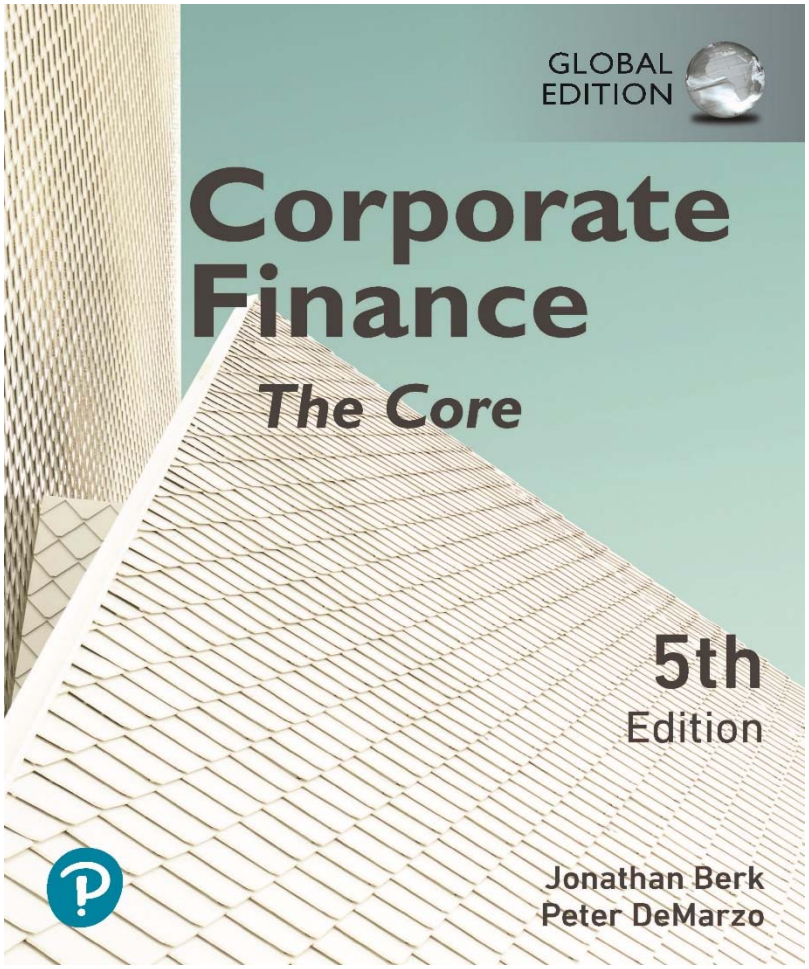
# Corporate Finance: The Core

Fifth Edition, Global Edition




## Chapter 2

Introduction to Financial Statement Analysis

# Chapter Outline

# Learning Objectives (1 of 5)

- 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.
- 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.

# Learning Objectives (2 of 5)

- Compute the following measures, and describe their usefulness in assessing firm performance: the debt-equity ratio, the enterprise value, earnings per share, operating margin, net profit margin, accounts receivable days, accounts payable days, inventory days, interest coverage ratio, return on equity, return on assets, price-earnings ratio, and market-to-book ratio.

# Learning Objectives (3 of 5)

- 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.
- 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.

# Learning Objectives (4 of 5)

- 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.
- Explain what is included in the management discussion and analysis section of the financial statements that cannot be found elsewhere in the financial statements.

# Learning Objectives (5 of 5)

- Explain the importance of the notes to the financial statements.
- List and describe the financial scandals described in the text, along with the new legislation designed to reduce that type of fraud.

