



CredGuild

STUDY NOTES

CFA® Program Level I

Financial Statement Analysis

2027 curriculum · 12 readings · 54 practice questions

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ABOUT THIS EDITION

CredGuild · CFA® Program Level I · Financial Statement Analysis
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USING THIS BOOK

These notes are a study aid. Use them alongside the CFA Institute curriculum. The latest version is free at credguild.com.

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How to use this book

These are the CredGuild notes for the 2027 CFA® Program Level I curriculum, Financial Statement Analysis: 12 readings. They are the same notes as on credguild.com, set out for reading on paper or offline.

What each reading contains

- **What you'll learn:** the learning outcome statements the reading covers.
- **The notes, module by module:** worked examples, key concepts, common exam traps, exam shortcuts and a bottom line.
- **A quick check after each module:** one question with its answer and the full explanation.
- **Practice questions at the end, with the answers.** The full explanation for each one is free on the reading's page at credguild.com; the link is under the answers.

The coloured boxes

KEY CONCEPT

Definitions and formulas to know.

Example. A worked problem, step by step. Try it before you read the working.

COMMON EXAM TRAPS

Mistakes that cost marks.

EXAM SHORTCUTS

Faster ways through a question.

BOTTOM LINE

What to remember from the module.

Using it with the website

Paper is good for reading. Practice works better on the site: it scores each answer as you go, explains every option, keeps a list of the questions you got wrong and spreads the readings across the weeks before your exam. If you are not sure where to start, the free diagnostic test (credguild.com/cfa/level-1/diagnostic/) gives you a score in each topic.

If this book helps you, pass it on to someone else who is studying.

CFA® PROGRAM LEVEL I · TOPIC

Financial Statement Analysis

Exam weight 11–14% · 12 readings

Reading the income statement, balance sheet and cash flow statement; the accounting for inventories, long-lived assets, leases, pensions and income taxes; judging reporting quality; ratio analysis; and a first financial statement model.

Reading 27 Introduction to Financial Statement Analysis

Reading 28 Analyzing Income Statements

Reading 29 Analyzing Balance Sheets

Reading 30 Analyzing Statements of Cash Flows I

Reading 31 Free Cash Flow

Reading 32 LIFO vs FIFO

Reading 33 Straight Line Depreciation

Reading 34 Finance Lease vs Operating Lease

Reading 35 Deferred Tax Liability

Reading 36 Financial Reporting Quality

Reading 37 Dupont Analysis

Reading 38 Pro Forma Financial Statements

FINANCIAL STATEMENT ANALYSIS · READING 27

Introduction to Financial Statement Analysis

What you'll learn

LOS 27.a Describe the six steps of the financial statement analysis framework.

LOS 27.b Distinguish the role of financial reporting from the role of financial statement analysis.

LOS 27.c Explain why regulatory filings, financial statement notes and supplementary information, management's commentary and audit reports matter to analysts.

LOS 27.d Describe what differing reporting systems (IFRS vs US GAAP) mean for analysis and why analysts must track changes in reporting standards.

LOS 27.e Describe the information sources analysts use beyond annual and interim financial reports.

MODULE 27.1

Financial Statement Roles

This reading sets out the six steps of the financial statement analysis framework and separates the role of financial reporting from the role of financial statement analysis. It then covers the information an analyst works with: regulatory filings, footnotes, segment data, management commentary and the audit report, the differences between IFRS and US GAAP as standards evolve, and sources outside the company's filings.

LOS 27.a — The financial statement analysis framework

The framework is a generic, repeatable process that works for any analytical purpose, whether valuing equity, judging a bond issue or assessing a merger. It has six steps, taken in this order:

KEY CONCEPT

#	Step	What happens in it
1	State the objective and context	Define the questions to be answered, the format of the output, and the time and resources available
2	Gather data	Obtain the financial statements plus industry and economic data; talk to management, suppliers and customers; visit sites
3	Process the data	Adjust the statements where needed, compute ratios and run statistical work, build exhibits such as graphs and common-size statements
4	Analyze and interpret the data	Use the processed data to answer the step-1 questions and decide which conclusions or recommendations the evidence supports
5	Report the conclusions or recommendations	Write up and communicate the findings to the intended audience, in line with the CFA Institute Code and Standards
6	Update the analysis	Repeat the process periodically and revise the conclusions when facts change

Each step works on the output of the one before it. The questions written down in step 1 decide which data are collected in step 2, and those data decide which adjustments, ratios and exhibits can be prepared in step 3. Skipping step 1 therefore leaves the later steps without a target.

Example. A credit analyst at a regional bank is asked whether to raise a borrower's credit line. She first writes down the question and the deadline (step 1). She downloads three years of filings and sector data (step 2), restates leases and computes coverage ratios (step 3), and concludes that the borrower can service more debt (step 4). She sends a memo to the credit committee (step 5) and schedules a review after the next annual report (step 6).

Common exam traps

- Obtaining statements or interviewing suppliers belongs to gathering data. It is not processing.
- Adjusting statements and calculating ratios is processing the data. Using the ratios to reach a conclusion is analyzing and interpreting the data.
- Ratios and common-size statements are outputs of processing the data and inputs to analyzing and interpreting it. Revised reports and recommendations come from updating the analysis.
- Deciding whether a security suits a particular client is not a step of this framework.

LOS 27.b — Financial reporting and financial statement analysis

- **Financial reporting** is the way a company prepares and publishes financial statements that show its performance and position to investors, creditors and anyone else with an interest in it. Its role is to give a wide range of users useful information about the company's performance and financial position.
- **Financial statement analysis** is the use of that information, together with other relevant data, to make economic decisions about the company: whether to buy or recommend its securities, extend trade or bank credit, or assign a credit rating. Analysts evaluate past performance and the current position to judge how well the firm is likely to generate profits and cash flow in the future, and they identify the risk factors along the way.

Financial statement analysis as described here is done by external users. Management also analyzes financial information for day-to-day decisions, but it can draw on internal data kept in other formats that outsiders never see.

	Financial reporting	Financial statement analysis
Who	The company (management)	Investors, lenders, rating agencies, analysts
Activity	Prepare and present statements	Evaluate statements plus other data
Output	Information useful to many users	An economic decision or recommendation

Common exam traps

- "Provides users with useful information about performance and financial position" describes reporting.
- "Uses the statements to decide whether to lend or invest" describes analysis.
- The statements may give indirect evidence about the skill of individual executives, but judging managers is not a stated role of the analysis.

- Giving reasonable assurance that statements are free of material error is the auditor's job, not the analyst's.

LOS 27.c — Filings, notes, management commentary and audit reports

Standard setters and regulators

Standard-setting bodies are private professional bodies that write the reporting rules. The **FASB** issues **US GAAP**; the **IASB** issues **IFRS**, and older IASB standards are called IAS. Other national standard setters also exist. **Regulatory authorities** are government agencies with legal power to enforce the rules, such as the **Securities and Exchange Commission (SEC)** in the United States and the UK's Financial Conduct Authority. Most national regulators belong to the **International Organization of Securities Commissions (IOSCO)**, whose members between them regulate over 95% of global financial markets. IOSCO itself is not a regulator. Its members cooperate across borders to make national regulation and enforcement more uniform. Its Objectives and Principles of Securities Regulation rest on three objectives: protecting investors; ensuring that markets are fair, efficient and transparent; and reducing systemic risk. IOSCO expects issuers to give full, accurate and timely disclosure of financial results, risks and other decision-relevant information, prepared under high-quality, internationally accepted accounting standards.

The **Sarbanes-Oxley Act**, enforced by the SEC, limits the non-audit services a company's external auditor may provide. The purpose of that limit is to avoid conflicts of interest and protect auditor independence. The act also requires executives to certify that the statements are fairly presented and to include a statement on the effectiveness of internal control over financial reporting.

Exam convention: the external auditor must also confirm the effectiveness of the company's internal controls. Current practice: the auditor attestation in Section 404(b) applies to accelerated and large accelerated filers; non-accelerated filers and emerging growth companies (EGCs) are exempt.

Securities regulation in the EU is set by each member state separately. Exam convention: all EU countries are required to report using IFRS. Current practice: the EU IAS Regulation requires IFRS for the consolidated statements of listed companies. Exam convention: the body that advises the European Commission on securities regulation is called the European Securities Commission. Current practice: its official name is the European Securities Committee. The **European Securities and Markets Authority (ESMA)** coordinates regulation within the EU.

Key SEC filings:

Filing	Content
Form S-1	Registration statement filed before new securities are sold to the public: the securities offered, audited statements, risk assessment, underwriters, and the estimated amount and use of the proceeds
Form 10-K	Required annual filing: the business, its risks and management, audited statements and disclosures, and legal matters. The annual report to shareholders does not replace it. Foreign issuers file Form 40-F (Canadian) or Form 20-F (others)
Form 10-Q	Quarterly filing of US firms with interim statements, which need not be audited, and disclosures such as significant legal proceedings or accounting policy changes; non-US issuers typically file Form 6-K semiannually

Filing	Content
Form DEF-14A	The proxy statement filed when shareholders must vote
Form 8-K	Material events: major asset acquisitions or disposals, changes in management or corporate governance, and matters involving the company's accountants, its financial statements or the markets where its securities trade
Form 144	Exam convention: a notice to the SEC that the company will sell securities to certain qualified buyers without registering them. Current practice: Form 144 is the notice an affiliate files before a proposed sale of restricted or control securities under Rule 144
Forms 3, 4 and 5	Beneficial ownership of the company's securities by officers and directors; used to track insider purchases and sales

Financial statement notes

Financial statement notes (footnotes) give the detail behind the summary numbers so that users can judge the amount, timing and uncertainty of estimates. They cover the basis of presentation (fiscal period, IFRS or US GAAP, consolidated entities) and the **accounting methods, assumptions and estimates** chosen by management. They also give details on contingencies and commitments, legal actions, acquisitions and disposals, employee benefit plans, related-party transactions, significant customers, segments and post-balance-sheet events. Footnotes are audited together with the primary statements.

Segment reporting

Both IFRS (IFRS 8) and US GAAP require segment disclosures. For each segment, a smaller set of items than the company-wide statements is reported: a measure of profit or loss; revenue, split into sales to outside customers and sales to other segments; measures of assets and liabilities; interest revenue and interest expense; income tax expense; depreciation and amortization; other noncash expenses; spending on PP&E and intangibles; and the share of results of equity-accounted investments. A **business segment (operating segment)** is a portion of the company whose risk and return characteristics are distinguishable from those of the company's other lines of business.

Exam convention: a business segment is one whose revenues, assets or income exceed 10% of the company's totals. Current practice (IFRS 8 and ASC 280): an operating segment is a part of the company that earns revenues and incurs expenses and whose results management reviews separately. It must be reported separately, as a **reportable segment**, when it meets any one of three size tests. It accounts for 10% or more of:

1. the combined revenue (external and intersegment) of all operating segments;
2. the combined assets of all operating segments; or
3. the larger of (i) the combined profit of all segments that report a profit and (ii) the combined loss of all segments that report a loss, with the segment's own profit or loss taken in absolute amount.

Reportable segments must together cover at least 75% of the company's external revenue; if they do not, more segments are reported. **Geographic segments** are identified on the same size criterion when an area's business environment differs from that of the rest of the company. Segment profit margins, asset turnover and return on assets give a clearer picture of the whole firm, and growth rates of segment revenues and profits help forecast future sales and profits.

Management commentary

Management commentary is also called the management report, the operating and financial review, or **management's discussion and analysis (MD&A)**. IFRS guidance recommends, but does not require, that it cover the nature of the business, management's objectives, past performance, performance measures, and the company's key relationships, resources and risks. Parts of it may be unaudited.

For US public companies, the SEC requires a discussion of trends and significant events and uncertainties affecting liquidity, capital resources and results of operations. Exam convention: management must also discuss any material effects of inflation and changing prices, contractual and off-balance-sheet obligations (purchase commitments, for example), accounting policies that call for significant judgment, and forward-looking expenditures and divestitures. Current practice: since the SEC's MD&A amendments took effect in 2021, inflation, off-balance-sheet arrangements and the contractual obligations table are no longer separate items; material effects are covered in the known-trends, liquidity and capital resources discussion. SEC rules also require a description of unusual or infrequent events or transactions that materially affected reported income from continuing operations. Information that belongs in other filings is not an MD&A requirement; the compensation of individual directors, for example, appears in the proxy statement.

Audits and the auditor's report

An **audit** is an independent review that aims to give an opinion on whether the statements are fair and reliable. Management prepares the statements and is responsible for them. The auditor is an independent accounting firm engaged by the board of directors. It reviews the company's accounting systems and internal controls, verifies its assets and liabilities, and tries to determine that the statements contain no material errors. The standard opinion states that:

1. the statements are management's responsibility, and the auditor performed an independent review;
2. generally accepted auditing standards were followed, giving **reasonable assurance** (not a guarantee) that there are no material errors; and
3. the statements conform to accepted accounting principles, and the principles and estimates chosen are reasonable.

The report must also explain any accounting method that has not been applied consistently between periods.

KEY CONCEPT

Opinion	When
Unqualified opinion (unmodified, clean)	Free of material omissions and errors
Qualified opinion	Specific exceptions to accounting principles, explained in the report; also a scope limitation (the auditor cannot obtain enough evidence on some items) whose possible effect is material but confined to those items
Adverse opinion	Statements are not presented fairly or are materially nonconforming
Disclaimer of opinion	Auditor cannot express an opinion at all, as when a scope limitation is pervasive and affects the statements as a whole

Any opinion other than unqualified is a **modified opinion**. Exam convention: an **explanatory paragraph** is added when a material loss is probable but cannot be reasonably estimated; the uncertainty may concern the **going concern** assumption (that the company will keep operating for the foreseeable future), the valuation or realization of assets, or litigation. Current practice: auditing standards still require a separate paragraph or section when there is substantial doubt about the company's ability to continue as a going concern, but for other uncertainties, such as pending litigation, an emphasis-of-matter paragraph is at the auditor's discretion. Such a paragraph can signal serious problems and deserves close attention from the analyst.

Reports also include **key audit matters** (international) or **critical audit matters** (US). These are the accounting areas of most significance to users: areas that need significant management judgment and estimates, the accounting for significant transactions, and areas the auditor found especially challenging or subjective, where the risk of misstatement is highest.

Internal controls are the processes that make the statements accurate, and they are management's responsibility. Weak controls open the door to low-quality or fraudulent reporting. Exam convention: for US publicly traded firms, the auditor must express an opinion on internal control, either as a fourth element of the standard opinion or separately. Current practice: this applies to accelerated and large accelerated filers; non-accelerated filers and emerging growth companies are exempt.

Common exam traps

- Management's view of results and outlook appears in management commentary. The footnotes cover methods, estimates and supporting detail.
- Footnotes are audited; management commentary and 10-Q interim statements may not be.
- IFRS recommends the content of management commentary. Securities regulators, not accounting standards, can require topics.
- A statement that the accounts follow GAAP is part of the standard report. It is not an explanatory paragraph.
- Being just below 10% on several segment tests does not make a segment reportable. One test at 10% or more does.

LOS 27.d — Alternative reporting systems and evolving standards

The IASB and FASB work toward convergence, but significant differences remain, so comparisons of firms in different jurisdictions need care:

KEY CONCEPT

Item	US GAAP	IFRS
Developed by	FASB	IASB
Approach	Rules-based	Principles-based
Inventory cost methods	FIFO, LIFO, weighted average	LIFO prohibited
Product development costs	Expensed	May be capitalized
Interest paid (cash flow)	CFO	CFO or CFF

Item	US GAAP	IFRS
Reversal of inventory write-downs	Prohibited	Allowed

Exam convention: under IFRS, interest paid may be classified in CFO or CFF (the IAS 7 choice). Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, removes that choice for companies whose main business is not financing; they report interest paid in CFF.

Standards keep changing, and new products and transactions may not fit existing standards. The analyst can use the financial reporting framework as a guide to their likely effect on the statements. The analyst should also follow the IASB and FASB websites, professional journals and CFA Institute position papers, and monitor company disclosures of significant accounting policies and estimates.

Common exam traps

- New transactions that existing standards do not yet cover are not unusual. The analyst uses the reporting framework to judge their likely effect rather than ignoring them until a standard is issued.

LOS 27.e — Other information sources

Besides annual reports, quarterly and semiannual reports and other regulatory filings, analysts use:

Category	Examples
Issuer sources	Earnings calls and earnings guidance, ad hoc presentations, press releases , contact with management and investor relations; unlikely to have been audited
Public third-party sources	Free industry reports and trade journals, government agency economic and industry statistics, media, social media
Proprietary third-party sources	Analyst reports, data platforms, specialist agency and consultancy reports
Proprietary primary research	Studies the analyst commissions, hands-on product experience, in-house technical specialists

Many companies publish **earnings guidance** ahead of their results. Once results are out, management often holds a call with analysts, takes their questions and gives detail beyond what the filings contain. Outside the company, trade publications, statistical data services and government statistics help the analyst judge the wider economy and the industry and benchmark the firm against its rivals.

Proxy statements are sent to shareholders when a vote is needed. They are a good source of information on board elections and qualifications, compensation, management qualifications and stock option issuance. Proxy statements are also filed with the SEC (Form DEF-14A), like the 10-K, 10-Q and 8-K. Press releases are issuer communications distributed by the company itself.

Common exam traps

- Press releases and earnings calls come from management and are unlikely to have been audited. Treat them as less objective than government statistics or audited statements.

- Analyst research reports are proprietary third-party sources. Trade journals and government statistics are public third-party sources.

BOTTOM LINE

- The financial statement analysis framework has six steps in a fixed order: first the objective and context are stated and data are gathered, then the data are processed, analyzed and interpreted, and finally the conclusions or recommendations are reported and the analysis is updated.
- Adjusting the statements and computing ratios and common-size statements is processing the data; using those outputs to reach a conclusion is analyzing and interpreting the data.
- Financial reporting gives a wide range of users useful information on a company's performance and financial position, while financial statement analysis uses that information, with other relevant data, to make economic decisions about the company.
- Financial statement footnotes give the accounting methods, assumptions and estimates management chose, plus detail such as contingencies, legal actions and related-party transactions, and they are audited together with the primary statements.
- Form 10-K is the required annual SEC filing with audited statements, Form 10-Q is the quarterly filing whose interim statements need not be audited, Form 8-K reports material events, and Form DEF-14A is the proxy statement.
- An audit gives reasonable assurance, not a guarantee, against material errors in the statements, and the opinion is unqualified (clean), qualified (specific exceptions, or a scope limitation whose possible effect is material but confined to some items), adverse (not presented fairly) or a disclaimer (no opinion can be expressed).
- US GAAP, issued by the FASB, is rules-based and allows LIFO; IFRS, issued by the IASB, is principles-based, prohibits LIFO, allows inventory write-downs to be reversed and allows product development costs to be capitalized.
- Proxy statements are the source for board elections, compensation, management qualifications and stock option issuance, while press releases and earnings calls come from the issuer and are unlikely to have been audited.

QUICK CHECK

Question 1

An analyst converts a competitor's inventory figures to the same cost basis as her subject company, then calculates liquidity and profitability ratios and prepares common-size statements. In the financial statement analysis framework, this work is *best* described as:

- A processing the data.
- B analyzing and interpreting the data.
- C gathering the data.

Answer: A

Adjusting the reported statements where appropriate, calculating ratios, and preparing exhibits such as graphs and common-size statements are the activities of step 3, process the data. No conclusion has yet been drawn from the ratios, so the analyst has not reached the analysis-and-interpretation step.

The six steps:

1. State the objective and context: questions to answer, output format, time and resources.
2. Gather data: statements, industry and economic data, discussions with management, suppliers and customers, site visits.
3. Process the data: adjustments, ratios, statistical work, exhibits such as graphs and common-size statements.
4. Analyze and interpret the data: answer the step-1 questions and decide what the evidence supports.
5. Report the conclusions or recommendations: communicate to the audience in line with the Code and Standards.
6. Update the analysis: repeat periodically and revise conclusions as needed.

The analyst's work (adjustment, ratios, common-size statements) fits step 3.

Why the other options are wrong

- **B.** Analyzing and interpreting (step 4) means using the processed figures to answer the questions posed in step 1 and deciding what conclusions or recommendations they support. The analyst is still preparing the figures.
- **C.** Gathering data (step 2) is acquiring the statements and other industry and economic information and asking questions of management, suppliers and customers. It comes before any adjustment or ratio work.

Key takeaway Adjusting, calculating and building exhibits is processing the data. Using the results to answer the questions is analyzing and interpreting the data.

Practice questions

Question 2

An analyst is reading the notes that accompany a retailer's audited annual financial statements. Which of the following statements about those notes is *least* accurate? The notes:

- A** disclose contingencies, such as losses that could arise from pending claims.
- B** are covered by the independent auditor's examination.
- C** present management's own assessment of the year's operating performance and financial results.

Question 3

Ilse Brandt covers Corrigan Freight, a US public company. She wants management's own account of known trends and of the significant events and uncertainties that could affect Corrigan's liquidity, capital resources and results of operations. She is *most likely* to find this in:

- A management's discussion and analysis (MD&A).
- B the proxy statement.
- C the notes to the financial statements.

Question 4

Priya Nandakumar is researching Corvell Biotech and wants information she can treat as objective. Which of the following sources should she be *least likely* to rely on for that purpose?

- A Industry output statistics published by a government agency.
- B A proxy statement that Corvell filed with the SEC.
- C A press release issued by Corvell's investor relations team.

Answers: 2. C · 3. A · 4. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/introduction-to-financial-statement-analysis/. The full bank has 29 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 28

Analyzing Income Statements

What you'll learn

LOS 28.a Explain the general principles of revenue recognition, the five-step model, specific recognition issues, and their implications for financial analysis.

LOS 28.b Explain the matching principle and expense recognition choices (inventory, depreciation, capitalization vs. expensing, estimates) and their effects on financial statements and ratios.

LOS 28.c Explain how discontinued operations, unusual or infrequent items, accounting changes and error corrections are reported and how analysts should treat them.

LOS 28.d Calculate and interpret basic and diluted EPS for simple and complex capital structures, including the treatment of antidilutive securities.

LOS 28.e Evaluate a company's performance using common-size income statements and income-statement ratios such as gross and net profit margin.

MODULE 28.1

Revenue Recognition

This reading covers how revenue and expenses are recognized, from the five-step revenue model to the choice between capitalizing and expensing, and how nonrecurring items and accounting changes are reported. The calculations to master are revenue on long-term contracts, basic and diluted EPS, and common-size income statements with their margins.

LOS 28.a — Revenue recognition: principles, applications and analysis

The accrual idea

Revenue belongs in the period in which it is **earned**, that is, when the company has done what it promised. This need not be the period in which cash arrives.

- **Credit sale:** revenue is recognized at the sale, and an asset, accounts receivable, is recorded.
- **Cash received in advance** (subscriptions, deposits, gift cards): no revenue is recognized yet. The company records cash and a liability, **unearned (deferred) revenue**. As the goods or services are delivered, the liability is reduced and revenue is recognized.
- Revenue is reported net of expected returns, discounts and allowances. Exam convention: estimated warranty provisions count as one of the allowances subtracted from revenue when the sale is made. Current practice: a standard (assurance-type) warranty is recognized at the sale as an expense with a matching provision, and a warranty sold as a separate service is a performance obligation whose share of the price is deferred.

The converged standard (IFRS 15 and ASC 606)

The IASB and FASB jointly developed this converged revenue standard. It is **principles-based**. Instead of many industry-specific rules, it rests on one core principle: recognize revenue when (or as) control of a promised good or service passes to the customer, at the amount the firm expects to be entitled to. The principle is applied through a five-step model:

KEY CONCEPT

Step	What the firm does	Key definition
1	Identify the contract with the customer	An agreement between two or more parties that creates enforceable rights and obligations; collection must be <i>probable</i> (IFRS and US GAAP define "probable" differently, so identical deals can be treated differently)
2	Identify the performance obligations	A promise to transfer a <i>distinct</i> good or service: one the customer can benefit from on its own (or with readily available resources) and that is separately identifiable from the other promises
3	Determine the transaction price	The amount the firm expects to receive. It is usually fixed but may include variable consideration (bonuses such as one for early delivery, rebates, penalties), included only to the extent that a significant later reversal is highly unlikely
4	Allocate the price to the obligations	Spread the transaction price across the performance obligations identified in Step 2
5	Recognize revenue when (or as) each obligation is satisfied	An obligation is satisfied when control transfers

Indicators that control has transferred are that the customer has physical possession, has accepted the item, bears the risks and rewards of ownership and holds legal title, and that the seller has a present right to payment.

Exam convention: revenue is recognized only when a later reversal is highly unlikely, so a firm may have to record a **refund liability**, with an asset for its right to the returned goods, when revenue from a sale cannot be estimated reliably. Current practice: under IFRS 15 and ASC 606, every sale with a right of return gives revenue only for the amount not expected to be refunded, a refund liability for expected refunds and an asset for the goods expected back.

Revenue over time (long-term contracts)**KEY CONCEPT**

An obligation is satisfied **over time** if any one of these conditions holds:

1. The customer receives and consumes the benefit as the firm performs, as with a cleaning or maintenance contract.
2. The firm's work creates or enhances an asset that the customer controls as it is built.
3. The asset has no alternative use to the seller, and the seller can enforce payment for work done to date.

Progress can be measured by **inputs** (cost incurred as a share of total expected cost) or by **outputs** (milestones, units delivered). Costs of securing a long-term contract, such as sales commissions, are capitalized and then expensed over the life of the contract.

A building is usually one performance obligation. Site preparation, foundations, wiring and the roof are not distinct promises, because each is an input to a single combined output that the customer contracted for.

Example. Fenwick Builders agrees to construct a cold-storage facility for \$30 million, plus a \$3 million bonus if the facility is finished within 18 months. The facility uses a new refrigeration design and the finish date depends on a supplier's delivery schedule, so Fenwick cannot conclude that a reversal of revenue from the bonus is highly unlikely. The bonus is left out of the transaction price, which stays at \$30 million. The expected total cost is \$25 million. Costs incurred are \$8 million in Year 1 and \$7 million in Year 2.

$$\text{Cumulative revenue}_t = \frac{\text{Cumulative cost to date}}{\text{Total expected cost}} \times \text{Transaction price}$$

- Year 1: $8/25 = 32\%$, so revenue is $0.32 \times 30 = \$9.6$ million.
- Year 2: $(8 + 7)/25 = 60\%$, so cumulative revenue is \$18.0 million and Year 2 revenue is $18.0 - 9.6 = \$8.4$ million.

The formula always uses the transaction price as currently estimated. Had the bonus become includable by the end of Year 2, cumulative revenue would be $0.60 \times 33 = \$19.8$ million and Year 2 revenue $19.8 - 9.6 = \$10.2$ million. Year 1 revenue is not restated, so the bonus share of the Year 1 work is recognized in Year 2.

The amounts billed or collected do not affect these figures. The result is the same as under the older percentage-of-completion method, although the converged standard no longer uses that name.

Specific applications

Situation	Treatment
Principal or agent	A <i>principal</i> controls the good before transfer and reports gross revenue, with the cost as an expense. An <i>agent</i> only arranges the sale, is not responsible for providing the good or service and bears no inventory or credit risk; it reports its net fee or commission.
Franchise fees	An upfront fee covering several years is deferred and recognized over the franchise term; royalties are recognized as they become payable. Revenue is disaggregated into categories with similar characteristics (company stores, royalties, supplies).
Software license or service	An "as-is" license, with updates and support under a separate contract, gives license revenue at the start; the support revenue is recognized as the service is provided, usually over the contract. A license under which the supplier keeps updating the software, the customer is exposed to the effects of those updates, and the updates are not a separate transfer of goods or services gives revenue over the contract. Cloud access without taking possession of the software is a service recognized over time.
Bill-and-hold	The customer pays before shipment. Such a payment is normally deferred revenue. Revenue before shipment is allowed only if the seller has completed its obligations, the customer has control, the customer requested the arrangement, and the goods are identified as the customer's, are ready for delivery and cannot be redirected.

Example. An online travel platform sells an €800 cruise cabin and keeps a €60 commission. As an agent it reports revenue of €60, a gross margin of 100%. If it were the principal, it would report €800 of revenue and €740 of cost, a gross margin of 7.5%. Gross profit is €60 either way, but revenue and margins differ sharply, which creates a comparability problem.

Disclosures and analysis

Firms must disclose contracts by category, contract assets and liabilities (and changes in them), remaining performance obligations with the price allocated to them, and the **judgments** used on timing and amount. Analysts should watch the choices that move revenue between periods: the measure of progress, estimates of variable consideration, contract modifications, and principal-versus-agent classification.

COMMON EXAM TRAPS

- Treating cash received as revenue. Advance payments create a liability.
- Confusing the contract (step 1) with a performance obligation (a distinct promise within the contract, step 2).
- Calling the converged standard "rules-based." It is principles-based.
- In over-time questions, reporting cumulative revenue for the year instead of subtracting revenue already recognized. For Fenwick, this reports Year 2 revenue of \$18.0 million instead of \$8.4 million.
- Reporting an agent's revenue at the gross sale price. Agents report net commission revenue. For the cruise cabin, this reports €800 of revenue instead of €60.

EXAM SHORTCUTS

- In an over-time contract measured by inputs, amounts billed or collected can be ignored: cumulative revenue depends only on the cumulative cost to date, the total expected cost and the current transaction price.

BOTTOM LINE

- Under IFRS 15 and ASC 606, revenue is recognized when (or as) control of a promised good or service passes to the customer, at the amount the firm expects to be entitled to.
- The five steps are: identify the contract with the customer; identify its performance obligations; determine the transaction price; allocate that price to the obligations; and recognize revenue when (or as) each obligation is satisfied.
- Cash received before goods or services are delivered is recorded as a liability, unearned (deferred) revenue, and becomes revenue as the delivery takes place.
- Variable consideration such as a bonus enters the transaction price only to the extent that a significant later reversal is highly unlikely.
- With an input measure of progress, cumulative revenue equals cumulative cost to date divided by total expected cost, times the transaction price, and the period's revenue is that figure less revenue already recognized.
- A principal controls the good before transfer and reports gross revenue with the cost as an expense; an agent only arranges the sale and reports its net fee or commission.

QUICK CHECK**Question 1**

On November 15, Halden Yacht Services receives \$24,000 in cash from a customer for a winter storage and maintenance package that Halden will provide from January through March. Halden has not yet performed any of the service. At November 30, the effect of this transaction on Halden's balance sheet is *best* described as:

- A** cash and retained earnings each increase by \$24,000.
- B** cash and unearned revenue each increase by \$24,000.
- C** accounts receivable and revenue each increase by \$24,000.

Answer: B

Revenue is recognized when it is earned, that is, as the promised service is provided. Cash received before any service is delivered creates a liability, unearned (deferred) revenue, because Halden still owes the customer the service. The asset cash rises by \$24,000 and the liability rises by the same amount; no revenue, and therefore no retained earnings, is recognized yet.

Why the other options are wrong

- **A.** This treats the prepayment as revenue that raises net income and retained earnings. No service has been performed, so no revenue has been earned by November 30.
- **C.** The customer has already paid, so there is no receivable, and revenue is not recognized before the service is provided.

Key takeaway Cash received in advance is a liability, unearned revenue. It becomes revenue only as the goods or services are delivered.

MODULE 28.2

Expense Recognition**LOS 28.b — Expense recognition, capitalization and expensing****How expenses are recognized under accrual accounting**

An **expense** is a decrease in economic benefits (assets used up or liabilities incurred) that lowers equity other than through distributions to owners. Under the accrual basis, an expense is recognized when the benefit is **consumed**, whether or not cash has been paid. Three routes achieve this:

KEY CONCEPT

Route	Idea	Examples
Matching	Costs that generate revenue are expensed in the same period as that revenue	Cost of goods sold is expensed when the goods are sold; estimated warranty cost and bad debt expense are recorded in the period of the sale
Expensing as incurred (period costs)	Costs that cannot be tied to specific revenue are expensed in the period they relate to	Head-office salaries, rent for the year (paid or not), interest accrued on a loan (paid or not)
Capitalization	Costs that bring benefits over several periods are recorded as an asset and expensed gradually	PP&E (depreciation), finite-life intangibles (amortization), natural resources (depletion)

Production or purchase costs stay on the balance sheet as inventory until the goods are sold. If nothing is sold in a period, none of those costs reaches the income statement.

A policy that recognizes expenses later is **aggressive** because it raises current income. A policy that recognizes them sooner is **conservative**, so expensing an outlay is more conservative than capitalizing it.

Recording a credit sale

When goods costing 70 are sold on credit for 100, receivables rise by 100 and inventory falls by 70, so total assets rise by 30. Retained earnings (equity) rise by the profit of 30, and liabilities are unaffected (ignoring taxes).

