Introduction to Financial Statement Analysis

CHAPTER 2

Learning Objectives

1. List the four major financial statements required by the SEC for publicly traded firms, define each of the four statements, and explain why each of these financial statements is valuable.
2. Discuss the difference between book value of stockholders' equity and market value of stockholders' equity; explain why the two numbers are almost never the same.
3. Compute and interpret various financial ratios
4. Discuss the uses of the DuPont identity in disaggregating ROE, and assess the impact of increases and decreases in the components of the identity on ROE.
5. Describe the importance of ensuring that valuation ratios are consistent with one another in terms of the inclusion of debt in the numerator and the denominator.

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Learning Objectives

6. Distinguish between cash flow, as reported on the statement of cash flows, and accrual-based income, as reported on the income statement; discuss the importance of cash flows to investors, relative to accrual-based income.
7. Explain what is included in the management discussion and analysis section of the financial statements that cannot be found elsewhere in the financial statements.
8. Explain the importance of the notes to the financial statements.
9. List and describe the financial scandals described in the text, along with the new legislation designed to reduce that type of fraud.

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2.1 Firms' Disclosure of Financial Information

Financial Statements
- Firm-issued accounting reports with past performance information
- Filed with the SEC
  - 10Q - Quarterly
  - 10K - Annual
- Must also send an annual report with financial statements to shareholders

Preparation of Financial Statements
- Generally Accepted Accounting Principles (GAAP)
- Auditor
  - Neutral third party that checks a firm's financial statements

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2.1 Firms' Disclosure of Financial Information

Financial Statements
- Balance Sheet
- Income Statement
- Statement of Cash Flows
- Statement of Stockholders' Equity

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2.2 Balance Sheet

A snapshot in time of the firm's financial position

Assets
- What the company owns

Liabilities
- What the company owes

Stockholder's Equity
- The difference between the value of the firm's assets and liabilities

The Balance Sheet Identity:

$$\text{Assets} = \text{Liabilities} + \text{Stockholders' Equity}$$

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Global Conglomerate Corporation

GLOBAL CONGLOMERATE CORPORATION

Consolidated Balance Sheet
Year Ended December 31 (in $ million)

Assets	2012	2011
Current Assets		
Cash	21.2	19.5
Accounts receivable	18.5	13.2
Inventories	15.3	14.3
Other current assets	2.0	1.0
Total current assets	57.0	48.0
Long-Term Assets		
Land	22.2	20.7
Buildings	36.5	30.5
Equipment	39.7	33.2
Less accumulated depreciation	(18.7)	(17.5)
Net property, plant, and equipment	79.7	66.9
Goodwill and intangible assets	20.0	20.0
Other long-term assets	21.0	14.0
Total long-term assets	120.7	100.9
Total Assets	**177.7**	**148.9**

Liabilities and Stockholders' Equity	2012	2011
Current Liabilities		
Accounts payable	29.2	24.5
Notes payable/short-term debt	3.5	3.2
Current maturities of long-term debt	13.3	12.3
Other current liabilities	2.0	4.0
Total current liabilities	48.0	44.0
Long-Term Liabilities		
Long-term debt	99.9	76.3
Capital lease obligations	—	—
Total debt	99.9	76.3
Deferred taxes	7.6	7.4
Other long-term liabilities	—	—
Total long-term liabilities	107.5	83.7
Total Liabilities	**155.5**	**127.7**
Stockholders' Equity	**22.2**	**21.2**
Total Liabilities and Stockholders' Equity	**177.7**	**148.9**

2.2 Balance Sheet

Net Working Capital
- Current Assets – Current Liabilities

Market Value Versus Book Value
- Market Value of Equity (Market Capitalization)
  - Market Price per Share x Number of Shares Outstanding
    - Cannot be negative
    - Often differs substantially from book value

Market Value Versus Book Value
- Market-to-Book Ratio
  - aka Price-to-Book Ratio
  - Value Stocks
    - Low M/B ratios
  - Growth stocks
    - High M/B ratios

$$\text{Market-to-Book Ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

2.2 Balance Sheet

Enterprise Value
- aka Total Enterprise Value (TEV)
- How much would it cost to buy 100% of the firm's assets?

