

# FINANCIAL STATEMENT ANALYSIS

CFA® Program Curriculum  
**2025 • LEVEL 1 • VOLUME 4**

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# How to Use the CFA Program Curriculum

The CFA® Program exams measure your mastery of the core knowledge, skills, and abilities required to succeed as an investment professional. These core competencies are the basis for the Candidate Body of Knowledge (CBOK™). The CBOK consists of four components:

A broad outline that lists the major CFA Program topic areas ([www.cfainstitute.org/programs/cfa/curriculum/cbok/cbok](http://www.cfainstitute.org/programs/cfa/curriculum/cbok/cbok))

Topic area weights that indicate the relative exam weightings of the top-level topic areas ([www.cfainstitute.org/en/programs/cfa/curriculum](http://www.cfainstitute.org/en/programs/cfa/curriculum))

Learning outcome statements (LOS) that advise candidates about the specific knowledge, skills, and abilities they should acquire from curriculum content covering a topic area: LOS are provided at the beginning of each block of related content and the specific lesson that covers them. We encourage you to review the information about the LOS on our website ([www.cfainstitute.org/programs/cfa/curriculum/study-sessions](http://www.cfainstitute.org/programs/cfa/curriculum/study-sessions)), including the descriptions of LOS “command words” on the candidate resources page at [www.cfainstitute.org/-/media/documents/support/programs/cfa-and-cipm-los-command-words.ashx](http://www.cfainstitute.org/-/media/documents/support/programs/cfa-and-cipm-los-command-words.ashx).

The CFA Program curriculum that candidates receive access to upon exam registration

Therefore, the key to your success on the CFA exams is studying and understanding the CBOK. You can learn more about the CBOK on our website: [www.cfainstitute.org/programs/cfa/curriculum/cbok](http://www.cfainstitute.org/programs/cfa/curriculum/cbok).

The curriculum, including the practice questions, is the basis for all exam questions. The curriculum is selected or developed specifically to provide candidates with the knowledge, skills, and abilities reflected in the CBOK.

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## CFA INSTITUTE LEARNING ECOSYSTEM (LES)

Your exam registration fee includes access to the CFA Institute Learning Ecosystem (LES). This digital learning platform provides access, even offline, to all the curriculum content and practice questions. The LES is organized as a series of learning modules consisting of short online lessons and associated practice questions. This tool is your source for all study materials, including practice questions and mock exams. The LES is the primary method by which CFA Institute delivers your curriculum experience. Here, candidates will find additional practice questions to test their knowledge. Some questions in the LES provide a unique interactive experience.

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## DESIGNING YOUR PERSONAL STUDY PROGRAM

An orderly, systematic approach to exam preparation is critical. You should dedicate a consistent block of time every week to reading and studying. Review the LOS both

knowledge, skills, and abilities described by the LOS and the assigned reading. Use the LOS as a self-check to track your progress and highlight areas of weakness for later review.

Successful candidates report an average of more than 300 hours preparing for each exam. Your preparation time will vary based on your prior education and experience, and you will likely spend more time on some topics than on others.

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## ERRATA

The curriculum development process is rigorous and involves multiple rounds of reviews by content experts. Despite our efforts to produce a curriculum that is free of errors, in some instances, we must make corrections. Curriculum errata are periodically updated and posted by exam level and test date on the Curriculum Errata webpage ([www.cfainstitute.org/en/programs/submit-errata](http://www.cfainstitute.org/en/programs/submit-errata)). If you believe you have found an error in the curriculum, you can submit your concerns through our curriculum errata reporting process found at the bottom of the Curriculum Errata webpage.

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## OTHER FEEDBACK

Please send any comments or suggestions to [info@cfainstitute.org](mailto:info@cfainstitute.org), and we will review your feedback thoughtfully.

# **Financial Statement Analysis**



## LEARNING MODULE

# 1

## Introduction to Financial Statement Analysis

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### LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	describe the steps in the financial statement analysis framework
<input type="checkbox"/>	describe the roles of financial statement analysis
<input type="checkbox"/>	describe the importance of regulatory filings, financial statement notes and supplementary information, management's commentary, and audit reports
<input type="checkbox"/>	describe implications for financial analysis of alternative financial reporting systems and the importance of monitoring developments in financial reporting standards
<input type="checkbox"/>	describe information sources that analysts use in financial statement analysis besides annual and interim financial reports

The two major accounting standard setters are as follows: 1) the International Accounting Standards Board (IASB) who establishes International Financial Reporting Standards (IFRS) and 2) the Financial Accounting Standards Board (FASB) who establishes US GAAP. Throughout this learning module both standards are referred to and many, but not all, of these two sets of accounting rules are identified. Note: changes in accounting standards as well as new rulings and/or pronouncements issued after the publication of this learning module may cause some of the information to become dated.

## 1

## INTRODUCTION

Financial analysis is the process of interpreting and evaluating a company's performance and position in the context of its economic environment. Financial analysis is used by analysts to make decisions and recommendations such as whether to invest in a company's debt or equity securities and at what price. A debt investor is concerned about a company's ability to pay interest and to repay the principal lent, while an equity investor is interested in a company's profitability and per-share value. Overall, a central focus of financial analysis is evaluating the company's ability to earn a return on its capital that is at least equal to the cost of that capital, to profitably grow its operations, and to generate enough cash to meet obligations and pursue opportunities.

Financial analysis starts with the information found in a company's financial reports. These financial reports include audited financial statements, additional disclosures required by regulatory authorities, and any accompanying (unaudited) commentary by management. Analysts supplement their analysis of a company's financial statements with industry and company research.

## LEARNING MODULE OVERVIEW



- Financial analysis for a company often includes obtaining an understanding of the target company's business model, financial performance, financial position, and broader information about the economic environment and the industry in which the company operates. When analytical tasks are not well defined, the analyst may need to make decisions about the approach, the tools, the data sources, the format for reporting the results, and the relative importance of different aspects of the analysis.
- Financial analysis will include evaluating financial results, and structuring and scaling data to facilitate comparisons by calculating percentages, changes, and ratios. Answers to analytical questions often rely not just on numerical results but also on the analyst's interpretation of the numerical results to support a conclusion or recommendation.
- The role of financial statement analysis is to form expectations about a company's future performance, financial position, and risk factors for the purpose of making investment, credit, and other economic decisions.
- Regulatory authorities require publicly traded companies to prepare financial reports in accordance with specified accounting standards and other securities laws and regulations. An example of such a regulatory authority is the Securities and Exchange Commission in the United States.
- Other organizations exist without explicit regulatory authority and develop reporting standards, facilitate cooperation, and advise governments. Examples include the International Organization of Securities Commissions, the European Securities Committee, and the European Securities and Market Authority.
- Sources of information for analysts and investors include standardized forms that are filed with regulatory authorities, disclosures made in notes, supplementary schedules, and management commentary that accompany financial statements, and audit reports. In an audit



information in the audited financial statements fairly presents the financial position, performance, and cash flows of the company in accordance with a specified set of accounting standards.

- Despite increasing convergence over time, differences still exist between IFRS (International Financial Reporting Standards) and US GAAP (Generally Accepted Accounting Principles) that affect financial reporting. Analysts must be aware of areas where accounting standards have not converged.
- In addition to information required by regulatory authorities, issuers also communicate through earnings calls, investor day events, press releases, company websites, and company visits. Analysts may also get information by speaking with management, investor relations, and other company personnel.
- Third-party sources for additional information include industry whitepapers, analyst reports, economic information from governments, general and industry-specific news outlets, and electronic data platforms. Analysts also use surveys, conversations, and product evaluations to generate their own information.

## FINANCIAL STATEMENT ANALYSIS FRAMEWORK

## 2



describe the steps in the financial statement analysis framework

Analysts work in a variety of positions within the investment management industry. Some are equity analysts whose main objective is to evaluate potential investments in a company's equity securities as a basis for deciding whether a prospective investment is attractive and what an appropriate purchase price might be. Others are credit analysts who evaluate the creditworthiness of a company to decide whether (and on what terms) a debt investment should be made or what credit rating should be assigned. Analysts may also be involved in a variety of other tasks, such as evaluating the performance of a subsidiary company, evaluating a private equity investment, or finding stocks that are overvalued for purposes of taking a short position.

Exhibit 1 presents a generic framework for financial statement analysis used in these various roles.

**Exhibit 1: Financial Statement Analysis Framework**

Phase	Sources of Information	Output
Articulate the purpose and context of the analysis.	<ul style="list-style-type: none"> <li>▪ The nature of the analyst's function, such as evaluating an equity or debt investment or issuing a credit rating.</li> <li>▪ Communication with client or supervisor on specific needs and concerns.</li> <li>▪ Institutional guidelines related to developing specific work product.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Statement of the purpose or objective of analysis.</li> <li>▪ A list (written or unwritten) of specific questions to be answered by the analysis.</li> <li>▪ Nature and content of report to be provided.</li> <li>▪ Timetable and budgeted resources for completion.</li> </ul>
Collect data.	<ul style="list-style-type: none"> <li>▪ Financial statements, other financial data, questionnaires, and industry/economic data.</li> <li>▪ Discussions with issuer investor relations, management, suppliers, customers, competitors, and company or industry experts.</li> <li>▪ Company site visits (e.g., to production facilities or retail stores).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Financial statements and other quantitative data in a usable form, such as a spreadsheet.</li> <li>▪ Completed questionnaires, if applicable.</li> </ul>
Process data.	Data from the previous phase.	<ul style="list-style-type: none"> <li>▪ Adjusted financial statements.</li> <li>▪ Common-size statements.</li> <li>▪ Ratios and graphs.</li> </ul>
Analyze/interpret the data.	Input data as well as processed data.	<ul style="list-style-type: none"> <li>▪ Analytical results.</li> <li>▪ Forecasts.</li> <li>▪ Valuations.</li> </ul>
Develop and communicate conclusions and recommendations (e.g., with an analysis report).	<ul style="list-style-type: none"> <li>▪ Analytical results and previous reports.</li> <li>▪ Institutional guidelines for published reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Analytical report answering questions posed in Phase 1.</li> <li>▪ Recommendation regarding the purpose of the analysis, such as whether to make an investment or extend credit.</li> </ul>
Follow-up.	Information gathered by periodically repeating the previous steps as necessary to determine whether changes to holdings or recommendations are necessary.	<ul style="list-style-type: none"> <li>▪ Comparison of actual to expected results</li> <li>▪ Revised forecasts</li> <li>▪ Updated reports and recommendations.</li> </ul>

The following sections discuss the individual phases of financial statement analysis.

### Articulate the Purpose and Context of the Analysis

Before undertaking any analysis, it is essential to understand the purpose of the analysis. An understanding of the purpose is particularly important in financial statement analysis because of the numerous available techniques and the substantial amount of data.

Some analytical tasks are well defined, in which case articulating the purpose of the analysis requires little decision making by the analyst. For example, a periodic credit review of an investment-grade debt portfolio or an equity analyst's quarterly report on a particular company may be guided by institutional norms such that the purpose of the analysis is given. Furthermore, the format, procedures, or sources of information may also be given.

For other analytical tasks, articulating the purpose of the analysis requires the analyst to make decisions about the approach, the tools, the data sources, the format in which to report the results of the analysis, and the relative importance of different aspects of the analysis.

When facing a substantial amount of data, a less experienced analyst may be tempted to start calculating ratios without considering what is relevant for the decision at hand. It is generally advisable to resist this temptation and thus avoid unnecessary or pointless efforts. Consider the questions: If you could have all the calculations and ratios completed instantly, what question would you be able to answer? What decision would your answer support?

The analyst should also define the context at this stage. Who is the intended audience? What is the deliverable—for example, a final report explaining conclusions and recommendations? What is the time frame (i.e., when is the report due)? What resources and resource constraints are relevant to completion of the analysis? Again, the context may be predefined (i.e., standard and guided by institutional norms).

Having clarified the purpose and context of the financial statement analysis, the analyst should next compile the specific questions to be answered by the analysis. For example, if the purpose of the financial statement analysis (or, more likely, a stage of a larger analysis) is to compare the historical performance of three companies operating in a particular industry, specific questions would include the following: What has been the relative growth rate of the companies, and what has been their relative profitability?

## Collect Data

Next, the analyst obtains information required to answer the specific questions. A key part of this step is obtaining an understanding of the target company's business model, financial performance, and financial position (including trends over time and relative to peer companies). Financial statement data alone may be adequate in some cases. For example, to screen a large number of companies to find those with a minimum level of historical profitability or sales growth, financial statement data alone would be adequate. But to address more in-depth questions, such as why and how one company performed better or worse than its competitors, additional information would be required.

Furthermore, information on the economy and industry is necessary to understand the environment in which the company operates. Analysts often take a top-down approach whereby they (1) gain an understanding of an issuer's macroeconomic environment, such as prospects for growth in the economy and inflation; (2) analyze the prospects of the industry in which the company operates, based on the expected macroeconomic environment; and (3) determine the prospects for the company given the expected industry and macroeconomic environments. For example, an analyst may need to forecast future growth in earnings for a company. Past company data provide the platform for statistical forecasting; however, an understanding of economic and industry conditions and an outlook for them can improve the analyst's ability to make forecasts.

## Process Data

After obtaining the requisite financial and other information, the analyst processes these data using appropriate analytical tools. For example, processing the data may involve computing ratios or growth rates; preparing common-size financial statements; creating charts; performing statistical analyses, such as regressions or Monte Carlo simulations; making forecasts; performing valuations; performing sensitivity

analyses; or using any other analytical tools or combination of tools that are available and appropriate for the task. A comprehensive financial analysis at this stage may include the following:

- Reading and evaluating financial results for each company being analyzed. This includes understanding any factors that may affect comparability between companies, such as differences in business models, operating decisions (e.g., leasing versus purchasing fixed assets), accounting policies (e.g., when to report revenue on the income statement), and tax jurisdictions.
- Making any needed adjustments to the financial statements or using alternative measures to facilitate comparison. Note that commonly used databases do not always make such analyst adjustments.
- Preparing or collecting common-size financial statement data (which scale data to directly reflect percentages [e.g., of sales] or changes [e.g., from the prior year]) and financial ratios (which are measures of various aspects of corporate performance based on financial statement elements. Analysts can use these to evaluate a company's relative profitability, liquidity, leverage, efficiency, and valuation in relation to past results or peers.

### Analyze/Interpret the Data

Once the data have been processed, the next step—critical to any analysis—is to interpret the output. The answer to a specific question is seldom the numerical answer alone. Rather, the answer relies on the analyst's interpretation of the output, and the use of this interpreted output to support a conclusion or recommendation. The answers to the specific analytical questions may themselves achieve the underlying purpose of the analysis, but usually, a conclusion or recommendation is required. For example, an equity analysis may involve forecasts of earnings, free cash flow, and a range of fair value estimates that would be used to issue a buy, hold, or sell recommendation. A credit analyst may also create forecasts of free cash flow, interest coverage, and leverage in support of an investment decision.

### Develop and Communicate Conclusions and Recommendations

Communicating the conclusion or recommendation in an appropriate format is the next step. The appropriate format will vary by analytical task, by institution, or by audience. For example, an equity analyst's report for external distribution would typically include the following components:

- summary and investment conclusion;
- industry overview and competitive analysis;
- financial statement model, potentially with several scenarios;
- valuation; and
- investment risks.

The contents of reports may also be specified by regulatory agencies or professional standards. For example, the CFA Institute *Standards of Practice Handbook* (*Handbook*) dictates standards that must be followed in communicating recommendations. According to the *Handbook*:

Standard V(B) states that members and candidates should communicate in a recommendation the factors that were instrumental in making the investment recommendation. A critical part of this requirement is to

distinguish clearly between opinions and facts. In preparing a research report, the member or candidate must present the basic characteristics of the security(ies) being analyzed, which will allow the reader to evaluate the report and incorporate information the reader deems relevant to his or her investment decision making process.<sup>1</sup>

The *Handbook* requires that limitations to the analysis and any risks inherent to the investment be disclosed. Furthermore, it requires that any report include elements important to the analysis and conclusions so that readers can evaluate the conclusions themselves.

## Follow-Up

The process does not end with the report. If an equity investment is made or a credit rating is assigned, periodic review is required to revise forecasts and recommendations based on the receipt of new information. In the case of a rejected investment, subsequent analyses may still be required should the security price or business conditions change. Follow-up may involve repeating all the previous steps in the process on a periodic basis.

## SCOPE OF FINANCIAL STATEMENT ANALYSIS

### 3

- ☐ describe the roles of financial statement analysis

The role of financial statement analysis is to use financial reports prepared by companies, combined with other information, to evaluate the past, current, and potential performance and financial position of a company for the purpose of making investment, credit, and other economic decisions. Managers within a company perform financial analysis to make operating, investing, and financing decisions but do not exclusively rely on analysis of related financial statements because they have access to nonpublic financial information.

In evaluating financial reports, analysts typically have a specific economic decision in mind. Examples of these decisions include the following:

- Evaluating an equity investment for inclusion in a portfolio.
- Valuing a security for making an investment recommendation to others.
- Determining the creditworthiness of a company to decide whether to extend a loan to the company and if so, what terms to offer.
- Assigning a debt rating to a company or bond issue.
- Deciding whether to make a venture capital or other private equity investment.
- Evaluating a merger or acquisition candidate.

These decisions demonstrate certain themes in financial analysis. In general, analysts seek to examine the past and current performance and financial position of a company to form expectations about its future performance and financial position. Analysts are also concerned about factors that affect the risks to a company's future performance and financial position. An examination of performance can include an

assessment of a company's profitability (the ability to earn a profit from delivering goods and services) and its ability to generate positive cash flows (cash receipts in excess of cash disbursements).

Exhibit 2 shows how news coverage of corporate earnings announcements places corporate results in the context of analysts' expectations. Panel A shows the earnings announcement, and Panel B shows a sample of the news coverage of the announcement. Earnings are also frequently used by analysts in valuation. For example, an analyst may value shares of a company by comparing its price-to-earnings ratio (P/E) to the P/Es of peer companies or may use forecasted future earnings as direct or indirect inputs into discounted cash flow models of valuation.

### **Exhibit 2: An Earnings Release and News Media Comparison with Analysts' Expectations**

#### **Panel A: Excerpt from Sea Limited's Earnings Release**

Singapore, August 16, 2022 – Sea Limited (NYSE: SE) (“Sea” or the “Company”) today announced its financial results for the second quarter ended June 30, 2022.

“As we navigate the current environment of increased macro uncertainty with that same nimble and decisive approach, we believe it is vital to be thoughtful, prudent, and disciplined. While we have strong resources and are well on-track to achieve our self-sufficiency targets, we are nevertheless rapidly prioritizing profitability and cash flow management. We are confident that this focus, combined with our demonstrated ability to execute, our scale and leadership, and our proven business models, will position us for long-term sustained success.”

#### **Second Quarter 2022 Highlights:**

- Total GAAP revenue was US\$2.9 billion, up 29.0% year-on-year.
- Total gross profit was US\$1.1 billion, up 17.1% year-on-year.
- Total net income (loss) was US\$(931.2) million compared to US\$(433.7) million for the second quarter of 2021. Total net loss excluding share-based compensation and impairment of goodwill was US\$(569.8) million compared to US\$(321.2) million for the second quarter of 2021.
- Total adjusted EBITDA was US\$(506.3) million compared to US\$(24.1) million for the second quarter of 2021.
- E-commerce Segment:
  - GAAP revenue was US\$1.7 billion, up 51.4% year-on-year. Based on constant currency assumptions, GAAP revenue was up 56.2% year-on-year.
  - Gross orders totaled 2.0 billion, an increase of 41.6% year-on-year.
  - Gross profit margin for e-commerce continued to improve sequentially quarter-on-quarter, as we have seen faster growth of transaction-based fees and advertising income, which have higher profit margin compared to product revenue and revenue generated from other value-added services.

#### **E-commerce Full Year 2022 Guidance Update:**

In our efforts to adapt to increasing macro uncertainties, we are proactively shifting our strategies to further focus on efficiency and optimization for the long-term sustainable profitability of the e-commerce business. Given this

strategic shift, we will be suspending e-commerce GAAP revenue guidance for the full year 2022. We believe such efforts will further strengthen our ability to better capture the long-term growth opportunities in our markets, which we remain highly positive about.

*Source:* Sea Limited, "Sea Limited Reports Second Quarter 2022 Results," accessed 16 August 2022, <https://cdn.sea.com/webmain/static/resource/seagroup/website/investornews/2Q2022/uXxGiCr8oTGxOFTPhBUB/2022.08.16%20Sea%20Second%20Quarter%202022%20Results.pdf>.

## **Panel B: Excerpt from News Article: Sea Limited Reports Mixed Results, Suspends Revenue Guidance**

Singapore-based Sea Limited (SE) reported second-quarter results early Tuesday that missed on revenue but beat on earnings. The company, however, said it will suspend guidance for its e-commerce unit, which accounts for about 60% of company revenue.

The company reported revenue of \$2.9 billion, missing estimates of \$2.98 billion. It lost 61 cents a share, better than the estimated loss of \$1.14 a share, according to FactSet.

SE stock plunged 14.3% during afternoon action on the stock market today.

Sea has one of the largest e-commerce and digital entertainment platforms in the Southeast Asia region. It also provides financial services.

The company said its decision to suspend revenue guidance was driven by a highly volatile and unpredictable macro environment.

"We think the right thing to do in this time of continuing heightened macro volatility is to prioritize efficiency and self-sufficiency," Chief Executive Forrest Li said in written remarks in the Sea Limited earnings report.

Sea's gaming unit, called Garena, accounts for about 31% of revenue.

"We are in an environment of increased macro uncertainty, with rising inflation, rising interest rates, local currency depreciations against the U.S. dollar, and ongoing reopening trends," said Li. "In this environment, being agile and adaptable is even more crucial to the long-term success of our business."

SE stock is down about 62% this year.

*Source:* Brian Deagon, "Sea Limited Reports Mixed Results, Suspends Revenue Guidance," 16 August 2022, <https://www.investors.com/news/technology/se-stock-drops-on-second-quarter-results-earnings/>.

Analysts are also interested in the financial position of a company, particularly for credit analysis, as depicted in Exhibit 3. Panel A of the exhibit is an excerpt from an August 2022 T-Mobile's press release highlighting a series of credit rating upgrades that the company received from the three major rating agencies. Panel B of the exhibit is an excerpt from a July 2022 announcement from Moody's Investor Service about its upgrade of T-Mobile's credit rating.

### **Exhibit 3: Credit Rating Upgrade for T-Mobile**

#### **Panel A: Excerpt from Announcement by T Mobile**

##### **T-Mobile Secures First-Ever Full Investment Grade Rating**

BELLEVUE, Wash.--(BUSINESS WIRE)-- T-Mobile US, Inc. (NASDAQ: TMUS) today announced that following an investment grade issuer rating from S&P Global Ratings (S&P) – the third it has received from credit rating agencies – the company now has its first-ever full investment grade rating. S&P has

assigned the Company a BBB- with positive outlook. This follows the company securing a Baa3 rating with a stable outlook from Moody's and a BBB- rating with a positive outlook from Fitch.

This full investment grade rating comes as a result of T-Mobile's successful operational and financial performance, which is consistently demonstrated through strong subscriber growth and the company's ability to translate that into increasing free cash flow.

"Achieving a full investment grade rating is an important milestone for T-Mobile that reflects the leading credit rating agencies' positive outlook on our Un-carrier leadership strategy that is rooted in an unwavering focus on putting customers first," said Peter Osvaldik, T-Mobile chief financial officer. "This 'clean sweep' in upgrades provides T-Mobile with the ability to unlock full access to the deep investment grade debt markets, which will further fuel our growth and momentum toward our mission of being the very best at connecting customers to their world."

*Source:* "T-Mobile Secures First-Ever Full Investment Grade Rating," 5 August 2022, <https://investor.t-mobile.com/events-and-presentations/news/news-details/2022/T-Mobile-Secures-First-Ever-Full-Investment-Grade-Rating/default.aspx>.

## **Panel B: Excerpt from Moody's Announcement About Rating Action on T-Mobile**

### **Rating Action: Moody's upgrades T-Mobile to Baa3; outlook stable**

New York, July 20, 2022 -- Moody's Investors Service (Moody's) upgraded T-Mobile USA, Inc.'s (T-Mobile) senior unsecured debt rating to Baa3 from Ba2 and affirmed the Baa3 rating on the company's existing senior secured notes and senior secured revolving credit facility.

Moody's has also withdrawn T-Mobile's Ba1 corporate family rating, Ba1-PD probability of default rating and SGL-1 speculative grade liquidity rating. With this rating action, Moody's changed T-Mobile's ratings outlook to stable from positive.

The ratings upgrade reflects T-Mobile's accelerated achievement of higher than expected operating cost synergies following its April 2020 merger with Sprint, significant and nearly complete network and operations integration and high visibility into the company's steady path towards sustained debt leverage (Moody's adjusted) below 3.75x. T-Mobile's sizable operating scale, high speed 5G coverage footprint, substantial upside growth potential in historically under-indexed rural and enterprise end market segments, solid incremental revenue growth adjacencies in fixed wireless access, extensive asset base and solid industry market position support continued subscriber growth, EBITDA margin expansion and ramping free cash flow over the next 12-18 months. The company's financial policy, which prudently focuses on network infrastructure investments to support market share growth, remains an important driver of the credit profile going forward. Moody's views network investments, including spectrum investments, as supportive of the business profile.

The stable outlook reflects Moody's expectation for T-Mobile's continued subscriber and service revenue growth, EBITDA margin expansion, debt leverage (Moody's adjusted) declining steadily towards and sustained around 3.75x and rising free cash flow.

*Source:* "Moody's Upgrades T-Mobile to Baa3; Outlook Stable," 20 July 2022, [https://www.moody.com/research/Moodys-upgrades-T-Mobile-to-Baa3-outlook-stable--PR\\_468077](https://www.moody.com/research/Moodys-upgrades-T-Mobile-to-Baa3-outlook-stable--PR_468077).



In conducting financial analysis of a company, the analyst will regularly refer to the company's financial statements, financial notes, and supplementary schedules as well as a variety of other information sources. The next lesson introduces commonly used information sources.

## REGULATED SOURCES OF INFORMATION

# 4

- ☐ describe the importance of regulatory filings, financial statement notes and supplementary information, management's commentary, and audit reports

Regulatory authorities require publicly traded issuers to prepare financial reports in accordance with specified accounting standards and other securities laws and regulations. For example, in Switzerland, Swiss-based companies listed on the main board of the Swiss Exchange must prepare their financial statements in accordance with either IFRS (International Financial Reporting Standards) or US GAAP (Generally Accepted Accounting Principles) if they are multinational.<sup>2</sup> While jurisdictions differ in their approach to securities regulations and corporate reporting standards, regulators of jurisdictions that oversee more than 95 percent of world's financial markets are members of the International Organization of Securities Commissions (IOSCO) and share objectives and principles, thereby creating a degree of global uniformity.

### International Organization of Securities Commissions

Although technically not a regulatory authority, IOSCO regulates a significant portion of the world's financial capital markets. This organization was formed in 1983 and consists of ordinary members, associate members, and affiliate members. Ordinary members are the securities commission or similar governmental regulatory authority with primary responsibility for securities regulation in the member country.<sup>3</sup> The members regulate more than 95 percent of the world's financial capital markets in more than 115 jurisdictions, and securities regulators in emerging markets account for 75 percent of its ordinary membership.

IOSCO's comprehensive set of *Objectives and Principles of Securities Regulation* is updated as required and is recognized as an international benchmark for all markets. The principles of securities regulation are based upon three core objectives:<sup>4</sup>

- protecting investors;
- ensuring that markets are fair, efficient, and transparent; and
- reducing systemic risk.

<sup>2</sup> "Financial Reporting Framework in Switzerland," Deloitte, <https://www.iasplus.com/en/jurisdictions/europe/switzerland>.

<sup>3</sup> Examples include the China Securities Regulatory Commission, Egyptian Financial Supervisory Authority, Securities and Exchange Board of India, Kingdom of Saudi Arabia Capital Market Authority, and Banco Central del Uruguay.

<sup>4</sup> *Objectives and Principles of Securities Regulation*, IOSCO, 2010.

IOSCO's principles are grouped into 10 categories, including principles for regulators, for enforcement, for auditing, and for issuers, among others. Within the category "Principles for Issuers," two principles relate directly to financial reporting:

- There should be full, accurate, and timely disclosure of financial results, risk, and other information that is material to investors' decisions.
- Accounting standards used by issuers to prepare financial statements should be of a high and internationally acceptable quality.

Historically, regulation and related financial reporting standards were developed within individual countries and were often based on the cultural, economic, and political norms of each country. As financial markets have become more global, it has become desirable to establish comparable financial reporting standards internationally. Ultimately, laws and regulations are established by individual jurisdictions, so this also requires cooperation among regulators. Another IOSCO principle deals with the use of self-regulatory organizations (SROs), which exercise some direct oversight for their areas of competence and should be subject to the oversight of the relevant regulator and observe fairness and confidentiality.<sup>5</sup>

To ensure consistent application of international financial standards (such as the Basel Committee on Banking Supervision's standards and IFRS), it is important to have uniform regulation and enforcement across national boundaries. IOSCO assists in attaining this goal of uniform regulation as well as cross-border cooperation in combating violations of securities and derivatives laws.

## US Securities and Exchange Commission

The US SEC has primary responsibility for securities and capital markets regulation in the United States and is an ordinary member of IOSCO. Any company issuing securities within the United States (e.g., on the New York Stock Exchange or NASDAQ), or otherwise involved in US capital markets, is subject to the rules and regulations of the SEC. The SEC, one of the oldest and most developed regulatory authorities, was created by reforms after the stock market crash of 1929 that preceded the Great Depression.

From a financial reporting and analysis perspective, the most significant statutes enforced by the SEC are the Securities Acts of 1933 and 1934 and the Sarbanes–Oxley Act of 2002.

- **Securities Act of 1933** (the 1933 Act): This law specifies the financial and other significant information that investors must receive when securities are sold, prohibits misrepresentations, and requires initial registration of all public issuances of securities.
- **Securities Exchange Act of 1934** (the 1934 Act): This law created the SEC, gave the SEC authority over all aspects of the securities industry, and empowered the SEC to require periodic reporting by companies with publicly traded securities.
- **Sarbanes–Oxley Act of 2002**: This law created the Public Company Accounting Oversight Board (PCAOB) to oversee auditors. The SEC is responsible for carrying out the requirements of the act and overseeing the PCAOB. The act addresses auditor independence (it prohibits auditors from providing certain non-audit services to the companies they audit); strengthens corporate responsibility for financial reports (it requires executive management to certify that the company's financial reports fairly present the company's condition); and requires management to report on

the effectiveness of the company's internal control over financial reporting (including obtaining external auditor confirmation of the effectiveness of internal control).

Companies comply with these acts principally through filing standardized forms created by the SEC and by responding to and complying with specific comments on their filings by the SEC staff. More than 50 different types of SEC forms are used to satisfy reporting requirements; the discussion herein is limited to those forms most relevant for financial analysts.

Most of the SEC filings are required to be made electronically, so filings that an analyst would be interested in can be retrieved online from one of many websites, including an issuer's investor relations website and the SEC's own website. Some filings are required on the initial offering of securities, whereas others are required on a periodic basis thereafter. The following are some of the more common filings used by analysts.

- **Securities Offerings Registration Statement:** The 1933 Act requires companies offering securities to file a registration statement. New issuers as well as previously registered companies that are issuing new securities are required to file these statements. Required information and the precise form vary depending upon the size and nature of the offering. Typically, required information includes (1) disclosures about the securities being offered for sale, (2) the relationship of these new securities to the issuer's other capital securities, (3) the information typically provided in the annual filings, (4) recent audited financial statements, and (5) risk factors involved in the business. Interim unaudited financial statements are also provided if the statement is filed three months or more after a fiscal year end.
- **Forms 10-K, 20-F, and 40-F:** Companies are required to file these forms *annually*. Form 10-K is for US registrants, Form 40-F is for certain Canadian registrants, and Form 20-F is for all other non-US registrants. These forms require a comprehensive overview, including information concerning a company's business, risk factors, financial disclosures, legal proceedings, and information related to management. The financial disclosures include audited financial statements and notes, management discussion and analysis (MD&A) of the company's financial condition and results of operations, and auditors' reports.
- **Annual Report:** In addition to the SEC's annual filings (e.g., Form 10-K), most companies prepare an annual report to shareholders. This is not a requirement of the SEC. The annual report is usually viewed as one of the most significant opportunities for a company to present itself to shareholders and other external parties; accordingly, it is often a highly polished marketing document with photographs, an opening letter from the chief executive officer, financial data, market segment information, research and development activities, and future corporate goals. In contrast, the Form 10-K is a more legal type of document with minimal marketing emphasis. Although the perspectives vary, a company's annual report and its Form 10-K have considerable overlap. Some companies prepare only Form 10-K or publish an annual report that consists of a few pages of material and a copy of the 10-K.
- **Proxy Statement/Form DEF-14A:** The SEC requires that shareholders of a company receive a proxy statement before a shareholder meeting. A proxy is an authorization from the shareholder giving another party the right to cast its vote. Shareholder meetings are held at least once a year, but any special meetings also require a proxy statement. Proxies, especially annual meeting

proxies, contain information that is often useful to financial analysts. Such information typically includes proposals that require a shareholder vote, details of security ownership by management and principal owners, biographical information on directors, and disclosure of executive compensation. Proxy statement information is filed with the SEC as Form DEF-14A.

- **Forms 10-Q and 6-K:** Companies are required to submit these forms for interim periods (quarterly for US companies on Form 10-Q, and semiannually for many non-US companies on Form 6-K). The filing requires certain financial information, including unaudited financial statements and an MD&A for the interim period covered by the report. Additionally, if certain types of non-recurring events—such as the adoption of a significant accounting policy, commencement of significant litigation, or a material limitation on the rights of any holders of any class of registered securities—take place during the period covered by the report, these events must be included in the Form 10-Q report. Companies may provide the 10-Q report to shareholders or may prepare a separate, abbreviated, quarterly report to shareholders.

#### KNOWLEDGE CHECK



1. In September 2017, Sea Ltd, the Singapore-based technology company, filed a registration statement with the US SEC to register its initial public offering of securities (American Depositary Shares, each representing one Class A Ordinary Share) on the New York Stock Exchange. In addition to a large amount of financial information, the registration statement provided over 50 pages of discussion on Sea Ltd.'s business and industry.

Which of the following is *most likely* to have been included in Sea's registration statement?

- A. Underwriters' fairness opinion of the offering
- B. Assessment of risk factors involved in the business
- C. Projected cash flows and earnings for the business

**Solution:**

B is correct. Information provided by companies in registration statements typically includes disclosures about the securities being offered for sale; the relationship of these new securities to the issuer's other capital securities; the information typically provided in the annual filings; recent audited financial statements; and risk factors involved in the business. Companies provide information useful in developing projected cash flows and earnings but do not typically include these in the registration statement, nor do they provide opinions of the underwriters.

A company or its officers make other SEC filings—either periodically, or, if significant events or transactions have occurred, in between the periodic reports noted previously. By their nature, these forms sometimes contain timely information that may have significant valuation implications.

- **Form 8-K:** In addition to filing annual and interim reports, SEC registrants must report material corporate events on a more current basis. Form 8-K (6-K for non-US registrants) is the “current report” companies must file with the SEC to announce such major events as acquisitions or disposals of

corporate assets, changes in securities and trading markets, matters related to accountants and financial statements, corporate governance and management changes, and Regulation FD disclosures.<sup>6</sup>

- **Forms 3, 4, 5, and 144:** Forms 3, 4, and 5 are required to report beneficial ownership of securities. These filings are required for any director or officer of a registered company as well as beneficial owners of greater than 10 percent of a class of registered equity securities. Form 3 is the initial statement, Form 4 reports changes, and Form 5 is the annual report. Form 144 is notice of the proposed sale of restricted securities or securities held by an affiliate of the issuer. These forms can be used to examine purchases and sales of securities by officers, directors, and other affiliates of the company, who collectively are regarded as corporate insiders.
- **Form 11-K:** This is the annual report of employee stock purchase, savings, and similar plans. It might be of interest to analysts for companies with significant employee benefit plans because it contains more information about these plans than disclosed in the company's financial statements.

In jurisdictions other than the United States, similar legislation exists for the purpose of regulating securities and capital markets. Regulatory authorities are responsible for enforcing regulation, and securities regulation is intended to be consistent with the IOSCO objectives described in the previous section. Within each jurisdiction, regulators will either establish or, more typically, recognize and adopt a specified set or sets of accounting standards. The regulators will also establish reporting and filing requirements. IOSCO members have agreed to cooperate in the development, implementation, and enforcement of internationally recognized and consistent standards of regulation.

## Capital Markets Regulation in Europe

Each individual member state of the European Union (EU) regulates capital markets in its jurisdiction. Certain regulations, however, have been adopted at the EU level. Importantly, the EU agreed that from 2005 consolidated accounts of EU-listed companies would use International Financial Reporting Standards. The endorsement process by which newly issued IFRS are adopted by the EU reflects the balance between the individual member state's autonomy and the need for cooperation and convergence. When the IASB issues a new standard, the European Financial Reporting Advisory Group advises the European Commission on the standard, and the Standards Advice Review Group provides the Commission with an opinion about that advice. Based on the input from these two entities, the Commission prepares a draft endorsement regulation. The Accounting Regulatory Committee votes on the proposal; and if the vote is favorable, the proposal proceeds to the European Parliament and the Council of the European Union for approval.<sup>7</sup>

Two bodies related to securities regulation established by the European Commission are the European Securities Committee (ESC) and the European Securities and Market Authority (ESMA). The ESC consists of high-level representatives of member states and advises the European Commission on securities policy issues. ESMA is an EU cross-border supervisor established to coordinate supervision of the EU market. As noted earlier, regulation still rests with the individual member states and, therefore,

6 Regulation Fair Disclosure (FD) provides that when an issuer discloses material non-public information to certain individuals or entities—generally, securities market professionals such as stock analysts or holders of the issuer's securities who may trade on the basis of the information—the issuer must make public disclosure of that information. In this way, the rule aims to promote full and fair disclosure.

7 European Commission. <https://www.esma.europa.eu/convergence/ias-regulation#:~:text=The%20objective%20of%20the%20regulation,The%20European%20Union%20will>

requirements for registering shares and filing periodic financial reports vary from country to country. ESMA is one of three European supervisory authorities; the two others supervise the banking and insurance industries.

## Financial Notes and Supplementary Schedules

The notes (also sometimes referred to as footnotes) that accompany the financial statements are required and often account for a large percentage of the financial disclosures made in regulatory filings. The notes provide information that is essential to understanding the information provided in the statements. Sea Ltd.'s 2021 financial statements, for example, include more than 60 pages of notes.

The notes disclose the basis of preparation for the financial statements. For example, Sea Ltd. discloses that its fiscal year corresponds to the calendar year; its financial statements are prepared in accordance with US GAAP; the statements are thousands of US dollars unless otherwise specified; and the figures have been rounded, which might give rise to minor discrepancies when they are added. Sea Ltd. also states that its financial statements are on a consolidated basis—that is, aggregating the financial records of all its subsidiaries it controls, after eliminating intercompany balances and transactions.

The notes also disclose information about the accounting policies, methods, and estimates used to prepare the financial statements. Both IFRS and US GAAP allow some flexibility in choosing among alternative policies and methods when accounting for certain items. This flexibility aims to meet the divergent needs of many businesses for reporting a variety of economic transactions. In addition to differences in accounting policies and methods, differences arise as a result of estimates needed to record and measure transactions, events, and financial statement line items.

Overall, flexibility in accounting choices is necessary because, ideally, a company will select those policies, methods, and estimates that are allowable and most relevant and that fairly reflect the unique economic environment of the company's business and industry. Flexibility can, however, create challenges for the analyst because the use of different policies, methods, and estimates reduces comparability across different companies' financial statements.

For example, if a company acquires a piece of equipment to use in its operations, accounting standards require that the cost of the equipment be reported as an expense (depreciation) by allocating its cost, less any residual value, in a systematic manner over the equipment's useful life. Accounting standards permit flexibility, however, in determining the way each year's expense is determined. Two companies may acquire similar equipment but use different methods and assumptions to record the expense over time. An analyst's ability to compare the companies' performance is hindered by the difference. Analysts must understand reporting choices to make appropriate adjustments when comparing companies' financial positions and performance.

For many companies, the financial notes and supplemental schedules provide explanatory information about every line item (or almost every line item) on the balance sheet and income statement. In addition, note disclosures include information about the following (this is not an exhaustive list):

- segment reporting;
- business acquisitions and disposals;
- contractual obligations, including both on- and off-balance sheet debt;
- financial instruments and risks arising from financial instruments;
- legal proceedings;
- related-party transactions; and

subsequent events, i.e., events that result after the balance sheet date

Experience using the disclosures made by a company and its competitors typically enhances an analyst's judgment about the relative importance of different disclosures and the ways in which they can be helpful.

## Business and Geographic Segment Reporting

Many companies are composed of several businesses. Although companies are not required to provide disaggregated full financial statements for all of its businesses or subsidiaries, they are required to provide some disaggregated information under both IFRS and US GAAP in the notes to financial statements by **operating segment**. An operating segment is defined as a component of a company that

- engages in activities that may generate revenue and create expenses, including a start-up segment that has yet to earn revenues;
- whose results are regularly reviewed by the company's senior management; and
- for which discrete financial information is available.

A company must disclose separate information about any operating segment that meets certain quantitative criteria—namely, the segment constitutes 10 percent or more of the combined operating segments' revenue, assets, or profit. (For purposes of determining whether a segment constitutes 10 percent or more of combined profits or losses, the criteria is expressed in terms of the absolute value of the segment's profit or loss as a percentage of the greater of (1) the combined profits of all profitable segments and (2) the absolute amount of the combined losses of all loss-making segments.) If, after applying these quantitative criteria, the combined revenue from external customers for all reportable segments combined is less than 75 percent of the total company revenue, the company must identify additional reportable segments until the 75 percent level is reached. Small segments might be combined as one if they share a substantial number of factors that define a business or geographical segment, or they might be combined with a similar significant reportable segment. Information about operating segments and businesses that are not reportable is combined in an "all other segments" category.

Companies must disclose the factors used to identify reportable segments and the types of products and services sold by each reportable segment.

For each reportable segment, the following should also be disclosed in the notes to financial statements:

- revenue, distinguishing between revenue to external customers and revenue from other segments;
- a measure of profit or loss;
- a measure of assets and liabilities (if these amounts are regularly reviewed by the company's chief decision-making officer);
- interest revenue and interest expense;
- cost of property, plant, and equipment, and intangible assets acquired;
- depreciation and amortization expense;
- other non-cash expenses;
- income tax expense or income; and
- share of the net profit or loss of an investment accounted for under the equity method.

Companies also must provide a reconciliation between the information of reportable segments and the consolidated financial statements in terms of segment revenue, profit or loss, assets, and liabilities.

A company's reporting segments can be useful as a means of quickly understanding what a company does and how and where it earns money. The segment data shown in Exhibit 4 appear in the notes to the financial statements for Sea Ltd.

#### Exhibit 4: Segment Reporting

### Excerpts from Note 22 (Segment Reporting) of Sea Ltd's 2021 Annual Report on Form 20-F

The Company has three reportable segments, namely digital entertainment, e-commerce and digital financial services. The Chief Operating Decision Maker (CODM) reviews the performance of each segment based on revenue and certain key operating metrics of the operations and uses these results for the purposes of allocating resources to and evaluating financial performance of each segment.

#### Description of Reportable Segments:

*Digital entertainment* – Garena's platform offers mobile and PC online games and develops mobile games for the global market. Garena is the global leader in eSports, it also provides access to other entertainment content and social features, such as live streaming of gameplay, user chat and online forums.

*E-commerce* – Shopee's platform is a mobile-centric, social-focused marketplace. It provides users with a convenient, safe, and trusted shopping environment with integrated payment, logistics infrastructure and comprehensive seller services. Products from manufacturers and third parties are also purchased and sold directly to buyers on Shopee platform.

*Digital financial services* – SeaMoney provides a variety of payment services and loans to individuals and businesses. It is an important payment infrastructure supporting the Company's digital entertainment and e-commerce businesses. In addition, SeaMoney also integrates with third party merchant partners and covers a broad set of consumption use cases.

A combination of multiple business activities that does not meet the quantitative thresholds to qualify as reportable segments are grouped together as "Other services".

#### Segment Results for Year Ended 31 December 2021 (000s of USD)

	Digital Entertainment	E-Commerce	Digital Financial Services	Other Services	Unallocated Expenses	Consolidated
Revenue	4,320,013	5,122,959	469,774	42,444	0	9,955,190
Operating income (loss)	2,500,081	(2,766,566)	(640,422)	(177,633)	(498,520)	(1,583,060)
Non-operating loss, net						(132,124)
Income tax expense						(332,865)



## Segment Results for Year Ended 31 December 2021 (000s of USD)

	Digital Entertainment	E-Commerce	Digital Financial Services	Other Services	Unallocated Expenses	Consolidated
Share of results of equity investees						5,019
Net loss						(2,043,030)

## Revenue by Geography (000s of USD)

Year Ended 31 December			
Revenue:	2019	2020	2021
Southeast Asia	1,378,141	2,791,894	6,316,782
Latin America	282,618	790,308	1,850,861
Rest of Asia	489,291	655,007	1,394,342
Rest of the World	25,328	138,455	393,205
<b>Consolidated revenue</b>	<b>2,175,378</b>	<b>4,375,664</b>	<b>9,955,190</b>

From the data in Exhibit 4, an analyst can quickly see that the e-commerce segment accounted for just over 50 percent of total revenues in 2021 but generated a large operating loss, while the digital entertainment segment accounted for most of the remaining revenues and was the only profitable segment. An analyst would likely spend a majority of their time on examining the past and present, and forecasting the future results of these two segments. Similarly, an analyst would use these disclosures to understand that Southeast Asia and Latin America are the company's most important geographies.

Identifying segments requires significant judgment by management, and companies often change the definition of segments and related disclosures.

Another required disclosure is the company's reliance on any single customer. If any single customer represents 10 percent or more of the company's total revenues, the company must disclose that fact, though not the identity of that customer. From an analysts' perspective, information about a concentrated customer base can be useful in assessing the risks faced by the company.

## Management Commentary or Management's Discussion and Analysis

Regulatory filings such as Form 10-K and 10-Q include a section in which management discusses a variety of issues, including the nature of the business, past results, and outlook. This section is referred to by a variety of names, including management report(ing), management commentary, operating and financial review, and MD&A.

The discussion by management is arguably one of the most useful parts of a company's annual report besides the financial statements themselves; however, other than excerpts from the financial statements, information included in the management commentary is typically unaudited. In Germany, management reporting has been required since 1931 and is audited.

To help improve the quality of the discussion by management, the International Accounting Standards Board (IASB) issued an IFRS Practice Statement "Management Commentary" includes a framework for the preparation and presentation of management commentary. The framework provides guidance rather than requirements.

requirements in a standard. The framework identifies five content elements of a “decision-useful management commentary”: (1) the nature of the business; (2) management’s objectives and strategies; (3) the company’s significant resources, risks, and relationships; (4) results of operations; and (5) critical performance measures.

In the United States, the SEC requires listed companies to provide an MD&A and specifies the content.<sup>8</sup> Management must highlight any favorable or unfavorable trends and identify significant events and uncertainties that affect the company’s liquidity, capital resources, and results of operations. The MD&A must also provide information about the effects of inflation, changing prices, or other material events and uncertainties that may cause the future operating results and financial condition to materially depart from the current reported financial information. In addition, the MD&A must provide information about off-balance-sheet obligations and about contractual commitments, such as purchase obligations. Management should also discuss the critical accounting policies that require them to make subjective judgments and that have a significant impact on reported financial results.

The management commentary, or MD&A, is a good starting place for understanding information in the financial statements. In particular, the forward-looking disclosures, such as those about planned capital expenditures, new store openings, or divestitures, can be useful in projecting a company’s future performance. However, the commentary is only one input for the analyst seeking an objective and independent perspective on a company’s performance and prospects.

Sea Ltd.’s 2021 annual report on Form 20-F includes much information of potential interest to an analyst. The lengthy report contains sections such as “Information on the Company” and “Operating and Financial Review and Prospects” that discuss the company’s history, business model, strategies, key performance indicators, risk factors, relevant laws and regulations, recent financial performance and position, cash flows and working capital, capital expenditures, and key accounting policies.

