Solutions to Chapter 3 Additional Problems

1. We are given ROA = 3% and Sales/Total assets = 1.5x

From Du Pont equation: ROA = profit margin x total assets turnover
3% = profit margin x 1.5

profit margin = 3%/1.5 = 2%

We can also calculate the company’s debt ratio in a similar manner, given the facts of the problem. We are given ROA (NI/A) and ROE (NI/E); if we use the reciprocal of ROE we have the following equation:

E/A = NI/A x E/NI and D/A = 1 - E/A, so

E/A = 3% x 1/.05 = 60%
D/A = 1 - .60 = .40 = 40%

Alternatively,

ROE = ROA x EM
5% = 3% x EM
EM = 5%/3% = TA/E

Take the reciprocal:

E/TA = 3/5 = 60%

therefore, D/A = 1 - .60 = .40 = 40%

Thus, the firm’s profit margin = 2% and its debt ratio = 40%
2. (a) Current assets/Current liabilities = 3.0x  

\[
\frac{\$810,000}{\text{Current liabilities}} = 3.0x
\]

Current liabilities = $270,000

(b) \(\frac{\text{Current assets} - \text{inventories}}{\text{Current liabilities}} = 1.4x\)

\[
\frac{\$810,000 - \text{inventories}}{\$270,000} = 1.4x
\]

inventories = $432,000

(c) \(\text{Current assets} = \text{cash} + \text{marketable securities} + \text{accounts receivable} + \text{inventories}\)

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\$810,000 = \$120,000 + \text{accounts receivable} + \$432,000
\]

Accounts receivable = $258,000

(d) \(\frac{\text{Sales}}{\text{Inventory}} = 6.0x\)

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\frac{\text{Sales}}{\$432,000} = 6.0x
\]

Sales = $2,592,000

(e) \(\text{DSO} = \frac{\text{Accounts receivable}}{\left(\frac{\text{Sales}}{360}\right)} = \frac{\$258,000}{\left(\frac{\$2,592,000}{360}\right)} = 36\text{ days}\)

3. \(\text{TIE} = \frac{\text{EBIT}}{\text{INT}}, \text{so find EBIT and INT}\)

Interest = $500,000 \times .1 = $50,000

Net income = $2,000,000 \times .05 = $100,000

Pre-tax income = $100,000/(1-T) = $100,000/.7 = $142,857

\(\text{EBIT} = \$142,857 + \$50,000 = \$192,857\)

\(\text{TIE} = \frac{\$192,857}{\$50,000} = 3.86x\)
4. ROE = Profit margin x TA turnover x equity multiplier

               = NI/Sales x Sales/TA x TA/Equity

Now we need to determine the inputs for the equation from the data that were given. On the left we set up an income statement, and we put numbers in it on the right:

Sales (given) $10,000,000
- Cost n/a
EBIT (given) $ 1,000,000
  - Int (given) 300,000
EBT $700,000
  - Taxes (34%) 238,000
NI $462,000

Now we can use some ratios to get some more data:

Total assets turnover = 2 = S/TA; TA = S/2 = $10,000,000/2 = $5,000,000

D/A = 60%; so E/A = 40%; and, therefore,

Equity multiplier = TA/E = 1/(E/A) = 1/.4 = 2.5

Now we can complete the Du Pont equation to determine ROE:

ROE = $462,000/$10,000,000 x $10,000,000/$5,000,000 x 2.5 = .231 = 23.1%