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash}$$

Table 2.2 Global Conglomerate Corporation Income Statement Sheet for 2012 and 2011

GLOBAL CONGLOMERATE CORPORATION
Income Statement
Year Ended December 31 (in $ million)

	2012	2011
Total sales	186.7	176.1
Cost of sales	(153.4)	(147.3)
Gross Profit	33.3	28.8
Selling, general, and administrative expenses	(13.5)	(13.0)
Research and development	(8.2)	(7.6)
Depreciation and amortization	(1.2)	(1.1)
Operating Income	10.4	7.1
Other income	—	—
Earnings Before Interest and Taxes (EBIT)	10.4	7.1
Interest income (expense)	(7.7)	(4.6)
Pretax Income	2.7	2.5
Taxes	(0.7)	(0.6)
Net Income	2.0	1.9
Earnings per share:	$0.556	$0.528
Diluted earnings per share:	$0.526	$0.500

2.3 Income Statement

Earnings per Share
Stock Options
Convertible Bonds
Dilution
- Diluted EPS

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}}$$

Table 2.3 Global Conglomerate Corporation Statement of Cash Flows for 2012 and 2011

GLOBAL CONGLOMERATE CORPORATION
Statement of Cash Flows
Year Ended December 31 (in $ million)

	2012	2011
Operating activities		
Net income	2.0	1.9
Depreciation and amortization	1.2	1.1
Other non-cash items	(2.8)	(1.0)
Cash effect of changes in		
Accounts receivable	(5.3)	(0.3)
Accounts payable	4.7	(0.5)
Inventory	(1.0)	(1.0)
Cash from operating activities	**(1.2)**	**0.2**
Investment activities		
Capital expenditures	(14.0)	(4.0)
Acquisitions and other investing activity	(7.0)	(2.0)
Cash from investing activities	**(21.0)**	**(6.0)**
Financing activities		
Dividends paid	(1.0)	(1.0)
Sale (or purchase) of stock	—	—
Increase in borrowing	24.9	5.5
Cash from financing activities	**23.9**	**4.5**
Change in cash and cash equivalents	**1.7**	**(1.3)**

2.4 Statement of Cash Flows

Net Income typically does NOT equal the amount of Cash the firm has earned.
- Non-Cash Expenses
  - Depreciation and Amortization
- Uses of Cash not on the Income Statement
  - Investment in Property, Plant, and Equipment

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2.4. Statement of Cash Flows

Three Sections
- Operating Activities
  - Adjusts net income by all non-cash items related to operating activities and changes in net working capital
    - Accounts Receivable – deduct the increases
    - Accounts Payable – add the increases
    - Inventories – deduct the increases
- Investing Activities
  - Capital Expenditures
  - Buying or Selling Marketable Securities
- Financing Activities
  - Payment of Dividends
    - Retained Earnings = Net Income – Dividends
  - Changes in Borrowings

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2.5 Other Financial Statement Information

Statement of Stockholders' Equity

$$\begin{aligned}\text{Change in Stockholders' Equity} &= \text{Retained Earnings} + \text{Net sales of stock} \\ &= \text{Net Income} - \text{Dividends} + \text{Sales of stock} - \text{Repurchase of Stock}\end{aligned}$$

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2.5 Other Financial Statement Information

Management Discussion and Analysis
- Off-Balance Sheet Transactions

Notes to the Financial Statements

2.6 Financial Statement Analysis

Question	Category of Ratios Used to Address the Question
1. How liquid is the firm? Will it be able to pay its bills as they come due?	Liquidity ratios
2. How has the firm financed the purchase of its assets?	Capital structure ratios
3. How efficient has the firm's management been in utilizing its assets to generate sales?	Asset management efficiency ratios
4. Has the firm earned adequate returns on its investments?	Profitability ratios
5. Are the firm's managers creating value for shareholders?	Market value ratios

2.6 Financial Statement Analysis

Liquidity Ratios
- Current Ratio
  - Current Assets / Current Liabilities
- Quick Ratio
  - (Cash + Short-Term Investments + A/R) / Current Liabilities
- Cash Ratio
  - Cash / Current Liabilities