Inventory cost-flow methods

Specific identification assigns each unit its own actual cost. It suits goods that can be tracked one by one, such as vehicles recorded by serial number. When individual units cannot be tracked this way, the firm assumes a cost flow:

Method	COGS contains	Physical flow it resembles	With rising prices
FIFO	Oldest costs	Units sold in the order produced (perishables, dated goods)	Lowest COGS, highest gross margin and net income; ending inventory near current cost
LIFO (US GAAP only; not permitted under IFRS)	Newest costs	Units taken from the top of a heap (road salt, sand)	Highest COGS, lowest margins and income
Weighted average cost	Average cost	Units drawn from a mixed stock	In between

Revenue is unaffected by the method, so differences in COGS pass directly into margins. Analysts comparing firms must adjust for different methods.

Depreciation methods

The depreciable base is cost minus salvage value. Straight-line spreads it evenly over the useful life.

$$\text{Straight-line} = \frac{\text{Cost} - \text{Salvage}}{\text{Useful life}}$$

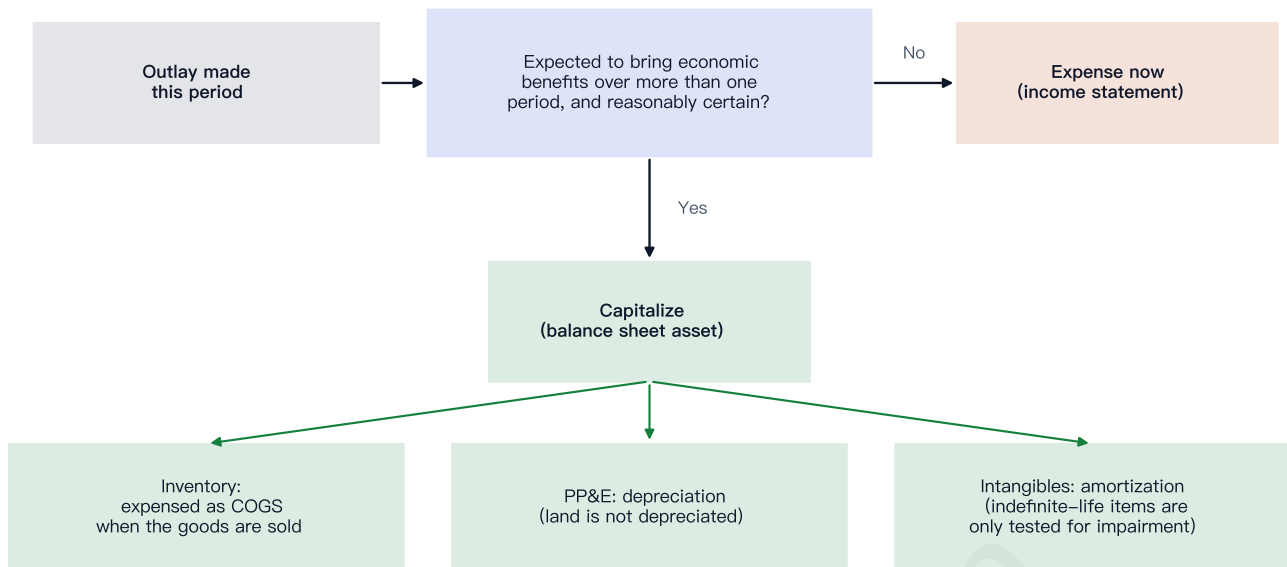
Example. A press costs \$60 million, has a salvage value of \$12 million and a 6-year life. Straight-line depreciation is $(60 - 12)/6 = \$8.0$ million a year.

Intangible assets

- **Finite-life intangibles** (patents, licenses, customer lists) are amortized over their useful lives.
- **Indefinite-life intangibles** (acquired goodwill, some trademarks or licenses renewable at little cost) are not amortized. They are tested for impairment at least annually under both IFRS and US GAAP.
- Most internally generated intangibles are expensed. **Research** costs (aimed at new scientific or technical knowledge) are expensed. Under IFRS, **development** costs (turning research findings into a plan or design for a new product or process) may be capitalized. Among other criteria, the firm must show that it is able to finish the asset and plans to use or sell it. Under US GAAP, R&D is generally expensed; the main exception is software developed for sale, which is capitalized after technological feasibility is established.
- When one firm capitalizes development costs and a peer expenses them, to make the two comparable, an analyst expenses the period's development spending and removes the amortization of earlier capitalized amounts from the income statement. On the balance sheet the capitalized asset is removed, which lowers assets and equity. In the cash flow statement the outlay moves from CFI to CFO, so CFO falls.

Capitalizing and expensing

An outlay expected to bring economic benefits over more than one period is capitalized. If the future benefit is unlikely or highly uncertain, it is expensed. The chart shows the decision and the route by which each kind of capitalized cost later reaches the income statement (see the figure below). A capitalized asset's cost includes the purchase price plus the costs needed to get the asset ready for use (freight, installation, non-recoverable taxes). Except for land and indefinite-life intangibles, that cost is then spread over the asset's life as depreciation, depletion or amortization. Later outlays that extend the asset's life or add capacity are also capitalized. Routine repairs, maintenance and staff training are expensed.



Capitalize or expense: the decision and how capitalized costs are expensed later

Example. A bakery buys an oven for \$48,000. It also pays \$1,500 for delivery, \$900 for installation, \$400 for test bakes before the oven goes into use and \$1,200 to train its staff. The oven is recorded at $48,000 + 1,500 + 900 + 400 = \$50,800$. The \$1,200 of training is expensed, because it does not get the oven ready for use.

KEY CONCEPT

Effect of capitalizing (compared with expensing)	Year of outlay	Later years
Net income, net margin	Higher	Lower (depreciation continues)
Total assets, equity	Higher (the extra asset is matched by higher retained earnings; liabilities are unchanged)	Higher, gap shrinks to zero
ROA, ROE	Higher	Lower
Asset turnover	Lower	Lower, gap shrinks
Earnings volatility	Lower (smoother)	Not applicable
Cash flow from operations	Higher (outflow sits in CFI)	Same if tax ignores the choice; higher if depreciation is deducted for tax
Cash flow from investing	Lower	Same
Debt-to-assets, debt-to-equity	Lower	Lower

Total cash flow is the same under both choices, provided the tax treatment does not depend on the accounting choice; only the classification between CFO and CFI differs. If the tax deduction follows the accounting choice, expensing brings the whole tax saving into the year of the outlay. Total cash flow is then higher in that year under expensing, CFO is higher in later years under capitalization (depreciation keeps reducing tax), and cumulative cash is the same by the end of the asset's life.

Example. A new firm buys a machine for \$20,000 with a 5-year life and no salvage value. Operating profit before the machine is \$25,000 a year, the tax rate is 25%, and depreciation is tax deductible.

- Capitalize: depreciation is \$4,000, so net income is $(25,000 - 4,000)(1 - 0.25) = \$15,750$ every year. CFO is $15,750 + 4,000 = \$19,750$ every year, and CFI is $-\$20,000$ in Year 1.
- Expense: Year 1 net income is $(25,000 - 20,000)(1 - 0.25) = \$3,750$, which is also Year 1 CFO. Years 2–5 net income and CFO are $25,000 \times 0.75 = \$18,750$.
- Year 1 total cash flow is $-\$250$ when capitalizing and $\$3,750$ when expensing. Capitalization then gives $\$1,000$ more CFO in each of Years 2–5, and five-year cash totals are $\$78,750$ either way.
- Cumulative net income over the five years is also $\$78,750$ under both choices ($5 \times 15,750 = 3,750 + 4 \times 18,750$). The choice moves income between years; it does not change the total.

The table describes a single outlay. A firm that capitalizes similar costs every year keeps reporting higher income than an expensing peer for as long as the amount capitalized each period exceeds that period's depreciation or amortization of the capitalized costs.

Capitalized interest

Interest incurred while a firm builds an asset for its own use must be capitalized as part of the asset's cost under both IFRS and US GAAP. In limited cases this also applies to an asset built for sale. Capitalized interest is not shown as interest expense. It later reaches income through depreciation (asset held for use) or COGS (asset held for sale), and the cash paid appears in investing cash flow. As with any capitalized cost, net income is higher while the asset is being built and lower in later years. In those later years EBIT is also lower, because the interest now sits inside depreciation, an operating expense. Exam convention: interest paid that is not capitalized is an operating outflow under US GAAP and an operating or financing outflow under IFRS. Current practice: under IFRS 18, effective for annual periods beginning on or after 1 January 2027, a company whose main business is not financing reports interest paid in CFF.

For interest coverage, analysts add the interest capitalized in the period to interest expense. They also add the depreciation of previously capitalized interest back to EBIT, because it is economically an interest cost rather than an operating cost.

KEY CONCEPT

$$\text{Adjusted coverage} = \frac{\text{EBIT} + \text{Depreciation of capitalized interest}}{\text{Interest expense} + \text{Interest capitalized}}$$

Example. A utility reports EBIT of \$90 million and interest expense of \$30 million. It capitalized \$15 million of interest this year, and depreciation includes \$6 million of interest capitalized in earlier years. Reported coverage is $90/30 = 3.0$. Adjusted coverage is $(90 + 6)/(30 + 15) = 2.13$. Had the \$15 million been

expensed, CFO would be \$15 million lower and CFI \$15 million higher (less negative), ignoring taxes and with interest paid classified in CFO, as under US GAAP.

Analyzing estimates

Bad-debt, warranty, useful-life and salvage estimates give management room to shift income. Analysts should ask why an estimate changed and compare it with peers. The footnotes and MD&A disclose accounting policies and significant estimates.

Example. A heater maker has Year 1 sales of \$1,000,000 and expects warranty repairs to cost 4% of sales. It records warranty expense of \$40,000 in Year 1, the year of the sales, together with a warranty provision (a liability) of the same amount. Repairs of \$35,000 carried out in Year 2 are charged against the provision, so they are not Year 2 expense. Had management assumed 2%, Year 1 pretax income would have been \$20,000 higher. A warranty rate well below that of peers may reflect better products or more aggressive expense recognition, and the analyst should find out which.

COMMON EXAM TRAPS

- Believing costs are expensed when paid. Accrued interest and rent are expenses of the period even if unpaid.
- Expensing inventory costs when incurred. They are expensed when the goods are sold.
- Reversing the FIFO and LIFO results. With rising prices, FIFO gives the highest margins and LIFO the lowest.
- Amortizing goodwill. Indefinite-life intangibles are only tested for impairment.
- Thinking capitalized interest is an IFRS-only or US GAAP-only rule. Both require it.
- Forgetting to deduct salvage value when computing straight-line depreciation. For the press, this gives \$10.0 million a year instead of \$8.0 million.

BOTTOM LINE

- Under accrual accounting, an expense is recognized when the benefit is consumed, whether or not cash has been paid: by matching it with revenue, as a period cost, or by capitalizing it and expensing it gradually.
- With rising prices, FIFO gives the lowest COGS and the highest gross margin and net income, LIFO (US GAAP only) gives the highest COGS and the lowest margins, and weighted average cost falls in between.
- Straight-line depreciation equals cost minus salvage value, divided by the useful life.
- Indefinite-life intangibles such as acquired goodwill are not amortized but are tested for impairment at least annually; research costs are expensed, development costs may be capitalized under IFRS, and US GAAP generally expenses R&D except software developed for sale once technological feasibility is established.
- Compared with expensing, capitalizing an outlay gives higher net income, ROA, ROE and CFO but lower CFI in the year of the outlay, higher assets and equity, lower debt ratios, and lower net income, ROA and ROE in later years.

- Interest incurred while a firm builds an asset for its own use is capitalized under both IFRS and US GAAP, and adjusted interest coverage is $(\text{EBIT} + \text{depreciation of capitalized interest}) / (\text{interest expense} + \text{interest capitalized})$.

QUICK CHECK

Question 2

Three U.S. hardware retailers are identical except for their inventory cost-flow assumption: one uses FIFO, one uses LIFO and one uses weighted average cost. Over the past several years, both the unit costs they pay suppliers and the number of units they sell have climbed steadily. An analyst who ranks the three on reported gross profit margin, without adjusting for inventory accounting, would *most likely* find the lowest margin at the retailer using:

- A LIFO.
- B Weighted average cost.
- C FIFO.

Answer: A

With rising purchase prices, LIFO charges the most recent, and therefore highest, costs to cost of goods sold. Revenue is the same whatever cost-flow method is used, so the higher COGS under LIFO produces the lowest gross profit (and net profit) margins.

Why the other options are wrong

- **B.** Weighted average cost blends older, cheaper units with newer, dearer ones, so its COGS and margins fall between those under FIFO and LIFO.
- **C.** FIFO charges the oldest, cheapest costs to COGS when prices are rising, so FIFO firms report the lowest COGS and the highest margins.

Key takeaway With rising prices, FIFO gives the lowest COGS and the highest margins, LIFO the highest COGS and the lowest margins, and average cost falls in between. Sales are unaffected by the choice.

MODULE 28.3

Nonrecurring Items

LOS 28.c — Nonrecurring items and accounting changes

Analysts forecast sustainable earnings, so they need to know which income statement items are likely to repeat. The standards give certain items special placement or treatment.

Unusual or infrequent items

Unusual or infrequent items are material items that are unusual in nature or infrequent in occurrence. Examples are:

- gains or losses on selling assets or parts of the business outside ordinary operations;

- impairments, write-downs and write-offs;
- restructuring charges.

They are reported within income from continuing operations, before tax, often as a separate line. Analysts should judge whether they are really one-off: a company with "unusual" charges almost every year is in effect reporting a recurring cost.

Discontinued operations

A **discontinued operation** is a component that management has decided to dispose of (and that is classified as held for sale) or has already disposed of during the period. Exam convention: the business must be physically and operationally separable from the rest of the firm in its assets, operations, and investing and financing activities. Current practice: IFRS 5 also requires a separate major line of business or geographical area (or a subsidiary bought only for resale), and US GAAP requires a strategic shift with a major effect on operations, so selling a minor product line or individual assets is not a discontinued operation.

- The **measurement date** is the date a formal disposal plan is adopted. The **phaseout period** runs from then to the actual disposal.
- The operation's income or loss, and any gain or loss on disposal, is reported after income from continuing operations, net of tax. Prior-period income statements presented are restated to show it separately.
- Once the component is held for sale, its assets are measured at the lower of carrying amount and fair value less costs to sell. An expected loss on disposal is therefore recognized immediately as a write-down. An expected gain is recognized only when the sale is completed.
- Exam convention: on the measurement date the firm accrues the estimated operating losses of the phaseout period along with any estimated loss on the sale. Current practice: IAS 37 prohibits provisions for future operating losses other than for onerous contracts, and US GAAP reports the results of a discontinued operation in the periods in which they occur. Under both frameworks, phaseout-period operating losses are therefore reported in discontinued operations as they are incurred.
- Analysts usually exclude discontinued operations when forecasting earnings, although the disposal itself can signal something about future cash flows.

Accounting changes

KEY CONCEPT

Type	Example	Treatment
Change in accounting policy (principle)	Switching inventory from FIFO to weighted average cost; adopting a new standard issued by the standard setter	Retrospective: unless this is impractical, prior periods presented are restated as if the new policy had always applied, so the periods stay comparable. A new standard may allow <i>modified retrospective</i> adoption, with no restatement and the cumulative effect adjusted in opening balances.
Change in accounting estimate	Revised useful life, salvage value, bad-debt rate or warranty rate	Prospective: current and future periods only, with no restatement. Usually no cash flow effect.

Type	Example	Treatment
Correction of a prior-period error	Moving from an incorrect method to an acceptable one; fixing omitted or misstated amounts	Prior-period adjustment , applied retrospectively: prior statements presented are restated, and the nature of the error and its effect on net income are disclosed. Usually no cash flow effect. Errors may indicate weak internal controls.

Example. Aldercrest Mills bought a machine for \$900,000 with no salvage value and a 9-year life. After 3 years, when the carrying value is \$600,000, it concludes that the machine will last 5 more years (8 years in total). This is a change in estimate.

$$\text{New annual depreciation} = \frac{\text{Carrying value}}{\text{Remaining life}} = \frac{600,000}{5} = \$120,000$$

The depreciation of \$100,000 per year for Years 1–3 is not restated; the new amount applies from Year 4 onward.

Changes in scope and exchange rates

Acquisitions (changes in scope, which alter the size of the combined entity) and currency movements (which change the reporting-currency value of foreign sales, purchases and subsidiaries' results) can distort year-on-year comparisons, even though the standards do not require their effects to be isolated. Analysts should adjust for them where possible.

Where items appear

KEY CONCEPT

Item	Location	Tax presentation
Unusual or infrequent items	In income from continuing operations	Pre-tax
Discontinued operations	Below income from continuing operations	Net of tax
Policy change or error correction	Restated prior periods (and opening retained earnings)	Not a current-period income line
Estimate change	Current and future period expenses	Ordinary lines

Example. Brackwell Foods earns operating income of \$52 million before a \$12 million restructuring charge. Interest expense is \$6 million and the tax rate is 25%. A frozen-meals division that is held for sale lost \$4 million after tax.

Line	Amount (millions)
Operating income before the restructuring charge	52.0
Restructuring charge (unusual or infrequent, pretax)	(12.0)

Line	Amount (millions)
Operating income	40.0
Interest expense	(6.0)
Income before tax	34.0
Income tax at 25%	(8.5)
Income from continuing operations	25.5
Loss from discontinued operations, net of tax	(4.0)
Net income	21.5

The forecast therefore starts from income from continuing operations of \$25.5 million. If the restructuring is truly a one-off, recurring after-tax income is $25.5 + 12 \times (1 - 0.25) = \34.5 million; if Brackwell restructures most years, the \$25.5 million figure stands.

COMMON EXAM TRAPS

- Changes in useful life or salvage value are changes in estimates, applied prospectively. They are not policy changes.
- Error corrections are neither unusual items nor policy changes. They are prior-period adjustments with restatement.
- Unusual or infrequent items are pre-tax and inside continuing operations. Only discontinued operations are shown net of tax below that line.

BOTTOM LINE

- Unusual or infrequent items are shown pre-tax within income from continuing operations, and an analyst judges whether they really are one-off.
- Discontinued operations are reported net of tax below income from continuing operations, prior-period income statements presented are restated to show them separately, and analysts usually exclude them when forecasting earnings.
- Assets of a component held for sale are measured at the lower of carrying amount and fair value less costs to sell, so an expected loss on disposal is recognized at once and an expected gain only when the sale is completed.
- A change in accounting policy is applied retrospectively, restating the prior periods presented unless that is impractical, while a change in accounting estimate is applied prospectively with no restatement.
- A correction of a prior-period error is a prior-period adjustment: prior statements presented are restated, and the nature of the error and its effect on net income are disclosed.
- After a change in an asset's estimated life, new annual depreciation equals carrying value divided by remaining life, and earlier depreciation is not restated.

QUICK CHECK

Question 3

During the current year, Brantley Industrial recorded a \$14 million restructuring charge to close two of its warehouses. Its board also approved a formal plan to sell Brantley's marine-engine business, a separate major line of business with its own plants, management and financing that can be clearly separated from the rest of the company. The business meets the criteria to be classified as held for sale, and the sale is expected to close next year at a gain. Which statement about Brantley's income statement for the current year is *most accurate*?

- A** The marine-engine business's results are reported net of tax after income from continuing operations, and the prior-year income statement presented is restated to show them separately.
- B** The restructuring charge is reported net of tax below income from continuing operations.
- C** The expected gain on the sale of the marine-engine business is recognized in the current year, when the disposal plan is approved.

Answer: A

The marine-engine business is a separate major line of business, physically and operationally distinct, and it is held for sale under a formal disposal plan. It therefore qualifies as a discontinued operation. Its income or loss is reported separately, net of tax, after income from continuing operations, and the prior-period income statements presented are restated so that the discontinued business is shown separately in every year.

Placement of the two items:

Item	Where it is reported	Tax presentation
Restructuring charge (an unusual or infrequent item)	Within income from continuing operations	Pre-tax
Marine-engine business (discontinued operation)	After income from continuing operations	Net of tax

The measurement date is the date the formal plan was approved; the period until the sale closes is the phaseout period. Had a loss on the sale been expected, the held-for-sale assets would be written down at once to fair value less costs to sell. Operating results of the phaseout period are recognized as they occur, and future operating losses are not accrued in advance. An expected gain is not recognized until the sale is completed.

Why the other options are wrong

- **B.** A restructuring charge is an unusual or infrequent item, so it is reported before tax, within income from continuing operations. Only discontinued operations are shown net of tax below that line.
- **C.** An expected gain on disposal cannot be recognized until the sale is actually completed. Only an expected loss on disposal is recognized early, as a write-down of the held-for-sale assets to fair value less costs to sell. Operating losses of the phaseout period are not accrued in advance either; they are recognized as incurred.

Key takeaway Unusual or infrequent items: pre-tax, inside continuing operations. Discontinued operations: net of tax, below continuing operations, with prior periods restated. Analysts usually exclude discontinued operations when forecasting earnings.

MODULE 28.4

Earnings Per Share

LOS 28.d — Basic and diluted earnings per share

Earnings per share (EPS) shows how much of the period's profit belongs to each common share. Only companies with publicly traded shares must report it, and it is always expressed per common share. There is no EPS figure for preferred shares.

Simple and complex capital structures

Capital structure	What it contains	EPS the firm must report
Simple capital structure	Common stock, <i>nonconvertible</i> bonds and <i>nonconvertible</i> preferred stock; nothing that could become new common shares	Basic EPS only
Complex capital structure	At least one potentially dilutive security : convertible bonds, convertible preferred stock, stock options or warrants	Both basic and diluted EPS

Straight (nonconvertible) debt and nonconvertible preferred stock cannot create new common shares, so they do not make a capital structure complex. Other features, such as a call feature, a cumulative dividend or a sinking fund, do not change this.

Exam convention: a company with a simple capital structure reports basic EPS only. Current practice: that is the US GAAP rule (ASC 260). IFRS (IAS 33) requires every company within its scope to present both basic and diluted EPS; with no dilutive potential shares the two figures are equal.

Basic EPS

KEY CONCEPT

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

- The numerator is **income available to common shareholders**. Subtract the current year's preferred dividends.
- Common dividends are not subtracted. They are a distribution of income that already belongs to common shareholders.
- Convertible securities do not enter basic EPS at all: there is no add-back in the numerator and no extra shares in the denominator.

Weighted average shares outstanding

Each block of shares is weighted by the fraction of the year it was outstanding. Strictly, the weight is days outstanding divided by days in the year; exam questions normally use months.

- New shares (sold for cash, issued in an acquisition, or treasury shares reissued) count from the issue date.
- Repurchased (treasury) shares drop out from the repurchase date.
- **Stock dividends** and **stock splits**, including a **reverse stock split**, are applied retroactively. Every share outstanding before the event is restated as if the event had happened at the start of the year, and prior-year figures are restated too, so EPS does not appear to fall because of a largely cosmetic change in the share count. Shares issued or repurchased after the event are not adjusted for it.
- A split or stock dividend brings in no new resources and leaves each holder's percentage of the company unchanged. Its date within the year therefore does not change how the shares outstanding before it are restated: a 2-for-1 split in late March and one in early November both double the opening shares for the full year.
- A 3-for-2 split and a 50% stock dividend have the same effect: each old share becomes 1.5 new shares. A 1-for-4 reverse split multiplies pre-event shares by 0.25.
- Issuing preferred shares has no effect on the common share count.

Example. Wrenfield Tools starts the year with 60,000 common shares. It sells 12,000 new shares on 1 March, executes a 3-for-2 stock split on 1 June and repurchases 9,000 shares on 1 October. Net income is \$450,000, and dividends on its nonconvertible preferred stock are \$39,000. Common dividends of \$50,000 were also paid.

Block	Split factor	Months	Weighted shares
60,000 opening shares	×1.5	12/12	90,000
12,000 issued 1 March	×1.5	10/12	15,000
9,000 repurchased 1 October	none (after split)	3/12	-2,250
Weighted average			102,750

$$\text{Basic EPS} = \frac{450,000 - 39,000}{102,750} = \frac{411,000}{102,750} = \$4.00$$

The \$50,000 of common dividends plays no part in the calculation. When comparing EPS across years, check whether a change comes from earnings or from the share count: repurchases can raise EPS while net income and margins stay flat.

Diluted EPS and the if-converted method

Diluted EPS shows the worst case for existing shareholders: what EPS would be if every dilutive security had been converted or exercised at the start of the year, or on its issue date if it was issued during the year.

KEY CONCEPT

$$\text{Diluted EPS} = \frac{\text{NI} - \text{Pref. div.} + \text{Conv. pref. div.} + \text{Conv. debt interest} \times (1 - t)}{\text{Wtd. avg. shares} + \text{Shares from conv. pref.} + \text{Shares from conv. debt} + \text{Shares from options/warr.}}$$

Convertibles are handled with the **if-converted method**, which assumes conversion even if the terms did not allow it during the period.

Convertible preferred stock. If the shares were converted, the preferred dividends would not be paid. Add them back to the numerator (they were subtracted to get income available to common) and add the conversion shares to the denominator. There is no tax adjustment, because preferred dividends are not tax-deductible.

Convertible bonds. If the bonds were converted, the interest would not be paid, but the tax deduction on that interest would also be lost. Add back the after-tax interest, $\text{Interest} \times (1 - t)$, and add the conversion shares. If the bonds were issued part-way through the year, weight both the interest add-back and the shares by the fraction of the year the bonds were outstanding.

Options and warrants. These are handled with the **treasury stock method**. There is no numerator adjustment, because exercise saves no expense. Assume exercise, and assume that the cash received is used to repurchase shares at the **average market price** for the period:

KEY CONCEPT

$$\text{Incremental shares} = N - \frac{N \times X}{\bar{P}} = \frac{\bar{P} - X}{\bar{P}} \times N$$

where N is the number of shares issuable, X is the **exercise price** and $\bar{P}$ is the average market price. Options are dilutive only when $X < \bar{P}$, that is, when they are in the money on average. The year-end price plays no part.

Testing for dilution

A security is **dilutive** if including it lowers EPS, and **antidilutive** if including it would raise EPS or reduce a loss per share. Antidilutive securities are excluded from diluted EPS, so diluted EPS can never exceed basic EPS.

A quick test for a convertible is to compute its per-share effect and compare it with basic EPS:

$$\text{Conv. preferred: } \frac{\text{Preferred dividends}}{\text{Shares on conversion}} \quad \text{Conv. bonds: } \frac{\text{Interest} \times (1 - t)}{\text{Shares on conversion}}$$

If the ratio is below basic EPS, the security is dilutive; if it is above, the security is antidilutive. Each potentially dilutive security is tested on its own.

When a company reports a net loss available to common shareholders, adding shares would make the loss per share smaller. All potential shares are then antidilutive, and diluted EPS equals basic EPS.

Example. Ridgeback Instruments has net income of \$3,000,000 and 900,000 weighted average common shares. It also has:

- 6% convertible preferred stock paying \$300,000 of dividends, convertible into 250,000 common shares;
- 100,000 options exercisable at \$40, with an average share price of \$50 (year-end price \$58);
- \$2,000,000 of 8% convertible bonds, convertible into 30,000 shares, with a tax rate of 25%.

Basic EPS = $(3,000,000 - 300,000) / 900,000 = \3.00 .

Security	Numerator add-back	Extra shares	Per-share effect	Result
Conv. preferred	\$300,000	250,000	\$1.20	Dilutive (below \$3.00)
Options	\$0	$100,000 \times (50 - 40) / 50 = 20,000$	\$0	Dilutive (X below average price)
Conv. bonds	$160,000 \times 0.75 = 120,000$	30,000	\$4.00	Antidilutive, so excluded

$$\text{Diluted EPS} = \frac{2,700,000 + 300,000}{900,000 + 250,000 + 20,000} = \frac{3,000,000}{1,170,000} = \$2.56$$

Including the bonds would raise EPS to $3,120,000 / 1,200,000 = \2.60 , which confirms that they are antidilutive. The \$58 year-end price plays no role.

COMMON EXAM TRAPS

- Subtracting common dividends from net income. Only preferred dividends are subtracted. For Wrenfield, subtracting the \$50,000 gives \$3.51 instead of \$4.00.
- Forgetting to restate pre-event shares for a split or stock dividend, or restating shares issued after it. For Wrenfield, leaving the opening and 1 March shares unrestated gives 67,750 weighted shares and EPS of \$6.07 instead of 102,750 and \$4.00.
- Adding back pre-tax instead of after-tax interest for convertible bonds, or applying a tax adjustment to preferred dividends.
- Using a full year of interest and shares for convertibles issued during the year.
- Using the year-end price instead of the average price in the treasury stock method, or including out-of-the-money options. For Ridgeback, the \$58 year-end price gives about 31,034 incremental shares and diluted EPS of \$2.54 instead of 20,000 and \$2.56.
- Including convertible shares in the basic EPS denominator.
- Including an antidilutive security. Diluted EPS must be less than or equal to basic EPS.

EXAM SHORTCUTS

- A convertible is dilutive when its per-share effect (preferred dividends, or interest $\times (1 - t)$, divided by the shares on conversion) is below basic EPS, so each convertible can be tested without computing diluted EPS with and without it.
- Options or warrants whose exercise price is not below the average market price are not dilutive, so they can be dropped before applying the treasury stock method.

- When a company reports a net loss available to common shareholders, every potential share is antidilutive and diluted EPS equals basic EPS, so no dilution test is needed.

BOTTOM LINE

- Basic EPS equals net income minus preferred dividends, divided by the weighted average number of common shares outstanding; common dividends are not subtracted.
- Stock dividends and stock splits are applied retroactively to all shares outstanding before the event, as if it had happened at the start of the year, and shares issued or repurchased after the event are not adjusted.
- Exam convention: a company with a simple capital structure reports basic EPS only. Current practice: that is the US GAAP rule, while IFRS requires every company within its scope to present both basic and diluted EPS.
- Under the if-converted method, diluted EPS adds back convertible preferred dividends and convertible debt interest $\times (1 - t)$ to the numerator and adds the conversion shares to the denominator.
- Under the treasury stock method, options and warrants add $(\bar{P} - X)/\bar{P} \times N$ shares, where $\bar{P}$ is the average market price, and they are dilutive only when $X < \bar{P}$.
- A security that would raise EPS or reduce a loss per share is antidilutive and is excluded, so diluted EPS can never exceed basic EPS.

QUICK CHECK

Question 4

Ravensworth Holdings entered 2025 with 3,000,000 common shares. Its capital transactions during the year, listed from latest to earliest, were: a sale of 240,000 new common shares on 31 October; an issue of €15 million of 6% convertible bonds on 31 May, convertible into common shares at a conversion price of €10; and a 20% stock dividend distributed on 28 February. The number of shares Ravensworth should use for its 2025 *basic* EPS is:

- A 3,540,000.
- B 3,640,000.
- C 5,140,000.

Answer: B

Basic EPS ignores potential shares from convertible securities, so the convertible bonds are not counted. The stock dividend is applied retroactively to the opening shares, and the new shares sold on 31 October are weighted for the remaining two months.

Opening shares restated: $3,000,000 \times 1.20 = 3,600,000$ (all year).

New shares: $240,000 \times \frac{2}{12} = 40,000$.

$$\text{WASO} = 3,600,000 + 40,000 = 3,640,000$$

(Monthly form: $[3,000,000(12) + 600,000(12) + 240,000(2)]/12 = 43,680,000/12 = 3,640,000$.) The €15 million of convertible bonds would convert into 1,500,000 shares, which matters only for diluted EPS.

Why the other options are wrong

- **A.** 3,540,000 treats the 600,000 dividend shares as outstanding only from 28 February ($3,000,000 \times 2/12 + 3,600,000 \times 10/12 + 40,000$). A stock dividend is applied retroactively to the start of the year.
- **C.** 5,140,000 adds the 1,500,000 shares issuable on conversion of the convertible bonds ($\text{€}15,000,000/\text{€}10$). Potential shares from convertibles are excluded from basic EPS.

Key takeaway Basic EPS denominator excludes convertibles; stock dividends are retroactive; new issues are time-weighted.

MODULE 28.5

Ratios and Common-Size Income Statements**LOS 28.e — Common-size income statements and margin analysis****Vertical common-size income statement**

In a **vertical common-size income statement**, every line is divided by **revenue** (sales) for the same period, so revenue = 100%. This removes the effect of size and lets an analyst compare:

- the same firm across years (**time-series** or trend analysis), and
- different firms in the same period (**cross-sectional** analysis), however different their scale.

KEY CONCEPT

$$\text{Common-size line item} = \frac{\text{Line item}}{\text{Revenue}}$$

A common-size figure shows the cost per unit of revenue. It does not show the absolute amount. If cost of sales goes from 55% to 60% of revenue, it has risen relative to sales; whether it rose in currency terms depends on what happened to revenue.

Tax is the exception. Tax expense is more informative relative to pretax income:

$$\text{Effective tax rate} = \frac{\text{Income tax expense}}{\text{Pretax income}}$$

The rate can be computed directly from common-size percentages because revenue cancels out. For example, tax of 6% of sales divided by pretax income of 24% of sales gives 25%.