# 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

# Types of Financial Statements

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

# 2.2 Balance Sheet (1 of 2)

- A snapshot in time of the firm's financial position
- The Balance Sheet Identity:

Assets = Liabilities + Stockholder's Equity

# 2.2 Balance Sheet (2 of 2)

- 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

# Assets (1 of 2)

- Current Assets: Cash or expected to be turned into cash in the next year
  - Cash
  - Marketable Securities
  - Accounts Receivable
  - Inventories
  - Other Current Assets
    - Example: Pre-paid expenses

# Assets (2 of 2)

- Long-Term Assets
  - Net Property, Plant, and Equipment
    - Depreciation (and Accumulated Depreciation)
    - Book Value = Acquisition Cost – Accumulated Depreciation
  - Goodwill and intangible assets
    - Amortization
  - Other long-term assets
    - Example: Investments in Long-Term Securities

# Table 2.1 Global Conglomerate Corporation Balance Sheet (1 of 2)

**GLOBAL CONGLOMERATE CORPORATION**

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

| Assets | 2018 | 2017 |
|---|---|---|
| **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 (1 of 3)

- Current Liabilities: Due to be paid within the next year
  - Accounts Payable
  - Short-Term Debt/Notes Payable
  - Current Maturities of Long-Term Debt
  - Other Current Liabilities
    - Taxes Payable
    - Wages Payable

# Liabilities (2 of 3)

- Net Working Capital
  - Current Assets – Current Liabilities

# Liabilities (3 of 3)

- Long-Term Liabilities
  - Long-Term Debt
  - Capital Leases
  - Deferred Taxes

# Table 2.1 Global Conglomerate Corporation Balance Sheet (2 of 2)

**GLOBAL CONGLOMERATE CORPORATION**

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

| Liabilities and Stockholders' Equity | 2018 | 2017 |
|---|---|---|
| **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** |

# Stockholder's Equity

- Book Value of Equity
  - Book Value of Assets – Book Value of Liabilities
    - Could possibly be negative
    - Many of the firm's valuable assets may not be captured on the balance sheet

# Market Value Versus Book Value (1 of 2)

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

# Market Value Versus Book Value (2 of 2)

- Market-to-Book Ratio
  - aka Price-to-Book Ratio

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

  - Value Stocks
    - Low M/B ratios
  - Growth stocks
    - High M/B ratios

# Enterprise Value

- aka Total Enterprise Value (TEV)

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

- Can be interpreted as the cost to take over the business

# Riding Hopes For Model 3
# Tesla Overtakes Ford In Market Value April 3, 2017

- **Bloomberg** lays out some of the stark facts:
  - In the past five years, **Ford** has reported net income of about $26 billion. **Tesla** lost $2.3 billion.
  - The same period saw **Ford** generate $151.8 billion in revenue, compared with **Tesla**'s $7 billion.
  - **Tesla** sold about 40,700 vehicles in the U.S. last year — roughly the same number of F-series trucks **Ford** delivers every three weeks.
- By the end of trading Monday, **Elon Musk's Silicon Valley automaker** had passed the venerable **Detroit titan** in market value, riding a 7% share-value surge to a market capitalization of about **$48.7 billion**.
- Meanwhile, a 1.7 percent dip brought the house that Henry Ford built to a value of **$45.6 billion**.

# Textbook Example 2.1 (1 of 2)

## Market Versus Book Value

## Problem

- If Global has 3.6 million shares outstanding, and these shares are trading for a price of $14 per share, what is Global's market capitalization?
- How does the market capitalization compare to Global's book value of equity in 2018?

# Textbook Example 2.1 (2 of 2)

## Market Versus Book Value

## Solution

Global's market capitalization is (3.6 million shares) × ($14/share) = $50.4 million. This market capitalization is significantly higher than Global's book value of equity of $22.2 million. Thus, investors are willing to pay 50.4/22.2 = 2.27 times the amount Global's shares are "worth" according to their book value.

