UNIVERSITY OF EXETER | BUSINESS SCHOOL

BEE1006 Introduction to Finance

Chapter 2: Introduction to Financial Statement Analysis

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Introduction to this Chapter

- We will learn some bases of a firm's financial statements
- We'll then discuss some financial ratios to analyse financial statements
- During this process we will have to to study some basic accounting
- But our focus is still on the finance side
- We are using the relevant accounting information to understand firms' financial conditions
- We will spend two (or three) weeks on this chapter

Motivation: Why This Chapter?

- Some of you may find this chapter a bit ‘dry’ or ‘too accounting’
- **But this doesn’t mean it is not important**
- Financial statements and ratios provide important information about firms’ performance
- Basic concepts and financial ratios discussed in this chapter are like basic ‘language’ of corporate finance
- Also good revision for those who’ve learned accounting before

We need to understand ratios such as ‘Market cap’ or ‘PE Ratio’

Apple Inc. (AAPL)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

Add to watchlist

162.41 -2.10 (-1.28%)
At close: January 21 04:00PM EST

161.62 -0.79 (-0.49%)
After hours: Jan 21, 07:59PM EST

Summary | Chart | Conversations | Statistics | Historical Data | Profile | Financials | Analysis | Options | Holders | Sustainability

Previous Close	164.51	Market Cap	2.653T
Open	164.41	Beta (5Y Monthly)	1.20
Bid	161.60 x 1800	PE Ratio (TTM)	28.95
Ask	161.62 x 800	EPS (TTM)	5.61
Day's Range	162.30 - 166.32	Earnings Date	Jan 27, 2022
52 Week Range	116.21 - 182.94	Forward Dividend & Yield	0.88 (0.54%)
Volume	122,848,858	Ex-Dividend Date	Nov 05, 2021
Avg. Volume	94,065,100	1y Target Est	179.87

Source: Yahoo! Finance

Why This Chapter?

- Another Reason: good for your CFA exam
- Contents discussed in this chapter are related to ‘Financial Reporting and Analysis’ of CFA Level I Exam
- Check the CFA Level I Textbook (via University’s website)
- https://encore.exeter.ac.uk/iii/encore/record/C__Rb4493119__SCFA__Orightresult__U__X6?lang=eng&suite=cobalt

Chapter Outline

2.1 Firms' Disclosure of Financial Information

2.2 The Balance Sheet

2.3 The Income Statement

2.4 The Statement of Cash Flows

2.5 Other Financial Statement Information

2.6 Financial Statement Analysis

2.7 (Optional) Financial Reporting in Practice

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 the various financial measures we've covered here, and describe their usefulness in assessing firm performance

Learning Objectives

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.