Margin ratios

Any subtotal divided by revenue is a margin:

$$\text{Gross profit margin} = \frac{\text{Revenue} - \text{COGS}}{\text{Revenue}} \quad \text{Operating profit margin} = \frac{\text{Operating profit (EBIT)}}{\text{Revenue}}$$

$$\text{Pretax margin} = \frac{\text{Earnings before tax}}{\text{Revenue}} \quad \text{Net profit margin} = \frac{\text{Net income}}{\text{Revenue}}$$

The differences between successive margins isolate each cost layer, all as a percentage of revenue:

KEY CONCEPT

Gap	What it measures
100% – gross margin	Cost of goods sold
Gross margin – operating margin	Operating expenses (SG&A, R&D, depreciation)
Operating margin – pretax margin	Net nonoperating expense (mainly interest, net of investment income)
Pretax margin – net margin	Income tax expense

Gross margin improves when a firm raises prices or cuts unit production costs. Product differentiation (brand, technology, patents) supports higher prices. Administrative costs do not affect gross margin. Net margin reflects every cost, including financing and tax. Both should be compared over time and against peers.

The table below shows what moves gross margin when there are no fixed production costs. A product sells for \$50 and costs \$30 per unit to make, a 40% gross margin.

Change	New gross margin
Unit volume +15%	Still $(50 - 30)/50 = 40\%$, because revenue and COGS grow together
Unit cost –6% (to \$28.20)	$(50 - 28.20)/50 = 43.6\%$
Selling price +5% (to \$52.50)	$(52.50 - 30)/52.50 \approx 42.9\%$
Administrative costs –10%	Unchanged; admin is below gross profit (it raises operating and net margin instead)

Common-size statements are also a starting point for strategy analysis. A firm that spends a larger share of revenue on research or marketing may be building the product differentiation that later shows up as a higher gross margin.

Example. Ashgrove Outfitters reports these margins as a percentage of revenue:

	Year 1	Year 2	Year 3
Gross margin	42%	42%	42%
Operating margin	16%	18%	20%
Pretax margin	14%	16%	18%
Net margin	10.5%	12%	13.5%

- COGS is a steady 58% of revenue.
- Operating expenses fell from 26% to 22% of revenue, so the whole improvement comes from cost control below gross profit.

- Nonoperating expense is a stable 2%, so financing costs are unchanged relative to sales.
- The effective tax rate is $3.5/14 = 4/16 = 4.5/18 = 25\%$ every year.

Example. Firm P has revenue of \$50 million, gross profit of \$15 million and operating profit of \$4 million. Firm Q has revenue of \$8 million, gross profit of \$5.2 million and operating profit of \$2.4 million. P earns more in absolute terms, but Q's gross margin (65% against 30%) and operating margin (30% against 8%) are far higher. Q is relatively more profitable, perhaps because its product is differentiated.

COMMON EXAM TRAPS

- A rising common-size percentage does not prove that the absolute amount rose; revenue may have fallen.
- A higher tax-to-sales ratio does not mean a higher tax rate. Divide tax by pretax income.
- An improvement in net margin can come from any layer. Check which gap actually moved.
- A constant interest-to-sales ratio suggests stable reliance on debt relative to activity. It does not by itself measure leverage, which needs the balance sheet.
- Vertical common-size income statements use revenue as the base. Assets and gross profit are not used as the base.

EXAM SHORTCUTS

- The effective tax rate can be read straight from common-size figures: tax as a percentage of sales divided by pretax income as a percentage of sales, because revenue cancels.

BOTTOM LINE

- A vertical common-size income statement divides every line by revenue for the same period, which removes the effect of size for time-series and cross-sectional comparison.
- The effective tax rate is income tax expense divided by pretax income, not tax as a percentage of revenue.
- Gross, operating, pretax and net profit margin are gross profit, operating profit (EBIT), earnings before tax and net income, each divided by revenue.
- As a percentage of revenue, gross margin minus operating margin is operating expenses, operating margin minus pretax margin is net nonoperating expense, and pretax margin minus net margin is income tax expense.
- Gross margin improves when a firm raises prices or cuts unit production costs, product differentiation supports higher prices, and administrative costs do not affect gross margin.

QUICK CHECK

Question 5

An analyst reviews the following margins for Halvorsen Marine:

Halvorsen Marine — selected margins from common-size income statements

Margin (% of revenue)	Year 1	Year 2	Year 3
Gross profit margin	30%	32%	34%
Operating profit margin	21%	23%	25%
Pretax margin	19%	19%	19%
Net profit margin	14%	14%	14%

Halvorsen's net profit margin has stayed flat even though its gross profit margin has widened. Based only on these data, the *most likely* explanation is an increase, relative to revenue, in:

- A selling, general and administrative expenses.
- B income tax expense.
- C nonoperating expenses such as interest.

Answer: C

The gap between operating margin and pretax margin measures net nonoperating expense, chiefly interest, as a share of revenue. That gap widens from 2% to 6% of revenue and absorbs the whole 4-point gain in operating margin, so pretax and net margins stay flat.

Each cost layer as % of revenue:

Layer	Formula	Yr 1	Yr 2	Yr 3
COGS	100% – gross margin	70%	68%	66%
Operating expenses	gross – operating margin	9%	9%	9%
Nonoperating expense	operating – pretax margin	2%	4%	6%
Income tax	pretax – net margin	5%	5%	5%

Effective tax rate = $5/19 \approx 26.3\%$ in every year.

Only the nonoperating layer grows (+4 points), offsetting the +4-point improvement in gross (and operating) margin.

Why the other options are wrong

- **A.** Operating expenses below gross profit (the gross-minus-operating-margin gap) are a constant 9% of revenue in all three years, so the operating margin rises one-for-one with the gross margin.
- **B.** The pretax-minus-net-margin gap is a constant 5% of revenue, and the effective tax rate is unchanged at about 26.3% of pretax income. Taxes do not explain the flat net margin.

Key takeaway Subtract adjacent margins to isolate each cost layer. Gross minus operating margin gives operating expenses; operating minus pretax margin gives nonoperating items; pretax minus net margin gives taxes.

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/analyzing-income-statements/. The full bank has 152 questions on this reading.

credguild.com

FINANCIAL STATEMENT ANALYSIS · READING 29

Analyzing Balance Sheets

What you'll learn

LOS 29.a Explain how intangible assets are recognized, measured and disclosed under IFRS and US GAAP, including R&D costs.

LOS 29.b Explain how goodwill arises, is measured and tested for impairment, and how analysts adjust for it.

LOS 29.c Explain the classification and measurement of financial instruments (marketable securities) under US GAAP and IFRS.

LOS 29.d Explain the reporting of non-current liabilities, including amortized cost, fair value exceptions and deferred tax liabilities.

LOS 29.e Calculate and interpret common-size balance sheets and balance-sheet-based liquidity and solvency ratios.

MODULE 29.1

Intangible Assets and Marketable Securities

This reading covers intangible assets, goodwill, financial instruments and non-current liabilities, including deferred tax liabilities, and ends with common-size balance sheets and balance sheet ratios. A candidate must be able to compute goodwill, state how each class of financial asset is measured and where its gains and losses are reported, and calculate the liquidity and solvency ratios.

LOS 29.a — Intangible assets

Intangible assets are nonmonetary assets that lack physical substance. Securities are financial assets, so they are not intangible assets.

Type	Features	Examples
Identifiable intangible assets	Can be acquired separately, or arise from legal rights or privileges	Patents, trademarks, copyrights, licenses, franchises
Unidentifiable intangible assets	Cannot be acquired separately; may have an unlimited life	Goodwill

Purchased intangibles: measurement after acquisition

KEY CONCEPT

	IFRS	US GAAP
Cost model (cost – accumulated amortization – impairment)	Allowed	Required
Revaluation model (carry at fair value)	Allowed only if an active market exists for the asset	Not allowed

Internally created intangibles. Under US GAAP, research and development costs are **expensed as incurred** (apart from certain legal costs). IFRS splits the project into two stages:

- **Research stage** (seeking new scientific or technical knowledge): expense the costs.
- **Development stage** (applying research to design or plan products): capitalize the costs once the project is technically feasible, the firm has the **intention and resources to complete** it and to use or sell the product, and a market exists. Capitalized development cost includes materials, direct labor and production overhead.

Both IFRS and US GAAP require these costs to be expensed when incurred: start-up costs, training costs, administrative overhead, advertising and promotional spending, relocation and reorganization costs, and termination costs.

Amortization and impairment. **Finite-lived intangibles** are amortized over the period they are expected to be used, and impairment testing follows the same rules as for PP&E. The amortization method and useful life are reassessed at least once a year. **Indefinite-lived intangibles** are **not amortized** but are **tested for impairment at least annually**.

Example. Oriel Diagnostics (IFRS) spends €450,000 on research for a new blood test until it proves feasible. After that, with resources, intent and buyers in place, it spends €300,000 on materials and direct labor, €90,000 on production overhead, €40,000 training technicians and €25,000 on administrative overhead.

- Capitalized (development): €300,000 + €90,000 = €390,000
- Expensed: research €450,000 + training €40,000 + admin €25,000 = €515,000
- Under US GAAP the whole €905,000 would be expensed.

A purchased patent costing \$360,000 with a six-year useful life is carried at $360,000 - 360,000/6 = \$300,000$ after one year under the cost model (straight-line, no residual value), even if its market value has risen.

Some analysts remove intangibles when analyzing balance sheets, but each one should first be judged on its value to the firm.

LOS 29.b — Goodwill

KEY CONCEPT

Goodwill = purchase price — fair value of identifiable net assets acquired

Buyers pay above fair value for items that are not on the target's balance sheet (reputation, customer loyalty, in-process R&D kept off the books) and for expected **synergies**, such as closing duplicate facilities.

- **Goodwill** is recognized only in an acquisition. **Internally generated goodwill** is expensed as incurred and never appears on the balance sheet.
- If the price is below the fair value of identifiable net assets (a **bargain purchase**), the difference is recognized immediately as a gain in the income statement, and no goodwill arises.
- Goodwill has an indefinite life. It is not amortized but is tested for impairment at least annually. An **impairment loss** reduces goodwill and net income but has no cash flow effect. Its carrying amount is the original goodwill less any impairment losses. An impairment suggests that the acquired business is now worth less than the price paid, because the company has lowered its estimate of the future excess returns that business is expected to generate. A loss is recognized only when the impairment test shows the goodwill is impaired.

Measuring goodwill at the acquisition date:

1. Start from the target's assets and remove any goodwill already on its balance sheet. That goodwill came from the target's own past acquisitions and cannot be separated, so it is not an identifiable asset.
2. Restate the remaining identifiable assets, and the liabilities, to fair value.
3. Identifiable net assets = fair value of identifiable assets – fair value of liabilities.
4. Subtract identifiable net assets from the purchase price, as in the goodwill formula above.

Example. Hale Partners pays \$9.2 million for a target whose balance sheet shows total assets of \$10.4 million, including \$0.6 million of goodwill, and liabilities of \$3.5 million. The target's plant is worth \$1.2 million more than its carrying amount; every other item is already at fair value. Identifiable assets = $10.4 - 0.6 + 1.2 = \$11.0$ million, identifiable net assets = $11.0 - 3.5 = \$7.5$ million, and goodwill = $9.2 - 7.5 = \$1.7$ million. Had Hale paid \$7.1 million, it would instead report a \$0.4 million gain.

Accounting goodwill

Economic goodwill

Source	Past acquisitions	Expected future performance of the firm
On the balance sheet?	Yes (purchased only)	No

Is goodwill an asset? One view treats it as the present value of the above-normal returns the target is expected to generate, and therefore a genuine asset. The other view notes that it cannot be sold separately and may simply reflect overpaying for the target. Goodwill impairments help an analyst judge how successful past acquisitions have been.

Manipulation risk. Because goodwill is not amortized, management can raise future net income by assigning more of the price to goodwill and less to depreciable or amortizable identifiable assets, especially when fair values are subjective. Depreciation and amortization fall and reported income rises, but the risk of a later impairment is higher.

Analyst adjustments. For comparability, analysts remove goodwill from the balance sheet and remove goodwill impairment losses from the income statement before computing ratios. An acquisition is assessed by comparing what was paid with the earning power obtained.

LOS 29.c — Financial instruments

Financial instruments are contracts that create a financial asset for one party and a financial liability or equity instrument for another. On the asset side they range from investment securities (bonds and stocks) to derivatives, receivables and loans. Three measurement bases are used: historical cost, amortized cost and **fair value (mark-to-market)**.

US GAAP classifications

KEY CONCEPT

Measurement basis	Items	Unrealized gains and losses
Historical cost	Unquoted equity investments whose fair value cannot be reliably measured; loans and notes receivable	Not recognized

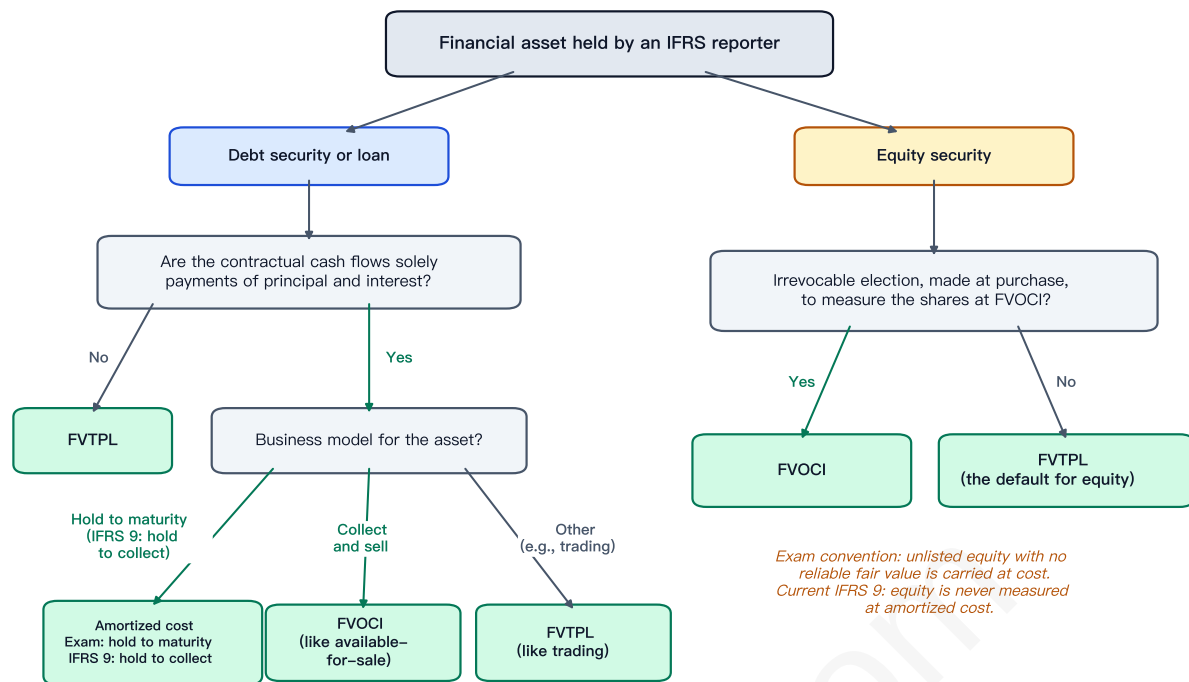
Measurement basis	Items	Unrealized gains and losses
Amortized cost	Held-to-maturity securities	Not recognized, because the security is not remeasured to market
Fair value	Trading securities and derivatives	Income statement
Fair value	Available-for-sale securities	Other comprehensive income

- **Amortized cost** = issue price – principal repayments + amortized discount (or – amortized premium) – impairment losses. Later market price changes are ignored.
- **Held-to-maturity securities** are debt securities the firm intends to hold until they mature; they are carried at amortized cost.
- **Trading securities** (held-for-trading) are debt securities bought to sell in the near term. They are reported at fair value, and unrealized gains and losses go to the income statement. Exam convention: all listed equity holdings without significant influence are treated this way, and US GAAP does not allow equity to be classified as available-for-sale. Current practice: ASC 321 measures these equity securities at fair value through net income without using the trading label, so the balance sheet value and the income statement effect are the same. Derivatives are treated like trading securities.
- **Available-for-sale securities** are debt securities that are neither held to maturity nor traded. They are reported at fair value, and unrealized gains and losses go to other comprehensive income (part of equity).
- Under US GAAP, for every classification, **interest and dividend income** and **realized gains and losses** go to the income statement. The categories differ only in balance sheet value and in where **unrealized gains and losses** (holding period gains and losses) are reported.

IFRS classifications and their US GAAP counterparts:

IFRS category	US GAAP counterpart	Used for
Amortized cost	Held-to-maturity	Exam convention: debt whose cash flows are solely principal and interest and that the firm intends to hold to maturity, plus loans and notes receivable. Current practice: IFRS 9 calls this business model "hold to collect" (holding the asset to collect its contractual cash flows) and applies the same solely-principal-and-interest (SPPI) test.
Fair value through other comprehensive income (FVOCI)	Available-for-sale	Debt held both to collect interest and to sell; equity securities if the firm makes an irrevocable election at purchase
Fair value through profit or loss (FVTPL)	Trading	Everything that fits neither category above (the default for all equity investments, listed or unlisted, and for derivatives); plus any financial asset the firm irrevocably designates at initial recognition under the fair value option

The IFRS categories can be read as a decision sequence (see the figure below).



Amortized-cost business model: exam convention 'hold to maturity'; current IFRS 9 'hold to collect'. Fair value option conditions are described in the text.

IFRS classification of financial assets as a decision sequence

Exam convention: interest, dividends and realized gains and losses reach the income statement under every IFRS category too, as under US GAAP. Current practice: IFRS 9 treats the two kinds of FVOCI asset differently. For a debt security at FVOCI, interest goes to profit or loss, and the cumulative gain or loss held in OCI is reclassified (recycled) to profit or loss when the security is sold. For an equity investment designated at FVOCI, dividends go to profit or loss, but fair value gains and losses stay in OCI and are never recycled, even on sale; the cumulative amount may be transferred within equity, for example to retained earnings.

Exam convention: unlisted equity securities whose fair value cannot be determined reliably are carried at historical cost under both frameworks, alongside loans and notes receivable. Current practice: IFRS 9 measures every equity investment at fair value (FVTPL, or FVOCI by election), with no cost-measurement exemption. In limited circumstances, such as too little recent information, cost may be an appropriate estimate of fair value, but the measurement basis remains fair value.

Fair value option. Exam convention: under IFRS a firm may irrevocably choose, at purchase, to carry any financial asset at FVTPL, and US GAAP offers no such choice. Current practice: the option exists under both frameworks, with conditions. A firm may, at initial recognition, irrevocably elect to carry a financial asset at fair value and report its unrealized gains and losses in profit or loss.

- IFRS: designation at FVTPL is allowed for a financial asset that would otherwise be at amortized cost or FVOCI only if it eliminates or significantly reduces an **accounting mismatch** (a measurement or recognition inconsistency with a related liability or asset).
- US GAAP: the fair value option (FASB Statement 159, now ASC 825) may be elected instrument by instrument for eligible financial assets, including debt that would otherwise be held-to-maturity.
- Absent an election, debt held to maturity is at amortized cost under both frameworks (current IFRS 9 calls this business model "hold to collect").

Example. Linwood Corp buys \$500,000 of 5% bonds at par; at year-end their fair value is \$488,000.

- Held-to-maturity / amortized cost: balance sheet \$500,000; interest income of \$25,000 in net income.
- Trading / FVTPL: balance sheet \$488,000; interest of \$25,000 and the unrealized loss of \$12,000 both in net income (net +\$13,000).
- Available-for-sale / FVOCI: balance sheet \$488,000; interest of \$25,000 in net income; the \$12,000 loss in OCI.

LOS 29.d — Non-current liabilities

Long-term financial liabilities (bank loans, notes payable, bonds payable, some derivatives) are usually reported at amortized cost: issue price – principal repayments + amortized discount (or – amortized premium). Premiums and discounts are amortized through interest expense, so the carrying amount converges on face value at maturity. A loan issued at face value simply stays at that amount, less repayments.

Liabilities reported at fair value include **held-for-trading liabilities** (e.g., a short position in a stock), **derivative liabilities**, and non-derivative liabilities whose exposures are hedged with derivatives.

Deferred tax liabilities (DTL) are income taxes payable in future periods because of temporary timing differences between financial and tax reporting. A DTL arises when income tax expense in the income statement exceeds taxes payable. This happens when:

- expenses are deducted for tax before they appear in the income statement (e.g., accelerated depreciation for tax, straight-line for reporting), or
- revenues or gains appear in the income statement in an earlier period than they are taxed (e.g., credit sales booked at sale but taxed on cash collection; subsidiary earnings recognized before dividends are paid).

DTLs reverse when the tax is eventually paid. **Permanent differences** (e.g., revenue that is never taxable) do not create deferred taxes.

COMMON EXAM TRAPS

- Training costs are expensed even when incurred during the development stage.
- An annual impairment test is not an annual write-down. A loss is recognized only when the test shows that the carrying amount is too high.
- Treating an intangible as indefinite-lived is not the conservative choice. No amortization is charged, so reported income is higher unless an impairment is later found.
- A consultant's valuation of internally built goodwill is never recorded.
- Computing goodwill from the target's book values, or counting goodwill already on the target's books as an identifiable asset. For Hale, book values give goodwill of \$2.9 million, and treating the target's \$0.6 million of goodwill as identifiable gives \$1.1 million, instead of \$1.7 million.
- "Unlisted equity is always at cost" and "listed equity is always at FVTPL" are both too absolute under IFRS.
- Moving held-to-maturity debt to FVTPL when the facts state that no fair value option was elected at initial recognition.
- An available-for-sale bond whose price falls still raises net income through interest income; the loss bypasses net income.
- Interest income is in net income for held-to-maturity securities too.

- Bonds issued at a premium or discount are carried at amortized cost. Face value and fair value are both wrong answers.
- When tax treatment matches book treatment, no deferred tax arises.

EXAM SHORTCUTS

- Under US GAAP, interest and dividend income and realized gains and losses go to the income statement for every classification of security, so only the balance sheet value and the location of unrealized gains and losses depend on the classification.

BOTTOM LINE

- After acquisition, IFRS allows purchased intangibles to be carried under the cost model or, only if an active market exists, the revaluation model, while US GAAP requires the cost model.
- US GAAP expenses R&D costs when incurred (apart from certain legal costs); IFRS expenses research costs and capitalizes development costs once the project is technically feasible, the firm has the intention and resources to complete it and to use or sell the product, and a market exists.
- Finite-lived intangibles are amortized over the period they are expected to be used, while indefinite-lived intangibles, including goodwill, are not amortized but are tested for impairment at least annually.
- Goodwill equals the purchase price minus the fair value of the identifiable net assets acquired; it arises only in an acquisition, and a price below that fair value is a bargain purchase recognized immediately as a gain.
- US GAAP carries held-to-maturity debt at amortized cost, trading securities and derivatives at fair value through the income statement, and available-for-sale debt at fair value through other comprehensive income; the IFRS counterparts are amortized cost, FVTPL and FVOCI respectively.
- A deferred tax liability arises when income tax expense exceeds taxes payable because of a temporary difference, and permanent differences create no deferred taxes.

QUICK CHECK

Question 1

Norvale Biotech, which reports under IFRS, is developing a rapid diagnostic kit. Early in the year it spent €640,000 on laboratory research, and that work showed the kit to be technically feasible. Norvale intends to finish the kit, has the resources to do so, and has signed a supply agreement with a hospital network. For the next phase it expects the following costs:

- staff training: €72,000
- materials and direct labor: €415,000
- production overhead: €185,000
- general administrative overhead: €38,000

The total amount Norvale should expense under IFRS is *closest* to:

- A €640,000.
- B €712,000.
- C €750,000.

Answer: C

Under IFRS, costs of the research phase are expensed, while development-phase costs are capitalized once the project is technically feasible, a market exists, and the firm has the intention and resources to complete and sell the product. All of these conditions are met here. Training costs and administrative overhead are expensed whenever they are incurred, even during development; materials, direct labor and production overhead of the development phase are capitalized.

Classify each cost:

Cost	Phase	Treatment
Laboratory research €640,000	Research	Expense
Staff training €72,000	Any	Expense
Administrative overhead €38,000	Any	Expense
Materials and direct labor €415,000	Development	Capitalize
Production overhead €185,000	Development	Capitalize

$$\text{Expensed} = 640,000 + 72,000 + 38,000 = \text{€}750,000$$

Capitalized development cost = $415,000 + 185,000 = \text{€}600,000$. (Under US GAAP all $\text{€}1,350,000$ would be expensed.)

Why the other options are wrong

- **A.** €640,000 expenses only the research-phase costs and wrongly capitalizes the training and administrative overhead, which must be expensed as incurred.
- **B.** €712,000 correctly expenses research and training but forgets that general administrative overhead is also expensed as incurred.

Key takeaway Research costs are expensed. Once the development criteria are met, materials, direct labor and production overhead are capitalized. Training, administrative overhead, advertising, start-up, relocation and termination costs are always expensed.

MODULE 29.2

Common-Size Balance Sheets**LOS 29.e — Common-size balance sheets and balance sheet ratios****Vertical common-size balance sheet**

A **vertical common-size balance sheet** divides every line item by total assets, so total assets equal 100%. It removes the effect of size, which allows **time-series analysis** (the same firm over time) and **cross-sectional analysis** (different firms at one date). A common-size income statement uses revenue (sales) as the base instead.

KEY CONCEPT

$$\text{Common-size item} = \frac{\text{balance sheet item}}{\text{total assets}}$$

What to read from it:

- **Working capital** = current assets — current liabilities, as a % of assets. A high value means more liquidity, but also more money tied up in low-return assets.
- Composition of current assets: cash, receivables and inventory. Unusually high inventory may signal obsolescence.
- Reliance on fixed assets (PP&E share) and on acquisitions (goodwill share).
- Capital structure: the shares of liabilities and equity. Equity as a % of assets is the reciprocal of the **financial leverage ratio** (total assets / total equity).
- Equity detail: **common stock** (par value) plus **additional paid-in capital** equals the amount received from issuing common shares. Equity also includes retained earnings and accumulated other comprehensive income; preferred stock is shown separately.

Example.

Item	Nolan Co.	%	Pryce Co.	%
Current assets	2,600	32.5%	1,170	18.0%
Non-current assets	5,400	67.5%	5,330	82.0%
Total assets	8,000	100%	6,500	100%
Current liabilities	1,200	15.0%	455	7.0%
Long-term debt	2,800	35.0%	1,495	23.0%
Equity	4,000	50.0%	4,550	70.0%

Nolan's working capital is $32.5\% - 15.0\% = 17.5\%$ of assets vs. $18.0\% - 7.0\% = 11.0\%$ for Pryce; Pryce is more asset-heavy (82% non-current). Nolan is more leveraged: financial leverage = $1/0.50 = 2.0$ vs. $1/0.70 \approx 1.43$.

Liquidity ratios (short-term obligations)

Each common-size percentage is a **balance sheet ratio**, one balance sheet item divided by another (here, total assets). Balance sheet ratios are used, over time and against peers, to judge liquidity and solvency. **Liquidity ratios** measure the ability to meet short-term obligations as they fall due.

KEY CONCEPT

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

$$\text{quick ratio} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{current liabilities}}$$

$$\text{cash ratio} = \frac{\text{cash} + \text{marketable securities}}{\text{current liabilities}}$$

The **quick ratio (acid-test ratio)** excludes inventory; the **cash ratio** also excludes receivables. Read them together: when Firm A's current ratio exceeds Firm B's while A's quick ratio is below B's, the difference must come from A holding relatively more inventory. Current liabilities include accounts payable and short-term debt.

Solvency ratios (long-term obligations)

Solvency ratios measure the ability to meet long-term obligations. The four below should be read together.

KEY CONCEPT

$$\text{long-term debt-to-equity} = \frac{\text{long-term debt}}{\text{total equity}} \quad \text{total debt-to-equity} = \frac{\text{total debt}}{\text{total equity}}$$

$$\text{debt ratio} = \frac{\text{total debt}}{\text{total assets}} \quad \text{financial leverage ratio} = \frac{\text{total assets}}{\text{total equity}}$$

In these ratios, debt means interest-bearing obligations (short- and long-term borrowings). Accounts payable and accruals are excluded. The financial leverage ratio captures all liabilities, whether or not they bear interest. A higher long-term debt-to-equity but lower total debt-to-equity than a peer means the peer relies more on short-term debt. When only percentages of assets are known, $\text{total liabilities/equity} = (1 - e)/e$, where e is equity as a fraction of assets.

Limitations

- Accounting standards and estimates differ across peers.
- Ratios may not be comparable across industries.
- Interpretation requires judgment.
- The balance sheet is a snapshot at a single point in time.

COMMON EXAM TRAPS

- The denominator of a common-size balance sheet is total assets. Equity and sales are wrong bases.
- Quick ratio numerator excludes inventory; the denominator is all current liabilities, including both payables and short-term debt.
- Using the prior year's balances when the question asks for the latest year.
- Inverting a ratio, for example computing current liabilities / current assets instead of current assets / current liabilities. For Nolan, the inverted current ratio is 0.46 instead of 2.17.
- Treating common stock plus additional paid-in capital as total equity.

EXAM SHORTCUTS

- If Firm A's current ratio is above Firm B's while A's quick ratio is below B's, A holds relatively more inventory, with no further data needed.
- From a common-size balance sheet alone, with e equal to equity as a fraction of total assets, the financial leverage ratio is $1/e$ and total liabilities to equity is $(1 - e)/e$.

BOTTOM LINE

- A vertical common-size balance sheet divides every line item by total assets, while a common-size income statement uses revenue as the base.
- The current ratio is current assets divided by current liabilities; the quick ratio uses cash, marketable securities and receivables in the numerator, and the cash ratio uses only cash and marketable securities.
- In the debt-to-equity and debt ratios, debt means interest-bearing short- and long-term borrowings, excluding accounts payable and accruals, while the financial leverage ratio, total assets divided by total equity, captures all liabilities.
- Equity as a percentage of total assets is the reciprocal of the financial leverage ratio.
- Balance sheet ratios are limited because accounting standards and estimates differ across peers, ratios may not be comparable across industries, interpretation requires judgment, and the balance sheet is a snapshot at a single point in time.

QUICK CHECK**Question 2**

Part of the most recent common-size balance sheet of Harrowgate Mills is shown below.

Harrowgate Mills — excerpt from common-size balance sheet (most recent year)

Item	% of total assets
Preferred stock	10%
Common stock	2%
Additional paid-in capital	23%

Which interpretation of these data is *most appropriate*?

- A** Preferred stock accounts for 10% of shareholders' equity.
- B** Shareholders' equity equals 35% of total assets.
- C** The amount received from issuing common stock equals 25% of total assets.

Answer: C

A common-size balance sheet states each item as a percentage of total assets. Capital raised by issuing common shares is recorded partly as common stock (at par value) and partly as additional paid-in capital (the excess over par), so together they show that common share proceeds are $2\% + 23\% = 25\%$ of total assets.

Common-share proceeds = common stock + additional paid-in capital = $2\% + 23\% = 25\%$ of total assets.

Why the other options are wrong

- **A.** The 10% is a percentage of total assets. As a share of shareholders' equity, preferred stock would be larger than 10%.
- **B.** Adding the three items (35%) leaves out other parts of equity, such as retained earnings and accumulated OCI, so total equity is very likely larger than 35% of assets.

Key takeaway Common stock (par) + additional paid-in capital = contributed capital from common shares. Every common-size balance sheet percentage is relative to total assets.

Practice questions

Question 3

Which statement *best* describes how available-for-sale securities are accounted for under US GAAP after purchase?

- A** They are carried at amortized cost, and changes in market value are ignored.
- B** They are carried at fair value, and unrealized gains and losses are recognized in other comprehensive income.
- C** They are carried at fair value, and unrealized gains and losses are recognized in the income statement.

Question 4

In Veloria, companies record revenue in their financial statements when a sale is made. Montclair Tiles sells mainly on 60-day credit terms. Which Velorian tax rule would *most likely* cause Montclair to report a deferred tax liability?

- A** Revenue is taxed when the sale is made.
- B** Revenue is taxed when cash is collected from the customer.
- C** Revenue is exempt from tax.

Question 5

The liabilities and equity section of Galloway Instruments' balance sheet is shown below.

Galloway Instruments — liabilities and equity

Item	Amount
Accounts payable	400
Accrued expenses	150
Short-term notes payable	300
Long-term debt	1,500
Total equity	2,650
Total liabilities and equity	5,000

Treating only interest-bearing obligations as debt, as is usual for solvency ratios, Galloway's debt ratio is *closest* to:

- A 36%.
- B 47%.
- C 68%.

Answers: 3. B · 4. B · 5. A

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/analyzing-balance-sheets/. The full bank has 35 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 30

Analyzing Statements of Cash Flows I

What you'll learn

LOS 30.a Describe how the cash flow statement links to the income statement and balance sheet, and how timing differences between accruals and cash appear in balance sheet accounts.

LOS 30.b Describe the steps in preparing direct and indirect cash flow statements, including computing operating, investing and financing cash flows from income statement and balance sheet data.