# 2.3 Income Statement

- aka the “statement of financial performance”
- aka the “bottom line”

# Earnings Calculations (1 of 6)

- Total Sales/Revenues
  - **minus**
- Cost of Sales
  - **equals**
- Gross Profit

# Earnings Calculations (2 of 6)

- Gross Profit
  - **minus**
- Operating Expenses
    - Selling, General, and Administrative Expenses
    - R and D
    - Depreciation and Amortization
  - **equals**
- Operating Income

# Earnings Calculations (3 of 6)

- Operating Income
  - **plus/minus**
- Other Income/Other Expenses
  - **equals**
- Earnings Before Interest and Taxes (EBIT)

# Earnings Calculations (4 of 6)

- Earnings Before Interest and Taxes (EBIT)
  - **plus/minus**
- Interest Income/Interest Expense
  - **equals**
- Pre-Tax Income

# Earnings Calculations (5 of 6)

- Pre-Tax Income
  - **minus**
- Taxes
  - **equals**
- Net Income

# Table 2.2 Global Conglomerate Corporation Income Statement Sheet

**GLOBAL CONGLOMERATE CORPORATION**

**Income Statement**
**Year Ended December 31 (in $ million)**

| | 2018 | 2017 |
|---|---|---|
| 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 |

# Earnings Calculations (6 of 6)

- Earnings per Share

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

- Stock Options
- Convertible Bonds
- Dilution
  - Diluted EPS

# 2.4 Statement of Cash Flows (1 of 2)

- 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

# 2.4 Statement of Cash Flows (2 of 2)

- Three Sections
  - Operating Activity
  - Investment Activity
  - Financing Activity

# Operating Activity

- Adjusts net income by all non-cash items related to operating activities and changes in net working capital
  - Depreciation – add the amount of depreciation
  - Accounts Receivable – deduct the increases
  - Accounts Payable – add the increases
  - Inventories – deduct the increases

# Investment Activity

- Capital Expenditures
- Buying or Selling Marketable Securities

# Financing Activity

- Payment of Dividends
  - Retained Earnings = Net Income – Dividends
- Changes in Borrowings

# Table 2.3 Global Conglomerate Corporation Statement of Cash Flows

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

| | 2018 | 2017 |
|---|---|---|
| Operating activities | | |
| Net income | 2.0 | 1.9 |
| Depreciation and amortization | 1.2 | 1.1 |
| Other non-cash items | 0.2 | 1.0 |
| Cash effect of changes in | | |
| Accounts receivable | (5.3) | (0.3) |
| Accounts payable | 4.7 | (0.5) |
| Inventory | (1.0) | (1.0) |
| Other net operating assets | (3.0) | (2.0) |
| **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)** |

# Textbook Example 2.2 (1 of 2)

## The Impact of Depreciation on Cash Flow

## Problem

- Suppose Global had an additional $1 million depreciation expense in 2018. If Global's tax rate on pretax income is 26%, what would be the impact of this expense on Global's earnings?
- How would it impact Global's cash balance at the end of the year?

# Textbook Example 2.2 (2 of 2)

## Solution

Depreciation is an operating expense, so Global's operating income, EBIT, and pretax income would fall by $1 million. This decrease in pretax income would reduce Global's tax bill by $26\% \times \$1 \text{ million} = \$0.26$ million. Therefore, net income would fall by $1 - 0.26 = \$0.74$ million.

On the statement of cash flows, net income would fall by $0.74 million, but we would add back the additional depreciation of $1 million because it is not a cash expense. Thus, cash from operating activities would rise by $-0.74 + 1 = \$0.26$ million. Thus, Global's cash balance at the end of the year would increase by $0.26 million, the amount of the tax savings that resulted from the additional depreciation expense.

# 2.5 Other Financial Statement Information

- Several other pieces of information contained in the financial statements warrant mention:
  - The statement of stockholders' equity
  - The management discussion and analysis
  - Notes to the financial statements

# Statement of Stockholders' Equity

$$\text{Change in Stockholders' Equity} = \text{Retained Earnings} + \text{Net sales of stock}$$

# Statement of Stockholders' Equity

Change in Stockholders' Equity = Retained Earnings

+ Net sales of stock

= Net Income

- Dividends

+ Sales of stock

- Repurchase of Stock

# Management Discussion and Analysis

- Off-Balance Sheet Transactions
  - Transactions or arrangements that can have a material impact on the firm's future performance yet do not appear on the balance sheet

# Notes to the Financial Statements

- In addition to the four financial statements, companies provide extensive notes with further details on the information provided in the statements.
- For example, the notes document important accounting assumptions that were used in preparing the statements.