## Auditor's Reports

Financial statements presented in companies’ annual reports are generally required to be audited by an independent accounting firm in accordance with specified auditing standards. The independent auditor then provides a written opinion on the financial statements. This opinion is referred to as the audit report. Audit reports may vary in different jurisdictions, but the minimum components, including a specific statement of the auditor’s opinion, are similar. Audits of financial statements may be required by contractual arrangement, law, or regulation.

International standards on auditing (ISAs) have been developed by the International Auditing and Assurance Standards Board (IAASB). This body has emerged from the International Federation of Accountants. ISAs have been adopted by many countries and are referenced in audit reports issued in those countries. Other countries, such as the United States, specify their own auditing standards. With the enactment of the Sarbanes–Oxley Act of 2002 in the United States, auditing standards for public companies are promulgated by the PCAOB.

<sup>8</sup> Relevant sections of SEC requirements are included for reference in the FASB Accounting Standards Codification (ASC). The FASB ASC does not include sections of SEC requirements that deal with matters outside the accounting and financial reporting domain.

Under ISAs, the overall objectives of an auditor in conducting an audit of financial statements are

- to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, thereby enabling the auditor to express an opinion on whether the financial statements are prepared, in all material respects, in accordance with an applicable financial reporting framework; and
- to report on the financial statements, and communicate as required by the ISAs, in accordance with the auditor's findings.<sup>9</sup>

Publicly traded companies may also have requirements set by regulators or stock exchanges, such as appointing an independent audit committee within its board of directors to oversee the audit process. The audit process provides a basis for the independent auditor to express an opinion on whether the information in the audited financial statements presents fairly the financial position, performance, and cash flows of the company in accordance with a specified set of accounting standards.

Audits are designed and conducted using sampling techniques, and financial statement line items may be based on estimates and assumptions. This means that the auditors cannot express an opinion that provides absolute assurance about the accuracy or precision of the financial statements. Instead, the independent audit report provides *reasonable assurance* that the financial statements are *fairly presented*, meaning that there is a high probability that the audited financial statements are free from *material* error, fraud, or illegal acts that have a direct effect on the financial statements.

The independent audit report expresses the auditor's opinion on the fairness of the audited financial statements, and specifies which financial statements were audited, the reporting entity, and the date. An *unqualified* audit opinion states that the financial statements give a "true and fair view" (international) or are "fairly presented" (international and United States) in accordance with applicable accounting standards. This is also referred to as an "unmodified" or a "clean" opinion and is the one that analysts would like to see in a financial report. There are several other types of modified opinions. A *qualified* audit opinion is one in which there is some scope limitation or exception to accounting standards. Exceptions are described in the audit report with additional explanatory paragraphs so that the analyst can determine the importance of the exception. An *adverse* audit opinion is issued when an auditor determines that the financial statements materially depart from accounting standards and are not fairly presented. Finally, a *disclaimer of opinion* occurs when, for some reason, such as a scope limitation, the auditors are unable to issue an opinion.

The audit report also describes the basis for the auditor's opinion and, for listed companies, includes a discussion of Key Audit Matters (international) and Critical Audit Matters (United States).<sup>10</sup> Key Audit Matters are defined as issues that the auditor considers to be most important, such as those that have a higher risk of misstatement, involve significant management judgment, or report the effects of significant transactions during the period. Critical Audit Matters are defined as issues that involve "especially challenging, subjective, or complex auditor judgment" and similarly include areas with higher risk of misstatement or that involve significant management judgment and estimates. However, Key and Critical Audit Matters are not necessarily the most important factors for analysts and investors.

<sup>9</sup> See the International Auditing and Assurance Standards Board (IAASB), *Handbook of International Quality Control, Auditing, Review, Other Assurance, and Related Services Pronouncements* (New York: International Federation of Accountants, 2020).

<sup>10</sup> Discussion of Key Audit Matters in the auditor's report is required by the International Standard on Auditing (ISA) ISA 701, effective in 2017, issued by the International Audit and Assurance Standards Board. Discussion of Critical Audit Matters in the auditor's report is required by the Auditor Reporting Standard AR 3100, effective in 2018, issued by the American Institute of Certified Public Accountants (AICPA).

Exhibit 5 presents excerpts from the independent auditor's report contained in Sea Ltd.'s 2021 annual report. Note that Sea Ltd. received an unqualified audit opinion (i.e., clean or unmodified opinion) from Ernst & Young LLP for the company's fiscal year ended 31 December 2021.

#### **Exhibit 5: Excerpts from Sea Ltd.'s 2021 Independent Audit Report**

To the Shareholders and the Board of Directors of Sea Limited

### **Opinion on the Financial Statements**

We have audited the accompanying consolidated balance sheets of Sea Limited (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive loss, cash flows, and shareholders' equity (deficit) for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated April 22, 2022 expressed an unqualified opinion thereon.

### **Basis for Opinion**

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB. We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

### **Critical Audit Matters**

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our independent opinion expressed in our audit report.

financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

## Recognition of Digital Entertainment (“DE”) Revenue

### Description of the Matter:

For the year ended December 31, 2021, the Company’s revenue arising from DE was \$4,320.0 million.

As outlined in Note 2(o) of the consolidated financial statements, DE revenue is recognized over the performance obligation period. The Company has determined that an implied obligation exists to the paying users to continue providing hosting services and access to the purchased virtual goods within the online games over an estimated service period. Such service period is largely determined in accordance with the estimated average lifespan of the paying users of the said games or similar games.

Auditing the DE revenue recognition process was complex and involved judgement to determine the historical paying users’ inactive rate and playing behavior, in estimating the average lifespan of the paying users of the said games or similar games. In addition, the Company utilized various operating systems to process user data and transactions and relied on automated processes and controls over the completeness and accuracy of the historical user and game data, which were key inputs to the above-mentioned estimates.

### How We Addressed the Matter in Our Audit:

We obtained an understanding, evaluated the design and tested the operating effectiveness of internal controls over the Company’s DE revenue recognition process. For example, we tested the automated controls of the related operating systems. We also tested the effectiveness of management’s review controls over assessing the completeness and accuracy of the historical user and game data and the appropriateness of the judgements regarding the most relevant historical user and game data to be applied in their estimates.

To test the recognition of DE revenue, our audit procedures included, among others, testing the completeness and accuracy of the above-mentioned underlying historical user and game data and assessing the reasonableness of the historical data applied in estimating the average lifespan of the paying users of the said games or similar games. We also recalculated the amount of revenue to be deferred based on management’s estimated service periods and compared those amounts with the amounts recorded by the Company.

## Measurement of long-lived assets in E-commerce (“EC”) segment

### Description of the Matter:

As at December 31, 2021, the Company’s long-lived assets in EC segment amounted to approximately 75.7% of the Company’s long-lived assets. The long-lived assets include property and equipment, operating lease right-of-use assets and intangible assets.

As outlined in Note 2(m) to the consolidated financial statements, the Company evaluates its long-lived assets for impairment when there are events or changes in circumstances which indicate that the carrying amounts of the long-lived assets may not be recoverable. Due to the continued losses incurred by EC segment, the Company evaluated the related long-lived assets for impairment at the asset group level by comparing the carrying amount of the asset group to the recoverable value determined by forecasted undiscounted cash flows expected to be generated by the asset group.

Auditing management's long-lived assets impairment test was highly judgmental due to the magnitude of the carrying amount of long-lived assets and management's judgement in estimating the recoverable value (undiscounted cash flows) of the asset group, which were sensitive to key assumptions such as projected revenue and sales and marketing expenses.

**How We Addressed the Matter in Our Audit:**

We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Company's long-lived asset impairment process to determine the recoverable value of the asset group. For example, we tested controls over management's review of the key assumptions used in estimating the recoverable value.

To test the impairment of long-lived assets, our audit procedures included, among others, obtaining an understanding from management regarding the basis of which the undiscounted cash flows were prepared and assessing the reasonableness of the forecasted undiscounted cash flows by comparing them against the Company's business strategies and underlying key assumptions over the forecast periods, taking into consideration current industry and economic trends. We performed sensitivity analyses over the key assumptions described above to evaluate the changes to the estimated recoverable value for the asset group that would result from changes in the assumptions.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2010.

Singapore

April 22, 2022

*Source: Sea Ltd., 2021 Annual Report.*

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In the United States, under the Sarbanes–Oxley Act, the auditors must also express an opinion on the company's internal control systems. This information may be provided in a separate opinion or incorporated as a paragraph in the opinion related to the financial statements. Internal controls are the company's processes, personnel, and systems designed to ensure that the company's process for generating financial reports is sound. Although management has always been responsible for maintaining effective internal control, the Sarbanes–Oxley Act greatly increases management's responsibility for demonstrating that the company's internal controls are effective. Management of publicly traded companies in the United States are now required by securities regulators to explicitly accept responsibility for the effectiveness of internal control, evaluate the effectiveness of internal control using suitable control criteria, support the evaluation with sufficient competent evidence, and provide a report on internal control.

Although these reports and attestations provide some assurances to analysts, they are not infallible. The analyst must always use a degree of healthy skepticism when analyzing financial statements.

## COMPARISON OF IFRS WITH ALTERNATIVE FINANCIAL REPORTING SYSTEMS

# 5

- describe implications for financial analysis of alternative financial reporting systems and the importance of monitoring developments in financial reporting standards

The adoption of IFRS as the required financial reporting standard by most countries outside the United States has advanced the goal of global convergence. Nevertheless, there are still significant differences in financial reporting in the global capital markets. Arguably, the most critical are the differences that exist between IFRS and US GAAP as a significant number of the world's listed companies use one of these two reporting standards.

In general, the IASB and FASB work together to coordinate changes to accounting standards and reduce differences between the standards. While convergence of conceptual frameworks and existing standards was put on hold in the late 2000s, new accounting standards have been mostly or entirely converged, resulting in increasing uniformity over time as major new standards have been adopted (e.g., revenue recognition, leasing, credit losses). Maintaining convergence on new standards remains a priority of both standard-setting bodies. Later modules provide a more detailed review of related differences in IFRS and US GAAP, though some major differences are outlined in Exhibit 6.

**Exhibit 6: Selected Major Differences between IFRS and US GAAP**

Basis for Comparison	US GAAP	IFRS
Developed by	Financial Accounting Standards Board (FASB)	International Accounting Standards Board (IASB)
Based on	Rules	Principles
Interest paid	Cash Flows from Operating Activities	Cash Flows from Financing Activities <i>or</i> Cash Flows from Operating Activities
Inventory valuation	First in, First out (FIFO); Last in, First out (LIFO); and Weighted Average Method	FIFO and Weighted Average Method
Development cost	Treated as an expense	Capitalized, only if certain conditions are satisfied
Reversal of Inventory Write-down	Prohibited	Permissible, if specified conditions are met

Because reconciliation disclosures between IFRS and US GAAP are not required, an analyst comparing two companies that use different reporting standards must be aware of areas in which accounting standards have not converged. In many cases, a user of financial statements prepared under different accounting standards does not have enough information to make the specific adjustments required to achieve comparability. Instead, an analyst must maintain caution in interpreting comparative

financial measures produced under different accounting standards and monitor significant developments in financial reporting standards, as this can have important implications for comparing the performance of companies and security valuation.

## Monitoring Developments in Financial Reporting Standards

Analysts need to monitor ongoing developments in financial reporting and assess their implications for security analysis and valuation. The need to monitor developments in financial reporting standards does not mean that analysts should be accountants. An accountant monitors these developments from a preparer's perspective; an analyst needs to monitor them from a user's perspective. More specifically, analysts need to know how these developments will affect financial reports.

Analysts can remain aware of developments in financial reporting standards by monitoring new products or transactions, actions of standard setters and other groups representing users of financial statements (such as CFA Institute), and company disclosures regarding critical accounting policies and estimates.

## New Products or Types of Transactions

New products and new types of transactions can have unusual or unique elements to them such that no explicit guidance in the financial reporting standards exists. New products or transactions typically arise from economic events, such as new businesses (e.g., fintech), or from a newly developed financial instrument or financial structure (e.g., cryptocurrencies and other digital assets). Financial instruments, whether exchange traded or not, are typically designed to enhance a company's business or to mitigate inherent risks. At times, however, financial instruments or structured transactions have been developed primarily for purposes of financial report "window dressing."

Although companies might discuss new products and transactions in their financial reports, the analyst can also monitor business journals and the capital markets to identify such items. Additionally, when one company in an industry develops a new product or transaction, other companies in the industry often do the same. Once new products, financial instruments, or structured transactions are identified, it is helpful to gain an understanding of the business purpose. If necessary, an analyst can obtain further information from a company's management, which should be able to describe the economic purpose, the financial statement reporting, significant estimates, judgments applied in determining the reporting, and future cash flow implications for these items.

## Evolving Standards and the Role of CFA Institute

The actions of standard setters and regulators are unlikely to be helpful in identifying new products and transactions, given the lag between new product development and regulatory action. Monitoring the actions of these authorities is nonetheless important for another reason: Changes in regulations can affect companies' financial reports and, thus, valuations. This is particularly true if the financial reporting standards change to require more explicit identification of matters affecting asset/liability valuation or financial performance. For example, one regulatory change required companies to include a provision for expenses associated with the grant and vesting of employee stock option grants as an expense in the income statement. Prior to the required expensing, an analyst could assess the dilutive effect to shareholders associated with stock option grants only by reviewing information disclosed in the notes to the financial statements.

To the extent that some market participants do not examine financial statement details and thus ignore some items when valuing a company's securities, more explicit identification and disclosure by the issuer of such items is important. Additionally,



plausible to believe that management is more attentive to and rigorous in any calculations/estimates of items that appear in the financial statements, compared with items that are disclosed only in the notes.

The IASB ([www.iasb.org](http://www.iasb.org)) and FASB ([www.fasb.org](http://www.fasb.org)) provide a great deal of information on their websites regarding new standards and proposals for future changes in standards. In addition, the IASB and FASB seek input from the financial analyst community—those who regularly use financial statements in making investment and credit decisions. When a new standard is proposed, an exposure draft is made available and users of financial statements can draft comment letters and position papers for submission to the IASB and FASB to evaluate the proposal.

CFA Institute is active in supporting improvements to financial reporting. Volunteer members of CFA Institute serve on several liaison committees that meet regularly to make recommendations to the IASB and FASB on proposed standards and to draft comment letters and position papers. The comment letters and position papers of these groups on financial reporting issues are available at [www.cfainstitute.org/advocacy](http://www.cfainstitute.org/advocacy).

In 2007, CFA Institute issued a position paper titled *A Comprehensive Business Reporting Model: Financial Reporting for Investors*, which provides a suggested model for significantly improving financial reporting. The position paper remains relevant in stating:

Corporate financial statements and their related disclosures are fundamental to sound investment decision making. The well-being of the world's financial markets, and of the millions of investors who entrust their financial present and future to those markets, depends directly on the information financial statements and disclosures provide. Consequently, the quality of the information drives global financial markets. The quality, in turn, depends directly on the principles and standards managers apply when recognizing and measuring the economic activities and events affecting their companies' operations. ...

Investors require timeliness, transparency, comparability, and consistency in financial reporting. Investors have a preference for decision relevance over reliability ... "analysts need to know economic reality—what is really going on—to the greatest extent it can be depicted by accounting numbers." Corporate financial statements that fail to reflect this economic reality undermine the investment decision-making process.<sup>11</sup>

Among other principles, the proposed model stresses the importance of information regarding the current fair value of assets and liabilities, of neutrality in financial reporting, and of providing detailed information on cash flows to investors through the choice of the so-called direct format for the cash flow statement.

In summary, analysts can improve their investment decision making by keeping current on financial reporting standards. In addition, analysts can contribute to improving financial reporting by sharing their perspective as users with standard-setting bodies, which typically invite comments concerning proposed changes.

<sup>11</sup> *A Comprehensive Business Reporting Model: Financial Reporting for Investors* (Charlottesville, VA: CFA Institute, 2007), [www.cfainstitute.org/advocacy](http://www.cfainstitute.org/advocacy), March 20, 2007, accessed July 13, 2007.

## 6

## OTHER SOURCES OF INFORMATION



describe information sources that analysts use in financial statement analysis besides annual and interim financial reports

In addition to regulated information from issuers such as the financial statements and notes in filings, analysts use a variety of other information sources for financial analysis, which we group by origin: issuers, public third-party, proprietary third-party, and proprietary primary research.

- Issuer sources (other than regulatory filings such as annual and quarterly reports and proxy statements)
  - Earnings calls. Earnings calls are webcast or teleconferenced presentations and question-and-answer sessions hosted by issuers' management to discuss financial results. The primary audience for the calls are analysts, investors, and members of the media. While not legally required, most public companies conduct these calls to provide complementary information to their regulatory filings, such as explaining differences in performances from expectations, revisions to forward-looking targets, and explaining corporate actions such as acquisitions and restructurings. Analysts ask probing questions to gain further color from management to understand past results and actions to sharpen their estimates. Platforms such as Bloomberg, Wind, and FactSet transcribe earnings calls and other presentations.
  - Presentations and events, such as investor days. Similar to earnings calls but scheduled on an ad hoc basis, issuers and investment banks sometimes host events during which management teams give in-depth presentations on their business or specific topics and business segments. Like earnings calls, analysts must be aware that management is biased to their perspective, and often need to ask questions for the information they want.
  - Press releases. Press releases are announcements and statements of information (typically in writing but can be videos or graphics) by companies and their management. Common topics include notifications of upcoming events, product releases and changes, management and board of director changes, and M&A or restructuring announcements. Press releases are often distributed not only on issuers' websites but also on third-party news sources.
  - Speaking with management, investor relations, or other company personnel.
  - Company website or properties that the analyst may be able to visit as a customer or an investor. It is often useful to experience an issuer's and competitors' products firsthand, though it is not always possible (e.g., pharmaceuticals).
- Public third-party sources
  - Free industry whitepapers or analyst reports from a consultancy, usually accessed through internet search engines.

- Economic or industry indicators from governments and other organizations, such as retail sales and price indexes, often released monthly or quarterly.
- General news outlets.
- Industry-specific news outlets.
- Social media, which may be a useful gauge of customer sentiment for a company's products.
- Proprietary third-party sources
  - Analyst reports and communications, including from the sell side or analysts and credit rating agencies.
  - Reports and data from platforms such as Bloomberg, Wind, and FactSet.
  - Reports and data from consultancies, often industry-specific sources, such as Rystad in energy, iQvia and Evaluate in biopharma, and Gartner and IDC in information technology industries.
- Proprietary primary research
  - Surveys, conversations, product comparisons, and other studies commissioned by the analyst or conducted directly.

Information on the economy, industry, and peer companies is useful in putting the company's financial performance and position in perspective and in assessing the company's future. In most cases, information from sources apart from the company is crucial to an analyst's effectiveness. For example, an analyst studying a consumer-oriented company will typically seek direct experience with the products (taste the food or drink, use the shampoo or soap, visit the stores or hotels). An analyst following a highly regulated industry will study the existing and expected relevant regulations. An analyst following a highly technical industry will gain relevant expertise personally or seek input from a technical specialist.

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## PRACTICE PROBLEMS

1. Ratios are an input into which step in the financial statement analysis framework?
  - A. Process data
  - B. Collect input data
  - C. Analyze/interpret the processed data
2. Which phase in the financial statement analysis framework is *most likely* to involve producing updated reports and recommendations?
  - A. Follow-up
  - B. Analyze/interpret the processed data
  - C. Develop and communicate conclusions and recommendations
3. Which of the following *best* describes the role of financial statement analysis?
  - A. To provide information about a company's performance
  - B. To provide information about a company's changes in financial position
  - C. To form expectations about a company's future performance and financial position
4. The primary role of financial statement analysis is *best* described as:
  - A. providing information useful for making investment decisions.
  - B. evaluating a company for the purpose of making economic decisions.
  - C. using financial reports prepared by analysts to make economic decisions.
5. International Financial Reporting Standards are currently developed by which entity?
  - A. IFRS Foundation
  - B. International Accounting Standards Board
  - C. International Organization of Securities Commissions
6. US GAAP are currently developed by which entity?
  - A. Securities and Exchange Commission
  - B. Financial Accounting Standards Board
  - C. Public Company Accounting Oversight Board
7. A core objective of the International Organization of Securities Commissions is to:
  - A. eliminate systemic risk.
  - B. protect users of financial statements.

- C. ensure that markets are fair, efficient, and transparent.
8. Which of the following *best* describes why the notes that accompany the financial statements are required? The notes:
- A. permit flexibility in statement preparation.
  - B. standardize financial reporting across companies.
  - C. provide information necessary to understand the financial statements.
9. Accounting policies, methods, and estimates used in preparing financial statements are *most likely* to be found in the:
- A. auditor's report.
  - B. management commentary.
  - C. notes to the financial statements.
10. Information about management and director compensation is *most likely* to be found in the:
- A. auditor's report.
  - B. proxy statement.
  - C. earnings release.
11. Information about a company's objectives, strategies, and significant risks are *most likely* to be found in the:
- A. auditor's report.
  - B. management commentary.
  - C. notes to the financial statements.
12. What type of audit opinion is preferred when analyzing financial statements?
- A. Adverse
  - B. Qualified
  - C. Unqualified
13. An auditor determines that a company's financial statements are prepared in accordance with applicable accounting standards except with respect to inventory reporting. This exception is *most likely* to result in an audit opinion that is:
- A. adverse.
  - B. qualified.
  - C. unqualified.
14. An independent audit report is *most likely* to provide:
- A. absolute assurance about the accuracy of the financial statements.
  - B. reasonable assurance that the financial statements are fairly presented.

- C. a qualified opinion with respect to the transparency of the financial statements.
15. Interim financial reports released by a company are *most likely* to be:
- A. monthly.
  - B. unaudited.
  - C. unqualified.
16. Which of the following sources of information used by analysts is found outside a company's annual report?
- A. Auditor's report
  - B. Peer company analysis
  - C. Management discussion and analysis

## SOLUTIONS

1. C is correct. Ratios are an output of the process information step but are an input into the analyze/interpret data step.
2. A is correct. The follow-up phase involves gathering information and repeating the analysis to determine whether it is necessary to update reports and recommendations.
3. C is correct. In general, analysts seek to examine the past and current performance and financial position of a company to form expectations about its future performance and financial position.
4. B is correct. The primary role of financial statement analysis is to use financial reports prepared by companies to evaluate their past, current, and potential performance and financial position for the purpose of making investment, credit, and other economic decisions.
5. B is correct. The International Accounting Standards Board (IASB) is currently charged with developing International Financial Reporting Standards.
6. B is correct. US Generally Accepted Accounting Principles are developed by the US Financial Accounting Standards Board (FASB).
7. C is correct. A core objective of IOSCO is to ensure that markets are fair, efficient, and transparent. The other core objectives are to reduce, not eliminate, systemic risk and to protect investors, not all users of financial statements.
8. C is correct. The notes provide information that is essential to understanding the information provided in the primary statements.
9. C is correct. The notes disclose choices in accounting policies, methods, and estimates.
10. B is correct. Disclosure of management compensation is typically included in the proxy statement. An earnings release is about corporate earnings, not what managers earn as compensation.
11. B is correct. These are components of management commentary.
12. C is correct. An unqualified opinion is a “clean” opinion and indicates that the financial statements present the company’s performance and financial position fairly in accordance with applicable accounting standards.
13. B is correct. A qualified audit opinion is one in which there is some scope limitation or exception to accounting standards. Exceptions are described in the audit report with additional explanatory paragraphs so that the analyst can determine the importance of the exception.
14. B is correct. The independent audit report provides reasonable assurance that the financial statements are fairly presented, meaning that there is a high probability that the audited financial statements are free from material error, fraud, or illegal acts that have a direct effect on the financial statements.
15. B is correct. Interim reports are typically provided semiannually or quarterly and require certain financial information, including unaudited financial statements

and an MD&A for the interim period covered by the report. Unqualified refers to a type of audit opinion.

16. B is correct. When performing financial statement analysis, analysts should review all company sources of information as well as information from external sources regarding the economy, the industry, the company, and peer (comparable) companies.



## LEARNING MODULE

# 2

### Analyzing Income Statements

by Elaine Henry, PhD, CFA, and Thomas R. Robinson, PhD, CAIA, CFA.

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#### LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	describe general principles of revenue recognition, specific revenue recognition applications, and implications of revenue recognition choices for financial analysis
<input type="checkbox"/>	describe general principles of expense recognition, specific expense recognition applications, implications of expense recognition choices for financial analysis and contrast costs that are capitalized versus those that are expensed in the period in which they are incurred
<input type="checkbox"/>	describe the financial reporting treatment and analysis of non-recurring items (including discontinued operations, unusual or infrequent items) and changes in accounting policies
<input type="checkbox"/>	describe how earnings per share is calculated and calculate and interpret a company's basic and diluted earnings per share for companies with simple and complex capital structures including those with antidilutive securities
<input type="checkbox"/>	evaluate a company's financial performance using common-size income statements and financial ratios based on the income statement

The two major accounting standard setters are as follows: 1) the International Accounting Standards Board (IASB) who establishes International Financial Reporting Standards (IFRS) and 2) the Financial Accounting Standards Board (FASB) who establishes US GAAP. Throughout this learning module both standards are referred to and many, but not all, of these two sets of accounting rules are identified. Note: changes in accounting standards as well as new rulings and/or pronouncements issued after the publication of this learning module may cause some of the information to become dated.

## 1

## INTRODUCTION

Income statements and analytical measures derived from them, such as sales growth, operating margin, and earnings per share (EPS), are critical for equity and credit analysis. Investors analyze income statements to evaluate companies' growth, profitability, and risks, and often use income statement figures in valuation. Corporate financial announcements frequently emphasize information reported in income statements, particularly earnings, more than information reported in the other financial statements.

### LEARNING MODULE OVERVIEW



- Revenue is recognized in the period it is earned, which may or may not be in the same period as the related cash collection.
- An analyst should identify differences in companies' revenue recognition methods and adjust reported revenue where possible to facilitate comparability. In cases in which the available information does not permit adjustment, an analyst can characterize the revenue recognition as more or less conservative and thus qualitatively assess how differences in policies might affect financial ratios and judgments about profitability.
- As of the beginning of 2018, revenue recognition standards have converged across US GAAP and International Financial Reporting Standards (IFRS). The core principle of the converged standards is that revenue should be recognized to "depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in an exchange for those goods or services."
- To achieve the core principle, the standard describes the application of five steps in recognizing revenue. The standard also specifies the treatment of some related contract costs and disclosure requirements.
- The general principles of expense recognition include a process to match expenses to revenue (e.g., cost of goods sold), to the period in which the expenditure occurs (e.g., administrative costs), or to the period of expected benefits of the expenditures (e.g., depreciation and amortization).
- In expense recognition, choice of method (i.e., depreciation method and inventory cost method), as well as estimates (i.e., uncollectible accounts, warranty expenses, assets' useful life, and salvage value) affect a company's reported income. An analyst should identify differences in companies' expense recognition methods and adjust reported financial statements where possible to facilitate comparability. In cases in which the available information does not permit adjustment, an analyst can characterize the policies and estimates as more or less conservative and thus qualitatively assess how differences in policies might affect financial ratios and judgments about companies' performance.
- To assess a company's future earnings, it is helpful to separate those prior years' items of income and expense that are likely to continue in the future from those items that are less likely to continue.

- Under IFRS, a company should present additional line items, headings, and subtotals beyond those specified when such presentation is relevant to an understanding of the entity's financial performance. Some items from prior years clearly are not expected to continue in future periods and are separately disclosed on a company's income statement. Under US GAAP, unusual or infrequently occurring items, which are material, are presented separately within income from continuing operations.
- Non-operating items are reported separately from operating items on the income statement. Under both IFRS and US GAAP, the income statement reports separately the effect of the disposal of a component operation as a "discontinued" operation, net of income taxes.
- Basic EPS is the amount of income available to common shareholders divided by the weighted average number of common shares outstanding over a period. The amount of income available to common shareholders is the amount of net income remaining after preferred dividends (if any) have been paid.
- If a company has a simple capital structure (i.e., one with no potentially dilutive securities), then its basic EPS is equal to its diluted EPS. If, however, a company has dilutive securities, its diluted EPS is no greater than its basic EPS.
- Diluted EPS is calculated using the if-converted method for convertible securities and the treasury stock method for options.
- Common-size analysis of the income statement involves stating each line item on the income statement as a percentage of sales. Common-size statements facilitate comparison across time periods and across companies of different sizes.

## REVENUE RECOGNITION

## 2



describe general principles of revenue recognition, specific revenue recognition applications, and implications of revenue recognition choices for financial analysis

### General Principles

A fundamental principle of accrual accounting is that revenue is recognized (reported on the income statement) when it is earned, so the company's financial records reflect revenue from the sale when the risk and reward of ownership is transferred; this is often when the company delivers the goods or services. If the delivery was on credit, a related asset, such as trade or accounts receivable, is created. Later, when cash changes hands, the company's financial records simply reflect that cash has been received to settle an account receivable. Similarly, in some situations, a company receives cash in advance and but delivers the product or service later, perhaps over a period of time. In this case, the company would record a liability for **unearned revenue**, or deferred

revenue, when the cash is initially received, and revenue would be recognized over time as products and services are delivered. An example would be a subscription payment received in advance for cloud-based software delivered over a year.

## Accounting Standards for Revenue Recognition

The converged accounting standards issued by the IASB and FASB in May 2014 introduced some changes to the basic principles of revenue recognition. The content of the two standards is nearly identical, and this discussion pertains to both, unless specified otherwise. The converged standard aims to provide a principles-based approach to revenue recognition that can be applied to many types of revenue-generating activities.

The core principle of the converged standard is that revenue should be recognized to “depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in an exchange for those goods or services.” To achieve the core principle, the standard describes the application of the following five steps in recognizing revenue:

1. identify the contract(s) with a customer,
2. identify the separate or distinct performance obligations in the contract,
3. determine the transaction price,
4. allocate the transaction price to the performance obligations in the contract, and
5. recognize revenue when (or as) the entity satisfies a performance obligation.

According to the standard, a contract is an agreement and commitment with commercial substance between the contacting parties. It establishes each party's *obligations* and *rights*, including payment terms. In addition, a contract exists only if collectability is probable. Each standard uses the same wording, but the threshold for probable collectability differs. Under IFRS, probable means more likely than not, and under US GAAP, it means likely to occur. As a result, economically similar contracts may be treated differently under IFRS and US GAAP.

The performance obligations within a contract represent promises to transfer distinct good(s) or service(s). A good or service is distinct if the customer can benefit from it on its own or in combination with readily available resources and if the promise to transfer it can be separated from other promises in the contract. Each identified performance obligation is accounted for separately.

The transaction price is what the seller estimates will be received in exchange for transferring the good(s) or service(s) identified in the contract. The transaction price is then allocated to each identified performance obligation. Revenue is recognized when a performance obligation is fulfilled. Steps three and four address amounts, and step five addresses timing of recognition. The amounts recognized reflect expectations about collectability and (if applicable) an allocation to multiple obligations within the same contract.

Revenue should be recognized only when it is highly probable that it will not be subsequently reversed. If it is likely to be reversed, the seller will record a minimal amount of revenue upon sale and recognize a refund liability and “right to returned goods” asset on the balance sheet based on the carrying amount of inventory less costs of recovery.

The entity will recognize revenue when it is able to satisfy the performance obligation by transferring control of the good or service to the customer. Factors to consider when assessing whether the customer has obtained control of include the following:

- entity has a present right to payment,
- customer has legal title

- customer has physical possession,
- customer has the significant risks and rewards of ownership, and
- customer has accepted the good or service.

For a simple contract with only one deliverable at a single point in time, completing these five steps is straight-forward. For more complex contracts—such as when the performance obligations are satisfied over time, when the terms of the multiperiod contracts change, or when the performance obligation includes various components of goods and services—accounting choices are less obvious. The steps in the standards are intended to provide guidance that can be generalized to most situations.

If the performance obligation is satisfied at the end of these five steps, and there is no contingency regarding payment, then revenue and accounts receivable are recognized. In cases in which revenue is recognized but the payment by the customer is conditional on some other future performance, a contract asset is initially presented on the balance sheet, until performance obligations are met, and a receivable can be recognized. If consideration is received in advance of transferring good(s) or service(s), the seller records a contract liability.

As an analyst, you will encounter many companies with complex revenue recognition policies, reflecting the diversity of business models in practice. Several examples adapted from real companies are discussed in Example 1.

#### EXAMPLE 1

### Applying the Converged Revenue Recognition Standards

#### Principal Versus Agent

MegaDigital is an online marketplace that sells goods and delivers them quickly to customers. For some sales, MegaDigital acts as a principal in which it controls the product before the goods are transferred to the customer. In other sales, MegaDigital acts as an agent in which it arranges for the transfer of a product controlled by a third-party seller. In transactions in which MegaDigital is the principal, revenue is recorded as the total amount of considerations received for the transfer of the product. In transactions in which MegaDigital is the agent, it records revenue only for the portion of the considerations, which amounts to its fee or commission. This can have a significant impact on common size and ratio analysis. Revenue is lower but profit margins are higher for sales for which MegaDigital is an agent.

Assume MegaDigital sells a particular product as a principal for USD100 that it purchased for USD70. Additionally, there are USD10 of other selling, general, and administrative costs. The margins would be:

Sales	USD100	100 percent
Cost of Sales	70	70 percent
Gross Profit	30	30 percent
SG&A	10	10 percent
Net Profit	20	20 percent

If MegaDigital acts an agent for the same item with the same retail price, MegaDigital would receive a commission of USD30 and still incurs USD10 of other costs. Margins would be:

Sales	USD30	100 percent
Cost of Sales	0	0 percent
Gross Profit	30	100 percent
SG&A	10	33 percent
Net Profit	20	67 percent

For companies selling both as a principal and agent, such as many e-commerce companies, an analyst would need to evaluate the relative proportion of principal versus agent sales to evaluate and forecast overall margins. This is especially important if the mix of principal and agent sales is expected to change.

### Franchising/Licensing

Mahjong Pizza both operates and franchises pizza delivery restaurants around the world. Revenue recognition standards require that the company disaggregate revenue from contracts with customers into categories that depict how the nature, amount, timing, and uncertainty of revenue and cash flows are affected by economic factors. Companies must present revenues disaggregated in consolidated statements of income to satisfy this requirement. Mahjong Pizza presents the following disaggregated revenue items:

- company-owned stores revenues,
- franchise royalties and fees, and
- supply chain revenues.

Company-owned stores revenues are of retail sales of food at stores that Mahjong owns and operates.

Franchise royalties and fees are comprised of fees from third-party franchisees that are licensed to operate Mahjong restaurants. Each franchisee is generally required to pay fees equal to 5.5 percent of restaurant sales. The company recognizes the royalty fee as revenue, not the total sales of the franchisees' restaurants. Upfront fees for opening new units are initially recognized as deferred revenue and subsequently amortized to revenue on a straight-line basis over the term of each respective franchise agreement, typically 10 years.

Supply chain revenues are primarily composed of sales of food, equipment, and supplies to franchisees. Revenues are recognized upon delivery or shipment of the related products to franchisees, based on shipping terms.

### Software as a Service or License

CReaM Software and Services is a technology company providing customer relationship management software and services to business, government and not-for-profit organizations. Organizations may purchase a software license and install it on their own systems. Alternatively, they may subscribe to CReaM's cloud services platform through which they can access CReaM's software over the internet for a monthly subscription fee.

Under IFRS 15, if a company provides a license to use software where the company will take possession of the software for installation on their own system, the company will report revenue either over the term of the license or at the time of the transfer of the license. Companies should report the revenue from the license over the term of the license, if under the contract or the company's normal business activities:

- the software provider will continue to undertake activities that significantly affect the software (e.g., upgrades/enhancements).

- the rights expose the customer to positive or negative impacts from those activities, and
- the activities do not result in a transfer of goods or services.

If these criteria are not met, then the revenue is recognized when the license is transferred to the customer. CReaM's annual report footnotes state:

Software revenues include revenues associated with term and perpetual software licenses that provide the customer with a right to use the software as it exists when made available. Revenues from term and perpetual software licenses are generally recognized at the point in time when the software is made available to the customer. Revenue from software support and updates is recognized as the support and updates are provided, which is generally ratably over the contract term.

Under the terms of CReaM's license, the software is sold "as is" and revenue is recognized at the time of the license transfer. CReaM, however, also provides a support contract for updates for which revenue is recognized over the contract term.

CReaM's cloud clients have access to constantly updated software. CReaM reports:

Cloud services allow customers to use the Company's software without taking possession of the software. Revenue is generally recognized over the contract term. Substantially all of the Company's subscription service arrangements are non-cancelable and do not contain refund-type provisions.

In the case of CReaM, an analyst must understand the composition of revenue between licensed software in which case revenue is recognized upfront versus software as a service in which case revenue is recognized over time.

### Long-Term Contracts

Armored Vehicles Inc. (AVI) manufactures weapons systems and vehicles for military customers. The company enters long-term contracts that generally extend over several years. Performance on the contracts is satisfied over time. Under IFRS 15, a performance obligation is satisfied over time if one of the following criteria is met:

- The customer simultaneously receives and consumes the benefits provided by the entity's performance as the entity performs (e.g., routine service contracts).
- The entity's performance creates or enhances an asset that the customer controls as the asset is created or enhanced (e.g., refurbishment of a factory owned and controlled by the customer or building a road for a governmental agency).
- The entity's performance does not create an asset with alternative use to the entity and the entity has an enforceable right to payment for performance completed to date (e.g., construction of a large unique asset that may not be able to be sold to another customer such as a weapons system).

AVI recognizes long-term contract revenue over the contract term as the work progresses, either as products are produced or as services are rendered because of the continuous transfer of control to the customer. For its military contracts, this continuous transfer of control to the customer is supported by

clauses in the contract that allow the customer to unilaterally terminate the contract for convenience, pay for costs incurred plus a reasonable profit, and take control of any work in process.

Under IFRS 15, the extent of progress towards completion may be measured by output methods (e.g., appraisals or units completed) or input methods (e.g., costs incurred relative to estimated total costs). AVI reports that its accounting for long-term contracts involves a judgmental process of estimating total sales, costs and profit for each performance obligation. Cost of sales is recognized as incurred. The amount reported as revenues is determined by adding a proportionate amount of the estimated profit to the amount reported as cost of sales. Recognizing revenue as costs are incurred provides an objective measure of progress on the long-term contract and thereby best depicts the extent of transfer of control to the customer.

As an example, AVI has a contract to produce a weapons system for a total price of USD10 million. The expected total costs to produce the system is USD7 million and the estimated profit is USD3 million. The system will take two years to produce. In Year 1 of the contract, AVI incurs USD4.2 million of costs representing 60 percent of total estimated costs. AVI would recognize revenue of USD6 million and profit of USD1.8 million in Year 1 (both 60 percent of expected revenue and profits).

If in Year 2, the system is completed with actual total cumulative costs of USD7.5 million, the company would report revenue of USD4 million and costs of USD3.3 million for a Year 2 profit of USD0.7 million and cumulative profit of USD2.5 million.

### Bill and Hold Arrangements

In addition to the long-term contracts discussed previously, AVI produces custom armored vehicles that some customers may not be able to take possession of immediately (because, for example, a lack of storage space). IFRS 15 provides that in such a “bill and hold” arrangement AVI can determine when it has satisfied its performance obligation based on when a customer obtains control of the product. Under IFRS 15, this is when all the following criteria are met:

- The reason for the bill and hold arrangement must be substantive (e.g., the customer has requested the arrangement).
- The product must be identified separately as belonging to the customer.
- The product currently must be ready for physical transfer to the customer.
- The entity cannot have the ability to use the product or to direct it to another customer.

In AVI’s case, each vehicle is identified by a unique vehicle identification number and upon completion, title and risk of loss has passed to the customer. AVI recognizes revenue when the product is ready for delivery to the customer but is directed by the customer to hold delivery.

The disclosure requirements under IFRS 15 are quite extensive to provide sufficient information to financial statement users on the nature, amount, and timing of cash flows from customers. Companies are required to disclose revenue from contracts with customers disaggregated into different categories of contracts. The categories might be based on the type of product, the geographic region, the type of customer or sales channel, the type of contract pricing terms, the contract duration, or the timing of transfer of control. Companies are also required to disclose balances of any contract-related



assets and liabilities and significant changes in those balances, remaining performance obligations and transaction price allocated to those obligations, and any significant judgments and changes in judgments related to revenue recognition. These disclosures are typically provided in a note to the financial statements titled “Revenue” or similar.

## EXPENSE RECOGNITION

# 3

- ☐ describe general principles of expense recognition, specific expense recognition applications, implications of expense recognition choices for financial analysis and contrast costs that are capitalized versus those that are expensed in the period in which they are incurred

Assume a company purchased inventory for cash and sold the entire inventory in the same period. When the company paid for the inventory, absent indications to the contrary, it is clear that inventory cost was incurred and when that inventory is sold, it should be recognized as an expense (cost of goods sold). Assume also that the company paid all operating and administrative expenses in cash within each accounting period. In such a simple hypothetical scenario, no issues of expense recognition would arise. In practice, however, as with revenue recognition, determining when expenses should be recognized can be somewhat more complex.

### General Principles

In general, a company recognizes expenses in the period that it consumes (i.e., uses up) the economic benefits associated with the expenditure, or loses some previously recognized economic benefit. The three common expense recognition models are as follows: the matching principle, expensing as incurred, and capitalization with subsequent depreciation or amortization.

Under matching, a company recognizes expenses (e.g., cost of goods sold) when associated revenues are recognized, and thus, expenses and revenues are matched. Associated revenues and expenses are those that result directly and jointly from the same transactions or events. Unlike the simple scenario in which a company purchases inventory and sells all of the inventory within the same accounting period, in practice, it is more likely that some of the current period's sales are made from inventory purchased in a previous period or previous periods. It is also likely that some of the inventory purchased in the current period will remain unsold at the end of the current period and so will be sold in a following period. Matching requires that a company recognizes cost of goods sold in the same period as revenues from the sale of the goods. Strictly speaking, IFRS do not refer to a “matching principle” but rather to a “matching concept” or to a process resulting in “matching of costs with revenues.”

Example 2 demonstrate matching applied to inventory and cost of goods sold.

#### EXAMPLE 2

#### The Matching of Inventory Costs with Revenues

Kahn Distribution Limited (KDL), a hypothetical company, purchases inventory items for resale. At the beginning of 20X1, Kahn had no inventory on hand. During 20X1, KDL had the following transactions:

### Inventory Purchases

First quarter	2,000	units at USD40 per unit
Second quarter	1,500	units at USD41 per unit
Third quarter	2,200	units at USD43 per unit
Fourth quarter	1,900	units at USD45 per unit
Total	7,600	units at a total cost of USD321,600

KDL sold 5,600 units of inventory during the year at USD50 per unit and received cash. KDL determines that there were 2,000 remaining units of inventory and specifically identifies that 1,900 were those purchased in the fourth quarter and 100 were purchased in the third quarter.

1. What are the revenue and expense associated with these transactions during 20X1 based on specific identification of inventory items as sold or remaining in inventory? (Assume that the company does not expect any products to be returned.)

#### Solution:

The revenue for 20X1 would be USD280,000 (5,600 units × USD50 per unit). Initially, the total cost of the goods purchased would be recorded as inventory (an asset) in the amount of USD321,600. During 20X1, the cost of the 5,600 units sold would be expensed (matched against the revenue) while the cost of the 2,000 remaining unsold units would remain in inventory as follows:

### Cost of Goods Sold

From the first quarter	2,000 units at USD40 per unit =	USD80,000
From the second quarter	1,500 units at USD41 per unit =	USD61,500
From the third quarter	2,100 units at USD43 per unit =	USD90,300
Total cost of goods sold		USD231,800

### Cost of Goods Remaining in Inventory

From the third quarter	100 units at USD43 per unit =	USD4,300
From the fourth quarter	1,900 units at USD45 per unit =	USD85,500
Total remaining (or ending) inventory cost		USD89,800

To confirm that total costs are accounted for: USD231,800 + USD89,800 = USD321,600. The cost of the goods sold would be expensed against the revenue of USD280,000 as follows:

Revenue	USD280,000
Cost of Goods Sold	231,800
Gross Profit	48,200

An alternative way to think about this is that the company created an asset (inventory) of USD321,600 as it made its purchases. At the end of the period, the value of the company's inventory on hand is USD89,800. Therefore, the amount of the Cost of goods sold expense recognized for the period should be the difference: USD231,800.

The remaining inventory amount of USD89,800 will be matched against revenue in a future year when the inventory items are sold.

**Period costs**, expenditures that less directly match revenues, are generally expensed as incurred (i.e., either when the company makes the expenditure in cash or incurs the liability to pay). Costs associated with administrative, managerial, information technology (IT), and research and development activities as well as the maintenance or repair of assets generally fit this model. For most companies, payroll expenses are accounted for this way, excluding employees whose compensation is considered a product cost and recognized as inventory and later cost of goods sold or items like sales commissions, which are capitalized and expensed systematically or with sales.

## Capitalization versus Expensing

Finally, certain expenditures are capitalized as assets on the balance sheet and typically appear as an investing cash outflow on the statement of cash flows. After initial recognition, a company expenses the capitalized amount over the asset's useful life as depreciation or amortization expense (except assets that are not depreciated, i.e., land, or amortized, e.g., intangible assets with indefinite lives). This expense reduces net income on the income statement and reduces the value of the asset on the balance sheet. Depreciation and amortization are non-cash expenses and therefore, apart from their effect on taxable income and taxes payable, they have no impact on the cash flow statement.

This model is a form of the matching principle, whereby expenses are recognized on the income statement over the expected useful life of the investment, so the costs and benefits are “matched.” Example 3 illustrates the impact on the financial statements of capitalizing versus expensing an expenditure.

### EXAMPLE 3

#### General Financial Statement Impact of Capitalizing versus Expensing

Assume two identical (hypothetical) companies, CAP Inc. (CAP) and NOW Inc. (NOW), start with EUR1,000 cash and EUR1,000 common stock. Each year the companies recognize total revenues of EUR1,500 cash and make cash expenditures, excluding an equipment purchase, of EUR500. At the beginning of operations, each company pays EUR900 to purchase equipment. CAP estimates the equipment will have a useful life of three years and an estimated salvage value of EUR0 at the end of the three years. NOW estimates a much shorter useful life and expenses the equipment immediately. The companies have no other assets and make no other asset purchases during the three-year period. Assume the companies pay no dividends, earn zero interest on cash balances, have a tax rate of 30 percent, and use the same accounting method for financial and tax purposes.

The left side of Exhibit 1 shows CAP's financial statements—that is, with the expenditure capitalized and depreciated at EUR300 per year based on the straight-line method of depreciation (EUR900 cost minus EUR0 salvage value equals EUR900, divided by a three-year life equals EUR300 per year). The right side of the exhibit shows NOW's financial statements, with the entire EUR900 expenditure treated as an expense in the first year. All amounts are in euro.

**Exhibit 1: Capitalizing versus Expensing**

CAP Inc.				NOW Inc.			
Capitalize EUR900 as Asset and Depreciate				Expense EUR900 Immediately			
For Year	1	2	3	For Year	1	2	3
Revenue	1,500	1,500	1,500	Revenue	1,500	1,500	1,500
Cash Expenses	500	500	500	Cash expenses	1,400	500	500
Depreciation	300	300	300	Depreciation	0	0	0
Income before Tax	700	700	700	Income before Tax	100	1,000	1,000
Tax at 30%	210	210	210	Tax at 30%	30	300	300
Net Income	490	490	490	Net Income	70	700	700
Cash from Operations	790	790	790	Cash from Operations	70	700	700
Cash Used in Investing	(900)	0	0	Cash Used in Investing	0	0	0
Total Change in Cash	(110)	790	790	Total Change in Cash	70	700	700

As of	Time 0	End of Year 1	End of Year 2	End of Year 3	Time	Time 0	End of Year 1	End of Year 2	End of Year 3
Cash	1,000	890	1,680	2,470	Cash	1,000	1,070	1,770	2,470
PP&E (net)	—	600	300	—	PP & E (net)	—	—	—	—
Total Assets	1,000	1,490	1,980	2,470	Total Assets	1,000	1,070	1,770	2,470
Retained Earnings	0	490	980	1,470	Retained Earnings	0	70	770	1,470
Common Stock	1,000	1,000	1,000	1,000	Common Stock	1,000	1,000	1,000	1,000
Total Shareholders' Equity	1,000	1,490	1,980	2,470	Total Shareholders' Equity	1,000	1,070	1,770	2,470

1. Which company reports higher net income over the three years? Total cash flow? Cash from operations?

**Solution:**

Neither company reports higher total net income or cash flow over the three years. The sum of net income over the three years is identical (EUR1,470 total) whether the EUR900 is capitalized or expensed. Also, the sum of the change in cash (EUR1,470 total) is identical under either scenario. CAP reports higher cash from operations by an amount of EUR900 because, under the capitalization scenario, the EUR900 purchase is treated as an investing cash flow.

