

Financial Analysis

Summer 2003

1 Outline

Chapter Organization

- 1 Cash Flow and Financial Statements: A Closer Look
- 2 Standardized Financial Statements
- 3 Ratio Analysis
- 4 The Du Pont Identity
- 5 Using Financial Statement Information
- 6 Summary and Conclusions

2 Hermetic, Inc., Balance Sheet

Hermetic, Inc. Balance Sheet as of December 31 (\$ in thousands)

Assets	1997	1998
Current Assets		
Cash	\$ 45	\$ 50
Accounts receivable	260	310
Inventory	320	385
Total	<u>\$ 625</u>	<u>\$ 745</u>
Fixed assets		
Net plant and equipment	985	1100
Total assets	<u>\$1610</u>	<u>\$1845</u>

2 Hermetic, Inc., Balance Sheet (concluded)

Liabilities and equity	1997	1998
Current liabilities		
Accounts payable	\$ 210	\$ 260
Notes payable	110	175
Total	<u>\$ 320</u>	<u>\$ 435</u>
Long-term debt	205	225
Stockholders' equity		
Common stock and paid-in surplus	290	290
Retained earnings	795	895
Total	<u>1085</u>	<u>1185</u>
Total liabilities and equity	<u>\$1610</u>	<u>\$1845</u>

3 Hermetic, Inc., Income Statement

(\$ in thousands)

Net sales	\$710.00
Cost of goods sold	480.00
Depreciation	30.00
Earnings before interest and taxes	\$200.00
Interest	20.00
Taxable income	180.00
Taxes	53.45
Net income	<u>\$126.55</u>
Retained earnings	\$100.00
Dividends	26.55

4 Statement of Cash Flows

■ Operating activities

- ◆ + Net income
- ◆ + Depreciation
- ◆ + Any decrease in current assets (except cash)
- ◆ + Increase in accounts payable
- ◆ – Any increase in current assets (except cash)
- ◆ – Decrease in accounts payable

4.1 Statement of Cash Flows (concluded)

- **Investment activities**
 - ◆ + Ending fixed assets
 - ◆ – Beginning fixed assets
 - ◆ + Depreciation
- **Financing activities**
 - ◆ – Decrease in notes payable
 - ◆ + Increase in notes payable
 - ◆ – Decrease in long-term debt
 - ◆ + Increase in long-term debt
 - ◆ + Increase in common stock
 - ◆ – Dividends paid

5 Hermetic, Inc., Statement of Cash Flows

- **Operating activities**

◆ + Net income	+ 126.55
◆ + Depreciation	+ 30.00
◆ + Increase in payables	+ 50.00
◆ – Increase in receivables	– 50.00
◆ – Increase in inventory	– 65.00
	91.55
- **Investment activities**

◆ + Ending fixed assets	+1,100.00
◆ – Beginning fixed assets	– 985.00
◆ + Depreciation	+ 30.00
	(145.00)

5.1 Hermetic, Inc., Statement of Cash Flows (concluded)

- **Financing activities**

◆ + Increase in notes payable	+ 65.00
◆ + Increase in long-term debt	+ 20.00
◆ – Dividends	– 26.55
	58.45

Putting it all together
 $+91.55 - 145.00 + 58.45 = +5.00$

6 Summary: Sources & Uses of Cash

- **Sources of cash include:**
 - ◆ Net income
 - ◆ Depreciation
 - ◆ Decrease in assets
 - ◆ Increase in liabilities
 - ◆ Sale of stock
- **Uses of cash include:**
 - ◆ Net loss
 - ◆ Increase in assets
 - ◆ Decrease in liabilities
 - ◆ Dividends paid
 - ◆ Repurchase of stock

7 Source or Use Application

- Based only on the following information for Asset Liquidation Corp., did cash go up or go down? By how much? Classify each event as a *source* or *use* of cash.

◆ Decrease in inventory	\$420
◆ Decrease in accounts payable	260
◆ Decrease in notes payable	750
◆ Increase in accounts receivable	900

7.1 Solution Source/Use application (concluded)

- | | <u>S or U</u> |
|-----------------------------------|---------------|
| ◆ Decrease in inventory | \$420 _____ |
| ◆ Decrease in accounts payable | 260 _____ |
| ◆ Decrease in notes payable | 750 _____ |
| ◆ Increase in accounts receivable | 900 _____ |
- Change in cash = sources – uses
 = \$ _____ – (\$ _____ + _____ + _____)
 = \$ _____

T3.17 Solution to Problem (concluded)

		S or U
◆ Decrease in inventory	\$420	S
◆ Decrease in accounts payable	260	U
◆ Decrease in notes payable	750	U
◆ Increase in accounts receivable	900	U
Change in cash	= Sources – Uses	
	= \$ 420 – (\$ 260 + 750 + 900)	
	= -\$1490	