# Textbook Example 2.3 (1 of 2)

**Problem**

In the Segment Results section of its financial statements, Hormel Foods Corp (HRL) reported the following sales revenues by reportable segment/product category ($ million):

| | 2017 | 2016 |
|---|---|---|
| Grocery Products | $1,761 | $1,684 |
| Refrigerated Foods | 4,404 | 4,647 |
| Jennie-O Turkey Store | 1,663 | 1,741 |
| Specialty Foods | 795 | 939 |
| International and Other | 545 | 511 |

Which category showed the highest percentage growth? If Hormel has the same percentage growth by category from 2017 to 2018, what will its total revenues be in 2018?

# Textbook Example 2.3 (2 of 2)

**Solution**

The percentage growth in the sales of grocery products was $1{,}761/1{,}684 - 1 = 4.6\%$. Similarly, growth in Refrigerated Foods was $-5.2\%$, Jennie-O Turkey Store was $-4.5\%$, Specialty Foods was $-15.4\%$, and International and Other categories were 6.7%. Thus, International and Other category showed the highest growth.

If these growth rates continue for another year, sales of Grocery Products will be $1{,}761 \times 1.046 = \$1{,}842$ million, and the other categories will be $4,173 million, $1,589 million, $672 million, and $581 million, respectively, for total revenues of $8.9 billion, a 3.4% decrease from 2017.

# 2.6 Financial Statement Analysis

- Used to:
  - Compare the firm with itself over time
  - Compare the firm to other similar firms