*Note:* Because the companies use the same accounting method for both financial and taxable income, absent the assumption of zero interest on cash balances, expensing the EUR900 would have resulted in higher income and cash flow for NOW because the lower taxes paid in the first year (EUR30 versus EUR210) would have allowed NOW to earn interest income on the tax savings.

2. Based on ROE and net profit margin, how does the profitability of the two companies compare?

**Solution:**

In general, Ending shareholders' equity = Beginning shareholders' equity + Net income + Other comprehensive income – Dividends + Net capital contributions from shareholders. Because the companies in this example do not have other comprehensive income, did not pay dividends, and reported no capital contributions from shareholders, Ending retained earnings = Beginning retained earnings + Net income, and Ending shareholders' equity = Beginning shareholders' equity + Net income.

ROE is calculated as Net income divided by Average shareholders' equity, and Net profit margin is calculated as Net income divided by Total revenue. For example, CAP had Year 1 ROE of 39 percent ( $\text{EUR}490 / [(\text{EUR}1,000 + \text{EUR}1,490) / 2]$ ), and Year 1 net profit margin of 33 percent ( $\text{EUR}490 / \text{EUR}1,500$ ).

CAP Inc.				NOW Inc.			
Capitalize EUR900 as Asset and Depreciate				Expense EUR900 Immediately			
For Year	1	2	3	For Year	1	2	3
ROE	39%	28%	22%	ROE	7%	49%	33%
Net Profit Margin	33%	33%	33%	Net Profit Margin	5%	47%	47%

As shown, compared to expensing, capitalizing results in higher profitability ratios (ROE and net profit margin) in the first year, and lower profitability ratios in subsequent years. For example, CAP's Year 1 ROE of 39 percent was higher than NOW's Year 1 ROE of 7 percent, but in Years 2 and 3, NOW reports superior profitability.

Note also that NOW's superior growth in net income between Year 1 and Year 2 is not attributable to superior performance compared to CAP but rather to the accounting decision to recognize the expense sooner than CAP. In general, all else equal, accounting decisions that result in recognizing expenses sooner will give the appearance of greater subsequent growth. Comparison of the growth of the two companies' net incomes without an awareness of the difference in accounting methods would be misleading. As a corollary, NOW's income and profitability exhibit greater volatility across the three years, not because of more volatile performance but rather because of the different accounting decision.

3. Why does NOW report change in cash of EUR70 in Year 1, while CAP reports total change in cash of (EUR110)?

**Solution:**

NOW reports an increase in cash of EUR70 in Year 1, while CAP reports a decrease in cash of EUR110 because NOW's taxes were EUR180 lower than CAP's taxes (EUR30 versus EUR210).

*Note* that this problem assumes the accounting method used by each company for its tax purposes is identical to the accounting method used by the company for its financial reporting. In many countries, companies are allowed to use different depreciation methods for financial reporting and taxes, which may give rise to deferred taxes.

As shown, discretion regarding whether to expense or capitalize expenditures can impede comparability across companies. Example 4 assumes the companies purchase a single asset in one year. Because the sum of net income over the three-year period is identical whether the asset is capitalized or expensed, it illustrates that although capitalizing results in higher profitability compared with expensing in the first year, it results in lower profitability in the subsequent years. Conversely, expensing results in lower profitability in the first year but higher profitability in later years, indicating a favorable trend.

Similarly, shareholders' equity for a company that capitalizes the expenditure will be higher in the early years because the initially higher profits result in initially higher retained earnings. Example 4 assumes the companies purchase a single asset in one year and report identical amounts of total net income over the three-year period, so shareholders' equity (and retained earnings) for the firm that expenses will be identical to shareholders' equity (and retained earnings) for the capitalizing firm at the end of the three-year period.

Although Example 3 shows companies purchasing an asset only in the first year, if a company continues to purchase similar or increasing amounts of assets each year, the profitability-enhancing effect of capitalizing continues if the amount of the expenditures in a period continues to be more than the depreciation expense. Example 4 illustrates this point.

#### EXAMPLE 4

##### Impact of Capitalizing versus Expensing for Ongoing Purchases

A company buys a GBP300 computer in Year 1 and capitalizes the expenditure. The computer has a useful life of three years and an expected salvage value of GBP0, so the annual depreciation expense using the straight-line method is GBP100 per year. Compared with expensing the entire GBP300 immediately, the company's pre-tax profit in Year 1 is GBP200 greater.

1. Assume that the company continues to buy an identical computer each year at the same price. If the company uses the same accounting treatment for each of the computers, when does the profit-enhancing effect of capitalizing versus expensing end?

##### **Solution:**

The profit-enhancing effect of capitalizing versus expensing would end in Year 3. In Year 3, the depreciation expense on each of the three computers bought in Years 1, 2, and 3 would total GBP300 (GBP100 + GBP100 + GBP100). Therefore, the total depreciation expense for Year 3 will be exactly equal to the capital expenditure in Year 3. The expense in Year 3 would be GBP300, regardless of whether the company capitalized or expensed the annual computer purchases.

2. If the company buys another identical computer in Year 4, using the same accounting treatment as the prior years, what is the effect on Year 4 profits of capitalizing versus expensing these expenditures?

##### **Solution:**

There is no impact on Year 4 profits. As in the previous year, the depreciation expense on each of the three computers bought in Years 2, 3, and 4 would total GBP300 (GBP100 + GBP100 + GBP100). Therefore, the total de-

preciation expense in Year 4 will be exactly equal to the capital expenditure.



in Year 4. Pre-tax profits would be reduced by GBP300, regardless of whether the company capitalized or expensed the annual computer purchases.

Compared with expensing an expenditure, capitalizing the expenditure typically results in greater amounts reported as cash from operations. Analysts should be alert to evidence of companies manipulating reported cash flow from operations by capitalizing expenditures that should be expensed.

In summary, holding all else constant, capitalizing an expenditure enhances current profitability and increases reported cash flow from operations. The profitability-enhancing effect of capitalizing continues so long as capital expenditures exceed the depreciation expense. Profitability-enhancing motivations for decisions to capitalize should be considered when analyzing performance. For example, a company may choose to capitalize more expenditures (within the allowable bounds of accounting standards) to achieve earnings targets for a given period. Expensing a cost in the period reduces current period profits but enhances future profitability and thus enhances the profit trend. Profit trend-enhancing motivations should also be considered when analyzing performance. If the company is in a reporting environment that requires identical accounting methods for financial reporting and taxes (unlike the United States, which permits companies to use depreciation methods for reporting purposes that differ from the depreciation method required by tax purposes), then expensing will have a more favorable cash flow impact because paying lower taxes in an earlier period creates an opportunity to earn interest income on the cash saved.

In contrast with these relatively simple examples, it is generally neither possible nor desirable to identify individual instances involving discretion about whether to capitalize or expense expenditures. An analyst can, however, typically identify significant items of expenditure treated differently across companies. The items of expenditure giving rise to the most relevant differences across companies will vary by industry. This cross-industry variation is apparent in the following discussion of the capitalization of expenditures.

#### CAPITALIZATION VERSUS EXPENSING



1. All else equal, in the fiscal year when long-lived equipment is purchased:

- A. depreciation expense increases.
- B. cash from operations decreases.
- C. net income is reduced by the amount of the purchase.

**Solution:**

A is correct. In the fiscal year when long-lived equipment is purchased, the assets on the balance sheet increase and depreciation expense on the income statement increases because of the new long-lived asset.

2. Companies X and Z have the same beginning-of-the-year book value of equity and the same tax rate. The companies have identical transactions throughout the year and report all transactions similarly except for one. Both companies acquire a GBP300,000 printer with a three-year useful life and a salvage value of GBP0 on 1 January of the new year. Company X capitalizes the printer and depreciates it on a straight-line basis, and Company

Z expenses the printer. The year-end information in Exhibit 2 is gathered for Company X.

#### Exhibit 2: Company X Year-End Information

Company X as of 31 December	
Ending Shareholders' Equity	GBP10,000,000
Tax Rate	25%
Dividends	GBP0.00
Net Income	GBP750,000

Based on the information in Exhibit 2, Company Z's return on equity using year-end equity will be *closest* to:

- A. 5.4 percent.
- B. 6.1 percent.
- C. 7.5 percent.

**Solution:**

B is correct. Company Z's return on equity based on year-end equity value will be 6.1 percent. Company Z will have an additional GBP200,000 of expenses compared with Company X. Company Z expensed the printer for GBP300,000 rather than capitalizing the printer and having a depreciation expense of GBP100,000 like Company X. Company Z's net income and shareholders' equity will be GBP150,000 lower ( $= \text{GBP}200,000 \times 0.75$ ) than that of Company X.

$$\begin{aligned}\text{ROE} &= \left( \frac{\text{Net income}}{\text{Shareholders' Equity}} \right) \\ &= \text{GBP}600,000 / \text{GBP}9,850,000 \\ &= 0.061 = 6.1\%.\end{aligned}$$

The following information relates to questions 3-6.

Melanie Hart, CFA, is a transportation analyst. Hart has been asked to write a research report on Altai Mountain Rail Company (AMRC). Like other companies in the railroad industry, AMRC's operations are capital intensive, with significant investments in such long-lived tangible assets as property, plant, and equipment. In November 2008, AMRC's board of directors hired a new team to manage the company. In reviewing the company's 2009 annual report, Hart is concerned about some of the accounting choices that the new management has made. These choices differ from those of the previous management and from common industry practice. Hart has highlighted the following statements from the company's annual report:

- Statement 1 "In 2009, AMRC spent significant amounts on track replacement and similar improvements. AMRC expensed rather than capitalized a significant proportion of these expenditures."
- Statement 2 "AMRC uses the straight-line method of depreciation for both financial and tax reporting purposes to account for plant and equipment."



Statement 3 “In 2009, AMRC recognized an impairment loss of EUR50 million on a fleet of locomotives. The impairment loss was reported as ‘other income’ in the income statement and reduced the carrying amount of the assets on the balance sheet.”

Exhibit 3 and 4 contain AMRC’s 2009 consolidated income statement and balance sheet. AMRC prepares its financial statements in accordance with International Financial Reporting Standards.

### Exhibit 3: Consolidated Statement of Income

	2009		2008	
For the Years Ended 31 December	Euro Millions	Revenues (%)	Euro Millions	Revenues (%)
Operating revenues	2,600	100.0	2,300	100.0
Operating expenses				
Depreciation	(200)	(7.7)	(190)	(8.3)
Other operating expense	(1,590)	(61.1)	(1,515)	(65.9)
Total operating expenses	(1,790)	(68.8)	(1,705)	(74.2)
Operating income	810	31.2	595	25.8
Other income	(50)	(1.9)	—	0.0
Interest expense	(73)	(2.8)	(69)	(3.0)
Income before taxes	687	26.5	526	22.8
Income taxes	(272)	(10.5)	(198)	(8.6)
Net income	415	16	328	14.2

### Exhibit 4: Consolidated Balance Sheet

As of 31 December	2009		2008	
Assets	Euro Millions	Assets (%)	Euro Millions	
Current assets	500	9.4	450	8.5
Property and equipment:				
Land	700	13.1	700	13.2
Plant and equipment	6,000	112.1	5,800	109.4
Total property and equipment	6,700	125.2	6,500	122.6
Accumulated depreciation	(1,850)	(34.6)	(1,650)	(31.1)
Net property and equipment	4,850	90.6	4,850	91.5
Total assets	5,350	100.0	5,300	100.0
<b>Liabilities and Shareholders' Equity</b>				
Current liabilities	480	9.0	430	8.1
Long-term debt	1,030	19.3	1,080	20.4
Other long-term provisions and liabilities	1,240	23.1	1,440	27.2
Total liabilities	2,750	51.4	2,950	55.7

### Liabilities and Shareholders' Equity

Shareholders' equity				
Common stock and paid-in-surplus	760	14.2	760	14.3
Retained earnings	1,888	35.5	1,600	30.2
Other comprehensive losses	(48)	(0.9)	(10)	(0.2)
Total shareholders' equity	2,600	48.6	2,350	44.3
Total liabilities & shareholders' equity	5,350	100.0	5,300	100.0

3. With respect to Statement 1, which of the following is the *most likely* effect of management's decision to expense rather than capitalize these expenditures?

- A. 2009 net profit margin is higher than if the expenditures had been capitalized.
- B. 2009 total asset turnover is lower than if the expenditures had been capitalized.
- C. Future profit growth will be higher than if the expenditures had been capitalized.

**Solution:**

C is correct. Expensing rather than capitalizing an investment in long-term assets will result in higher expenses and lower net income and net profit margin in the current year. Future years' incomes will not include depreciation expense related to these expenditures. Consequently, year-to-year growth in profitability will be higher. If the expenses had been capitalized, the carrying amount of the assets would have been higher and the 2009 total asset turnover would have been lower.

4. With respect to Statement 2, what would be the *most likely* effect in 2010 if AMRC were to switch to an accelerated depreciation method for both financial and tax reporting?

- A. Net profit margin would increase.
- B. Total asset turnover would decrease.
- C. Cash flow from operating activities would increase.

**Solution:**

C is correct. In 2010, switching to an accelerated depreciation method would increase depreciation expense and decrease income before taxes, taxes payable, and net income. Cash flow from operating activities would increase because of the resulting tax savings.

5. With respect to Statement 3, what is the *most likely* effect of the impairment loss?

- A. Net income in years prior to 2009 was likely understated.
- B. Net profit margins in years after 2009 will likely exceed the 2009 net profit margin.

- C. Cash flow from operating activities in 2009 was likely lower due to the impairment loss.

**Solution:**

B is correct. 2009 net income and net profit margin are lower because of the impairment loss. Consequently, net profit margins in subsequent years are likely to be higher. An impairment loss suggests that insufficient depreciation expense was recognized in prior years, and net income was overstated in prior years. The impairment loss is a non-cash item and will not affect operating cash flows.

6. Based on Exhibit 1 and 2, the *best estimate* of the average remaining useful life of the company's plant and equipment at the end of 2009 is:

- A. 20.75 years.  
B. 24.25 years.  
C. 30.00 years.

**Solution:**

A is correct. The estimated average remaining useful life is 20.75 years.

Estimate of remaining useful life = Net plant and equipment ÷ Annual depreciation expense

Net plant and equipment = Gross P & E – Accumulated depreciation

$$= €6000 - €1850 = €4150$$

Estimate of remaining useful life = Net P & E ÷ Depreciation expense

$$= €4150 \div €200 = 20.75$$

## Capitalization of Interest Costs

Companies generally must capitalize interest costs associated with acquiring or constructing an asset that requires a long period of time to get ready for its intended use.

As a consequence of this accounting treatment, a company's interest costs for a period can appear either on the balance sheet (to the extent they are capitalized) or on the income statement (to the extent they are expensed).

If the interest expenditure is incurred in connection with constructing an asset for the company's own use, the capitalized interest appears on the balance sheet as a part of the relevant long-lived asset. The capitalized interest is expensed over time as the property is depreciated—and is thus part of depreciation expense rather than interest expense. If the interest expenditure is incurred in connection with constructing an asset to sell, for example, by a real estate construction company, the capitalized interest appears on the company's balance sheet as part of inventory. The capitalized interest is then expensed as part of the cost of sales when the asset is sold.

The treatment of capitalized interest poses certain issues that analysts should consider. First, capitalized interest appears as part of investing cash outflows, whereas expensed interest typically reduces operating cash flow. US GAAP-reporting companies are required to categorize interest in operating cash flow, and IFRS-reporting companies can categorize interest in operating, investing, or financing cash flows. Although the treatment is consistent with accounting standards, an analyst may want to examine the impact on reported cash flows. Second, interest coverage ratios are solvency indicators measuring the extent to which a company's earnings (or cash flow) in a period covered its interest costs. To provide a true picture of a company's interest coverage, the entire amount of interest expenditure, both the capitalized portion and the expensed portion, should be used in the numerator of the coverage ratio. Analysts

if a company is depreciating interest that it capitalized in a previous period, income should be adjusted to eliminate the effect of that depreciation. Example 5 illustrates the calculations.

#### EXAMPLE 5

### Effect of Capitalized Interest Costs on Coverage Ratios and Cash Flow

Melco Resorts & Entertainment Limited (NASDAQ: MLCO), a Hong Kong SAR-based casino company, which is listed on the NASDAQ stock exchange and prepares financial reports under US GAAP, disclosed the following information in one of the footnotes to its 2017 financial statements: “Interest and amortization of deferred financing costs associated with major development and construction projects is capitalized and included in the cost of the project. . . . Total interest expenses incurred amounted to \$267,065, \$252,600, and \$253,168, of which \$37,483, \$29,033, and \$134,838 were capitalized during the years ended December 31, 2017, 2016, and 2015, respectively. Amortization of deferred financing costs of \$26,182, \$48,345, and \$38,511, net of amortization capitalized of nil, nil, and \$5,458, were recorded during the years ended December 31, 2017, 2016, and 2015, respectively” (Form 20-F filed 12 April 2018). Cash payments for deferred financing costs were reported in cash flows from financing activities.

#### Exhibit 5: Melco Resorts and Entertainment Limited Selected Data, as Reported (US dollar thousands)

	2017	2016	2015
EBIT (from income statement)	544,865	298,663	58,553
Interest expense (from income statement)	229,582	223,567	118,330
Capitalized interest (from footnote)	37,483	29,033	134,838
Amortization of deferred financing costs (from footnote)	26,182	48,345	38,511
Net cash provided by operating activities	1,162,500	1,158,128	522,026
Net cash from (used) in investing activities	(410,226)	280,604	(469,656)
Net cash from (used) in financing activities	(1,046,041)	(1,339,717)	(29,688)

Notes: EBIT represents “Income (Loss) Before Income Tax” plus “Interest expenses, net of capitalized interest” from the income statement.

1. Calculate and interpret Melco’s interest coverage ratio with and without capitalized interest.

#### Solution:

Interest coverage ratios with and without capitalized interest were as follows:

For 2017

2.37 (USD544,865 ÷ USD229,582) without adjusting for capitalized interest; and

2.14  $[(\text{USD}544,865 + \text{USD}26,182) \div (\text{USD}229,582 + \text{USD}37,483)]$ , including an adjustment to EBIT for depreciation of previously capitalized interest and an adjustment to interest expense for the amount of interest capitalized in 2017.

For 2016

1.34  $(\text{USD}298,663 \div \text{USD}223,567)$  without adjusting for capitalized interest; and

1.37  $[(\text{USD}298,663 + \text{USD}48,345) \div (\text{USD}223,567 + \text{USD}29,033)]$ , including an adjustment to EBIT for depreciation of previously capitalized interest and an adjustment to interest expense for the amount of interest capitalized in 2016.

For 2015

0.49  $(\text{USD}58,533 \div \text{USD}118,330)$  without adjusting for capitalized interest; and

0.38  $[(\text{USD}58,533 + \text{USD}38,511) \div (\text{USD}118,330 + \text{USD}134,838)]$ , including an adjustment to EBIT for depreciation of previously capitalized interest and an adjustment to interest expense for the amount of interest capitalized in 2015.

These calculations indicate that Melco's interest coverage improved in 2017 compared with the previous two years. In both 2017 and 2015, the coverage ratio was lower when adjusted for capitalized interest.

2. Calculate Melco's percentage change in operating cash flow from 2016 to 2017. Assuming the financial reporting does not affect reporting for income taxes, what were the effects of capitalized interest on operating and investing cash flows?

**Solution:**

If the interest had been expensed rather than capitalized, operating cash flows would have been lower in all three years. On an adjusted basis, but not an unadjusted basis, the company's operating cash flow declined in 2017 compared with 2016. On an unadjusted basis, for 2017 compared with 2016, Melco's operating cash flow increased by 0.4 percent in 2017  $[(\text{USD}1,162,500 \div \text{USD}1,158,128) - 1]$ . Including adjustments to expense all interest costs, Melco's operating cash flow also decreased by 0.4 percent in 2017  $\{[(\text{USD}1,162,500 - \text{USD}37,483) \div (\text{USD}1,158,128 - \text{USD}29,033)] - 1\}$ . If the interest had been expensed rather than capitalized, financing cash flows would have been higher in all three years.

The treatment of capitalized interest raises issues for consideration by an analyst. First, capitalized interest appears as part of investing cash outflows, whereas expensed interest reduces operating or financing cash flow under IFRS and operating cash flow under US GAAP. An analyst may want to examine the impact on reported cash flows of interest expenditures when comparing companies. Second, interest coverage ratios are solvency indicators measuring the extent to which a company's earnings (or cash flow) in a period covered its interest costs. To provide a true picture of a company's interest coverage, the entire amount of interest, both the capitalized portion and the expensed portion, should be used in calculating interest coverage ratios.

Generally, including capitalized interest in the calculation of interest coverage ratios provides a better assessment of a company's solvency. In assigning credit ratings, rating agencies include capitalized interest in coverage ratios. For example, Standard & Poor's calculates the EBIT interest coverage ratio as EBIT divided by gross interest (defined as interest prior to deductions for capitalized interest or interest income).

Maintaining a minimum interest coverage ratio is a financial covenant often included in lending agreements (e.g., bank loans and bond indentures). The definition of the coverage ratio can be found in the company's credit agreement. The definition is relevant because treatment of capitalized interest in calculating coverage ratios would affect an assessment of how close a company's actual ratios are to the levels specified by its financial covenants and thus the probability of breaching those covenants.

## Capitalization of Internal Development Costs

Accounting standards require companies to capitalize software development costs after a product's feasibility is established. Despite this requirement, judgment in determining feasibility means that companies' capitalization practices may differ. For example, as illustrated in Exhibit 6, Microsoft judges product feasibility to be established very shortly before manufacturing begins and, therefore, effectively expenses—rather than capitalizes—research and development costs.

### Exhibit 6: Disclosure on Software Development Costs

Excerpt from Management's Discussion and Analysis (MD&A) of Microsoft Corporation, Application of Critical Accounting Policies, Research and Development Costs:

Costs incurred internally in researching and developing a computer software product are charged to expense until technological feasibility has been established for the product. Once technological feasibility is established, all software costs are capitalized until the product is available for general release to customers. Judgment is required in determining when technological feasibility of a product is established. We have determined that technological feasibility for our software products is reached after all high-risk development issues have been resolved through coding and testing. Generally, this occurs shortly before the products are released to production. The amortization of these costs is included in cost of revenue over the estimated life of the products.

*Source: Microsoft Corporation, 2017 Annual Report on Form 10-K, p. 45.*

Expensing rather than capitalizing development costs results in lower net income in the current period. Expensing rather than capitalizing will continue to result in lower net income so long as the amount of the current-period development expenses is higher than the amortization expense that would have resulted from amortizing prior periods' capitalized development costs—the typical situation when a company's development costs are increasing. On the statement of cash flows, expensing rather than capitalizing development costs results in lower net operating cash flows and higher net investing cash flows. This is because the development costs are reflected as operating cash outflows rather than investing cash outflows.

In comparing the financial performance of a company that expenses most or all software development costs, such as Microsoft, with another company that capitalizes software development costs, adjustments can be made to make the two comparable. For the company that capitalizes software development costs, an analyst can adjust

(1) the income statement to include software development costs as an expense and to

exclude amortization of prior years' software development costs; (2) the balance sheet to exclude capitalized software (decrease assets and equity); and (3) the statement of cash flows to decrease operating cash flows and decrease cash used in investing by the amount of the current period development costs. Any ratios that include income, long-lived assets, or cash flow from operations—such as return on equity—also will be affected.

**EXAMPLE 6****Software Development Costs**

You are working on a project involving the analysis of JHH Software, a (hypothetical) software development company that established technical feasibility for its first product in 2017. Part of your analysis involves computing certain market-based ratios, which you will use to compare JHH to another company that expenses all of its software development expenditures. Relevant data and excerpts from the company's annual report are included in Exhibit 7.

**Exhibit 7: JHH SOFTWARE (US dollar thousands, except per share amounts)****Consolidated Statement of Earnings—Abbreviated**

<b>For Year Ended 31 December:</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>
Total revenue	USD91,424	USD91,134	USD96,293
Total operating expenses	78,107	78,908	85,624
Operating income	13,317	12,226	10,669
Provision for income taxes	3,825	4,232	3,172
Net income	USD9,492	USD7,994	USD7,479
Earnings per share (EPS)	USD1.40	USD0.82	USD0.68

**Statement of Cash Flows—Abbreviated**

<b>For Year Ended 31 December:</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>
Net cash provided by operating activities	USD15,007	USD14,874	USD15,266
Net cash used in investing activities*	(11,549)	(4,423)	(5,346)
Net cash used in financing activities	(8,003)	(7,936)	(7,157)
Net change in cash and cash equivalents	(USD4,545)	USD2,515	USD2,763
<i>*Includes software development expenses of and includes capital expenditures of</i>	<i>(USD6,000)</i> <i>(USD2,000)</i>	<i>(USD4,000)</i> <i>(USD1,600)</i>	<i>(USD2,000)</i> <i>(USD1,200)</i>

**Additional Information:**

<b>For Year Ended 31 December:</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>
Market value of outstanding debt	0	0	0
Amortization of capitalized software development expenses	(USD2,000)	(USD667)	0
Depreciation expense	(USD2,200)	(USD1,440)	(USD1,320)

**Additional Information:**

<b>For Year Ended 31 December:</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>
Market price per share of common stock	USD42	USD26	USD17
Shares of common stock outstanding (thousands)	6,780	9,765	10,999

*Footnote disclosure of accounting policy for software development:  
Expenses that are related to the conceptual formulation and design of software products are expensed to research and development as incurred. The company capitalises expenses that are incurred to produce the finished product after technological feasibility has been established.*

1. Compute the following ratios for JHH based on the reported financial statements for fiscal year ended 31 December 2018, with no adjustments. Next, determine the approximate impact on these ratios if the company had expensed rather than capitalized its investments in software. (Assume the financial reporting does not affect reporting for income taxes. There would be no change in the effective tax rate.)

- A. P/E: Price/Earnings per share
- B. P/CFO: Price/Operating cash flow per share
- C. EV/EBITDA: Enterprise value/EBITDA, where enterprise value is defined as the total market value of all sources of a company's financing, including equity and debt, and EBITDA is earnings before interest, taxes, depreciation, and amortization.

**Solution:**

(US dollars are in thousands, except per share amounts.) JHH's 2019 ratios are presented in the following table:

	<b>Ratios</b>	<b>As reported</b>	<b>As adjusted</b>
A	P/E ratio	30.0	42.9
B	P/CFO	19.0	31.6
C	EV/EBITDA	16.3	24.7

- A. Based on the information as reported, the P/E ratio was 30.0 ( $\text{USD}42 \div \text{USD}1.40$ ). Based on EPS adjusted to expense software development costs, the P/E ratio was 42.9 ( $\text{USD}42 \div \text{USD}0.98$ ).

Price: Assuming that the market value of the company's equity is based on its fundamentals, the price per share is USD42, regardless of a difference in accounting.

EPS: As reported, EPS was USD1.40. Adjusted EPS was USD0.98. Expensing software development costs would have reduced JHH's 2018 operating income by USD6,000, but the company would have reported no amortization of prior years' software costs, which would have increased operating income by USD2,000. The net change of USD4,000 would have reduced operating income from the reported USD13,317 to USD9,317. The effective tax rate for 2018 ( $\text{USD}3,825 \div \text{USD}13,317$ ) is 28.72%, and using this effective tax rate would give an adjusted net income of USD6,641 [ $\text{USD}9,317 \times (1 - 0.2872)$ ], compared to USD9,492 before the adjustment. The EPS would therefore be reduced from the reported USD1.40 to USD0.98 (adjusted net income of USD6,641 divided by 6,780 shares).



- B.** Based on information as reported, the P/CFO was 19.0 ( $\text{USD}42 \div \text{USD}2.21$ ). Based on CFO adjusted to expense software development costs, the P/CFO was 31.6 ( $\text{USD}42 \div \text{USD}1.33$ ).

Price: Assuming that the market value of the company's equity is based on its fundamentals, the price per share is USD42, regardless of a difference in accounting.

CFO per share, as reported, was USD2.21 (total operating cash flows USD15,007  $\div$  6,780 shares).

CFO per share, as adjusted, was USD1.33. The company's USD6,000 expenditure on software development costs was reported as a cash outflow from investing activities, so expensing those costs would reduce cash from operating activities by USD6,000, from the reported USD15,007 to USD9,007. Dividing adjusted total operating cash flow of USD9,007 by 6,780 shares results in cash flow per share of USD1.33.

- C.** Based on information as reported, the EV/EBITDA was 16.3 ( $\text{USD}284,760 \div \text{USD}17,517$ ). Based on EBITDA adjusted to expense software development costs, the EV/EBITDA was 24.7 ( $\text{USD}284,760 \div \text{USD}11,517$ ).

Enterprise Value: Enterprise value is the sum of the market value of the company's equity and debt. JHH has no debt, and therefore the enterprise value is equal to the market value of its equity. The market value of its equity is USD284,760 ( $\text{USD}42 \text{ per share} \times 6,780 \text{ shares}$ ).

EBITDA, as reported, was USD17,517 (earnings before interest and taxes of USD13,317 plus USD2,200 depreciation plus USD2,000 amortization).

EBITDA, adjusted for expensing software development costs by the inclusion of USD6,000 development expense and the exclusion of USD2,000 amortization of prior expense, would be USD11,517 (earnings before interest and taxes of USD9,317 plus USD2,200 depreciation plus USD0 amortization).

## 2. Interpret the changes in the ratios.

### **Solution:**

Expensing software development costs would decrease historical profits, operating cash flow, and EBITDA, and would thus increase all market multiples. So JHH's stock would appear to be more expensive if it expensed rather than capitalized the software development costs.

If the unadjusted market-based ratios were used in the comparison of JHH to its competitor that expenses all software development expenditures, then JHH might appear to be under-priced when the difference is solely related to accounting factors. JHH's adjusted market-based ratios provide a better basis for comparison.

For the company in Example 6, current period software development expenditures exceed the amortization of prior periods' capitalized software development expenditures. As a result, expensing rather than capitalizing software development costs would have the effect of lowering income. If, however, software development expenditures slowed such that current expenditures were lower than the amortization of prior periods' capitalized software development expenditures, then expensing software development costs would have the effect of increasing income relative to capitalizing it.

This section illustrated how decisions about capitalizing versus expensing affect financial statements and ratios. Earlier expensing lowers current profits but enhances trends, whereas capitalizing now and expensing later enhances current profits. Having described the accounting for acquisition of long-lived assets, we now turn to the topic of measuring long-lived assets in subsequent periods.

### Implications for Financial Analysts: Expense Recognition

As with revenue recognition policies, a company's choice of expense recognition can be characterized by its relative conservatism. A policy that results in recognition of expenses later rather than sooner is considered less conservative. In addition, many items of expense require the company to make estimates that can significantly affect net income. Analysis of a company's financial statements, and particularly comparison of one company's financial statements with those of another, requires an understanding of differences in these estimates and their potential impact.

If, for example, a company shows a significant year-to-year change in its estimates of uncollectible accounts as a percentage of sales, warranty expenses as a percentage of sales, or estimated useful lives of assets, the analyst should seek to understand the underlying reasons. Do the changes reflect a change in business operations (e.g., lower estimated warranty expenses reflecting recent experience of fewer warranty claims because of improved product quality)? Or are the changes seemingly unrelated to changes in business operations and thus possibly a signal that a company is manipulating estimates to achieve a particular effect on its reported net income?

As another example, if two companies in the same industry have dramatically different estimates for uncollectible accounts as a percentage of their sales, warranty expenses as a percentage of sales, or estimated useful lives as a percentage of assets, it is important to understand the underlying reasons. Are the differences consistent with differences in the two companies' business operations (e.g., lower uncollectible accounts for one company reflecting a different, more creditworthy customer base or possibly stricter credit policies)? Another difference consistent with differences in business operations would be a difference in estimated useful lives of assets if one of the companies employs newer equipment. Or, alternatively, are the differences seemingly inconsistent with differences in the two companies' business operations, possibly signaling that a company is manipulating estimates?

Information about a company's accounting policies and significant estimates are described in the notes to the financial statements and in the management discussion and analysis section of a company's annual report.

When possible, the monetary effect of differences in expense recognition policies and estimates can facilitate more meaningful comparisons with a single company's historical performance or across a number of companies. An analyst can use the monetary effect to adjust the reported expenses so that they are on a comparable basis.

Even when the monetary effects of differences in policies and estimates cannot be calculated, it is generally possible to characterize the relative conservatism of the policies and estimates and, therefore, to qualitatively assess how such differences might affect reported expenses and thus financial ratios.

## NON-RECURRING ITEMS

# 4

- ☐ describe the financial reporting treatment and analysis of non-recurring items (including discontinued operations, unusual or infrequent items) and changes in accounting policies

From a company's income statements, we can see its earnings from the year just ended and the previous year. Looking forward, the question is: What will the company earn next year and in the years thereafter?

To assess a company's future earnings, it is helpful to separate those prior years' items of income and expense that are likely to continue in the future from those items that are less likely to continue. Some items from prior years are clearly not expected to continue in the future periods and are separately disclosed on a company's income statement. IFRS describe considerations that enter into the decision to present information other than that explicitly specified by a standard. Both IFRS and US GAAP specify that the results of discontinued operations should be reported separately from continuing operations. Other items that may be reported separately on a company's income statement, such as unusual items, items that occur infrequently, effects due to accounting changes, and non-operating income, require the analyst to make some judgments.

### Unusual or Infrequent Items

IFRS require that items of income or expense that are material or relevant to the understanding of the entity's financial performance should be disclosed separately. Unusual or infrequent items are likely to meet these criteria. Under US GAAP, material items that are unusual or infrequent, and that are both as of reporting periods beginning after December 15, 2015, are shown as part of a company's continuing operations but are presented separately. For example, restructuring charges, such as costs to close plants and employee termination costs, are considered part of a company's ordinary activities. As another example, gains and losses arising when a company sells an asset or part of a business, for more or less than its carrying value, are also disclosed separately on the income statement. These sales are considered ordinary business activities.

Highlighting the unusual or infrequent nature of these items assists an analyst in judging the likelihood that such items will reoccur. This meets the IFRS criteria of disclosing items that are relevant to the understanding of an entity's financial performance. In Exhibit 8, the income statement of Danone shows an amount for "Recurring operating income" followed by a separate line item for "other operating income (expense)," which is not included as a component of recurring income. Exhibit 9 presents an excerpt from Danone's additional disclosure about this non-recurring amount.

#### Exhibit 8: Danone Income Statement

##### Groupe Danone Consolidated Income Statement (in Millions of Euros) [Excerpt]

	Year Ended 31 December	
	2016	2017
Sales	21,944	24,677
Cost of goods sold	(10,744)	(12,490)

**Groupe Danone Consolidated Income Statement (in Millions of Euros) [Excerpt]**

	Year Ended 31 December	
	2016	2017
Selling expense	(5,562)	(5,890)
General and administrative expense	(2,004)	(2,225)
Research and development expense	(333)	(342)
Other income (expense)	(278)	(219)
<b>Recurring operating income</b>	<b>3,022</b>	<b>3,543</b>
Other operating income (expense)	(99)	192
<b>Operating income</b>	<b>2,923</b>	<b>3,734</b>
Interest income on cash equivalents and short-term investments	130	151
Interest expense	(276)	(414)
Cost of net debt	(146)	(263)
Other financial income	67	137
Other financial expense	(214)	(312)
<b>Income before tax</b>	<b>2,630</b>	<b>3,296</b>
Income tax expense	(804)	(842)
<b>Net income from fully consolidated companies</b>	<b>1,826</b>	<b>2,454</b>
Share of profit of associates	1	109
Net income	1,827	2,563
 <b>Net income – Group share</b>	 <b>1,720</b>	 <b>2,453</b>
Net income – Non-controlling interests	107	110

**Exhibit 9: Highlighting Infrequent Nature of Items—Excerpt from Groupe Danone footnotes to its 2017 financial statements****NOTE 6. Events and Transactions Outside the Group's Ordinary Activities [Excerpt]**

Other operating income (expense) is defined under Recommendation 2013-03 of the French CNC relating to the format of consolidated financial statements prepared under international accounting standards, and comprises significant items that, because of their exceptional nature, cannot be viewed as inherent to Danone's current activities. These mainly include capital gains and losses on disposals of fully consolidated companies, impairment charges on goodwill, significant costs related to strategic restructuring and major external growth transactions, and incurred or estimated costs related to major crises and major litigation. Furthermore, in connection with Revised IFRS 3 and Revised IAS 27, Danone also classifies in Other operating income (expense) (i) acquisition costs related to business combinations, (ii) revaluation profit or loss accounted for following a loss of control, and (iii) changes in earn-outs related to business combinations and subsequent to the acquisition date.

In 2017, the net Other operating income of €192 million consisted mainly of the following items:

<b>(Euro Millions)</b>	<b>Related Income (Expense)</b>
Capital gain on disposal of Stonyfield	628
Compensation received following the decision of the Singapore arbitration court in the Fonterra case	105
Territorial risks, mainly in certain countries in the ALMA region	(148)
Costs associated with the integration of WhiteWave	(118)
Impairment of several intangible assets in Waters and Specialized Nutrition Reporting entities	(115)

*Remainder of table omitted*

In Exhibit 9, Danone provides details on items considered to be “exceptional” items and not “inherent” to the company’s current activities. The exceptional items include gains on asset disposals, receipts from a legal case, costs of integrating an acquisition, and impairment of intangible assets, among others. Generally, in forecasting future operations, an analyst would assess whether the items reported are likely to reoccur and also possible implications for future earnings. It is generally not advisable simply to ignore all unusual items.

## Discontinued Operations

When a company disposes of or establishes a plan to dispose of one of its component operations and will have no further involvement in the operation, the income statement reports separately the effect of this disposal as a “discontinued” operation under both IFRS and US GAAP. Financial standards provide various criteria for reporting the effect separately, which are generally that the discontinued component must be separable both physically and operationally.

Results of discontinued operations are presented on a net basis at the bottom of the income statement, including on a per share basis. The remaining parts of income statement (e.g., revenue, costs of goods sold, EPS from the remaining businesses) are the results of continuing operations and are disclosed as such. Assets and liabilities related to the discontinued operations are aggregated and recognized on the balance sheet as held for sale. This presentation allows an analyst to clearly evaluate continuing versus discontinued operations.

Because the discontinued operation will no longer provide earnings (or cash flow) to the company once the sale or disposal is complete, an analyst may eliminate discontinued operations in formulating expectations about a company’s future financial performance after a certain date.

## Changes in Accounting Policy

At times, standard setters issue new standards that require companies to change accounting policies. Depending on the standard, companies may be permitted to adopt the standards prospectively (in the future) or retrospectively (restate financial statements as though the standard existed in the past). In other cases, changes in accounting policies (e.g., from one acceptable inventory costing method to another)

are made by management for various reasons, such as providing a better reflection of the company's performance. Changes in accounting policies are reported through retrospective application<sup>1</sup> unless it is impractical to do so.

*Retrospective application* means that the financial statements for all fiscal years shown in a company's financial report are presented as if the newly adopted accounting principle had been used throughout the entire period. Notes to the financial statements describe the change and explain the justification for the change. Because changes in accounting principles are retrospectively applied, the financial statements that appear within a financial report are comparable.

Example 7 presents an excerpt from Microsoft Corporation's Form 10-K for the fiscal year ended 30 June 2018 describing a change in accounting principle resulting from the new revenue recognition standard. Microsoft elected to adopt the new standard 1 July 2017, earlier than the required adoption date. Microsoft also elected to use the "full retrospective method," which requires companies to restate prior periods' results. On its income statement, both 2016 and 2017 are presented as if the new standard had been used throughout both years. In the footnotes to its financial statements, Microsoft discloses the impact of the new standard.

#### EXAMPLE 7

### Microsoft Corporation—Excerpt from Footnotes to the Financial Statements

The most significant impact of the [new revenue recognition] standard relates to our accounting for software license revenue. Specifically, for Windows 10, we recognize revenue predominantly at the time of billing and delivery rather than ratably over the life of the related device. For certain multi-year commercial software subscriptions that include both distinct software licenses and SA, we recognize license revenue at the time of contract execution rather than over the subscription period. Due to the complexity of certain of our commercial license subscription contracts, the actual revenue recognition treatment required under the standard depends on contract-specific terms and in some instances may vary from recognition at the time of billing. Revenue recognition related to our hardware, cloud offerings (such as Office 365), LinkedIn, and professional services remains substantially unchanged. Refer to Impacts to Previously Reported Results below for the impact of adoption of the standard in our consolidated financial statements.

#### Exhibit 10: Microsoft Impacts to Previously Reported Results

(US dollar millions, except per share amounts)	As Previously Reported	New Revenue Standard Adjustment	As Restated
<b>Income Statements</b>			
<b>Year Ended 30 June 2017</b>			
Revenue	89,950	6,621	96,571
Provision for income taxes	1,945	2,467	4,412
Net income	21,204	4,285	25,489
Diluted earnings per share	2.71	0.54	3.25

<sup>1</sup> IAS No. 8, Accounting Policies, Changes in Accounting Estimates and Errors, and FASB ASC Topic 250, Accounting Changes and Error Corrections.

(US dollar millions, except per share amounts)	As Previously Reported	New Revenue Standard Adjustment	As Restated
<b>Year Ended 30 June 2016</b>			
Revenue	85,320	5,834	91,154
Provision for income taxes	2,953	2,147	5,100
Net income	16,798	3,741	20,539
Diluted earnings per share	2.1	0.46	2.56

1. Based on Exhibit 10, describe whether Microsoft's results appear better or worse under the new revenue recognition standard.

**Solution:**

Microsoft's results appear better under the new revenue recognition standard. Revenues and income are higher under the new standard. The net profit margin is higher under the new standard. For 2017, the net profit margin is 26.4 percent ( $= 25,489/96,571$ ) under the new standard versus 23.6 percent ( $= 21,204/89,950$ ) under the old standard. Reported revenue grew faster under the new standard. Revenue growth under the new standard was 5.9 percent [ $= (96,571/91,154) - 1$ ] compared with 5.4 percent [ $= (89,950/85,320) - 1$ ] under the old standard.

Microsoft's presentation of the effects of the new revenue recognition enables an analyst to identify the impact of the change in accounting standards.

Note that the new revenue recognition standard also offered companies the option of using a "modified retrospective" method of adoption. Under the modified retrospective approach, companies were not required to revise previously reported financial statements. Instead, they adjusted opening balances of retained earnings (and other applicable accounts) for the cumulative impact of the new standard.

In contrast to changes in accounting policies (such as whether to expense the cost of employee stock options), companies sometimes make *changes in accounting estimates* (such as the useful life of a depreciable asset). Changes in accounting estimates are handled prospectively, with the change affecting the financial statements for the period of change and future periods. No adjustments are made to prior statements, and the adjustment is not shown on the face of the income statement. Significant changes should be disclosed in the notes. Exhibit 11 provides an excerpt from the annual Form 10-K of Catalent Inc., a US-based biotechnology company, that illustrates a change in accounting estimate.

**Exhibit 11: Change in Accounting Estimate—Excerpt from Catalent Form 10-K**

Catalent Inc. discloses a change in the method it uses to calculate both annual expenses related to its defined benefit pension plans. Rather than use a single, weighted-average discount rate in its calculations, the company will use the spot rates applicable to each projected cash flow.

## Post-Retirement and Pension Plans

The measurement of the related benefit obligations and the net periodic benefit costs recorded each year are based upon actuarial computations, which require management's judgment as to certain assumptions. These assumptions include the discount rates used in computing the present value of the benefit obligations and the net periodic benefit costs...

Effective June 30, 2016, the approach used to estimate the service and interest components of net periodic benefit cost for benefit plans was changed to provide a more precise measurement of service and interest costs. Historically, the Company estimated these service and interest components utilizing a single weighted-average discount rate derived from the yield curve used to measure the benefit obligation at the beginning of the period. Going forward, the Company has elected to utilize an approach that discounts the individual expected cash flows using the applicable spot rates derived from the yield curve over the projected cash flow period. The Company has accounted for this change as a change in accounting estimate that is inseparable from a change in accounting principle and accordingly has accounted for it prospectively.

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Another possible adjustment is a *correction of an error for a prior period* (e.g., in financial statements issued for an earlier year). This cannot be handled by simply adjusting the current period income statement. Correction of an error for a prior period is handled by restating the financial statements (including the balance sheet, statement of owners' equity, and cash flow statement) for the prior periods presented in the current financial statements. Note that disclosures are required regarding the error. These disclosures should be examined carefully because they may reveal weaknesses in the company's accounting systems and financial controls.

## Changes in Scope and Exchange Rates

When an issuer acquires a controlling interest in another company, it consolidates its financial statements as of the closing date. Depending on the size of the target relative to the acquirer, an acquisition can materially affect the comparability of the acquirer's financial results and position from prior periods. Additionally, changes in exchange rates often affect multinational companies' income statements (e.g., a strengthening functional currency against the reporting currency increases reported revenues, while a declining functional currency against the reporting currency decreases reported revenues). Unfortunately, accounting standards do *not* require issuers to disclose the effects of either scope or exchange rate changes on the financial statements or in individual items, although most issuers disclose useful summary information (such as revenue and EPS growth rates excluding scope and exchange rate changes) in management reporting or elsewhere.

The financial statement implications of changes in scope and exchange rates will be discussed in detail later in the curriculum.



## EARNINGS PER SHARE

## 5

- describe how earnings per share is calculated and calculate and interpret a company's basic and diluted earnings per share for companies with simple and complex capital structures including those with antidilutive securities

One income statement metric of particular importance to equity investors is earnings per share (EPS). IFRS require the presentation of EPS on the face of the income statement for net profit or loss (net income) and profit or loss (income) from continuing operations and similar presentation is required under US GAAP. This lesson outlines the calculations for EPS and explains how the calculation differs for a simple versus complex capital structure.

### Simple versus Complex Capital Structure

A company's capital is composed of its equity and debt. Some types of equity have preference over others, and some debt (and other instruments) may be converted into equity. Under IFRS, the type of equity for which EPS is presented is referred to as ordinary. **Ordinary shares** are those equity shares that are subordinate to all other types of equity. The ordinary shareholders are basically the owners of the company—the equity holders who are paid last in a liquidation of the company and who benefit the most when the company does well. Under US GAAP, this ordinary equity is referred to as **common stock** or **common shares**, reflecting US language usage. The terms “ordinary shares,” “common stock,” and “common shares” are used interchangeably in the following discussion.

When a company has issued any financial instruments that are potentially convertible into common stock, it is said to have a complex capital structure. Examples of financial instruments that are potentially convertible into common stock include convertible bonds, convertible preferred stock, employee stock options, and warrants (a warrant is essentially an equity call option issued by the company; a warrant holder has the right but not the obligation to purchase newly issued shares at the exercise price). If a company's capital structure does not include such potentially convertible financial instruments, it is said to have a simple capital structure.

The distinction between simple versus complex capital structure is relevant to the calculation of EPS because financial instruments that are potentially convertible into common stock could, as a result of conversion or exercise, potentially dilute (i.e., decrease) EPS. Information about such a potential dilution is valuable to a company's current and potential shareholders; therefore, accounting standards require companies to disclose what their EPS would be if all dilutive financial instruments were converted into common stock. The EPS that would result if all dilutive financial instruments were converted is called **diluted EPS**. In contrast, **basic EPS** is calculated using the reported earnings available to common shareholders of the parent company and the weighted average number of shares outstanding.