LOS 30.c Demonstrate how an indirect-method statement of cash flows is converted to the direct method.

LOS 30.d Contrast statements of cash flows prepared under IFRS and US GAAP (classification of interest, dividends, taxes and bank overdrafts; CFO presentation).

MODULE 30.1

Cash Flow Introduction and Direct Method CFO

This reading explains how the statement of cash flows connects with the income statement and balance sheet, and how operating, investing and financing cash flows are prepared. A candidate must be able to compute CFO with both the direct and the indirect method, derive investing and financing flows from balance sheet changes, convert an indirect statement to the direct format, and classify items under IFRS and US GAAP.

LOS 30.a — How the cash flow statement links to the income statement and balance sheet

Why a separate cash flow statement?

The income statement is prepared on the **accrual basis**, so net income differs from the cash a firm generates. The **statement of cash flows** reports the actual **cash receipts** and **cash payments** of the period and sorts them into three activities:

KEY CONCEPT

Activity	What it captures	Balance sheet accounts it relates to
Cash flow from operations (CFO)	Cash effects of the firm's day-to-day revenue and expense transactions	Mostly working capital accounts (current operating assets and current operating liabilities)
Cash flow from investing activities (CFI)	Buying and selling long-term assets and certain investments	Noncurrent assets (PP&E, intangibles, long-term investments)
Cash flow from financing activities (CFF)	Transactions with creditors and shareholders that change the capital structure	Noncurrent liabilities and equity

The terms **cash flow from operations**, **cash flow from operating activities** and **operating cash flow** mean the same thing.

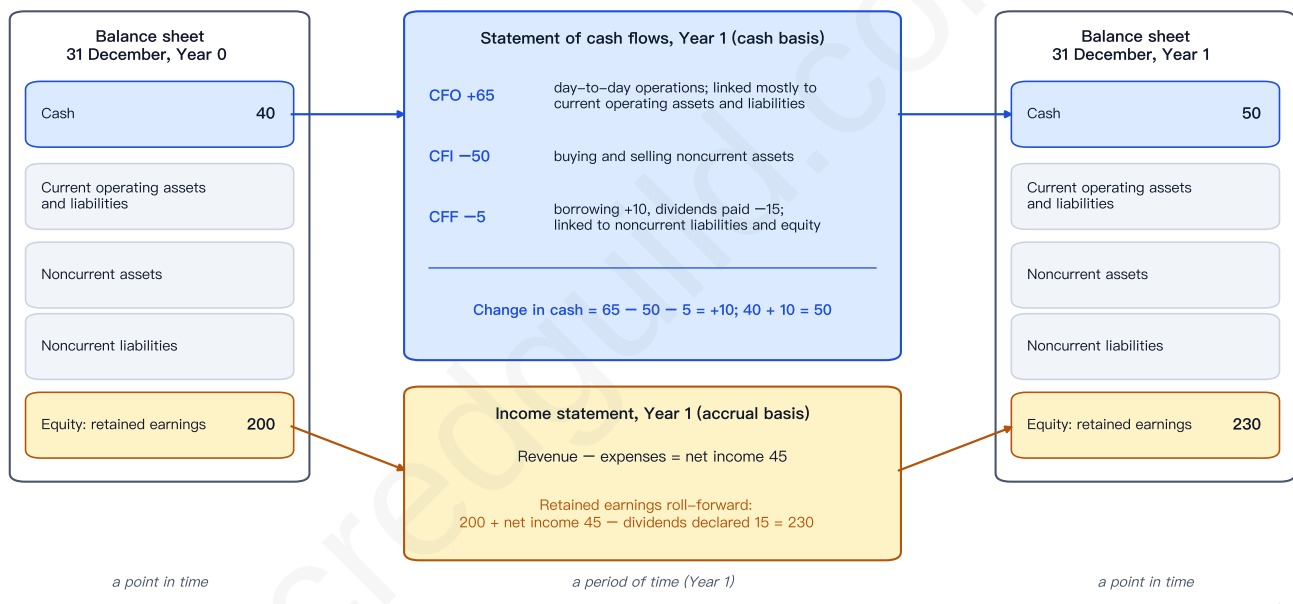
The classification depends on what a transaction means for the company reporting it. When a machinery maker sells a press to a printing firm, the maker reports an operating inflow, because selling presses is its business. The printing firm reports an investing outflow, because it is buying a long-term asset.

The statement reconciles the opening and closing cash balances. Each section is a signed net amount, so a net outflow enters as a negative number:

KEY CONCEPT

$$\text{CFO} + \text{CFI} + \text{CFF} = \Delta\text{Cash}; \quad \text{Beginning cash} + \Delta\text{Cash} = \text{Ending cash}$$

The income statement is also a **flow** statement (sometimes called a dynamic statement): like the statement of cash flows, it covers the period between two balance sheet dates, and net income reaches the closing balance sheet through retained earnings (see the figure below). Because of accrual accounting, net income is not the cash the firm generated, and many investing and financing cash flows, such as buying equipment or borrowing, do not touch the income statement when they occur.



The income statement and the statement of cash flows link two balance sheets

Analysts use the statement of cash flows to judge **liquidity**, **solvency** and **financial flexibility**, meaning whether operations can fund the business, repay maturing debt, absorb shocks and take up opportunities without new financing. It also shows the **quality of earnings**. Earnings are of higher quality when CFO is close to, or above, net income; earnings that persistently exceed CFO are not backed by cash.

Timing differences show up on the balance sheet

When revenue or expense recognition and the cash flow happen in different periods, a balance sheet account absorbs the difference:

Situation

Balance sheet effect

Sales exceed **cash collected from customers** (sales on credit) **Accounts receivable** increase

Situation	Balance sheet effect
Cash collected exceeds sales	Accounts receivable decrease
Purchases exceed cash paid to suppliers	Accounts payable increase
Cash paid to suppliers exceeds purchases	Accounts payable decrease
Customers pay before revenue is recognized	Unearned revenue (a liability) increases
Premiums paid before the expense is recognized	Prepaid expenses (an asset) increase
Every such account can be written as a roll-forward, e.g. for receivables:	

$$\text{Beginning AR} + \text{Sales} - \text{Cash collected} = \text{Ending AR}$$

so that cash collected = sales – increase in AR (or + decrease in AR). Knowing any three items gives the fourth. Revenue recognition rules decide when a sale reaches the income statement, not when the customer pays. Cash received in advance, for instance for a multi-year service contract, is reported in the statement of cash flows when it arrives, while the revenue is recognized gradually as the contract runs. Tracing each account this way also helps an analyst detect aggressive accounting, since reported revenue or expenses that do not fit the related cash and balance sheet changes stand out.

Example. Sales are \$540,000; AR rise from \$62,000 to \$77,000; unearned revenue rises from \$9,000 to \$13,000. Cash collected = $540,000 - 15,000 + 4,000 = \$529,000$.

LOS 30.b — Preparing CFO with the direct method

Sources and uses of cash

CFO can be presented with the **direct method** or the **indirect method**. The presentation differs but the CFO total is the same, and CFI and CFF are presented the same way whichever method is chosen. Sources of cash are shown as positive numbers (inflows) and uses of cash as negative numbers (outflows).

KEY CONCEPT

Change in account	Effect on cash
Increase in an operating asset	Use of cash (subtract)
Decrease in an operating asset	Source of cash (add)
Increase in an operating liability	Source of cash (add)
Decrease in an operating liability	Use of cash (subtract)

The direct method

The **direct method** lists the operating cash receipts and payments themselves. Typical lines are **cash collected from customers** (usually the largest component), **cash paid to suppliers** (cash inputs), cash paid for operating expenses such as wages, **cash paid for interest** and **cash paid for taxes**. It gives the analyst more detail than the indirect method, which helps with forecasting.

Steps: begin with the first line of the income statement; for each revenue or expense line (treat expenses as negative numbers), find the related operating asset or liability, apply the source/use rules to its change, and move to the next line. **Noncash items** such as **depreciation** and **gains and losses** on asset disposals are ignored because they are not operating cash flows. Sum the adjusted lines to get CFO. Net income never appears in a direct-method CFO section.

Key formulas. Each formula starts from the income statement amount and corrects it for the part that was not received or paid in cash this period, using the change in the related balance sheet account.

$$\text{Cash collected} = \text{Net sales} - \Delta\text{AR} + \Delta\text{Unearned revenue}$$

$$\text{Purchases} = \text{COGS} + \text{Ending inventory} - \text{Beginning inventory} = \text{COGS} + \Delta\text{Inventory}$$

$$\text{Cash paid to suppliers} = \text{Purchases} - \Delta\text{AP} = \text{COGS} + \Delta\text{Inventory} - \Delta\text{AP}$$

$$\text{Cash paid for wages} = \text{Wage expense} - \Delta\text{Wages payable}$$

$$\text{Cash paid for interest} = \text{Interest expense} - \Delta\text{Interest payable}$$

$$\text{Cash paid for insurance} = \text{Insurance expense} + \Delta\text{Prepaid insurance}$$

$$\text{Cash taxes paid} = \text{Tax expense} - \Delta\text{Taxes payable} - \Delta\text{Deferred tax liability} + \Delta\text{Deferred tax asset}$$

If purchases are given directly, no further inventory adjustment is made, because the inventory change is already built into purchases. The same identities can be run backwards: expense = cash paid – increase in the related prepaid asset, or = cash paid + increase in the related payable.

Example. A retailer reports sales of \$820,000, COGS of \$510,000, wage expense of \$140,000, depreciation of \$35,000 and tax expense of \$30,000. AR fell by \$12,000, inventory rose by \$18,000, AP rose by \$9,000, wages payable fell by \$4,000, taxes payable were unchanged.

Line	Computation	Cash flow
Cash collected	820,000 + 12,000	832,000
Cash paid to suppliers	–510,000 – 18,000 + 9,000	(519,000)
Cash paid for wages	–140,000 – 4,000	(144,000)
Depreciation	noncash, ignored	0
Cash taxes paid	–30,000	(30,000)
CFO		139,000

COMMON EXAM TRAPS

- Linking operating activities to noncurrent assets (investing) or to long-term debt and equity (financing).

- Subtracting the ending balance of AR from sales instead of the change in AR. In the LOS 30.a example, this gives cash collected of \$467,000 instead of \$529,000.
- Forgetting that an increase in unearned revenue means cash arrived before the sale was recorded, so the increase is added. In the LOS 30.a example, subtracting the \$4,000 increase gives \$521,000 instead of \$529,000.
- Including depreciation, a **noncash charge**, as a cash expense. For the retailer, this gives CFO of \$104,000 instead of \$139,000.
- Adjusting purchases a second time for the inventory change.
- Getting the sign of a liability change wrong. A decrease in wages or interest payable means more cash was paid than expensed. For the retailer, adding the \$4,000 decrease in wages payable gives cash paid for wages of \$136,000 instead of \$144,000, and CFO of \$147,000 instead of \$139,000.
- Dropping interest paid and taxes paid from direct-method CFO. Under US GAAP both are operating outflows.

EXAM SHORTCUTS

- A balance sheet roll-forward such as $\text{beginning AR} + \text{sales} - \text{cash collected} = \text{ending AR}$ links four items, so any three of them give the fourth.

BOTTOM LINE

- CFO relates mostly to working capital accounts, CFI to noncurrent assets, and CFF to noncurrent liabilities and equity.
- $\text{CFO} + \text{CFI} + \text{CFF}$ equals the change in cash, and beginning cash plus that change equals ending cash.
- Earnings are of higher quality when CFO is close to, or above, net income; earnings that persistently exceed CFO are not backed by cash.
- An increase in an operating asset is a use of cash and an increase in an operating liability is a source of cash; decreases work the other way.
- Cash collected from customers equals $\text{net sales} - \Delta\text{AR} + \Delta\text{unearned revenue}$, and cash paid to suppliers equals $\text{COGS} + \Delta\text{inventory} - \Delta\text{AP}$.
- The direct method lists operating cash receipts and payments and ignores noncash items, for example depreciation or a gain on an asset sale, so net income never appears in a direct-method CFO section.

QUICK CHECK

Question 1

Alvern Truck Works builds delivery trucks for sale. It sells 25 new trucks for cash to Ardwell Couriers, which will use them in its delivery business for about eight years. Both companies report under US GAAP. How will the cash that changes hands be classified in each company's statement of cash flows? Answer in the form: Alvern; Ardwell.

- A Operating inflow; investing outflow.
- B Operating inflow; operating outflow.
- C Investing inflow; investing outflow.

Answer: A

Cash flows are classified by what the transaction means for the company that reports it. Selling trucks is Alvern's ordinary business: the trucks are its inventory, the sale produces revenue and cost of goods sold, and the cash is collected from a customer, so it is an operating inflow. For Ardwell the trucks are long-term assets bought for use over several years, so the payment is an investing outflow. One transaction can therefore fall in different sections of the two companies' statements.

- Alvern: trucks held for sale are inventory. Cash received from customers is part of cash flow from operations (CFO).
- Ardwell: trucks bought for use are property, plant, and equipment, a noncurrent asset. Purchases of long-term assets belong in cash flow from investing activities (CFI). Ardwell will later depreciate the trucks, which reduces net income but is a noncash expense.

Why the other options are wrong

- **B.** This treats Ardwell's purchase as an operating payment. Buying a long-term asset for use over several years is an investing activity; only Alvern, for which the trucks are inventory, reports an operating cash flow.
- **C.** This treats Alvern's sale as the disposal of a long-term asset. Trucks that Alvern builds in order to sell them are inventory, not PP&E, so the proceeds are cash collected from customers, an operating inflow.

Key takeaway Classify a cash flow by its role for the reporting company. The sale of inventory is operating for the seller, while the same asset bought for long-term use is an investing outflow for the buyer.

MODULE 30.2

Indirect Method CFO**LOS 30.b — Preparing CFO with the indirect method****Starting point: net income**

The **indirect method** starts with **net income** and reconciles it to CFO. Net income already contains noncash items and nonoperating gains and losses, so these are unwound, and then the changes in operating working capital are applied:

KEY CONCEPT

$$\text{CFO} = \text{NI} + \text{NCC} - \text{WC}_{\text{INV}}$$

where NCC are **noncash charges** and WC_{INV} is the **investment in working capital** (the net increase in operating assets less operating liabilities).

Step 1–2: noncash charges, gains and losses

KEY CONCEPT

Add back to net income	Subtract from net income
Depreciation , depletion and amortization	Gains on asset disposals
Losses on asset disposals	Gains on early retirement of debt
Asset impairments and write-downs	Reversals of impairments and write-downs
Losses on early retirement of debt	Amortization of premiums on bonds issued (amortized cost method)
Amortization of discounts on bonds issued (amortized cost method)	Decreases in deferred tax liabilities, increases in deferred tax assets
Increases in deferred tax liabilities , decreases in deferred tax assets	
Losses of equity-accounted associates	

Noncash components of revenue are subtracted in the same way. Although these items are called noncash "charges", they can raise or lower net income.

An inventory write-down reduces both net income and the inventory balance, so it must be counted only once; the two consistent ways to handle it are set out under LOS 30.c.

A gain on the sale of equipment is removed because the whole cash proceeds from the sale belong in CFI. The gain is the part of those proceeds above **carrying value**, and it also sits in net income. Leaving it in would count it twice and misclassify investing cash as operating cash. A loss reduced net income without any operating cash outflow, so it is added back.

Step 3: working capital changes

KEY CONCEPT

Add	Subtract
Decreases in current operating assets (AR, inventory, prepaid expenses)	Increases in current operating assets
Increases in current operating liabilities (AP, wages payable, interest payable, taxes payable, unearned revenue)	Decreases in current operating liabilities

Only operating working capital counts. Cash and short-term investments are ignored, except trading securities, whose flows are CFO. Short-term interest-bearing debt and **dividends payable** are financing items and are also ignored.

The definition of **working capital** depends on the context. For ratio analysis it is total current assets minus total current liabilities. For cash flow work, and in corporate finance, it means operating assets minus operating liabilities, often called **noncash working capital**. The working capital changes can be applied line by line or as

one net figure: the increase in noncash working capital is subtracted.

Some items never enter CFO under the indirect method because they are not in net income or are not operating: issuing or repaying bonds, issuing or buying back stock, **dividends paid** (CFF under US GAAP), and purchases of PP&E or land (CFI). They matter for CFO only through any gain or loss they create.

Example

Net income \$64,000; depreciation \$15,000; gain on sale of a delivery van \$3,000; AR up \$7,000; inventory down \$4,000; prepaid rent up \$1,000; AP up \$6,000; wages payable down \$2,000; dividends paid \$10,000.

$$\text{CFO} = 64,000 + 15,000 - 3,000 - 7,000 + 4,000 - 1,000 + 6,000 - 2,000 = \$76,000$$

The \$10,000 dividend is a financing outflow and is not deducted. When there are no disposals, the increase in **accumulated depreciation** equals the period's depreciation, which is the add-back seen from the balance sheet.

Direct vs. indirect presentation

	Direct method	Indirect method
Starts with	Cash receipts from customers	Net income
Depreciation and gains/losses	Not considered (noncash)	Adjusted (added back / subtracted)
Working capital changes	Used to convert each revenue/expense line	Used to adjust net income
Main advantage	Shows actual operating receipts and payments	Shows why net income and CFO differ (earnings quality)

The CFO totals agree because both methods start from the same income statement and use the same working capital changes. The direct method converts each revenue and expense line to cash and leaves out noncash items. The indirect method takes net income, in which those lines are already netted, and unwinds the noncash items and gains instead.

Example. The retailer in the direct-method example of Module 30.1 has net income of 820,000 – 510,000 – 140,000 – 35,000 – 30,000 = \$105,000. Indirect method: 105,000 + 35,000 + 12,000 – 18,000 + 9,000 – 4,000 = \$139,000, the same CFO that the direct method gives.

Most firms present CFO with the indirect method. What each framework requires of the choice is compared under LOS 30.d.

COMMON EXAM TRAPS

- Adding a gain (or subtracting a loss) instead of the reverse. In the example, adding the \$3,000 gain gives CFO of \$82,000 instead of \$76,000.
- Subtracting depreciation, or adding it under the direct method. In the example, subtracting the \$15,000 of depreciation gives \$46,000 instead of \$76,000.
- Deducting dividends paid or bond repayments in CFO. In the example, deducting the \$10,000 dividend gives \$66,000 instead of \$76,000.

- Using the full sale proceeds of an asset in CFO instead of removing only the gain.
- Computing a gain from an out-of-date carrying value. The carrying value on the sale date includes the depreciation charged in the year of sale.

EXAM SHORTCUTS

- The direct and indirect methods give the same CFO total, so a CFO figure found with one method need not be recomputed with the other.
- Dividends paid, debt and stock issues or repayments, and purchases of PP&E or land can be skipped when computing indirect CFO; they matter only through a gain or loss they create.

BOTTOM LINE

- Under the indirect method, CFO equals net income plus noncash charges minus the investment in working capital.
- Depreciation, amortization, impairments and losses on asset disposals are added back to net income, while gains on disposals are subtracted, because the whole sale proceeds belong in CFI.
- Decreases in current operating assets and increases in current operating liabilities are added to net income; increases in operating assets and decreases in operating liabilities are subtracted.
- Only operating working capital enters CFO: short-term interest-bearing debt and dividends payable are financing items, and cash is ignored.
- The direct method shows the actual operating receipts and payments, while the indirect method shows why net income and CFO differ.

QUICK CHECK

Question 2

An analyst is rebuilding the operating section of Castellan Paper's statement of cash flows, which is prepared using the indirect method. Which of the following items recorded by Castellan during the year requires an addition to net income in arriving at cash flow from operating activities?

- A A loss on the early retirement of its bonds.
- B A gain on the sale of a delivery truck.
- C A decrease in its deferred tax liability.

Answer: A

The indirect method starts with net income and removes items that affected income without a matching operating cash flow. A loss on retiring debt early reduced net income, but the cash paid to retire the bonds is a financing outflow, so the loss is added back. Otherwise operating cash flow would be reduced by an amount that belongs in financing activities.

Why the other options are wrong

- **B.** A gain on the sale of a truck raised net income, but the full sale proceeds are an investing inflow. The gain is subtracted so that it is not counted in operating cash flow as well.

- **C.** A decrease in a deferred tax liability means income tax expense was lower than the tax payable for the period, so net income overstates the cash left after taxes. The decrease is subtracted from net income.

Key takeaway Indirect method: add back losses and subtract gains that arise from investing or financing transactions, such as asset sales and debt retirement. Add increases and subtract decreases in deferred tax liabilities.

MODULE 30.3

Investing and Financing Cash Flows and IFRS/US GAAP Differences

LOS 30.b — Cash flow from investing and financing activities

Investing activities (CFI)

Cash flow from investing activities covers buying and selling long-term assets and investments: purchases and sales of PP&E and intangibles, purchases and sales of investments in bonds and shares (trading securities excepted), and loans the firm makes to others and later collects. Only the cash paid or received counts. For an asset sale the cash is the **disposal proceeds**:

KEY CONCEPT

$$\text{Proceeds} = \text{Carrying value of asset sold} + \text{Gain (or - Loss)}$$

When the proceeds must be backed out of the balance sheet:

$$\text{Gross cost of disposals} = \text{Beginning gross PP\&E} + \text{Purchases} - \text{Ending gross PP\&E}$$

$$\text{Accumulated depreciation removed} = \text{Beginning AD} + \text{Depreciation expense} - \text{Ending AD}$$

Carrying value sold = gross cost – accumulated depreciation removed; then add the gain or subtract the loss. The three steps can be combined:

$$\text{Carrying value disposed} = \text{Beginning net PP\&E} - \text{Depreciation} + \text{Purchases} - \text{Ending net PP\&E}$$

Land is not depreciated, so its carrying value is its cost. With no land purchases, the carrying value of land sold is the fall in the land balance.

WORKED EXAMPLE: PROCEEDS FROM AN EQUIPMENT SALE

A firm's gross PP&E is \$480,000 at the start of the year and \$515,000 at the end, and it bought \$95,000 of equipment for cash during the year. Accumulated depreciation is \$160,000 at the start and \$178,000 at the end, and depreciation expense for the year is \$52,000. The income statement shows a \$7,000 gain on the sale of equipment. Find the carrying value of the equipment sold, the cash proceeds and the firm's CFI, assuming no other investing transactions.

Step 1. Gross cost of disposals = $480,000 + 95,000 - 515,000 = \$60,000$.

Step 2. Accumulated depreciation removed = $160,000 + 52,000 - 178,000 = \$34,000$.

Step 3. Carrying value sold = $60,000 - 34,000 = \$26,000$. The one-line check gives the same figure: beginning net PP&E of \$320,000 less depreciation of \$52,000, plus purchases of \$95,000, less ending net PP&E of \$337,000 = \$26,000.

Step 4. Proceeds = $26,000 + 7,000 = \$33,000$, an investing inflow; the \$7,000 gain is subtracted from net income in indirect CFO.

Result. CFI = $-95,000 + 33,000 = -\$62,000$.

Financing activities (CFF)

Cash flow from financing activities covers transactions with the providers of capital:

$$\text{CFF} = (\text{New borrowing} - \text{Principal repaid}) + (\text{Stock issued} - \text{Stock repurchased}) - \text{Cash dividends paid}$$

Dividends paid often have to be derived:

$$\text{Dividends declared} = \text{Beginning retained earnings} + \text{Net income} - \text{Ending retained earnings}$$

$$\text{Dividends paid} = \text{Dividends declared} - \Delta \text{Dividends payable}$$

Example. Net income is \$640, retained earnings rise from \$1,500 to \$1,880, and dividends payable fall from \$70 to \$40. Dividends declared = $1,500 + 640 - 1,880 = \$260$. Dividends paid = $260 - (40 - 70) = \$290$, a financing outflow. More cash went out than was declared because part of the payable left over from last year was also settled.

The Level I convention assumes bonds are issued at par and shares are repurchased at their issue price, so the changes in bonds payable and in **contributed capital** (common stock at par plus additional paid-in capital) give the principal and equity flows. For a bond issued at a discount or premium, the amortization is noncash: interest expense = coupon + discount amortized – premium amortized, and the carrying value of the bond changes without any financing cash flow. When buybacks occur at a price different from the issue price, the difference goes through retained earnings. The total of CFO, CFI and CFF must equal the change in the cash balance, which serves as a check figure.

Noncash investing and financing activities

Transactions with no cash, such as buying an asset in exchange for bonds or stock or converting bonds into preferred or common stock, do not appear in CFI or CFF. They are disclosed in a footnote or supplementary schedule. If an asset is bought partly for cash, only the cash portion is an investing outflow.

US GAAP classification summary

KEY CONCEPT

	Operating	Investing	Financing
Inflows	Cash from customers; interest received; dividends received ; sales of trading securities	Sale of PP&E and intangibles; sale of debt/equity investments; collection of loans made	Debt issued; stock issued
Outflows	Suppliers and employees; other expenses; interest paid; taxes paid ; purchases of trading securities	Purchase of PP&E and intangibles; purchase of investments; loans made	Principal repaid; stock repurchased; dividends paid

Example. A firm buys machinery for \$42,000, sells a warehouse (carrying value \$30,000) for \$36,000, issues bonds of \$25,000, repays a bank loan of \$8,000 and pays dividends of \$11,000. $CFI = -42,000 + 36,000 = -\$6,000$; $CFF = 25,000 - 8,000 - 11,000 = \$6,000$. The \$6,000 gain is removed from net income in CFO.

LOS 30.c — Converting an indirect statement to the direct method

Only the CFO section differs between the two formats, so the conversion uses the income statement plus the working capital changes from the indirect statement:

1. Total the revenues and gains, and separately total the expenses and losses.
2. Remove all noncash items (depreciation, amortization, gains and losses, **inventory writedowns**, deferred tax changes) and break the rest into individual lines.
3. Convert each line from accrual to cash using the related working capital change.

Direct-method line	Adjustment
Cash collected from customers	Start with net sales ; subtract an increase (add a decrease) in AR; add an increase (subtract a decrease) in unearned revenue
Cash paid to suppliers (as a positive amount)	Start with COGS; add an increase (subtract a decrease) in inventory; subtract an increase (add a decrease) in AP; subtract noncash items inside COGS such as an inventory writedown or depreciation included in COGS. When the writedown is removed from COGS, the inventory change must also exclude the writedown (see below)

An inventory writedown (lower of cost or market / net realizable value) raises COGS but involves no cash, so it is taken out of COGS when computing cash paid to suppliers. A decrease in inventory means some goods sold came out of existing stock and were not bought this period, so it also reduces the cash paid.

The writedown also lowers the ending inventory balance, so it must not be counted twice. There are two consistent routes:

1. Subtract the writedown from COGS and use the inventory change before the writedown (purchases less cost of units sold), or
2. Keep COGS including the writedown and use the raw balance sheet inventory change (after the writedown), with no separate writedown adjustment.

Example. Beginning inventory 200, cash purchases 90, cost of units sold 70, writedown 20, ending inventory 200, AP unchanged. Reported COGS is 90 and the balance sheet inventory change is 0. Route 1: $90 - 20 + (+20) = 90$. Route 2: $90 + 0 = 90$. Cash paid = 90 either way; mixing the routes ($90 - 20 + 0 = 70$) is wrong.

LOS 30.d — IFRS versus US GAAP

KEY CONCEPT

Item	US GAAP	IFRS
Interest received	CFO	CFO or CFI
Interest paid	CFO	CFO or CFF
Dividends received	CFO	CFO or CFI
Dividends paid	CFF	CFO or CFF
Bank overdraft	Treated as debt (a financing item)	Included in cash and cash equivalents when repayable on demand and part of cash management
Taxes paid	All CFO	May be split among CFO, CFI and CFF according to the transaction that caused the tax to become payable (CFO unless tied to an investing or financing transaction)
Presentation of CFO	Direct encouraged; indirect allowed; direct users must disclose the indirect reconciliation	Direct encouraged; indirect allowed

Under these IAS 7 choices, interest and dividends received are never financing and interest and dividends paid are never investing, and every US GAAP classification of the four items is also allowed under IFRS. Exam convention: the IAS 7 choices in the table above. Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, amends IAS 7 and removes most of this choice for companies whose main business is not investing or financing (interest and dividends received go to CFI; interest and dividends paid go to CFF).

Example. Investment property is sold for \$3.2 million and tax of \$0.25 million is paid on the gain. Under US GAAP the statement shows a CFI inflow of \$3.2 million and a CFO outflow of \$0.25 million. Under IFRS the firm may classify the tax in investing activities, so the sale adds a net \$2.95 million to CFI (total taxes paid are still disclosed).

COMMON EXAM TRAPS

- Putting interest paid in CFF for a US GAAP firm.
- Treating dividends paid as CFO for a US GAAP firm (only IFRS allows it).
- Including noncash exchanges (bonds for land, bonds converted to stock) in CFI or CFF.
- Using dividends declared as the CFF outflow without adjusting for the change in dividends payable. In the dividend example, this gives an outflow of \$260 instead of \$290.
- Using the gain, or the carrying value, instead of the sale proceeds in CFI. In the CFI example, the gain gives CFI of -\$36,000 and the carrying value gives -\$12,000, instead of -\$6,000.

EXAM SHORTCUTS

- The carrying value of PP&E disposed of can be found in one line as beginning net PP&E – depreciation + purchases – ending net PP&E, instead of working through gross cost and accumulated depreciation separately.

BOTTOM LINE

- Proceeds from an asset sale equal the carrying value of the asset sold plus the gain, or minus the loss, and only the proceeds are reported in CFI.
- CFF equals new borrowing minus principal repaid, plus stock issued minus stock repurchased, minus cash dividends paid, where dividends paid equal dividends declared (opening retained earnings plus net income less closing retained earnings) minus the change in dividends payable.
- Noncash investing and financing transactions, such as buying an asset with bonds or converting bonds into stock, are not in CFI or CFF but are disclosed in a footnote or supplementary schedule.
- Under US GAAP, interest received, dividends received, interest paid and taxes paid belong in CFO, and dividends paid belong in CFF.
- Exam convention: IFRS allows interest and dividends received in CFO or CFI and interest and dividends paid in CFO or CFF. Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, removes most of this choice for companies whose main business is not investing or financing.
- An inventory writedown is noncash and must be counted only once when cash paid to suppliers is computed: either subtract it from COGS and use the inventory change before the writedown, or keep it in COGS and use the balance sheet inventory change.

QUICK CHECK**Question 3**

On December 31, Tarn Retail, which reports under IFRS, borrowed €45,000 on a 90-day bank note and used the cash to buy merchandise inventory. On the same day it issued €200,000 of seven-year bonds and used the proceeds to buy delivery vans. No interest was paid during the year. The combined effect of these transactions on Tarn's statement of cash flows for the year is that:

- A** cash flow from financing activities increases by €200,000.
- B** cash flow from operating activities decreases by €45,000.
- C** cash flow from operating activities is unchanged.

Answer: B

Classification follows the nature of each cash flow, not the maturity of the borrowing. Buying inventory is part of day-to-day operations, so the €45,000 paid is an operating outflow. Borrowing, whether on a short-term note or long-term bonds, is a financing inflow, and buying vans is an investing outflow.

CFO: inventory purchase –€45,000.

CFI: vans –€200,000.

CFF: note +€45,000 and bonds +€200,000, a total of +€245,000.

The net change in cash is zero.

Why the other options are wrong

- **A.** Financing cash flow rises by €245,000, because the 90-day note is also borrowing and belongs in financing activities together with the bonds.
- **C.** The cash used to buy inventory is an operating outflow, so operating cash flow falls by €45,000 even though the purchase was funded by a bank note.

Key takeaway Borrowing of any maturity is financing; paying for inventory is operating; buying long-term assets is investing. Match each leg of a transaction to its own section.

Practice questions**Question 4**

Dmitri Volkov is deciding whether to present the operating section of a projected statement of cash flows using the direct or the indirect format. Which of the following statements is *most accurate*?

- A** Under the direct method, depreciation is added to cash collected from customers because it is a noncash expense.
- B** Under the indirect method, depreciation is added back to net income because it is a noncash expense.
- C** Under the indirect method, changes in accounts receivable need no adjustment because net income already reflects them.

Question 5

Under US GAAP and under IFRS, how may **interest paid** be classified in the statement of cash flows?

- A US GAAP: CFO or CFF; IFRS: CFO.
- B US GAAP: CFO; IFRS: CFO or CFF.
- C US GAAP: CFF; IFRS: CFO or CFF.

Answers: 4. B · 5. B

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/analyzing-statements-of-cash-flows-i/. The full bank has 59 questions on this reading.

credguild.com

FINANCIAL STATEMENT ANALYSIS · READING 31

Free Cash Flow

What you'll learn

LOS 31.a Analyze and interpret reported and common-size cash flow statements, including sources and uses of cash and the sustainability of operating cash flow.

LOS 31.b Calculate and interpret free cash flow to the firm, free cash flow to equity, and cash flow performance and coverage ratios.