# Profitability Ratios (1 of 2)

- Gross Margin

$$\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$$

- Operating Margin

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales}}$$

# Profitability Ratios (2 of 2)

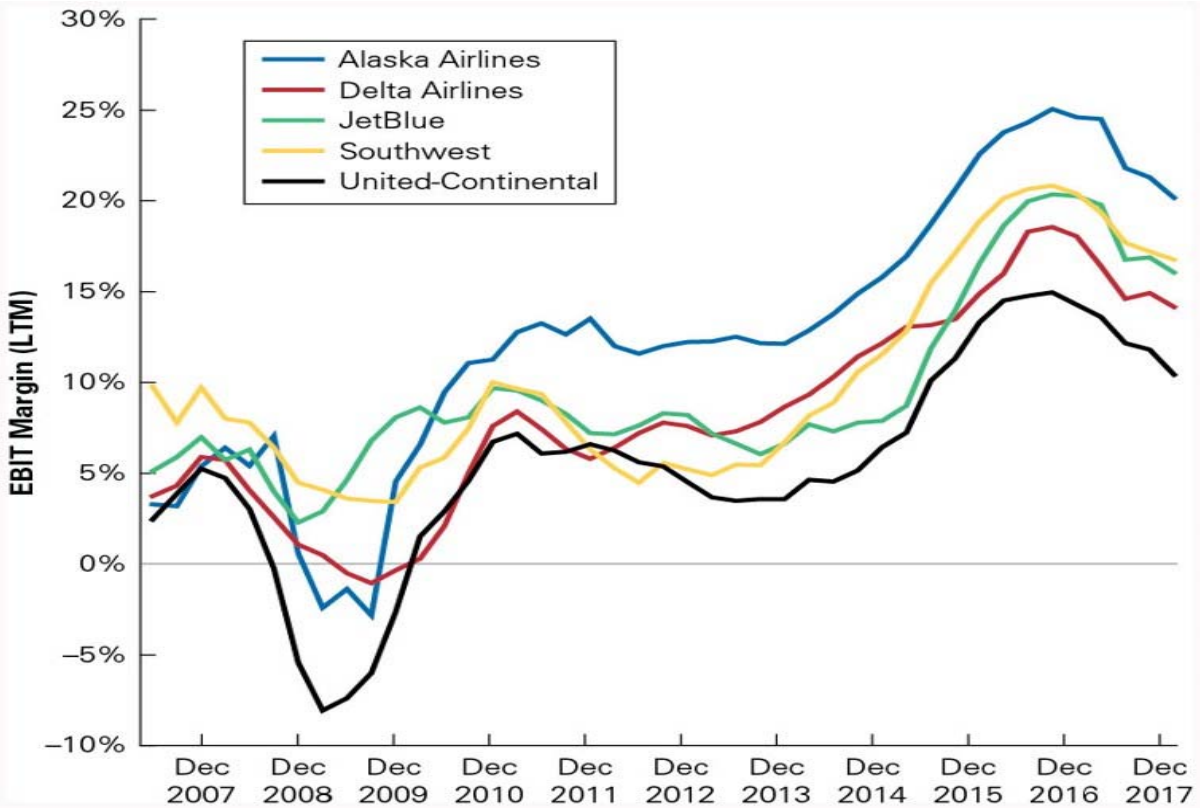
- EBIT Margin

$$\text{EBIT} = \frac{\text{EBIT}}{\text{Sales}}$$

- Net Profit Margin

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Total Sales}}$$

# Figure 2.1 EBIT Margins for Five U.S. Airlines




**Source:** Capital IQ

# Liquidity Ratios

- Current Ratio

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

- Quick Ratio

$$\frac{\text{(Cash + Short-Term Investments + A/R)}}{\text{Current Liabilities}}$$

- Cash Ratio

$$\frac{\text{Cash}}{\text{Current Liabilities}}$$

# Textbook Example 2.4 (1 of 2)

## Computing Liquidity Ratios

## Problem

Calculate Global's quick ratio and cash ratio. Based on these measures, how has its liquidity changed between 2017 and 2018?

# Textbook Example 2.4 (2 of 2)

**Solution**

In 2017, Global's quick ratio was $(19.5 + 13.2)/44 = 0.74$ and its cash ratio was $19.5/44 = 0.44$. In 2018, these ratios were $0.83$ and $21.2/48 = 0.44$, respectively. Thus, Global's cash ratio remained stable over this period, while its quick ratio improved slightly. But although these liquidity measures have not deteriorated, a more worrisome indicator for investors regarding Global's liquidity might be its ongoing negative cash flow from operating and investing activities, shown in the statement of cash flows.

# Working Capital Ratios (1 of 2)

- Accounts Receivable Days

$$\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$$

- Accounts Payable Days

$$\text{Accounts Payable Days} = \frac{\text{Accounts Payable}}{\text{Average Daily Cost of Sales}}$$

- Inventory Days

$$\text{Inventory Days} = \frac{\text{Inventory}}{\text{Average Daily Cost of Sales}}$$

# Working Capital Ratios (2 of 2)

- 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

$$\text{Inventory Turnover} = \frac{\text{Annual Cost of Sales}}{\text{Inventory}}$$

# Interest Coverage Ratios

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

# Textbook Example 2.5 (1 of 2)

## Computing Interest Coverage Ratios

## Problem

Assess Global's ability to meet its interest obligations by calculating interest coverage ratios using both EBIT and EBITDA

# Textbook Example 2.5 (2 of 2)

- **Solution**

In 2017 and 2018, Global had the following interest coverage ratios:

$$\text{2017: } \frac{\text{EBIT}}{\text{Interest}} = \frac{7.1}{4.6} = 1.54 \text{ and } \frac{\text{EBITDA}}{\text{Interest}} = \frac{7.1+1.1}{4.6} = 1.78$$

$$\text{2018: } \frac{\text{EBIT}}{\text{Interest}} = \frac{10.4}{7.7} = 1.35 \text{ and } \frac{\text{EBITDA}}{\text{Interest}} = \frac{10.4+1.2}{7.7} = 1.51$$

In this case Global's low—and declining—interest coverage could be a source of concern for its creditors.