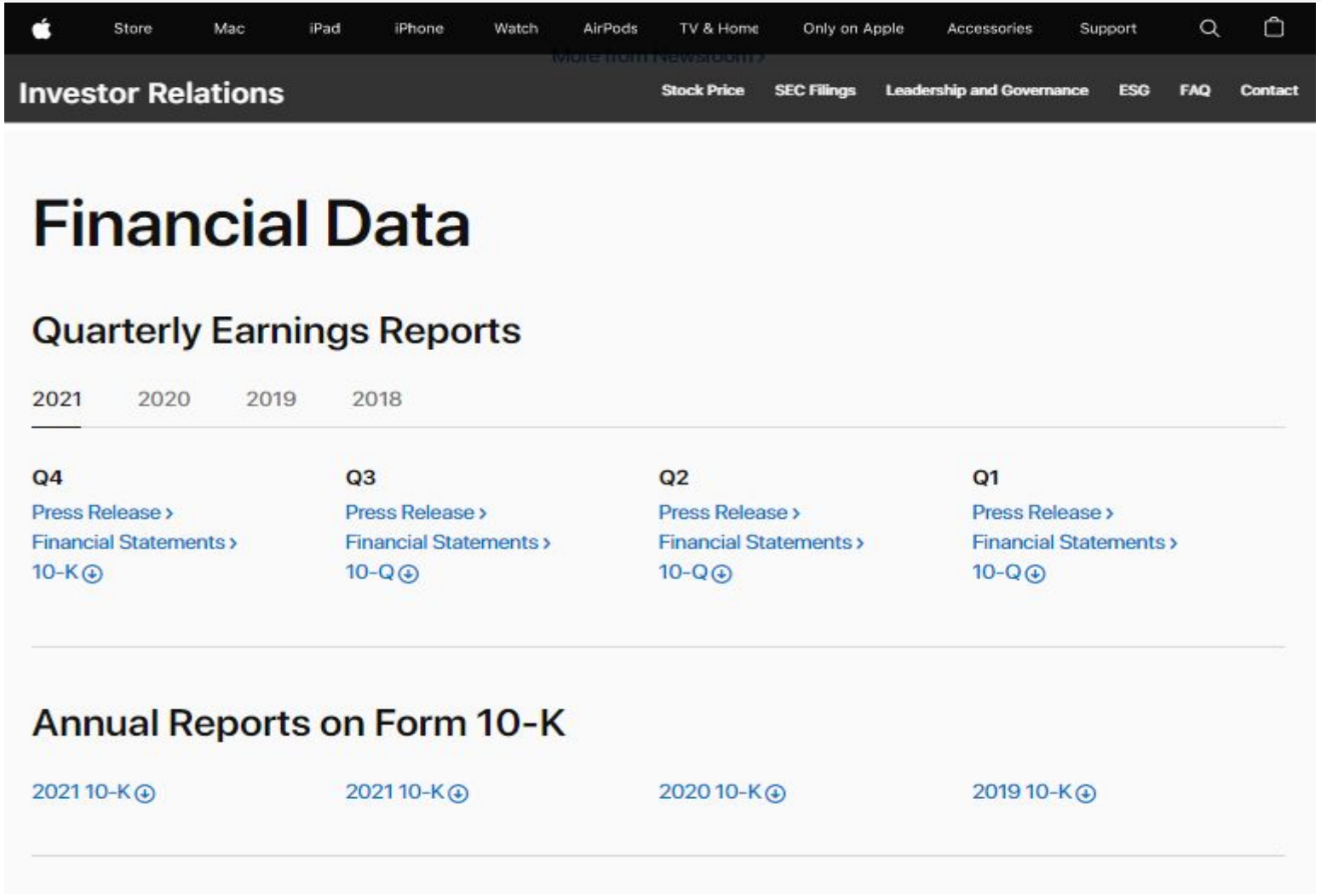
5. Distinguish between cash flow, as reported on the statement of cash flows, and accrual-based income, as reported on the income statement; discuss the importance of cash flows to investors, relative to accrual-based income.

2.1
Firms' Disclosure of Financial Information

Financial Statements

- Firm-issued accounting reports with past performance information
- Filed with the SEC (U.S. Securities and Exchange Commission)
  - 10Q
    - ✔ Quarterly
  - 10K
    - ✔ Annual
- Must also send an annual report with financial statements to shareholders

Apple Inc. Financial Statements



- Link: https://investor.apple.com/investor-relations/default.aspx

Preparation of Financial Statements

- Generally Accepted Accounting Principles (GAAP)
  - A common set of rules and standard format for public companies to use when they prepare their reports
  - Different countries have their own GAAPs
- International Financial Reporting Standards (IFRS)
  - International effort to harmonise accounting standards
- (Optional) Reading on IFRS vs US GAAP
  - https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/03/ifrs-us-gaap-2020.pdf

Preparation of Financial Statements

- Auditor
  - Neutral third party that checks a firm's financial statements
  - Four leading firms in global auditing market: 'Big Four'
  - In reality, auditing firms have their own interests and may be far from neutral
    - ✔ Andersen and Enron
    - ✔ Wirecard and EY
  - Calls for the Big Four to be more strictly regulated