2.6 Financial Statement Analysis

Working Capital Ratios

- Accounts Receivable Turnover $\text{Accounts Receivable Turnover} = \frac{\text{Annual Sales}}{\text{Accounts Receivable}}$
- Accounts Payable Turnover $\text{Accounts Payable Turnover} = \frac{\text{Annual Cost of Sales}}{\text{Accounts Payable}}$
- Inventory Turnover $\text{Inventory Turnover} = \frac{\text{COGS}}{\text{Inventory}}$

2.6 Financial Statement Analysis

Working Capital Ratios

- Accounts Receivable Days $\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}} = \frac{\text{AR}}{(\text{Sales}/365)}$
- Accounts Payable Days $\text{Accounts Payable Days} = \frac{\text{Accounts Payable}}{\text{Average Daily Cost of Sales}} = \frac{\text{AP}}{(\text{COGS}/365)}$
- Inventory Days $\text{Inventory Days} = \frac{\text{Inventory}}{\text{Average Daily Cost of Sales}} = \frac{\text{Inventory}}{(COGS/365)}$

2.6 Financial Statement Analysis

Interest Coverage Ratios

- EBIT/Interest
- EBITDA/Interest
  - EBITDA = EBIT + Depreciation and Amortization

2.6 Financial Statement Analysis

Leverage Ratios

- Debt-Equity Ratio $\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$
- Debt-to-Capital Ratio $\text{Debt-to-Capital Ratio} = Det - Asset\ Ratio = \frac{\text{Total Debt}}{\text{Total Equity + Total Debt}} = \frac{\text{Total Debt}}{\text{TA}}$
- Debt-to-Enterprise Value $\text{Debt-to-Enterprise Value Ratio} = \frac{\text{Net Debt}}{\text{Entrprise Value}}$
  - Net Debt = Total Debt + Excess Cash & Short-Term Investments
- Equity Multiplier = Total Assets / Book Value of Equity

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Asset Management Efficiency Ratios

Total Asset Turnover Ratio represents the amount of sales generated per dollar invested in firm's assets.

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{\$2{,}700 \text{ million}}{\$1{,}971 \text{ million}} = 1.37 \text{ times}$$

Peer-group total asset turnover = 1.15 times

Fixed asset turnover ratio measures firm's efficiency in utilizing its fixed assets (such as property, plant and equipment).

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Net Plant and Equipment}} = \frac{\$2{,}700 \text{ million}}{\$1{,}327.5 \text{ million}} = 2.03 \text{ times}$$

Peer-group fixed asset turnover = 1.75 times

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2.6 Financial Statement Analysis

Profitability Ratios

- Gross Margin $\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$
- Operating Margin $\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales}}$
- EBIT Margin $\text{EBIT} = \frac{\text{EBIT}}{\text{Sales}}$
- Net Profit Margin $\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Total Sales}}$

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2.6 Financial Statement Analysis

- Valuation Ratios
  - P/E Ratio $P / E \text{ Ratio} = \frac{\text{Market Capitalization}}{\text{Net Income}} = \frac{\text{Share Price}}{\text{Earnings per Share}}$
  - Enterprise Value to EBIT $\text{EnterpriseValuetoEBIT} = \frac{\text{TEV}}{\text{EBIT}}$
  - Enterprise Value to Sales $\text{EnterpriseValuetoSales} = \frac{\text{TEV}}{\text{Sales}}$

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Example

Problem:

Consider the following data for the FY 2011 for Yahoo! and Google (in millions):

	Yahoo!	Google
Sales	$4,984	$37,905
EBIT	$825	$11,742
Depreciation & Amortization	$648	$1,851
Net Income	$1,049	$9,737
Market Capitalization	$19,195	$209,850
Cash	$1,562	$9,983
Debt	$994	$14,429

Compare Yahoo! and Google's operating margin, net profit margin, P/E ratio, and the ratio of enterprise value to operating income and sales.

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Example

Ratio	Yahoo!	Google
EBIT Margin	16.55%	30.98%
Net Profit Margin	21.04%	25.69%
P/E Ratio	18.30	21.55
Enterprise Value to Sales	3.73	5.65
Enterprise Value to EBIT	22.58	18.25
Enterprise Value to EBITDA	12.65	15.77

Even though Yahoo! And Google are competitors, their ratios look much different. Yahoo! has a lower profit margin and lower P/E ratio than Google. Their enterprise value to sales ratio is also lower than that of Google. The difference is consistent with Yahoo!'s lower margins.

