1/3 of the proceeds to buy Substitute of A: $\$304.35 \times 1/3 = \101.45 million
 Use 2/3 of the proceeds to buy Substitute of B: $\$304.35 \times 2/3 = \202.90 million
 Receive a return of $\$101.45 \times 20\% = \20.29 million from Substitute of A
 Receive a return of $\$202.90 \times 25\% = \50.72 million from Substitute of B
 Pay a return of $\$304.35 \times 23\% = \70 million to the merged firm
 Net return = $\$20.29 + \$50.72 - \$70 = \1.01 million
 Assuming there are 10,000,000 shares of the merged firm outstanding, the arbitrage would earn
 $\$1.01 \text{ million} / 10,000,000 \text{ shares} = \0.10 per share.
 d. The combination would cause a decrease in liquidity for investors, as they could not choose to sell only one of the two firms and could not replicate this transaction with substitutes. The loss in liquidity would cause them to demand a higher return. A higher required return would result in a lower market value.
- C2. a. Favorable A, Favorable B: Firm = \$400 Debt = \$280 Equity = \$120
 Favorable A, Unfavorable B: Firm = \$300 Debt = \$280 Equity = \$20
 Unfavorable A, Favorable B: Firm = \$300 Debt = \$280 Equity = \$20
 Unfavorable A, Unfavorable B: Firm = \$200 Debt = \$200 Equity = \$0
 b. Expected Return Debtholders = $0.75 \times \$280 + 0.25 \times \$200 = \$260$ which is higher than the previously expected return of \$240.
 c. Expected Return Stockholders = $0.25 \times \$120 + 0.5 \times \$20 + 0.25 \times \$0 = \40 which is lower than the previously expected return of \$60.
 d. The merger expropriates wealth from the stockholders to the debtholders by coinsuring each firms debt with the expected earnings of the other firm.
- C3. a.

Year	CFAT	PV@18%	New Debt	Int on \$200	Int on \$50	T*INT	PV@12%
0	-273	\$ (273.00)	\$ 200.00				
1	25	\$ 21.19	\$ 180.00	\$ 28.00	\$ 4.00	\$8.00	\$ 7.14
2	30	\$ 21.55	\$ 160.00	\$ 25.20	\$ 4.00	\$7.30	\$ 5.82
3	35	\$ 21.30	\$ 140.00	\$ 22.40	\$ 4.00	\$6.60	\$ 4.70
4	40	\$ 20.63	\$ 120.00	\$ 19.60	\$ 4.00	\$5.90	\$ 3.75
5	45	\$ 19.67	\$ 100.00	\$ 16.80	\$ 4.00	\$5.20	\$ 2.95
6	1189	\$ 440.44	\$ -	\$ 14.00	\$ 4.00	\$4.50	\$ 2.28
Total:		\$ 271.78					\$ 26.64
NPV =		\$ 298.42					

b.

Year	CFAT	PV@18%	New Debt	Int on \$200	Int on \$50	T*INT	PV@12%
0	-273	\$ (273.00)	\$ 200.00				
1	25	\$ 21.19	\$ 180.00	\$ 28.00	\$ 4.00	\$8.00	\$ 7.14
2	30	\$ 21.55	\$ 160.00	\$ 25.20	\$ 4.00	\$7.30	\$ 5.82
3	35	\$ 21.30	\$ 140.00	\$ 22.40	\$ 4.00	\$6.60	\$ 4.70
4	40	\$ 20.63	\$ 120.00	\$ 19.60	\$ 4.00	\$5.90	\$ 3.75
5	45	\$ 19.67	\$ 100.00	\$ 16.80	\$ 4.00	\$5.20	\$ 2.95
6	826	\$ 305.98	\$ -	\$ 14.00	\$ 4.00	\$4.50	\$ 2.28
Total:		\$ 137.31					\$ 26.64
NPV =		\$ 163.95					

C4. a. The year 10 incremental free cash flow is \$60.683 million ($= 15 \times (1.15)^{10}$) so the terminal value will be \$505.69 million ($= [125/15] \times 60.683$) and tax on the capital gain will be \$152.276 million ($= 0.4 \times [505.69 - 125]$). The net terminal value will be \$353.414 million ($= 505.69 - 152.276$).

The net effect of the taxable transaction is a \$10 million depreciation recapture tax liability with additional depreciation expense of \$5 million per year for 5 years. The NPV of a taxable transaction is

$$(0.4) \times \sum_{t=1}^5 \frac{5}{(1.10)^t} - 10 = -\$2.42 \text{ million}$$

Radnor's NPV of acquiring Excelsior is:

$$\text{NPV} = -125 + \sum_{t=1}^{10} \frac{15 \cdot (1.15)^t}{(1.16)^t} + \frac{353.414}{(1.16)^{10}} - 2.42 = \$95.76 \text{ million}$$

$$\text{NPV} = -125 + \sum_{t=1}^{10} \frac{15 \cdot (1.15)^t}{(1.16)^t} + \frac{353.414}{(1.16)^{10}} = \$98.18 \text{ million}$$

b. Radnor's NPV of acquiring Excelsior's common stock in a tax-free transaction is:

c. Because Miami Media would have to realize a \$25 million taxable gain in a taxable transaction, it would prefer a tax-free transaction. The present value difference in taxes payable is:

$$25 \times \left[1 - \frac{1}{(1.15)^{10}} \right] = \$18.82 \text{ million}$$

- d. Miami Media and Radnor are both better off, from a purely tax standpoint, in a tax-free transaction. Unless there are nontax reasons for structuring the acquisition in a taxable manner, they should structure it as a tax-free acquisition.