# Leverage Ratios (1 of 2)

- Debt-Equity Ratio

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

- Debt-to-Capital Ratio

$$\text{Debt-to-Capital Ratio} = \frac{\text{Total Debt}}{\text{Total Equity + Total Debt}}$$

# Leverage Ratios (2 of 2)

- Net Debt
  - Total Debt - Excess Cash & Short-Term Investments
- Debt-to-Enterprise Value

$$\text{Debt-to-Enterprise Value Ratio} = \frac{\text{Net Debt}}{\text{Market Value of Equity} + \text{Net Debt}}$$

- Equity Multiplier

$$\frac{\text{Total Assets}}{\text{Book Value of Equity}}$$

# Valuation Ratios

- P/E Ratio

$$\text{P/E Ratio} = \frac{\text{Market Capitalization}}{\text{Net Income}} = \frac{\text{Share Price}}{\text{Earnings per Share}}$$

- Enterprise Value to EBIT

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

- Enterprise Value to Sales

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

# Textbook Example 2.6 (1 of 3)

## Computing Profitability and Valuation Ratios

### Problem

Consider the following data as of February 2017 for Walmart and Target Corporation (in $ billion):

| | Walmart (WMT) | Target (TGT) |
|---|---|---|
| Sales | 485.9 | 69.5 |
| EBIT | 22.8 | 5.0 |
| Depreciation and Amortization | 10.1 | 2.3 |
| Net Income | 13.6 | 2.7 |
| Market Capitalization | 213.2 | 37.1 |
| Cash | 6.9 | 2.5 |
| Debt | 46.6 | 12.7 |

Compare Walmart's and Target's EBIT margins, net profit margins, P/Eratios, and the ratio of enterprise value to sales, EBIT, and EBITDA.

# Textbook Example 2.6 (2 of 3)

**Solution**

Walmart had an EBIT Margin of $22.8 / 485.9 = 4.7\%$,
a net profit margin of $13.6 / 485.9 = 2.8\%$, and a P/E ratio of
$213.2 / 13.6 = 15.7$.

Its enterprise value was $213.2 + 46.6 - 6.9 = \$252.9$ billion,
which has a ratio of $252.9 / 485.9 = 0.52$ to sales,
$252.9 / 22.8 = 11.1$ to EBIT, and $252.9 / (22.8 + 10.1) = 7.7$ to EBITDA.

# Textbook Example 2.6 (3 of 3)

**Solution**

Target had an EBIT margin of $5.0/69.5 = 7.2\%$,

a net profit margin of $2.7/69.5 = 3.9\%$, and a P/E ratio of

$37.1/2.7 = 13.7$.

Its enterprise value was $37.1 + 12.7 - 2.5 = \$47.3$ billion,

which has a ratio of $47.3/69.5 = 0.68$ to sales, $47.3/5 = 9.5$ to

EBIT, and $47.3/(5 + 2.3) = 6.5$ to EBITDA.

Note that despite the large difference in the size of the two firms, their valuation multiples are comparable. Walmart trades at a somewhat higher earnings multiple, whereas Target trades at a higher multiple of sales (likely due to its higher profit margin).

# 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

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

# Textbook Example 2.7 (1 of 3)

## Computing Operating Returns

## Problem

Assess how Global's ability to use its assets effectively has changed in the last year by computing the change in its return on invested capital.

# Textbook Example 2.7 (2 of 3)

**Solution**

In 2018, Global's ROA was $(2.0 + 7.7)/177.7 = 5.5\%$,

compared to an ROA in 2017 of $(1.9 + 4.6)/148.9 = 4.4\%$.

To compute the return on invested capital, we need to calculate after-tax EBIT, which requires an estimate of Global's tax rate. Because

Net income $=$ Pretax Income $\times (1 -$ Tax Rate$)$, we can estimate

$(1 -$ Tax Rate$) =$ Net Income/Pretax Income.