Companies are required to report both basic and diluted EPS as well as amounts for continuing operations. Exhibit 12 shows the per share amounts reported by AB InBev at the bottom of its income statement. The company's basic EPS (“before dilution”) was USD4.06, and diluted EPS (“after dilution”) was USD3.98 for 2017. In addition, in the same way that AB InBev's income statement shows income from continuing operations separately from total income, EPS from continuing operations is also shown separately from total EPS. For 2017, the basic and diluted EPS from continuing operations were USD4.04 and USD3.96, respectively. Amounts in millions of USD.

EPS was much higher in 2017 than in 2016. An analyst would seek to understand the causes underlying the changes in EPS, a topic we will address following an explanation of the calculations of both basic and diluted EPS.

#### Exhibit 12: AB InBev's Earnings per Share (USD)

	12 Months Ended 31 December		
	2017	2016	2015
Basic earnings per share	4.06	0.72	5.05
Diluted earnings per share	3.98	0.71	4.96
Basic earnings per share from continuing operations	4.04	0.69	5.05
Diluted earnings per share from continuing operations	3.96	0.68	4.96

### Basic EPS

Basic EPS is the amount of income available to common shareholders divided by the weighted average number of common shares outstanding over a period. The amount of income available to common shareholders is the amount of net income remaining after preferred dividends (if any) have been paid. Thus, the formula to calculate basic EPS is as follows:

$$\text{Basic EPS} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Weighted average number of shares outstanding}}$$

The weighted average number of shares outstanding is a time weighting of common shares outstanding. For example, assume a company began the year with 2,000,000 common shares outstanding and repurchased 100,000 common shares on 1 July. The weighted average number of common shares outstanding would be the sum of 2,000,000 shares  $\times$  1/2 year + 1,900,000 shares  $\times$  1/2 year, or 1,950,000 shares. So, the company would use 1,950,000 shares as the weighted average number of shares in calculating its basic EPS.

If the number of shares of common stock increases as a result of a stock dividend or a stock split, the EPS calculation reflects the change retroactively to the beginning of the period.

Example 8, 9, and 10 illustrate the computation of basic EPS.

#### EXAMPLE 8

##### A Basic EPS Calculation (1)

1. For the year ended 31 December 2018, Shopalot Company had net income of USD1,950,000. The company had 1,500,000 shares of common stock outstanding, no preferred stock, and no convertible financial instruments. What is Shopalot's basic EPS?

**Solution:**

Shopalot's basic EPS is USD1.30 (USD1,950,000 divided by 1,500,000 shares).

**EXAMPLE 9****A Basic EPS Calculation (2)**

For the year ended 31 December 2018, Angler Products had net income of USD2,500,000. The company declared and paid USD200,000 of dividends on preferred stock. The company also had the common stock share information shown in Exhibit 13:

**Exhibit 13: Angler's Common Stock Shares**

Shares outstanding on 1 January 2018	1,000,000
Shares issued on 1 April 2018	200,000
Shares repurchased (treasury shares) on 1 October 2018	(100,000)
Shares outstanding on 31 December 2018	1,100,000

1. What is the company's weighted average number of shares outstanding?

**Solution:**

The weighted average number of shares outstanding is determined by the length of time each quantity of shares was outstanding:

$1,000,000 \times (3 \text{ months}/12 \text{ months}) =$	250,000
$1,200,000 \times (6 \text{ months}/12 \text{ months}) =$	600,000
$1,100,000 \times (3 \text{ months}/12 \text{ months}) =$	275,000
Weighted average number of shares outstanding	1,125,000

2. What is the company's basic EPS?

**Solution:**

Basic EPS = (Net income – Preferred dividends)/Weighted average number of shares =  $(\text{USD}2,500,000 - \text{USD}200,000)/1,125,000 = \text{USD}2.04$

**EXAMPLE 10****A Basic EPS Calculation (3)**

1. Assume the same facts as Example 7 except that on 1 December 2018, a previously declared 2-for-1 stock split took effect. Each shareholder of record receives two shares in exchange for each current share that he or she owns. What is the company's basic EPS?

**Solution:**

For EPS calculation purposes, a stock split is treated as if it occurred at the beginning of the period. The weighted average number of shares would, therefore, be 2,250,000, and the basic EPS would be USD1.02 [=  $(\text{USD}2,500,000 - \text{USD}200,000)/2,250,000$ ].

## Diluted EPS: The If-Converted Method

If a company has a simple capital structure (in other words, one that includes no potentially dilutive financial instruments), then its basic EPS is equal to its diluted EPS. If, however, a company has potentially dilutive financial instruments, its diluted EPS may differ from its basic EPS. Diluted EPS, by definition, is always equal to or less than basic EPS. The following sections describe the effects of three types of potentially dilutive financial instruments on diluted EPS: convertible preferred, convertible debt, and employee stock options. The final section explains why not all potentially dilutive financial instruments actually result in a difference between basic and diluted EPS.

## Diluted EPS When a Company Has Convertible Preferred Stock Outstanding

When a company has convertible preferred stock outstanding, diluted EPS is calculated using the **if-converted method**. The if-converted method is based on what EPS would have been if the convertible preferred securities had been converted at the beginning of the period. In other words, the method calculates what the effect would have been if the convertible preferred shares converted at the beginning of the period. If the convertible shares had been converted, there would be two effects. First, the convertible preferred securities would no longer be outstanding; instead, additional common stock would be outstanding. Thus, under the if-converted method, the weighted average number of shares outstanding would be higher than in the basic EPS calculation. Second, if such a conversion had taken place, the company would not have paid preferred dividends. Thus, under the if-converted method, the net income available to common shareholders would be higher than in the basic EPS calculation.

Diluted EPS using the if-converted method for convertible preferred stock is equal to net income divided by the weighted average number of shares outstanding from the basic EPS calculation plus the additional shares of common stock that would be issued upon conversion of the preferred. Thus, the formula to calculate diluted EPS using the if-converted method for preferred stock is as follows:

$$\text{Diluted EPS} = \frac{(\text{Net income})}{(\text{Weighted average number of shares outstanding} + \text{New common shares that would have been issued at conversion})}$$

A diluted EPS calculation using the if-converted method for preferred stock is provided in Example 11.

### EXAMPLE 11

#### A Diluted EPS Calculation Using the If-Converted Method for Preferred Stock

1. For the year ended 31 December 2018, Bright-Warm Utility Company (fictitious) had net income of USD1,750,000. The company had an average of 500,000 shares of common stock outstanding, 20,000 shares of convertible preferred, and no other potentially dilutive securities. Each share of preferred pays a dividend of USD10 per share, and each is convertible into five

shares of the company's common stock. Calculate the company's basic and diluted EPS.

**Solution:**

If the 20,000 shares of convertible preferred had each converted into five shares of the company's common stock, the company would have had an additional 100,000 shares of common stock (five shares of common for each of the 20,000 shares of preferred). If the conversion had taken place, the company would not have paid preferred dividends of USD200,000 (USD10 per share for each of the 20,000 shares of preferred). As shown in Exhibit 14, the company's basic EPS was USD3.10 and its diluted EPS was USD2.92.

**Exhibit 14: Calculation of Diluted EPS for Bright-Warm Utility Company Using the If-Converted Method: Case of Preferred Stock**

	Basic EPS	Diluted EPS Using If-Converted Method
Net income	USD1,750,000	USD1,750,000
Preferred dividend	-200,000	0
<b>Numerator</b>	USD1,550,000	USD1,750,000
Weighted average number of shares outstanding	500,000	500,000
Additional shares issued if preferred converted	0	100,000
<b>Denominator</b>	500,000	600,000
<b>EPS</b>	<b>USD3.10</b>	<b>USD2.92</b>

## Diluted EPS When a Company Has Convertible Debt Outstanding

When a company has convertible debt outstanding, the diluted EPS calculation also uses the if-converted method. Diluted EPS is calculated as if the convertible debt had been converted at the beginning of the period. If the convertible debt had been converted, the debt securities would no longer be outstanding; instead, additional shares of common stock would be outstanding. Also, if such a conversion had taken place, the company would not have paid interest on the convertible debt, so the net income available to common shareholders would increase by the after-tax amount of interest expense on the debt converted.

Thus, the formula to calculate diluted EPS using the if-converted method for convertible debt is as follows:

$$\text{Diluted EPS} = \frac{(\text{Net income} + \text{After-tax interest on convertible debt} - \text{Preferred dividends})}{(\text{Weighted average number of shares outstanding} + \text{Additional common shares that would have been issued at conversion})}$$

A diluted EPS calculation using the if-converted method for convertible debt is provided in Example 12.

**EXAMPLE 12****A Diluted EPS Calculation Using the If-Converted Method for Convertible Debt**

1. Oppnox Company (fictitious) reported net income of USD750,000 for the year ended 31 December 2018. The company had a weighted average of 690,000 shares of common stock outstanding. In addition, the company has only one potentially dilutive security: USD50,000 of 6 percent convertible bonds, convertible into a total of 10,000 shares. Assuming a tax rate of 30 percent, calculate Oppnox's basic and diluted EPS.

**Solution:**

If the debt securities had been converted, the debt securities would no longer be outstanding and instead, an additional 10,000 shares of common stock would be outstanding. Also, if the debt securities had been converted, the company would not have paid interest of USD3,000 on the debt, so net income available to common shareholders would have increased by USD2,100 [= USD3,000(1 – 0.30)] on an after-tax basis. Exhibit 15 illustrates the calculation of diluted EPS using the if-converted method for convertible debt.

**Exhibit 15: Calculation of Diluted EPS for Oppnox Company Using the If-Converted Method: Case of a Convertible Bond**

	Basic EPS	Diluted EPS Using If-Converted Method
Net income	USD750,000	USD750,000
After-tax cost of interest		2,100
<b>Numerator</b>	USD750,000	USD752,100
Weighted average number of shares outstanding	690,000	690,000
If converted	0	10,000
<b>Denominator</b>	690,000	700,000
<b>EPS</b>	<b>USD1.09</b>	<b>USD1.07</b>

**Diluted EPS: The Treasury Stock Method**

When a company has stock options, warrants, or their equivalents outstanding, diluted EPS is calculated as if the financial instruments had been exercised and the company had used the proceeds from exercise to repurchase as many shares of common stock as possible at the average market price of common stock during the period. The weighted average number of shares outstanding for diluted EPS is thus increased by the number of shares that would be issued upon exercise minus the number of shares that would have been purchased with the proceeds. This method is called the treasury stock method under US GAAP because companies typically hold repurchased shares as treasury stock. The same method is used under IFRS but is not named.

For the calculation of diluted EPS using this method, the assumed exercise of these financial instruments would have the following effects:

- The company is assumed to receive cash upon exercise and, in exchange, to issue shares.
- The company is assumed to use the cash proceeds to repurchase shares at the weighted average market price during the period.

As a result of these two effects, the number of shares outstanding would increase by the incremental number of shares issued (the difference between the number of shares issued to the holders and the number of shares assumed to be repurchased by the company). For calculating diluted EPS, the incremental number of shares is weighted based upon the length of time the financial instrument was outstanding in the year. If the financial instrument was issued before the beginning of the year, the weighted average number of shares outstanding increases by the incremental number of shares. If the financial instruments were issued during the year, then the incremental shares are weighted by the amount of time the financial instruments were outstanding during the year.

The assumed exercise of these financial instruments would not affect net income. For calculating EPS, therefore, no change is made to the numerator. The formula to calculate diluted EPS using the treasury stock method (same method as used under IFRS but not named) for options is as follows:

$$\text{Diluted EPS} = \frac{(\text{Net income} - \text{Preferred dividends})}{[\text{Weighted average number of shares outstanding} + (\text{New shares that would have been issued at option exercise} - \text{Shares that could have been purchased with cash received upon exercise}) \times (\text{Proportion of year during which the financial instruments were outstanding})]}$$

A diluted EPS calculation using the treasury stock method for options is provided in Example 13.

#### EXAMPLE 13

##### A Diluted EPS Calculation Using the Treasury Stock Method for Options

1. Hihotech Company (fictitious) reported net income of USD2.3 million for the year ended 30 June 2018 and had a weighted average of 800,000 common shares outstanding. At the beginning of the fiscal year, the company has outstanding 30,000 options with an exercise price of USD35. No other potentially dilutive financial instruments are outstanding. Over the fiscal year, the company's market price has averaged USD55 per share. Calculate the company's basic and diluted EPS.

##### **Solution:**

Using the treasury stock method, we first calculate that the company would have received USD1,050,000 (USD35 for each of the 30,000 options exercised) if all the options had been exercised. The options would no longer be outstanding; instead, 30,000 shares of common stock would be outstanding. Under the treasury stock method, we assume that shares would be repurchased with the cash received upon exercise of the options. At an average market price of USD55 per share, the USD1,050,000 proceeds from option

incremental number of shares issued is 10,909 (calculated as 30,000 minus 19,091). For the diluted EPS calculation, no change is made to the numerator. As shown in Exhibit 16, the company's basic EPS was USD2.88 and the diluted EPS was USD2.84.

**Exhibit 16: Calculation of Diluted EPS for Hihotech Company Using the Treasury Stock Method: Case of Stock Options**

	Basic EPS	Diluted EPS Using Treasury Stock Method
Net income	USD2,300,000	USD2,300,000
<b>Numerator</b>	USD2,300,000	USD2,300,000
Weighted average number of shares outstanding	800,000	800,000
If converted	0	10,909
<b>Denominator</b>	800,000	810,909
<b>EPS</b>	<b>USD2.88</b>	<b>USD2.84</b>

As noted, IFRS require a similar computation but does not refer to it as the “treasury stock method.” The company is required to consider that any assumed proceeds are received from the issuance of new shares at the average market price for the period. These new “inferred” shares would be disregarded in the computation of diluted EPS, but the excess of the new shares that would be issued under options contracts minus the new inferred shares would be added to the weighted average number of shares outstanding. The results are the same as the treasury stock method, as shown in Example 14.

**EXAMPLE 14**

**Diluted EPS for Options under IFRS**

1. Assuming the same facts given in Example 13, calculate the weighted average number of shares outstanding for diluted EPS under IFRS.

**Solution:**

If the options had been exercised, the company would have received USD1,050,000. If this amount had been received from the issuance of new shares at the average market price of USD55 per share, the company would have issued 19,091 shares. IFRS refer to the 19,091 shares the company would have issued at market prices as the inferred shares. The number of shares issued under options (30,000) minus the number of inferred shares (19,091) equals 10,909. This amount is added to the weighted average number of shares outstanding of 800,000 to get diluted shares of 810,909. Note that this is the same result as that obtained under US GAAP; it is just derived in a different manner.



## Other Issues with Diluted EPS and Changes in EPS

It is possible that some potentially convertible securities could be **antidilutive** (i.e., their inclusion in the computation would result in an EPS higher than the company's basic EPS). Under IFRS and US GAAP, antidilutive securities are not included in the calculation of diluted EPS. Diluted EPS should reflect the maximum potential dilution from conversion or exercise of potentially dilutive financial instruments. Diluted EPS will always be less than or equal to basic EPS. Example 15 provides an illustration of an antidilutive security.

### EXAMPLE 15

#### An Antidilutive Security

- For the year ended 31 December 2018, Dim-Cool Utility Company (fictitious) had net income of USD1,750,000. The company had an average of 500,000 shares of common stock outstanding, 20,000 shares of convertible preferred, and no other potentially dilutive securities. Each share of preferred pays a dividend of USD10 per share, and each is convertible into three shares of the company's common stock. What was the company's basic and diluted EPS?

#### Solution:

If the 20,000 shares of convertible preferred had each converted into three shares of the company's common stock, the company would have had an additional 60,000 shares of common stock (three shares of common for each of the 20,000 shares of preferred). If the conversion had taken place, the company would not have paid preferred dividends of USD200,000 (USD10 per share for each of the 20,000 shares of preferred). The effect of using the if-converted method would be EPS of USD3.13, as shown in Exhibit 17. Because this is greater than the company's basic EPS of USD3.10, the securities are said to be antidilutive and the effect of their conversion would not be included in diluted EPS. Diluted EPS would be the same as basic EPS (i.e., USD3.10).

#### Exhibit 17: Calculation for an Antidilutive Security

	Basic EPS	Diluted EPS Using If-Converted Method
Net income	USD1,750,000	USD1,750,000
Preferred dividend	−200,000	0
<b>Numerator</b>	USD1,550,000	USD1,750,000
Weighted average number of shares outstanding	500,000	500,000
If converted	0	60,000

	Basic EPS	Diluted EPS Using If-Converted Method	
Denominator	500,000	560,000	
EPS	USD3.10	USD3.13	←Exceeds basic EPS; security is antidilutive and, therefore, <b>not</b> included. <b>Reported</b> <b>diluted EPS=</b> <b>USD3.10.</b>

### Changes in EPS

Having explained the calculations of both basic and diluted EPS, we return to an examination of changes in EPS. As noted in Exhibit 12, AB InBev's fully diluted EPS from continuing operations increased from USD0.68 in 2016 to USD3.96 in 2017. In general, an increase in EPS results from an increase in net income, a decrease in the number of shares outstanding, or a combination of both. In the notes to its financial statements (not shown), AB InBev discloses that the weighted average number of shares for both the basic and fully diluted calculations was greater in 2017 than in 2016. Thus, for AB InBev, the improvement in EPS from 2016 to 2017 was driven by an increase in net income. Changes in the numerator and denominator explain the changes in EPS arithmetically. To understand the business drivers of those changes requires further research. Lesson 5 presents analytical tools that an analyst can use to highlight areas for further examination.

## 6

### INCOME STATEMENT RATIOS AND COMMON-SIZE ANALYSIS



evaluate a company's financial performance using common-size income statements and financial ratios based on the income statement

In this lesson, we apply two analytical tools to analyze the income statement: common-size analysis and income statement ratios. The objective of this analysis is to assess over a period of time a company's performance relative to its own past performance or to that of another company.

#### Common-Size Analysis of the Income Statement

Common-size analysis of the income statement can be performed by stating each line item on the income statement as a percentage of revenue. Common-size statements facilitate comparison across time periods (time series analysis) and across companies (cross-sectional analysis) because the standardization of each line item removes the effect of size.

To illustrate, Panel A of Exhibit 18 presents an income statement for three hypothetical companies in the same industry. Company A and Company B, each with USD10 million in sales, are larger (as measured by sales) than Company C, which has only USD2 million in sales. In addition, Companies A and B both have higher operating profit: USD2 million and USD1.5 million, respectively, compared with Company C's operating profit of only USD400,000.

How can an analyst meaningfully compare the performance of these companies? By preparing a common-size income statement, as illustrated in Panel B, an analyst can readily see that the percentages of Company C's expenses and profit relative to its sales are exactly the same as for Company A. Furthermore, although Company C's operating profit is lower than Company B's in absolute dollars, it is higher in percentage terms (20 percent for Company C compared with only 15 percent for Company B). For each USD100 of sales, Company C generates USD5 more operating profit than Company B. In other words, Company C is relatively more profitable than Company B based on this measure.

The common-size income statement also highlights differences in companies' strategies. Comparing the two larger companies, Company A reports significantly higher gross profit as a percentage of sales than does Company B (70 percent compared with 25 percent). Given that both companies operate in the same industry, why can Company A generate so much higher gross profit? One possible explanation is found by comparing the operating expenses of the two companies. Company A spends significantly more on research and development and on advertising than Company B. Expenditures on research and development likely result in products with superior technology. Expenditures on advertising likely result in greater brand awareness. So, based on these differences, it is likely that Company A is selling technologically superior products with a better brand image. Company B may be selling its products more cheaply (with a lower gross profit as a percentage of sales) but is saving money by not investing in research and development or advertising. In practice, differences across companies are more subtle, but the concept is similar. An analyst, noting significant differences, would do more research and seek to understand the underlying reasons for the differences and their implications for the future performance of the companies.

#### Exhibit 18: income Statement for Three Hypothetical Companies

Panel A: Income Statements for Companies A, B, and C (US dollars)

	A	B	C
Sales	USD10,000,000	USD10,000,000	USD2,000,000
Cost of sales	3,000,000	7,500,000	600,000
Gross profit	7,000,000	2,500,000	1,400,000
Selling, general, and administrative expenses	1,000,000	1,000,000	200,000
Research and development	2,000,000	—	400,000

**Panel A: Income Statements for Companies A, B, and C (US dollars)**

	<b>A</b>	<b>B</b>	<b>C</b>
Advertising	2,000,000	—	400,000
Operating profit	2,000,000	1,500,000	400,000

**Panel B: Common-Size Income Statements for Companies A, B, and C (%)**

	<b>A</b>	<b>B</b>	<b>C</b>
Sales	100%	100%	100%
Cost of sales	30	75	30
Gross profit	70	25	70
Selling, general, and administrative expenses	10	10	10
Research and development	20	0	20
Advertising	20	0	20
Operating profit	20	15	20

*Note:* Each line item is expressed as a percentage of the company's sales.

For most expenses, comparison to the amount of sales is appropriate. In the case of taxes, however, it is more meaningful to compare the amount of taxes with the amount of pretax income. Using note disclosure, an analyst can then examine the causes for differences in effective tax rates. To project the companies' future net income, an analyst would project the companies' pretax income and apply an estimated effective tax rate determined in part by the historical tax rates.

Vertical common-size analysis of the income statement is particularly useful in cross-sectional analysis—comparing companies with each other for a particular time period or comparing a company with industry or sector data. The analyst could select individual peer companies for comparison, use industry data from published sources, or compile data from databases based on a selection of peer companies or broader industry data. For example, Exhibit 19 presents median common-size income statement data compiled for the components of the S&P 500 classified into the 10 S&P/MSCI Global Industrial Classification System (GICS) sectors using 2017 data. Note that when compiling aggregate data such as this, some level of aggregation is necessary and less detail may be available than from peer company financial statements. The performance of an individual company can be compared with industry or peer company data to evaluate its relative performance.

**Exhibit 19: Median Common-Size Income Statement Statistics for the S&P 500 Classified by S&P/MSCI GICS Sector Data for 2017**

	<b>Energy</b>	<b>Materials</b>	<b>Industrials</b>	<b>Consumer Discretionary</b>	<b>Consumer Staples</b>	<b>Health Care</b>
Number of observations	34	27	69	81	34	59
Gross Margin	37.7%	33.0%	36.8%	37.6%	43.4%	59.0%

	Energy	Materials	Industrials	Consumer Discretionary	Consumer Staples	Health Care
Operating Margin	6.4%	14.9%	13.5%	11.0%	17.2%	17.4%
Net Profit Margin	4.9%	9.9%	8.8%	6.0%	10.9%	7.2%

	Financials	Information Technology	Telecom-munication Services	Utilities	Real Estate
Number of observations	63	64	4	29	29
Gross Margin	40.5%	62.4%	56.4%	34.3%	39.8%
Operating Margin	36.5%	21.1%	15.4%	21.7%	30.1%
Net Profit Margin	18.5%	11.3%	13.1%	10.1%	21.3%

*Source:* Based on data from Compustat. Operating margin based on EBIT (earnings before interest and taxes).

## Income Statement Ratios

One aspect of financial performance is profitability. One indicator of profitability is **net profit margin**, also known as **profit margin** and **return on sales**, which is calculated as net income divided by revenue (or sales):

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Revenue}}.$$

Net profit margin measures the amount of income that a company was able to generate for each dollar of revenue. A higher level of net profit margin indicates higher profitability and is thus more desirable. Net profit margin can also be found directly on the common-size income statements.

For AB InBev, net profit margin based on continuing operations for 2017 was 16.2 percent (calculated as profit from continuing operations of USD9,155 million, divided by revenue of USD56,444 million). To judge this ratio, some comparison is needed. AB InBev's profitability can be compared with that of another company or with its own previous performance. Compared with previous years, AB InBev's profitability is higher than in 2016 but lower than 2015. In 2016, net profit margin based on continuing operations was 6.0 percent, and in 2015, it was 22.9 percent.

Another measure of profitability is the gross profit margin. Gross profit (gross margin) is calculated as revenue minus cost of goods sold, and the **gross profit margin** is calculated as the gross profit divided by revenue:

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Revenue}}.$$

The gross profit margin measures the amount of gross profit that a company has generated for each dollar of revenue. A higher level of gross profit margin indicates higher profitability and thus is generally more desirable, although differences in gross profit margins across companies reflect differences in companies' strategies. For example, consider a company pursuing a strategy of selling a differentiated product (e.g., a product differentiated based on brand name, quality, superior technology, or patent protection). The company would likely be able to sell the differentiated product at a higher price than a similar, but undifferentiated, product and, therefore, would likely show a higher gross profit margin than a company selling an undifferentiated product. Although a company selling a differentiated product would likely show a higher gross

profit margin, this may take time. In the initial stage of the strategy, the company would likely incur costs to create a differentiated product, such as advertising or research and development, which would not be reflected in the gross margin calculation.

AB InBev's gross profit was USD35,058 million in 2017, USD27,715 million in 2016, and USD26,467 million in 2015. Expressing gross profit as a percentage of revenues, we see that the gross profit margin was 62.1 percent in 2017, 60.9 percent in 2016, and 60.7 percent in 2015. In absolute terms, AB InBev's gross profit was higher in 2016 than in 2015. However, AB InBev's gross profit *margin* was approximately constant between 2015 and 2016.

Exhibit 20 presents a common-size income statement for AB InBev and highlights certain profitability ratios. The net profit margin and gross profit margin described previously are just two of the many subtotals that can be generated from common-size income statements. Other “margins” used by analysts include the **operating profit margin** (profit from operations divided by revenue) and the **pretax margin** (profit before tax divided by revenue).

**Exhibit 20: AB InBev's Margins: Abbreviated Common-Size Income Statement**

	12 Months Ended 31 December					
	2017		2016		2015	
	US dollars	%	US dollars	%	US dollars	%
<b>Revenue</b>	56,444	100.0	45,517	100.0	43,604	100.0
Cost of sales	(21,386)	(37.9)	(17,803)	(39.1)	(17,137)	(39.3)
<b>Gross profit</b>	<b>35,058</b>	<b>62.1</b>	<b>27,715</b>	<b>60.9</b>	<b>26,467</b>	<b>60.7</b>
Distribution expenses	(5,876)	(10.4)	(4,543)	(10.0)	(4,259)	(9.8)
Sales and marketing expenses	(8,382)	(14.9)	(7,745)	(17.0)	(6,913)	(15.9)
Administrative expenses	(3,841)	(6.8)	(2,883)	(6.3)	(2,560)	(5.9)
<i>Portions omitted</i>						
<b>Profit from operations</b>	<b>17,152</b>	<b>30.4</b>	<b>12,882</b>	<b>28.3</b>	<b>13,904</b>	<b>31.9</b>
Finance cost	(6,885)	(12.2)	(9,382)	(20.6)	(3,142)	(7.2)
Finance income	378	0.7	818	1.8	1,689	3.9
Net finance income/(cost)	(6,507)	(11.5)	(8,564)	(18.8)	(1,453)	(3.3)
Share of result of associates and joint ventures	430	0.8	16	0.0	10	0.0
<b>Profit before tax</b>	<b>11,076</b>	<b>19.6</b>	<b>4,334</b>	<b>9.5</b>	<b>12,461</b>	<b>28.6</b>
Income tax expense	(1,920)	(3.4)	(1,613)	(3.5)	(2,594)	(5.9)
<b>Profit from continuing operations</b>	<b>9,155</b>	<b>16.2</b>	<b>2,721</b>	<b>6.0</b>	<b>9,867</b>	<b>22.6</b>
Profit from discontinued operations	28	0.0	48	0.1	—	—
<b>Profit of the year</b>	<b>9,183</b>	<b>16.3</b>	<b>2,769</b>	<b>6.1</b>	<b>9,867</b>	<b>22.6</b>

*Note:* reported total amounts may have slight discrepancies due to rounding

The profitability ratios and the common-size income statement yield quick insights about changes in a company's performance. For example, AB InBev's decrease in profitability in 2016 was not driven by a decrease in gross profit margin. Gross profit margin in 2016 was actually slightly higher than in 2015. The company's decrease in profitability in 2016 was driven in part by higher operating expenses and, in particular, by a significant increase in finance costs. The increased finance costs resulted from the 2016 merger with SABMiller. Valued at more than USD100 billion, the acquisition

was one of the largest in history. The combination of AB InBev and SABMiller also explains the increase in revenue from around USD45 billion to over USD56 billion. The profitability ratios and the common-size income statement thus highlight areas about which an analyst might wish to gain further understanding.

## PRACTICE PROBLEMS

1. Under IFRS, income includes increases in economic benefits from:
  - A. increases in liabilities not related to owners' contributions.
  - B. enhancements of assets not related to owners' contributions.
  - C. increases in owners' equity related to owners' contributions.
2. Fairplay reported the information shown in Exhibit 1 related to the sale of its products during 2009, which was its first year of business:

### Exhibit 1: Fairplay

Revenue	USD1,000,000
Returns of goods sold	USD100,000
Cash collected	USD800,000
Cost of goods sold	USD700,000

Under the accrual basis of accounting, how much net revenue would be reported on Fairplay's 2009 income statement?

- A. USD200,000
  - B. USD900,000
  - C. USD1,000,000
3. Apex Consignment sells items over the internet for individuals on a consignment basis. Apex receives the items from the owner, lists them for sale on the internet, and receives a 25 percent commission for any items sold. Apex collects the full amount from the buyer and pays the net amount after commission to the owner. Unsold items are returned to the owner after 90 days. During 2009, Apex had the following information:
  - Total sales price of items sold during 2009 on consignment was EUR2,000,000.
  - Total commissions retained by Apex during 2009 for these items was EUR500,000.

How much revenue should Apex report on its 2009 income statement?

  - A. EUR500,000
  - B. EUR2,000,000
  - C. EUR1,500,000
4. A company previously expensed the incremental costs of obtaining a contract. All else being equal, adopting the May 2014 IASB and FASB converged accounting standards on revenue recognition makes the company's profitability initially appear:

A. lower



- B. unchanged.
  - C. higher.
5. Under IFRS, a loss from the destruction of property in a fire would most likely be classified as:
- A. continuing operations.
  - B. discontinued operations.
  - C. other comprehensive income.
6. A company chooses to change an accounting policy. This change requires that, if practical, the company restate its financial statements for:
- A. all prior periods.
  - B. current and future periods.
  - C. prior periods shown in a report.
7. For 2009, Flamingo Products had net income of USD1,000,000. At 1 January 2009, there were 1,000,000 shares outstanding. On 1 July 2009, the company issued 100,000 new shares for USD20 per share. The company paid USD200,000 in dividends to common shareholders. What is Flamingo's basic earnings per share for 2009?
- A. USD0.80
  - B. USD0.91
  - C. USD0.95
8. A company with no debt or convertible securities issued publicly traded common stock three times during the current fiscal year. Under both IFRS and US GAAP, the company's:
- A. basic EPS equals its diluted EPS.
  - B. capital structure is considered complex at year-end.
  - C. basic EPS is calculated by using a simple average number of shares outstanding.
9. For its fiscal year-end, Sublyme Corporation reported net income of USD200 million and a weighted average of 50,000,000 common shares outstanding. There are 2,000,000 convertible preferred shares outstanding that paid an annual dividend of USD5. Each preferred share is convertible into two shares of the common stock. The diluted EPS is *closest to*:
- A. USD3.52
  - B. USD3.65
  - C. USD3.70
10. For its fiscal year-end, Calvin Water Corporation (CWC) reported net income of USD12 million and a weighted average of 2,000,000 common shares outstanding. The company paid USD800,000 in preferred dividends and had 100,000 options.

outstanding with an average exercise price of USD20. CWC's market price over the year averaged USD25 per share. CWC's diluted EPS is *closest* to:

- A. USD5.33
- B. USD5.54
- C. USD5.94

11. Laurelli Builders (LB) reported the financial data shown in Exhibit 1 for year-end 31 December:

#### Exhibit 1: Laurelli Builders

Common shares outstanding, 1 January	2,020,000
Common shares issued as stock dividend, 1 June	380,000
Warrants outstanding, 1 January	500,000
Net income	USD3,350,000
Preferred stock dividends paid	USD430,000
Common stock dividends paid	USD240,000

Which statement about the calculation of LB's EPS is *most* accurate?

- A. LB's basic EPS is USD1.12.
  - B. LB's diluted EPS is equal to or less than its basic EPS.
  - C. The weighted average number of shares outstanding is 2,210,000.
12. Cell Services Inc. (CSI) had 1,000,000 average shares outstanding during all of 2009. During 2009, CSI also had 10,000 options outstanding with exercise prices of USD10 each. The average stock price of CSI during 2009 was USD15. For purposes of computing diluted earnings per share, how many shares would be used in the denominator?
- A. 1,003,333
  - B. 1,006,667
  - C. 1,010,000
13. When calculating diluted EPS, which of the following securities in the capital structure increases the weighted average number of common shares outstanding without affecting net income available to common shareholders?
- A. Stock options
  - B. Convertible debt that is dilutive
  - C. Convertible preferred stock that is dilutive
14. Which statement is *most* accurate? A common size income statement:
- A. restates each line item of the income statement as a percentage of net income.

- B. allows an analyst to conduct cross-sectional analysis by removing the effect of company size.
- C. standardizes each line item of the income statement but fails to help an analyst identify differences in companies' strategies.

## SOLUTIONS

1. B is correct. Under IFRS, income includes increases in economic benefits from increases in assets, enhancement of assets, and decreases in liabilities.
2. B is correct. Net revenue is revenue for goods sold during the period less any returns and allowances, or USD1,000,000 minus USD100,000 = USD900,000.
3. A is correct. Apex is not the owner of the goods and should only report its net commission as revenue.
4. C is correct. Under the converged accounting standards, the incremental costs of obtaining a contract and certain costs incurred to fulfill a contract must be capitalized. If a company expensed these incremental costs in the years prior to adopting the converged standards, all else being equal, its profitability will appear higher under the converged standards.
5. A is correct. A fire may be infrequent, but it would still be part of continuing operations and reported in the profit and loss statement. Discontinued operations relate to a decision to dispose of an operating division.
6. C is correct. If a company changes an accounting policy, the financial statements for all fiscal years shown in a company's financial report are presented, if practical, as if the newly adopted accounting policy had been used throughout the entire period; this retrospective application of the change makes the financial results of any prior years included in the report comparable. Notes to the financial statements describe the change and explain the justification for the change.
7. C is correct. The weighted average number of shares outstanding for 2009 is 1,050,000. Basic earnings per share would be USD1,000,000 divided by 1,050,000, or USD0.95.
8. A is correct. Basic and diluted EPS are equal for a company with a simple capital structure. A company that issues only common stock, with no financial instruments that are potentially convertible into common stock has a simple capital structure. Basic EPS is calculated using the weighted average number of shares outstanding.

9. C is correct.

Diluted EPS

$$= (\text{Net income}) / (\text{Weighted average number of shares outstanding} + \text{New common shares that would have been issued at conversion})$$

$$= \text{USD}200,000,000 / [50,000,000 + (2,000,000 \times 2)]$$

$$= \text{USD}3.70$$

The diluted EPS assumes that the preferred dividend is not paid and that the shares are converted at the beginning of the period.

10. B is correct. The formula to calculate diluted EPS is as follows:

## Diluted EPS

= (Net income – Preferred dividends)/[Weighted average number of shares outstanding + (New shares that would have been issued at option exercise – Shares that could have been purchased with cash received upon exercise) × (Proportion of year during which the financial instruments were outstanding)].

The underlying assumption is that outstanding options are exercised, and then the proceeds from the issuance of new shares are used to repurchase shares already outstanding:

Proceeds from option exercise =  $100,000 \times \text{USD}20 = \text{USD}2,000,000$

Shares repurchased =  $\text{USD}2,000,000/\text{USD}25 = 80,000$

The net increase in shares outstanding is thus  $100,000 - 80,000 = 20,000$ . Therefore, the diluted EPS for CWC =  $(\text{USD}12,000,000 - \text{USD}800,000)/2,020,000 = \text{USD}5.54$ .

11. B is correct. LB has warrants in its capital structure; if the exercise price is less than the weighted average market price during the year, the effect of their conversion is to increase the weighted average number of common shares outstanding, causing diluted EPS to be lower than basic EPS. If the exercise price is equal to the weighted average market price, the number of shares issued equals the number of shares repurchased. Therefore, the weighted average number of common shares outstanding is not affected and diluted EPS equals basic EPS. If the exercise price is greater than the weighted average market price, the effect of their conversion is anti-dilutive. As such, they are not included in the calculation of basic EPS. LB's basic EPS is  $\text{USD}1.22 [= (\text{USD}3,350,000 - \text{USD}430,000)/2,400,000]$ . Stock dividends are treated as having been issued retroactively to the beginning of the period.
12. A is correct. With stock options, the treasury stock method must be used. Under that method, the company would receive  $\text{USD}100,000 (10,000 \times \text{USD}10)$  and would repurchase 6,667 shares ( $\text{USD}100,000/\text{USD}15$ ). The shares for the denominator would be:

Shares outstanding	1,000,000
Options exercises	10,000
Treasury shares purchased	(6,667)
Denominator	1,003,333

13. A is correct. When a company has stock options outstanding, diluted EPS is calculated as if the financial instruments had been exercised and the company had used the proceeds from the exercise to repurchase as many shares possible at the weighted average market price of common stock during the period. As a result, the conversion of stock options increases the number of common shares outstanding but has no effect on net income available to common shareholders. The conversion of convertible debt increases the net income available to common shareholders by the after-tax amount of interest expense saved. The conversion of convertible preferred shares increases the net income available to common shareholders by the amount of preferred dividends paid; the numerator becomes the net income.
14. B is correct. Common size income statements facilitate comparison across time periods (time-series analysis) and across companies (cross-sectional analysis) by stating each line item of the income statement as a percentage of revenue. The relative performance of different companies can be more easily assessed because

scaling the numbers removes the effect of size. A common size income statement states each line item on the income statement as a percentage of revenue. The standardization of each line item makes a common size income statement useful for identifying differences in companies' strategies.

## LEARNING MODULE

# 3

### Analyzing Balance Sheets

#### LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	explain the financial reporting and disclosures related to intangible assets
<input type="checkbox"/>	explain the financial reporting and disclosures related to goodwill
<input type="checkbox"/>	explain the financial reporting and disclosures related to financial instruments
<input type="checkbox"/>	explain the financial reporting and disclosures related to non-current liabilities
<input type="checkbox"/>	calculate and interpret common-size balance sheets and related financial ratios

#### INTRODUCTION

1

The balance sheet discloses what an entity owns (assets), what an entity owes (liabilities), and the owners' interest in the net assets of a company (equity) at a specific point in time. While many balance sheet items are reported at historical cost, some items are measured differently, such as at fair value, and some events and transactions—perhaps contrary to analyst's expectations—are not recognized at all. Analysts must be familiar with the different rules and practices for recognition, measurement, and disclosure of balance sheet items to evaluate the liquidity, solvency, and overall financial position of companies. To do so, analysts often compute ratios involving the balance sheet and other financial statements, such as the ratio of debt to operating income or cash flows, which can be compared to other companies and over time.

#### LEARNING MODULE OVERVIEW

- Some assets and liabilities are measured at fair value and some are measured at amortized or historical cost. Notes to the financial statements provide information that is helpful in assessing the comparability of measurement bases across companies.



The two major accounting standard setters are as follows: 1) the International Accounting Standards Board (IASB) who establishes International Financial Reporting Standards (IFRS) and 2) the Financial Accounting Standards Board (FASB) who establishes US GAAP. Throughout this learning module both standards are referred to and many, but not all, of these two sets of accounting rules are identified. Note: changes in accounting standards as well as new rulings and/or pronouncements issued after the publication of this learning module may cause some of the information to become dated.

- Intangible assets refer to identifiable non-monetary assets without physical substance. Examples include patents, licenses, and trademarks. For each intangible asset, a company assesses whether its useful life is finite or indefinite.
- An intangible asset with a finite useful life is amortized on a systematic basis over the best estimate of its useful life, with the amortization method and useful life estimate reviewed at least annually. Intangibles are subject to impairment as well, in a similar manner to tangible assets like property, plant, and equipment.
- An intangible asset with an indefinite useful life is not amortized. Instead, it is tested for impairment at least annually.
- For internally generated intangible assets, the International Financial Reporting Standards (IFRS) require that costs incurred during the research phase must be expensed. Costs incurred in the development stage can be capitalized as intangible assets if certain criteria are met, including technological feasibility, the ability to use or sell the resulting asset, and the ability to complete the project.
- The most common intangible asset that is not a separately identifiable asset is goodwill, which arises in business combinations. Goodwill is not amortized; instead it is tested for impairment at least annually.
- Financial instruments are contracts that give rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. In general, financial instruments are measured in two ways: fair value or amortized cost. For financial instruments measured at fair value, the two basic alternatives in how net changes in fair value are recognized are (1) as profit or loss on the income statement, or (2) as other comprehensive income (loss) that bypasses the income statement.
- Common long-term liabilities include loans (i.e., borrowings from banks), notes or bonds payable (i.e., fixed-income securities issued to investors), leases, and post-employment liabilities. Liabilities are usually reported at amortized cost or fair value on the balance sheet.
- Vertical common-size analysis of the balance sheet involves expressing each balance sheet item as a percentage of total assets.
- Balance sheet ratios include liquidity ratios (measuring the company's ability to meet its short-term obligations) and solvency ratios (measuring the company's ability to meet long-term and other obligations).

## 2

### INTANGIBLE ASSETS



explain the financial reporting and disclosures related to intangible assets



**Intangible assets** are identifiable non-monetary assets without physical substance.<sup>1</sup> An identifiable asset can be acquired on a standalone basis (i.e., can be separated from the entity) or arises from contractual or legal rights and privileges. Common examples include patents, licenses, trademarks, and customer lists. The most common intangible that is *not* separately identifiable is goodwill, which arises in business combinations and is discussed further in the next lesson.

IFRS permits companies to report intangible assets using either a cost model or a revaluation model. The revaluation model can be selected only when there is an active market for an intangible asset. Both measurement models are essentially the same as described for property, plant, and equipment (PP&E). US GAAP permits only the cost model.

For each intangible asset, a company assesses whether the useful life of the asset is finite or indefinite. Amortization and impairment principles apply as follows:

- An intangible asset with a finite useful life is amortized on a systematic basis over the best estimate of its useful life, with the amortization method and useful life estimate reviewed at least annually.
- Impairment principles for an intangible asset with a finite useful life are the same as for PP&E.
- An intangible asset with an indefinite useful life is not amortized. Instead, at least annually, the reasonableness of assuming an indefinite useful life for the asset is reviewed and the asset is tested for impairment.

Financial analysts traditionally view reported values of intangible assets - particularly goodwill - with caution. Consequently, in assessing financial statements, some analysts exclude the book value assigned to intangibles, reducing net equity by an equal amount (obtaining a “tangible book value”) and increasing pretax income by any amortization expense or impairment associated with the intangibles. An arbitrary assignment of zero value to intangibles is not advisable; instead, an analyst should examine each listed intangible and assess whether an adjustment should be made. Note disclosures about intangible assets may provide useful information to the analyst. These disclosures include information about useful lives, amortization rates and methods, and impairment losses recognized or reversed.

Further, a company may have developed intangible assets internally that can be recognized only in certain circumstances. Companies may also have assets that are never recorded on a balance sheet because they are non-identifiable and the company does not have sufficient control over their future economic benefits. These assets might include management and technical skills of employees, market share, name recognition, a good reputation among customers, and so forth. Such assets are valuable and are reflected, in theory, in the price at which the company's equity securities trade in the market (and the price at which the entirety of the company's equity would be sold in an acquisition transaction). Such assets may be recognized as goodwill by an acquirer if the company is sold.

## Identifiable Intangibles

Under IFRS, identifiable intangible assets are recognized on the balance sheet if it is probable that future economic benefits will flow to the company and the cost of the asset can be measured reliably. Examples of identifiable intangible assets include patents, trademarks, copyrights, franchises, licenses, and other rights. Identifiable intangible assets may have been created internally or purchased by a company. Determining the

cost of internally created intangible assets can be difficult and subjective. For these reasons, under IFRS and US GAAP, the general requirement is that internally created identifiable intangibles are expensed rather than reported on the balance sheet.

IFRS provides that for internally created intangible assets, the company must separately identify its research phase and development phase.<sup>2</sup> The research phase includes activities that seek new knowledge or products. The development phase occurs after the research phase and includes design or testing of prototypes and models. IFRS requires that costs to internally generate intangible assets during the research phase must be expensed on the income statement while costs incurred in the development stage can be capitalized as intangible assets if certain criteria are met, including technological feasibility, the ability to use or sell the resulting asset, and the ability to complete the project.

US GAAP prohibits the capitalization of most costs of internally developed intangibles and research and development. All such costs are expensed. Costs related to the following categories typically are expensed under IFRS and US GAAP. They include the following:

- internally generated brands, mastheads, publishing titles, and customer lists;
- start-up costs;
- training costs;
- administrative and other general overhead costs;
- advertising and promotion;
- relocation and reorganization expenses; and
- redundancy and other termination costs.

In contrast to internally created intangibles, *acquired* or *purchased* intangible assets are capitalized and reported as separately identifiable intangible, so long as they arise from contractual rights (such as a licensing agreement), other legal rights (such as patents), or have the ability to be separated and sold (such as a customer list).

#### MEASURING INTANGIBLE ASSETS



Alpha Inc., a motor vehicle manufacturer, has a research division that worked on the following projects during the year:

- Project 1 Research aimed at finding a steering mechanism that does not operate like a conventional steering wheel but reacts to the impulses from a driver's fingers.
- Project 2 The design of a prototype welding apparatus that is controlled electronically rather than mechanically. The apparatus has been determined to be technologically feasible, salable, and feasible to produce.

The following is a summary of the expenses of the research division (in thousands of euros):

**Exhibit 1: Summary of Expenses**

	General	Project 1	Project 2
Material and services	128	935	620
Labor			
▪ Direct labor	—	630	320
▪ Administrative personnel	720	—	—
Design, construction, and testing	270	450	470

1. Five percent of administrative personnel costs can be attributed to each project (Project 1 and 2). Explain the accounting treatment of Alpha's costs for Projects 1 and 2 under IFRS and US GAAP.

**Solution to 1:**

Under IFRS, the capitalization of internal development costs for Projects 1 and 2 would be as follows:

		Amount Capitalized as an Asset (in thousands of euros)
Project 1:	Classified as in the research stage, so all costs are recognized as expenses	0
Project 2:	Classified as in the development stage, so costs may be capitalized. Note that administrative costs are not capitalized.	$(620 + 320 + 470) = 1,410$

Under US GAAP, there would no capitalization of these costs as US GAAP prohibits the capitalization of most costs of internally developed intangibles and research and development. All costs would be expensed.

Consider the balance sheet information presented in Exhibit 2 and 3 for SAP and Apple. SAP's 2017 balance sheet shows EUR2,967 million of intangible assets, and Apple's 2017 balance sheet shows acquired intangible assets, net of USD2,298 million. SAP's notes to financial statements disclose the types of intangible assets (software and database licenses, purchased software to be incorporated into its products, customer contracts, and acquired trademark licenses) and indicates that all of its purchased intangible assets other than goodwill have finite useful lives and are amortized either based on expected consumption of economic benefits or on a straight-line basis over their estimated useful lives, which range from 2 to 20 years. Apple's notes disclose that its acquired intangible assets consist primarily of patents and licenses, and almost the entire amount represents definite-lived and amortizable assets for which the remaining weighted-average amortization period is 3.4 years as of 2017.

**Exhibit 2: SAP Group Consolidated Statements of Financial Position (Excerpt: Non-Current Assets Detail) (in millions of EUR)**

	<b>As of 31 December</b>	
<b>Assets</b>	<b>2017</b>	<b>2016</b>
Total current assets	11,930	11,564
Goodwill	21,274	23,311
Intangible assets	2,967	3,786
Property, plant and equipment	2,967	2,580
Other financial assets	1,155	1,358
Trade and other receivables	118	126
Other non-financial assets	621	532
Tax assets	443	450
Deferred tax assets	1,022	571
Total non-current assets	30,567	32,713
<b>Total assets</b>	<b>42,497</b>	<b>44,277</b>
Total current liabilities	10,210	9,674
Total non-current liabilities	6,747	8,205
<b>Total liabilities</b>	<b>16,958</b>	<b>17,880</b>
<b>Total equity</b>	<b>25,540</b>	<b>26,397</b>
<b>Total equity and liabilities</b>	<b>€42,497</b>	<b>€44,277</b>

Source: SAP Group 2017 annual report.