MODULE 31.1

Analyzing Statements of Cash Flows II

This reading shows how an analyst evaluates a statement of cash flows: the sources and uses of cash in each section, what CFO says about earnings quality, and the two formats of common-size cash flow statement. It then defines free cash flow to the firm and to equity and the cash flow performance and coverage ratios, all of which a candidate must be able to calculate.

LOS 31.a — Reading reported and common-size cash flow statements

What the statement of cash flows tells an analyst

The cash flow statement gives an analyst information for assessing a firm's **liquidity**, **solvency** and **financial flexibility**. It answers practical questions:

- Do ordinary operations produce enough cash to keep the business running?
- Can maturing debt be repaid from internally generated cash, or will new financing be needed?
- Could the firm absorb an unexpected obligation or seize a new opportunity?

The analysis starts by listing the **sources and uses of cash** in each of the three sections (operating, investing and financing) and asking whether the pattern fits the firm's stage in its **life cycle**.

Stage	Typical pattern
Early growth	Operating cash flow often negative (cash tied up in receivables and inventory); gap funded by issuing debt or equity, which cannot continue indefinitely
Mature	Operating cash flow positive and larger than capital spending; surplus returned to lenders and shareholders

Operating activities: sources of CFO

Sustainable operating cash flow comes from the firm's **earnings-generating activities**. A firm can also boost CFO temporarily by shrinking **noncash working capital**:

- collecting receivables faster or running down inventory (these cannot fall below zero), or
- paying suppliers more slowly.

Such cash is classified as operating cash flow. It is not a sustainable source of cash, because suppliers will eventually refuse to extend more credit if payment keeps slipping.

Earnings quality. A stable relationship between CFO and net income signals good **earnings quality**. For a mature firm whose working capital is not growing, CFO normally exceeds net income, because depreciation and amortization reduce net income without using cash ($CFO = NI + NCC - WC_{INV}$). If net income persistently runs well ahead of CFO, the firm may be making aggressive or improper choices, such as recognizing revenue too early or deferring expenses. The variability of both net income and CFO is also an indicator of risk.

Investing and financing activities

- Rising **capital expenditures** usually indicate growth; cutting capex or selling long-lived assets frees cash now but may mean heavier outflows later when old assets must be replaced. Investing flows also include acquisitions and purchases/sales of securities.
- The financing section (**cash flow from financing activities**) shows whether cash is being raised by issuing debt or equity and whether cash is going to repay debt, repurchase shares or pay dividends. Borrowing to pay dividends or buy back stock deserves scrutiny.

Common-size cash flow statements

Two formats are used:

Format	Denominator	Main use
Revenue-based	Every line item as a % of net revenue for the period	Spotting trends and forecasting : once revenue is forecast, revenue-linked cash flows can be projected
Inflow/outflow-based	Each cash inflow as a % of total cash inflows ; each cash outflow as a % of total cash outflows	Seeing which sources dominate and where cash goes

Neither format uses total assets, the net change in cash, or CFO as the denominator. CFO is itself a net figure that mixes inflows and outflows, so it cannot serve as a base for individual payments.

Example. Cumbria Home Goods reports revenue of \$4,000, cash paid to suppliers of \$2,200 and total cash outflows of \$3,600. Payments to suppliers are $2,200/4,000 = 55\%$ of revenue in the revenue-based format and $2,200/3,600 \approx 61.1\%$ of total outflows in the inflow/outflow format.

If a revenue-based statement shows CFO falling as a % of revenue while the inventory line (a use of cash) grows, the firm is tying up cash in stock. This is consistent with growth, but the analyst should ask whether the build-up was intended.

LOS 31.b — Free cash flow and cash flow ratios

Free cash flow to the firm (FCFF)

Free cash flow is the cash left for discretionary use once the firm has paid for its capital expenditures. It is widely used in valuation, and the two most common measures are FCFF and FCFE.

Free cash flow to the firm (FCFF) is the cash available to all capital providers (debtholders and shareholders) after the firm pays its operating costs and taxes and makes its investments in fixed capital and working capital.

From net income:

$$FCFF = NI + NCC + [Int \times (1 - t)] - FC_{INV} - WC_{INV}$$

From operating cash flow (because $CFO = NI + NCC - WC_{INV}$):

KEY CONCEPT

$$FCFF = CFO + [Int \times (1 - t)] - FC_{INV}$$

where NCC = **noncash charges** (depreciation and amortization), Int = cash interest paid, t = tax rate, FC_{INV} = **fixed capital investment** = cash paid for new fixed assets less cash proceeds from fixed assets sold, and WC_{INV} = **working capital investment** (an increase in receivables or inventory, or a decrease in payables, is a use of cash).

- After-tax interest is added back because interest is paid to debtholders, who are among the capital providers FCFF serves. If the tax rate is not given, it can be inferred as income tax expense ÷ income before tax.
- Fixed capital investment differs from CFI, which may also include purchases of securities or loans made.
- Under IFRS, if interest paid is classified in financing activities, CFO already excludes it, so no interest is added back. If dividends paid were classified in operating activities, they are added back to CFO with no tax adjustment, because dividends are not tax deductible.

Free cash flow to equity (FCFE)

Free cash flow to equity (FCFE) is the cash available to common shareholders after all obligations, including those to lenders:

KEY CONCEPT

$$FCFE = CFO - FC_{INV} + \text{net borrowing}$$

$$FCFE = FCFF - [Int \times (1 - t)] + \text{net borrowing}$$

Net borrowing = debt issued – debt repaid (subtract it if repayments exceed new borrowing). If no borrowing information is given, net borrowing is zero.

The chart shows how the three measures connect: start from CFO, give back the after-tax interest and pay for fixed capital to reach FCFF, then pay the lenders and add net borrowing to reach FCFE (see the figure below).



Shortcut: $FCFE = CFO - \text{Fixed capital investment} + \text{Net borrowing}$

* Add back interest only if it was included in CFO; if classified as financing, do not add it again.

From operating cash flow to FCFF and FCFE

Example. A firm reports CFO of \$920, cash interest paid of \$80 (tax rate 25%), purchases of equipment of \$310, proceeds from equipment sold of \$40 and net new borrowing of \$50.

- $FC_{INV} = 310 - 40 = 270$
- $FCFF = 920 + 80(1 - 0.25) - 270 = 920 + 60 - 270 = 710$
- $FCFE = 920 - 270 + 50 = 700$; check: $710 - 60 + 50 = 700$

Cash flow ratios

Cash flow ratios are compared over time for one firm or across firms, and fall into two groups.

Performance ratios (how well operations generate cash):

Ratio	Formula
Cash flow-to-revenue ratio	$\text{CFO} / \text{net revenue}$
Cash return-on-assets ratio	$\text{CFO} / \text{average total assets}$
Cash return-on-equity ratio	$\text{CFO} / \text{average total equity}$
Cash-to-income ratio	$\text{CFO} / \text{operating income}$
Cash flow per share	$(\text{CFO} - \text{preferred dividends}) / \text{weighted average number of common shares}$

Coverage ratios (ability to meet obligations and fund spending from CFO):

KEY CONCEPT

Ratio	Formula	Measures
Debt coverage ratio	$\text{CFO} / \text{total debt}$	Financial risk and leverage
Interest coverage ratio	$(\text{CFO} + \text{interest paid} + \text{taxes paid}) / \text{interest paid}$	Ability to meet interest obligations

Ratio	Formula	Measures
Reinvestment ratio	CFO / cash paid for long-term assets	Ability to acquire long-term assets from operating cash
Debt payment ratio	CFO / cash long-term debt repayment	Ability to repay long-term debt from operating cash
Dividend payment ratio	CFO / dividends paid	Ability to pay dividends from operating cash
Investing and financing ratio	CFO / cash outflows from investing and financing activities	Ability to purchase assets, satisfy debts and pay dividends

If interest paid is in financing activities (IFRS), no interest add-back is needed in the interest coverage ratio. If common dividends were placed in operating activities, they are added back to CFO for cash flow per share.

Example. CFO of \$1,500 and \$600 of cash spent on new long-term assets give a reinvestment ratio of $1,500/600 = 2.5$: operating cash covers capital spending 2.5 times.

COMMON EXAM TRAPS

- Recording the cash from paying suppliers more slowly as a financing inflow, or treating it as a lasting source of cash.
- The reinvestment ratio divides CFO by cash paid for long-term assets. Net CFI (which nets in asset sales and, for an IFRS firm, may include interest and dividends received) and total investing-plus-financing outflows (the investing and financing ratio) are wrong denominators.
- In FCFF from CFO, after-tax interest is added, never subtracted. In the example, subtracting it gives FCFF of 590 instead of 710.
- FC_{INV} is net of proceeds from asset sales; forgetting the proceeds understates free cash flow. In the example, ignoring the proceeds of 40 gives FCFF of 670 instead of 710.
- From net income, working capital investment must be deducted: a rise in receivables and a fall in payables both reduce free cash flow.
- The cash-to-income ratio is a performance ratio; the debt payment ratio is a coverage ratio.

EXAM SHORTCUTS

- When FCFF is already known, FCFE follows directly as $FCFF - \text{Int} \times (1 - t) + \text{net borrowing}$, without starting again from CFO.

BOTTOM LINE

- The statement of cash flows helps an analyst assess a firm's liquidity, solvency and financial flexibility.
- Cash generated by collecting receivables faster, running down inventory or paying suppliers more slowly is classified as operating cash flow, but it is not a sustainable source of cash.
- For a mature firm whose working capital is not growing, CFO normally exceeds net income; net income that persistently runs well ahead of CFO may point to aggressive or improper accounting choices.

- Common-size cash flow statements come in two formats: every line divided by net revenue, or inflows divided by total inflows and outflows divided by total outflows.
- FCFF equals $CFO + Int \times (1 - t) - FCInv$, or $NI + NCC + Int \times (1 - t) - FCInv - WCInv$, where FCInv is cash paid for fixed assets less cash proceeds from fixed assets sold.
- FCFE equals $CFO - FCInv + \text{net borrowing}$, where net borrowing is debt issued minus debt repaid.
- When interest paid is classified in financing activities under IFRS, CFO already excludes it, so no after-tax interest is added back in FCFF and no interest is added back in the interest coverage ratio.
- Performance ratios, such as cash flow-to-revenue and cash-to-income, measure how well operations generate cash, while coverage ratios, such as debt coverage and the reinvestment ratio ($CFO / \text{cash paid for long-term assets}$), measure the ability to meet obligations and fund spending from CFO.

QUICK CHECK

Question 1

An analyst reviews three years of results for Pinecrest Media:

Pinecrest Media — net income and cash flow from operations (\$ millions)

Year	Net income	Cash flow from operations	Accounts receivable (year-end)
Year 1	42	45	60
Year 2	51	38	84
Year 3	63	31	117

Which conclusion is *most appropriate* based on these data?

- A** Earnings quality appears high, because net income has grown steadily in every year.
- B** The widening gap is expected and harmless, because growing firms always report operating cash flow above net income.
- C** Earnings quality may be deteriorating; the firm could be recognizing revenue too early or delaying expense recognition.

Answer: C

A stable relationship between net income and operating cash flow indicates good earnings quality. Here net income rises from 42 to 63 while CFO falls from 45 to 31, and receivables nearly double; earnings that increasingly exceed operating cash flow can signal aggressive or even improper accounting, such as recognizing revenue too early or delaying the recognition of expenses. The build-up in receivables points to revenue being booked well ahead of cash collection.

Net income minus CFO: Year 1 = $42 - 45 = -3$; Year 2 = $51 - 38 = 13$; Year 3 = $63 - 31 = 32$.

Receivables grow from 60 to 117 (+95%) while net income grows 50%, so revenue is being booked faster than it is collected.

Why the other options are wrong

- **A.** Steady growth in reported income says little about quality when operating cash flow is moving the opposite way; the diverging trend is the warning sign.
- **B.** Growing firms often have operating cash flow below net income because working capital expands, so the direction of the statement is wrong. A persistent, widening gap also calls for investigation.

Key takeaway Compare net income with CFO over several years: a persistent, widening excess of earnings over CFO is a red flag for earnings quality.

Practice questions

Question 2

Amara Osei is valuing Kestrel Logistics, which reports under US GAAP (interest paid is included in operating activities). She collects the following data:

Kestrel Logistics — selected data for the year

Item	Amount (\$)
Net cash provided by operating activities	4,600
Fixed capital investment (net)	950
Cash interest paid	300
Income before tax	5,000
Income tax expense	1,250
Net income	3,750

Kestrel's free cash flow to the firm (FCFF) is *closest* to:

- A \$3,875.
- B \$3,425.
- C \$3,025.

Question 3

Vasquez Dental Supply reports under US GAAP, so interest paid and income taxes paid are both included in its cash flow from operating activities. For the latest year, CFO was \$7,800, cash interest paid was \$600, and cash income taxes paid were \$1,500. Vasquez's (cash flow) interest coverage ratio is *closest* to:

- A 16.5.
- B 14.0.
- C 13.0.

Answers: 2. A · 3. A

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/free-cash-flow/. The full bank has 14 questions on this reading.

credguild.com

FINANCIAL STATEMENT ANALYSIS · READING 32

LIFO vs FIFO

What you'll learn

LOS 32.a Describe measurement of inventory at the lower of cost and net realizable value (and lower of cost or market under US GAAP) and the effects of write-downs and reversals on financial statements and ratios.

LOS 32.b Calculate and explain how inflation and deflation of inventory costs affect the financial statements and ratios of companies using FIFO, LIFO or weighted average cost, including LIFO liquidations.

LOS 32.c Describe inventory presentation and disclosures and the issues analysts consider when examining inventory disclosures, inventory mix and inventory ratios.

MODULE 32.1

Inventory Measurement

This reading covers how inventory is measured on the balance sheet, how FIFO, LIFO and weighted average cost change the financial statements when prices rise or fall, and what inventory disclosures and ratios tell an analyst. The calculations to master are the inventory write-down, the LIFO-to-FIFO restatement and inventory turnover.

LOS 32.a — Lower of cost or net realizable value (and lower of cost or market)

Review: which costs go into inventory?

Before measuring inventory, separate capitalized costs from period expenses. Inventory cost includes the purchase price net of trade discounts and rebates, import duties, transport and handling needed to reach the present location and condition, direct labor, and fixed and variable production overhead. Normal waste is included in production cost. Expense abnormal waste; storage unless it is necessary during production; administrative overhead; and selling costs. Capitalizing a cost that should be expensed overstates inventory and current profit. When the goods are sold, their capitalized cost becomes cost of goods sold.

Which measurement rule applies?

Framework / cost method	Balance-sheet measure	Later recovery in value
IFRS (FIFO, weighted average cost, specific identification; LIFO is not permitted)	Lower of cost or net realizable value	Write-up allowed , but only up to the amount previously written down (carrying value never exceeds original cost)
US GAAP , any method other than LIFO or the retail method (e.g., FIFO, weighted average cost)	Lower of cost or NRV	No write-up
US GAAP , LIFO or the retail method	Lower of cost or market	No write-up

KEY CONCEPT

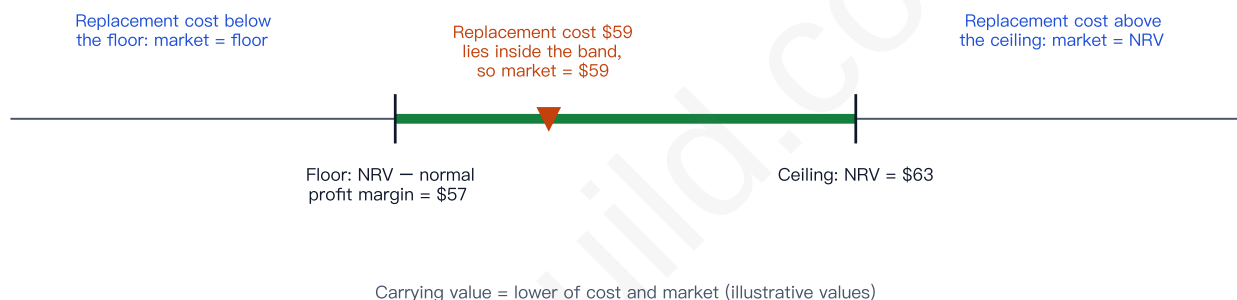
Net realizable value (NRV) = estimated selling price – estimated **selling costs** (disposal costs) – estimated completion costs.

Lower of cost or market (US GAAP, LIFO and retail firms)

Market is normally **replacement cost**, constrained to a band:

KEY CONCEPT

- Ceiling: NRV. If replacement cost is above NRV, market = NRV.
- Floor: NRV – **normal profit margin**. If replacement cost is below the floor, market = NRV – normal profit margin.
- In between, market = replacement cost.

**Lower of cost or market: where replacement cost falls decides market (illustrative values)**

Then carrying value = lower of (original cost, market). The width of the band equals the normal profit margin, so the lowest possible "market" figure is selling price – selling (and completion) costs – normal profit margin.

Example

Per unit: original cost \$64, expected selling price \$70, selling costs \$5, completion costs \$2, replacement cost \$59, normal profit margin \$6.

- $NRV = 70 - 5 - 2 = 63$. Lower of cost or NRV: $\min(64, 63) = 63$, a write-down of \$1 per unit.
- Market band: floor = $63 - 6 = 57$, ceiling = 63. Replacement cost of 59 lies inside, so market = 59. Lower of cost or market: $\min(64, 59) = 59$, a write-down of \$5 per unit.

Next year NRV recovers to \$67. An IFRS firm writes the unit back up to \$64 (a \$1 gain, capped by the original write-down); a US GAAP firm keeps it at its new cost basis and simply earns a higher margin when the unit is sold.

How the write-down is recorded

- The loss is recognized in the income statement, usually by increasing **cost of goods sold** (or as a separate line item if large). The **inventory equation** shows why: ending inventory = beginning inventory + purchases – COGS. Ending inventory falls with beginning inventory and purchases unchanged, so COGS must rise.

- Firms often use a **valuation allowance**, a **contra-asset account** similar to accumulated depreciation, so that original cost and carrying value are both visible.
- Under IFRS a write-up (reversal) is reported in profit or loss, as its own line or as a reduction of COGS.
- Under US GAAP, the written-down amount becomes the new cost basis.
- During inflation, LIFO firms are less likely to need write-downs, because their inventory carries older, lower costs.
- Producers and dealers of commodities (agricultural and forest products, mineral ores, precious metals) are an exception under both IFRS and US GAAP: they may report inventory at NRV even when it is above historical cost, with unrealized gains and losses in the income statement. The quoted price in an active market is used where one exists; otherwise recent market transactions are used.

Effects of a write-down on ratios (period of the write-down, loss charged to COGS)

Item / ratio	Effect	Why
Current assets, total assets, equity	Decrease	Inventory falls; the loss reduces retained earnings
Current ratio	Decrease	Inventory is in current assets
Quick ratio	No effect	Inventory is excluded from the numerator (cash + marketable securities + receivables) and current liabilities are unchanged
Inventory turnover	Increase	Higher COGS over a lower inventory; days of inventory on hand and the cash conversion cycle fall
Total asset turnover	Increase	Revenue unchanged, total assets lower
Debt-to-assets, debt-to-equity	Increase	Debt unchanged, assets and equity lower
Gross, operating and net profit margins	Decrease	COGS higher
ROA, ROE	Decrease	The percentage drop in net income is typically larger than the drop in assets or equity

In later periods the lower carrying amount flows through COGS, so COGS is lower and income higher. Combined with a smaller asset and equity base, ROA and ROE rise in those periods. Write-downs therefore distort comparisons of ratios across periods.

COMMON EXAM TRAPS

- NRV deducts both selling (disposal) costs and completion costs from the selling price. In the example, deducting only the selling costs gives an NRV of \$65, above the \$64 cost, so the \$1 write-down is missed.
- Lower of cost or market applies under US GAAP only to LIFO and retail-method firms; a US GAAP FIFO firm uses lower of cost or NRV.
- Replacement cost is not automatically "market": check the ceiling (NRV) and the floor (NRV – normal profit margin).
- IFRS reversals are limited to the original write-down, so carrying value can never exceed cost. US GAAP allows no reversal at all.

- Expecting an inventory write-down to lower the quick ratio.

EXAM SHORTCUTS

- Under lower of cost or market, market is the middle value of replacement cost, NRV and NRV minus the normal profit margin.
- An inventory write-down leaves the quick ratio unchanged, because the quick ratio excludes inventory, so an answer in which the quick ratio moves can be ruled out.

BOTTOM LINE

- IFRS firms, and US GAAP firms not using LIFO or the retail method, measure inventory at the lower of cost or NRV; US GAAP LIFO and retail-method firms use the lower of cost or market.
- NRV is the estimated selling price minus selling costs and completion costs.
- Market is replacement cost, but not above NRV and not below NRV minus the normal profit margin.
- IFRS allows a write-up only up to the amount previously written down; US GAAP allows no reversal.
- A write-down raises COGS, lowers the current ratio, margins, ROA and ROE, raises inventory turnover and leaves the quick ratio unchanged.

QUICK CHECK

Question 1

Brenvale Creamery makes aged cheese. Its costs for the year are shown below.

Brenvale Creamery: costs incurred during the year (\$)

Cost	Amount
Milk and other direct materials	410,000
Direct labor	185,000
Fixed production overhead	260,000
Storage of cheese wheels during the aging stage of production	38,000
Normal spoilage during production	6,200
Spoilage caused by a refrigeration breakdown (abnormal)	29,000
Storage of packaged cheese awaiting delivery to customers	17,500

The cost that Brenvale should include in inventory is *closest* to:

- A \$928,200.
- B \$916,700.

C \$899,200.

Answer: C

Inventory cost includes the costs of purchase and conversion needed to bring the goods to their present location and condition: materials, direct labor, production overhead, normal spoilage and storage that is a necessary part of production, such as aging. Abnormal waste and storage of finished goods waiting for delivery are expensed as incurred.

$$410,000 + 185,000 + 260,000 + 38,000 + 6,200 = \$899,200$$

Expensed: abnormal spoilage \$29,000 and storage of packaged cheese \$17,500.

Why the other options are wrong

- **A.** \$928,200 also capitalizes the \$29,000 of abnormal spoilage from the refrigeration breakdown, $899,200 + 29,000$. Abnormal waste is expensed when it occurs.
- **B.** \$916,700 also capitalizes the \$17,500 of storage after production, $899,200 + 17,500$. Storage is part of inventory cost only when it is required in the production process.

Key takeaway Put purchase and conversion costs, normal waste and production-related storage into inventory; expense abnormal waste, post-production storage, administrative overhead and selling costs.

MODULE 32.2

Inflation Impact on FIFO and LIFO

LOS 32.b — How inflation and deflation affect FIFO, LIFO and weighted average cost

Review: the three cost flow assumptions

Method	Costs assigned to COGS	Costs left in ending inventory	Permitted
FIFO (first-in, first-out)	Oldest costs	Most recent costs	IFRS and US GAAP
LIFO (last-in, first-out)	Most recent costs	Oldest costs	US GAAP only (prohibited under IFRS)
Weighted average cost	Average cost of goods available for sale	Average cost	IFRS and US GAAP

The methods differ in which costs are assigned to units sold and to units kept. The physical flow of goods does not have to match.

Example (periodic system)

Beginning inventory 100 units at \$10; purchases of 200 units at \$12, then 200 units at \$14. Sales: 350 units. Goods available: 500 units costing $1,000 + 2,400 + 2,800 = 6,200$.

Method	COGS	Ending inventory (150 units)
FIFO	$1,000 + 2,400 + 50 \times 14 = 4,100$	$150 \times 14 = 2,100$
LIFO	$2,800 + 150 \times 12 = 4,600$	$50 \times 12 + 1,000 = 1,600$
Weighted average	$350 \times 12.40 = 4,340$	$150 \times 12.40 = 1,860$

Average cost = $6,200/500 = 12.40$. In every case COGS + ending inventory = 6,200. With rising costs, weighted average lies between FIFO and LIFO. The difference between FIFO and LIFO inventory ($2,100 - 1,600 = 500$) is the **LIFO reserve**.

A US GAAP firm that uses LIFO discloses its LIFO reserve, which lets an analyst restate its figures on a FIFO basis before comparing it with FIFO or IFRS peers:

KEY CONCEPT

1. FIFO inventory = LIFO inventory + LIFO reserve, at each balance sheet date.
2. FIFO COGS = LIFO COGS – (ending LIFO reserve – beginning LIFO reserve).
3. Recompute the ratios with the FIFO figures.

Example. A LIFO retailer reports COGS of \$5,300, beginning inventory of \$900 and ending inventory of \$1,100, and its LIFO reserve rose from \$300 to \$420. FIFO COGS = $5,300 - (420 - 300) = \$5,180$, and FIFO inventories are $900 + 300 = \$1,200$ and $1,100 + 420 = \$1,520$. Inventory turnover falls from $5,300/1,000 = 5.30$ on the reported LIFO basis to $5,180/1,360 \approx 3.81$ on a FIFO basis.

Rising prices, stable or increasing quantities

Item	FIFO vs. LIFO
Cost of goods sold	FIFO lower , LIFO higher
Ending inventory	FIFO higher , LIFO lower
Gross profit, operating profit, pretax and net income	FIFO higher
Income taxes	FIFO higher
Cash flow (after tax)	LIFO higher (lower taxes paid)
Working capital, current ratio	FIFO higher
Stockholders' equity (retained earnings), total assets	FIFO higher
Debt-to-equity, debt ratio	FIFO lower
Inventory turnover (COGS / average inventory)	LIFO higher (higher numerator, lower denominator); FIFO has higher days of inventory on hand

Weighted average cost figures fall between FIFO and LIFO. When prices are falling, every effect reverses: LIFO then has lower COGS, higher gross profit and net income, higher inventory, higher working capital, higher taxes and lower cash flow than FIFO; FIFO gives the lowest income.

Stable prices. If purchase costs have not changed (and beginning inventory was bought at the same cost, or is zero), FIFO, LIFO and weighted average cost give identical COGS, ending inventory and gross profit.

Minimizing reported pretax income (and taxes) in inflation. A US GAAP firm uses LIFO. Under IFRS, where LIFO is prohibited, weighted average cost gives lower income than FIFO.

Which figure is "most useful"?

- Balance sheet: FIFO inventory best approximates current cost (economic value), because it contains the most recent purchase costs.
- Income statement: LIFO COGS best approximates current cost. It matches recent costs against current revenue, which gives a better measure of current income and future profitability.
- This holds whether prices are rising or falling.

LIFO liquidation

A **LIFO liquidation** occurs when a LIFO firm's inventory quantity declines, so units are drawn from older, lower-cost **LIFO layers** into COGS. In an inflationary environment this:

- lowers COGS and raises gross and operating profit margins and income taxes;
- produces profits that are not sustainable, because the firm cannot keep selling old layers without replenishing them;
- may be deliberate (management drawing down inventory to boost earnings) or involuntary (strikes, supplier shortages, lower expected orders).

Analysts look for a decrease in the LIFO reserve in the footnotes as a signal of a possible liquidation and adjust margins if its effect is material.

Example. Layers of 100 units at \$8 and 100 units at \$11; this year the firm buys 400 units at \$15 and sells 450 units. LIFO COGS = $400 \times 15 + 50 \times 11 = 6,550$; had it bought 450 units, COGS would have been $450 \times 15 = 6,750$. The liquidation adds $50 \times (15 - 11) = 200$ to gross profit.

WORKED EXAMPLE: RESTATING A LIFO FIRM ON A FIFO BASIS

A US GAAP retailer that uses LIFO reports revenue of \$26,000, COGS of \$18,600, beginning inventory of \$3,100 and ending inventory of \$3,500. Its LIFO reserve rose from \$900 to \$1,250 during the year.

Step 1. FIFO inventories: $3,100 + 900 = \$4,000$ at the start of the year and $3,500 + 1,250 = \$4,750$ at the end.

Step 2. FIFO COGS = $18,600 - (1,250 - 900) = \$18,250$.

Step 3. Gross margin: $(26,000 - 18,600)/26,000 = 28.5\%$ on LIFO and $(26,000 - 18,250)/26,000 = 29.8\%$ on FIFO.

Step 4. Inventory turnover: $18,600/3,300 = 5.64$ on LIFO and $18,250/4,375 = 4.17$ on FIFO, so days of inventory on hand are 64.8 and 87.5.

Result. On a FIFO basis the retailer shows a higher gross margin and slower inventory turnover. Both differences match the rising-price pattern: LIFO COGS is higher and LIFO inventory is lower than under FIFO.

COMMON EXAM TRAPS

- Higher cash flow under LIFO in inflation comes from lower taxes. Pretax cash costs are the same under every method.
- Every inflation result reverses when prices are falling.
- A LIFO firm can report a higher margin than a FIFO firm even with rising prices if it has a LIFO liquidation.
- LIFO is not available to IFRS reporters.
- **Specific identification**, which assigns each unit its own actual cost, can give values above or below the other methods, depending on which units are sold.

EXAM SHORTCUTS

- With rising prices, start from LIFO's higher COGS: lower income, lower taxes and higher after-tax cash flow follow, and every comparison reverses when prices fall.
- With prices moving in one direction, weighted average cost figures always lie between FIFO and LIFO.

BOTTOM LINE

- FIFO puts the oldest costs in COGS and the most recent in ending inventory, LIFO does the reverse, and IFRS prohibits LIFO.
- With rising prices and stable or increasing quantities, LIFO gives higher COGS, lower income and taxes and higher after-tax cash flow, while FIFO gives higher inventory, working capital and equity.
- $\text{FIFO inventory} = \text{LIFO inventory} + \text{LIFO reserve}$, and $\text{FIFO COGS} = \text{LIFO COGS} - (\text{ending} - \text{beginning LIFO reserve})$.
- FIFO inventory best approximates current cost on the balance sheet; LIFO COGS best approximates current cost on the income statement.
- A LIFO liquidation in inflation lowers COGS and raises margins and taxes, but the extra profit is not sustainable; a decrease in the LIFO reserve signals it.

QUICK CHECK**Question 2**

Tolworth Hardware Supply reports under US GAAP and uses the LIFO method. For the year just ended it reported cost of goods sold of \$4,815,000. Its inventory footnote shows a LIFO reserve of \$612,000 at the beginning of the year and \$538,000 at the end. Purchase costs fell during the year, and inventory quantities were unchanged. An analyst restates Tolworth's results to a FIFO basis to compare it with a peer that reports under IFRS. Tolworth's cost of goods sold on a FIFO basis is *closest* to:

- A \$4,889,000.
- B \$4,741,000.
- C \$4,277,000.

Answer: A

FIFO cost of goods sold equals LIFO cost of goods sold minus the change in the LIFO reserve over the year. The reserve fell by \$74,000, so the change is negative and FIFO COGS is higher than LIFO COGS. That fits falling purchase costs: FIFO charges the older, higher costs to COGS, while LIFO charges the newest, lower costs. Inventory quantities did not change, so no old LIFO layers were drawn down: the fall in the reserve reflects lower purchase costs, not a LIFO liquidation. The restatement formula would be the same in either case.

Change in the LIFO reserve = $538,000 - 612,000 = -74,000$.

$$\text{FIFO COGS} = \text{LIFO COGS} - (\text{ending LIFO reserve} - \text{beginning LIFO reserve})$$

$$\text{FIFO COGS} = 4,815,000 - (-74,000) = 4,889,000$$

Check with the inventory equation, $\text{COGS} = \text{beginning inventory} + \text{purchases} - \text{ending inventory}$. Purchases are the same under both methods. FIFO inventory exceeds LIFO inventory by \$612,000 at the start of the year and by \$538,000 at the end, so FIFO COGS exceeds LIFO COGS by $612,000 - 538,000 = 74,000$.

Why the other options are wrong

- **B.** \$4,741,000 subtracts \$74,000 from LIFO COGS, as if the reserve had risen. The reserve fell, so the change is negative and subtracting it raises COGS.
- **C.** \$4,277,000 subtracts the whole ending LIFO reserve of \$538,000. The ending reserve is the cumulative difference between FIFO and LIFO inventory and is the balance sheet adjustment. Only the change in the reserve during the year passes through COGS.

Key takeaway $\text{FIFO COGS} = \text{LIFO COGS} - \Delta \text{LIFO reserve}$ and $\text{FIFO inventory} = \text{LIFO inventory} + \text{LIFO reserve}$. A falling reserve makes FIFO COGS higher than LIFO COGS.

MODULE 32.3

Presentation and Disclosure

LOS 32.c — Inventory presentation, disclosures and what analysts look for

Required disclosures (broadly the same under IFRS and US GAAP)

Inventory disclosures, mostly in the footnotes, help the analyst judge how well inventory is managed and adjust the statements so the firm can be compared with its peers.

- The **cost flow method** used (FIFO, LIFO, weighted average cost, etc.), so the analyst does not need to infer it.
- Total **carrying value** of inventory and carrying value by classification (**raw materials, work in progress, finished goods**) where appropriate.
- Carrying value of inventories reported at **fair value less selling costs**.
- The amount of inventory cost expensed in the period (COGS).
- The amount of **inventory write-downs** (valuation allowances) during the period.
- **Reversals of write-downs** during the period, with a discussion of the circumstances that led to the reversal. Only IFRS firms report this item, since reversals are prohibited under US GAAP.