Thus, EBIT $\times (1 -$ Tax Rate$) = 10.4 \times (2.0/2.7) = 7.7$ in 2018,

and $7.1 \times (1.9/2.5) = 5.4$ in 2017.

# Textbook Example 2.7 (3 of 3)

**Solution**

To compute invested capital, note first that Global's net debt was $3.2 + 12.3 + 76.3 - 19.5 = 72.3$ in 2017 and $3.5 + 13.3 + 99.9 - 21.2 = 95.5$ in 2018. Thus, ROIC in 2018 was $7.7/(22.2 + 95.5) = 6.5\%$, compared with $5.4/(21.2 + 72.3) = 5.8\%$ in 2017.

The improvement in Global's ROA and ROIC from 2017 to 2018 suggests that Global was able to use its assets more effectively and increase its return over this period.

# The DuPont Identity

- Expresses the ROE in terms of the firm's profitability, asset efficiency, and leverage

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

# Textbook Example 2.8 (1 of 3)

## Determinants of ROE

## Problem

For the year ended January 2017, Walmart (WMT) had sales of $485.9 billion, net income of $13.6 billion, assets of $198.8 billion, and a book value of equity of $77.8 billion.

For the same period, Target (TGT) had sales of $69.5 billion, net income of $2.7 billion, total assets of $37.4 billion, and a book value of equity of $11 billion.

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

# Textbook Example 2.8 (2 of 3)

**Solution**

Walmart's net profit margin (from Example 2.6) was $13.6 / 485.9 = 2.80\%$, which was below Target's net profit margin of $2.7 / 69.5 = 3.88\%$.

On the other hand, Walmart used its assets more efficiently, with an asset turnover of $485.9 / 198.8 = 2.44$, compared to only $69.5 / 37.4 = 1.86$ for Target.

Finally, Target had greater leverage (in terms of book value), with an equity multiplier of $37.4 / 11 = 3.40$, relative to Walmart's equity multiplier of $198.8 / 77.8 = 2.56$.

Next, let's compute the ROE of each firm directly, and using the DuPont Identity.

# Textbook Example 2.8 (3 of 3)

**Solution**

$$\text{Walmart ROE} = \frac{13.6}{77.8} = 17.5\% = 2.80\% = 2.44 \times 2.56$$

$$\text{Target ROE} = \frac{2.7}{11} = 24.5\% = 3.88\% \times 1.86 \times 3.40$$

**Solution**

Note that despite its lower asset turnover, Target had a higher ROE than Walmart due to its higher net profit margin and leverage. If Target had been able to match Walmart's asset turnover, its ROE would have been significantly higher: $3.88\% \times 2.44 \times 3.40 = 32.3\%$.