**Exhibit 3: Apple, Inc. Consolidated Balance Sheets (Excerpt: Non-Current Assets Detail) (in millions of US dollars)**

<b>Assets</b>	<b>30 September 2017</b>	<b>24 September 2016</b>
Total current assets	128,645	106,869
Long-term marketable securities	194,714	170,430
Property, plant and equipment, net	33,783	27,010
Goodwill	5,717	5,414
Acquired intangible assets, net	2,298	3,206
Other non-current assets	10,162	8,757
<i>[All other assets]</i>	<i>246,674</i>	<i>214,817</i>
<b>Total assets</b>	<b>375,319</b>	<b>321,686</b>
<b>Liabilities and shareholders' equity</b>		
Total current liabilities	100,814	79,006
<i>[Total non-current liabilities]</i>	<i>140,458</i>	<i>114,431</i>
<b>Total liabilities</b>	<b>241,272</b>	<b>193,437</b>
<b>Total shareholders' equity</b>	<b>134,047</b>	<b>128,249</b>
<b>Total liabilities and shareholders' equity</b>	<b>375,319</b>	<b>321,686</b>

Note: The balance sheet items presented in this excerpt are in millions of US dollars.

financial statement as prepared by the company.  
 Source: Apple Inc. 2017 annual report (Form 10K).

## GOODWILL

### 3

- ☐ explain the financial reporting and disclosures related to goodwill

When one company acquires another, the purchase price is allocated to all of the identifiable assets (tangible and intangible) and liabilities acquired, based on fair value. If the purchase price is greater than the fair value of the identifiable assets and liabilities acquired, the excess amount is recognized as an asset, **goodwill**. To understand why an acquirer would pay more to purchase a company than the fair value of the target company's identifiable assets net of liabilities, consider the following three observations. First, certain items not recognized in the acquiree's financial statements (e.g., its reputation, established distribution system, trained employees) have value. Second, a target company's expenditures in research and development may not have resulted in a separately identifiable asset that meets the criteria for recognition but nonetheless may have created some value. Third, part of the value of an acquisition may arise from improved strategic positioning versus a competitor or from perceived synergies such as operating cost saving opportunities after the acquisition.

The subject of recognizing goodwill in financial statements has both proponents and opponents. The proponents of goodwill recognition assert that goodwill is the present value of excess returns that a company is expected to earn. This group claims that determining the present value of these excess returns is analogous to determining the present value of future cash flows associated with other assets and projects. Opponents of goodwill recognition claim that the prices paid for acquisitions often turn out to be based on unrealistic expectations, thereby leading to future write-offs of goodwill.

Analysts should distinguish between accounting goodwill and economic goodwill. Economic goodwill is based on the economic performance of the entity, whereas accounting goodwill is based on accounting standards and is reported only in the case of acquisitions. Economic goodwill is important to analysts and investors, and it is not necessarily reflected on the balance sheet. Instead, economic goodwill is reflected in the stock price (at least in theory). Some financial statement users believe that goodwill should not be listed on the balance sheet, because it cannot be sold separately from the entity. These financial statement users believe that only assets that can be separately identified and sold should be reflected on the balance sheet. Other financial statement users analyze goodwill and any subsequent impairment charges to assess management's performance on prior acquisitions.

Under both IFRS and US GAAP, accounting goodwill arising from acquisitions is capitalized. Goodwill is not amortized but is tested for impairment annually. If goodwill is deemed to be impaired, an impairment loss is charged against income in the current period, reducing earnings. An impairment loss also reduces total assets, so some performance measures, such as return on assets (net income divided by average total assets), may increase in future periods. An impairment loss is a non-cash item.

Accounting standards' requirements for recognizing goodwill can be summarized by the following steps:

- Step 1 The total cost to purchase the target company (the acquiree) is determined.

- Step 2 The acquiree's identifiable assets are measured at fair value. The acquiree's liabilities and contingent liabilities are measured at fair value. The difference between the fair value of identifiable assets and the fair value of the liabilities and contingent liabilities equals the net identifiable assets acquired.
- Step 3 Goodwill arising from the purchase is the excess of (1) the cost to purchase the target company over (2) the net identifiable assets acquired. Occasionally, a transaction will involve the purchase of net identifiable assets with a value greater than the cost to purchase. Such a transaction is called a "bargain purchase." Any gain from a bargain purchase is recognized in profit and loss in the period in which it arises.<sup>3</sup>

Companies are also required to disclose information that enables users to evaluate the nature and financial effect of business combinations. The required disclosures include, for example, the acquisition date fair value of the total cost to purchase the target company, the acquisition date amount recognized for each major class of assets and liabilities, and a qualitative description of the factors that make up the goodwill recognized.

Despite the guidance incorporated in accounting standards, analysts should be aware that the estimations of fair value involve considerable management judgment. Values for intangible assets, such as computer software, might not be easily validated when analyzing acquisitions. Management judgment about valuation in turn affects current and future financial statements because identifiable intangible assets with definite lives are amortized over time. In contrast, neither goodwill nor identifiable intangible assets with indefinite lives are amortized; instead, as noted, both are tested annually for impairment.

The recognition and impairment of goodwill can significantly affect the comparability of financial statements between companies. Therefore, analysts often adjust the companies' financial statements by removing the impact of goodwill. Such adjustments include the following:

- excluding goodwill from balance sheet data used to compute financial ratios, and
- excluding goodwill impairment losses from income data used to examine operating trends.

In addition, analysts can develop expectations about a company's performance following an acquisition by taking into account the purchase price paid relative to the net assets and earnings prospects of the acquired company.

#### GOODWILL IMPAIRMENT



Safeway, Inc., is a North American food and drug retailer. On 25 February 2010, Safeway issued a press release that included the following information:

- Safeway Inc. today reported a net loss of USD1,609.1 million (USD4.06 per diluted share) for the 16-week fourth quarter of 2009. Excluding a non-cash goodwill impairment charge of USD1,818.2 million, net of tax (USD4.59 per diluted share), net income would have been

<sup>3</sup> IERS 3, *Business Combinations* and Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 323, *Investments—Equity Method and Joint Ventures*.

<p>USD209.1 million (USD0.53 per diluted share). Net income was USD338.0 million (USD0.79 per diluted share) for the 17-week fourth quarter of 2008.</p> <ul style="list-style-type: none"> <li>▪ In the fourth quarter of 2009, Safeway recorded a non-cash goodwill impairment charge of USD1,974.2 million (USD1,818.2 million, net of tax). The impairment was due primarily to Safeway's reduced market capitalization and a weak economy. . . . The goodwill originated from previous acquisitions.</li> <li>▪ Safeway's balance sheet as of 2 January 2010 showed goodwill of USD426.6 million and total assets of USD14,963.6 million. The company's balance sheet as of 3 January 2009 showed goodwill of USD2,390.2 million and total assets of USD17,484.7 million.</li> </ul>	
<p>1. How significant was this goodwill impairment charge?</p> <p><b>Solution:</b></p> <p>The goodwill impairment was more than 80 percent of the total value of goodwill and 11 percent of total assets, so it was clearly significant. (The charge of USD1,974.2 million equals 82.6 percent of the USD2,390.2 million of goodwill at the beginning of the year and 11.3 percent of the USD17,484.7 million total assets at the beginning of the year.)</p>	
<p>2. With reference to acquisition prices, what might this goodwill impairment indicate?</p> <p><b>Solution:</b></p> <p>The goodwill had originated from previous acquisitions. The impairment charge implies that the acquired operations are now worth less than the price that was paid for their acquisition.</p>	

As presented in Exhibits 2 and 3, SAP's 2017 balance sheet shows EUR21,274 million of goodwill, and Apple's 2017 balance sheet shows goodwill of USD5,717 million. Goodwill represents 50.1 percent of SAP's total assets and only 1.5 percent of Apple's total assets. An analyst may be concerned that goodwill represents such a high proportion of SAP's total assets.

## FINANCIAL INSTRUMENTS

# 4



explain the financial reporting and disclosures related to financial instruments

IFRS defines a financial instrument as a contract that gives rise to a financial asset of one entity, and a financial liability or equity instrument of another entity.<sup>4</sup> This lesson focuses on financial assets, such as a company's investments in stocks issued by another company or its investments in the notes, bonds, or other fixed-income instruments issued by another company (or issued by a governmental entity). Financial liabilities, such as notes payable and bonds payable issued by the company, will be discussed later. Some financial instruments may be classified as either an asset or a liability

depending on the contractual terms and current market conditions. One example of such a financial instrument is a derivative. **Derivatives** are financial instruments for which the value is derived based on some underlying factor (interest rate, exchange rate, commodity price, security price, or credit rating) and for which little or no initial investment is required.

Financial instruments are generally recognized when the entity becomes a party to the contractual provisions of the instrument. In general, the two basic alternative ways that financial instruments are measured subsequent to initial acquisition are fair value or amortized cost. Recall that fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly market transaction.<sup>5</sup> The amortized cost of a financial asset (or liability) is the amount at which it was initially recognized, minus any principal repayments, plus or minus any amortization of discount or premium, and minus any reduction for impairment.

Under IFRS, financial assets are subsequently measured at amortized cost if the asset's cash flows occur on specified dates and consist solely of principal and interest, and if the business model is to hold the asset to maturity. The concept is similar in US GAAP, where this category of asset is referred to as **held-to-maturity**. An example is an investment in a long-term bond issued by another company or by a government; the value of the bond will fluctuate, for example with interest rate movements, but if the bond is classified as a held-to-maturity investment, it will be measured at amortized cost on the balance sheet of the investing company. Other types of financial assets measured at amortized cost are loans to other companies.

For financial instruments measured at fair value, the two basic alternatives in how net changes in fair value are recognized are (1) as profit or loss on the income statement, or (2) as other comprehensive income (loss), which bypasses the income statement. Note that these alternatives refer to *unrealized* changes in fair value, that is, changes in the value of a financial asset that has not been sold and is still owned at the end of the period. Unrealized gains and losses also are referred to as holding period gains and losses. *Realized* gains or losses as a result of a sale are reported on the income statement.

Under IFRS, financial assets are subsequently measured at fair value through other comprehensive income (i.e., any unrealized holding gains or losses are recognized in other comprehensive income) if the business model's objective involves both collecting contractual cash flows and selling the financial assets. This IFRS category applies specifically to debt investments, namely assets with cash flows occurring on specified dates and consisting solely of principal and interest. However, IFRS also permits equity investments to be measured at fair value through other comprehensive income if, at the time a company buys an equity investment, the company decides to make an irrevocable election to measure the asset in this manner.<sup>6</sup> The concept is similar to the US GAAP investment category **available-for-sale** in which assets are measured at fair value, with any unrealized holding gains or losses recognized in other comprehensive income. Unlike IFRS, however, the US GAAP category available-for-sale applies only to debt securities and is not permitted for investments in equity securities.<sup>7</sup>

Under IFRS, financial assets are subsequently measured at fair value through profit or loss (i.e., any unrealized holding gains or losses are recognized in the income statement) if they are not assigned to either of the other two measurement categories described earlier. In addition, IFRS allows a company to make an irrevocable election at acquisition to measure a financial asset in this category. Under US GAAP, all investments in equity securities (other than investments giving rise to ownership

5 IFRS 13, *Fair Value Measurement*; and US GAAP ASC 820, *Fair Value Measurement*.

6 IFRS 7, *Financial Instruments: Disclosures*, paragraph 8(h); and IFRS 9 *Financial Instruments*, paragraph 5.7.5.

7 US GAAP Accounting Standards Update (ASU) 2016-01, *Recognition and Measurement of Financial Assets and Liabilities*, paragraph 11.



positions that confer significant influence over the investee) are measured at fair value with unrealized holding gains or losses recognized in the income statement. Under US GAAP, debt securities designated as trading securities are also measured at fair value with unrealized holding gains or losses recognized in the income statement. The trading securities category pertains to a debt security that is acquired with the intent of selling it rather than holding it to collect the interest and principal payments.

Exhibit 4 summarizes how various financial assets are classified and measured subsequent to acquisition.

#### Exhibit 4: Measurement of Financial Assets

Measured at Cost or Amortized Cost	Measured at Fair Value through Other Comprehensive Income	Measured at Fair Value through Profit and Loss
<ul style="list-style-type: none"> <li>Debt securities that are to be held to maturity.</li> <li>Loans and notes receivable</li> <li>Unquoted equity instruments (in limited circumstances in which the fair value is not reliably measurable, cost may serve as a proxy [estimate] for fair value)</li> </ul>	<ul style="list-style-type: none"> <li>“Available-for-sale” debt securities (US GAAP); debt securities for which the business model involves both collecting interest and principal and selling the security (IFRS)</li> <li>Equity investments for which the company irrevocably elects this measurement at acquisition (IFRS only)</li> </ul>	<ul style="list-style-type: none"> <li>All equity securities unless the investment gives the investor significant influence (US GAAP only)</li> <li>“Trading” debt securities (US GAAP)</li> <li>Securities not assigned to either of the other two categories, or investments for which the company irrevocably elects this measurement at acquisition (IFRS only)</li> </ul>

To illustrate the different accounting treatments of the gains and losses on financial assets, consider an entity that invests EUR100,000,000 on 1 January 202X in a fixed-income security investment, with a 5 percent coupon paid semi-annually. After six months, the company receives the first coupon payment of EUR2,500,000. Additionally, market interest rates have declined such that the value of the fixed-income investment has increased by EUR2,000,000 as of 30 June 202X. Exhibit 5 illustrates how this situation will be portrayed on the balance sheet and income statement (ignoring taxes) of the entity concerned, under each of the following three measurement categories of financial assets: assets held for trading purposes, assets available for sale, and held-to-maturity assets.

#### Exhibit 5: Accounting for Gains and Losses on Marketable Securities

IFRS Categories	Measured at Cost or Amortized Cost	Measured at Fair Value through Other Comprehensive Income	Measured at Fair Value through Profit and Loss
<i>US GAAP Comparable Categories</i>	<i>Held to Maturity</i>	<i>Available-for-Sale Debt Securities</i>	<i>Trading Debt Securities</i>
<b>Income Statement for period 1 January–30 June 202X</b>			
Interest income	2,500,000	2,500,000	2,500,000
Unrealized gains	—	—	2,000,000
Impact on profit and loss	2,500,000	2,500,000	4,500,000
<b>Balance Sheet as of 30 June 202X</b>			
<i>Assets</i>			
Cash and cash equivalents	2,500,000	2,500,000	2,500,000
Cost of securities	100,000,000	100,000,000	100,000,000

IFRS Categories	Measured at Cost or Amortized Cost	Measured at Fair Value through Other Comprehensive Income	Measured at Fair Value through Profit and Loss
Unrealized gains on securities	—	2,000,000	2,000,000
	102,500,000	104,500,000	104,500,000
<i>Liabilities</i>			
<i>Equity</i>			
Paid-in capital	100,000,000	100,000,000	100,000,000
Retained earnings	2,500,000	2,500,000	4,500,000
Accumulated other comprehensive income	—	2,000,000	—
	102,500,000	104,500,000	104,500,000

In the case of securities classified as Measured at Cost or Amortized Cost, or equivalently held-to-maturity (US GAAP), the income statement shows only the interest income (which is then reflected in retained earnings on the ending balance sheet). Because the securities are measured at cost rather than at fair value, no unrealized gain is recognized. On the balance sheet, the investment asset is shown at its amortized cost of EUR100,000,000.

In the case of securities classified as Measured at Fair Value through Other Comprehensive Income (IFRS), or equivalently as Available-for-Sale debt securities (US GAAP), the income statement shows only the interest income (which is then reflected in retained earnings on the ending balance sheet). The unrealized gain does not appear on the income statement; instead, it would appear on a Statement of Comprehensive Income as Other Comprehensive Income. On the balance sheet, the investment asset is shown at its fair value of EUR102,000,000. (Exhibit 5 shows the unrealized gain on a separate line solely to highlight the impact of the change in value. In practice, the investments would be shown at their fair value on a single line.) In the case of securities classified as Measured at Fair Value through Profit and Loss (IFRS), or equivalently as trading debt securities (US GAAP), both the interest income and the unrealized gain are included on the income statement and thus are reflected in retained earnings on the balance sheet.

From the information presented in Exhibits 2 and 6, SAP's 2017 balance sheet shows other financial assets of EUR990 million (current, Exhibit 6) and EUR1,155 million (non-current, Exhibit 2). The company's notes disclose that the largest component of the current financial assets are loans and other financial receivables (EUR793 million) and the largest component of the non-current financial assets is EUR827 million of available-for-sale equity investments.

**Exhibit 6: SAP Group Consolidated Statements of Financial Position (Excerpt: Current Assets Detail) (in millions of euros)**

Assets	As of 31 December	
	2017	2016
Cash and cash equivalents	€4,011	€3,702
Other financial assets	990	1,124
Trade and other receivables	5,800	5,924

Assets	As of 31 December	
	2017	2016
Other non-financial assets	725	581
Tax assets	306	233
Total current assets	11,930	11,564
Total non-current assets	30,567	32,713
<b>Total assets</b>	<b>42,497</b>	<b>44,277</b>
Total current liabilities	10,210	9,674
Total non-current liabilities	6,747	8,205
Total liabilities	16,958	17,880
Total equity	25,540	26,397
<b>Total equity and liabilities</b>	<b>€42,497</b>	<b>€44,277</b>

Source: SAP Group 2017 annual report.

**Exhibit 7: Apple, Inc. Consolidated Balance Sheets (Excerpt: Current Assets Detail) (in millions of US dollars)**

Assets	30 September, 2017	24 September, 2016
Cash and cash equivalents	\$20,289	\$20,484
Short-term marketable securities	53,892	46,671
Accounts receivable, less allowances of \$58 and \$53, respectively	17,874	15,754
Inventories	4,855	2,132
Vendor non-trade receivables	17,799	13,545
Other current assets	13,936	8,283
Total current assets	128,645	106,869
<i>[All other assets]</i>	<i>246,674</i>	<i>214,817</i>
<b>Total assets</b>	<b>375,319</b>	<b>321,686</b>
Total current liabilities	100,814	79,006
<i>[Total non-current liabilities]</i>	<i>140,458</i>	<i>114,431</i>
Total liabilities	241,272	193,437
Total shareholders' equity	134,047	128,249
<b>Total liabilities and shareholders' equity</b>	<b>\$375,319</b>	<b>\$321,686</b>

Note: The italicized subtotals presented in this excerpt are not explicitly shown on the face of the financial statement as prepared by the company.

Source: Apple Inc. 2017 annual report (Form 10K).

In Exhibits 3 and 7, Apple's 2017 balance sheet shows USD53,892 million of short-term marketable securities (current, Exhibit 7) and USD194,714 million of long-term marketable securities (non-current, Exhibit 3). In total, marketable securities represent more than 66 percent of Apple's USD375.3 billion in total assets. Marketable securities plus cash and cash equivalents represent around 72 percent of the company's total assets. Apple's notes disclose that most of the company's marketable securities are fixed-income securities issued by the US government or its agencies (USD60,237 million) and by other companies, including technology companies (USD114,454 million).

In accordance with its investment policy, Apple invests in highly rated securities (which the company defines as investment grade) and limits its credit exposure to any one issuer. The company classifies its marketable securities as available for sale and reports them on the balance sheet at fair value. Unrealized gains and losses are reported in other comprehensive income.

## 5

### NON-CURRENT LIABILITIES



explain the financial reporting and disclosures related to non-current liabilities

All liabilities that are not classified as current are considered to be non-current or long-term. Exhibit 8 and Exhibit 9 present balance sheet excerpts for SAP Group and Apple Inc. showing the line items for the companies' non-current liabilities.

Both companies' balance sheets show non-current unearned revenue (deferred income for SAP Group and deferred revenue for Apple). These amounts represent unearned revenue relating to goods and services expected to be delivered in periods beyond 12 months following the reporting period. The sections that follow focus on two common types of non-current (long-term) liabilities: long-term financial liabilities and deferred tax liabilities.

#### Exhibit 8: SAP Group Consolidated Statements of Financial Position (Excerpt: Non-Current Liabilities Detail) (in millions of euros)

	As of 31 December	
	2017	2016
<b>Assets</b>		
Total current assets	11,930	11,564
Total non-current assets	30,567	32,713
Total assets	42,497	44,277
Financial liabilities (current)	1,561	1,813
Total current liabilities	10,210	9,674
Trade and other payables	119	127
Tax liabilities	470	365
Financial liabilities	5,034	6,481
Other non-financial liabilities	503	461
Provisions	303	217
Deferred tax liabilities	240	411
Deferred income	79	143
Total non-current liabilities	6,747	8,205
Total liabilities	16,958	17,880
Total equity	25,540	26,397
Total equity and liabilities	EUR42,497	EUR44,277

Source: SAP Group 2017 annual report.

**Exhibit 9: Apple Inc. Consolidated Balance Sheet (Excerpt: Non-Current Liabilities Detail)\* (in millions of US dollars)**

<b>Assets</b>	<b>30 September 2017</b>	<b>24 September 2016</b>
Total current assets	128,645	106,869
<i>[All other assets]</i>	<i>246,674</i>	<i>214,817</i>
<b>Total assets</b>	<b>375,319</b>	<b>321,686</b>
<b>Liabilities and shareholders' equity</b>		
Total current liabilities	100,814	79,006
Deferred revenue, non-current	2,836	2,930
Long-term debt	97,207	75,427
Other non-current liabilities	40,415	36,074
<i>[Total non-current liabilities]</i>	<i>140,458</i>	<i>114,431</i>
<b>Total liabilities</b>	<b>241,272</b>	<b>193,437</b>
<b>Total shareholders' equity</b>	<b>134,047</b>	<b>128,249</b>
<b>Total liabilities and shareholders' equity</b>	<b>375,319</b>	<b>321,686</b>

Note: The italicized subtotals presented in this excerpt are not explicitly shown on the face of the financial statement as prepared by the company.

Source: Apple Inc. 2017 annual report (Form 10K).

## Long-Term Financial Liabilities

Typical long-term financial liabilities include loans (i.e., borrowings from banks) and notes or bonds payable (i.e., fixed-income securities issued to investors). Liabilities such as loans payable and bonds payable are usually reported at amortized cost on the balance sheet. At maturity, the amortized cost of the bond (carrying amount) will be equal to the face value of the bond. For example, if a company issues USD10,000,000 of bonds at par value, the bonds are reported as a long-term liability of USD10 million. The carrying amount (amortized cost) from the date of issue to the date of maturity remains at USD10 million. As another example, if a company issues USD10,000,000 of bonds at a price of 97.50 percent of par value (a discount to par), the bonds are reported as a liability of USD9,750,000 at issue date. Over the bond's life, the discount of USD250,000 is amortized so that the bond will be reported as a liability of USD10,000,000 at maturity. Similarly, any bond premium would be amortized for bonds issued at a price in excess of par value.

In certain cases, liabilities such as bonds issued by a company are reported at fair value. Those cases include financial liabilities held for trading, derivatives that are a liability to the company, and some non-derivative instruments, such as those which are hedged by derivatives.

SAP's balance sheet in Exhibit 8 shows EUR5,034 million in financial liabilities, and the notes disclose that these liabilities are mostly for bonds payable. Apple's balance sheet in Exhibit 9 shows USD97,207 million in long-term debt, and the notes disclose that this debt includes floating- and fixed-rate notes with varying maturities.

## Deferred Tax Liabilities

**Deferred tax liabilities** result from temporary timing differences between a company's income as reported for tax purposes (taxable income) and income as reported for financial statement purposes (reported income). Deferred tax liabilities result when taxable income, and the actual income tax payable in a period based on it, is less than the reported financial statement income before taxes and the income tax expense based on it. Deferred tax liabilities are defined as the amounts of income taxes payable in future periods in respect of taxable temporary differences.<sup>8</sup> In contrast, in the previous discussion of unearned revenue, inclusion of revenue in taxable income in an earlier period created a deferred tax asset (essentially prepaid tax).

Deferred tax liabilities typically arise when some expenses are included in taxable income in earlier periods than for financial statement net income. This results in taxable income being less than income before taxes in the earlier periods. As a result, taxes payable based on taxable income are less than income tax expense based on accounting income before taxes. The difference between taxes payable and income tax expense results in a deferred tax liability—for example, when companies use accelerated depreciation methods for tax purposes and straight-line depreciation methods for financial statement purposes. Deferred tax liabilities also arise when some income is included in taxable income in later periods—for example, when a company's subsidiary has profits that have not yet been distributed and thus have not yet been taxed.

SAP's balance sheet in Exhibit 8 shows EUR240 million of deferred tax liabilities. Apple's balance sheet in Exhibit 9 does not show a separate line item for deferred tax liabilities; however, note disclosures indicate that most of the USD40,415 million of other non-current liabilities reported on Apple's balance sheet represents deferred tax liabilities, which totaled USD31,504 million.

Non-current liabilities will be explored in greater detail in a later learning module.

## 6

## RATIOS AND COMMON-SIZE ANALYSIS



calculate and interpret common-size balance sheets and related financial ratios

Analysis of a company's balance sheet can provide insight into the company's liquidity and solvency—as of the balance sheet date—as well as the economic resources the company controls. **Liquidity** refers to a company's ability to meet its short-term financial commitments. Assessments of liquidity focus on a company's ability to convert assets to cash to pay for operating needs. **Solvency** refers to a company's ability to meet its financial obligations over the longer term. Assessments of solvency focus on the company's financial structure and its ability to pay long-term financing obligations. This lesson describes two tools for analyzing the balance sheet: common-size analysis and balance sheet ratios.

## Common-Size Analysis of the Balance Sheet

The first technique, vertical common-size analysis, involves stating each balance sheet item as a percentage of total assets.<sup>9</sup> Common-size balance sheets are useful in comparing a company's balance sheet composition over time (time-series analysis) and across companies in the same industry. To illustrate, Panel A of Exhibit 10 presents balance sheets for three hypothetical companies. Company C, with assets of USD9.75 million is much larger than Company A and Company B, each with only USD3.25 million in assets. The common-size balance sheet presented in Panel B facilitates a comparison of these different-size companies.

### Exhibit 10: Balance Sheets for Companies A, B, and C

<b>Panel A: Balance Sheets</b>			
<b>(in thousands of US dollars)</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>ASSETS</b>			
Current assets			
Cash and cash equivalents	1,000	200	3,000
Short-term marketable securities	900	—	300
Accounts receivable	500	1,050	1,500
Inventory	100	950	300
Total current assets	2,500	2,200	5,100
Property, plant, and equipment, net	750	750	4,650
Intangible assets	—	200	—
Goodwill	—	100	—
Total assets	3,250	3,250	9,750
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>			
Current liabilities			
Accounts payable	—	2,500	600
Total current liabilities	—	2,500	600
Long-term bonds payable	10	10	9,000
Total liabilities	10	2,510	9,600
Total shareholders' equity	3,240	740	150
Total liabilities and shareholders' equity	3,250	3,250	9,750

<b>Panel B: Common-Size Balance Sheets</b>			
<b>(Percent)</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>ASSETS</b>			
Current assets			
Cash and cash equivalents	30.8	6.2	30.8
Short-term marketable securities	27.7	0.0	3.1
Accounts receivable	15.4	32.3	15.4
Inventory	3.1	29.2	3.1

<sup>9</sup> Another type of common-size analysis, known as "horizontal common-size analysis," states quantities in terms of a selected base-year value. Unless otherwise indicated, text references to "common-size analysis" refer to vertical analysis.

**Panel B: Common-Size Balance Sheets**

(Percent)	A	B	C
Total current assets	76.9	67.7	52.3
Property, plant, and equipment, net	23.1	23.1	47.7
Intangible assets	0.0	6.2	0.0
Goodwill	0.0	3.1	0.0
Total assets	100.0	100.0	100.0
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>			
Current liabilities			
Accounts payable	0.0	76.9	6.2
Total current liabilities	0.0	76.9	6.2
Long-term bonds payable	0.3	0.3	92.3
Total liabilities	0.3	77.2	98.5
Total shareholders' equity	99.7	22.8	1.5
Total liabilities and shareholders' equity	100.0	100.0	100.0

Most of the assets of Company A and B are current assets; however, Company A has nearly 60 percent of its total assets in cash and short-term marketable securities, whereas Company B has only 6 percent of its assets in cash. Company A is more liquid than Company B. Company A shows no current liabilities (its current liabilities round to less than USD10,000), and it has cash on hand of USD1.0 million to meet any near-term financial obligations it might have. In contrast, Company B has USD2.5 million of current liabilities, which exceed its available cash of only USD200,000. To pay those near-term obligations, Company B will need to collect some of its accounts receivables, sell more inventory, borrow from a bank, or raise more long-term capital (e.g., by issuing more bonds or more equity). Company C also appears more liquid than Company B. It holds more than 30 percent of its total assets in cash and short-term marketable securities, and its current liabilities are only 6.2 percent of the amount of total assets.

Company C's USD3.3 million in cash and short-term marketable securities is substantially more than its current liabilities of USD600,000. Turning to the question of solvency, however, note that 98.5 percent of Company C's assets are financed with liabilities. If Company C experiences significant fluctuations in cash flows, it may be unable to pay the interest and principal on its long-term bonds. Company A is far more solvent than Company C, with less than 1 percent of its assets financed with liabilities.

These examples are hypothetical only. Other than general comparisons, little more can be said without further detail. In practice, a wide range of factors affect a company's liquidity management and capital structure. The study **capital structure** is a fundamental issue addressed in Corporate Issuers modules.

Common-size balance sheets can also highlight differences in companies' strategies. Comparing the asset composition of the companies, Company C has made a greater proportional investment in property, plant, and equipment (PP&E)—possibly because it manufactures more of its products in-house. The presence of goodwill on Company B's balance sheet signifies that it has made one or more acquisitions in the past. In contrast, the lack of goodwill on the balance sheets of Company A and Company C suggests that these two companies may have pursued a strategy of internal growth rather than growth by acquisition. Company A may be in either a start-up or liquidation stage of operations as evidenced by the composition of its balance sheet. It has relatively little inventory and no accounts payable. It either has not yet established trade credit or it is in the process of paying off its obligations in the process of liquidating.



**COMMON-SIZE ANALYSIS**

1. Based on the information presented in Exhibits 2, 6, and 8, which of the following items increased as a percentage of total assets from 2016 to 2017? (Note: More than one answer may be correct.)
  - A. Total current assets
  - B. Total financial liabilities
  - C. Cash and cash equivalents

**Solution:**

A and C are correct.

Total current assets increased from 26.1 percent of total assets in 2016 ( $\text{EUR}11,564 \div \text{EUR}44,277$ ) to 28.1 percent in 2017 ( $\text{EUR}11,930 \div \text{EUR}42,497$ ).

Cash and cash equivalents increased from 8.4 percent of total assets in 2016 ( $\text{EUR}3,702 \div \text{EUR}44,277$ ) to 9.4 percent in 2017 ( $\text{EUR}4,011 \div \text{EUR}42,497$ ).

Total financial liabilities decreased in 2017 both in absolute euro amounts ( $\text{EUR}5,034$ ) and as a percentage of total assets ( $\text{EUR}5,034 \div \text{EUR}42,497 = 11.8\%$ ) when compared with 2016 ( $\text{EUR}6,481 \div \text{EUR}44,277 = 14.6\%$ ).

Overall, aspects of the company's liquidity position are somewhat stronger in 2017 than in 2016. The company's cash balances as a percentage of total assets increased. While current liabilities increased as a percentage of total assets and total liabilities remained approximately the same percentage, the mix of liabilities shifted. Financial liabilities, which represent future cash outlays, decreased as a percentage of total assets.

Common-size analysis of the balance sheet is particularly useful in cross-sectional analysis—comparing companies to each other for a particular time period or comparing a company with industry or sector data. The analyst could select individual peer companies for comparison, use industry data from published sources, or compile data from databases. When analyzing a company, many analysts prefer to select the peer companies for comparison or to compile their own industry statistics.

Exhibit 11 presents common-size balance sheet data compiled for the 10 sectors of the S&P 500 using 2017 data. The sector classification follows the S&P/MSCI Global Industrial Classification System (GICS). The exhibit presents mean and median common-size balance sheet data for those companies in the S&P 500 for which 2017 data was available in the Compustat database.<sup>10</sup>

### Some interesting general observations can be made from these data:

- Energy and utility companies have the largest amounts of PP&E. Telecommunication services, followed by utilities, have the highest level of long-term debt. Utilities also use some preferred stock.
- Financial companies have the greatest percentage of total liabilities. Financial companies typically have relatively high financial leverage.
- Utility and real estate companies have the lowest level of receivables.

<sup>10</sup> An entry of zero for an item (e.g., current assets) was excluded from the data, except in the case of preferred stock. Note that most financial institutions did not provide current asset or current liability data. Sources: Compustat and not available in the Compustat database.

Exhibit 11: Common-Size Balance Sheet Statistics for the S&P 500 Grouped by S&P/MSCI GICS Sector, 2017 (in percent except for No. of Observations)

Panel A. Median Data												
	10	15	20	25	30	35	40	45	50	55	60	
	Energy	Materials	Industrials	Consumer Discretionary	Consumer Staples	Health Care	Financials	Information Technology	Telecommunication Services	Utilities	Real Estate	
Number of observations	34	27	68	81	33	59	64	64	4	29	30	
Cash and short-term investments	6.8%	6.3%	8.1%	8.3%	4.1%	11.2%	6.2%	22.7%	1.2%	0.7%	1.4%	
Receivables	5.8%	8.8%	12.9%	6.8%	6.5%	9.7%	20.4%	9.6%	3.7%	3.6%	2.0%	
Inventories	1.6%	8.9%	6.9%	14.9%	9.6%	4.3%	0.0%	1.3%	0.3%	1.7%	0.0%	
Total current assets	16.1%	26.0%	30.5%	41.5%	29.1%	31.4%	N.A.	48.7%	8.6%	7.3%	10.8%	
&E	73.3%	36.3%	12.5%	19.8%	17.2%	8.1%	0.9%	6.2%	35.0%	72.0%	33.4%	
Intangibles	1.6%	27.9%	33.3%	16.8%	41.9%	37.6%	2.8%	26.4%	49.6%	6.2%	1.0%	
Goodwill	0.7%	20.0%	28.3%	11.3%	26.2%	22.8%	2.2%	22.3%	26.0%	4.8%	0.0%	
Accounts payable	5.7%	7.3%	6.2%	8.0%	8.0%	3.1%	27.0%	2.7%	2.5%	3.0%	1.3%	
Current liabilities	10.9%	16.5%	22.5%	25.8%	25.0%	16.5%	N.A.	21.2%	11.5%	11.5%	7.1%	
Long-term debt	27.3%	31.4%	28.0%	28.7%	32.3%	24.3%	6.4%	22.9%	46.8%	32.5%	43.4%	
Total liabilities	49.3%	64.2%	65.5%	64.9%	63.8%	59.2%	86.7%	59.9%	75.8%	71.8%	53.3%	
Common equity	47.3%	33.8%	34.5%	34.7%	36.2%	39.4%	12.6%	39.3%	23.9%	27.7%	40.4%	
Preferred stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Total equity	47.3%	33.8%	34.5%	34.7%	36.2%	39.4%	13.2%	39.3%	23.9%	28.0%	41.8%	

(Continued from previous Exhibit)

Panel B. Mean Data (Continued from Previous Example)

	10	15	20	25	30	35	40	45	50	55	60
	Energy	Materials	Industrials	Consumer Discretionary	Consumer Staples	Health Care	Financials	Information Technology	Telecommunication Services	Utilities	Real Estate
Number of observations	34	27	68	81	33	59	64	64	4	29	30
Cash and short-term investments	6.9%	7.4%	9.2%	12.9%	7.3%	15.4%	11.2%	28.3%	3.6%	1.3%	2.9%
Receivables	6.6%	10.5%	15.2%	9.0%	7.7%	11.2%	31.5%	11.8%	5.0%	3.8%	3.8%
Inventories	3.4%	9.3%	7.8%	18.3%	10.6%	6.3%	3.8%	4.1%	0.3%	1.6%	0.1%
Total current assets	17.7%	28.8%	32.9%	40.6%	27.8%	36.4%	N.A.	49.4%	10.1%	8.6%	16.1%
LT	68.0%	36.9%	24.5%	25.1%	21.6%	11.2%	2.1%	10.3%	39.0%	69.9%	34.9%
Intangibles	7.8%	26.6%	35.6%	23.0%	43.6%	43.9%	11.4%	31.1%	48.2%	6.8%	10.3%
Goodwill	5.4%	18.4%	26.8%	14.6%	24.6%	27.3%	7.7%	24.5%	25.9%	5.7%	5.7%
Accounts payable	5.9%	8.1%	7.1%	11.8%	9.8%	8.1%	35.9%	5.1%	3.1%	2.9%	2.0%
Current liabilities	11.8%	17.0%	23.0%	26.8%	24.6%	21.2%	N.A.	26.1%	11.9%	11.8%	12.8%
Long-term debt	28.3%	31.2%	29.4%	31.3%	32.4%	28.5%	10.3%	24.8%	47.5%	35.0%	44.8%
Total liabilities	50.3%	63.4%	67.1%	67.5%	68.3%	60.1%	80.1%	61.8%	77.6%	73.9%	54.5%
Common equity	46.4%	34.2%	32.3%	32.3%	30.9%	38.9%	18.2%	37.5%	22.2%	24.7%	40.2%
Preferred stock	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.4%	0.3%	0.0%	0.3%	2.2%
Total equity	46.4%	34.2%	32.4%	32.3%	30.9%	39.0%	18.5%	37.8%	22.2%	25.0%	42.3%

LT = Long term.

PE = Property, plant, and equipment. LT = Long term.

Source: Based on data from Compustat.

- Inventory levels are highest for consumer discretionary. Materials and consumer staples have the next highest inventories.
- Information technology companies use the least amount of leverage as evidenced by the lowest percentages for long-term debt and total liabilities and highest percentages for common and total equity.

Example 1 discusses an analyst using cross-sectional common-size balance sheet data.

#### EXAMPLE 1

### Cross-Sectional Common-Size Analysis

Jason Lu is comparing two companies in the computer industry to evaluate their relative financial position as reflected on their balance sheets. He has compiled the following vertical common-size data for Apple and Microsoft, which is presented in Exhibit 12.

**Exhibit 12: Cross-Sectional Analysis: Consolidated Balance Sheets  
(as percent of total assets)**

	Apple	Microsoft
<b>ASSETS:</b>	<b>30 September 2017</b>	<b>30 June 2017</b>
Current assets:		
Cash and cash equivalents	5.4	3.2
Short-term marketable securities	14.4	52.0
Accounts receivable	4.8	8.2
Inventories	1.3	0.9
Vendor non-trade receivables	4.7	0.0
Other current assets	3.7	2.0
<b>Total current assets</b>	<b>34.3</b>	<b>66.3</b>
Long-term marketable securities	51.9	2.5
Property, plant, and equipment, net	9.0	9.8
Goodwill	1.5	14.6
Acquired intangible assets, net	0.6	4.2
Other assets	2.7	2.6
<b>Total assets</b>	<b>100.0</b>	<b>100.0</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY:</b>		
Current liabilities:		
Accounts payable	13.1	3.1
Short-term debt	3.2	3.8
Current portion of long-term debt	1.7	0.4
Accrued expenses	6.9	2.7
Deferred revenue	2.0	14.1
Other current liabilities	0.0	2.6
<b>Total current liabilities</b>	<b>26.9</b>	<b>26.8</b>
Long-term debt	25.9	31.6
Deferred revenue non-current	0.8	4.3
Other non-current liabilities	10.8	7.3

	Apple	Microsoft
ASSETS:	30 September 2017	30 June 2017
Commitments and contingencies		
<b>Total shareholders' equity</b>	35.7	30.0
<b>Total liabilities and shareholders' equity</b>	100.0	100.0

Source: Based on data from companies' annual reports.

From these data, Lu learns the following:

- Apple and Microsoft have high levels of cash and short-term marketable securities, consistent with the information technology sector as reported in Exhibit 11. Apple also has a high balance in long-term marketable securities. This may reflect the success of the company's business model, which has generated large operating cash flows in recent years.
- Apple's level of accounts receivable is lower than Microsoft's and lower than the industry average. Further research is necessary to learn the extent to which this is related to Apple's cash sales through its own retail stores. An alternative explanation would be that the company has been selling or factoring receivables to a greater degree than the other companies; however, that explanation is unlikely given Apple's cash position. Additionally, Apple shows vendor non-trade receivables, reflecting arrangements with its contract manufacturers.
- Apple and Microsoft both have low levels of inventory, similar to industry medians as reported in Exhibit 11. Apple uses contract manufacturers and can rely on suppliers to hold inventory until needed. Additionally, in the Management Discussion and Analysis section of their annual report, Apple discloses USD38 billion of noncancelable manufacturing purchase obligations, USD33 billion of which is due within 12 months. These amounts are not currently recorded as inventory and reflect the use of contract manufacturers to assemble and test some finished products. The use of purchase commitments and contract manufacturers implies that inventory may be "understated." Microsoft's low level of inventory is consistent with its business mix, which is more heavily weighted to software than to hardware.
- Apple and Microsoft have a level of PP&E that is relatively close to the sector median, as reported in Exhibit 11.
- Apple has a very low amount of goodwill, reflecting its strategy to grow organically rather than through acquisition. Microsoft's level of goodwill, while higher than Apple's, is lower than the industry median and mean. Microsoft made a number of major acquisitions (e.g., Nokia in 2014), but subsequently (in 2015) it wrote off significant amounts of goodwill as an impairment charge.
- Apple's level of accounts payable is higher than the computer industry average, but given the company's high level of cash and investments, it is unlikely that this is a problem.
- Apple's and Microsoft's levels of long-term debt are slightly higher than industry averages. Again, given the companies' high level of cash and investments, it is unlikely that this is a problem.

## Balance Sheet Ratios

Ratios facilitate time-series and cross-sectional analysis of a company's financial position. **Balance sheet ratios** are those involving balance sheet items only. Each of the line items on a vertical common-size balance sheet is a ratio in that it expresses a balance sheet amount in relation to total assets. Other balance sheet ratios compare one balance sheet item to another. For example, the current ratio expresses current assets in relation to current liabilities as an indicator of a company's liquidity. Balance sheet ratios include **liquidity ratios** (measuring the company's ability to meet its short-term obligations) and **solvency ratios** (measuring the company's ability to meet long-term and other obligations). These ratios and others are discussed in a later reading. Exhibit 13 summarizes the calculation and interpretation of selected balance sheet ratios.

**Exhibit 13: Balance Sheet Ratios**

Liquidity Ratios	Calculation	Indicates
Current	Current assets ÷ Current liabilities	Ability to meet current liabilities
Quick (acid test)	(Cash + Marketable securities + Receivables) ÷ Current liabilities	Ability to meet current liabilities
Cash	(Cash + Marketable securities) ÷ Current liabilities	Ability to meet current liabilities
<b>Solvency Ratios</b>		
Long-term debt-to-equity	Total long-term debt ÷ Total equity	Financial risk and financial leverage
Debt-to-equity	Total debt ÷ Total equity	Financial risk and financial leverage
Total debt	Total debt ÷ Total assets	Financial risk and financial leverage
Financial leverage	Total assets ÷ Total equity	Financial risk and financial leverage

### RATIO ANALYSIS



1. Based on its balance sheet presented earlier, the current ratio for SAP Group at 31 December 2017 is *closest* to:

- A. 1.17.
- B. 1.20.
- C. 2.00.

**Solution:**

A is correct. SAP Group's current ratio (Current assets ÷ Current liabilities) at 31 December 2017 is 1.17 (EUR11,930 million ÷ EUR10,210 million).

2. Based on SAP's balance sheets presented earlier, which of the following liquidity ratios decreased in 2017 relative to 2016? (Note: More than one answer may be correct.)

- A. Cash

**B.** Quick

**C.** Current

**Solution:**

A, B, and C are correct. The cash ratio, quick ratio, and current ratio are lower in 2017 than in 2016.

Liquidity Ratios	Calculation	2017 EUR in millions	2016 EUR in millions
Current	Current assets ÷ Current liabilities	EUR11,930 ÷ EUR10,210 = <b>1.17</b>	EUR11,564 ÷ EUR9,674 = <b>1.20</b>
Quick (acid test)*	(Cash + Marketable securities + Receivables) ÷ Current liabilities	(EUR4,011 + EUR990 + EUR5,899) ÷ EUR10,210 = <b>1.07</b>	(EUR3,702 + EUR1,124 + EUR5,924) ÷ EUR9,674 = <b>1.11</b>
Cash*	(Cash + Marketable securities) ÷ Current liabilities	(EUR4,011 + EUR990 ÷ EUR10,210 = <b>0.49</b>	(EUR3,702 + EUR1,124 ÷ EUR9,674 = <b>0.50</b>

\* Marketable securities is assumed to be equal to Other Financial Assets as shown in Exhibit 6.

3. Based on SAP's balance sheets presented earlier, which of the following leverage ratios decreased in 2017 relative to 2016? (Note: more than one answer may be correct.)

**A.** Debt-to-equity.

**B.** Financial leverage.

**C.** Long-term debt-to-equity.

**Solution:**

A, B, and C are correct. All three leverage ratios decreased in 2017 relative to 2016.

### Solvency Ratios

Long-term debt-to-equity	Total long-term debt ÷ Total equity	EUR5,034 ÷ EUR25,540 = <b>19.7%</b>	EUR6,481 ÷ EUR26,397 = <b>24.6%</b>
Debt-to-equity	Total debt ÷ Total equity	(EUR1,561 + EUR5,034) ÷ EUR25,540 = <b>25.8%</b>	(EUR 1,813 + EUR6,481) ÷ EUR26,397 = <b>31.4%</b>
Financial Leverage	Total assets ÷ Total equity	EUR42,497 ÷ EUR25,540 = <b>1.66</b>	EUR44,277 ÷ EUR26,397 = <b>1.68</b>

Cross-sectional financial ratio analysis can be limited by differences in accounting methods. In addition, lack of homogeneity of a company's operating activities can limit comparability. For diversified companies operating in different industries, using industry-specific ratios for different lines of business can provide better comparisons. Companies disclose information on operating segments. The financial position and performance of the operating segments can be compared to the relevant industry.

Ratio analysis requires a significant amount of judgment. One key area requiring judgment is understanding the limitations of any ratio. The current ratio, for example, is only a rough measure of liquidity at a specific point in time. The ratio captures only the amount of current assets, but the components of current assets differ significantly in their nearness to cash (e.g., marketable securities versus inventory).

Another limitation of the current ratio is its sensitivity to end-of-period financing and operating decisions that potentially can affect current asset and current liability amounts. Another overall area requiring judgment is determining whether a ratio for a company is within a reasonable range for an industry. Yet another area requiring judgment is evaluating whether a ratio signifies a persistent condition or reflects only a temporary condition. Overall, evaluating specific ratios requires an examination of the entire operations of a company, its competitors, and the external economic and industry setting in which it is operating.



## PRACTICE PROBLEMS

1. All of the following are current assets *except*:
  - A. cash.
  - B. goodwill.
  - C. inventories.
2. The initial measurement of goodwill is *most likely* affected by:
  - A. an acquisition's purchase price.
  - B. the acquired company's book value.
  - C. the fair value of the acquirer's assets and liabilities.
3. For financial assets classified as trading securities, how are unrealized gains and losses reflected in shareholders' equity?
  - A. They are not recognized.
  - B. They flow through income into retained earnings.
  - C. They are a component of accumulated other comprehensive income.
4. For financial assets classified as available for sale, how are unrealized gains and losses reflected in shareholders' equity?
  - A. They are not recognized.
  - B. They flow through retained earnings.
  - C. They are a component of accumulated other comprehensive income.
5. For financial assets classified as held to maturity, how are unrealized gains and losses reflected in shareholders' equity?
  - A. They are not recognized.
  - B. They flow through retained earnings.
  - C. They are a component of accumulated other comprehensive income.
6. A company has total liabilities of GBP35 million and total stockholders' equity of GBP55 million. Total liabilities are represented on a vertical common-size balance sheet by a percentage *closest* to:
  - A. 35 percent.
  - B. 39 percent.
  - C. 64 percent.
7. Which of the following would an analyst *most likely* be able to determine from a common-size analysis of a company's balance sheet over several periods?
  - A. An increase or decrease in sales

- B. An increase or decrease in financial leverage
  - C. A more efficient or less efficient use of assets
8. Defining total asset turnover as revenue divided by average total assets, all else equal, impairment write-downs of long-lived assets owned by a company will *most likely* result in an increase for that company in:
- A. the debt-to-equity ratio but not the total asset turnover.
  - B. the total asset turnover but not the debt-to-equity ratio.
  - C. both the debt-to-equity ratio and the total asset turnover.
9. An investor concerned about a company's ability to meet its near-term obligations is *most likely* to calculate the:
- A. current ratio.
  - B. return on total capital.
  - C. financial leverage ratio.
10. The most stringent test of a company's liquidity is its:
- A. cash ratio.
  - B. quick ratio.
  - C. current ratio.
11. An investor worried about a company's long-term solvency would *most likely* examine its:
- A. current ratio.
  - B. return on equity.
  - C. debt-to-equity ratio.
12. Consider the common-size balance sheets in Exhibit 1 for Company A, Company B, as well as the industry average. Which statement is correct?