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2.6 Financial Statement Analysis

Operating Returns

- Return on Equity $$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$
- Return on Assets $$\text{Return on Assets} = \frac{\text{Net Income} + \text{Interest Expense}}{\text{Book Value of Assets}}$$
- Return on Invested Capital $$\text{Return on Invested Capital} = \frac{\text{EBIT (1 - Tax Rate)}}{\text{Book Value of Equity} + \text{Net Debt}}$$

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2.6 Financial Statement Analysis

The DuPont Identity

$$\text{ROE} = \underbrace{\left(\frac{\text{Net Income}}{\text{Sales}}\right)}_{\text{Net Profit Margin}} \times \underbrace{\left(\frac{\text{Sales}}{\text{Total Assets}}\right)}_{\text{Asset Turnover}} \times \underbrace{\left(\frac{\text{Total Assets}}{\text{Book Value of Equity}}\right)}_{\text{Equity Multiplier}}$$

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Textbook Example 2.8

Determinants of ROE

Problem

For the year ended January 2012, Wal-Mart Stores had sales of $446.9 billion, net income of $15.7 billion, assets of $193.4 billion, and a book value of equity of $71.3 billion. For the same period, Target (TGT) had sales of $69.9 billion, net income of $2.9 billion, total assets of $46.6 billion, and a book value of equity of $15.8 billion. Compare these firms' profitability, asset turnover, equity multipliers, and return on equity during this period. If Target had been able to match Wal-Mart's asset turnover during this period, what would its ROE have been?

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Textbook Example 2.8

Solution

Wal-Mart's net profit margin (from Example 2.6) was 15.7/446.9 = 3.51%, which was below Target's net profit margin of 2.9/69.9 = 4.15%. On the other hand, Wal-Mart used its assets more efficiently, with an asset turnover of 446.9/193.4 = 2.31, compared to only 69.9/46.6 = 1.50 for Target. Finally, Target had greater leverage (in terms of book value), with an equity multiplier of 46.6/15.8 = 2.95, relative to Wal-Mart's equity multiplier of 193.4/71.3 = 2.71. Next, let's compute the ROE of each firm directly, and using the DuPont Identity:

$$\text{Wal-Mart ROE} = \frac{15.7}{71.3} = 22.0\% = 3.51\% \times 2.31 \times 2.71$$

$$\text{Target ROE} = \frac{2.9}{15.8} = 18.4\% = 4.15\% \times 1.50 \times 2.95$$

Note that due to its lower asset turnover, Target had a lower ROE than Wal-Mart despite its higher net profit margin and leverage. If Target had been able to match Wal-Mart's asset turnover, its ROE would have been significantly higher: 4.15% × 2.31 × 2.95 = 28.3%.

Example

Problem

- The following data is for FY 2011

	Yahoo!	Google
Sales	$4,984	$37,905
Total Assets	$14,783	$72,574
Book Value of Equity	$12,581	$58,145
Net Income	$1,049	$9,737

- Compare these firms' profitability, asset turnover, equity multipliers, and return on equity during this period.
- If Yahoo! had been able to match Google's asset turnover during this period, what would its ROE have been?

Example

Solution

- Yahoo!
  - Net Profit Margin = $1,049 / $4,984 = 21.04%
  - Total Asset Turnover = $4,984 / $14,783 = 0.337
  - Equity Multiplier = $14,783 / $12,581 = 1.18
  - ROE = $1,049 / $12,581 = 8.34%
- Google
  - Net Profit Margin = $9,737 / $37,905 = 25.69%
  - Total Asset Turnover = $37,905 / $72,574 = 0.522
  - Equity Multiplier = $72,574 / $58,145 = 1.25
  - ROE = $9,737 / $58,145 = 16.75%

- Google had a higher Profit Margin, Total Asset Turnover, and Equity Multiplier. Thus, it is not surprising that Google had a superior ROE.
- If Yahoo! had been able to match Google's asset turnover during this period, its ROE would have been: ROE = 21.04% x 0.522 x 1.18 =12.97%, or over 50% higher.

