Contemporary Engineering Economics 7th edition Park Solutions Manual

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Chapter 2 Accounting Information for Engineering Economic Decisions

2.1

(2) Income statement; (1) balance sheet; (3) cash flow statement; (4) operating activities; (5) investing activities, and (6) financing activities; (7) capital account (paid-in capital)

2.2

(7), (8), (1), (11), (3), (9)

2.3

(a)

- Current assets = $150,000 + $200,000 + $150,000 + $50,000 + $30,000 = $580,000
- Current liabilities = $50,000 + $100,000 + $80,000 = $230,000
- Working capital = $580,000 - $230,000 = $350,000
- Shareholder's equity = $100,000 + $150,000 + $150,000 + $70,000 = $470,000

(b) EPS = $500,000/10,000 = $50 per share

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(c) Par value = $15; capital surplus = $150,000/10,000 = $15

Market price = $15 + $15 = $30 per share

2.4

(a) Shareholder's equity in 2021 = $700 - $510 = $190(M)
Shareholder's equity in 2022 = $900 - $640 = $260(M)

(b) Net working capital in 2021 = $100 - $60 = $40(M)
Net working capital in 2022 = $200 - $90 = $110(M)

(c) The income taxes in year 2022:

($2,350 - $1,130-$420-$210) *0.35 = $206.5(M)

(d) $383.50 + $420=$803.50 (M)
(Cash from Operating activities = Net income + Depreciation)

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2.5 (a)

	Company A	Company B
ROE (= Net income/Equity)	26.03%	22.29%
ROA (= Net income + interest expense (1-tax rate)/Average total assets)	17.34%	12.59%

(b) Company A has performed better in terms of profitability.

(c) If two companies were merged, the impact on the results of ROE could be positive under the situation where the Company A leads the acquisition using a stock swap instead of issuing new stocks for M&A cost. If Company A uses a stock swap, the stock value wouldn't be decreased in terms of scarcity.

2.6

Inventory turnover ratio (2021) = Sales/Average inventory balance
= \$3,776,395 / (\$202,794 + \$231,313)×0.5
= 17.4 times

Inventory turnover ratio (2022) = 15.6 times

This ratio shows how many times the inventory of a firm is sold and replaced over a specific period. From the data, Metronix was holding more stocks of inventory than last year; having more inventories on stock is unproductive.

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2.7 (b)

2.8 (b)

2.9 (d)

2.10

Given Olson's EPS = \$8 per share; Cash dividend = \$4 per share; Book value per share = \$80; Changes in the retained earnings = \$24 million; Total debt = \$240 million; Find debt ratio = total debt/total assets

- $\text{EPS} = \dfrac{\text{Net Income}}{\text{X}} = \$8$
  Where X = the number of outstanding shares

- $\text{Book value} = \dfrac{\text{Total shareholders' equity}}{\text{X}} = \$80$

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- Retained earnings = Net income – Cash dividend; Net income = 8X from EPS relationship and the total cash dividend = 4X, so we rewrite 8X – 4X = $24 million, or X = 6 million shares

- From the book value per share, we know that the total shareholders' equity = 80X, or $480 million; Total assets = Total liabilities + Total shareholders' equity = $240 million + $480 million = $720 million

- Debt ratio = $240 million/$720 million = 0.33

2.11

(a) Debt ratio (= Total debt/Total assets)

= $19,483,000/$38,599,000 = 50.48%

(b) Times-interest-earned ratio (= EBIT/Interest expense)

= Not defined

(c) Current ratio (= Current assets/Current liabilities)

= 29,021,000/19,483,000 = 1.49

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(d) Quick (acid test) ratio (= (Current assets - Inventories)/Current liabilities))

= (29,021,000-1,301,000)/19,483,000 = 1.42

(d) Inventory-turnover ratio (= Sales/Avg. inventory balance)

= 61,494,000/ ((1,301,000+1,051,000)×0.5) = 52.29

(f) Days-sales-outstanding ratio (= Receivables/ (Annual sales/365))

=10,136,000/ (61,494,000/365) = 60.16

(g) Total-assets-turnover ratio (= Sales/Total assets)

= 61,494,000/38,599,000 = 1.59

(h) Profit margin on sales (= Net income available to common stockholders/Sales)

= 2,635,000/61,494,000 = 4.28%

(i) Return on total assets (= (Net income + interest expense (1-tax rate))/Avg. total assets)

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= 2,635,000/ ((38,599,000 + 33,652,000)×0.5) = 7.29%

(j) Return on common equity (= (Net income available to common stockholders)/Avg. common equity)

= 2,635,000/ ((7,766,000 + 5,641,000)×0.5) = 39.31%

(k) Price/earnings ratio (= Price per share/Earnings per share)

=13.47/ (3,350,000/1,944,000) = 7.82

(l) Book value per share (= (Total stockholders' equity-Preferred stock)/Shares outstanding)

= 7,766,000/1,944,000 = $3.99

To make an informed analysis of the firm's financial health, we need to calculate the various financial ratios of the firm's competitors along with the S&P 500.