Optional Reading on Auditing Market and Regulation

- https://www.ft.com/content/96d4b090-f973-11e9-a354-36acbbb0d9b6
- https://www.ft.com/content/7ad4d113-0c33-44b2-b4e4-ede47f334505
- https://www.ft.com/content/d5103236-2799-4eab-bb71-afad7b703ae4
- https://www.ft.com/content/4219750e-612a-11e9-a27a-fdd51850994c
- https://www.theguardian.com/business/2004/dec/17/europeanunion

Types of Financial Statements

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

Stock vs Flow

- A **stock** is measured at a specific time, and represents a quantity existing at that point in time
- A **flow** is measured over an interval of time.

- Example of stock: on 16/12/2020, my bank account has deposit of £1000
- Example of flow: during 16/12/2020 to 16/1/2021, I earn £1000 from the University and spent £900
- What is the new stock: on 16/01/2021, my bank account has a deposit of 1000+(1000-900)=£1100

2.2
Balance Sheet

Balance Sheet

- A snapshot in time of the firm's financial position
- We are looking at stocks (not flow)
- The Balance Sheet Identity:

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

Table 2.1 Global Conglomerate Corporation Balance Sheet

GLOBAL CONGLOMERATE CORPORATION

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

Assets	2018	2017	Liabilities and Stockholders' Equity	2018	2017
Current Assets			**Current Liabilities**		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	**Total Liabilities**	**155.5**	**127.7**
Total long-term assets	120.7	100.9	**Stockholders' Equity**	**22.2**	**21.2**
Total Assets	**177.7**	**148.9**	**Total Liabilities and Stockholders' Equity**	**177.7**	**148.9**

Balance Sheet

- 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

- Current Assets: Cash or assets expected to be turned into cash in the next year
  - Cash
  - Marketable Securities
    - ✔ Example: Government debt that matures within a year
  - Accounts Receivable
  - Inventories
  - Other Current Assets
    - ✔ Example: Pre-paid expenses (Further Reading)

Assets

- Long-Term Assets
  - Net Property, Plant, & Equipment
    - Depreciation (and Accumulated Depreciation)
    - Notice that you don’t really pay cash due to depreciation
    - Book Value = Acquisition cost – Accumulated depreciation
  - Goodwill and intangible assets
    - Amortization
    - Notice that you don’t really pay cash due to amortization
  - Other long-term assets
    - Example: Investments in Long-term Securities

Liabilities

- 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
- **Net Working Capital**: Current Assets – Current Liabilities

Liabilities

Long-Term Liabilities

- Long-Term Debt
- Capital Leases
- Deferred Taxes

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Stockholder's Equity: Market Value Versus Book Value

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

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

Market-to-Book Ratio

- Also called 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
- https://www.investopedia.com/terms/b/booktomarketratio.asp

Enterprise Value

- Market Capitalization measures the market value of equity
- What is the market value of the business?
- Enterprise Value (EV)
- Also called Total Enterprise Value (TEV)
- A good measure to value a firm for a potential takeover

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

Textbook Example 2.1

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

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

Income Statement

- **Income statement** lists the firm's revenues and expenses over a period of time
- So we are looking at *flow* here (not stock)
- The bottom line of income statement is **net income**
- Net income measures a firm's profit (after paying tax and interest expenses)
- Income statement shows how net income is calculated using revenues and expenses

Income Statement

- **Reminder: net income is accounting profit (not change of *cash*)**
  - ***Net income*** is generally not equal to ***Change in cash and cash equivalent*** (the net change of cash)
  - For example, depreciation reduces accounting profit but does not really reduce the cash in the firm
  - And many other factors that make *net income* generally unequal to *Change in cash and cash equivalent*
  - We will discuss change of cash in Chapter 2.4

Table 2.2 Global Conglomerate Corporation Income Statement

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

Example: Apple Inc.