Table 2.4
A Summary of Key Financial Ratios

Ratio	Formula
Profitability Ratios	
Gross Margin	$\frac{\text{Gross Profit}}{\text{Sales}}$
Operating Margin	$\frac{\text{Operating Income}}{\text{Sales}}$
EBIT Margin	$\frac{\text{EBIT}}{\text{Sales}}$
Net Profit Margin	$\frac{\text{Net Income}}{\text{Sales}}$
Liquidity Ratios	
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
Quick Ratio	$\frac{\text{Cash \& Short-term Investments} + \text{Accounts Receivable}}{\text{Current Liabilities}}$
Cash Ratio	$\frac{\text{Cash}}{\text{Current Liabilities}}$
Working Capital Ratios	
Accounts Receivable Days	$\frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$
Accounts Payable Days	$\frac{\text{Accounts Payable}}{\text{Average Daily Cost of Sales}}$
Inventory Days	$\frac{\text{Inventory}}{\text{Average Daily Cost of Sales}}$
Accounts Receivable Turnover	$\frac{\text{Annual Sales}}{\text{Accounts Receivable}}$
Accounts Payable Turnover	$\frac{\text{Annual Cost of Sales}}{\text{Accounts Payable}}$
Inventory Turnover	$\frac{\text{Annual Cost of Sales}}{\text{Inventory}}$
Interest Coverage Ratios	
EBIT/Interest Coverage	$\frac{\text{EBIT}}{\text{Interest Expense}}$
EBITDA/Interest Coverage	$\frac{\text{EBITDA}}{\text{Interest Expense}}$
Leverage Ratios	
Debt-Equity Ratio	$\frac{\text{Total Debt}}{\text{Book (or Market) Value of Equity}}$
Debt-to-Capital Ratio	$\frac{\text{Total Debt}}{\text{Total Equity} + \text{Total Debt}}$
Debt-to-Enterprise Value Ratio	$\frac{\text{Net Debt}}{\text{Enterprise Value}}$
Equity Multiplier (book)	$\frac{\text{Total Assets}}{\text{Book Value of Equity}}$
Equity Multiplier (market)	$\frac{\text{Enterprise Value}}{\text{Market Value of Equity}}$
Valuation Ratios	
Market-to-Book Ratio	$\frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$
Price-Earnings Ratio	$\frac{\text{Share Price}}{\text{Earnings per Share}}$
Enterprise Value Ratios	$\frac{\text{Enterprise Value}}{\text{EBIT or EBITDA or Sales}}$
Operating Returns	
Asset Turnover	$\frac{\text{Sales}}{\text{Total Assets}}$
Return on Equity (ROE)	$\frac{\text{Net Income}}{\text{Book Value of Equity}}$
Return on Assets (ROA)	$\frac{\text{Net Income} + \text{Interest Expense}}{\text{Book Value of Assets}}$
Return on Invested Capital (ROIC)	$\frac{\text{EBIT } (1 - \text{Tax Rate})}{\text{Book Value of Equity} + \text{Net Debt}}$

Using Financial Ratios

Financial ratios in isolation are not very useful

- Trend Analysis – compares a firm's financial statements over time (time-series comparisons).
- Peer Group Comparisons – compares the subject firm's financial statements with "peer" firms.
  - Usually same industry

2.8 Financial Reporting in Practice

Even with safeguards, reporting abuses still happen:

- Enron
- WorldCom

Lead to legislation

- Sarbanes-Oxley Act (SOX)
- Dodd-Frank Act

Discussion of Key Topic

If a firm's P/E ratio is lower than the industry average, do you expect the stock price to go up? Could there be reasons other than undervaluation for a firm to have a low P/E?

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Chapter Quiz

1. The book value of a company's assets usually does not equal the market value of those assets. What are some reasons for this difference?
2. What is a firm's enterprise value?
3. What is the difference between a firm's gross profit and its net income?
4. What is the DuPont identity?
5. What are the components of the statement of cash flows?
6. What information do the notes to the financial statements provide?

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