# Table 2.4 Key Financial Ratios for Large U.S. Firms, Spring 2018

| | |
|---|---|
| **Profitability Ratios** | |
| Gross Margin [28%, 43%, 67%] | Gross Profit / Sales |
| Operating Margin [6%, 12%, 22%] | Operating Income / Sales |
| EBIT Margin [5%, 11%, 18%] | EBIT / Sales |
| Net Profit Margin [2%, 7%, 15%] | Net Income / Sales |
| **Liquidity Ratios** | |
| Current Ratio [1.2x, 1.8x, 2.9x] | Current Assets / Current Liabilities |
| Quick Ratio [0.7x, 1.2x, 2.0x] | (Cash & Short-term Investments + Accounts Receivable) / Current Liabilities |
| Cash Ratio [0.1x, 0.4x, 0.9x] | Cash / Current Liabilities |
| **Working Capital Ratios** | |
| Accounts Receivable Days [33, 51, 68] | Accounts Receivable / Average Daily Sales |
| Accounts Payable Days [26, 43, 65] | Accounts Payable / Average Daily Cost of Sales |
| Inventory Days [28, 59, 96] | Inventory / Average Daily Cost of Sales |
| **Interest Coverage Ratios** | |
| EBIT/Interest Coverage [2.5x, 5.7x, 12.8x] | EBIT / Interest Expense |
| EBITDA/Interest Coverage [4.7x, 8.6x, 17.1x] | EBITDA / Interest Expense |
| **Leverage Ratios** | |
| Debt-Equity Ratio (book) [24%, 62%, 124%] | Total Debt / Book Value of Equity |
| Debt-Equity Ratio (market) [6%, 21%, 47%] | Total Debt / Market Value of Equity |
| **Leverage Ratios (continued)** | |
| Debt-to-Capital Ratio [20%, 40%, 57%] | Total Debt / Total Equity + Total Debt |
| Debt-to-Enterprise Value Ratio [–3%, 10%, 25%] | Net Debt / Enterprise Value |
| Equity Multiplier (book) [1.8x, 2.5x, 4.3x] | Total Assets / Book Value of Equity |
| Equity Multiplier (market) [1.0x, 1.1x, 1.4x] | Enterprise Value / Market Value of Equity |
| **Valuation Ratios** | |
| Market-to-Book Ratio [1.8x, 3.1x, 6.1x] | Market Value of Equity / Book Value of Equity |
| Price-Earnings Ratio [16.1x, 23.7x, 37.9x] | Share Price / Earnings per Share |
| Enterprise Value to Sales [1.5x, 2.7x, 5.0x] | Enterprise Value / Sales |
| Enterprise Value to EBIT [13.9x, 18.3x, 26.9x] | Enterprise Value / EBIT |
| Enterprise Value to EBITDA [9.9x, 13.0x, 18.3x] | Enterprise Value / EBITDA |
| **Operating Returns** | |
| Asset Turnover [0.3x, 0.6x, 1.0x] | Sales / Total Assets |
| Return on Equity (ROE) [3%, 10%, 18%] | Net Income / Book Value of Equity |
| Return on Assets (ROA) [–1%, 3%, 7%] | Net Income + Interest Expense / Book Value of Assets |
| Return on Invested Capital (ROIC) [6%, 12%, 20%] | EBIT (1 − Tax Rate) / Book Value of Equity + Net Debt |

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# 2.7 Financial Reporting in Practice

- Even with safeguards, reporting abuses still happen:
  - Enron
  - WorldCom
  - Sarbanes-Oxley Act (SOX)
  - Dodd-Frank Act

# The Enron Collapse

- October 16, 2001: Enron was one of the world's largest electricity and natural gas traders
  - Reported a $618 million third-quarter loss and disclosed a $1.2 billion reduction in shareholder equity
- U.S. Securities and Exchange Commission (SEC) inquiry into possible conflict of interest related to company's dealings with partnerships run by CFO Fastow

# The Enron Collapse (cont'd.)

- Volume of financial contracts was far greater than volume of contracts to actually deliver commodities
- Some partnerships were faked to mask billions of dollars in debt
- Enron's financial statements had been audited by Arthur Andersen, a highly regarded accounting firm
- Andersen employees on the Enron engagement team were instructed to destroy documentation relating to Enron

# Outcome of the Enron Scandal

- Shareholders lost an estimated $40 billion dollars
- Thousands of workers lost their jobs
- 31 individuals were either charged or pled guilty to criminal charges
- Jurors convicted accounting firm Arthur Andersen for obstructing justice by destroying Enron documents
- U.S. Congress passed Sarbanes-Oxley Act of 2002
  - Act was designed to prevent the kind of fraud and abuse that led to the Enron downfall

# Key Features of the Sarbanes-Oxley Act

- Designed to encourage top management accountability in firms that are publicly traded in the United States
- Title IX
  - Financial statements filed with the Securities and Exchange Commission must include a statement signed by the chief executive officer and chief financial officer, certifying that the financial statement complies with SEC rules