- Carrying value of **inventories pledged as collateral** for liabilities. This is a disclosure only: the inventory stays in current assets and is not offset against the debt.

Reading the inventory mix

Merchandisers (retailers, wholesalers) report a single inventory line. Manufacturers report raw materials, work in progress and finished goods, and the mix can signal future demand:

Pattern	Likely signal
Raw materials and/or work in progress rising	Management expects higher demand, so higher future revenue and earnings
Finished goods rising while raw materials and work in progress fall	Weakening demand; possible future write-downs
Finished goods growing faster than sales	Declining demand, excess or obsolete inventory ; lower future earnings when written down; extra storage, insurance and tax costs and idle cash

Analysts corroborate these signals with **management's discussion and analysis**, industry data and trade publications, other parts of the annual report, communication with management, and peer companies' accounts.

Inventory ratios

KEY CONCEPT

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{average inventory}}$$

$$\text{Days of inventory on hand (DOH)} = \frac{365}{\text{inventory turnover}}$$

Example. COGS of 4,800 and average inventory of 600 give turnover of 8.0 and $DOH = 365/8 \approx 45.6$ days.

Observation	Possible interpretation
Turnover too low / DOH high or rising	Slow-moving or obsolete inventory; future write-downs
Turnover high with sales growth at or above the industry	Efficient inventory management
Turnover high with sales growth below the industry	Too little inventory and lost sales; also possible if write-downs have shrunk inventory

Other checks: the gross profit margin (rising input costs squeeze margins), the valuation allowance as a share of finished goods cost (a rising share points to obsolescence), and liquidity. The **current ratio** includes inventory while the **quick ratio** excludes it, so a sharp inventory drop can lower the current ratio while the quick ratio improves. Inventory is one of the least liquid current assets, since turning it into cash takes roughly days of inventory on hand plus days of sales outstanding. For that reason some analysts prefer the quick ratio.

COMMON EXAM TRAPS

- Looking for write-down reversals in a US GAAP firm's notes.
- Netting pledged inventory against the loan it secures, or moving it out of current assets.
- Reading a build-up of raw materials and work in progress as a sign of weak demand.

BOTTOM LINE

- Inventory disclosures include the cost flow method, carrying value by class, the cost expensed, write-downs, reversals (IFRS only) and inventory pledged as collateral.
- Rising raw materials and work in progress suggest management expects higher demand; finished goods growing faster than sales suggest weak demand or obsolete inventory.
- Inventory turnover = $\text{COGS} \div \text{average inventory}$, and days of inventory on hand equal 365 divided by that turnover.
- Low turnover points to slow-moving or obsolete inventory; high turnover with sales growth below the industry points to too little inventory.

QUICK CHECK**Question 3**

An analyst reviews the following data for Merrow Cycle Parts, whose industry peers have maintained steady inventory levels:

Merrow Cycle Parts — inventory data (\$ thousands)

Item	Year 1	Year 2
Cost of goods sold	7,300	7,665
Average inventory	1,000	1,680
Finished goods (year-end)	610	975
Sales growth	4%	3%

Merrow's days of inventory on hand in Year 2, and the *most likely* interpretation, are:

- A** About 50 days; inventory is being managed more efficiently.
- B** About 80 days; inventory is being managed more efficiently.
- C** About 80 days; inventory may be slow-moving or obsolete.

Answer: C

Days of inventory on hand equals 365 divided by inventory turnover ($\text{COGS} / \text{average inventory}$). DOH has risen from 50 to 80 days while sales growth has slowed and finished goods have grown far faster than sales. These are signs of slow-moving or obsolete inventory that could require write-downs and depress future earnings.

Year 1: turnover = $7,300/1,000 = 7.30$; DOH = $365/7.30 = 50$ days.

Year 2: turnover = $7,665/1,680 = 4.5625$; DOH = $365/4.5625 = 80$ days.

Finished goods grow $975/610 - 1 \approx 59.8\%$ versus sales growth of 3%.

Why the other options are wrong

- **A.** About 50 days is the Year 1 figure; in Year 2 turnover fell to about 4.56, so DOH rose to about 80 days. A rise in DOH is not a sign of greater efficiency.
- **B.** The DOH figure is right, but a higher DOH (lower turnover) means inventory is sitting longer. Together with finished goods outpacing sales, this points to weaker inventory management.

Key takeaway Low turnover or rising DOH, together with finished goods outpacing sales, points to obsolescence and future write-downs.

Practice questions

Question 4

Three companies each report that the net realizable value of their inventory is now above its original cost. Which company is *most likely* permitted to carry that inventory on its balance sheet at an amount above historical cost?

- A** Ridgeback Electronics, a US GAAP retailer of smartphones.
- B** Coldwater Timber, an IFRS producer of forest products that trade in an active market.
- C** Marigold Apparel, an IFRS reporter that wrote its clothing down to net realizable value last year.

Question 5

An analyst suspects that Cordell Hardware, a LIFO user facing rising purchase costs, drew down old inventory layers this year to lift its reported profit. The *most* reliable evidence of such a LIFO liquidation is a:

- A** decrease in the LIFO reserve reported in the inventory footnote.
- B** rise in the gross profit margin.
- C** fall in inventory that is out of line with the change in sales.

Answers: 4. B · 5. A

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/lifo-vs-fifo/. The full bank has 44 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 33

Straight Line Depreciation

What you'll learn

LOS 33.a Compare the accounting for intangible assets that are purchased, developed internally, or acquired in a business combination.

LOS 33.b Explain and evaluate how impairment, revaluation and derecognition of PP&E and intangible assets affect the financial statements and ratios.

LOS 33.c Analyze and interpret disclosures about PP&E and intangible assets, including estimates of average age and useful lives.

MODULE 33.1

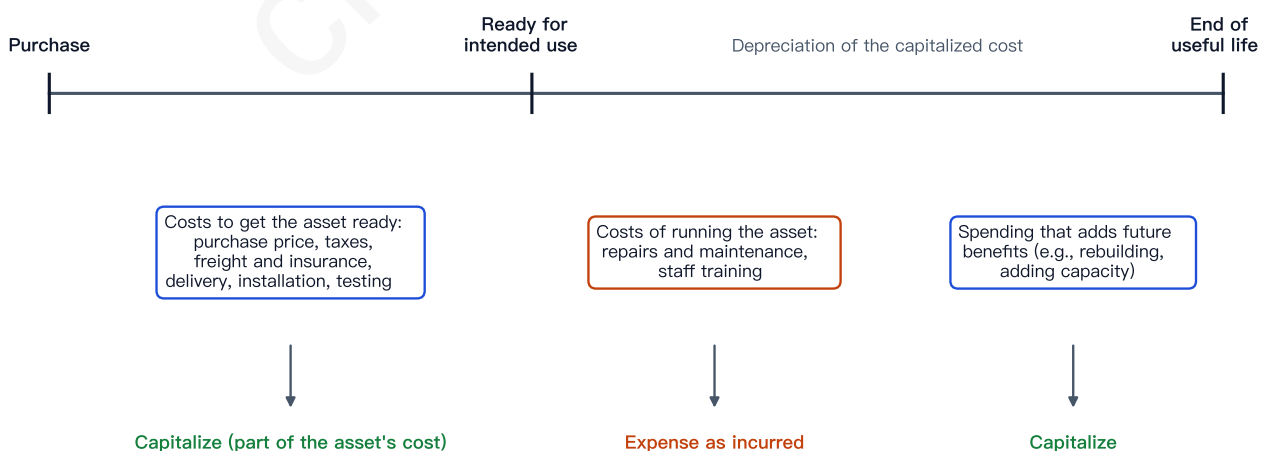
Intangible Long-Lived Assets

This reading covers how intangible assets are recognized according to how they were obtained, how PP&E and intangibles are impaired, revalued and derecognized, and what the disclosures about them show. A candidate must be able to measure an impairment loss under IFRS and US GAAP, compute the gain or loss when an asset is derecognized, and estimate average age, total useful life and remaining useful life from the disclosures.

LOS 33.a — Intangible assets: purchased, internally developed, and acquired in a business combination

Review of assumed knowledge: capitalizing a long-lived asset

This reading assumes that the capitalize-versus-expense decision is already familiar. A cost is **capitalized** (recorded as part of an asset) when it brings future benefits, and **expensed** when its benefit is used up in the current period. For a long-lived asset, the costs of getting it ready for its intended use are capitalized; the costs of running it are expensed as incurred.



Capitalize or expense: costs along the life of a long-lived asset

Long-lived assets are then measured after acquisition under the **cost model** (cost less accumulated depreciation and impairment), which US GAAP requires. IFRS lets a company choose the cost model or the **revaluation model** for each class of asset.

What an intangible asset is

Intangible assets are long-term assets without physical substance, such as patents, copyrights, brand names, **trademarks**, licenses, **franchise rights** and customer lists. Two classifications drive the accounting:

KEY CONCEPT

Classification	Meaning	Accounting consequence
Finite-lived intangible asset	Benefits end at a predictable date (legal, contractual or economic limit)	Cost is amortized over the useful life
Indefinite-lived intangible asset	No foreseeable limit to the period of benefit (e.g., goodwill , a trademark or license renewable at minimal cost)	Not amortized; tested for impairment at least annually
Identifiable intangible asset	Separable (or arises from contractual/legal rights), controlled by the firm, expected to give probable future benefits, cost reliably measurable	Can be recognized separately
Unidentifiable intangible asset	Cannot be bought or sold separately from the business	Main example: goodwill

A purchased patent or a franchise with a fixed contractual term is finite-lived and is amortized over its remaining useful life until it is derecognized. A patent whose protection lapses later this year is still an asset and is amortized for the months that remain. Only a right that has already expired and brings no further benefit fails to qualify as an asset.

How the asset was obtained decides whether it is on the balance sheet

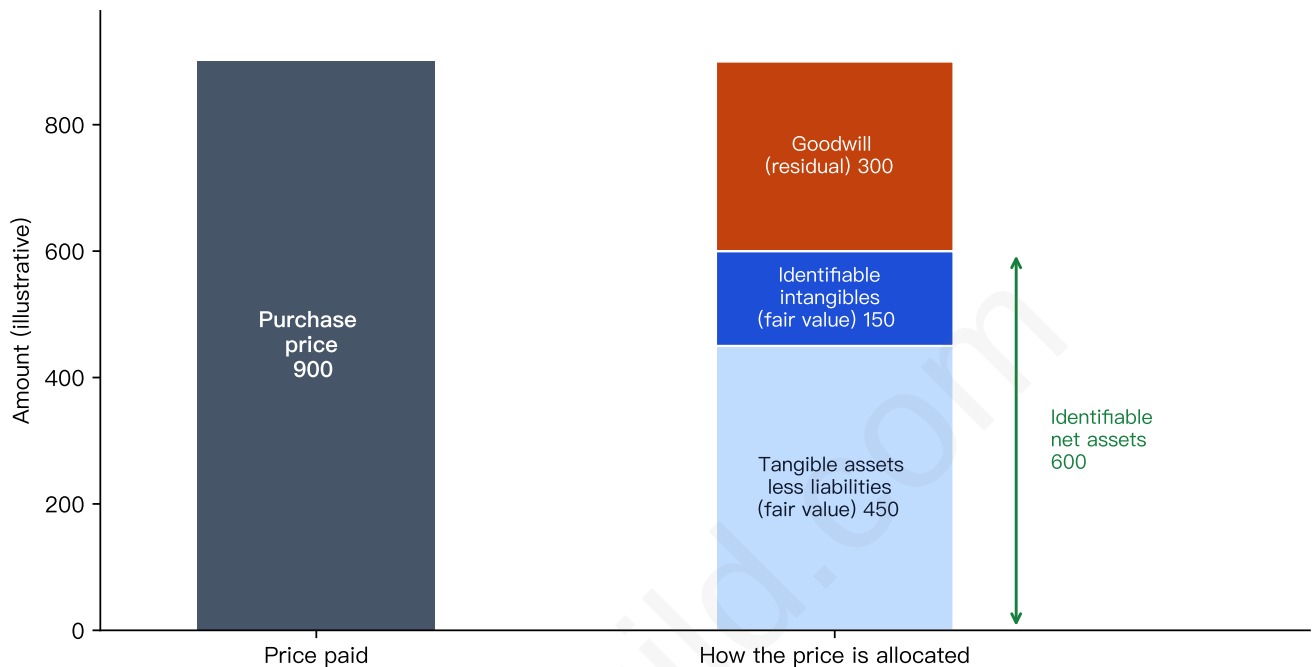
Source of the intangible	Treatment
Purchased from another party	Recorded at cost (normally fair value at purchase); a group purchase is allocated by relative fair values
Internally developed	Costs generally expensed as incurred , so internally created brands, trademarks and "goodwill" do not appear on the balance sheet
Acquired in a business combination	Acquisition method: purchase price allocated to the fair values of the target's identifiable assets and liabilities, including identifiable intangibles the target built internally and had expensed; the remainder is goodwill

Internally built intangibles rarely pass the recognition tests. The future benefits of building a brand or a customer base are hard to show as probable, and the cost is hard to measure reliably because it is mixed in with ordinary operating spending. A purchase or a business combination fixes a measurable amount for each identifiable item, so the same kind of asset can then be capitalized.

Goodwill

$$\text{Goodwill} = \text{Purchase price} - \text{Fair value of identifiable net assets acquired}$$

Recognizing more identifiable intangibles at acquisition leaves less of the price allocated to goodwill, because goodwill is the residual.



Goodwill is the residual of the purchase price (illustrative values)

When intangibles are bought as a group, the analyst usually cares more about what kind of asset was acquired than about the amount allocated to it. Newly acquired franchise rights, for instance, say something about future operating performance whatever value they are booked at.

Research, development and software

KEY CONCEPT

Cost	IFRS	US GAAP
Research costs (discovering new knowledge)	Expensed	Expensed
Development costs (turning research into a product or process plan)	May be capitalized once criteria are met (e.g., the firm can complete the asset and intends to use or sell it)	Generally expensed
Software developed for sale	Development-cost rules	Expensed until technological feasibility is established, capitalized afterward

Cost	IFRS	US GAAP
Software developed for internal use	Development-cost rules	Expensed until it is probable the project will be completed and the software used as intended, capitalized afterward

Technological feasibility is a harder hurdle than "probable completion", so software for sale tends to have more of its costs expensed.

Capitalizing versus expensing — effects on the statements

When a cost is **capitalized**, it becomes an asset and flows to the income statement later as **amortization** (or depreciation). Compared with **expensing** the same cost:

KEY CONCEPT

Item	Year the cost is incurred	Later years of the asset's life
Net income	Higher	Lower (amortization expense)
Total assets and equity	Higher	Higher (until fully amortized)
ROA and ROE	Usually higher	Lower (lower numerator, higher denominator)
Cash flow from operations (CFO)	Higher; the outlay is an investing outflow	Unchanged for a single outlay; amortization is noncash (added back)
Cash flow from investing (CFI)	Lower	No effect
Debt-to-assets, debt-to-equity	Lower	Lower

Total cash flow is identical; only the classification differs (ignoring any tax differences). A firm that capitalizes new outlays every year reports higher CFO every year, because each year's outlay is an investing outflow.

Example. Kestrel Apps spends \$300,000 in Year 1 on development that qualifies for capitalization and amortizes it straight-line over three years. Capitalizing, Year 1 expense is $300,000/3 = \$100,000$ instead of \$300,000, so Year 1 pre-tax income is \$200,000 higher. In Years 2 and 3 the capitalizer reports \$100,000 of amortization while the expenser reports nothing, so its income is lower, and because its assets are also higher, its ROA in those years is lower.

A company that develops its intangibles internally shows lower assets than an otherwise identical company that buys them, and analysts should adjust for this when comparing the two.

COMMON EXAM TRAPS

- Internally developed trademarks, brands and goodwill are expensed; the same items bought or acquired in a business combination are capitalized.

- Indefinite-lived intangibles (including goodwill and cheaply renewable trademarks) are not amortized; they are tested for impairment instead.
- US GAAP generally expenses R&D, with software as the exception; for software to be sold the trigger is technological feasibility.
- "Capitalizing raises net income" is true only in the first year; afterward net income and ROA are lower.
- Capitalized outlays are investing cash outflows, so CFO is higher under capitalization in the period the outlay is paid. Later amortization is noncash and does not raise CFO again.

BOTTOM LINE

- Finite-lived intangibles are amortized over their useful life, while indefinite-lived intangibles, such as goodwill, are not amortized and are tested for impairment at least annually.
- Purchased intangibles are recorded at cost, and internally developed intangibles are generally expensed as incurred, so internally created brands, trademarks and goodwill are not on the balance sheet.
- In a business combination the price is allocated to the fair values of the target's identifiable assets and liabilities, including identifiable intangibles the target built and expensed, and the remainder is goodwill.
- Research costs are expensed under both IFRS and US GAAP; development costs may be capitalized under IFRS once the criteria are met and are generally expensed under US GAAP.
- Under US GAAP, software developed for sale is capitalized once technological feasibility is established, and software for internal use once it is probable the project will be completed and the software used as intended.
- Compared with expensing, capitalizing a cost gives higher net income, assets, equity and CFO and lower CFI in the year it is incurred, then lower net income and ROA in later years, with total cash flow identical apart from any tax differences.

QUICK CHECK

Question 1

Holloway Brands owns three trademarks, each with a finite useful life. One was bought from a competitor, one was recognized when Holloway acquired Pinecrest Foods, and one was created by Holloway's own marketing department. Which trademark is *least likely* to be carried on Holloway's balance sheet at amortized cost?

- A The trademark bought from a competitor.
- B The trademark recognized in the acquisition of Pinecrest Foods.
- C The trademark created by Holloway's own marketing department.

Answer: C

The costs of creating an intangible asset such as a trademark internally are generally expensed as incurred, so no asset is recognized and there is nothing to amortize. A trademark bought from another party is recorded at cost, and one obtained in a business combination is recorded at its fair value under the acquisition method; both are then amortized because they have finite lives.

Why the other options are wrong

- **A.** A purchased intangible asset is recognized at cost (its fair value when bought). Because this trademark has a finite life, that cost is amortized, so it does appear at amortized cost.
- **B.** Under the acquisition method, identifiable intangibles of the target are recognized at fair value on the acquisition date, even if the target built them itself. A finite-lived trademark recognized this way is then amortized.

Key takeaway Intangibles that are purchased or acquired in a business combination are on the balance sheet; those created internally are expensed, apart from the R&D and software exceptions.

MODULE 33.2

Impairment and Derecognition

LOS 33.b — Impairment and derecognition of PP&E and intangible assets

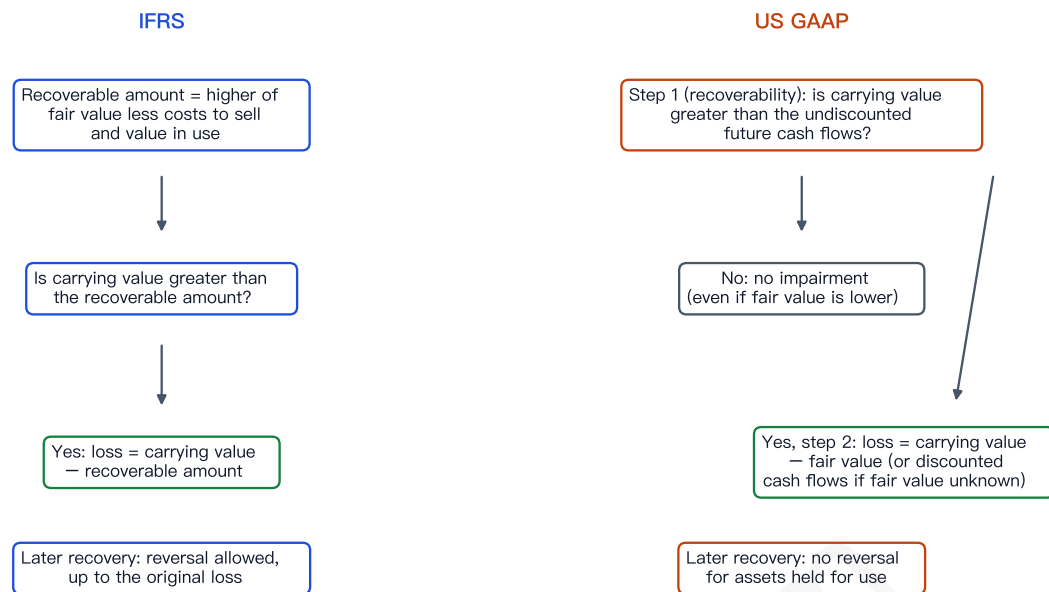
Depreciation and **amortization** allocate an asset's cost over the periods that benefit from it. An **impairment** is an unexpected decline in value that pushes the asset's value below its **carrying value** (cost – accumulated depreciation – any earlier impairment). **Derecognition** removes the asset when it is sold, exchanged, abandoned or distributed.

Impairment of assets held for use: IFRS and US GAAP

These rules cover long-lived assets, tangible or intangible, that have finite lives and are still in use. Both frameworks recognize an impairment as a loss in the income statement.

KEY CONCEPT

	IFRS	US GAAP
When tested	Assess every year whether there are indicators of impairment	Only when events or circumstances suggest the carrying value may not be recoverable
Test	Carrying value > recoverable amount ; the same comparison measures the loss	Step 1, recoverability test : carrying value > undiscounted future cash flows
Recoverable amount	Greater of fair value less costs to sell and value in use (PV of future cash flows)	—
Loss measured as	Carrying value – recoverable amount	Step 2: carrying value – fair value (or discounted future cash flows if fair value is unknown)
Later reversal	Allowed, limited to the original loss (carrying value cannot exceed what it would have been without the impairment)	Not permitted for assets held for use



Impairment test for an asset held for use: IFRS versus US GAAP

The recoverable amount is the higher of the two measures because the owner can either sell the asset or keep using it and would pick whichever brings in more cash. The asset is impaired only if even the better of the two cannot recover its carrying value.

KEY CONCEPT

$$\text{IFRS loss} = CV - \max(\text{FV} - \text{costs to sell}, \text{VIU})$$

$$\text{US GAAP loss} = CV - \text{FV} \quad (\text{only if } CV > \text{undiscounted CF})$$

Example. A machine cost \$2,000,000 and has accumulated depreciation of \$800,000, so $CV = \$1,200,000$. Fair value is \$1,105,000, costs to sell are \$15,000, value in use is \$1,130,000 and undiscounted expected cash flows are \$1,150,000.

- IFRS: recoverable amount = $\max(1,090,000, 1,130,000) = 1,130,000$; loss = $1,200,000 - 1,130,000 = \$70,000$.
- US GAAP: in step 1, undiscounted cash flows of \$1,150,000 are below \$1,200,000, so the asset fails recoverability; in step 2, the loss is $1,200,000 - 1,105,000 = \$95,000$.

If undiscounted cash flows had exceeded the carrying value, US GAAP would record no loss even if fair value were lower. Because the test uses undiscounted flows, rising interest rates alone do not trigger impairments. The US GAAP loss is measured against fair value itself, not fair value less costs to sell; the discounted cash flows used when fair value is unknown correspond to value in use under IFRS. Both value in use and the undiscounted cash flow estimate depend heavily on management's forecasts (and, for value in use, on the choice of discount rate).

Effects of an impairment on the statements and ratios

KEY CONCEPT

Item	Year of impairment	Later years
Net income	Lower (loss; shown as an unusual or infrequent item if material)	Higher (smaller depreciation base)
Total assets, equity	Lower	Lower
ROA, ROE	Lower	Higher (higher NI, smaller denominators)
Asset turnover	Higher	Higher
Debt-to-equity, debt-to-assets	Higher (debt unchanged, equity/assets lower)	Higher
Cash flow	No effect; the loss is not tax-deductible until disposal	No effect
Deferred tax liability	The tax base is unchanged while the book value falls, so any DTL on the asset decreases	Stays below the no-impairment amount; the gap narrows as the lower book depreciation catches up

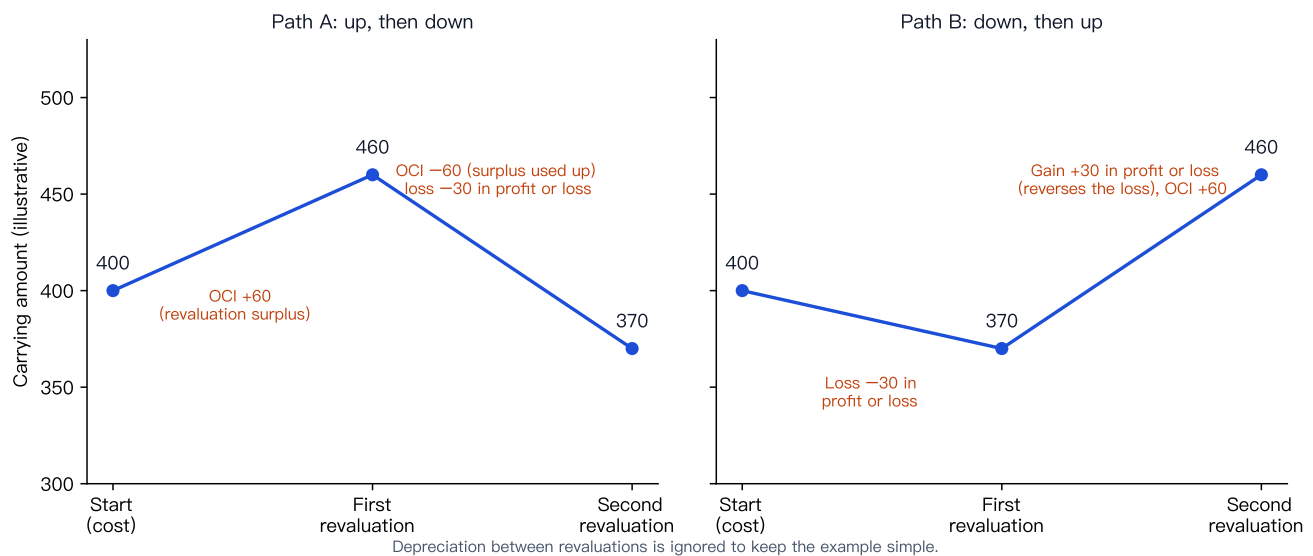
An impairment signals that past depreciation was too low, so past earnings were overstated. Because impairments require judgment, managers can time them. Delaying a loss until a year of strong earnings smooths reported results. Alternatively, management may take a "big bath" when results are already poor for external reasons or when new management arrives, so the low earnings are not blamed on them; the smaller asset and equity base then boosts future ROA and ROE.

Revaluation model (IFRS only)

IFRS lets a firm carry a class of PP&E at fair value (**revaluation model**); US GAAP requires the **cost model** and prohibits upward revaluation of assets held for use.

- An increase goes to other comprehensive income as a **revaluation surplus**. The exception is the part that reverses an impairment previously charged to the income statement, which is recognized as a gain in the income statement.
- A decrease is charged to profit or loss, except to the extent it reverses an existing revaluation surplus (then it reduces OCI).

The order of the changes decides where each one goes. In the figure, the same asset ends at different amounts after two revaluations. Each step first undoes whatever the previous step recorded, in the same place, and only the rest goes to the other place.



Revaluation model: where each change is recognized depends on the order (illustrative values)

- After an upward revaluation, assets and equity are higher, so solvency ratios (debt-to-equity, debt-to-assets) are lower and asset turnover is lower. The larger depreciable base raises future depreciation, so future net income, ROA and ROE are lower.

Indefinite-lived intangibles and assets held for sale

- Indefinite-lived intangibles** are not amortized and are tested for impairment at least annually. Exam convention: the asset is impaired when its carrying amount is above its fair value, and the loss equals the difference; there is no undiscounted cash flow screen. Current practice: US GAAP applies this fair-value comparison, while IFRS (IAS 36) compares the carrying amount with the recoverable amount, the greater of fair value less costs to sell and value in use. With a carrying amount of 100, fair value of 80 and value in use of 110, US GAAP records a loss of 20 and IFRS records none.
- For an asset **held for sale** (intent to sell, sale probable, asset available immediately), depreciation stops, and the asset is impaired if carrying value exceeds fair value less costs to sell; it is then written down to that amount, with the loss in the income statement. Under both IFRS and US GAAP the loss can be reversed, but not above the original carrying value.

Derecognition

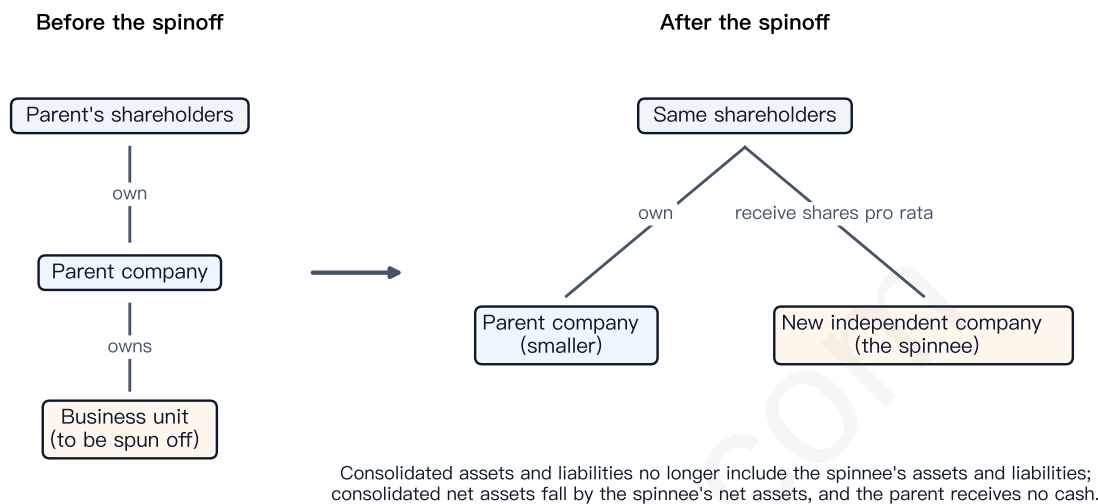
Event	Accounting
Sale	Gain or loss = proceeds – carrying value (cost – accumulated depreciation – impairments), reported with other gains and losses or separately if material; with the indirect method the gain/loss is removed from net income in CFO, and the proceeds are an investing inflow
Abandonment	Loss equal to the carrying value (no proceeds)
Exchange	Gain or loss = fair value of old asset (or of new asset if more clearly evident) – carrying value of old asset; new asset recorded at fair value (at the old asset's carrying value if no reliable fair value)

Event

Accounting

Spinoff

A division or subsidiary is placed in a new legal entity whose shares go to the parent's shareholders, who give up no parent shares; the spinnee then leaves the parent's consolidated accounts. Classification before the distribution and any gain or loss: see below



Ownership before and after a spinoff

Exam convention: once a spinoff is probable, the spinnee's assets and liabilities are reclassified as held for sale (also called held for distribution), and no gain or loss is recorded on the distribution. Current practice: IFRS 5 classifies them as held for distribution once the distribution is highly probable, and IFRIC 17 measures a pro rata non-cash distribution to owners at fair value, so a gain or loss can arise unless the entity is under common control. US GAAP keeps them as held and used until the distribution and records the spinoff at carrying amount, with no gain or loss.

Example. Equipment costing \$500,000 with \$320,000 accumulated depreciation is sold for \$150,000: loss = $150,000 - 180,000 = -\$30,000$.

Example. A delivery van that cost \$70,000 and has accumulated depreciation of \$44,000 (carrying value \$26,000) is traded for a forklift. The van's fair value is \$31,000. The van is removed from the balance sheet, the forklift is recorded at \$31,000 and a gain of $31,000 - 26,000 = \$5,000$ is reported. If neither fair value could be measured reliably, the forklift would be recorded at \$26,000 and no gain or loss would arise.

COMMON EXAM TRAPS

- US GAAP uses undiscounted cash flows to test for impairment but fair value to measure the loss. For the machine, measuring the loss against the undiscounted cash flows gives \$50,000 instead of \$95,000.

- Under IFRS, the recoverable amount is the higher of two measures: fair value less costs to sell, and value in use. For the machine, using the lower measure, fair value less costs to sell, gives a loss of \$110,000 instead of \$70,000.
- Impairment raises future ROA and ROE and raises leverage ratios; it has no cash flow effect.
- US GAAP allows no reversal and no upward revaluation for assets in use, so a higher appraisal changes nothing.
- An upward revaluation lowers future profitability (more depreciation) and lowers solvency ratios.

EXAM SHORTCUTS

- Under US GAAP, when undiscounted future cash flows are at or above carrying value there is no impairment, whatever the fair value, so step 2 is not needed.
- Because the US GAAP recoverability test uses undiscounted cash flows, a rise in interest rates alone does not trigger an impairment.