**Exhibit 1: Balance Sheet and Industry Average**

	Company A	Company B	Industry Average
<b>ASSETS</b>			
Current assets			
Cash and cash equivalents	5	5	7
Marketable securities	5	0	2
Accounts receivable, net	5	15	12
Inventories	15	20	16
Prepaid expenses	5	15	11
Total current assets	35	55	48

	Company A	Company B	Industry Average
Property, plant, and equipment, net	40	35	37
Goodwill	25	0	8
Other assets	0	10	7
<b>Total assets</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>			
Current liabilities			
Accounts payable	10	10	10
Short-term debt	25	10	15
Accrued expenses	0	5	3
Total current liabilities	35	25	28
Long-term debt	45	20	28
Other non-current liabilities	0	10	7
Total liabilities	80	55	63
Total shareholders' equity	20	45	37
<b>Total liabilities and shareholders' equity</b>	<b>100</b>	<b>100</b>	<b>100</b>

- A. Company A has below-average liquidity risk.
  - B. Company B has above-average solvency risk.
  - C. Company A has made one or more acquisitions.
13. The quick ratio for Company A is *closest* to:
- A. 0.43.
  - B. 0.57.
  - C. 1.00.
14. The financial leverage ratio for Company B is *closest* to:
- A. 0.55.
  - B. 1.22.
  - C. 2.22.
15. Which ratio indicates lower liquidity risk for Company A compared with Company B?
- A. Cash ratio
  - B. Quick ratio
  - C. Current ratio

## SOLUTIONS

1. B is correct. Goodwill is a long-term asset, and cash and inventories are current assets.
2. A is correct. Initially, goodwill is measured as the difference between the purchase price paid for an acquisition and the fair value of the acquired, not acquiring, company's net assets (identifiable assets less liabilities).
3. B is correct. For financial assets classified as trading securities, unrealized gains and losses are reported on the income statement and flow to shareholders' equity as part of retained earnings.
4. C is correct. For financial assets classified as available for sale, unrealized gains and losses are not recorded on the income statement and instead are part of *other* comprehensive income. Accumulated other comprehensive income is a component of shareholders' equity.
5. A is correct. Financial assets classified as held to maturity are measured at amortized cost. Gains and losses are recognized only when realized.
6. B is correct. Vertical common-size analysis involves stating each balance sheet item as a percentage of total assets. Total assets are the sum of total liabilities (GBP35 million) and total stockholders' equity (GBP55 million), or GBP90 million. Total liabilities are shown on a vertical common-size balance sheet as  $(\text{GBP}35 \text{ million} \div \text{GBP}90 \text{ million}) \approx 39\%$ .
7. B is correct. A common-size balance sheet analysis provides information about the composition of the balance sheet and it changes over time. As a result, it can provide information about an increase or decrease in a company's financial leverage.
8. C is correct. Impairment write-downs reduce equity in the denominator of the debt-to-equity ratio but do not affect debt, so the debt-to-equity ratio is expected to increase. Impairment write-downs reduce total assets but do not affect revenue. Thus, total asset turnover is expected to increase.
9. A is correct. The current ratio provides a comparison of assets that can be turned into cash relatively quickly and liabilities that must be paid within one year. The other ratios are more suited to evaluate longer-term concerns.
10. A is correct. The cash ratio determines how much of a company's near-term obligations can be settled with existing amounts of cash and marketable securities.
11. C is correct. The debt-to-equity ratio, a solvency ratio, is an indicator of financial risk.
12. C is correct. The presence of goodwill on Company A's balance sheet signifies that it has made one or more acquisitions in the past. The current, cash, and quick ratios are lower for Company A than for the sector average. These lower liquidity ratios imply above-average liquidity risk. The total debt, long-term debt-to-equity, debt-to-equity, and financial leverage ratios are lower for Company B than for the sector average. These lower solvency ratios imply below-average solvency risk.

Current ratio is  $(35 \div 35) = 1.00$  for Company A, versus  $(48 \div 28)$

= 1.71 for the sector average.

Cash ratio is  $(5 + 5) \div 35 = 0.29$  for Company A, versus  $(7 + 2) \div 28 = 0.32$  for the sector average.

Quick ratio is  $(5 + 5 + 5) \div 35 = 0.43$  for Company A, versus  $(7 + 2 + 12) \div 28 = 0.75$  for the sector average.

Total debt ratio is  $(55 \div 100) = 0.55$  for Company B, versus  $(63 \div 100) = 0.63$  for the sector average.

Long-term debt-to-equity ratio is  $(20 \div 45) = 0.44$  for Company B, versus  $(28 \div 37) = 0.76$  for the sector average.

Debt-to-equity ratio is  $(55 \div 45) = 1.22$  for Company B, versus  $(63 \div 37) = 1.70$  for the sector average.

Financial leverage ratio is  $(100 \div 45) = 2.22$  for Company B, versus  $(100 \div 37) = 2.70$  for the sector average.

13. A is correct. The quick ratio is defined as  $(\text{Cash and cash equivalents} + \text{Marketable securities} + \text{receivables}) \div \text{Current liabilities}$ . For Company A, this calculation is  $(5 + 5 + 5) \div 35 = 0.43$ .
14. C is correct. The financial leverage ratio is defined as  $\text{Total assets} \div \text{Total equity}$ . For Company B, total assets are 100 and total equity is 45; hence, the financial leverage ratio is  $100 \div 45 = 2.22$ .
15. A is correct. A higher cash ratio reflects lower liquidity risk. The cash ratio is defined as  $(\text{Cash} + \text{Marketable securities}) \div \text{Current liabilities}$ . Company A's cash ratio,  $(5 + 5) \div 35 = 0.29$ , is higher than  $(5 + 0) \div 25 = 0.20$  for Company B.



## LEARNING MODULE

# 4

## Analyzing Statements of Cash Flows I

by Elaine Henry, PhD, CFA, Thomas R Robinson, PhD, CFA, CAIA, J. Hennie van Greuning, DCom, CFA, and Michael A Broihahn, CPA, CIA, CFA.

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### LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	describe how the cash flow statement is linked to the income statement and the balance sheet
<input type="checkbox"/>	describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data
<input type="checkbox"/>	demonstrate the conversion of cash flows from the indirect to direct method
<input type="checkbox"/>	contrast cash flow statements prepared under International Financial Reporting Standards (IFRS) and US generally accepted accounting principles (US GAAP)

The two major accounting standard setters are as follows: 1) the International Accounting Standards Board (IASB) who establishes International Financial Reporting Standards (IFRS) and 2) the Financial Accounting Standards Board (FASB) who establishes US GAAP. Throughout this learning module both standards are referred to and many, but not all, of these two sets of accounting rules are identified. Note: changes in accounting standards as well as new rulings and/or pronouncements issued after the publication of this learning module may cause some of the information to become dated.

## 1

## INTRODUCTION

The statement of cash flows provides important information about a company's cash receipts and cash payments during an accounting period, reconciling the cash accounts between balance sheet dates. Although the income statement provides similar measures on an accrual basis, cash flows and their timing are crucial to valuation as payments to investors are made in cash. Investors also use statement of cash flows to evaluate the company's liquidity, solvency, and financial flexibility. In this module, we discuss the components of the cash flow statement and its links to the other financial statements.

### LEARNING MODULE OVERVIEW



- Understanding the interrelationships among the balance sheet, income statement, and cash flow statement is useful not only in evaluating the company's financial health but also in detecting accounting irregularities.
- The income statement and statement of cash flows provide key linkages between the current assets and current liabilities sections of the balance sheet.
- Companies can use either the direct or the indirect method for reporting their operating cash flow:
- The direct method discloses operating cash inflows by source (e.g., cash received from customers, cash received from investment income) and operating cash outflows by use (e.g., cash paid to suppliers, cash paid for interest) in the operating activities section of the cash flow statement.
- The indirect method reconciles net income to operating cash flow by adjusting net income for all non-cash items and the net changes in working capital accounts.
- Although the indirect method is most common, an analyst may desire to review direct-format operating cash flow to review trends in cash receipts and payments, such as cash received from customers or cash paid to suppliers.
- Cash flows from operating activities reported under the indirect method can generally be converted to an approximation of the direct format by following a simple three-step process.
- Cash flows from investing activities and from financing activities are both reported using a direct method, regardless of the method used for reporting operating cash flows.
- Compared with US GAAP, the International Financial Reporting Standards (IFRS) allow more flexibility in the classification of items as operating, investing, or financing activities, such as interest paid or received and dividends paid or received and in how income tax expense is classified.



## LINKAGES BETWEEN THE FINANCIAL STATEMENTS

## 2



describe how the cash flow statement is linked to the income statement and the balance sheet

### Primary Financial Statements

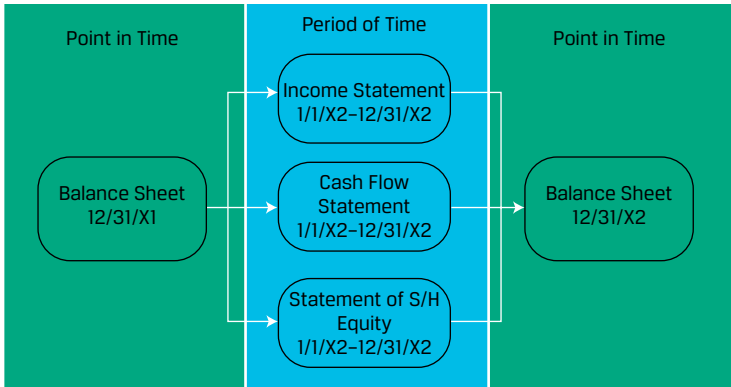
Recall that the four primary financial statements are interrelated and each provides specific information to analysts about an entity. The primary financial statements are as follows:

1. **Balance Sheet**—shows the financial position of an entity *at a point in time*, reporting the balances of “permanent” or “stock” accounts showing the entity’s assets and how those assets are financed.
2. **Income Statement**—provides information about a company’s financial performance between balance sheet dates. The income statement is made up of revenue, expense, gain, and loss accounts. In contrast to the balance sheet, the income statement is a “flow” statement as it captures income activity between two balance sheet dates. Income statements prepared under IFRS or US GAAP are based on accrual accounting, so they do not necessarily reflect cash inflows and outflows.
3. **Statement of Cash Flows**—reports the change in an entity’s cash, cash equivalents, and restricted cash between balance sheet dates. The statement classifies cash inflows and outflows during the period as operating, investing, or financing activities. Because the cash flow statement reports performance over a period of time, it is also a “flow” statement, like the income statement.
4. **Statement of Shareholder’s Equity**—provides information about how a company’s equity has changed between balance sheet dates. The statement identifies the significant components of shareholders equity that are reported on the balance sheet (e.g., common stock and retained earnings) and the activities that occurred during the period that impacted these accounts (e.g., share issuance, net income or loss). Like the income statement and statement of cash flows, the statement of shareholders equity is also a “flow” statement.

### Relationship between Financial Statements

As illustrated in Exhibit 1, the income statement, cash flow statement and statement of shareholders’ equity link the balance sheet from one period to the next.

Exhibit 1: Relationship between the Financial Statements

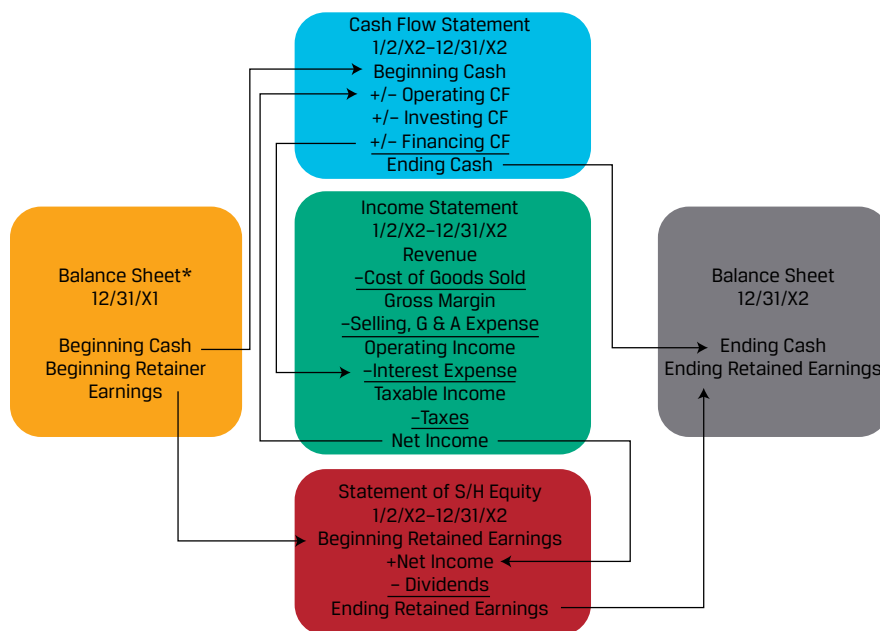


For example, the beginning and ending balances of cash are shown on the company’s 20X1 and 20X2 balance sheets, and the bottom of the 20X2 cash flow statement reconciles 20X1 cash to 20X2 cash. The relationship, stated in general terms, is as shown in Exhibit 2.

Exhibit 2: Beginning and Ending Balances

Balance Sheet at 31 December 20X1	Statement of Cash Flows for Year Ended 31 December 20X2		Balance Sheet at 31 December 20X2
Beginning cash (as of Year-end 31 December 20x1)	Plus: Cash inflows (from oper- ating, investing, and financing activities)	Less: Cash outflows (for oper- ating, investing, and financing activities)	Ending cash (as of Year-end 31 December 20x2)

Exhibit 3 adds greater detail to Exhibit 1, tracing specific linkages through the four financial statements.

**Exhibit 3: Interaction of Financial Statement Accounts**

For example, the 20X2 statement of shareholders' equity reconciles the equity accounts reported on 20X1 balance sheet to the equity accounts reported on the 20X2 balance sheet, including additions (or subtractions) resulting from net income or loss reported on the income statement and dividends paid that are also reported on the statement of cash flows if made in cash.

### Linkages Between Current Assets and Current Liabilities

The income statement and statement of cash flows also provide key linkages between the current assets and current liabilities sections of the balance sheet. Differences between the accrual and cash accounting recognition of operating activities result in an increase or decrease in a current asset or liability on the balance sheet. For example, accrual basis revenue in excess of cash collections will be accompanied by an increase in accounts receivable. If expenses reported using accrual accounting are lower than cash actually paid, the result will typically be a decrease in accounts payable or another accrued liability account. Finally, in situations in which a company is paid in advance for the delivery of a service or product in the future, it will recognize the cash received as an asset, but it also must recognize a liability for its obligation to deliver service or product in the future, typically referred to as deferred revenue. A deferred revenue liability account is derecognized upon the recognition of revenue when the entity satisfies its performance obligations.

If an analyst knows beginning accounts receivable, revenues, and cash collected from customers, they can compute ending accounts receivable, as the accounts are linked as shown in Exhibit 4.

**Exhibit 4: Ending Accounts Receivable**

<b>Beginning Balance Sheet at 31 December 20X1</b>	<b>Income Statement for Year Ended 31 December 20X1</b>	<b>Statement of Cash Flows for Year Ended 31 December 20X1</b>	<b>Ending Balance Sheet at 31 December 20X2</b>
Beginning accounts receivable	Plus: Revenues	Minus: Cash collected from customers	Equals: Ending accounts receivable

Understanding the interrelationships among the balance sheet, income statement, and cash flow statement is useful not only in evaluating the company's financial health but also in detecting accounting irregularities. Recall the extreme illustration of a hypothetical company that makes sales on account without regard to future collections and thus reports healthy sales and significant income on its income statement yet lacks cash inflow. Such a pattern would occur if a company improperly recognized revenue.

Example 1–Example 4 demonstrate how common business transactions affect a company's balance sheet, income statement, and statement of cash flows. Notice how all three financial statements are needed to fully account for the transactions.

**EXAMPLE 1****Inventory Purchase and Sale Impact on Financial Statements**

Assume fictional company ABC, a retailer, purchases USD100 of inventory on 1 January 1, 20X1 on credit with payment due to its supplier in 30 days. On 1 February, ABC sells the product to Customer X for USD150 with payment due by 16 February, 20X1. Customer X pays for the product on 15 February, 20X1.

This series of transaction would affect ABC's financial statements as follows shown in Exhibit 5.

**Exhibit 5: ABC's Financial Statements**

<b>Date</b>	<b>Balance Sheet</b>	<b>Income Statement</b>	<b>Statement of Cash Flows</b>
1 January	Inventory (asset) increases by USD100 Accounts Payable (liability) increases by USD100	N/A	N/A
30 January	Cash (asset) decreases by USD100 Accounts Payable (liability) decreases by USD100	N/A	Cash flows from operating activities decreases by USD100
1 February	Accounts Receivable (asset) increases by USD150 Inventory (asset) decreases by USD100	Revenue increases by USD150 Cost of sales increases by USD100	N/A
15 February	Cash (asset) increases by USD150 Accounts receivable (asset) decreases by USD150		Cash flows from operating activities increases by USD100

Note the statement of cash flows is affected only when the company pays or receives cash, which differs from recognition on the income statement.

**EXAMPLE 2****Depreciation Impact on Financial Statements**

On 1 January, fictional company Notion Ltd, a manufacturing company, owns USD100 of equipment used in the production of a product that is sold to wholesale customers. The equipment has a 10-year life and no salvage value. Notion uses straight-line depreciation, so the annual depreciation expense is USD10. On 1 July, Notion Ltd. makes a new capital investment for a different piece of equipment with a purchase price of USD200 and annual depreciation expense of USD50. Notion Ltd. pays for the equipment in cash upon receipt. Depreciation expense is recorded at the end of the fiscal year. The impact on Notion Ltd's financial statements is summarized in Exhibit 6.

**Exhibit 6: Notion Ltd. Financial Statement**

Date	Balance Sheet	Income Statement	Statement of Cash Flows
1 January	Equipment (asset) of USD100	N/A	N/A
1 July	Equipment (asset) increases by USD200 Cash (asset) decreases by USD200	N/A	Cash flows from investing activities decreases by USD200
31 December	Accumulated Depreciation (contra asset) increases by USD35	Depreciation expense increases by USD35	N/A

**EXAMPLE 3****Borrowing Impact on Financial Statements**

On 31 March, fictional Geneva Company borrows USD500 from Stockholm Bank (also fictional). The terms of the loan are interest accrues at 10 percent and payment is due along with principal upon maturity of the loan on 30 September. Accordingly, Geneva is to pay USD525 to Stockholm Bank on 30 September consisting of USD500 in loan principal and USD25 of interest ( $\text{USD500 loan} \times 10\% \times \frac{1}{2} \text{ year}$ .) The impact on Geneva's financial statements is summarized in Exhibit 7.

**Exhibit 7: Geneva Financial Statement**

Date	Balance Sheet	Income Statement	Statement of Cash Flows
31 March	Cash (asset) increases by USD500 Loans payable (liability) increases by USD500	N/A	Cash flows from financing activities increases by USD500
30 September	Cash (asset) decreases by USD525 Loans payable (liability) decreases by USD500	Interest expense increases by USD25	Cash flows from financing or operating activities decreases by USD25 Cash flows from financing activities decreases by USD500

**EXAMPLE 4****Equipment Purchase Impact on Financial Statements**

Assume Mountain Company, a fictional manufacturer, agrees to produce a custom-made piece of equipment for Cirrus Corp. (another fictional company) in two months for a sales price of USD1,000. On 1 October, Cirrus provides Mountain with a down payment of USD300 from Cirrus and agrees to pay the balance of USD700 when the equipment is delivered on 30 November. Mountain Company recognizes deferred revenue when it receives the USD300 on 1 October, which will be derecognized when Mountain fulfills its obligation and delivers the equipment. The impact on Mountain Company's financial statement is summarized in Exhibit 8.

**Exhibit 8: Mountain Company Financial Statement**

Date	Balance Sheet	Income Statement	Statement of Cash Flows
1 October	Cash (asset) increases by USD300 Deferred revenue (liability) increases by USD300	N/A	Cash flows from operating activities increases by USD300
30 September	Cash (asset) increases by USD700 Deferred revenue (liability) decreases by USD300	Revenue increases by USD1,000	Cash flows from operating activities increases by USD700

## THE DIRECT METHOD FOR CASH FLOWS FROM OPERATING ACTIVITIES

### 3

- describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data

The first step in preparing the cash flow statement is to determine cash flows from operating activities, which can be presented using the direct or indirect method. The direct method uses the major categories of gross cash receipts and payments, and the indirect method reconciles net income to net cash flow. Cash flows from investing activities and from financing activities are identical regardless of whether the direct or indirect method is used to present operating cash flows.

- Companies often disclose only indirect operating cash flow information but understanding how cash flow information is put together will enable you to take an indirect statement apart and reconfigure it to approximate a direct cash flow statement, which—while not perfectly accurate—can be useful. This lesson demonstrates the approximate preparation of a direct cash flow statement using the income statement and the comparative balance sheets for Acme Corporation (a fictitious retail company) shown in Exhibit 9 and Exhibit 10.

#### Exhibit 9: Acme Corporation Income Statement Year Ended 31 December 2018

Revenue (net)		USD23,598
Cost of goods sold		11,456
Gross profit		12,142
Salary and wage expense	USD4,123	
Depreciation expense	1,052	
Other operating expenses	3,577	
Total operating expenses		8,752
Operating profit		3,390
Other revenues (expenses):		
Gain on sale of equipment	205	
Interest expense	(246)	(41)
Income before tax		3,349
Income tax expense		1,139
Net income		USD2,210

#### Exhibit 10: Acme Corporation Comparative Balance Sheets 31 December 2018 and 2017

	2018	2017	Net Change
Cash	5,000	4,837	USD1,163
Accounts receivable	1,000	1,000	USD0
Inventory	1,000	1,000	USD0
Prepaid expenses	1,000	1,000	USD0
Accounts payable	1,000	1,000	USD0
Long-term debt	1,000	1,000	USD0
Equity	1,000	1,000	USD0

Accounts receivable	1,012	957	55
Inventory	3,984	3,277	707
Prepaid expenses	155	178	(23)
Total current assets	6,162	5,575	587
Land	510	510	—
Buildings	3,680	3,680	—
Equipment*	8,798	8,555	243
Less: accumulated depreciation	(3,443)	(2,891)	(552)
Total long-term assets	9,545	9,854	(309)
Total assets	USD15,707	USD15,429	USD278
Accounts payable	USD3,588	USD3,325	USD263
Salary and wage payable	85	75	10
Interest payable	62	74	(12)
Income tax payable	55	50	5
Other accrued liabilities	1,126	1,104	22
Total current liabilities	4,916	4,628	288
Long-term debt	3,075	3,575	(500)
Common stock	3,750	4,350	(600)
Retained earnings	3,966	2,876	1,090
Total liabilities and equity	USD15,707	USD15,429	USD278

\* During 2018, Acme purchased new equipment for a total cost of \$1,300. No items impacted retained earnings other than net income and dividends.

## Operating Activities: Direct Method

We first determine how much cash Acme received from its customers (sometimes referred to as “cash collections”), followed by how much cash was paid to suppliers and to employees, as well as how much cash was paid for other operating expenses, interest, and income taxes.

### Cash Received From Customers

The income statement for Acme reported revenue of USD23,598 for the year ended 31 December 2018. To determine the approximate cash receipts from its customers, it is necessary to adjust this revenue amount by the net change in accounts receivable for the year. If accounts receivable increase during the year, revenue on an accrual basis is higher than cash receipts from customers, and vice versa. For Acme Corporation, accounts receivable increased by USD55, so cash received from customers was USD23,543, as shown in Exhibit 11.

#### Exhibit 11: Cash Received from Customers

Revenue	USD23,598
Less: Increase in accounts receivable	(USD55)
Cash received from customers	USD23,543



Cash received from customers affects the accounts receivable account as shown in Exhibit 12.

**Exhibit 12: Effect on Accounts Receivable, 1**

Beginning accounts receivable	957
Plus revenue	23,598
Minus cash collected from customers	<u>(23,543)</u>
Ending accounts receivable	USD1,012

The accounts receivable account information can also be presented as shown in Exhibit 13.

**Exhibit 13: Effect on Accounts Receivable, 2**

Beginning accounts receivable	USD957
Plus revenue	23,598
Minus ending accounts receivable	<u>(1,012)</u>
Cash collected from customers	<b>USD23,543</b>

Acme did not have any deferred or unearned revenue. If it did, further adjustment would be required to arrive at cash collected from customers (a decrease in deferred revenue would be a negative adjustment and vice versa).

**EXAMPLE 5**

**Computing Cash Received from Customers**

1. Blue Bayou, a fictitious advertising company, reported revenues of USD50 million, total expenses of USD35 million, and net income of USD15 million in the most recent year. If accounts receivable decreased by USD12 million, how much cash did the company receive from customers?

- A. USD38 million
- B. USD50 million
- C. USD62 million

**Solution:**

C is correct. Revenues of USD50 million plus the decrease in accounts receivable of USD12 million equals USD62 million cash received from customers. The decrease in accounts receivable means that the company received more in cash than the amount of revenue it reported.

**Cash Paid to Suppliers**

For Acme, the cash paid to suppliers was USD11,900, determined as shown in Exhibit 14.

**Exhibit 14: Cash Paid to Suppliers**

Cost of goods sold	USD11,456
Plus: Increase in inventory	707
Equals purchases from suppliers	USD12,163
Less: Increase in accounts payable	(263)
Cash paid to suppliers	<b>USD11,900</b>

There are two pieces to this calculation: the amount of inventory purchased and the amount paid for it. To determine purchases from suppliers, cost of goods sold is adjusted for the change in inventory. If inventory increased during the year, then purchases during the year exceeded cost of goods sold, and vice versa. Acme reported cost of goods sold of USD11,456 for the year ended 31 December 2018. For Acme Corporation, inventory increased by USD707, so purchases from suppliers was USD12,163. Purchases from suppliers affect the inventory account, as shown in Exhibit 15.

**Exhibit 15: Effect on Inventory**

Beginning inventory	USD3,277
Plus purchases	12,163
Minus cost of goods sold	(11,456)
Ending inventory	USD3,984

Acme purchased USD12,163 of inventory from suppliers in 2018, but is this the amount of cash that Acme paid to its suppliers during the year? Not necessarily. Acme may not have yet paid for all of these purchases and may yet owe for some of the purchases made this year. In other words, Acme may have paid less cash to its suppliers than the amount of this year's purchases, in which case Acme's liability (accounts payable) will have increased by the difference. Alternatively, Acme may have paid even more to its suppliers than the amount of this year's purchases, in which case Acme's accounts payable will have decreased.

Therefore, once purchases have been determined, cash paid to suppliers can be calculated by adjusting purchases for the change in accounts payable. If the company made all purchases with cash, then accounts payable would not change and cash outflows would equal purchases. If accounts payable increased during the year, then purchases on an accrual basis would be higher than they would be on a cash basis, and vice versa. In this example, Acme made more purchases than it paid in cash, so the balance in accounts payable increased. For Acme, the cash paid to suppliers was USD11,900, determined as shown in Exhibit 16.

**Exhibit 16: Cash Paid to Suppliers**

Purchases from suppliers	USD12,163
Less: Increase in accounts payable	(263)
Cash paid to suppliers	<b>USD11,900</b>

The amount of cash paid to suppliers is reflected in the accounts payable account, as shown in Exhibit 17.

**Exhibit 17: Cash Paid to Suppliers**

Beginning accounts payable	USD3,325
Plus purchases	12,163
Minus cash paid to suppliers	<u>(11,900)</u>
Ending accounts payable	USD3,588

**EXAMPLE 6****Computing Cash Paid to Suppliers**

1. Orange Beverages Plc., a fictitious manufacturer of tropical drinks, reported cost of goods sold for the year of USD100 million. Total assets increased by USD55 million, but inventory declined by USD6 million. Total liabilities increased by USD45 million, but accounts payable decreased by USD2 million. How much cash did the company pay to its suppliers during the year?

- A. USD96 million  
 B. USD104 million  
 C. USD108 million

**Solution:**

A is correct. Cost of goods sold of USD100 million less the decrease in inventory of USD6 million equals purchases from suppliers of USD94 million. The decrease in accounts payable of USD2 million means that the company paid USD96 million in cash (USD94 million plus USD2 million).

**Cash Paid to Employees**

To determine the cash paid to employees, it is necessary to adjust salary and wage expenses by the net change in salary and wages payable for the year. If salary and wages payable increased during the year, then salary and wage expenses on an accrual basis would be higher than the amount of cash paid for this expense, and vice versa. For Acme, salary and wages payable increased by USD10, so cash paid for salary and wages was USD4,113, as shown in Exhibit 18.

**Exhibit 18: Salary and Wages**

Salary and wages expense	USD4,123
Less: Increase in salary and wages payable	<u>(10)</u>
Cash paid to employees	USD4,113

The amount of cash paid to employees is reflected in the salary and wages payable account, as shown in Exhibit 19.

**Exhibit 19: Cash Paid to Employees**

Beginning salary and wages payable	USD75
Plus salary and wages expense	4,123

Minus cash paid to employees	(4,113)
Ending salary and wages payable	USD85

### **Cash Paid for Other Operating Expenses**

To determine the cash paid for other operating expenses, it is necessary to adjust the other operating expense amounts on the income statement by the net changes in pre-paid expenses and accrued expense liabilities for the year. If prepaid expenses increased during the year, other operating expenses on a cash basis would be higher than on an accrual basis, and vice versa. Likewise, if accrued expense liabilities increased during the year, other operating expenses on a cash basis would be lower than on an accrual basis, and vice versa. For Acme Corporation, the amount of cash paid for operating expenses in 2018 was USD3,532, as shown in Exhibit 20.

#### **Exhibit 20: Cash Paid for Operating Expenses**

Other operating expenses	USD3,577
Less: Decrease in prepaid expenses	(23)
Less: Increase in other accrued liabilities	(22)
Cash paid for other operating expenses	USD3,532

### **EXAMPLE 7**

#### **Computing Cash Paid for Other Operating Expenses**

1. Black Ice, a fictitious sportswear manufacturer, reported other operating expenses of USD30 million. Prepaid insurance expense increased by USD4 million, and accrued utilities payable decreased by USD7 million. Insurance and utilities are the only two components of other operating expenses. How much cash did the company pay in other operating expenses?

- A. USD19 million
- B. USD33 million
- C. USD41 million

**Solution:**

C is correct. Other operating expenses of USD30 million plus the increase in prepaid insurance expense of USD4 million plus the decrease in accrued utilities payable of USD7 million equals USD41 million.

### **Cash Paid for Interest**

The cash paid for interest is included in operating cash flows under US GAAP and may be included in operating or financing cash flows under IFRS. To determine the cash paid for interest, it is necessary to adjust interest expense by the net change in interest payable for the year. If interest payable increases during the year, then interest expense on an accrual basis will be higher than the amount of cash paid for interest, and vice versa. For Acme Corporation, interest payable decreased by USD12, and cash paid for interest was USD258, as shown in Exhibit 21.

**Exhibit 21: Cash Paid for Interest**

Interest expense	USD246
Plus: Decrease in interest payable	12
Cash paid for interest	<b>USD258</b>

Alternatively, cash paid for interest may also be determined by an analysis of the interest payable account, as shown in Exhibit 22.

**Exhibit 22: Interest Payable Account**

Beginning interest payable	USD74
Plus interest expense	246
Minus cash paid for interest	<b>(258)</b>
Ending interest payable	USD62

**Cash Paid for Income Taxes**

To determine the cash paid for income taxes, it is necessary to adjust the income tax expense amount on the income statement by the net changes in taxes receivable, taxes payable, and deferred income taxes for the year. If taxes receivable or deferred tax assets increase during the year, income taxes on a cash basis will be higher than on an accrual basis, and vice versa. Likewise, if taxes payable or deferred tax liabilities increase during the year, income tax expense on a cash basis will be lower than on an accrual basis, and vice versa. For Acme Corporation, the amount of cash paid for income taxes in 2018 was USD1,134, as shown in Exhibit 23.

**Exhibit 23: Cash Paid for Income Taxes**

Income tax expense	USD1,139
Less: Increase in income tax payable	(5)
Cash paid for income taxes	<b>USD1,134</b>

## THE INDIRECT METHOD FOR CASH FLOWS FROM OPERATING ACTIVITIES

# 4



describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data

The alternative approach to reporting cash from operating activities is the indirect method. In this lesson, we reconcile Acme's net income to its operating cash flow using the indirect method.

## Operating Activities: Indirect Method

To perform this reconciliation, net income is adjusted for the following: (1) any non-operating activities, (2) any non-cash expenses, and (3) changes in operating working capital items.

The only non-operating activity in Acme's income statement, the sale of equipment, resulted in a gain of USD205. This amount is removed from the operating cash flow section; the cash effects of the sale are shown in the investing section.

Acme's only non-cash expense was a depreciation expense of USD1,052. Under the indirect method, this depreciation expense must be added back to net income because it was a non-cash deduction in the calculation of net income.

Changes in working capital accounts include increases and decreases in the current operating asset and liability accounts. The changes in these accounts arise from applying accrual accounting—that is, recognizing revenues when they are earned and expenses when they are incurred instead of when the cash is received or paid. To make the working capital adjustments under the indirect method, any increase in a current operating asset account is subtracted from net income and a net decrease is added to net income. As described previously, the increase in accounts receivable, for example, resulted from Acme recording income statement revenue higher than the amount of cash received from customers. Therefore, to reconcile back to operating cash flow, that increase in accounts receivable must be deducted from net income. For current operating liabilities, a net increase is added to net income and a net decrease is subtracted from net income. As described previously, the increase in wages payable, for example, resulted from Acme recording income statement expenses higher than the amount of cash paid to employees.

Exhibit 24 presents a tabulation of the most common types of adjustments that are made to net income when using the indirect method to determine net cash flow from operating activities.

### Exhibit 24: Adjustments to Net Income Using the Indirect Method

Additions	<ul style="list-style-type: none"> <li>▪ Non-cash items               <ul style="list-style-type: none"> <li>• Depreciation expense of tangible assets</li> <li>• Amortization expense of intangible assets</li> <li>• Depletion expense of natural resources</li> <li>• Amortization of bond discount</li> </ul> </li> <li>▪ Non-operating losses               <ul style="list-style-type: none"> <li>• Loss on sale or write-down of assets</li> <li>• Loss on retirement of debt</li> <li>• Loss on investments accounted for under the equity method</li> </ul> </li> <li>▪ Increase in deferred income tax liability</li> <li>▪ Changes in working capital resulting from accruing higher amounts for expenses than the amounts of cash payments or lower amounts for revenues than the amounts of cash receipts               <ul style="list-style-type: none"> <li>• Decrease in current operating assets (e.g., accounts receivable, inventory, and prepaid expenses)</li> <li>• Increase in current operating liabilities (e.g., accounts payable and accrued expense liabilities)</li> </ul> </li> </ul>
Subtractions	<ul style="list-style-type: none"> <li>▪ Non-cash items (e.g., amortization of bond premium)</li> </ul>

- Non-operating items
  - Gain on sale of assets
  - Gain on retirement of debt
  - Income on investments accounted for under the equity method
- Decrease in deferred income tax liability
- Changes in working capital resulting from accruing lower amounts for expenses than for cash payments or higher amounts for revenues than for cash receipts
  - Increase in current operating assets (e.g., accounts receivable, inventory, and prepaid expenses)
  - Decrease in current operating liabilities (e.g., accounts payable and accrued expense liabilities)

Accordingly, for Acme Corporation (using Exhibits 9 and 10), the USD55 increase in accounts receivable and the USD707 increase in inventory are subtracted from net income and the USD23 decrease in prepaid expenses is added to net income. For Acme's current liabilities, the increases in accounts payable, salary and wage payable, income tax payable, and other accrued liabilities (USD263, USD10, USD5, and USD22, respectively) are added to net income and the USD12 decrease in interest payable is subtracted from net income. Exhibit 25 presents the cash flow statement for Acme Corporation under the indirect method using the information that we have determined from our analysis of the income statement and the comparative balance sheets. Note that the investing and financing sections are identical to the statement of cash flows prepared using the direct method.

**Exhibit 25: Acme Corporation Cash Flow Statement  
(Indirect Method) Year Ended 31 December 2018**

<b>Cash flow from operating activities:</b>	
Net income	USD2,210
Depreciation expense	1,052
Gain on sale of equipment	(205)
Increase in accounts receivable	(55)
Increase in inventory	(707)
Decrease in prepaid expenses	23
Increase in accounts payable	263
Increase in salary and wage payable	10
Decrease in interest payable	(12)
Increase in income tax payable	5

<b>Cash flow from operating activities:</b>	
Increase in other accrued liabilities	22
Net cash provided by operating activities	2,606
<b>Cash flow from investing activities:</b>	
Cash received from sale of equipment	762
Cash paid for purchase of equipment	(1,300)
Net cash used for investing activities	(538)
<b>Cash flow from financing activities:</b>	
Cash paid to retire long-term debt	(500)
Cash paid to retire common stock	(600)
Cash paid for dividends	(1,120)
Net cash used for financing activities	(2,220)
Net decrease in cash	(152)
Cash balance, 31 December 2017	1,163
Cash balance, 31 December 2018	USD1,011

## 5

## CONVERSION FROM THE INDIRECT TO DIRECT METHOD



demonstrate the conversion of cash flows from the indirect to direct method

An analyst may desire to review direct-format operating cash flow to review trends in cash receipts and payments (such as cash received from customers or cash paid to suppliers). If a direct-format statement is not available, cash flows from operating activities reported under the indirect method can be converted to the direct method. Accuracy of conversion depends on adjustments using data available in published financial reports. The method described in this lesson is sufficiently accurate for most analytical purposes.

### Method to Convert Cash Flow from Indirect to Direct

The three-step conversion process is demonstrated for Acme Corporation in Exhibit 26. Referring again to Exhibits 9 and 10 for Acme Corporation's income statement and balance sheet information, begin by disaggregating net income of USD2,210 into total revenues and total expenses (Step 1). Next, remove any non-operating and non-cash items (Step 2). For Acme, we therefore remove the non-operating gain on the sale of equipment of USD205 and the non-cash depreciation expense of USD1,052. Then, convert accrual amounts of revenues and expenses to cash flow amounts of receipts and payments by adjusting for changes in working capital accounts (Step 3). The results of these adjustments are the items of information for the direct format of operating cash flows. These line items are shown as the results of Step 3.



**Exhibit 26: Conversion from the Indirect to the Direct Method**

<i>Step 1</i>	Total revenues	USD23,803
Aggregate all revenue and all expenses	Total expenses	21,593
	Net income	USD2,210
<i>Step 2</i>	Total revenue less noncash item revenues:	
Remove all noncash items from aggregated revenues and expenses and break out remaining items into relevant cash flow items	(USD23,803 – USD205) =	USD23,598
	Revenue	USD23,598
	Total expenses less noncash item expenses:	
	(USD21,593 – USD1,052) =	USD20,541
	Cost of goods sold	USD11,456
	Salary and wage expenses	4,123
	Other operating expenses	3,577
	Interest expense	246
	Income tax expense	1,139
	Total	USD20,541
<i>Step 3</i>	Cash received from customers <sup>a</sup>	USD23,543
Convert accrual amounts to cash flow amounts by adjusting for working capital changes	Cash paid to suppliers <sup>b</sup>	(11,900)
	Cash paid to employees <sup>c</sup>	(4,113)
	Cash paid for other operating expenses <sup>d</sup>	(3,532)
	Cash paid for interest <sup>e</sup>	(258)
	Cash paid for income tax <sup>f</sup>	(1,134)
	Net cash provided by operating activities	USD2,606

Calculations for Step 3:

<sup>a</sup>Revenue of \$23,598 less increase in accounts receivable of \$55.

<sup>b</sup>Cost of goods sold of \$11,456 plus increase in inventory of \$707 less increase in accounts payable of \$263.

<sup>c</sup>Salary and wage expense of \$4,123 less increase in salary and wage payable of \$10.

<sup>d</sup>Other operating expenses of \$3,577 less decrease in prepaid expenses of \$23 less increase in other accrued liabilities of \$22.

<sup>e</sup>Interest expense of \$246 plus decrease in interest payable of \$12.

<sup>f</sup>Income tax expense of \$1,139 less increase in income tax payable of \$5.

**CASH FLOWS FROM INVESTING ACTIVITIES****6**

describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data

The second and third steps in preparing the cash flow statement are to determine the total cash flows from investing activities and from financing activities. The presentation of this information is identical, regardless of whether the direct or indirect method is used for operating cash flows.

### Cash Flows from Investing Activities

Purchases and sales of equipment were the only investing activities undertaken by Acme in 2018, as evidenced by the fact that the amounts reported for land and buildings were unchanged during the year. An informational note in Exhibit 10 tells us that Acme *purchased* new equipment in 2018 for a total cost of USD1,300. However, the amount of equipment shown on Acme's balance sheet increased by only USD243 (ending balance of USD8,798 minus beginning balance of USD8,555); therefore, Acme must have also *sold or otherwise disposed of* some equipment during the year. To determine the cash inflow from the sale of equipment, we analyze the equipment and accumulated depreciation accounts as well as the gain on the sale of equipment from Exhibits 9 and 10. Assuming that the entire accumulated depreciation is related to equipment, the cash received from sale of equipment is determined as follows.

The historical cost of the equipment sold was USD1,057. This amount is determined as shown in Exhibit 27:

#### Exhibit 27: Cost of Equipment Sold

Beginning balance equipment (from balance sheet)	USD8,555
Plus equipment purchased (from informational note)	1,300
Minus ending balance equipment (from balance sheet)	(8,798)
Equals historical cost of equipment sold	USD1,057

The accumulated depreciation on the equipment sold was USD500, determined as shown in Exhibit 28:

#### Exhibit 28: Accumulated Depreciation

Beginning balance accumulated depreciation (from balance sheet)	USD2,891
Plus depreciation expense (from income statement)	1,052
Minus ending balance accumulated depreciation (from balance sheet)	(3,443)
Equals accumulated depreciation on equipment sold	USD500

The historical cost information, accumulated depreciation information, and information from the income statement about the gain on the sale of equipment can be used to determine the cash received from the sale, as shown in Exhibit 29:

#### Exhibit 29: Cash Received from the Sale

Historical cost of equipment sold (calculated above)	USD1,057
Less accumulated depreciation on equipment sold (calculated above)	(500)
Equals book value of equipment sold	USD557

Plus gain on sale of equipment (from the income statement)

205

Equals cash received from sale of equipment

USD762

## QUESTION SET



1. Copper, Inc., a fictitious brewery and restaurant chain, reported a gain on the sale of equipment of USD12 million. In addition, the company's income statement shows depreciation expense of USD8 million and the cash flow statement shows capital expenditure of USD15 million, all of which was for the purchase of new equipment.

## Exhibit 30: Copper Inc.

Balance sheet item	31 December 2017	31 December 2018	Change
Equipment	USD100 million	USD109 million	USD9 million
Accumulated depreciation—equipment	USD30 million	USD36 million	USD6 million

Using the information in Exhibit 30 from the comparative balance sheets, how much cash did the company receive from the equipment sale?

- A. USD12 million
- B. USD16 million
- C. USD18 million

**Solution:**

B is correct. Selling price (cash inflow) minus book value equals gain or loss on sale; therefore, gain or loss on sale plus book value equals selling price (cash inflow). The amount of gain is given, USD12 million. To calculate the book value of the equipment sold, find the historical cost of the equipment and the accumulated depreciation on the equipment.

- Beginning balance of equipment of USD100 million plus equipment purchased of USD15 million minus ending balance of equipment of USD109 million equals historical cost of equipment sold, or USD6 million.
- Beginning accumulated depreciation on equipment of USD30 million plus depreciation expense for the year of USD8 million minus ending balance of accumulated depreciation of USD36 million equals accumulated depreciation on the equipment sold, or USD2 million.
- Therefore, the book value of the equipment sold was USD6 million minus USD2 million, or USD4 million.
- Because the gain on the sale of equipment was USD12 million, the amount of cash received must have been USD16 million.

2. Silverago Incorporated, an international metals company, reported a loss on the sale of equipment of USD2 million in 2018. In addition, the company's

flow statement shows capital expenditure of USD10 million, all of which was for the purchase of new equipment. Using the information in Exhibit 31 from the comparative balance sheets, how much cash did the company receive from the equipment sale?

**Exhibit 31: Silverago Inc.**

Balance Sheet Item	31 December 2017	31 December 2018	Change
Equipment	USD100 million	USD105 million	USD5 million
Accumulated depreciation—equipment	USD40 million	USD46 million	USD6 million

- A. USD1 million
- B. USD2 million
- C. USD3 million

**Solution:**

A is correct. Selling price (cash inflow) minus book value equals gain or loss on sale; therefore, gain or loss on sale plus book value equals selling price (cash inflow). The amount of loss is given—USD2 million. To calculate the book value of the equipment sold, find the historical cost of the equipment and the accumulated depreciation on the equipment.

- Beginning balance of equipment of USD100 million plus equipment purchased of USD10 million minus ending balance of equipment of USD105 million equals the historical cost of equipment sold, or USD5 million.
- Beginning accumulated depreciation of USD40 million plus depreciation expense for the year of USD8 million minus ending balance of accumulated depreciation of USD46 million equals accumulated depreciation on the equipment sold, or USD2 million.
- Therefore, the book value of the equipment sold was USD5 million minus USD2 million, or USD3 million.
- Because the loss on the sale of equipment was USD2 million, the amount of cash received must have been USD1 million.

## 7

### CASH FLOWS FROM FINANCING ACTIVITIES



describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data

As with investing activities, the presentation of financing activities is identical, regardless of whether the direct or indirect method is used for operating cash flows.

## Cash Flow from Financing activities: Long-Term Debt and Common Stock

The change in long-term debt, based on the beginning 2018 (ending 2017) and ending 2018 balances in [Exhibit 10](#), was a decrease of USD500. Absent other information, this indicates that Acme retired USD500 of long-term debt. Retiring long-term debt is a cash outflow relating to financing activities.

Similarly, the change in common stock during 2018 was a decrease of USD600. Absent other information, this indicates that Acme repurchased USD600 of its common stock. Repurchase of common stock is also a cash outflow related to financing activity.

## Computing Dividends Paid

Recall the following relationship:

$$\text{Beginning retained earnings} + \text{Net income} - \text{Dividends} = \text{Ending retained earnings}$$

Based on this relationship, the amount of cash dividends paid in 2018 can be determined from an analysis of retained earnings, as shown in Exhibit 32.

### Exhibit 32: Analysis of Retained Earnings

Beginning balance of retained earnings (from the balance sheet)	USD2,876
Plus net income (from the income statement)	2,210
Minus ending balance of retained earnings (from the balance sheet)	(3,966)
Equals dividends paid	<b>USD1,120</b>

Note that dividends paid are presented in the statement of changes in equity.

### EXAMPLE 8

#### Computing Cash Flow from Financing Activity

1. Jaderong Plinkett Stores reported net income of USD25 million. The company has no outstanding debt. Using the information in Exhibit 33 from the comparative balance sheets (in millions), what should the company report in the financing section of the statement of cash flows in 2018?