8 Hermetic, Inc., Common-Size Balance Sheet

Assets	1997	1998
<u>Current Assets</u>		
Cash	2.8%	2.7%
Accounts receivable	16.1	16.8
Inventory	19.9	20.9
Total	<u>38.8%</u>	<u>40.4%</u>
Fixed assets		
Net plant and equipment	61.2%	59.6%
Total assets	<u>100%</u>	<u>100%</u>

8.1 Hermetic, Inc., Common-Size Balance Sheet (continued)

Liabilities and equity	1997	1998
<u>Current liabilities</u>		
Accounts payable	13.0%	14.1%
Notes payable	6.8	9.5
Total	<u>19.8%</u>	<u>23.6%</u>
Long-term debt	12.7%	12.2%
<u>Stockholders' equity</u>		
Common stock and paid-in surplus	18.0%	15.7%
Retained earnings	49.4	48.5
Total	<u>67.4</u>	<u>64.2</u>
Total liabilities and equity	<u>100%</u>	<u>100%</u>

8.2 Hermetic, Inc., Common-Size Balance Sheet (concluded)

More on Standardized Statements

Suppose we ask: "What happened to Hermetic's net plant and equipment (NP&E) over the period?"

1. Based on the 1997 and 1998 B/S, NP&E rose from \$985 to \$1100, so NP&E rose by \$115 (a use of cash).
2. If we standardized the 1998 numbers by dividing each by the 1997 number, we get a *common base year* statement. In this case, $\$1100/\$985 = 1.117$, so NP&E rose by 11.7% over this period.
3. Did the firm's NP&E go up or down? Obviously, it went up, but so did *total* assets. In fact, looking at the standardized statements, NP&E went from 61.2% of total assets to 59.6% of total assets.
4. If we standardized the 1998 common size numbers by dividing each by the 1997 common size number, we get a combined *common size, common base year* statement. In this case, $59.6\%/61.2\% = 97.4\%$, so NP&E fell by 2.6% as a percentage of assets.

In absolute terms, NP&E is up by \$115, or 11.7%, but relative to total assets, NP&E fell by 2.6%.

Which is more relevant?

9 Hermetic, Inc., Common-Size Income Statement

Net sales	100.0 %
Cost of goods sold	67.6
Depreciation	<u>4.2</u>
Earnings before interest and taxes	28.2
Interest	<u>2.8</u>
Taxable income	25.4
Taxes	<u>7.5</u>
Net income	<u>17.8 %</u>
Retained earnings	14.1 %
Dividends	3.7 %

Ratio Analysis

■ **What aspect of the firm or its operations are we attempting to analyze?**

- ◆ Firm performance can be measured along "dimensions"

■ **What goes into a particular ratio?**

- ◆ Historical cost? Market values? Accounting conventions?

■ **What is the unit of measurement?**

- ◆ Dollars? Days? Turns?

■ **What would a desirable ratio value be? What is the benchmark?**

- ◆ Time-series analysis? Cross-sectional analysis?

11 Categories of Financial Ratios

- **Short-Term Solvency or Liquidity**
 - ◆ Ability to pay bills in the short-run
- **Long-Term Solvency**
 - ◆ Ability to meet long-term obligations
- **Asset Management**
 - ◆ Intensity and efficiency of asset use
- **Profitability**
 - ◆ Ability to generate returns
- **Market Value**
 - ◆ Going beyond financial statements

12 Common Financial Ratios

I. Short-Term Solvency or Liquidity Ratios

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{inventory}}{\text{Current liabilities}}$$

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}}$$

$$\text{Net working capital to total assets} = \frac{\text{Net working capital}}{\text{Total assets}}$$

$$\text{Interval measure} = \frac{\text{Current assets}}{\text{Average daily operating costs}}$$

12.1 Common Financial Ratios (continued)

II. Long-Term Solvency

$$\text{Total debt ratio} = \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$$

$$\text{Debt/equity ratio} = \frac{\text{Total debt}}{\text{Total equity}}$$

$$\text{Equity multiplier} = \frac{\text{Total assets}}{\text{Total equity}}$$

$$\text{Long-term debt ratio} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Total equity}}$$

$$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

$$\text{Cash coverage ratio} = \frac{\text{EBIT} + \text{depreciation}}{\text{Interest}}$$

12.2 Common Financial Ratios (continued)

III. Asset Utilization or Turnover Ratios

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}}$$

$$\text{Days' sales in inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}}$$

$$\text{Receivables turnover} = \frac{\text{Sales}}{\text{Accounts receivable}}$$

$$\text{Days' sales in receivables} = \frac{365 \text{ days}}{\text{Receivables turnover}}$$

$$\text{NWC turnover} = \frac{\text{Sales}}{\text{NWC}}$$

$$\text{Fixed asset turnover} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

