**Solutions Chapter 6**

**Exercise 6.1**
a. (workings in $1,000)
Current ratio: 1,300/1,100 = 1.18  Quick ratio: 900/1,100 = 0.82.
b. Liquidity will improve if goods are sold for a profit. Cash (or receivables) increases while inventories decrease, but to a lesser extent.
c. Current ratio will improve (1,000/800 = 1.25) yet quick ratio will decline (600/800 = 0.75). The overall capability to meet short-term obligations has not really changed.
d. Finished products are a more liquid asset than raw materials so, other elements being equal, situation one shows the higher liquidity.
e. Debt ratio = 4,000/5,000 = 0.80
f. Debt ratio will be: 3,700/4,700 = 0.79. Even though this ratio improves slightly, the capacity to service the remaining debts has not really changed.

**Exercise 6.2**
a. (workings in $1,000)
EBIT = 1,336 − 1,250 = 86. ROI = 86/1,000 = 8.6%.
b. Profit = 86 − (0.10*400) = 46. ROE = 46/600 = 7.67%.

**Exercise 6.3**
(workings in $1,000)
EBIT = 0.08*(500+300) = 64. Interest = 64 − 35 = 29. ROD = 29/300 = 9.67%.

**Exercise 6.4**
a. (workings in $1,000)
ROI = 33/300 = 11% (for all companies).
b.

|  | A | B | C |
|---|---|---|---|
| EBIT | 33 | 33 | 33 |
| Interest | 12 | 9 | 0 |
| Profit | 21 | 24 | 33 |
| ROE | 21/100=21% | 24/150=16% | 33/300=11% |

c. The various degrees of leverage explain the differences in ROE. In this case ROI > ROD so employing more debt increases ROE.
d. ROE and ROI are equal if ROI = ROD. Therefore ROI must become 6%. EBIT = 0.06*300 = 18. Profit will be 18 −12 = 6. ROE = 6/100 = 6%.
e. ROE and ROI are equal if ROI = ROD. Therefore ROD must become 11%. Interest expense will be 0.11*200 = 22. Profit will be 33 − 22 = 11. ROE = 11/100 = 11%.

**Exercise 6.5**
(workings in $1,000)
Total investment is 1,200/0.4 = 3,000. ROI = 300/3,000 = 10%. ROI > ROD so leverage effect is positive. Reducing debt would lower ROE.

|  | Old situation | New situation |
|---|---|---|
| EBIT | 300 | 300 |
| Interest | 0.08*1,800 = 144 | 0.08*900 = 72 |

| Profit | 156 | 228 |
|---|---|---|
| ROE | 156/1,200 = 13% | 228/2,100 = 10.86% |

**Exercise 6.6**
(workings in $1,000)

| Assets | | Sources | |
|---|---|---|---|
| Premises | 285 | Common stock | 300 |
| Equipment | 100 | Bonds | 130 |
| Vehicles | 40 | Mortgage | 80 |
| Inventories | 160 | Payables | 140 |
| Receivables | 40 | Tax payable | 10 |
| Cash | 35 | | |
| Total | 660 | | 660 |

Total interest = 0.09*130 + 0.10*80 = 19.7. EBIT = 30 + 19.7 = 49.7.

| Ratio | Calculations |
|---|---|
| *Liquidity* | |
| -Current ratio | 235/150 = 1.57 |
| -Quick ratio | 75/150 = 0.50 |
| -Net working capital | 235 – 150 = 85 |
| *Leverage* | |
| -Debt ratio | 360/660 = 0.55 |
| -Times interest earned | 49.7/19.7 = 2.52 |
| *Profitability* | |
| -ROI | 49.7/660 = 7.53% |
| -ROE | 30/300 = 10% |
| -ROD | 19.7/360 = 5.47% |
| -Margin on sales | 49.7/1,122 = 4.43% |
| *Activity* | |
| -Collection period | 40/1,122*365 = 13 |
| -Inventory period | 160/(0.8*1,122)*365 = 65 |
| -Turnover rate | 1,122/660 = 1.7 |

Comments:
Liquidity is a critical point. The quick ratio is well below one.
Leverage is not a problem. The debt ratio is normal for many industries and also the EBIT can drop substantially before the interest payments are endangered.

The profitability of the business is positive. The ROD is smaller than ROI. However the ROD is calculated including all debts, also non-interest bearing debts like trade payables. The interest rates on the long-term loans are higher than ROI and so cause a negative leverage effect regarding these loans.

The inventory period is high. Inventory is sufficient to accommodate 65 days (two months) of sales. By lowering the investment in excess inventory, the turnover rate, and thus the profitability, could increase.

**Exercise 6.7**
Number of shares: 50,000/10 = 5,000 (beginning year 1) and 70,000/10 = 7,000 (ending year 1).
a. EPS1 = $82,500/7,000 = $11.79. EPS2 = $60,000/7,000 = $8.57.
b. P/E1 = $80/$11.79 = 6.79. P/E2 = $82.5/$8.57 = 9.63.
c. Dividend year 1: $82,500 - $50,000 = $32,500. Dividend per share = $4.64. Yield = $4.64/$75 = 6.19%.
Dividend year 2: $60,000 - $25,000 = $35,000. Dividend per share = $5. Yield is $5/$80 = 6.25%.
(Dividend yields based on assumption of buying shares at beginning of the year)
d. Total yield 1: ($4.64 + $5)/$75 = 12.85%. Total yield 2: ($5 + $2.50)/$80 = 9.38%.
(Total yields based on assumption of buying shares at beginning of the year)
e.

|  | Begin 1 | End 1 | End 2 |
|---|---|---|---|
| Market value | $75 | $80 | $82.5 |
| Book value | $350,000/5,000 = $70 | $525,000/7,000 = $75 | $550,000/7,000 = $79 |
| Ratio | 1.07 | 1.067 | 1.05 |

f. Year 1: Average total investment = ($650,000 + $725,000)/2 = $687,500. Average debt = $250,000. Interest = 0.06*$250,000 = $15,000. EBIT = $82,500 + $15,000 = $97,500. ROI = $97,500/$687,500 = 14.18%.
Year 2: Average total investment = ($725,000+ $800,000)/2 = $762,500. Average debt = $225,000. Interest = 0.06*$225,000 = $13,500. EBIT = $60,000 + $13,500 = $73,500. ROI = $73,500/$762,500 = 9.64%.
g. Year 1: Average equity = ($350,000 + $525,000)/2 = $437,500.
ROE = $82,500/$437,500 = 18.85%.
Year 2: Average equity = ($525,000 + $550,000)/2 = $537,500.
ROE = $60,000/$537,500 = 11.16%.

**Exercise 6.8**
a. ROI = $420,000/$3,500,000 = 12%.
b. ($420,000 – $120,000)/$2,000,000 = 15%.
c. $300,000/100,000 = $3.
d. $30/$3 = 10.

|  | *New shares* | *New loan* |
|---|---|---|
| EBIT | $580,000 | $580,000 |
| Interest | $120,000 | $210,000 |
| Profit | $460,000 | $370,000 |
| e. ROI | $580,000/$4,500,000 = 12.9% | $580,000/$4,500,000 = 12.9% |
| f. ROE | $460,000/$3,000,000 = 15.3% | $370,000/$2,000,000 = 18.5% |
| g. EPS | $460,000/140,000 = $3.29 | $370,000/100,000 = $3.70 |
| h. Market price | 12*$3.29 = $39.48 | 11*$3.70 = $40.70 |

All ratios indicate that debt financing better serves the interests of the current stockholders.

i. The PE is lower in the case of debt financing due to the higher level of risk.