- Apple's 2021 Income Statement
- From its 2021 10-K Annual Report (Page 32)
- Link:

  https://s2.q4cdn.com/470004039/files/doc_financials/2021/q4/_10-K-2021-(As-Filed).pdf

Income Statement

$$\textbf{Gross Profit} = Total\ Sales - Cost\ of\ Sales$$

$$\textbf{Operating Expenses} = Selling, General, and\ Administrative\ Expenses + R\&D + Depreciation\ \&\ Amortization$$

$$\textbf{Operating Income} = \textbf{Gross Profit} - Operating\ Expenses$$

$$\textbf{Earnings Before Interest and Taxes (EBIT)} = Operating\ Income + (Other\ Income - Other\ Expenses)$$

Complete Formula

$$\boldsymbol{Pre\text{-}Tax\ Income} =$$
$$\boldsymbol{Earnings\ Before\ Interest\ and\ Taxes}\ (\boldsymbol{EBIT})$$
$$+\ (Interest\ Income - Interest\ Expense)$$

$$\boldsymbol{Net\ Income} = \ Pre\text{-}Tax\ Income - Taxes$$

Complete Formula of Net Income

$$
\begin{aligned}
&\boldsymbol{Net\ Income} \\
&= (Total\ Sales - Cost\ of\ Sales) \\
&- (Selling, General, and\ Administrative\ Expenses\ +\ R\&D \\
&+\ Depreciation\ \&\ Amortization) \\
&+(Other\ Income - Other\ Expenses) \\
&+(Interest\ Income - Interest\ Expense) - Taxes
\end{aligned}
$$

What can Net Income be used for?

- Net Income can be used to:
  - Pay dividends to the shareholders
    - ✓ **Dividends**
  - Retained in the firm
    - ✓ **Retained Earnings**
    - ✓ Can be used for reinvestment

$$\boldsymbol{Net\ Income = Retained\ Earnings + Dividends}$$

Income Statement

- **Earnings per Share**
- $\text{EPS} = \dfrac{\text{Net Income}}{\text{Shares Outstanding}}$
- In the future, even if Net Income the same, EPS may go down due to:
  - Stock Options
  - Convertible Bonds
- To take into account of possible dilution, we can look at:
  - Diluted EPS

2.4
Statement of Cash Flows

Statement of Cash Flows

- Net Income typically does NOT equal the amount of cash the firm has earned.
- **Net Income is accounting profit, but not change of cash**
- The difference between net income and change of cash comes from:
  - Non-Cash Items
    - ✔ Non-Cash Items are expenses that are listed in the income statement that do not involve cash payment
    - ✔ For example, **Depreciation and Amortization**

Statement of Cash Flows

- The difference between net income and cash flow may also come from:
  - Uses of Cash not on the Income Statement
    - ✔ Investment in Property, Plant, and Equipment
    - ✔ Payment of the principal amount of debt
    - ✔ Many other items

Statement of Cash Flows: 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

Cash from Operating Activities

Cash from Operating Activities
= Net Income
+Depreciation and amortization + Other non-cash items
− change in Accounts Receivable
+ change in Accounts Payable
– change in Inventories

Investment Activity and Financing Activity

- Investment Activity
  - Capital Expenditures
  - Buying or Selling Marketable Securities
- Financing Activity
  - Payment of Dividends
    - ✔ Retained Earnings = Net Income – Dividends
  - Changes in Borrowings (the principal amount)
    - ✔ **Interest expenses already deducted when calculating net income**

Cash from Investment Activities

$$\text{Cash from Investment Activities} =$$
$$-\text{Capital Expenditure}$$
$$-\text{Acquisitions and other investing activities}$$

Cash from Financing Activities

$$\text{Cash from Financing Activities} =$$
$$-\text{Dividends Paid}$$
$$+(\text{Sales of stock} - \text{repurchasing of stock})$$
$$+\text{Increasing in borrowing}$$