2.12

Income Statement:

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A	B	C	D	E	F
$900,000	$585,000	$315,000	$270,000	$108,000	$162,000

Balance Sheet:

⓪	①	②	③	④	⑤
$160,000	$120,000	$320,000	$600,000	$900,000	$1,500,000

⑥	⑦	⑧	⑨	⑩
$450,000	$700,000	$100,000	$700,000	$800,000

- From Current ratio

  Total current assets = 2.4 × $250,000 = $600,000 ---------- ③

  Plant and equipment, net = $1,500,000-$600,000=$900,000---------- ④

- From Quick ratio

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Inventory = \$600,000 - (1.12 × \$250,000) = \$320,000 ----------②

- From Inventory Turnover
  Net Revenue = ((\$320,000 +\$280,000)/2) × 6.0 =\$1,800,000
  Cost of goods sold = \$1,800,000- \$900,000= \$900,000 ------- A

- From DSO
  Accounts receivable = 24.3333 × (\$1,800,000 ÷365) = \$120,000 ---------- ①
  Cash = ③-(②+①) = \$160,000 ----------ⓞ

- From interest expense of income statement
  Bond = \$450,000 ---------- ⑥
  250,000 + ⑥ = \$700,000 ----------⑦

- From Debt-to-Equity ratio
  Total Equity ⑩ = \$700,000 ÷ 0.875 =\$ 800,000 ---------- ⑩
  Total assets or Total liabilities and equity = ⑦ + ⑩ = \$1,500,000 ------⑤

- From Return on total assets

  Net income F = 14%× (\$1,350,000) - (\$45,000) (0.6) = \$162,000

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- From F, D =F ÷ 0.6 = \$270,000,
  E = D× (0.4) =\$108,000
  C = D+45,000 = \$315,000
  B=\$900,000-C = \$585,000

- From EPS
  Stock Outstanding = F ÷ 4.05 = 40,000 shares
  Common stock = \$2.50 × 40,000 = \$100,000 ----------⑧

  Retained Earnings = ⑩ - ⑧ = \$700,000 ----------⑨

2.13

- Accounts receivable = DSO × Sales/365 = 45 days × (\$1,200)/365 days) = \$147.945
- Current assets = (Cash and marketable securities) + (Accounts receivable) + Inventory = \$427.945
- Long-term debt = (Total assets) – (Current liabilities) – (Common equities)
  = \$427.945 + \$280 – (current assets/current ratio) - \$500
  = (\$207.945) – (427.945/3.2)
  = \$74.212
- Total assets turnover = Sales/Total assets = \$1,200/ (\$427.945 + \$280) = 1.695 times

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2.14

(a) Find Tiger's accounts receivable.

$$DSO = 91.25 = \frac{AR}{200,000/365} \Rightarrow AR = \$50,000$$

(b) Determine the amount of current liabilities.

$$CA = Cash + Inventory + AR = \$10,000 + \$150,000 + \$50,000 = \$210,000$$

$$Current\ Ratio = 4.2 = \frac{\$210,000}{Current\ Liabilities} \Rightarrow Current\ Liabilities = \$50,000$$

(c) Calculate the amount of the long-term debt.

$$Total\ Asset = Current\ Asset + Fixed\ Asset = \$210,000 + \$90,000 = \$300,000$$

$$\$300,000 = (\$50,000 + Long\ term\ debt) + \$200,000$$

$$\Rightarrow Long\ term\ debt = \$50,000$$

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(d) Calculate the Return on Common Equity.

$$ROE = \frac{net\ income}{equity} = \frac{\$15,000}{\$200,000} = 0.075 \Rightarrow 7.5\%$$

2.15

(a) Find Fisher's accounts receivable.

$$DSO = \frac{AR}{1,200/365} \rightarrow AR = \mathbf{147.95M}$$

(b) Calculate the amount of current assets.

$$CA = cash + Inv. + AR = 100 + 180 + 147.95 = \mathbf{427.95M}$$

(c) Determine the amount of current liabilities.

$$CR = 3.2 = \frac{CA}{CL} = \frac{427.95}{CL} \rightarrow CL = \mathbf{133.73M}$$

(d) Determine the amount of total assets.

$$TA = CA + FA = 427.95 + 280 = \mathbf{707.95M}$$

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(e) Calculate the amount of the long-term debt.

$$707.95 = (133.73 + LB) + 500 \rightarrow LB = \mathbf{74.22M}$$

(f) Calculate the profit margin.

$$profit\ margin = \frac{net\ income}{sales} = \frac{358}{1{,}200} = \mathbf{29.83\%}$$

(g) Calculate the Return on Common Equity

$$ROE = \frac{net\ income}{equity} = \frac{358}{500} = \mathbf{71.6\%}$$

Short Case Studies with Excel

ST2.1

Not provided

ST2.2

(a) Working capital = Current assets – Current liabilities

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Working capital requirements = Changes in current assets – Changes in current liabilities:

WC req. = (+$100,000 - $20,000) – (+$30,000 - $40,000) = $90,000,

indicating that additional financing is needed to fund the increase in current assets.

(b) Taxable income = $1,500,000 - $650,000 - $150,000 - $20,000 = $680,000

(c) Net income = $680,000 - $272,000 = $408,000

(d) Net cash flow:

- Operating activities = net income + depreciation – WC = $408,000 + $200,000 - $90,000 = $518,000
- Investing activities = equipment purchase = ($400,000)
- Financing activities = borrowed fund = $200,000
- Net cash flow = $518,000 - $400,000 + $200,000 = $318,000

ST2.3

Not provided

(Visit the websites and get the most recent financial statements available)

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