BOTTOM LINE

- Under IFRS, a long-lived asset held for use is impaired when its carrying value exceeds its recoverable amount, the greater of fair value less costs to sell and value in use; the loss is the difference, and a later reversal is allowed up to the original loss.
- Under US GAAP, an asset held for use is impaired only if its carrying value exceeds its undiscounted future cash flows; the loss is carrying value minus fair value (or discounted cash flows if fair value is unknown), and no reversal is permitted.
- In the year of an impairment, net income, assets and equity fall and leverage ratios rise; in later years net income, ROA and ROE are higher; the impairment itself has no cash flow effect.
- Under the IFRS revaluation model, an increase goes to OCI as a revaluation surplus unless it reverses an impairment previously charged to the income statement, and a decrease is charged to profit or loss unless it reverses an existing revaluation surplus.
- An asset held for sale is no longer depreciated and is written down if its carrying value exceeds fair value less costs to sell; under both IFRS and US GAAP the loss can be reversed, but not above the original carrying value.
- On a sale, the gain or loss is proceeds minus carrying value; on an exchange, it is the fair value of the old asset (or of the new asset if that is more clearly evident) minus the carrying value of the old asset.

QUICK CHECK

Question 2

Tamarind Beverages reports under US GAAP. It owns a beverage brand that it acquired several years ago, and management has concluded that the brand has an indefinite useful life. The annual impairment review of the brand produces the following estimates.

Tamarind Beverages: impairment review of an indefinite-lived brand

Item	\$ millions
Carrying amount	64
Undiscounted expected future cash flows	90
Present value of expected future cash flows (value in use)	58
Fair value	52
Costs to sell	3

The impairment loss that Tamarind recognizes on the brand is *closest* to:

- A \$12 million.
- B \$6 million.
- C \$0.

Answer: A

An intangible asset with an indefinite useful life is not amortized. It is tested for impairment at least annually, and an impairment loss is recognized when its carrying amount exceeds its fair value. Under US GAAP there is no recoverability screen based on undiscounted cash flows for such an asset, so the \$64 million carrying amount is compared directly with the \$52 million fair value. The loss of \$12 million is measured against fair value itself, with no deduction for costs to sell.

$$\text{Impairment loss} = \text{carrying amount} - \text{fair value} = 64 - 52 = \$12 \text{ million}$$

The brand is written down to \$52 million and the \$12 million loss is reported in the income statement.

For comparison, the two tests that do not apply here:

Test	Calculation	Result
US GAAP recoverability test for PP&E held for use	undiscounted cash flows 90 > carrying amount 64	no impairment
IFRS recoverable amount	$\max(52 - 3, 58) = 58$; loss = $64 - 58$	loss of 6

Why the other options are wrong

- **B.** \$6 million uses the IFRS recoverable amount, the higher of fair value less costs to sell (\$49 million) and value in use (\$58 million). Tamarind reports under US GAAP, which measures the loss against fair value.
- **C.** \$0 applies the US GAAP recoverability test used for PP&E and finite-lived assets held for use: undiscounted cash flows of \$90 million exceed the carrying amount, so that test would stop there. An indefinite-lived intangible asset is compared directly with its fair value, so the undiscounted cash flows do not matter.

Key takeaway Under US GAAP, PP&E held for use passes an undiscounted cash flow test before any loss is measured. An indefinite-lived intangible asset skips that screen: whenever its carrying amount exceeds fair value, the excess is an impairment loss, even if undiscounted cash flows are well above the carrying amount.

MODULE 33.3

Long-Term Asset Disclosures

LOS 33.c — Disclosures about PP&E and intangible assets, and what an analyst does with them

Required disclosures

	IFRS	US GAAP
PP&E, per class	Measurement basis, depreciation method , useful lives or rates, depreciation expense, gross carrying amount and accumulated depreciation at the start and end of the period, reconciliation of opening to closing carrying amount	Depreciation expense for the period, balances of major classes of assets (land, buildings, machinery ...), accumulated depreciation by class or in total, general description of depreciation methods
Other PP&E items	Title restrictions and assets pledged as collateral , agreements to acquire PP&E	Not listed separately, but title restrictions and assets pledged as collateral are generally disclosed under both frameworks
Revalued assets (IFRS only)	Revaluation date, how fair value was determined, carrying amount under the cost model, revaluation surplus in OCI	Not applicable (no revaluation)
Intangible assets	Like PP&E, plus whether useful lives are finite or indefinite	Like PP&E, plus estimated amortization expense for each of the next five years
Impairments	Losses and reversals by class, where they sit in the income statement, circumstances causing them	Description of the impaired asset, circumstances, how fair value was determined, amount of loss, where it sits in the income statement (no reversals to disclose for assets held for use , because US GAAP does not permit them)

Presentation. IFRS income statements "by nature" show depreciation and amortization on the face; statements "by function" include them in cost of sales and SG&A. Under the indirect method, depreciation and amortization are added back as noncash charges in CFO; purchases and disposal proceeds of long-lived assets are investing cash flows. US GAAP firms using the direct method must still disclose the indirect reconciliation in the notes. Average age is not a required disclosure; the analyst estimates it.

Review of assumed knowledge: depreciation methods

The reading also assumes the common depreciation methods are known. Depreciation spreads the depreciable cost (cost less residual value) over the periods that use the asset.

Three depreciation methods, with a first-year example (illustrative values: cost \$50,000, residual value \$5,000, 5-year life, capacity 90,000 units, 22,000 units produced in Year 1)

Method	Annual depreciation	Year 1 example	Pattern
Straight-line	$(\text{Cost} - \text{residual value}) \div \text{useful life}$	$(50,000 - 5,000) \div 5 = \$9,000$	Same amount every year
Double-declining balance	$(2 \div \text{useful life}) \times \text{carrying value at the start of the year, never taking carrying value below residual value}$	$(2 \div 5) \times 50,000 = \$20,000$	High early, falling later
Units-of-production	$(\text{Cost} - \text{residual value}) \times \text{units produced} \div \text{total expected units}$	$45,000 \times 22,000 \div 90,000 = \$11,000$	Follows usage

Two details are often tested. Double-declining balance applies its rate to the whole carrying value, not to cost less residual value, but it stops once the carrying value reaches the residual value, so the last year's charge is often a plug. Choosing a longer useful life or a higher residual value lowers depreciation expense, which raises net income and the carrying value of the assets and lowers asset turnover.

Ratios built from the disclosures

$$\text{Fixed asset turnover} = \frac{\text{Revenue}}{\text{Average fixed assets}}$$

Fixed asset turnover measures revenue generated per dollar of fixed assets; a higher ratio indicates more efficient use of long-term assets.

Assuming straight-line depreciation and zero salvage value:

KEY CONCEPT

$$\text{Average age} \approx \frac{\text{Accumulated depreciation}}{\text{Annual depreciation expense}}$$

$$\text{Total useful life} \approx \frac{\text{Gross (historical cost) PP\&E}}{\text{Annual depreciation expense}}$$

$$\text{Remaining useful life} \approx \frac{\text{Net PP\&E}}{\text{Annual depreciation expense}} = \text{Total useful life} - \text{Average age}$$

KEY CONCEPT

Ratio	Numerator	What it tells the analyst
Average age	Accumulated depreciation	How old the asset base is (see the two uses below)
Total useful life	Gross PP&E (historical cost)	Typical life of the asset base when new
Remaining useful life	Net PP&E	Roughly when major replacement spending will be needed
Capex / depreciation	Capital expenditures	Whether the firm is replacing capacity as fast as it wears out (≈ 1 or more)

Average age is useful in two ways. A company running older, less efficient assets may be at a competitive disadvantage, and the estimate helps predict the timing of major capital expenditures and therefore the company's future (near-term) financing requirements.

Example. Gross PP&E is \$1,200 million, accumulated depreciation \$450 million and depreciation expense \$75 million.

- Average age = $450/75 = 6$ years
- Total useful life = $1,200/75 = 16$ years
- Remaining useful life = $(1,200 - 450)/75 = 750/75 = 10$ years ($= 16 - 6$)

Limitations. The estimates are rough: assets are grouped in broad classes, accelerated methods and material salvage values distort them, and the asset mix matters.

COMMON EXAM TRAPS

- Matching the numerator to the question: accumulated depreciation gives average age, gross PP&E gives total life, and net PP&E gives remaining life. In the example, dividing net PP&E by depreciation gives an "average age" of 10 years instead of 6, and dividing gross PP&E gives a "remaining life" of 16 years instead of 10.
- The ratios use end-of-year balances with the year's depreciation expense.
- Average age is used to anticipate capital spending and financing needs, not to measure earnings potential.
- Only US GAAP requires the five-year amortization forecast; only IFRS has revaluation disclosures, and only IFRS permits (and so discloses) impairment reversals for assets held for use.

EXAM SHORTCUTS

- Remaining useful life equals total useful life minus average age, so once two of the three estimates are known the third needs no further division.

BOTTOM LINE

- Assuming straight-line depreciation and zero salvage value, average age is about accumulated depreciation divided by annual depreciation expense, total useful life is about gross PP&E divided by it, and remaining useful life is about net PP&E divided by it.
- Fixed asset turnover is revenue divided by average fixed assets, and a higher ratio indicates more efficient use of long-term assets.
- Average age helps show whether a company runs older, less efficient assets and helps predict the timing of major capital spending and the related financing needs.
- Only US GAAP requires estimated amortization expense for each of the next five years, while only IFRS has revaluation disclosures and permits, and so discloses, impairment reversals for assets held for use.
- A longer useful life or a higher residual value lowers depreciation expense, which raises net income and the carrying value of the assets and lowers asset turnover.

QUICK CHECK**Question 3**

Harrowgate Freight uses straight-line depreciation with negligible salvage values. Selected data from its PP&E note are shown below.

Harrowgate Freight — PP&E note, latest fiscal year (USD millions)

Item	Amount
Gross PP&E, end of year	840
Accumulated depreciation, end of year	336
Depreciation expense for the year	48

The estimated remaining useful life of Harrowgate's PP&E is *closest* to:

- A 7.0 years.
- B 10.5 years.
- C 17.5 years.

Answer: B

Remaining useful life is net PP&E (gross PP&E minus accumulated depreciation) divided by annual depreciation expense.

$$\text{Net PP\&E} = 840 - 336 = 504$$

$$\text{Remaining useful life} = \frac{504}{48} = 10.5 \text{ years}$$

Check: total useful life = $840/48 = 17.5$; average age = $336/48 = 7.0$; $17.5 - 7.0 = 10.5$.

Why the other options are wrong

- **A.** 7.0 years is the average age (accumulated depreciation / depreciation expense = $336 / 48$).
- **C.** 17.5 years is the total useful life (gross PP&E / depreciation expense = $840 / 48$).

Key takeaway Remaining life = total life – average age; computing all three is a quick consistency check.

Practice questions

Question 4

Two otherwise identical companies each spend the same amount on a long-lived asset in Year 1. Brackley Tools capitalizes the outlay and depreciates it; Ostrander Tools expenses it immediately. For the years that follow Year 1, Brackley, compared with Ostrander, will *most likely* report:

- A** Lower net income and higher return on assets.
- B** Lower net income and lower return on assets.
- C** Higher net income and lower return on assets.

Answers: 4. B

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/straight-line-depreciation/. The full bank has 25 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 34

Finance Lease vs Operating Lease

What you'll learn

LOS 34.a Explain how lessees and lessors report finance and operating leases under IFRS and US GAAP.

LOS 34.b Explain the reporting of defined contribution, defined benefit and share-based compensation plans.

LOS 34.c Describe the presentation and disclosure of leases, pensions and share-based compensation.

MODULE 34.1

Leases

This reading covers lease accounting by lessees and lessors, defined contribution and defined benefit pension plans, share-based compensation, and the disclosures required for each. A candidate must be able to classify a lease, measure the lessee's lease liability and right-of-use asset over the lease term, compute a pension plan's funded status and measure the expense of a share-based award.

LOS 34.a — Financial reporting of leases by lessees and lessors

What a lease is and why firms lease

In a **lease**, the **lessee** buys the right to use a specific asset owned by the **lessor** for a period, in exchange for periodic payments. A contract is a lease only if it (1) refers to a specific asset, (2) gives the lessee effectively all of the asset's economic benefits during the term, and (3) gives the lessee the right to direct how the asset is used.

Leasing is an alternative to borrowing and buying. Typical advantages for the lessee:

- Less initial cash outflow. A lease needs little or no down payment.
- Less costly financing. The lease is effectively secured by the asset, so the implicit rate can be below the rate on a loan to buy it.
- Less risk of obsolescence. The asset usually goes back to the lessor, which bears the residual-value risk and prices it into the implicit rate. If the lessee guarantees a residual value, that risk stays with the lessee.

What the lessee gives up is ownership. It normally does not benefit if the asset rises in value, unless it holds a **purchase option**.

Classification: finance lease vs. operating lease

KEY CONCEPT

A **finance lease** transfers substantially all the **benefits and risks of ownership** to the lessee. If either the benefits or the risks are not substantially transferred, the lease is an **operating lease**. Lessee and lessor classify a given lease the same way. A lease is a finance lease if any one of these conditions holds:

1. Ownership transfers to the lessee by the end of the term.
2. The lessee holds a purchase option that it is expected to exercise.
3. The lease covers most of the asset's useful life.
4. The **present value of the lease payments** is at least equal to the asset's fair value.

5. The asset is so specialized that the lessor has no other use for it.

A long term alone does not decide the classification, because the test compares the term with the asset's useful life. The payment test uses the present value of the payments, not their undiscounted sum.

Exam convention: the purchase option counts when the lessee is expected to exercise it, and the payment test is met when the lease payments have a present value at least equal to the asset's fair value. Current practice: IFRS 16 and ASC 842 require exercise of the purchase option to be reasonably certain, include any residual value guaranteed by the lessee in the payments, and ask whether their present value amounts to substantially all of the fair value. A present value at or above fair value always passes, and one slightly below fair value can also pass.

Lessee accounting

At commencement the lessee records a **right-of-use (ROU) asset** and a **lease liability**. Both equal the present value of the lease payments, discounted at the rate implicit in the lease. The ROU asset is the lessee's right to use the underlying asset; the physical asset stays with the lessor. The lease liability is then carried like an amortizing loan: each payment is split into interest (liability × rate) and principal.

Exam convention: the ROU asset is an intangible asset, not PP&E. Current practice: IFRS 16 lets the lessee present it as a separate line item or within the line where the same kind of asset would appear if owned (for example, PP&E), with disclosure of which lines include ROU assets.

KEY CONCEPT

	IFRS (all leases) and US GAAP finance lease	US GAAP operating lease	Short-term leases (both) and low-value leases (IFRS)
Balance sheet	ROU asset + lease liability	ROU asset + lease liability	Nothing recognized
ROU asset	Amortized straight-line	Reduced by the principal repayment each period, so ROU asset = liability throughout	n/a
Income statement	Amortization + interest expense reported separately	Single lease expense = the lease payment (straight-line)	Rent expense , straight-line
Cash flow statement	Principal → CFF ; interest → CFO (US GAAP) or CFO/CFF (IFRS)	Entire payment → CFO	Entire payment → CFO

Exam convention: an IFRS lessee may report the interest part of a lease payment in CFO or CFF (the IAS 7 choice). Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, removes that choice for companies whose main business is not financing; they report interest paid in CFF.

Under IFRS, a short-term lease is one of 12 months or less, and a low-value lease is roughly USD 5,000 or less. Every other IFRS lease, whatever its classification, is accounted for by the lessee like a finance lease.

Exam convention: lease payments are made at the end of each period (in arrears). Current practice: most leases call for payment at the start of each period.

At inception the lease liability is the present value of the remaining lease payments, discounted at the rate implicit in the lease. With equal payments PMT at the end of each of N periods and a periodic rate r :

$$\text{Lease liability}_0 = \sum_{t=1}^N \frac{PMT}{(1+r)^t} = PMT \times \frac{1 - (1+r)^{-N}}{r}$$

Each period, interest expense is r times the opening liability, and the rest of the payment reduces the liability.

Example. A lessee leases a machine for 3 years, paying \$40,000 at the end of each year. The implicit rate is 8%.

$$PV = 40,000 \times \frac{1 - 1.08^{-3}}{0.08} = \$103,084$$

On the calculator: $N = 3$, $I/Y = 8$, $PMT = -40,000$, $FV = 0$, $CPT PV$. Straight-line amortization is $103,084/3 = \$34,361$ a year.

Year	Interest (8%)	Principal	Ending liability	Finance lease: ROU asset	Finance lease: total expense	US GAAP operating: expense
1	8,247	31,753	71,331	68,723	42,608	40,000
2	5,706	34,294	37,037	34,361	40,068	40,000
3	2,963	37,037	0	0	37,324	40,000

Under the finance lease method the ROU asset falls faster than the liability in the early years, because the principal repaid early on is smaller than the straight-line amortization. Total expense is front-loaded. Over the whole lease both methods expense the same \$120,000.

The cash paid is \$40,000 a year under either method; only its classification differs. In Year 1 a US GAAP finance-lease lessee reports the \$8,247 of interest in CFO and the \$31,753 of principal in CFF. A US GAAP operating-lease lessee reports the whole \$40,000 in CFO.

KEY CONCEPT

Effect (lessee)	Finance lease	US GAAP operating lease
ROU asset	Lower	Higher
Lease liability	Same	Same
Net income, early years / later years	Lower / higher	Higher / lower
EBIT	Higher (interest is below EBIT)	Lower
Interest expense	Higher	Lower (none reported)
CFO	Higher	Lower

Effect (lessee)	Finance lease	US GAAP operating lease
CFF	Lower	Higher

Lessor accounting

In a finance lease, the lessor derecognizes the leased asset and recognizes a **lease receivable**. Its initial amount is the **net investment in the lease**: the present value of the lease payments plus the present value of the expected residual value. The receivable is amortized with the effective interest method, and the lessor reports **interest income**; for a manufacturer or dealer this interest income is part of revenue. A profit or loss arises at inception only if the lease's value differs from the asset's carrying amount.

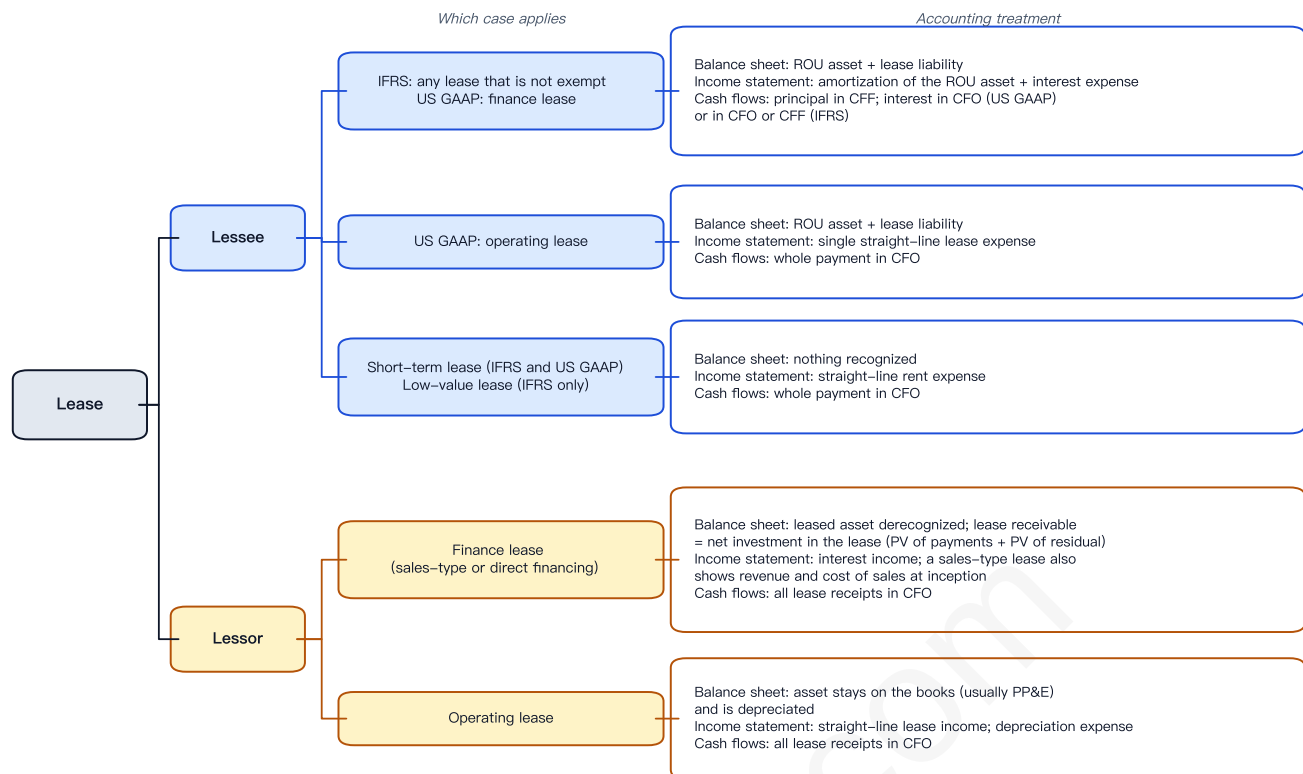
The net investment in the lease equals the asset's fair value, because the rate implicit in the lease is defined as the discount rate at which the payments plus the residual value are worth the asset's fair value. By the end of the term the receivable has fallen to the expected residual value. If the lessor later disposes of the asset for a different amount, it reports a further gain or loss.

- In a **sales-type lease** the lessor is a manufacturer or dealer. Revenue is the present value of the lease payments, and cost of sales is the carrying value minus the present value of the residual. The selling profit is recognized at inception, as with a sale of inventory.
- In a **direct financing lease** the lessor is a financing company. Exam convention: no gain or loss is recognized at inception; a gain is deferred and recognized as interest income over the term, and a loss is deferred and recognized as an expense over the term. Current practice: under ASC 842 a selling profit on a direct financing lease is deferred and earned through interest income, but a selling loss is recognized at commencement. IFRS 16 does not use the term direct financing lease, and it allows selling profit or loss at commencement only for manufacturer or dealer lessors.

In an operating lease, the lessor keeps the asset on its balance sheet (usually in PP&E) and continues to depreciate it. It reports the lease payments as income on a straight-line basis, with depreciation and other costs as expenses. No receivable is created.

For the lessor, all lease cash inflows are CFO under either classification. Total income over the lease is the same under both methods; only the timing differs.

The figure brings both sides together. For the lessee, the model depends on the reporting framework as well as the classification; for the lessor, it depends on the classification alone.



Lease accounting models for lessees and lessors

COMMON EXAM TRAPS

- At commencement the lessee's ROU asset equals the lease liability. Both equal the present value of the payments, which is neither the fair value nor the undiscounted total. For the machine lease, this is \$103,084, not the undiscounted \$120,000.
- Lessees with operating leases still recognize an ROU asset and a lease liability under IFRS and US GAAP. The exceptions are short-term leases and, under IFRS, low-value leases.
- In an operating lease the physical asset stays on the lessor's books. The lessee shows only an ROU asset.
- The principal portion of a lessee's finance lease payment is a financing outflow. For a US GAAP operating lease the whole payment is an operating outflow.
- Sales-type and direct financing leases are both kinds of finance lease. In both, the lessor derecognizes the asset and earns interest income.

EXAM SHORTCUTS

- For a US GAAP operating lease, the lessee's single lease expense equals the lease payment and the ROU asset equals the lease liability throughout, so the expense needs no split into interest and amortization.

BOTTOM LINE

- Exam convention: a lease is a finance lease if any one of these holds: title passes to the lessee by the end of the term, the lessee has a purchase option it is expected to exercise, the term covers most of the asset's useful life, the lease payments have a present value at least equal to the asset's fair value, or the asset is so specialized that the lessor has no other use for it.
- Current practice under IFRS 16 and ASC 842 requires exercise of the purchase option to be reasonably certain, includes any lessee-guaranteed residual value in the lease payments, and asks whether their present value amounts to substantially all of the asset's fair value.
- At commencement a lessee records a right-of-use asset and a lease liability, each measured as the lease payments discounted at the rate implicit in the lease, except for short-term leases and, under IFRS, low-value leases.
- Under IFRS (other than for short-term and low-value leases) and for US GAAP finance leases, the lessee reports straight-line amortization of the ROU asset and interest expense separately, with the principal repaid in CFF; for a US GAAP operating lease it reports one straight-line lease expense and the whole payment in CFO.
- In a finance lease the lessor derecognizes the asset, records a lease receivable equal to the net investment in the lease (present value of the lease payments plus present value of the expected residual value) and reports interest income; a sales-type lessor also recognizes the selling profit at inception.
- In an operating lease the lessor keeps the asset on its balance sheet, continues to depreciate it and reports the lease payments as income on a straight-line basis.

QUICK CHECK**Question 1**

Which of the following is the *least likely* reason for Northgate Printing to lease a new press rather than purchase it?

- A** To lower its financing cost.
- B** To reduce the cash it pays out at the start.
- C** To share in any increase in the press's value.

Answer: C

A lessee usually returns the asset at the end of the lease, so it does not benefit from any appreciation (unless the lease includes a purchase option). Capturing gains in the asset's value is a reason to own the asset rather than lease it.

Why the other options are wrong

- **A.** Since the leased asset effectively serves as collateral, the implicit lease rate may be below what a lender would charge to finance a purchase. This is a genuine reason to lease.
- **B.** Leases typically require a small initial payment, if any, so leasing conserves cash at inception compared with a purchase. This is also a genuine reason to lease.

Key takeaway Advantages of leasing: smaller initial outflow, cheaper financing, less obsolescence

risk. Appreciation belongs to the owner (the lessor).

MODULE 34.2

Deferred Compensation and Disclosures

LOS 34.b — Defined contribution, defined benefit and share-based compensation plans

Pensions and **share-based compensation** are forms of **deferred compensation**: employees earn them now but receive them later, so their accounting relies on management estimates.

Defined contribution vs. defined benefit plans

KEY CONCEPT

	Defined contribution plan	Defined benefit plan
Employer's promise	Contribute an agreed amount each period (e.g., a % of salary)	Pay a defined benefit after retirement (e.g., $1.5\% \times \text{final salary} \times \text{years of service}$)
Who bears investment risk	Employee	Employer
Income statement	Pension expense = employer's contribution for the period	Components of the change in funded status (see below)
Balance sheet	Nothing once the contribution is paid	Net pension asset or liability (funded status)

A defined benefit plan creates a balance sheet item because the employer has promised the retirement benefit itself rather than a fixed contribution. Each year of service adds to that promise, and the obligation remains until the benefits are paid.

The **funded status** of a defined benefit plan is

KEY CONCEPT

$$\text{Funded status} = \text{Fair value of plan assets} - \text{PV of the defined benefit obligation}$$

A positive amount means the plan is **overfunded** and the sponsor reports a **net pension asset**. A negative amount means it is **underfunded** and the sponsor reports a **net pension liability**.

The sponsor usually funds a defined benefit plan by transferring assets to a separate legal entity, typically a trust, which invests them to meet the benefits as they fall due. The **fair value of plan assets** is the current value of that pool. The obligation is the present value, at the balance sheet date, of the benefits earned to date that will be paid from retirement until death. IFRS calls it the **present value of the defined benefit obligation (PVDBO)**; US GAAP calls it the **projected benefit obligation (PBO)**. Both terms describe the same obligation. Estimating the obligation requires external actuaries and assumptions about future compensation (salary growth), employee

turnover, retirement age, mortality and the discount rate. Post-retirement health care plans are typically not prefunded with plan assets, so they appear as a liability. Analysts treat a net pension liability like debt when computing leverage.

Example. Plan assets of \$780 million and a benefit obligation of \$860 million give a funded status of $-\$80$ million, which is a net pension liability of \$80 million. If that is the net liability at the start of a year and the discount rate is 5%, IFRS net interest expense for the year is $0.05 \times 80 = \$4$ million.

Where the change in funded status goes

KEY CONCEPT

Component	IFRS	US GAAP
Service cost (current period)	Income statement	Income statement
Past service cost	Income statement (part of service cost)	OCI, then amortized into income over the service period
Interest	Net interest = discount rate $\times$ net pension asset/liability, in the income statement (income if the plan starts the year overfunded, expense if underfunded)	Interest cost (growth of the obligation with the passage of time), in the income statement
Return on plan assets	Netted against interest cost inside net interest; the difference between actual and expected return is a remeasurement	Expected return on plan assets shown separately (it can use a different rate) and reduces expense in the income statement
Remeasurements / actuarial gains and losses	OCI (never recycled)	OCI, generally amortized into income (immediate recognition allowed)

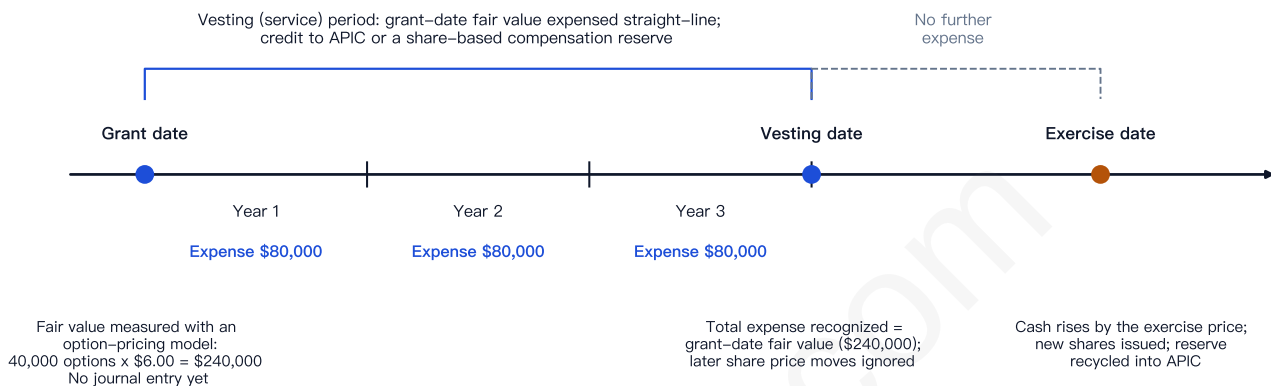
US GAAP therefore has five components: three in the income statement and two in OCI. Given the same actuarial assumptions, the **total periodic cost** of the plan is the same under both standards. The standards differ only in how that cost is divided between the income statement and OCI. Manufacturers allocate pension expense to inventory (and so to COGS) and to SG&A, so the full amount may be visible only in the financial statement notes.

Share-based compensation

Share-based pay aligns managers' and shareholders' interests without an immediate cash outflow. Newly issued shares, however, **dilute** existing owners and reduce EPS. The main criticisms are that employees have limited control over the share price, that share grants can make managers too **risk-averse** while options (with their asymmetric payoff) can encourage **excessive risk taking**, and that performance shares based on accounting metrics can invite manipulation.

For equity-settled awards (stock grants, restricted stock units, performance shares, employee stock options), both IFRS and US GAAP require the company to measure the **fair value at the grant date** and to expense it over the **vesting period** (service period). The vesting period runs from the grant date until the employee receives the shares or is first able to exercise the option. The grant-date value is not updated afterward, so a rise or fall in the share price after the grant does not change the expense. If vesting is immediate, the whole fair value is expensed at grant, and common stock and APIC rise by the same amount.

The timeline follows an award of 40,000 employee stock options with a grant-date fair value of \$6.00 each and a three-year vesting period.



Timeline of an equity-settled employee stock option award

Instrument	Fair value at grant	Accounting
Stock grants (awarded outright, with restrictions, or contingent on performance); restricted stock units (grants that vest only after service or performance criteria are met); performance shares (grants tied to a target such as ROE rather than the share price)	Share price on the grant date	Expense straight-line over the service period; credit an equity reserve or APIC; at vesting the reserve is recycled into common stock and APIC
Employee stock options	Option-pricing model (e.g., Black-Scholes-Merton, binomial); inputs such as volatility are subjective	No entry at grant; expense straight-line over the vesting period with a credit to APIC or a share-based compensation reserve; on exercise the company issues new shares, cash rises by the exercise price, equity rises by the same amount (common stock at par and APIC), and any reserve is recycled into APIC; if vested options expire unexercised, no adjustment is made

Instrument	Fair value at grant	Accounting
Stock appreciation rights (SARs) / phantom stock (usually cash-settled)	Payoff linked to the change in the share price; the holder does not need to own the stock	Paid in cash, so there is no dilution but there is a cash outflow when the stock does well; option-like payoffs avoid the risk-aversion bias of share grants; phantom stock, used by firms whose shares are not exchange traded, pays according to a hypothetical stock

Exam convention: share-based pay is measured at grant-date fair value and expensed over the service period; the expense lowers retained earnings and the offsetting credit to APIC or a reserve leaves total equity unchanged. Current practice: this holds for **equity-settled** awards, while cash-settled awards such as SARs and phantom stock are carried as a liability that is remeasured to fair value at each reporting date until settlement, with the changes in profit or loss, so total equity falls by the expense. Both kinds of award are measured at fair value. Intrinsic value (share price – exercise price) is not used, and an at-the-money or out-of-the-money option still has a positive grant-date fair value.

Example. A company grants 20,000 restricted stock units when the share price is \$30, vesting after three years. The expense is $20,000 \times 30/3 = \$200,000$ per year.