Change in cash and cash equivalents

Change in cash and cash equivalents

=

Cash from Operating Activities

+

Cash from Investment Activities

+

Cash from Financing Activities

Another way to calculate change in cash

- Another (and easier way) to calculate Change in Cash and Cash equivalents
- Check the balance sheets at the beginning and the end of this period (in our example, balance sheets in 2017 and 2018)
- Check the numbers in the 'Cash and Cash equivalents'
- $\text{Change in Cash and Cash equivalents during } 2018 = \text{Cash and Cash equivalent}_{2018} - \text{Cash and Cash equivalent}_{2017}$
- So why bother to go through the previous process?
- To understand how cash is earned and spend in various activities

Change in cash and cash equivalents

Change in Cash and Cash equivalents

=Cash from Operating Activities
+Cash from Investment Activities
+Cash from Financing Activities

=Cash and Cash equivalents at the end of the period
−Cash and Cash equivalents at the beginning of the period

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)**

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Total Assets	**177.7**	**148.9**	**Total Liabilities and Stockholders' Equity**	**177.7**	**148.9**

2.5 Other Financial Statement Information

Statement of Stockholders' Equity

$$\begin{aligned}&\text{Change in Stockholders' Equity}\\&=\text{Retained Earnings}+\text{Net Sales of Stock}\\&=(\text{Net Income}-\text{Dividends})\\&+(\text{Sales of Stock}-\text{Repurchases of stocks})\end{aligned}$$

Other Financial Statement Information

- Management Discussion and Analysis
  - Off-Balance Sheet Transactions
- Notes to the Financial Statements

Textbook Example 2.3

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 & 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

Solution

The percentage growth in the sales of grocery products was 1761/1684 − 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 categories showed the highest growth.

If these growth rates continue for another year, sales of Grocery Products will be 1761 × 1.046 = $1842 million, and the other categories will be $4173 million, $1589 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

Financial Statement Analysis

- Financial Statement Analysis can be used
  - Compare the firm with itself over time
  - Compare the firm to other similar firms

Types of Ratios

- Profitability Ratios
- Liquidity Ratios
- Working Capital Ratios
- Interest Coverage Ratios
- Leverage Ratios
- Valuation Ratios
- Operating Returns