### Exhibit 33: Jaderong Plinkett Stores

Balance Sheet Item	31 December 2017	31 December 2018	Change
Common stock	USD100	USD102	USD2
Additional paid-in capital common stock	USD100	USD140	USD40
Retained earnings	USD100	USD115	USD15
Total stockholders' equity	USD300	USD357	USD57

- A. Issuance of common stock of USD42 million; dividends paid of USD10 million

- B.** Issuance of common stock of USD38 million; dividends paid of USD10 million
- C.** Issuance of common stock of USD42 million; dividends paid of USD40 million

**Solution:**

A is correct. The increase of USD42 million in common stock and additional paid-in capital indicates that the company issued stock during the year. The increase in retained earnings of USD15 million indicates that the company paid USD10 million in cash dividends during the year, determined as beginning retained earnings of USD100 million plus net income of USD25 million minus ending retained earnings of USD115 million, which equals USD10 million in cash dividends.

## 8

## DIFFERENCES IN CASH FLOW STATEMENTS PREPARED UNDER US GAAP VERSUS IFRS



contrast cash flow statements prepared under International Financial Reporting Standards (IFRS) and US generally accepted accounting principles (US GAAP)

The key differences between statements of cash flows prepared under IFRS and US GAAP are summarized in Exhibit 34. Most significantly, IFRS allow more flexibility in the reporting of such items as interest paid or received and dividends paid or received and in how income tax expense is classified.

US GAAP classify interest and dividends received from investments as operating activities, whereas IFRS allow companies to classify those items as either operating or investing cash flows. Likewise, US GAAP classify interest expense as an operating activity, even though the principal amount of the debt issued is classified as a financing activity. IFRS allow companies to classify interest expense as either an operating activity or a financing activity. US GAAP classify dividends paid to stockholders as a financing activity, whereas IFRS allow companies to classify dividends paid as either an operating activity or a financing activity.

US GAAP classify all income tax expenses as an operating activity. IFRS also classify income tax expense as an operating activity, unless the tax expense can be specifically identified with an investing or financing activity (e.g., the tax effect of the sale of a discontinued operation could be classified under investing activities).

### Exhibit 34: Cash Flow Statements: Differences between IFRS and US GAAP

Topic	IFRS	US GAAP
Classification of cash flows:		
• Interest received	Operating or investing	Operating
• Interest paid	Operating or financing	Operating
• Dividends received	Operating or investing	Operating
• Dividends paid	Operating or financing	Financing

Topic	IFRS	US GAAP
• Bank overdrafts	Considered part of cash equivalents	Not considered part of cash and cash equivalents and classified as financing
• Taxes paid	Generally operating, but a portion can be allocated to investing or financing if it can be specifically identified with these categories	Operating
Format of statement:	Direct or indirect; direct is encouraged	Direct or indirect; direct is encouraged. A reconciliation of net income to cash flow from operating activities must be provided regardless of method used

Sources: IAS 7; FASB ASC Topic 230; and "IFRS and US GAAP: Similarities and Differences," PricewaterhouseCoopers (November 2017), available at [www.pwc.com](http://www.pwc.com).

### QUESTION SET



1. Which of the following is an example of a financing activity on the cash flow statement under US GAAP?

- A. Payment of interest
- B. Receipt of dividends
- C. Payment of dividends

**Solution:**

C is correct. Payment of dividends is a financing activity under US GAAP. Payment of interest and receipt of dividends are included in operating cash flows under US GAAP. Note that IFRS allow companies to include receipt of interest and dividends as either operating or investing cash flows and to include payment of interest and dividends as either operating or financing cash flows.

2. Interest paid is classified as an operating cash flow under:

- A. US GAAP but may be classified as either operating or investing cash flows under IFRS.
- B. IFRS but may be classified as either operating or investing cash flows under US GAAP.
- C. US GAAP but may be classified as either operating or financing cash flows under IFRS.

**Solution:**

C is correct. Interest expense is always classified as an operating cash flow under US GAAP but may be classified as either an operating or financing cash flow under IFRS.

3. Cash flows from taxes on income must be separately disclosed under:

- A. IFRS only.
- B. US GAAP only.

C. both IFRS and US GAAP.

**Solution:**

C is correct. Taxes on income are required to be separately disclosed under IFRS and US GAAP. The disclosure may be in the cash flow statement or elsewhere.

4. Mabel Corporation (MC) reported accounts receivable of USD66 million at the end of its second fiscal quarter. MC had revenues of USD72 million for its third fiscal quarter and reported accounts receivable of USD55 million at the end of its third fiscal quarter. Based on this information, the amount of cash MC collected from customers during the third fiscal quarter is:

A. USD61 million.

B. USD72 million.

C. USD83 million.

**Solution:**

C is correct. The amount of cash collected from customers during the quarter is equal to beginning accounts receivable plus revenues minus ending accounts receivable:  $\text{USD66 million} + \text{USD72 million} - \text{USD55 million} = \text{USD83 million}$ . A reduction in accounts receivable indicates that cash collected during the quarter was greater than revenue on an accrual basis.

5. Red Road Company, a consulting company, reported total revenues of USD100 million, total expenses of USD80 million, and net income of USD20 million in the most recent year. If accounts receivable increased by USD10 million, how much cash did the company receive from customers?

A. USD90 million.

B. USD100 million.

C. USD110 million.

**Solution:**

A is correct. Revenues of USD100 million minus the increase in accounts receivable of USD10 million equal USD90 million cash received from customers. The increase in accounts receivable means that the company received less in cash than it reported as revenue.



## PRACTICE PROBLEMS

- Based on the information in Exhibit 1 for Pinkerly Inc., a fictitious company, what are the total adjustments that the company would make to net income in order to derive operating cash flow?

### Exhibit 1: Pinkerly Inc.

		Year Ended	
Income statement item		12/31/2018	
Net income		USD30 million	
Depreciation		USD7 million	
Balance sheet item	12/31/2017	12/31/2018	Change
Accounts receivable	USD15 million	USD30 million	USD15 million
Inventory	USD16 million	USD13 million	(USD3 million)
Accounts payable	USD10 million	USD20 million	USD10 million

- Add USD5 million
  - Add USD21 million
  - Subtract USD9 million
- When computing net cash flow from operating activities using the indirect method, an addition to net income is *most likely* to occur when there is a:
    - gain on the sale of an asset.
    - loss on the retirement of debt.
    - decrease in a deferred tax liability.
  - An analyst gathered the information in Exhibit 1 from a company's 2018 financial statements:

### Exhibit 1: 2018 Financial Statement (US dollars, millions)

Balances as of Year Ended 31 December	2017	2018
Retained earnings	120	145
Accounts receivable	38	43
Inventory	45	48
Accounts payable	36	29

In 2018, the company declared and paid cash dividends of USD10 million and recorded depreciation expense in the amount of USD25 million. The company considers dividends paid a financing activity. The company's 2018 cash flow from operations (in USD millions) was *closest* to:

- B. 45.
- C. 75.
4. Based on the information in Exhibit 1 for Star Inc., what are the total net adjustments that the company would make to net income to derive operating cash flow?

**Exhibit 1: Star Inc.**

Year Ended			
Income Statement Item		12/31/2018	
Net income		USD20 million	
Depreciation		USD2 million	
Balance Sheet Item	12/31/2017	12/31/2018	Change
Accounts receivable	USD25 million	USD22 million	(USD3 million)
Inventory	USD10 million	USD14 million	USD4 million
Accounts payable	USD8 million	USD13 million	USD5 million

- A. Add USD2 million
- B. Add USD6 million
- C. Subtract USD6 million.
5. In 2018, a company using US GAAP made cash payments of USD6 million for salaries, USD2 million for interest expense, and USD4 million for income taxes. Additional information for the company is provided in the Exhibit 1:

**Exhibit 1: Cash Payments**

(US dollars, millions)	2017	2018
Revenue	42	37
Cost of goods sold	18	16
Inventory	36	40
Accounts receivable	22	19
Accounts payable	14	12

Based only on the information in Exhibit 1, the company's operating cash flow for 2018 is *closest to*:

- A. USD6 million.
- B. USD10 million.
- C. USD14 million.
6. Green Glory Corp., a garden supply wholesaler, reported cost of goods sold for the year of USD80 million. Total assets increased by USD55 million, including an increase of USD5 million in inventory. Total liabilities increased by USD45

million, including an increase of USD2 million in accounts payable. The cash paid by the company to its suppliers is most likely *closest* to:

- A. USD73 million.
  - B. USD77 million.
  - C. USD83 million.
7. Purple Fleur S.A., a retailer of floral products, reported cost of goods sold for the year of USD75 million. Total assets increased by USD55 million, but inventory declined by USD6 million. Total liabilities increased by USD45 million, and accounts payable increased by USD2 million. The cash paid by the company to its suppliers is most likely *closest* to:
- A. USD67 million.
  - B. USD79 million.
  - C. USD83 million.
8. White Flag, a women's clothing manufacturer, reported salaries expense of USD20 million. The beginning balance of salaries payable was USD3 million, and the ending balance of salaries payable was USD1 million. How much cash did the company pay in salaries?
- A. USD18 million
  - B. USD21 million
  - C. USD22 million
9. An analyst gathered the information in Exhibit 1 from a company's 2018 financial statements:

**Exhibit 1: 2018 Financial Statements (US dollars, millions)**

Year ended 31 December	2017	2018
Net sales	245.8	254.6
Cost of goods sold	168.3	175.9
Accounts receivable	73.2	68.3
Inventory	39.0	47.8
Accounts payable	20.3	22.9

Based only on the information in Exhibit 1, the company's 2018 statement of cash flows in the direct format would include amounts (in US dollars millions) for cash received from customers and cash paid to suppliers, respectively, that are *closest* to:

	Cash received from customers	Cash paid to suppliers
A.	249.7	169.7
B.	259.5	174.5
C.	259.5	182.1

10. Golden Cumulus Corp., a commodities trading company, reported interest expense of USD19 million and taxes of USD6 million. Interest payable increased by USD3 million, and taxes payable decreased by USD4 million over the period. How much cash did the company pay for interest and taxes?
- A. USD22 million for interest and USD10 million for taxes
  - B. USD16 million for interest and USD2 million for taxes
  - C. USD16 million for interest and USD10 million for taxes
11. The information in Exhibit 1 is extracted from Sweetfall Incorporated's financial statements.

**Exhibit 1: Sweetfall Inc.**

Income Statement		Balance Sheet Changes	
Revenue	USD56,800	Decrease in accounts receivable	USD1,324
Cost of goods sold	27,264	Decrease in inventory	501
Other operating expense	562	Increase in prepaid expense	6
Depreciation expense	2,500	Increase in accounts payable	1,063

The amount of cash Sweetfall Inc. paid to suppliers is:

- A. USD25,700.
- B. USD26,702.
- C. USD27,826.

## SOLUTIONS

1. A is correct. To derive operating cash flow, the company would make the following adjustments to net income: add depreciation (a non-cash expense) of USD7 million; add the decrease in inventory of USD3 million; add the increase in accounts payable of USD10 million; and subtract the increase in accounts receivable of USD15 million. Total additions of USD20 million and total subtractions of USD15 million result in net total additions of USD5 million.
2. B is correct. An addition to net income is made when there is a loss on the retirement of debt, which is a non-operating loss. A gain on the sale of an asset and a decrease in deferred tax liability are both subtracted from net-income.
3. B is correct. All dollar amounts are in millions. Net income (NI) for 2018 is USD35. This amount is the increase in retained earnings, USD25, plus the dividends paid, USD10. Depreciation of USD25 is added back to net income, and the increases in accounts receivable, USD5, and in inventory, USD3, are subtracted from net income because they are uses of cash. The decrease in accounts payable is also a use of cash and, therefore, a subtraction from net income. Thus, cash flow from operations is  $\text{USD}25 + \text{USD}10 + \text{USD}25 - \text{USD}5 - \text{USD}3 - \text{USD}7 = \text{USD}45$ .
4. B is correct. To derive operating cash flow, the company would make the following adjustments to net income: Add depreciation (a non-cash expense) of USD2 million; add the decrease in accounts receivable of USD3 million; add the increase in accounts payable of USD5 million; and subtract the increase in inventory of USD4 million. Total additions would be USD10 million, and total subtractions would be USD4 million, which gives net additions of USD6 million.

5. A is correct.

Operating cash flows

= Cash received from customers – (Cash paid to suppliers + Cash paid to employees + Cash paid for other operating expenses + Cash paid for interest + Cash paid for income taxes)

Cash received from customers = Revenue + Decrease in accounts receivable

=  $\text{USD}37 + \text{USD}3 = \text{USD}40$  million

Cash paid to suppliers

= Cost of goods sold + Increase in inventory + Decrease in accounts payable

=  $\text{USD}16 + \text{USD}4 + \text{USD}2 = \text{USD}22$  million

Therefore, the company's operating cash flow =  $\text{USD}40 - \text{USD}22 - \text{Cash paid for salaries} - \text{Cash paid for interest} - \text{Cash paid for taxes} = \text{USD}40 - \text{USD}22 - \text{USD}6 - \text{USD}2 - \text{USD}4 = \text{USD}6$  million.

6. C is correct. Cost of goods sold of USD80 million plus the increase in inventory of USD5 million equals purchases from suppliers of USD85 million. The increase in accounts payable of USD2 million means that the company paid USD83 million in cash (USD85 million minus USD2 million) to its suppliers.
7. A is correct. Cost of goods sold of USD75 million less the decrease in inventory of USD6 million equals purchases from suppliers of USD69 million. The increase

in accounts payable of USD2 million means that the company paid USD67 million in cash (USD69 million minus USD2 million).

8. C is correct. Beginning salaries payable of USD3 million plus salaries expense of USD20 million minus ending salaries payable of USD1 million equals USD22 million. Alternatively, the expense of USD20 million plus the USD2 million decrease in salaries payable equals USD22 million.
9. C is correct. Cash received from customers = Sales + Decrease in accounts receivable =  $254.6 + 4.9 = 259.5$ . Cash paid to suppliers = Cost of goods sold + Increase in inventory – Increase in accounts payable =  $175.9 + 8.8 - 2.6 = 182.1$ .
10. C is correct. Interest expense of USD19 million less the increase in interest payable of USD3 million equals interest paid of USD16 million. Tax expense of USD6 million plus the decrease in taxes payable of USD4 million equals taxes paid of USD10 million.
11. A is correct. The amount of cash paid to suppliers is calculated as follows:  
= Cost of goods sold – Decrease in inventory – Increase in accounts payable  
=  $\text{USD}27,264 - \text{USD}501 - \text{USD}1,063$   
=  $\text{USD}25,700$ .

## LEARNING MODULE

# 5

## Analyzing Statements of Cash Flows II

### LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	analyze and interpret both reported and common-size cash flow statements
<input type="checkbox"/>	calculate and interpret free cash flow to the firm, free cash flow to equity, and performance and coverage cash flow ratios

## INTRODUCTION

1

An analysis of a company's statement of cash flows provides crucial information for evaluating a company's financial position and for forecasting its future cash flows, which is foundational to the valuation of the company's debt and equity securities. This module discusses tools and techniques for analyzing the statement of cash flows, including the analysis of sources and uses of cash and cash flow, common-size analysis, and the calculation of free cash flow measures and cash flow ratios.

### LEARNING MODULE OVERVIEW



- An evaluation of a cash flow statement involves an assessment of the sources and uses of cash and the main drivers of cash flow within operating, investing, and financing activities.
- Analyst can use common-size statement analysis for the cash flow statement by expressing cash flow items as a percentage of total cash inflows/total cash outflows or as a percentage of net revenues.
- The cash flow statement can be used to calculate free cash flow to the firm (FCFF) and free cash flow to equity (FCFE), which are important profit measures for investors.
- The cash flow statement may also be used to calculate financial ratios that measure a company's profitability, performance, and financial position. Analysts use these ratios to evaluate the company over time and to compare multiple companies.

The two major accounting standard setters are as follows: 1) the International Accounting Standards Board (IASB) who establishes International Financial Reporting Standards (IFRS) and 2) the Financial Accounting Standards Board (FASB) who establishes US GAAP. Throughout this learning module both standards are referred to and many, but not all, of these two sets of accounting rules are identified. Note: changes in accounting standards as well as new rulings and/or pronouncements issued after the publication of this learning module may cause some of the information to become dated.

be examined; for example, if the company will in fact increase sales and profits at a mid-teens rate in FY2022, does that result in an investment decision? Finally, the performance of, and guidance provided by, other alcohol and spirits companies should be compared to these figures as a check for reasonableness.

## Representativeness Bias

Representativeness bias refers to the tendency to classify information based on past experiences and known classifications. New information might resemble or seem representative of familiar elements already classified but can in fact be very different and is better viewed from a different perspective. In these instances, the classification reflex can deceive, producing an incorrect understanding that biases all future thinking about the information. Base-rate neglect is a common form of representativeness bias in forecasting. In base-rate neglect, a phenomenon's rate of incidence in a larger population, or characteristics of a larger class to which a specific member belongs—its base rate—is neglected in favor of situation- or member-specific information. Considering the base rate is sometimes known as the “outside view,” while the situation-specific is known as the “inside view.”

For example, an analyst is modeling operating costs and margins for a biopharmaceutical company. The “inside view” approach would consider company-specific factors such as the types of drugs the company sells, the number of salespeople needed in each geographic region for each drug, and so on. The “outside view” approach would view the company as a member of the “biopharmaceuticals” industry, of which there are many others, and use industry or sector averages for gross margin, R&D expense as percentage of sales, and so on in the model.

Neither the outside nor inside view is superior; what makes for a superior forecast is considering both. One way of doing so is by starting with the base rate but determining which factors make the target company different from the base rate or class average and what the implications of those differences are, if any. For example, the analyst modeling the biopharmaceuticals company might start with industry averages in the model but change some of the variables to account for factors such as royalties versus product sales revenues, geographic composition of revenues, and whether the company is likely to face patent expirations on its products over the forecast period.

### EXAMPLE 4

#### Considering Base Rates for Rémy

While constructing the Rémy model in the prior lesson, little attention was given to comparable companies or to the broader industry to which Rémy belongs. In other words, the model was constructed primarily with the “inside view.” In this example, Rémy is put in the context of six other spirits-focused alcohol companies: Brown-Forman Corporation, Pernod Ricard SA, Davide Campari-Milano N.V., Diageo plc, Beclé S.A.B de C.V. (Cuervo), and the Wine & Spirits segment of LVMH (LVMH W&S) for the five most recently reported fiscal years at the time of analysis. The variable used for the industry comparison is the five-year average of EBIT margin because it is a key model input, and the profitability of an individual company is strongly influenced by industry profitability. Many of these peer companies are significantly larger by revenue than Rémy, which is useful because we have modeled Rémy becoming larger over time. The analysis for Exhibit 16 is included in the Exhibit 16 worksheet in the downloadable

Microsoft Excel workbook.



**Exhibit 16: EBIT Margin Comparison of Spirits Companies, Last Five Reported Fiscal Years (euro millions)**

EBIT margin	MRY-4	MRY-3	MRY-2	MRY-1	Most Recent Year (MRY)
Rémy	20%	20%	24%	19%	23%
Brown Forman	34%	32%	34%	32%	34%
Pernod	24%	25%	26%	26%	12%
Campari	22%	26%	25%	25%	17%
Diageo	27%	30%	30%	31%	18%
Cuervo	23%	26%	20%	18%	20%
LVMH W&S	31%	31%	32%	31%	29%
Peer average (ex Rémy)	27%	28%	28%	27%	22%
Peer five-year average (ex Rémy)	26%				

1. Evaluate the base case forecasts in the Rémy model as well as Rémy's management's FY2030 objective of a 33 percent operating margin considering the analysis in Exhibit 16.

**Solution:**

The base case forecasts in the Rémy model are for EBIT margins of 24.8 percent, 26.2 percent, and 27.6 percent in FY2022E, FY2023E, and FY2024E, respectively. The most recently reported fiscal year(s) for most of the peer companies include the effect of deleveraging from sales declines associated with the COVID-19 pandemic. Aside from that, the base case forecasts are close to the peer average and by that measure appear reasonable, though they are substantially higher than the past five years of profitability for Rémy itself.

Rémy management's objective of 33 percent operating margin in 2030 appears high relative to those of its peers; only one company, Brown Forman, has achieved that level of profitability, on annual revenues ~3.0× that of Rémy. Industry-leading growth and profitability of Rémy's Cognac segment will be required to meet this objective.

## Confirmation Bias

Confirmation bias is the tendency to look for and notice what confirms prior beliefs and to ignore or undervalue whatever contradicts them. A common manifestation of this bias among investment analysts is to structure the research process in pursuit of only positive news or certain criteria, or with a narrow scope. For example, an analyst might research a particular company but conduct only cursory research on its competitors and companies that offer substitute products. An analyst who has a positive view on a company might speak only to other analysts who share that view and the company's management, all of whom will likely tell the analyst what they want to hear and already know. Confirmation bias is closely related to overconfidence and representativeness biases.

The extent to which company management can be excessively optimistic is shown in Exhibit 17, which analyzes the annual report of a major European bank for 2007, published mere months before it entered bankruptcy and was nationalized.

Speaking with management is valuable given their role and should not be excluded from the research process, but analysts must be aware of management’s inherent bias and seek differing perspectives, especially when examining a company with significant controversy. Two approaches to mitigating confirmation bias in the forecasting process are to speak to or read research from analysts with a negative opinion on the security under scrutiny and to seek perspectives from colleagues who are not economically or psychologically invested in the subject security.

EXAMPLE 5

Management Optimism

Consider this text analysis of the chairman’s statement and business review in the 2007 annual report of a major European bank published in 2008, a few months before the bank was rescued by the government.

Exhibit 17: Text Analysis

Occurrences of ...			
Negative words		Positive words	
Disappoint/disappointed	0	Good	55
Bad/badly	0	Excellent	12
Poor	0	Success/successful	35
Weaker/weakening	7	Improvement	23
Slowdown	6	Strong/stronger/strongly	78

4

THE IMPACT OF COMPETITIVE FACTORS IN PRICES AND COSTS

- ☐
- explain how the competitive position of a company based on a Porter’s five forces analysis affects prices and costs

One of the tools that analysts can use to think about how competition will affect financial results is Michael Porter’s widely used “five forces” framework (see Porter 1980) introduced in earlier learning modules.

Cognac Industry Overview

The cognac segment is Rémy Cointreau Group’s most important business segment, accounting for over 90 percent of total operating profit. An important feature of the cognac market is that supply is limited and demand is growing. Supply is limited because the production of cognac, like that of champagne, is highly regulated, in this case through The Bureau National Interprofessionnel du Cognac. By regulation, cognac can be produced only in designated regions in France and the surrounding area.

in southwest France. Furthermore, within the region, production volume is capped each year. Approximately 98 percent of production is exported. The cognac market is highly concentrated, with the top four players controlling 78 percent of world volume and 84 percent of global value. Rémy's market share is approximately 16 percent and 18 percent of global volume and value, respectively (*The Spirits Business*, June 2018). Demand for cognac has been growing because of increasing demand from Asia, particularly China and Singapore, more than offsetting a weakening European market. The global spirits market has grown more than 5 percent annually during the 2000–17 period (*Source*: IWSR drinks market analysis). Simultaneously, Rémy has also seen a product mix improvement because consumers increasingly prefer superior quality and more expensive cognac. Exhibit 18 summarizes Porter's five forces analysis of the cognac industry.

#### Exhibit 18: Porter's Five Forces Analysis of the Cognac Industry

Force	Degree	Factors to Consider
Threat of substitutes	Low	<ul style="list-style-type: none"> <li>■ Cognac consumers show brand loyalty and do not easily shift to other beverages or high-end spirits.</li> </ul>
Rivalry	Low	<ul style="list-style-type: none"> <li>■ The market is consolidated, with four players controlling 78 percent of the world market in volume and 84 percent of global value.</li> <li>■ Only the European market is fragmented, with less than half of the market controlled by the top four.</li> </ul>
Bargaining power of suppliers	Low/medium	<ul style="list-style-type: none"> <li>■ A large number of small independent vineyards supply inputs.</li> <li>■ Most of the distillation is carried out by a large body of independent distillers that sell to the big houses.</li> </ul>
Bargaining power of buyers	Low	<ul style="list-style-type: none"> <li>■ Premium beverages are sold primarily to wine and spirits retail outlets that do not coordinate purchasing.</li> <li>■ Premium beverages are consumed primarily in small and fragmented on-premises outlets (restaurants, etc.).</li> </ul>
Threat of new entrants	Low	<ul style="list-style-type: none"> <li>■ Producers have long-term contracts with suppliers in the Cognac area.</li> <li>■ Barriers to entry are high.               <ul style="list-style-type: none"> <li>• Building brands is difficult because they must have heritage/pedigree.</li> <li>• A large capital investment is required to build an inventory with "aged" cognac and set up a distribution network.</li> </ul> </li> </ul>

In summary, the cognac market, Rémy's largest and most profitable operating segment, exhibits a favorable profitability profile. In addition to limited supply and growing demand, the industry faces a generally favorable situation with respect to substitutes, rivalry, suppliers, buyers, and potential new entrants.

**EXAMPLE 6****Analysis of Anheuser-Busch InBev Using Porter's Five Forces**

The competitive structure a company faces can vary among countries, with implications for modeling revenue growth, profit margins, capital expenditures, and return on investments. For example, Anheuser-Busch (AB) InBev, the largest global brewer, operates in many countries, two of which are the United Kingdom and Brazil, the world's third largest beer market. AB InBev's competitive position and prospects in the highly consolidated and growing Brazilian market are much more favorable than in the fragmented and declining UK market.

The Brazilian beer market is divided among four players. AmBev (AB InBev's subsidiary in Brazil, of which it owns a 61.9 percent stake) is the dominant brewer with an estimated 65 percent market share in 2018 versus 20 percent for Heineken and 12 percent for Petropolis, Brazil's largest privately owned brewing group. Helped by its dominant market position and strong distribution network, AmBev was able to report an EBITDA margin of nearly 50.4 percent in 2018 (ri.ambev.com.br), the highest in the global beer industry. The industry participants focus less on price competition and more on expanding distribution and "premiumization" (i.e., selling more expensive beers.) Although the 2015–18 time period saw challenging trading conditions due to subdued consumer demand, causing years of decline in the market by volume, Brazil is still considered a promising market. In this environment, an analyst would likely forecast solid revenue growth for AmBev. Exhibit 19 presents an analysis of the Brazilian beer market using Porter's five forces framework. Most of the competitive forces represent a low threat to profitability (consistent with AmBev's historical profitability), implying that analysts would most likely forecast continued above-average profitability.

**Exhibit 19: Analysis of the Brazilian Beer Market Using Porter's Five Forces**

Force	Degree	Factors to Consider
Threat of substitutes	Medium	<ul style="list-style-type: none"> <li>Beer consumers do not easily shift to other beverages, but such alternatives as wine and spirits are available.</li> <li>Unlike in many other countries, the range of beers is relatively limited.</li> </ul>
Rivalry	Low	<ul style="list-style-type: none"> <li>AmBev dominates the market with a 65% market share. Its economies of scale in production and distribution yield significant cost advantages relative to competition.</li> <li>Price competition is limited because of AmBev's cost advantages and because of typically increasing beer volumes.</li> </ul>
Bargaining power of suppliers	Low	<ul style="list-style-type: none"> <li>The primary inputs (water, hops, barley, and packaging) are basically commodities.</li> </ul>

Force	Degree	Factors to Consider
Bargaining power of buyers	Low	<ul style="list-style-type: none"> <li>Beer is mostly consumed in bars and restaurants. The owners of these outlets represent a large and highly fragmented group of beer buyers.</li> <li>The supermarket industry in Brazil is relatively fragmented, and supermarkets are less likely to offer alternatives, such as private labels.</li> </ul>
Threat of new entrants	Low	<ul style="list-style-type: none"> <li>New entrants face relatively high barriers to entry because of the high costs of building a brewery, establishing a national distribution network, and establishing a nationally known brand name.</li> </ul>

The UK beer market is also divided among four players, but the competitive structure is totally different than in Brazil. The market is more fragmented, with smaller market shares held by the largest players. Heineken, MolsonCoors, AB InBev, and Carlsberg had market shares of 24 percent (adbrands.net), 18 percent, 18 percent (www.ab-inbev.com), and 11 percent (carlsberggroup.com), respectively, in 2018. Consequently, the British market has no dominant brewer. Given the high fixed costs of a brewery, declining volumes of UK beer consumption, and the highly consolidated customer base, which provides the clients with substantial purchasing power (particularly in the retail channels), price competition is usually intense. A gradual switch from drinking beer in pubs and restaurants (“on-trade”) to consumption at home (“off-trade”) is making brewers even more exposed to the bargaining power of the dominant retail supermarket (grocers) chains. Increasing taxes on beer and rents faced by pub landlords add to the burden faced by the industry, leading to a steady decline of Britain’s pub industry. Profitability has been lower than the beer industry’s global average; operating margins are believed to be less than 10 percent. In this kind of environment, analysts would most likely forecast only very cautious revenue growth, if any. Exhibit 20 presents an analysis of the UK beer market using Porter’s five forces framework.

#### Exhibit 20: Analysis of the UK Beer Market Using Porter’s Five Forces

Force	Degree	Factors to Consider
Threat of substitutes	Medium	Beer consumers do not easily shift to other beverages, but such alternatives as wine, spirits, and cider are available.
Rivalry	High	<p>The market is relatively fragmented with no dominant market leader and large numbers of small breweries.</p> <p>Declining beer volumes make price wars more likely.</p> <p>Brand loyalty is less developed because of the extensive range of alternative beers.</p>
Bargaining power of suppliers	Low	The primary inputs (water, hops, barley, and packaging) are basically commodities.

Force	Degree	Factors to Consider
Bargaining power of buyers	High	The large supermarket chains that dominate the grocery sector have significant bargaining power. Large pub chains in the “on-trade” business (where beer is sold in pubs and restaurants) also have strong bargaining power.
Threat of new entrants	Low	Barriers to entry are relatively high because of the high costs of building a brewery, establishing a national distribution network (particularly given the history of brewers owning pubs and bars), and establishing a nationally known brand.  Because the United Kingdom consists of islands, companies with breweries in other countries face higher transportation costs than existing participants.

There is a distinction between Porter’s five forces and other factors that can affect profitability, such as government regulation and taxes:

Industry structure, as manifested in the strength of the five competitive forces, determines the industry’s long-run profit potential because it determines how the economic value created by the industry is divided. Government is not best understood as a sixth force because government involvement is neither inherently good nor bad for industry profitability. The best way to understand the influence of government on competition is to analyze how specific government policies affect the five competitive forces. (Porter 2008, page 10)

#### EXAMPLE 7

##### EuroAlco Case

In 20X2, EuroAlco was the beer market leader in Eurolandia (a fictional country) with 35 percent market share. The other four large brewers held 15 percent, 15 percent, 10 percent, and 7 percent share, respectively. The Eurolandia market is considered a growth market. It historically had high overall alcohol consumption but a relatively low per capita consumption of beer, a product that is attracting interest from the growing, younger population and is further supported by increasing disposable incomes.

At the start of year 20X1, the Eurolandia government, in its fight to curb alcohol consumption, tripled the excise duty (a special tax) on beer from EUR0.3 per liter to EUR0.9 and announced that excise duty will further increase by EUR0.1 per liter.

In the following year, 20X2, EuroAlco made efforts to strengthen the position of the more expensive brands in its portfolio. These efforts led to a 20 percent increase in selling costs. Similar to most consumer staple companies, EuroAlco experienced higher production costs. Poor grain harvests put price pressure on buyers of almost all feedstocks, and rising oil prices resulted in higher packaging costs. In 20X2, competing companies were much more cautious with A&P spending than EuroAlco.

Two analysts research EuroAlco at the start of year 20X3. In making their EuroAlco forecasts, both analysts use market data and the published annual report from EuroAlco (see Exhibit 21 and/or the Example 7 worksheet in the downloadable Microsoft Excel workbook). Based on the published data, they consider a number of scenarios and reach different conclusions.

**Exhibit 21: EuroAlco Key Financial and Operational Data**

€ millions	20X2	20X1	20X0	% change	
				20X2/20X1	20X1/20X0
Retailer gross sales	11,504	10,248	9,180	12%	12%
Excise duty	2,900	2,520	900	15%	180%
As % of retail revenues	25%	25%	10%		
Value-Added-Tax, VAT (20%)	1,434	1,288	1,380	11%	-7%
Retailer net sales	7,170	6,440	6,900	11%	-7%
Typical retailer profit	935	840	900	11%	-7%
As % of retailer net sales	13%	13%	13%		
Brewer net sales	6,235	5,600	6,000	11%	-7%

Key Financial Indicators	20X2	20X1	20X0	% change	
				20X2/20X1	20X1/20X0
Volume (mln hectoliters)	29	28	30	4%	-7%
Net sales	6,235	5,600	6,000	11%	-7%
Cost of sales	3,190	2,800	3,150	14%	-11%
Gross profit	3,045	2,800	2,850	9%	-2%
Selling expenses	2,088	1,680	1,650	24%	2%
Administrative expenses	145	140	150	4%	-7%
Operating profit	812	980	1,050	-17%	-7%
Average invested capital	3,000	3,000	3,100	0%	-3%
Gross margin	48.8%	50.0%	47.5%		
Selling expense %	33.5%	30.0%	27.5%		
Operating margin	13.0%	17.5%	17.5%		
Return on invested capital (pre-tax)	27%	33%	34%		

€ per hectoliter (hl)	20X2	20X1	20X0	% change	
				20X2/20X1	20X1/20X0
Retail price	397	366	306	8%	20%
Excise duty	100	90	30	11%	200%
VAT	49	46	46	7%	0%

€ per hectoliter (hl)	20X2	20X1	20X0	% change	
				20X2/20X1	20X1/20X0
Typical distributor profit	32	30	30	7%	0%
Brewer net sales	215	200	200	8%	0%
Cost of sales	110	100	105	10%	−5%
Gross profit	105	100	95	5%	5%
Selling expenses	72	60	55	20%	9%
Administrative expenses	5	5	5	0%	0%
Operating profit	28	35	35	−20%	0%

Both analysts assume that the government will impose a further increase in the excise duty (special tax on beer). They also assume that the excise duty increase will be borne by the consumers, who will face a 10 percent price increase that will allow the brewers to maintain their net (after-tax) revenues per hectoliter (hl). They assume that half the cost of sales is fixed per hectoliter and half is variable based on volume, that selling expenses will remain unchanged as a percentage of sales, and that administrative expenses are fixed.

1. Analyst A expects price elasticity of 0.8, indicating that volume will fall by 8 percent given the 10 percent retail price increase. Calculate the impact on operating profit and operating profit margin in 20X3 using Exhibit 22, which is also in the Example 7 sheet in the downloadable Microsoft Excel workbook.

**Exhibit 22: EuroAlco's Costs Structure for 20X2–20X3E (euro millions, unless noted)**

	20X2	Analyst A		Analyst B	
		20X3E	YoY%	20X3E	YoY%
Volume (millions of hl)	29	26.7	−8.0%	27.6	−5.0%
Brewer net sales (€ per hl)	215				
Net sales	6,235				
Cost of sales	3,190				
Gross profit	3,045				
Gross margin	48.8%				
Selling expenses	2,088				
Administrative expenses	145	145		145	
Operating profit	812				
Operating profit margin	13.0%				
Cost of sales (fixed)	1,595	1,595		1,595	
Cost of sales (variable)	1,595				



	Analyst A			Analyst B	
	20X2	20X3E	YoY%	20X3E	YoY%
Cost of sales (variable) per hl	55	55		55	
Selling expenses as % of sales	33.5%	33.5%		33.5%	

**Solution:**

Exhibit 23 (see the Example 7 worksheet in the downloadable Microsoft Excel workbook) shows the results for both analysts' projections. Analyst A predicts that operating profit will decrease by 25 percent to EUR608 in 20X3, resulting in an operating margin decline from 13.0 percent in 20X2 to 10.6 percent in 20X3. Analyst A calculates a revenue decline of 8 percent to EUR5,736 based on volume dropping by 8 percent and a constant price per hectoliter of EUR215. The decrease in volume reflects the price elasticity of 0.8 and the price increase of 10 percent as a result of the excise duty increase. COGS sold fell only 4 percent because part of the costs are fixed. COGS as the sum of fixed and variable costs is  $\text{EUR1,595} + [26.68 (\text{hl volume}) \times 55 (\text{hl cost})] = \text{EUR1,595} + 1,467$  (ignoring rounding error) or EUR3,062. Analyst A predicts selling expenses will decline in line with sales by 8 percent and administrative costs will remain unchanged because of their fixed character in the short term.

2. Analyst B expects price elasticity of 0.5, indicating that volume will fall by 5 percent given the 10 percent retail price increase. Calculate the impact on operating profit and operating profit margin in 20X3 using Exhibit 22, which is also in the Example 7 sheet in the downloadable Microsoft Excel workbook.

**Solution:**

Analyst B forecasts that operating profit will decline by 16 percent to EUR684. Analyst B's calculations follow the same pattern as those of Analyst A, but Analyst B predicts a smaller, 5 percent, decline in volume. Analyst A's estimates are more pessimistic than those of Analyst B. Note that the net price per hectoliter for the brewer is held constant while the price for the consumer increased 10 percent as a result of the excise duty increase. Because of Analyst B's more optimistic volume forecast, fixed costs are spread over a higher level of sales than is the case for Analyst A. Consequently, Analyst B will have a higher operating margin estimate than Analyst A. However, both analysts are predicting a decline in operating margin in 20X3.

**Exhibit 23: Analysts' Results for EuroAlco's Cost Structure and Projection (euro millions, unless noted)**

	Analyst A			Analyst B	
	20X2	20X3E	YoY%	20X3E	YoY%
Volume (millions of hl)	29	26.7	-8%	27.6	-5%
Brewer net sales per hl	215	215	0%	215	0%
Net sales	6,235	5,736	-8%	5,923	-5%
Cost of sales	3,190	3,062	-4%	3,110	-3%
Gross profit	3,045	2,674	-12%	2,813	-8%
Gross margin	48.8%	46.6%	-5%	47.5%	-3%

	20X2	Analyst A		Analyst B	
		20X3E	YoY%	20X3E	YoY%
Selling expenses	2,088	1,921	-8%	1,984	-5%
Administrative expenses	145	145	0%	145	0%
Operating profit	812	608	-25%	684	-16%
Operating profit margin	13.0%	10.6%	-19%	11.6%	-11%
Cost of sales (fixed)	1,595	1,595	0%	1,595	0%
Cost of sales (variable)	1,595	1,467	-8%	1,515	-5%
Cost of sales (variable) per hl	55	55	0%	55	0%
Selling expenses as % of net sales	33.5%	33.5%	0%	33.5%	0%

3. Gross margin improved in 20X1 (50.0 percent) but fell in 20X2 (48.8 percent). Cost of sales was relatively high in 20X2 because of high barley costs, an important ingredient for brewing beer. Assume that in 20X2, half of the cost of sales is fixed and half is based on volume. Of the variable part of the cost of sales, assume that half the amount is related to the barley price in 20X2. Barley prices increased 25 percent in 20X2. Consider a scenario where no additional taxes are imposed in 20X3, revenues and volumes remain stable, and barley prices return to their 20X1 level. Calculate EuroAlco's estimated gross margin for 20X3.

**Solution:**

If barley prices return to their 20X1 level, they will decline 20 percent in 20X3. Because volumes are assumed to remain constant, other variable costs will not change. Gross profit in 20X2 was 48.8 percent of sales, which indicates the cost of sales was 51.2 percent ( $100\% - 48.8\%$ ). Barley is 25 percent of the cost of sales (because barley represents half of variable costs, and variable cost of sales represents half of total cost of sales). Cost of sales is predicted to decline by  $25\% \times 20\% = 5\%$ . New cost of sales will be  $51.2\% - (5\% \times 51.2\%)$  or 48.6 percent. Consequently, gross margin is predicted to be  $100\% - 48.6\% = 51.4\%$  in 20X3. Compared with the gross margin of 48.8 percent in 20X2, gross margin is predicted to increase by 260 bps.

**Exhibit 24: Gross Margin Analysis**

	20X3	20X2	YoY%
Volume	29	29	0%
Revenue	6,235	6,235	0%
Cost of sales	3,031	3,190	-5%
Variable	1,436	1,595	-10%
Barley related	638	798	-20%
Not barley related	798	798	0%
Fixed	1,595	1,595	0%
Gross profit	3,205	3,045	5%

	20X3	20X2	YoY%
Gross margin	51.4%	48.8%	5%

4. EuroAlco's selling expenses increased from 30 percent of sales in 20X1 to 33.5 percent of sales in 20X2. Which competitive forces most likely influenced EuroAlco's significant increase in selling expenses?

**Solution:**

Intra-industry rivalry and threat of substitutes most likely influenced EuroAlco's significant increase in selling costs. By spending more on advertising, EuroAlco wanted to enhance the brand loyalty of its products, thus improving its competitive position versus its brewer rivals and makers of other alcoholic beverages. Furthermore, buyers' bargaining power probably also influenced EuroAlco's increased spending to the extent that advertising creates demand by the ultimate consumer. Strong demand at the ultimate consumer level for EuroAlco's specific brands could enhance the company's bargaining position with its direct customers, the distributors who serve as intermediaries.

5. Retailers are the direct customers of brewers. They buy directly from the brewer and sell to the ultimate consumer. Analyst A expects that the increase in mass retailers in Eurolandia will cause brewers' margins to decline. He expects EuroAlco's operating margin will decrease from 13 percent in 20X2 to 8 percent in 20X6, with stable sales (EUR6,235 million) and an unchanged amount of average invested capital (EUR3,000 million). Analyst B also sees the increasing importance of the larger food retailers but expects that EuroAlco can offset potential pricing pressure by offering more attractive trade credit (e.g., allowing the retailers longer payment terms). He thinks operating margin can remain stable at 13 percent with no sales growth. Average invested capital (EUR3,000 million), however, will double because of the extra investments in inventory and receivables. Describe the analysts' expectations about the impact of large retailers on brewers in terms of Porter's five forces and return on invested capital (ROIC; pre-tax). Which of the two scenarios would be better for EuroAlco?

**Solution:**

The increase in mass retailers in EuroAlco is expected to strengthen the bargaining power of buyers relative to brewers. According to Analyst A, this will lead to a lower operating margin of 8 percent, while Analyst B believes margins can be maintained if the company offers much more favorable credit terms reflected in doubling of invested capital. Analyst A expects operating profit on invested capital to fall from 27.1 percent ( $13 \text{ percent} \times \text{EUR}6,235/\text{EUR}3,000$ ) to 16.6 percent ( $8 \text{ percent} \times \text{EUR}6,235/\text{EUR}3,000$ ). Analyst B's assumptions indicate that the ROIC (operating profit divided by invested capital) in 20X2 of 27 percent will fall by half to 13.5 percent as the operating profit is earned on double the amount of invested capital (i.e.,  $13 \text{ percent} \times \text{EUR}6,235/\text{EUR}6,000$ ). The scenario envisioned by Analyst A is better for EuroAlco. Full supporting calculations are in the Example 7 worksheet in the downloadable Microsoft Excel workbook.

Porter's five forces framework and similar analytical tools can help analysts assess the relative profit potential of a company by helping them understand the company's industry and its position within that industry. Understanding the industry and competitive contexts of a company helps analysts estimate whether, for example, sales growth is likely to be relatively high or low (relative to history, relative to the overall growth in the economy or a sector, and/or relative to competing companies) and whether profit margins are likely to be relatively high or low (relative to historical profit margins and relative to competing companies). The process of incorporating an industry and competitive analysis into expectations for future financial performance requires judgment. Suppose analysts observe that a given company is the market leader in a moderately competitive industry with limited buyer and supplier power and relatively high barriers to entry. In broad terms, analysts might project that the company's future revenue growth will be in line with that of the overall industry and that its profit margins and ROIC might be somewhat higher than those of other companies in the industry. But there is no mechanical link between the analysts' observations and projecting the company's future sales growth and profit margin. Instead, the link is more subjective and probabilistic.

## 5

## MODELING INFLATION AND DEFLATION



explain how to forecast industry and company sales and costs when they are subject to price inflation or deflation

Inflation and deflation (i.e., general increase and decrease in the prices of goods and services) can significantly affect the accuracy of forecasts for a company's future revenue, profit, and cash flow. The impact of inflation or deflation on revenue and expenses differs from company to company. Even within a single company, the impact of inflation or deflation is generally different for revenue and expenses categories.

Some companies are better able to pass on higher input costs by raising the prices at which they sell their output. The ability to pass on price increases can be the result of, for example, strong branding (Coca-Cola) or proprietary technology (Apple). Companies that are well positioned to pass on price increases are, in turn, more likely to have higher and more stable profits and cash flow, relative to competitors.

We first consider the impact of inflation on sales and then on costs.

### Sales Projections with Inflation and Deflation

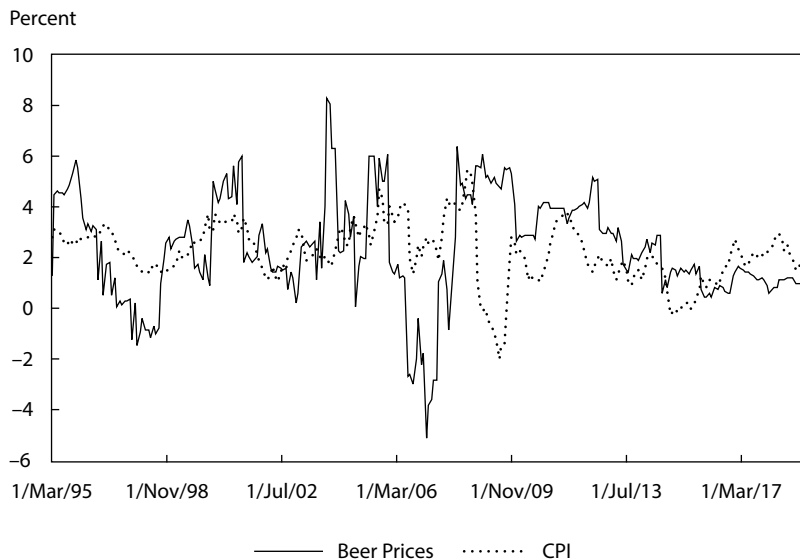
The following analysis addresses the projection of industry sales and company sales in the presence of inflation.

#### *Industry Sales and Inflation or Deflation*

Most increases in the cost of inputs, such as commodities or labor, will eventually result in higher prices for end products. Industry structure can be an important factor in determining the relationship between increases in input costs and increases in the price of end products. For example, in the United States, the beer market is an oligopoly, with one player, AB InBev, controlling almost half of the market. Moreover, the three-tier structure of the US beer market, in which the producers (the brewers) must use a third party (the wholesalers) to get their products (beer) to the consumers (bars, restaurants, and retailers) results in a fragmented customer base because brewers are not allowed to deliver directly to the end consumer. The three-tier structure is a

distributors. These wholesalers often differ state by state. Large nationwide retailers, such as Walmart, still must negotiate with several different wholesalers instead of using their dominant national market position to negotiate directly with the brewers. The industry structure in the United States has likely contributed to increases in beer prices roughly in line with the US Consumer Price Index. In other words, beer prices have generally risen during years of inflation in input costs and decreased when costs have eased (though there have been brief exceptional periods where the opposite has occurred). If necessary, US brewers have been able to increase prices to compensate for costs of inflation. In contrast, European beer companies distribute through a more concentrated customer base—namely, such dominant retail outlets as Carrefour, Tesco, and Ahold—which results in a weaker pricing position for the brewers. Also, the European market lacks an overall dominant brewer. As a result of the industry structure and the lack of underlying volume growth, changes in beer prices in Europe have been on average 100 bps less than customer inflation.