12.3 Common Financial Ratios (continued)

IV. Profitability Ratios

$$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

$$\text{Return on assets (ROA)} = \frac{\text{Net income}}{\text{Total assets}}$$

$$\text{Return on equity (ROE)} = \frac{\text{Net income}}{\text{Total equity}}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

12.4 Common Financial Ratios (concluded)

V. Market Value Ratios

$$\text{Price / earnings ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$\text{Market-to-book ratio} = \frac{\text{Price per share}}{\text{Book value per share}}$$

13 The Du Pont Identity: Hermetic application

1. Return on equity (ROE) can be decomposed as follows:

$$\begin{aligned} \text{ROE} &= \text{Net income} / \text{Total equity} \\ &= \text{Net income} / \text{Total equity} \times \text{Total assets} / \text{Total assets} \\ &= \text{Net income} / \text{Total assets} \times \text{Total assets} / \text{Total equity} \\ &= \text{Profit margin} \times \text{Equity multiplier} \end{aligned}$$

Check: $6.86\% \times 1.56 = 10.7\%$ ✓

2. Return on assets (ROA) can be decomposed as follows:

$$\begin{aligned} \text{ROA} &= \text{Net income} / \text{Total assets} \times \text{Sales} / \text{Sales} \\ &= \text{Net income} / \text{Sales} \times \text{Sales} / \text{Total assets} \\ &= \text{Profit margin} \times \text{Asset turnover} \end{aligned}$$

Check: $17.8\% \times .385 = 6.86\%$ ✓

13 The Du Pont Identity

1. Return on equity (ROE) can be decomposed as follows:

$$\begin{aligned} \text{ROE} &= \text{Net income} / \text{Total equity} \\ &= \text{Net income} / \text{Total equity} \times \text{Total assets} / \text{Total assets} \\ &= \text{Net income} / \text{Total assets} \times \text{Total assets} / \text{Total equity} \\ &= 126.55 / 1845 \times (1845 / 1185) \quad \text{Equity multiplier} \end{aligned}$$

Check: $6.86\% \times 1.56 = 10.7\%$ ✓

2. Return on assets (ROA) can be decomposed as follows:

$$\begin{aligned} \text{ROA} &= \text{Net income} / \text{Total assets} \times \text{Sales} / \text{Sales} \\ &= \text{Net income} / \text{Sales} \times \text{Sales} / \text{Total assets} \\ &= 126.55 / 710 \times 710 / 1845 \end{aligned}$$

Check: $17.8\% \times .385 = 6.86\%$ ✓

13.1 The Du Pont Identity (concluded)

3. Putting it all together gives the Du Pont identity:

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Equity multiplier} \\ &= \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier} \end{aligned}$$

Check: $17.8\% \times .385 \times 1.56 = 10.7\%$ ✓

4. Profitability (or the lack thereof!) thus has three parts:

- ◆ Operating efficiency
- ◆ Asset efficiency
- ◆ Financial leverage

14 Dupont application: Problem

Determine net income, ROA, and ROE for a company with sales of \$25 million, total assets of \$36 million, and total debt of \$7 million. The profit margin is 6%.

$$\begin{aligned} \text{Profit margin} &= \text{Net income} / \text{Sales} \\ .06 &= \text{Net income} / \$25 \text{ million} \\ \text{Net income} &= \$1,500,000 \end{aligned}$$

$$\begin{aligned} \text{ROE} &= \text{Net income} / \text{Stockholders' equity} \\ \text{Total assets} &= \text{Total debt} + \text{Stockholders' equity} \\ \text{Stockholders' equity} &= \text{Total assets} - \text{Total debt} \\ \text{Stockholders' equity} &= \text{_____} \\ \text{ROE} &= \$1,500,000 / \text{_____} \\ &= \text{_____} \end{aligned}$$

$$\begin{aligned} \text{ROA} &= \text{Net income} / \text{Total assets} \\ &= \$1,500,000 / \text{_____} \\ &= \text{_____} \end{aligned}$$

14.1 Solution

Determine net income, ROA, and ROE for a company with sales of \$25 million, total assets of \$36 million, and total debt of \$7 million. The profit margin is 6%.

$$\begin{aligned} \text{Profit margin} &= \text{Net income} / \text{Sales} \\ .06 &= \text{Net income} / \$26 \text{ million} \\ \text{Net income} &= \underline{\$1,500,000} \end{aligned}$$

$$\begin{aligned} \text{ROE} &= \text{Net income} / \text{Stockholders' equity} \\ \text{Total assets} &= \text{Total debt} + \text{Stockholders' equity} \\ \text{Stockholders' equity} &= \text{Total assets} - \text{Total debt} \\ \text{Stockholders' equity} &= \underline{\$29,000,000} \\ \text{ROE} &= \$1,500,000 / \underline{\$29,000,000} \\ &= \underline{5.17\%} \end{aligned}$$

$$\begin{aligned} \text{ROA} &= \text{Net income} / \text{Total assets} \\ &= \$1,500,000 / \underline{\$36,000,000} \\ &= \underline{4.17\%} \end{aligned}$$

Using Financial Statement Information

Why evaluate Financial Statements?