Profitability Ratios

- Gross Margin

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

- Operating Margin

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

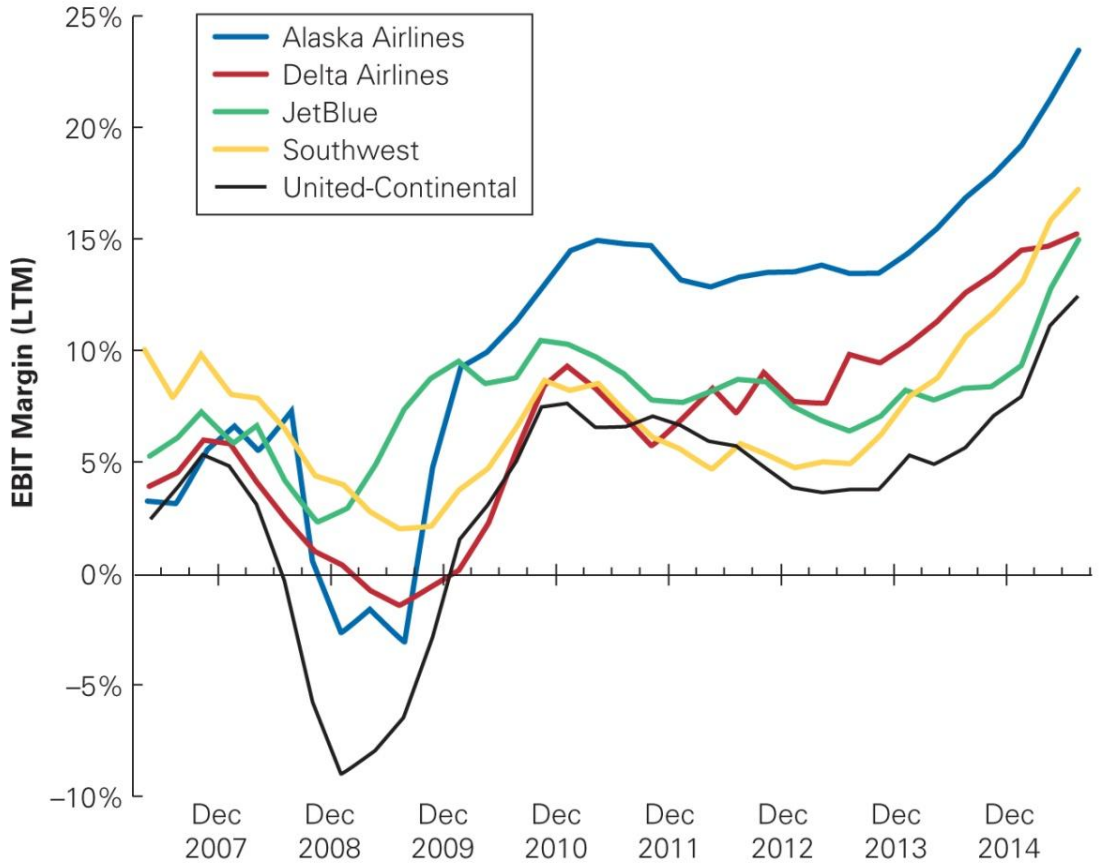
- EBIT Margin

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

- Net Profit Margin

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

Figure 2.1 EBIT Margins for Five U.S. Airlines



Source: Capital IQ

Liquidity Ratios

- Current Ratio
  - Current Ratio=Current Assets / Current Liabilities
- Quick Ratio
  - Quick Ratio=(Cash + Short-Term Investments + Account Receivable) / Current Liabilities
- Cash Ratio
  - Cash Ratio=Cash/ Current Liabilities

Textbook Example 2.4

Problem

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

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Year Ended December 31 (in $ million)

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Textbook Example 2.4

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

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

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

Problem

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

Table 2.1 Global Conglomerate Corporation Balance Sheet

GLOBAL CONGLOMERATE CORPORATION

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

Assets	2018	2017	Liabilities and Stockholders' Equity	2018	2017
Current Assets			**Current Liabilities**		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	**Total Liabilities**	**155.5**	**127.7**
Total long-term assets	120.7	100.9	**Stockholders' Equity**	**22.2**	**21.2**
Total Assets	**177.7**	**148.9**	**Total Liabilities and Stockholders' Equity**	**177.7**	**148.9**

Table 2.2 Global Conglomerate Corporation Income Statement

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

Textbook Example 2.5

Solution

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

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

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

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

Leverage Ratios

- Debt-Equity Ratio

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

- Debt-to-Capital Ratio

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

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Total long-term assets	120.7	100.9	**Stockholders' Equity**	**22.2**	**21.2**
Total Assets	**177.7**	**148.9**	**Total Liabilities and Stockholders' Equity**	**177.7**	**148.9**

Leverage Ratios

- 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
  - Total Assets / 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

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

- Enterprise Value to Sales

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

Valuation Ratios

- Enterprise Value to EBITDA

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

Textbook Example 2.6

Problem

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

	WMT	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/E ratios, and the ratio of enterprise value to sales, EBIT, and EBITDA.

Textbook Example 2.6

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.

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

$$\text{Return on Assets} = \frac{\text{Net Income} + \text{Interest Expense}}{\text{Total Assets}}$$

- 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

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 assets and return on invested capital.

Table 2.2 Global Conglomerate Corporation Income Statement

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

Textbook Example 2.7

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.

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

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

Textbook Example 2.8

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 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

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:

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

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

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% × 2.44 × 3.40 = 32.3%.

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

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

2.7 (Optional) Financial Reporting in Practice

(Optional) Financial Reporting in Practice

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

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?