**Exhibit 25: US General Inflation and Inflation in Beer Prices**

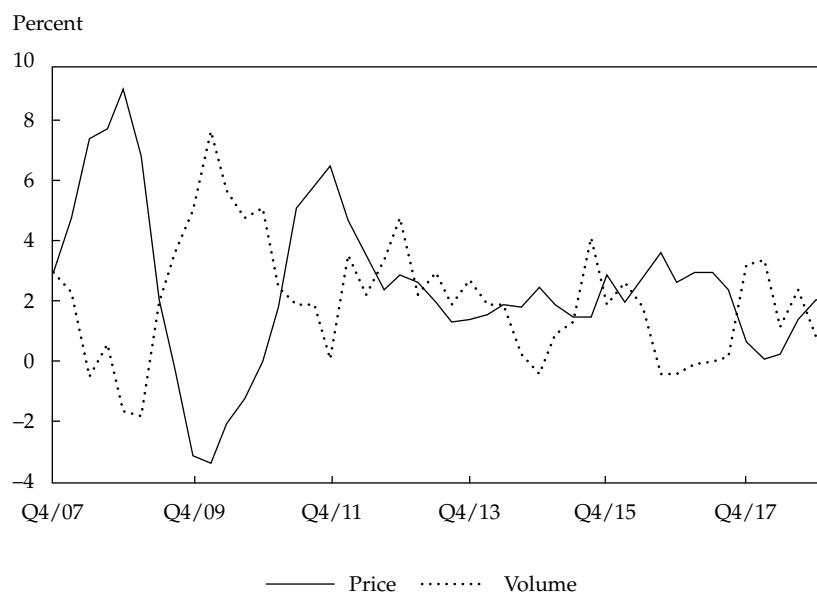


Source: US Bureau of Labor Statistics.

A company's efforts to pass on inflation through higher prices can have a negative impact on volume if the demand is price elastic, which is the case if cheaper substitutes are available. If selling prices could be increased 10 percent while maintaining unit sales volume to offset an increase of 10 percent in input costs, gross profit margin percentage would be the same but the absolute amount of gross profit would increase. In the short term, however, volumes will usually decline as result of a price increase. The decline would depend not only on the price elasticity of demand but also on the reaction of competitors and the availability of substitutes. Lower input costs also make lower consumer prices possible. The first competitor to lower prices will usually benefit with an uptick in volume. Competitors react quickly, however, resulting in a short-term benefit. The price-volume trade-off can make accurate revenue projections difficult. In an inflationary environment, raising prices too late will result in a profit margin squeeze but acting too soon could result in volume losses. In a deflationary environment, lowering prices too soon will result in a lower gross margin, but waiting too long will result in volume losses.

In the highly competitive consumer goods market, pricing is strongly influenced by movements in input prices, which can account for half of the COGS. In some time periods, customers' price sensitivity has resulted in a strong inverse relationship between volume and pricing. For example, Exhibit 26 illustrates Unilever's annual underlying volume and price growth from 2001 to 2020. Increased input prices for packaging, wheat, and milk forced Anglo-Dutch consumer staple company Unilever to increase prices for its products significantly in 2008. Consequently, volumes deteriorated. But as raw material prices fell in 2009–2010, the company's prices were lowered and volumes recovered strongly. As the company started to increase prices in 2011, volume growth once again slowed. In 2016, the company faced challenging conditions in several emerging markets as currency-devaluation-led cost increases led to weaker volumes. Both volume and price growth have moderated to low-single digit growth rates, also exhibiting lower volatility.

**Exhibit 26: Unilever Overall Revenue Growth by Percentage Change in Volume and Price**



Sources: Unilever PLC filings.

### **Company Sales and Inflation or Deflation**

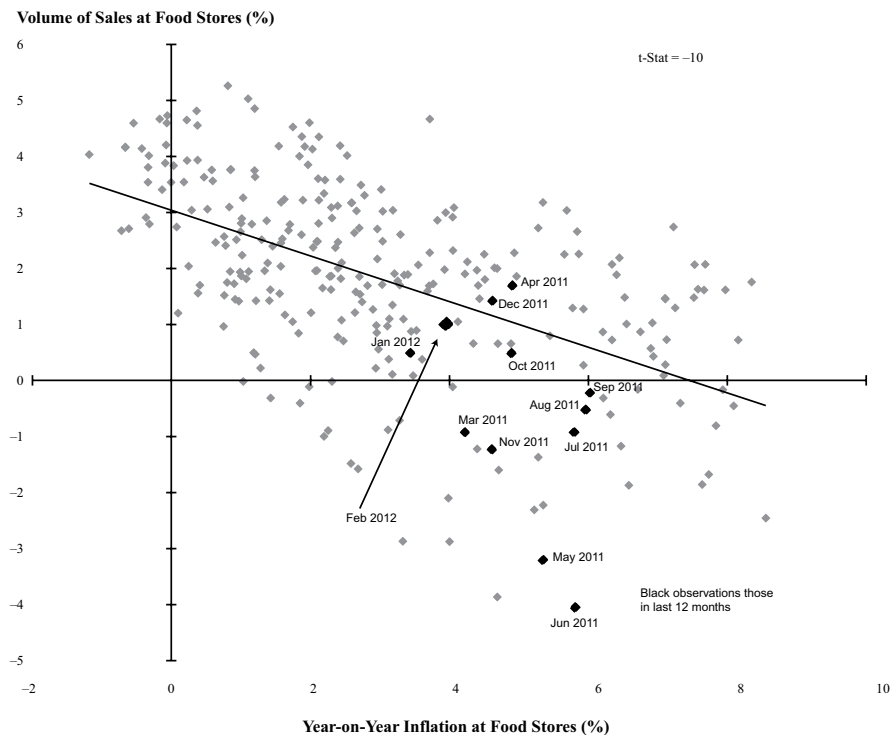
Revenue projections in a model are based on the expected volume and price development. Forecasting revenue for a company faced with inflation in input costs requires some understanding of the price elasticity of the products, the different rates of cost inflation in the countries where the company is active, and, if possible, the likely inflation in costs relevant to a company's individual product categories. Pricing strategy and market position are also important.

The impact of higher prices on volume depends on the price elasticity of demand (i.e., how the quantity demanded varies with price). If demand is relatively price inelastic, revenues will benefit from inflation. If demand is relatively price elastic (i.e., elasticity is greater than unit price elasticity), revenue can decline even if unit prices are raised. For example, a regression of volume on food inflation in UK food stores

from 1989 to 2012 (shown in Exhibit 27) gives a regression slope coefficient of  $-0.398$ . (For every increase by 1 percentage point in year-on-year food prices, year-on-year sales decreased by approximately 0.4 percent.)

An analyst covering UK food retailers can use this information when building forecast profit models. By assuming an expected level of food inflation, volume growth can be estimated and revenue calculated.

**Exhibit 27: UK Relationship between Food Inflation and Volume, January 1989–February 2012**



Source: Based on data from Datastream. Analysis is the authors'.

The expected pricing component for an international company should consider the geographic mix of its revenues to reflect different rates of inflation among countries. Of course, strategy and competitive factors, in addition to inflation in input costs, play roles in price setting.

AB InBev's volume growth and pricing have been more robust in emerging markets, for example, thanks to strong demand for its new beer products. The impact of inflation is also an important factor. In its Latin America South division, which then mainly consisted of Argentina, the brewer reported strong 24.7 percent organic revenue growth in 2011, of which only 2.1 percent was driven by volume and the remainder by price. As costs increased in line with revenues, operating margin remained more or less stable, and organic operating profit growth was high at 27 percent. With only a limited negative currency impact, reported operating profit increased 24 percent in US dollars.

High inflation in a company's export market relative to a company's domestic inflation rate generally implies that the export country's currency will come under pressure and any pricing gain could be wiped out by the currency losses. The strong pricing increases AB InBev reported in its Latin America South division were clearly

driven by input price inflation. The absence of a negative currency impact should be seen as a positive surprise but not as a typical outcome. A country's currency will usually come under pressure and depreciate if high rates of inflation persist for an extended period.

Most analysts adjust for recent high inflation in foreign countries by assuming a normalized growth rate for both revenues and costs after one or two years. This constant currency growth rate is based on an underlying growth rate assumption for the business. This approach can understate revenues in the short term. Other analysts reflect in their forecasts the high impact of inflation on revenues and expenses and adjust growth rates for the expected currency (interest rate parity) impact. This approach is also imperfect given the difficulty in projecting currency rates.

Identifying a company's major input costs provides an indication of likely pricing. For a specialist retail bakery chain, for example, the impact of increased grain prices will be more significant than for a diversified standard supermarket chain. Consequently, it seems logical that the bakery is likely to increase its prices by a higher percentage than the grocer in response to increased grain prices.

Company strategy is also an important factor. Faced with rising input prices, a company might decide to preserve its margins by passing on the costs to its customers, or it might decide to accept some margin reduction to increase its market share. In other words, the company could try to gain market share by not fully increasing prices to reflect increased costs. On the one hand, Sysco Company (the largest food distributor to restaurants and institutions in North America) has sometimes not passed on food price increases in recessionary conditions out of concern of not financially weakening already recession-affected customers (e.g., restaurants, private clubs, schools, nursing homes). On the other hand, in 2011 and 2012, the large French cognac houses substantially increased the prices of their products in China to reduce strong demand. Because older cognac generates a higher price, it can be more profitable to build an inventory of vintage cognac rather than maximizing short-term volumes.

#### EXAMPLE 8

##### Passing on Input Cost Increases or Not

Four food retail analysts are assessing the impact of a potential increase in input costs on the global supermarket chain Carrefour. In this hypothetical scenario, they believe that rising oil prices and packaging prices will affect many of the company's suppliers. They believe that Carrefour is likely to be confronted with 4 percent inflation in its COGS (with stable volume). The analysts have their own expectations about how the company will react. Exhibit 28 shows Carrefour's 2020 results, and Exhibit 29 shows the four analysts' estimates of input prices, volume growth, and pricing for the following year. Both exhibits are in the Example 8 worksheet in the downloadable Microsoft Excel workbook.

**Exhibit 28: Carrefour Data (euro millions, unless noted)**

	2020
Total revenue	72,150
COGS	56,705
Gross profit	15,445
Gross margin	21.4%



**Exhibit 29: Four Analysts' Estimates of Carrefour's Reaction to Inflation**

	A	B	C	D
Price increase for revenues	0.00%	2.00%	3.00%	4.00%
Volume growth	5.00%	2.00%	1.00%	−4.00%
Total revenue growth	5.00%	4.04%	4.03%	−0.16%
Input costs increase	4.00%	4.00%	4.00%	4.00%

1. What are each analyst's predictions for gross profit and gross margin?

**Solution:**

The results for each analyst are shown in Exhibit 30 and the Example 8 worksheet in the downloadable Microsoft Excel workbook. For Analyst B, revenues increase 4 percent [= (1.02 × 1.02) − 1] and COGS 6.1 percent [= (1.02 × 1.04) − 1]. The difference between the calculated revenue and COGS is the new gross profit and gross margin is gross profit as a percentage of revenue.

**Exhibit 30: Results for Analysts' Predictions (EUR millions, unless noted)**

	2020	Analyst A 2021E	YoY%	Analyst B 2021E	YoY%	Analyst C 2021E	YoY%	Analyst D 2021E	YoY%
Total revenue	72,150	75,758	5.0%	75,065	4%	75,058	4.0%	72,035	−0.2%
COGS	56,705	61,922	9.2%	60,153	6%	59,563	5.0%	56,614	−0.2%
Gross profit	15,445	13,836	−10%	14,912	−3%	15,495	0%	15,420	−0.2%
Gross margin	21.4%	18.3%		19.9%		20.6%		21.4%	

2. Which analyst has the highest forecast for gross margin?

**Solution:**

The highest gross margin is projected by Analyst D, who assumes that selling prices would increase by 4 percent to offset rising input costs and keep gross margin stable from the 2020 level.

3. Which analyst has the highest forecast for gross profit?

**Solution:**

The highest gross profit is projected by Analyst D.

## Cost Projections with Inflation and Deflation

The following analysis addresses the forecasting of industry and company costs in the presence of inflation and deflation.

### Industry Costs and Inflation or Deflation

Familiarity with the specific purchasing characteristics of an industry can also be useful in forecasting costs. For example, long-term price-fixed forward contracts and hedges can delay the impact of price increases. Thus, an analyst forecasting costs for

an industry in which companies customarily use such purchasing practices would incorporate any expected input price fluctuations more slowly than they would for an industry in which the participants do not use long-term contracts or hedges.

Monitoring the underlying drivers of input prices can also be useful in forecasting costs. For example, weather conditions can have a dramatic impact on the price of agricultural products and consequently on the cost base of industries that rely on them. An analyst observing a particular weather pattern might thus be able to incorporate this information into forecasts of costs.

How inflation or deflation affects an industry's cost structure depends on its competitive environment. For example, if the participants within the industry have access to alternative inputs or are vertically integrated, the impact of volatility in input costs can be mitigated. Jacobs Douwe Egberts (JDE) is a coffee company that has been facing high and volatile coffee prices. However, its coffee is a blend of different kinds of beans. By shifting the mix slightly, JDE can keep both taste and costs constant by reducing the amount of the more expensive types of coffee beans in the blend. But if all supplier countries significantly increase the price of coffee simultaneously, JDE cannot use blending as an offset and will be confronted with overall higher input costs. To sustain its profitability, JDE will have to increase its prices to its clients. But if competition from other companies, such as Nestlé (Nespresso, Dolce Gusto, Nescafé) makes it difficult to increase prices, JDE will have to look for alternatives if it wants to keep its profit margins stable. An easy solution for the short term could be reducing advertising and promotional (A&P) spending, which usually improves profit. For the longer term, however, it could be harmful for revenues because the company's brand position could be weakened.

For example, in 2010, Russia experienced a heat wave that destroyed large parts of its grain harvest, causing prices for malting barley, a major input for beer, to increase significantly. Carlsberg, as the largest Russian brewer at that time, was particularly hard hit because it had to pay more for its Russian barley and also needed to import grain into the country, incurring additional transportation costs. By increasing imports from Western Europe, Carlsberg also pushed up barley prices in this region, affecting the cost base of other Western European brewers.

### ***Company Costs and Inflation or Deflation***

In forecasting a company's costs, it is often helpful to segment the cost structure by category and geography. For each item of cost, an assessment should be made about the impact of potential inflation and deflation on input prices. This assessment should take into account the company's ability to substitute cheaper alternatives for expensive inputs or to increase efficiency to offset the impact of increases in input prices. For example, although a jump in raw material prices in 2011 caused Unilever's and Nestlé's gross margins to fall sharply (by 110–170 bps), increases in operational efficiencies, such as reducing advertising spending, enabled both companies to achieve slightly higher overall operating profit margins that year. Example 9 shows the use of common size (percent-of-sales) analysis of inflation in input costs.

#### **EXAMPLE 9**

### **Inflation in Input Costs**

Two fictional consumer staple companies—chocolate and sweets specialist “Choco A” and a food producer “Sweet B”—have costs that are constantly affected by inflation and deflation. Exhibit 31 (see the Example 9 worksheet in the downloadable Microsoft Excel workbook) presents a common size analysis.

**Exhibit 31: Common Size Analysis for Sweet B and Choco A**

	Sweet B	Choco A
Net sales	100%	100%
COGS	50%	36%
Gross margin	50%	64%
SG&A	31%	47%
Depreciation	3%	4%
EBIT	16%	13%
Raw materials	22%	22%
Packaging	12%	10%
Other COGS	16%	4%
Total COGS	50%	36%

Assume inflation of 10 percent for all costs (except depreciation) and that the companies are not able to pass on this increase through higher prices (total revenues will remain constant).

1. Calculate the gross profit margin for each company. Which company will experience the greater reduction in gross profit margin?

**Solution:**

The company with the higher COGS as a percent of net sales—equivalently, the lower gross margin—will experience the greater negative impact. Sweet B has a lower gross margin than Choco A: 50 percent compared with 64 percent, as shown in Exhibit 31. After the 10 percent increase in COGS to  $1.10 \times 50\% = 55\%$ , Sweet B's gross margin will fall to 45 percent, as shown in Exhibit 32. Sweet B's resulting gross margin of 45 percent represents a proportional decline of 10 percent from the initial value of 50 percent. In contrast, the proportional decline in Choco A's gross margin is approximately  $4\%/64\% = 6\%$ .

**Exhibit 32: Effect of Cost Inflation**

	All Costs (Except Depreciation) + 10%		Raw Materials + 10%	
	Sweet B	Choco A	Sweet B	Choco A
Net sales	100%	100%	100%	100%
COGS	55%	40%	52%	38%
Gross margin	45%	60%	48%	62%
SG&A	34%	52%	31%	47%
Depreciation	3%	4%	3%	4%
EBIT	8%	5%	14%	11%

2. Calculate the operating profit margin for each company. Which company will experience the greater reduction in operating profit (EBIT) margin?

**Solution:**

Choco A has higher overall costs than Sweet B, primarily as a consequence of its high SG&A expenses. Choco A's operating profit margin will drop to approximately 5 percent, as shown in Exhibit 32, representing a proportional decline of approximately 62 percent compared with a proportional decline of approximately  $8\%/16\% = 50\%$  for Sweet B.

3. Assume inflation of 10 percent only for the raw material costs (reflected in COGS) and that the companies are not able to pass on this increase through higher prices. Which company will be more affected negatively in terms of gross profit margin and operating profit margin?

**Solution:**

The company with the higher raw material expense component will experience the more negative effect. In this case, raw materials represent 22 percent of net sales for both Sweet B and Choco A. Gross margin and operating margin will decline by 220 bps for both. This impact is more severe on gross margin on a relative basis for Sweet B ( $2.2\%/50\% = 4.4\%$  decline) than for Choco A ( $2.2\%/64\% = 3.4\%$  decline). But the relative effect on operating margin will be more severe for Choco A ( $2.2\%/13\% = 16.9\%$  decline) than for Sweet B ( $2.2\%/16\% = 13.8\%$ ).

## 6

### THE FORECAST HORIZON AND LONG-TERM FORECASTING



explain considerations in the choice of an explicit forecast horizon and an analyst's choices in developing projections beyond the short-term forecast horizon

The choice of the forecast time horizon can be influenced by certain factors, including the investment strategy for which the security is being considered, the cyclical nature of the industry, company-specific factors, and the analyst's employer's preferences. Most professionally managed investment strategies describe the investment time frame, or average holding period, in the stated investment objectives of the strategy; the time frame should ideally correspond with average annual turnover of the portfolio. For example, a stated investment time horizon of three to five years would imply average annual portfolio turnover between 20 percent and 33 percent (average holding period is calculated as one/portfolio turnover). The cyclical nature of the industry could also influence the analyst's choice of time frame because the forecast period should be long enough to allow the business to reach an expected mid-cycle level of sales and profitability. Similar to cyclical nature, various company-specific factors, including recent acquisition or restructuring activity, can influence the selection of the forecast period to allow enough time for the realization of the expected benefits from such activity to be reflected in the financial statements. In other cases, there might be no individual analyst choice in the sense that the analyst's employer has specified more or less fixed parameters. Much of the discussion so far has focused on various methods of

short-term forecast period. Although the underlying principles remain the same if one extends the time horizon, certain considerations and choices are available to the analyst when developing longer-term projections.

Longer-term projections often provide a better representation of the normalized earnings potential of a company than a short-term forecast, especially when certain temporary factors are present. **Normalized earnings** are the expected level of mid-cycle earnings for a company in the absence of any unusual or temporary factors that affect profitability (either positively or negatively). For example, at any given point in time, a company's profitability can be influenced by a number of temporary factors, including the stage in the business cycle, recent merger and acquisition activity, and restructuring activity. Similarly, normalized free cash flow can be defined as the expected level of mid-cycle cash flow from operations adjusted for unusual items just described less recurring capital expenditures. By extending the forecast period, an analyst is able to adjust for these unusual or temporary factors and derive an estimate of earnings that the company is likely to earn in a normal year. We will consider various alternatives for two aspects of long-term forecasting: revenue forecasts and terminal value.

As with most income statement projections, a long-term forecast begins with a revenue projection, with most of the remaining income statement items subsequently derived from the level or change in revenue. Revenue projection methods were covered earlier.

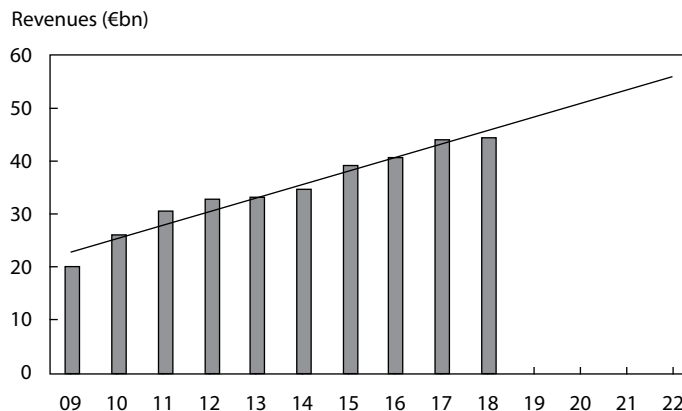
### Case Study: Estimating Normalized Revenue

Exhibit 33 contains 10 years of historical revenue data and four years of estimated normalized data for Continental AG, a global automotive supplier. The accompanying bar chart in Exhibit 34 graphically depicts the data and includes a trend line based on a linear regression of the data. The numerical values for each point along the trend line can be found by using the TREND formula in Microsoft Excel. The TREND formula uses observations on the dependent variable (in this case revenue) and observations on the explanatory (time) variable to perform a linear regression by using least squares criterion to find the best fit. After computing the best fit regression model, the TREND formula returns predicted values associated with new points in time. The worksheet for Exhibit 33 and Exhibit 34 in the downloadable Microsoft Excel workbook demonstrates the calculations used in the exhibits.

**Exhibit 33: Historical and Estimated Revenue Data for Continental AG, 2011–2024E (euro billions)**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Revenue	30.5	32.7	33.3	34.5	39.2	40.6	44.0	44.4	44.5	37.7				
Normalized revenue	31.8	33.2	34.6	36.0	37.4	38.9	40.3	41.7	43.1	44.5	45.9	47.3	48.7	50.1
Percent above/below trend	−4.1%	−1.4%	−3.7%	−4.2%	4.8%	4.4%	9.3%	−6.6%	3.3%	−15.2%				

**Exhibit 34: Historical and Estimated Revenue for Continental AG, 2011–2024E**



The “growth relative to GDP growth” and “market growth and market share” methods discussed earlier can also be applied to developing longer-term projections. Once a revenue projection has been established, previously described methods of forecasting costs can be used to complete the income statement, balance sheet, and cash flow statement.

If an analyst is creating a valuation model such as a DCF model, estimating a terminal value is required to capture the going-concern value of the company after the explicit forecast period. Certain considerations should be kept in mind when deriving the terminal value based on long-term projections.

First, an analyst should consider whether the terminal year free cash flow projection should be normalized before that cash flow is incorporated into a long-term projection. For example, if the explicitly forecasted terminal year free cash flow is “low” (e.g., because of business cycle reasons or capital investment projects), an adjustment to normalize the amount might be warranted. Second, an analyst should consider whether and how the future long-term growth rate will differ from the historical growth rate. For example, even some mature companies might be able to accelerate their long-term growth rate through product innovation and/or market expansion (e.g., Apple), whereas other seemingly well-protected “growers” could experience an unanticipated decline in their business as a result of technological change (e.g., Eastman Kodak Company, a global commercial printing and imaging company).

One of the greatest challenges facing the analyst is anticipating inflection points, when the future will look significantly different from the recent past. Most DCF models rely on a perpetuity calculation, which assumes that the cash flows from the last year of an explicit forecast grow at a constant rate forever. Because the perpetuity can account for a relatively large portion of the overall valuation of the company, it is critical that the cash flow used is representative of a “normalized” or “mid-cycle” result. If the analyst is examining a cyclical company, using a boom year as the starting point for the perpetuity could result in a grossly overstated valuation. Similarly, using a trough year could result in a valuation that is much too low.

Another important consideration is economic disruption. The economy can occasionally experience sudden, unprecedented changes that affect a wide variety of companies, such as the 2008 global financial crisis or the COVID-19 pandemic. Even a company with a sound strategy and solid operations can be thrown far off course by a sudden economic disruption, particularly if the company has a high degree of financial leverage.

Regulation and technology are also potential drivers of inflection points, and it is important for the analyst to keep a close eye on both. Government actions can have extreme, sudden, and unpredictable impacts on some businesses. Technological advances can turn fast-growing innovators obsolete in a matter of months. Both regulation and technology affect some industries more than others. Utilities experience intense regulation but might not see a significant technological change for decades. Semiconductor manufacturers must constantly keep up with new technology but experience relatively light regulation. Pharmaceutical manufacturers are heavily exposed to both regulation and technological advances.

Finally, long-term growth is a key input in the perpetuity calculation. Some companies and industries can grow faster than the overall economy for long periods of time, causing them to account for an increasing share of overall output. Examples include some technology companies, such as Tencent, Amazon, and Google. Other companies, such as those in the print media sector, are likely to grow slower than the overall economy or even shrink over time. Using an unrealistic long-term growth rate can put the analyst's valuation far off the mark.

**EXAMPLE 10****Important Considerations When Making Assumptions**

1. Turkish Airlines (THYAO.IS) operates in the highly cyclical global airline industry. Operating margins for 2011–2019 are shown in the following table and in the Example 10 worksheet in the downloadable Microsoft Excel workbook.

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Operating margin	1.0%	10.8%	6.5%	5.6%	8.6%	−2.9%	9.0%	9.9%	7.9%

On the basis of only the information in the table, which of the following operating margins would *most likely* be appropriate to use in a perpetuity calculation for Turkish Airlines to arrive at a reasonable intrinsic value estimate?

- A. 6.0 percent
- B. 9.0 percent
- C. 9.9 percent

**Solution:**

A is correct. Because the airline industry is cyclical, an estimate of “mid-cycle” or “normalized” operating margin is necessary to estimate a perpetuity value. The nine-year average operating margin was 6.3 percent.

For each of the companies in the following problems, indicate which of the choices is *least likely* to cause a change in the company's outlook.

2. ABC Diesel (hypothetical company), a manufacturer of diesel-power trucks
  - A. Consumers have started switching to trucks with electric engines, threatening ABC's historic strength in diesel engine trucks.
  - B. ABC Diesel has formed a partnership with Electrico (hypothetical), a company involved in research and innovation in electric engines.



- C. Environmental regulations have been getting tighter in most regions, and consistent with prior experience, this need to make the engines less polluting is expected to continue over the next several years.

**Solution:**

C is correct. Although it is important that environmental regulations have been getting stricter, this is consistent with past experience and so does not represent a turning point.

3. Abbott Laboratories, a diversified manufacturer of health care products, including medical devices
- A. Management reiterates its long-standing approach to capital deployment.
  - B. A competitor has demonstrated favorable efficacy data on a medical device candidate that will compete with an important Abbott product.
  - C. It has become more difficult for medical device manufacturers to receive regulatory approval for new products because of heightened safety concerns.

**Solution:**

A is correct. Management is sticking with its historical approach to capital deployment, so this does not represent a turning point.

4. Grupo Aeroportuario del Sureste, operator of nine airports in Mexico, especially in the tourist-heavy southeast
- A. Global economic disruption has caused a sharp decline in international travel.
  - B. Regulators will allow the construction of a new airport by a competitor in Grupo Aeroportuario del Sureste's service territory.
  - C. A technological advance will allow airlines to save 5 percent on fuel costs, but it is not expected to meaningfully alter passenger volumes. Similar developments in the past have benefited airlines but not airports, whose price per passenger is regulated.

**Solution:**

C is correct. Although the technological advance is good for the airlines, it will not have a meaningful effect on passenger volumes, which will likely prevent the airports from sharing in that benefit. In contrast, both A and B could have a significant impact on the long-run earnings power of Mexican airports.

5. LinkedIn, operator of an online social network for professionals and part of Microsoft Corporation, with limited investment needs and no debt
- A. Facebook, another online social network, announces a plan to enhance its offerings in the professional category.
  - B. Regulators announce an investigation of LinkedIn's privacy practices, which could result in significant changes to the service.



- C. The US Federal Reserve has just increased interest rates. Although this will raise borrowing costs, the rate increase is not expected to have a negative impact on the economy.

**Solution:**

C is correct. Because LinkedIn carries no debt, it is unlikely that higher interest rates will cause a change in the company's outlook.

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## PRACTICE PROBLEMS

### The following information relates to questions 1-7

Nigel French, an analyst at Taurus Investment Management, is analyzing Archway Technologies, a manufacturer of luxury electronic auto equipment, at the request of his supervisor, Lukas Wright. French is asked to evaluate Archway's profitability over the past five years relative to its two main competitors, which are located in different countries with significantly different tax structures.

French begins by assessing Archway's competitive position within the luxury electronic auto equipment industry using Porter's five forces framework. A summary of French's industry analysis is presented in Exhibit 1.

#### Exhibit 1: Analysis of Luxury Electronic Auto Equipment Industry Using Porter's Five Forces Framework

Force	Factors to Consider
Threat of substitutes	Customer switching costs are high
Rivalry	Archway holds 60 percent of world market share; each of its two main competitors holds 15 percent
Bargaining power of suppliers	Primary inputs are considered basic commodities, and there are a large number of suppliers
Bargaining power of buyers	Luxury electronic auto equipment is very specialized (non-standardized)
Threat of new entrants	High fixed costs to enter industry

French notes that for the year just ended (2019), Archway's COGS was 30 percent of sales. To forecast Archway's income statement for 2020, French assumes that all companies in the industry will experience an inflation rate of 8 percent on the COGS. Exhibit 2 shows French's forecasts relating to Archway's price and volume changes.

#### Exhibit 2: Archway's 2020 Forecasted Price and Volume Changes

Average price increase per unit	5.00%
Volume growth	-3.00%

After putting together income statement projections for Archway, French forecasts Archway's balance sheet items. He uses Archway's historical efficiency ratios to forecast the company's working capital accounts.

Based on his financial forecast for Archway, French estimates a terminal value using a valuation multiple based on the company's average price-to-earnings multiple (P/E) over the past five years. Wright discusses with French how the terminal value estimate is sensitive to key assumptions about the company's future

prospects. Wright asks French:

“What change in the calculation of the terminal value would you make if a technological development that would adversely affect Archway was forecast to occur sometime beyond your financial forecast horizon?”

1. Which profitability metric should French use to assess Archway’s five-year historic performance relative to its competitors?
  - A. Current ratio
  - B. Operating margin
  - C. Return on invested capital
2. Based on the current competitive landscape presented in Exhibit 1, French should conclude that Archway’s ability to:
  - A. pass along price increases is high.
  - B. demand lower input prices from suppliers is low.
  - C. generate above-average returns on invested capital is low.
3. Based on the current competitive landscape presented in Exhibit 1, Archway’s operating profit margins over the forecast horizon are *least likely* to:
  - A. decrease.
  - B. remain constant.
  - C. increase.
4. Based on Exhibit 2, Archway’s forecasted gross profit margin for 2020 is *closest* to:
  - A. 62.7 percent.
  - B. 67.0 percent.
  - C. 69.1 percent.
5. French’s approach to forecasting Archway’s working capital accounts would be *most likely* classified as a:
  - A. hybrid approach.
  - B. top-down approach.
  - C. bottom-up approach.
6. The *most appropriate* response to Wright’s question about the technological development is to:
  - A. increase the required return.
  - B. decrease the perpetual growth rate.
  - C. decrease the price-to-earnings multiple.

7. If the luxury electronic auto equipment industry is subject to rapid technological changes and market share shifts, how should French best adapt his approach to

modeling?

- A. Examine base rates
  - B. Forecast multiple scenarios
  - C. Speak to analysts who hold diverse opinions on the stock
- 

## The following information relates to questions 8-14

Gertrude Fromm is a transportation sector analyst at Tucana Investments. She is conducting an analysis of Omikroon, N.V., a hypothetical European engineering company that manufactures and sells scooters and commercial trucks.

Omikroon's petrol scooter division is the market leader in its sector and has two competitors. Omikroon's petrol scooters have a strong brand name and a well-established distribution network. Given the strong branding established by the market leaders, the cost of entering the industry is high. But Fromm anticipates that small, inexpensive, imported petrol-fueled motorcycles could become substitutes for Omikroon's petrol scooters.

Fromm uses ROIC as the metric to assess Omikroon's performance.

Omikroon has just introduced the first electric scooter to the market at year-end 2019. The company's expectations are as follows:

- Competing electric scooters will reach the market in 2021.
- Electric scooters will not be a substitute for petrol scooters.
- The important research costs in 2020 and 2021 will lead to more efficient electric scooters.

Fromm decides to use a five-year forecast horizon for Omikroon after considering the following three factors:

Factor 1 The annual portfolio turnover at Tucana Investments is 30 percent.

Factor 2 The electronic scooter industry is expected to grow rapidly over the next 10 years.

Factor 3 Omikroon has announced it would acquire a light truck manufacturer that will be fully integrated into its truck division by 2021 and will add 2 percent to the company's total revenues.

Fromm uses the base case forecast for 2020 shown in Exhibit 1 to perform the following sensitivity analysis:

- The price of an imported specialty metal used for engine parts increases by 20 percent.
- This metal constitutes 4 percent of Omikroon's cost of sales.
- Omikroon will not be able to pass on the higher metal expense to its customers.

**Exhibit 1: Omikroon's Selected Financial Forecasts for 2020 Base Case (euro millions)**

	<b>Petrol Scooter Division</b>	<b>Commercial Truck Division</b>	<b>Electric Scooter Division</b>	<b>Total</b>
Sales	99.05	45.71	7.62	152.38
Cost of sales				105.38
Gross profit				47.00
Operating profit				9.20

Omikroon will initially outsource its electric scooter parts. But manufacturing these parts in-house beginning in 2021 will imply changes to an existing factory. This factory cost EUR7 million three years ago and had an estimated useful life of 10 years. Fromm is evaluating two scenarios:

Scenario 1 Refit the existing factory for EUR27 million.

Scenario 2 Sell the existing factory for EUR5 million. Build a new factory costing EUR30 million with a useful life of 10 years.

8. Using Porter's five forces analysis, which of the following competitive factors is *most likely* to have the greatest impact on Omikroon's petrol scooter pricing power?
  - A. Rivalry
  - B. Threat of substitutes
  - C. Threat of new entrants
9. The metric used by Fromm to assess Omikroon's performance incorporates:
  - A. the degree of financial leverage.
  - B. operating liabilities relative to operating assets.
  - C. the firm's competitiveness relative to companies in other tax regimes.
10. Based on Omikroon's expectations, the gross profit margin of Omikroon's electric scooter division in 2021 is *most likely* to be affected by:
  - A. competition.
  - B. research costs.
  - C. cannibalization by petrol scooters.
11. Which factor *best* justifies the five-year forecast horizon for Omikroon selected by Fromm?
  - A. Factor 1
  - B. Factor 2
  - C. Factor 3
12. Fromm's sensitivity analysis will result in a decrease in the 2020 base case gross

profit margin *closest to*:

- A. 0.55 percent.
  - B. 0.80 percent.
  - C. 3.32 percent.
13. Fromm's estimate of growth capital expenditures included in Omikroon's PP&E under Scenario 1 should be:
- A. lower than under Scenario 2.
  - B. the same as under Scenario 2.
  - C. higher than under Scenario 2.
14. To validate the forecast for rapid growth in the electronic scooter market over the next 10 years, Fromm speaks to the management of Omikroon and investor relations of ZeroWheel, a competitor. Which behavioral bias is Fromm *most likely* subject to?
- A. Confirmation
  - B. Conservatism
  - C. Overconfidence

## The following information relates to questions 15-21

Angela Green, an investment manager at Horizon Investments, intends to hire a new investment analyst. After conducting initial interviews, Green has narrowed the pool to three candidates. She plans to conduct second interviews to further assess the candidates' knowledge of industry and company analysis.

Prior to the second interviews, Green asks the candidates to analyze Chrome Network Systems, a company that manufactures internet networking products. Each candidate is provided Chrome's financial information presented in Exhibit 1.

**Exhibit 1: Chrome Network Systems Selected Financial Information (US dollar millions)**

	Year-End		
	2017	2018	2019
Net sales	46.8	50.5	53.9
Cost of sales	18.2	18.4	18.8
Gross profit	28.6	32.1	35.1
SG&A expenses	19.3	22.5	25.1
Operating income	9.3	9.6	10.0

	Year-End		
	2017	2018	2019
Interest expense	0.5	0.7	0.6
Income before provision for income tax	8.8	8.9	9.4
Provision for income taxes	2.8	2.8	3.1
Net income	6.0	6.1	6.3

Green asks each candidate to forecast the 2020 income statement for Chrome and to outline the key assumptions used in their analysis. The job candidates are told to include Horizon's economic outlook for 2020 in their analysis, which assumes nominal GDP growth of 3.6 percent, based on expectations of real GDP growth of 1.6 percent and inflation of 2.0 percent.

Green receives the models from each of the candidates and schedules second interviews. To prepare for the interviews, Green compiles a summary of the candidates' key assumptions in Exhibit 2.

#### Exhibit 2: Summary of Key Assumptions Used in Candidates' Models

Metric	Candidate A	Candidate B	Candidate C
Net sales	Net sales will grow at the average annual growth rate in net sales over the 2017–19 time period.	Industry sales will grow at the same rate as nominal GDP, but Chrome will have a two-percentage-point decline in market share.	Net sales will grow 50 bps slower than nominal GDP.
Cost of sales	The 2020 gross margin will be the same as the average annual gross margin over the 2017–19 time period.	The 2020 gross margin will decline as costs increase by expected inflation.	The 2020 gross margin will increase by 20 bps from 2019.
SG&A expenses	The 2020 SG&A/net sales ratio will be the same as the average ratio over the 2017–19 time period.	The 2020 SG&A will grow at the rate of inflation.	The 2020 SG&A/net sales ratio will be the same as the 2019 ratio.
Interest expense	The 2020 interest expense assumes the effective interest rate will be the same as the 2019 rate.	The 2020 interest expense will be the same as the 2019 interest expense.	The 2020 interest expense will be the same as the average expense over the 2017–19 time period.
Income taxes	The 2020 effective tax rate will be the same as the 2019 rate.	The 2020 effective tax rate will equal the blended statutory rate of 30%.	The 2020 effective tax rate will be the same as the average effective tax rate over the 2017–19 time period.

15. Based on Exhibit 1, which of the following provides the strongest evidence that Chrome displays economies of scale?

A. Increasing net sales



- B. Profit margins that are increasing with net sales
  - C. Gross profit margins that are increasing with net sales
16. Based on Exhibit 2, the job candidate *most likely* using a bottom-up approach to model net sales is:
- A. Candidate A.
  - B. Candidate B.
  - C. Candidate C.
17. Based on Exhibit 2, the modeling approach used by Candidate B to project future net sales is *most accurately* classified as a:
- A. hybrid approach.
  - B. top-down approach.
  - C. bottom-up approach.
18. Based on Exhibits 1 and 2, Candidate C's forecast for cost of sales in 2020 is *closest to*:
- A. USD18.3 million.
  - B. USD18.9 million.
  - C. USD19.3 million.
19. Based on Exhibits 1 and 2, Candidate A's forecast for SG&A expenses in 2020 is *closest to*:
- A. USD23.8 million.
  - B. USD25.5 million.
  - C. USD27.4 million.
20. Based on Exhibit 2, forecasted interest expense will reflect changes in Chrome's debt level under the forecast assumptions used by:
- A. Candidate A.
  - B. Candidate B.
  - C. Candidate C.
21. Candidate B asks Green if she had additional information on Horizon's industry peers and competitors, to put the profitability estimates in a richer context. By asking for this additional information for their analysis, Candidate B is *most likely* seeking to mitigate which behavioral bias?
- A. Conservatism
  - B. Base rate neglect
  - C. illusion of control

## SOLUTIONS

1. B is correct. Operating (EBIT) margin is a pre-tax profitability measure that can be useful in the peer comparison of companies in countries with different tax structures. Archway's two main competitors are located in different countries with significantly different tax structures; therefore, a pre-tax measure is better than an after-tax measure, such as ROIC. The current ratio is a liquidity measure, not a profitability measure.
2. A is correct. Porter's five forces framework in Exhibit 1 describes an industry with high barriers to entry, high customer switching costs (suggesting a low threat of substitutes), and a specialized product (suggesting low bargaining power of buyers). Furthermore, the primary production inputs from the large group of suppliers are considered basic commodities (suggesting low bargaining power of suppliers). These favorable industry characteristics will likely enable Archway to pass along price increases and generate above-average returns on invested capital.
3. A is correct. The current favorable characteristics of the industry (high barriers to entry, low bargaining power of suppliers and buyers, low threat of substitutes), coupled with Archway's dominant market share position, will likely lead to Archway's profit margins being at least equal to or greater than current levels over the forecast horizon.
4. C is correct. The calculation of Archway's gross profit margin for 2020, which reflects the industry-wide 8% inflation on COGS, is calculated as follows:

Revenue growth	1.85%
COGS increase	4.76%
Forecasted revenue (Base revenue = 100)	101.85
Forecasted COGS (Base COGS = 30)	31.43
Forecasted gross profit	70.42
Forecasted gross profit margin	69.14%

$$\begin{aligned}
 \text{Revenue growth} &= (1 + \text{Price increase for revenue}) \times (1 + \text{Volume growth}) - 1 \\
 &= (1.05) \times (0.97) - 1 \\
 &= 1.85\%.
 \end{aligned}$$

$$\begin{aligned}
 \text{COGS increase} &= (1 + \text{Price increase for COGS}) \times (1 + \text{Volume growth}) - 1 \\
 &= (1.08) \times (0.97) - 1 \\
 &= 4.76\%.
 \end{aligned}$$

$$\begin{aligned}
 \text{Forecasted revenue} &= \text{Base revenue} \times \text{Revenue growth increase} \\
 &= 100 \times 1.0185 \\
 &= 101.85.
 \end{aligned}$$

$$\text{Forecasted COGS} = \text{Base COGS} \times \text{COGS increase}$$

$$= 30 \times 1.0476$$

$$= 31.43.$$

Forecasted gross profit = Forecasted revenue – Forecasted COGS

$$= 101.85 - 31.43$$

$$= 70.42.$$

Forecasted gross profit margin = Forecasted gross profit/Forecasted revenue

$$= 70.42/101.85$$

$$= 69.14\%.$$

5. C is correct. French is using a bottom-up approach to forecast Archway's working capital accounts by using the company's historical efficiency ratios to project future performance.
6. C is correct. If the future growth or profitability of a company is likely to be lower than the historical average (in this case, because of a potential technological development), then the target multiple should reflect a discount to the historical multiple to reflect this difference in growth and/or profitability. If a multiple is used to derive the terminal value of a company, the choice of the multiple should be consistent with the long-run expectations for growth and required return. French tells Wright he believes that such a technological development could have an adverse impact on Archway beyond the forecast horizon.
7. B is correct. Forecasting a single scenario would not be appropriate given the high degree of uncertainty and range of potential outcomes for companies in this industry.
8. B is correct. Small, inexpensive, imported petrol-fueled motorcycles are substitutes for petrol scooters and could increasingly have an impact on Omikroon's petrol scooter pricing power.
9. B is correct. Return on invested capital is net operating profit minus adjusted taxes divided by invested capital, where invested capital is defined as operating assets minus operating liabilities.
10. A is correct. Competition from other electric scooter manufacturers is expected to begin in one year. After this time, competing electric scooters could lead to lower demand for Omikroon's electric scooters and affect Omikroon's gross profit margin.
11. B is correct. The electric scooter market is expected to grow rapidly, so the contribution of Omikroon's new electric scooter division is forecast to expand significantly over the next 10 years. A is incorrect because the investment company's portfolio turnover is not relevant for forecasting Omikroon's future results. C is incorrect because the light truck division is expected to add only 2% to total revenues in the future.
12. A is correct. The sensitivity analysis consists of an increase of 20 percent in the price of an input that constitutes 4 percent of cost of sales. Change in gross profit margin because of that increase is calculated as the change in cost of sales because of price increase divided by sales:

$$= (\text{Cost of sales} \times 0.04 \times 0.2) / \text{Sales}$$

$$= (105.38 \times 0.04 \times 0.2) / 152.38$$

$$= 0.0055 \text{ or } 0.55\%$$

13. C is correct. In Scenario 1, growth capital expenditures of EUR27 million for the refit of the existing idle factory is higher than the growth capital expenditures in Scenario 2 of EUR25 million. The EUR25 million is the cost of building a new factory for EUR30 million less the proceeds from the sale of the existing idle factory of EUR5 million.
14. A is correct. The management of Omikroon and investor relations of ZeroWheel are almost certainly biased in favor of expecting strong growth for the markets they participate in. To evaluate the forecast, Fromm should seek more independent sources and balance the biased sources with sources biased in the opposite direction or an analyst who is more skeptical.
15. C is correct. Economies of scale are a situation in which average costs decrease with increasing sales volume. Chrome's gross margins have been increasing with net sales. Gross margins that increase with sales levels provide evidence of economies of scale, assuming that higher levels of sales reflect increased unit sales. Gross margin more directly reflects the cost of sales than does profit margin.

Metric	2017	2018	2019
Net sales	\$46.8	\$50.5	\$53.9
Gross profit	28.6	32.1	35.1
Gross margin (gross profit/ net sales)	61.11%	63.56%	65.12%

16. A is correct. A bottom-up approach for developing inputs to equity valuation models begins at the level of the individual company or a unit within the company. By modeling net sales using the average annual growth rate, Candidate A is using a bottom-up approach. B and C are incorrect because both Candidate B and Candidate C are using a top-down approach, which begins at the level of the overall economy.
17. B is correct. A top-down approach usually begins at the level of the overall economy. Candidate B assumes industry sales will grow at the same rate as nominal GDP but that Chrome will have a 2-percentage-point decline in market share. A and C are incorrect because Candidate B is not using any elements of a bottom-up approach; therefore, a hybrid approach is not being employed.
18. C is correct. Candidate C assumes that the 2020 gross margin will increase by 20 bps from 2019 and that net sales will grow at 50 bps slower than nominal GDP (nominal GDP = Real GDP + Inflation = 1.6% + 2.0% = 3.6%). Accordingly, the 2020 forecasted cost of sales is USD19.27 million, rounded to USD19.3 million.

Metric	Calculation	Result
2020 gross margin = 2019 gm + 20 bps	USD35.1/USD53.9 = 65.12% + 0.20% =	65.32%
2020 CoS/net sales = 100% – gross margin	100% – 65.32% =	34.68%

Metric	Calculation	Result
2020 net sales = 2019 net sales $\times$ (1 + Nominal GDP – 0.50%)	USD53.9 million $\times$ (1 + 0.036 – 0.005) = USD53.9 million $\times$ 1.031 =	USD55.57 million
2020 cost of sales = 2020 net sales $\times$ CoS/net sales	USD55.57 $\times$ 34.68% =	USD19.27 million

19. B is correct. Candidate A assumes that the 2020 SG&A/net sales will be the same as the average SG&A/net sales over the 2017–19 time period and that net sales will grow at the annual average growth rate in net sales over the 2017–19 time period. Accordingly, the 2020 forecasted SG&A expenses are USD25.5 million.

Metric	Calculation	Result
Average SG&A/net sales, 2017–2019*	(41.24% + 44.55% + 46.57%)/3 =	44.12%
Average annual growth sales in net sales, 2017–2019**	(7.91% + 6.73%)/2 =	7.32%
2020 net sales = 2019 net sales $\times$ (1 + Average annual growth rate in net sales)	USD53.9 million $\times$ 1.0732 =	\$57.85 million
2020 SG&A = 2020 net sales $\times$ Average SG&A/net sales	USD57.85 million $\times$ 44.12% =	\$25.52 million

	2017	2018	2019
Net Sales	USD46.8	USD50.5	USD53.9
SG&A expenses	USD19.3	USD22.5	USD25.1
SG&A-to-sales ratio	41.24%	44.55%	46.57%

Year	Calculation
2018	(USD50.5/USD46.8) – 1 = 7.91%
2019	(USD53.9/USD50.5) – 1 = 6.73%

20. A is correct. In forecasting financing costs, such as interest expense, the debt/equity structure of a company is a key determinant. Accordingly, a method that recognizes the relationship between the income statement account (interest expense) and the balance sheet account (debt) would be a preferable method for forecasting interest expense when compared with methods that forecast based solely on the income statement account. By using the effective interest rate (interest expense divided by average gross debt), Candidate A is taking the debt/equity structure into account. B and C are incorrect because Candidate B (who forecasts 2020 interest expense to be the same as 2019 interest expense) and Candidate C (who forecasts 2020 interest expense to be the same as the 2017–19 average interest expense) are not taking the balance sheet into consideration.
21. B is correct. Base rates refer to attributes of a reference class and base rate neglect is ignoring such class information in favor of specific information. By incorporating industry data, Candidate B is seeking to mitigate this behavioral bias.



# Glossary

This is a placeholder page. Please replace with real glossary.