- Internal Uses
 - ◆ Allocate capital by division
 - ◆ Measure and reward performance
- External Uses
 - ◆ Extend trade credit to customers
 - ◆ Investor Community Ratio Analysis
 - ◆ Banks requiring loan covenants
 - ◆ Competitor Analysis
 - ◆ Valuing a target in an acquisition
- Benchmarks
 - ◆ Year on year
 - ◆ Peer group

Using Financial Statement Information

Problems with Financial Statement Analysis

- The need for theory
 - ◆ There is no compelling rationale for use of financial statement to make judgements about value and risk.
 - ◆ Which ratios matter most?
 - ◆ What is the "right" value for the ratio
- Conglomerates
 - ◆ Not identified in a single industry or sector
 - ◆ Hard to find comparables
- Global reach
 - ◆ Comparability of financial statements between countries

Ratio comparison across retail firms

Company	Year Ended	Sales(\$B)	Sales Growth	Sales/Emp
Sears Canada	01-Jan-00	6.131	11.86%	147,447
Hudson's Bay Co.	31-Jan-00	7.295	-5.32%	104,214
Jean Contu Group	31-May-00	2.577	12.58%	160,291
Gendis Inc.	29-Jan-00	0.401	-1.87%	80,200

Company	P/E	Price/Book	Price/Sales	52 Wk Price
Sears Canada	20.5	10.89	6.30	-47%
Hudson's Bay Co.	9.3	3.46	2.03	13%
Jean Contu Group	36.6	29.07	11.64	-31%
Gendis Inc.	16.3	15.91	10.60	4%

Ratio comparison across retail firms

Company	Year	EBIT	Profit/Loss (\$m)	ROCE
Sears Canada	2000	416.9	199.6	15.9%
Hudson's Bay Co.	2000	271.5	96.0	4.5%
Jean Contu Group	2000	148.4	86.2	15.7%
Gendis Inc.	2000	6.9	4.3	2.6%

15 Case of the Unidentified Industries

Match the following 5 types of companies with their corresponding balance sheets and financial ratios (shown in the next 2 slides):

1. Electric Utility
2. Japanese Trading Company
3. Retail Jewelry Chain
4. Automobile Manufacturer
5. Supermarket Chain

15.1 Ratio Comparisons across Business Types: Case of the Unidentified Industries

Balance Sheet Percentages	A	B	C	D	E
Cash	7.3%	.8%	13.5%	7.2%	11.3%
Receivables	22.5	5.4	5.8	60.3	10.9
Inventories	8.3	2.8	35.8	8.7	61.5
Other current assets	4.6	.1	4.1	7.3	2.7
Property and equipment (net)	35.0	83.0	23.6	4.3	8.3
Other assets	22.3	7.9	17.2	12.2	5.3
Total assets	100.0%	100.0%	100.0%	100.0%	100.0%
Notes payable	2.4%	1.8%	4.5%	50.8%	5.5%
Accounts payable	7.9%	3.2	14.6	15.2	14.3
Other current liabilities	14.7	2.2	10.6	5.7	10.5
Long-term debt	19.3	29.6	15.8	22.7	9.2
Other liabilities	17.9	17.8	8.5	1.3	2.5
Owners' equity	37.8	45.4	46.0	4.3	58.0
Total liabilities and equity	100.0%	100.0%	100.0%	100.0%	100.0%

15.2 Ratio Comparison across Business Types (concluded)

Selected Ratios	A	B	C	D	E
Net profits/Net sales	.04	.16	.014	.01	.05
Net profits/Total assets	.05	.06	.07	.01	.06
Net profits/Owners' equity	.12	.13	.15	.13	.12
Net sales/Total assets	1.2	.38	5.6	2.1	1.5
Collection period (days)	71	52	3	6	23
Inventory turnover	12	11	12	23	1.2
Total liabilities/Total assets	.62	.55	.54	.96	.42
Long-term debt/Owners' equity	.51	.65	.34	5.3	.16
Current assets/Current liabilities	1.7	1.3	2.0	1.0	2.9
Quick ratio	1.4	.9	.8	.9	.8