LOS 34.c — Presentation and disclosures for leases, pensions and share-based pay

Lease disclosures (IFRS 16)

Lease disclosures help users assess the effect of leases on the entity's financial position, its performance and its cash flows. Lessees and lessors provide both qualitative and quantitative information. IFRS and US GAAP set the objectives; companies have discretion over how to meet them, within the guidance the standards give.

Lessee	Lessor, finance leases	Lessor, operating leases
Carrying amount of ROU assets by class; additions to ROU assets	Selling profit or loss on derecognition	Lease income , variable payments shown separately
Interest expense on lease liabilities; ROU amortization by class	Finance income on the net investment in the lease	Maturity analysis of lease payments receivable (each of next 5 years + thereafter)
Total lease cash outflows; expenses for short-term and low-value leases and for variable payments	Income from variable payments not in the net investment	Leased asset stays on the books, so PP&E disclosures (IAS 16) by class and impairment disclosures (IAS 36) apply
Maturity analysis of lease liabilities; split into current and noncurrent	Explanation of significant changes in the net investment	
Nature of leasing activities, residual value guarantees, restrictions and covenants imposed by leases, sale and leaseback transactions	Maturity analysis of lease payments receivable; reconciliation of undiscounted payments to the net investment	

A **maturity analysis** is the item common to lessees and both types of lessor. In the lessee's balance sheet, the principal due within the next year is a current liability and the remaining principal is long-term.

Variable lease payments come in two types. Payments linked to an index or rate (such as an inflation index or a market reference rate) are included in the lease liability and ROU asset at the current index level. The liability and the ROU asset are remeasured when the index changes. Payments that depend on the lessee's future sales or on how much the asset is used are left out of the liability and expensed as incurred.

Pension disclosures (IAS 19)

- Defined contribution plans. The only requirement is to disclose separately the **employer's contribution expensed** in the income statement.
- Defined benefit plans. The disclosures have three objectives: (1) explain the **characteristics and risks** of the plan; (2) identify the amounts in the financial statements arising from it; (3) describe how it affects the **amount, timing and uncertainty of future cash flows**, which mainly means employer contributions. Minimum disclosures include the plan's nature, governance and risks; reconciliations of plan assets, obligation and funded status; a **sensitivity analysis** of the obligation to key actuarial assumptions; the composition of plan assets; **expected employer contributions** for the next period; and the maturity profile of the obligation.

Share-based compensation disclosures

These disclosures help users understand the nature and extent of the arrangements and their effect on current and future cash flows. Companies must disclose the nature and key terms of the plans (grant date, vesting date, service period, settlement in shares or cash), **how grant-date fair value was determined**, and the **effect on earnings and financial position** (income statement and balance sheet).

COMMON EXAM TRAPS

- Only defined benefit plans create a net pension asset or liability on the balance sheet.
- Under IFRS, remeasurements (actuarial gains and losses) go to OCI and never pass through the income statement.
- IAS 19's third objective concerns future cash flows. Future net income is not one of the objectives.
- Equity-settled share-based pay is measured at grant-date fair value and expensed over the vesting period under both IFRS and US GAAP. Cash-settled SARs and phantom stock are instead a liability remeasured each period. The share price at the reporting date is not a required disclosure.
- Lessor operating lease disclosures include impairment of the leased asset. Selling profit and finance income are finance lease disclosures.

BOTTOM LINE

- In a defined contribution plan the employee bears the investment risk and pension expense equals the employer's contribution; in a defined benefit plan the employer bears the investment risk and reports the plan's funded status on the balance sheet.
- Funded status equals the fair value of plan assets minus the PVDBO (called the PBO under US GAAP); a positive amount is a net pension asset and a negative amount a net pension liability.
- Under IFRS, service cost (including past service cost) and net interest, the discount rate times the net pension asset or liability, go to the income statement, while remeasurements go to OCI and are never recycled.

- Given the same actuarial assumptions, IFRS and US GAAP give the same total periodic cost for a defined benefit plan and differ only in how it is split between the income statement and OCI.
- Equity-settled share-based pay is measured at fair value on the grant date and expensed over the vesting period under both IFRS and US GAAP, and later share price changes do not change the expense.
- IAS 19 disclosures for a defined benefit plan explain its characteristics and risks, identify the amounts it creates in the financial statements, and describe its effect on the amount, timing and uncertainty of future cash flows.

QUICK CHECK

Question 2

Marrick Semiconductor grants employee stock options on the terms below and expects all of them to vest.

Marrick Semiconductor — employee stock option grant (1 January)

Item	Value
Options granted	60,000
Share price on grant date	\$38.00
Exercise price	\$40.00
Fair value per option on grant date (option-pricing model)	\$7.50
Vesting period	4 years (all options vest together)

The compensation expense Marrick recognizes in the first year is *closest* to:

- A \$450,000.
- B \$112,500.
- C \$0.

Answer: B

Both IFRS and US GAAP measure an employee stock option at its fair value on the grant date, estimated with an option-pricing model, and recognize that amount straight-line over the vesting period as compensation expense (with a matching credit to equity).

$$\text{Total fair value} = 60,000 \times 7.50 = \$450,000$$

$$\text{Annual expense} = \frac{450,000}{4} = \$112,500$$

Each year: compensation expense \$112,500; equity (APIC or a share-based compensation reserve) +\$112,500, so total equity is unchanged.

Why the other options are wrong

- **A.** \$450,000 is the total grant-date fair value ($60,000 \times 7.50$), which would be expensed at once only if the options vested immediately. Here it is spread over four years.
- **C.** \$0 uses the intrinsic value at grant (the share price of \$38 is below the \$40 exercise price). The expense is based on the options' grant-date fair value, which is positive even though they are out of the money.

Key takeaway Option expense equals grant-date fair value divided by the vesting years. It is not based on intrinsic value and is not remeasured for later share price changes.

Practice questions

Question 3

Aerolinea Sur leases a regional jet from Skyward Capital under an arrangement classified as an operating lease. The jet itself is reported as a physical asset on the balance sheet of:

- A** neither the lessor nor the lessee.
- B** the lessee.
- C** the lessor.

Question 4

Which of the following items is *least likely* to be a required disclosure about Tavener Systems' share-based compensation plans?

- A** How the fair value of the awards at the grant date was determined.
- B** The effect of share-based payment transactions on the company's balance sheet.
- C** Tavener's share price at the reporting date.

Answers: 3. C · 4. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/finance-lease-vs-operating-lease/. The full bank has 31 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 35

Deferred Tax Liability

What you'll learn

LOS 35.a Contrast accounting profit, taxable income, taxes payable and income tax expense, and temporary versus permanent differences between accounting profit and taxable income.

LOS 35.b Explain how deferred tax liabilities and assets are created and how analysts should treat them (liability, equity, realizability) for financial analysis.

LOS 35.c Calculate, interpret and contrast an issuer's effective tax rate, statutory tax rate and cash tax rate.

LOS 35.d Analyze deferred tax disclosures and the effective tax rate reconciliation, and explain how they affect financial statements and ratios.

MODULE 35.1

Differences Between Accounting Profit and Taxable Income

This reading explains why tax reporting and financial reporting differ, how temporary differences create deferred tax liabilities and assets, and how analysts treat those balances and the related disclosures. A candidate must be able to compute income tax expense from taxes payable and the changes in deferred taxes, remeasure deferred taxes after a change in the tax rate, and calculate and interpret the statutory, effective and cash tax rates.

LOS 35.a — Two sets of books: tax return versus financial statements

Companies prepare their financial statements under IFRS or US GAAP, but they compute the tax they owe under the tax law of each jurisdiction. The two sets of rules often disagree about when an item counts, and sometimes about whether it counts at all. As a result, the tax charge in the income statement rarely equals the tax on the return.

Differences between tax reporting and financial reporting arise when:

- revenues and expenses are recognized in different periods in the income statement and on the tax return;
- some items count for the income statement only, or for the tax return only;
- assets or liabilities have carrying amounts that differ from their tax bases;
- gains or losses are recognized differently in the income statement and on the tax return;
- tax losses from prior periods offset future taxable income;
- adjustments made in the financial statements do not affect the tax return, or affect it in a different period.

Terms on each side

Tax return side

Taxable income: income subject to tax according to the tax return

Taxes payable: the tax liability produced by taxable income (also called the *current tax expense*); the term also names the balance sheet liability for taxes due but not yet paid

Financial reporting side

Accounting profit: pretax income under accounting standards (also called income before tax or earnings before tax)

Income tax expense: the tax charge in the income statement, equal to taxes payable adjusted for the changes in deferred tax liabilities and assets

Tax return side

Income tax paid: the actual cash paid for income taxes, which can include payments or refunds relating to other years

Tax loss carryforward: a current or past taxable loss that can be used to reduce taxable income (and taxes payable) in future periods; it can create a deferred tax asset

Tax base: the net amount of an asset or liability used for tax reporting

Financial reporting side

Deferred tax liabilities (DTLs): balance sheet amounts arising when income tax expense exceeds taxes payable, expected to cause future cash outflows

Deferred tax assets (DTAs): balance sheet amounts arising when taxes payable exceed income tax expense, expected to be recovered from future operations; tax loss carryforwards also create them

Carrying value: the net balance sheet amount of an asset or liability

A **valuation allowance** is a reduction of deferred tax assets that reflects the likelihood that they will not be realized. Under US GAAP it is a contra account.

Temporary versus permanent differences

- A **temporary difference** arises when an asset's or liability's carrying value differs from its tax base, and the gap will lead to taxable or deductible amounts in later periods. Over the life of the item the same total passes through both the income statement and the tax return; only the timing differs. Temporary differences create deferred tax assets or deferred tax liabilities.
- A **permanent difference** is a gap between pretax income and taxable income that never reverses. Examples are revenue that is never taxable (such as tax-exempt municipal bond interest in the United States), expenses that are never deductible (such as premiums on life insurance for key officers, or fines and donations where the law disallows them), and tax credits. No DTA or DTL results from a permanent difference. They make the effective tax rate differ from the statutory tax rate.

Taxes payable are driven by taxable income $\times$ tax rate. Pretax accounting profit $\times$ tax rate does not determine them. Temporary differences therefore make taxes payable differ from income tax expense, and the change in deferred taxes bridges the two. Income tax expense can in turn differ from pretax income $\times$ the statutory rate, for the reasons listed under LOS 35.c.

When is a DTL created?**KEY CONCEPT**

A **deferred tax liability (DTL)** is created when

- revenues or gains appear in the income statement *before* they are taxed, or
- expenses or losses are deducted on the tax return *before* they are expensed in the income statement.

The classic case is accelerated depreciation on the tax return with straight-line depreciation in the accounts. These are called **taxable temporary differences**: the firm pays less tax now and more tax when the difference reverses.

When is a DTA created?

A **deferred tax asset (DTA)** is created when

- revenues or gains are taxed in an *earlier* period than they reach the income statement (for example, **unearned revenue** taxed on receipt),

- expenses or losses are expensed in the income statement *before* they are deductible (for example, warranty provisions, bad-debt provisions, post-employment benefits, restructuring accruals, or R&D expensed in the accounts but capitalized for tax), or
- **tax loss carryforwards** are available to reduce future taxable income.

These are **deductible temporary differences**: they provide future tax savings.

A quick test: if a temporary difference first makes taxable income lower than pretax accounting profit, a DTL is created; if it first makes taxable income higher than pretax accounting profit, a DTA is created.

The balance sheet test (carrying value vs. tax base)

KEY CONCEPT

Item	Relationship	Result
Asset	Carrying value > tax base	Deferred tax liability
Asset	Carrying value < tax base	Deferred tax asset
Liability	Carrying value > tax base	Deferred tax asset
Liability	Carrying value < tax base	Deferred tax liability

The DTA or DTL balance is the absolute value of (carrying value – tax base) × tax rate. For a liability such as a warranty provision, the tax base is the carrying value minus the amounts that will be deductible in future tax returns. If the whole provision will be deductible when claims are paid, the tax base is zero.

The income tax expense equation

Income tax expense is also called the **tax provision**. The current period's transactions created or changed the deferred tax balances, so accrual accounting records those changes in this period's tax expense, on top of the taxes payable on this year's taxable income:

KEY CONCEPT

$$\text{income tax expense} = \text{taxes payable} + \Delta DTL - \Delta DTA$$

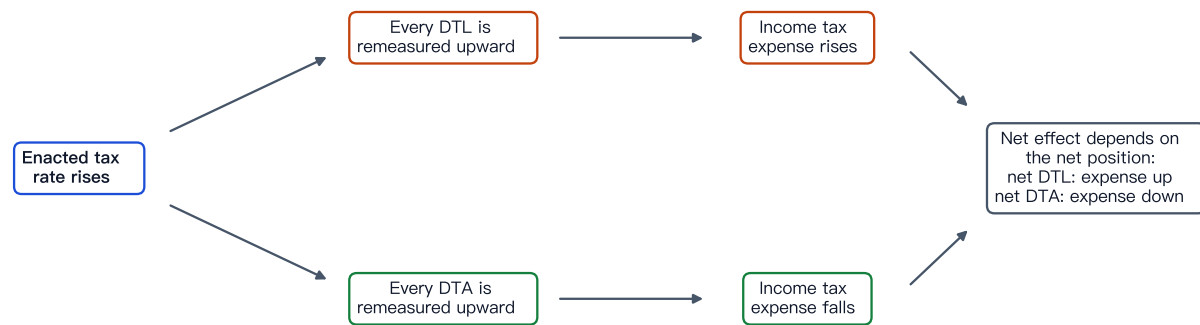
Any rearrangement must preserve the signs, e.g. $\Delta DTL = \text{income tax expense} - \text{taxes payable} + \Delta DTA$ and $\Delta DTA = \text{taxes payable} - \text{income tax expense} + \Delta DTL$. Creating or increasing a DTL raises tax expense; creating or increasing a DTA lowers it.

Example. Kestrel Tools reports taxes payable of \$1,150. During the year its DTL rose by \$90 and its DTA rose by \$40. Income tax expense is $1,150 + 90 - 40 = \$1,200$.

Changes in the enacted tax rate

DTAs and DTLs are measured at the tax rate expected to apply when they reverse. If the enacted rate changes, existing balances are remeasured. An increase in the rate raises both DTAs and DTLs, and a decrease lowers both. The remeasurement flows through income tax expense. Whether a rate increase raises or lowers that

expense depends on the net position. A firm with a net DTL sees its DTL rise by more than its DTA, so tax expense rises. A firm with a net DTA sees its DTA rise by more, so tax expense falls.



A rate cut works the same way with every arrow reversed.

How a change in the enacted tax rate flows through deferred taxes to income tax expense

Example. Orla Freight has a DTL of \$64,000 and a DTA of \$16,000, both measured at 20%. The rate rises to 25%. The underlying differences are $64,000/0.20 = 320,000$ and $16,000/0.20 = 80,000$. The new DTL is 80,000 (up 16,000) and the new DTA is 20,000 (up 4,000). Income tax expense rises by $16,000 - 4,000 = \$12,000$, so net income falls by \$12,000.

When new temporary differences arise in the same year as a rate change, work in this order:

1. Taxes payable = taxable income $\times$ the rate in force this year.
2. Cumulative temporary difference at year-end = beginning difference (beginning DTL $\div$ old rate) + the difference created this year.
3. Ending DTL = cumulative difference $\times$ the rate enacted for the years in which it will reverse.
4. Income tax expense = taxes payable + (ending DTL – beginning DTL).

Example. Harlan Mills begins the year with a DTL of \$90 from accelerated tax depreciation, measured at 30%. This year pretax income is \$1,000 and taxable income is \$800; the \$200 gap is a new taxable temporary difference. The rate for this year is 30%, and a cut to 25%, effective from next year, is enacted during the year. Taxes payable are $800 \times 0.30 = 240$. The cumulative difference is $90/0.30 + 200 = 500$, so the ending DTL is $500 \times 0.25 = 125$. Income tax expense is $240 + (125 - 90) = \$275$. Without the rate cut it would have been $240 + (150 - 90) = \$300$, which is 30% of pretax income.

COMMON EXAM TRAPS

- Confusing taxes payable (tax return) with income tax expense (income statement).
- Treating a permanent difference as if it created a DTA or DTL. It changes the effective tax rate instead.
- Getting the direction wrong. A tax deduction taken earlier than the book expense creates a DTL; a book expense recognized earlier than the tax deduction creates a DTA.
- A tax rate change remeasures existing deferred balances. It does not by itself create a new DTA.

- After a rate change, compute the changes in the DTL and the DTA separately. The net effect on tax expense is $\Delta\text{DTL} - \Delta\text{DTA}$. For Orla Freight, adding the two increases gives a \$20,000 rise in tax expense instead of \$12,000.

EXAM SHORTCUTS

- If a temporary difference first makes taxable income lower than pretax accounting profit, it creates a DTL; if it first makes taxable income higher, it creates a DTA.
- After an increase in the enacted tax rate, the direction of the change in income tax expense follows from the net position alone: it rises for a firm with a net DTL and falls for a firm with a net DTA.

BOTTOM LINE

- Taxes payable are computed from taxable income on the tax return, while income tax expense, the income statement charge, equals taxes payable + $\Delta\text{DTL} - \Delta\text{DTA}$.
- A DTL arises when revenues or gains reach the income statement before they are taxed, or when expenses or losses are deducted for tax before they are expensed; a DTA arises in the reverse cases and from tax loss carryforwards.
- An asset whose carrying value exceeds its tax base, or a liability whose carrying value is below its tax base, gives a DTL; the opposite cases give a DTA, equal to the absolute value of (carrying value – tax base) $\times$ tax rate.
- Permanent differences never reverse, create no DTA or DTL, and make the effective tax rate differ from the statutory rate.
- When the enacted tax rate changes, existing DTAs and DTLs are remeasured at the new rate, and the remeasurement flows through income tax expense.

QUICK CHECK

Question 1

When pretax income reported in the financial statements differs from taxable income because of a temporary difference, the *most likely* consequence is:

- A** the recognition of a deferred tax asset or deferred tax liability.
- B** a gain or loss recognized in other comprehensive income.
- C** a permanent gap between the firm's effective and statutory tax rates.

Answer: A

A temporary difference creates a deferred tax item: a DTL if income tax expense (financial reporting) exceeds taxes payable (tax reporting), or a DTA if taxes payable exceed income tax expense. Permanent differences, rather than temporary ones, are what make the effective tax rate differ from the statutory rate.

Why the other options are wrong

- **B.** Neither temporary nor permanent differences generate a gain or loss; they affect tax balances and tax expense.

- **C.** Temporary differences typically do not make the effective and statutory rates differ, because the deferred tax expense adjusts income tax expense to the statutory rate on pretax income. Permanent differences cause that gap.

Key takeaway A temporary difference creates a deferred tax item. A permanent difference makes the effective rate differ from the statutory rate.

MODULE 35.2

Deferred Tax Assets and Liabilities

LOS 35.b — Creating deferred tax balances and treating them in analysis

How the balances build up and reverse

Measuring a deferred tax balance at any date depends on precise definitions of carrying value and tax base.

For a depreciable asset, the **carrying value** is cost less accumulated book depreciation. The **tax base** is cost less accumulated tax depreciation, which equals the tax depreciation still to be deducted in future returns.

Liabilities follow the tax-base rule given under LOS 35.a, with one exception: revenue received in advance is taxed on receipt, so its tax base is the carrying value less amounts that will *not* be taxable in future.

Example. Linnet Packaging buys a machine for \$48,000 with a four-year life and no residual value. The books use straight-line depreciation (\$12,000 a year). For tax, the machine is depreciated straight-line over two years (\$24,000 a year). The tax rate is 20%.

End of year	Carrying value	Tax base	Difference	DTL (20%)	Change in DTL
1	36,000	24,000	12,000	2,400	+2,400
2	24,000	0	24,000	4,800	+2,400
3	12,000	0	12,000	2,400	-2,400
4	0	0	0	0	-2,400

The DTL builds while tax depreciation runs ahead of book depreciation. It then reverses to zero once tax deductions stop but book depreciation continues. In Years 1–2 income tax expense exceeds taxes payable by \$2,400 a year; in Years 3–4 it is \$2,400 lower.

Warranties. The provision is recognized at the time of sale under the matching principle, while the tax deduction waits until repair costs are incurred. The liability's tax base is therefore zero (LOS 35.a).

Receivables. A receivable of \$50,000 carries a bad-debt allowance of \$4,000, so its carrying value is \$46,000. If bad debts are deductible only when they are written off, the tax base is the full \$50,000. The asset's carrying value is below its tax base, so at a 25% tax rate there is a DTA of $4,000 \times 0.25 = \$1,000$.

Realizability of deferred tax assets

Deferred tax balances are not discounted to present value. A DTA has value only if the firm will earn enough future taxable income to use it, so DTAs are reviewed at every balance sheet date.

KEY CONCEPT

	IFRS	US GAAP
Doubt about recovering a DTA	The DTA is reduced directly (a smaller DTA is reported)	The full DTA is kept, and a valuation allowance is deducted if it is <i>more likely than not</i> that some of it will not be realized
Effect on earnings	Reduction increases income tax expense	Creating or increasing the allowance increases income tax expense and reduces net income; reducing it does the opposite

Management must be able to support the carrying amount of every DTA. Evidence against realization includes cumulative recent losses and a history of tax loss carryforwards expiring unused. Evidence for realization includes order backlogs and existing profitable contracts. The judgement is subjective, so changes in the valuation allowance are a potential tool of **earnings management**: a surprise reduction in the allowance boosts earnings.

Example. A US GAAP firm reports taxes payable of \$260, an increase in its DTL of \$18, an increase in its gross DTA of \$12 and an increase in its valuation allowance of \$5. The net DTA rises by only $12 - 5 = 7$, so income tax expense is $260 + 18 - 7 = \$271$.

Treatment for analytical purposes

The central question is whether, and when, the DTL will reverse.

KEY CONCEPT

Expectation	Analytical treatment
DTL expected to reverse (e.g., capital spending flat or falling)	Treat as a liability
DTL not expected to reverse in the foreseeable future (typically because capital expenditures keep growing, so new timing differences replace the reversing ones)	Treat as equity : reduce liabilities and increase equity by the same amount

In practice treatments vary, so the analyst decides **case by case** whether, and when, each DTL will reverse.

Reclassifying a DTL as equity leaves total assets unchanged, lowers liabilities and raises equity. The **debt-to-equity ratio** and the financial leverage ratio (assets/equity) therefore fall. Return on equity also falls because its denominator is larger. **Return on assets** is unaffected, since neither net income nor total assets changes.

COMMON EXAM TRAPS

- A DTL that is expected not to reverse is treated as equity. It is neither ignored nor offset by a valuation allowance.
- A valuation allowance applies to DTAs only. Increasing it raises tax expense. In the example, ignoring the \$5 increase in the allowance gives tax expense of \$266 instead of \$271.
- Under IFRS there is no separate valuation allowance account; the DTA is reduced directly.
- Deferred taxes are not discounted.

- Reclassifying a DTL to equity lowers leverage ratios, while ROA does not change.
- The DTL at a date is $(\text{carrying value} - \text{tax base}) \times \text{rate}$, using the balances at that date. The change during the year is a different number. For Linnet at the end of Year 2, reporting the year's change gives \$2,400 instead of the DTL of \$4,800.

EXAM SHORTCUTS

- Reclassifying a DTL as equity changes neither net income nor total assets, so an answer in which ROA changes can be ruled out.

BOTTOM LINE

- For a depreciable asset, the carrying value is cost less accumulated book depreciation and the tax base is cost less accumulated tax depreciation.
- Deferred tax assets and liabilities are not discounted to present value.
- Under US GAAP a DTA is kept in full and reduced by a valuation allowance when it is more likely than not that part of it will not be realized, while IFRS reduces the DTA directly; either reduction raises income tax expense.
- Because realizing a DTA is a subjective judgment, changes in the valuation allowance are a potential tool of earnings management, and a surprise reduction boosts earnings.
- A DTL expected to reverse is treated as a liability, while one not expected to reverse in the foreseeable future is treated as equity, and the analyst decides case by case.
- Reclassifying a DTL as equity lowers the debt-to-equity ratio, the financial leverage ratio and ROE, and leaves ROA unchanged.

QUICK CHECK

Question 2

An analyst reclassifies a company's deferred tax liability from liabilities to equity. Which of the following ratios is *least likely* to be affected by this reclassification?

- A Return on assets.
- B Debt-to-equity ratio.
- C Return on equity.

Answer: A

Reclassifying a DTL moves an amount from liabilities to equity; total assets and net income are unchanged, so return on assets is unaffected. Equity rises, which changes every ratio that uses equity in the numerator or denominator.

Why the other options are wrong

- **B.** The debt-to-equity ratio falls because liabilities decrease and equity increases.
- **C.** Return on equity falls because the equity denominator becomes larger while net income is unchanged.

Key takeaway Reclassifying a DTL as equity lowers leverage ratios and ROE but leaves ROA unchanged.

MODULE 35.3

Tax Rates and Disclosures

LOS 35.c — Statutory, effective and cash tax rates

Three tax rates measure different things:

KEY CONCEPT

Rate	Definition	What it shows
Statutory tax rate	The corporate income tax rate of the jurisdiction where the company is domiciled	The "headline" rate set by law
Effective tax rate	$\frac{\text{income tax expense}}{\text{pretax income}}$	The tax charge actually reported per unit of accounting profit; the most useful rate for forecasting earnings
Cash tax rate	$\frac{\text{cash taxes paid}}{\text{pretax income}}$	The cash burden of taxes; useful for forecasting cash flows

The effective and cash tax rates both use pretax (accounting) income as the denominator. The statutory rate is not computed from the financial statements at all; it is set by tax law and applied to taxable income. When only net income is given, add income tax expense back first: $\text{pretax income} = \text{net income} + \text{income tax expense}$.

Why the effective rate differs from the statutory rate

- Different tax rates in different jurisdictions (foreign operations)
- **Permanent differences:** tax credits, tax-exempt income, nondeductible expenses, and different tax treatment of capital gains versus operating income
- New tax legislation or changed tax rates
- Tax holidays granted in some countries

Temporary differences typically do *not* make the effective and statutory rates differ, because deferred tax expense adjusts income tax expense back toward statutory rate $\times$ pretax income. They do, however, make the cash tax rate differ from the effective rate.

Example. Rennick Foods earns pretax income of \$500 at home (tax rate 28%) and \$300 in a subsidiary abroad (tax rate 16%). Income tax expense is $0.28(500) + 0.16(300) = 140 + 48 = 188$. The effective tax rate is $188/800 = 23.5\%$, below the 28% statutory rate because of the low-tax foreign operations.

Example. Pretax income is \$400, including \$20 of tax-exempt interest. The statutory rate is 30% and there are no other differences. Income tax expense is $0.30 \times (400 - 20) = 114$, and the effective rate is $114/400 = 28.5\%$.

Using the rate reconciliation

The footnotes must reconcile the statutory rate to the effective rate. Understanding why reported income tax expense differs from tax at the statutory rate helps the analyst forecast earnings and cash flows. For each reconciling item, look at its relative size, its trend so far and the direction it is expected to take; the footnotes and management's discussion and analysis are the sources. Percentages can be converted into amounts when that helps. When studying trends and forecasting, include only reconciliation items that are **continuous** in nature and set aside those that are **sporadic**:

Usually continuous

Different tax rates in different countries
Tax-exempt income
Nondeductible expenses

Usually sporadic

Large asset sales
Tax holiday savings
Other one-off "special items"

For a **tax holiday** (a temporary exemption from tax in a jurisdiction), find out when it ends and whether accumulated taxes become payable at that point. Volatile reconciliation items make the effective rate hard to forecast and reduce comparability with peers.

LOS 35.d — Deferred tax disclosures and their analytical use

Common temporary differences

KEY CONCEPT

Source	Result	Why
Accelerated tax depreciation, straight-line in the books	DTL	Tax deductions come first; consider the firm's growth and capex before assuming reversal
Impairments	DTA	Write-down expensed now; tax deduction usually only on sale/disposal
Restructuring charges	DTA	Expensed when announced; deducted when paid (large cash outflows follow, net of tax savings)
Inventory cost flow method	Usually none in the US (LIFO conformity); can arise elsewhere	Book and tax methods may differ outside the US
Post-employment benefits, deferred compensation	DTA	Expensed when earned by employees; deducted when paid

Source	Result	Why
Unrealized gains/losses on available-for-sale securities	Deferred tax adjustment in equity	Gains go directly to equity; tax only when realized

Exam convention: the future tax on unrealized gains and losses from available-for-sale securities is recorded as a deferred tax adjustment to stockholders' equity, and the balance sheet shows no DTL for it. Current practice: for available-for-sale debt securities (US GAAP) and FVOCI assets (IFRS 9), ASC 740 and IAS 12 recognize the deferred tax liability (or asset) on the balance sheet and charge the related tax to other comprehensive income, so the income statement tax expense is unaffected. Unrealized gains on these securities therefore appear among deferred tax liabilities in disclosure tables.

On the balance sheet, deferred tax assets and liabilities are classified as **noncurrent** under both IFRS and US GAAP. They are not split into current and noncurrent portions by expected reversal date.

What is typically disclosed

- DTLs, DTAs, any **valuation allowance** and the net change in the allowance during the period
- Any unrecognized deferred tax liability (DTL) that relates to earnings retained by subsidiaries or joint ventures
- For each kind of temporary difference, its tax effect in the current year
- The components of income tax expense (current and deferred)
- A reconciliation between reported income tax expense and tax computed at the statutory rate
- Tax loss carryforwards and credits

Reading the disclosures

- If income tax expense keeps exceeding taxes payable, DTLs are growing faster than DTAs (deferred tax expense is positive).
- A decrease in the valuation allowance lowers deferred tax expense and raises reported earnings. It signals that management now expects more future taxable income, so check that it is justified.
- With a straight-line book schedule and an accelerated tax schedule, taxes payable can be computed year by year. Taxable income is pretax income before depreciation minus tax depreciation, and taxes payable are taxable income $\times$ rate. When only temporary differences exist and the tax rate does not change, income tax expense is pretax accounting income $\times$ rate.

Example. Book depreciation is 40 a year and tax depreciation is 60 in Year 1. Income before depreciation is 250 and the tax rate is 20%. Taxes payable are $(250 - 60) \times 0.20 = 38$. Income tax expense is $(250 - 40) \times 0.20 = 42$. The DTL rises by $42 - 38 = 4 = (60 - 40) \times 0.20$.

COMMON EXAM TRAPS

- Effective and cash tax rates divide by pretax income. Net income and taxable income are the wrong denominators. For Rennick, dividing by net income of \$612 gives an effective rate of 30.7% instead of 23.5%.
- Taxes payable use tax depreciation; income tax expense uses book depreciation. In the depreciation example, swapping the two gives taxes payable of 42 and income tax expense of 38 instead of 38 and 42.

- Changes in DTAs and DTLs from temporary differences at an unchanged tax rate, and higher cash taxes, do not by themselves make the effective rate differ from the statutory rate. Permanent differences and foreign rates do.
- Tax holidays are sporadic items; identify the end date.

EXAM SHORTCUTS

- When only temporary differences exist and the tax rate does not change, income tax expense is pretax accounting income $\times$ the tax rate, so no deferred tax schedule is needed to find it.

BOTTOM LINE

- The effective tax rate is income tax expense divided by pretax income, the cash tax rate is cash taxes paid divided by pretax income, and the statutory rate is set by law in the jurisdiction where the company is domiciled.
- The effective rate differs from the statutory rate because of different rates in foreign jurisdictions, permanent differences, new legislation or rate changes, and tax holidays; temporary differences typically do not cause the gap but make the cash tax rate differ from the effective rate.
- When forecasting from the rate reconciliation, an analyst includes continuous items such as foreign rate differences, tax-exempt income and nondeductible expenses, and sets aside sporadic items, for example tax holiday savings or a large asset sale.
- Accelerated tax depreciation with straight-line book depreciation creates a DTL, while impairments, restructuring charges and post-employment benefits create DTAs.
- Deferred tax assets and liabilities are classified as noncurrent under both IFRS and US GAAP.
- Income tax expense that keeps exceeding taxes payable means DTLs are growing faster than DTAs, and a decrease in the valuation allowance raises reported earnings.

QUICK CHECK

Question 3

An analyst reviewing Kittredge Pharma notes that its effective tax rate is 6 percentage points below its statutory rate. Almost all of the gap comes from a tax holiday granted for a new plant in Malaysia. This reconciliation item is *most likely*:

- A** continuous in nature, so the date on which the holiday ends does not matter.
- B** sporadic in nature, but its effect is normally cancelled out by higher home-country tax when the profits are repatriated.
- C** sporadic in nature, and the analyst should find out when the holiday ends and whether taxes will become payable at that point.

Answer: C

A tax holiday is a temporary exemption from tax in a particular jurisdiction, so it is a sporadic reconciliation item. The key analytical task is to establish when the holiday will expire and how its expiry (including any requirement to pay accumulated taxes) will affect future taxes payable and the effective rate.

Why the other options are wrong

- **A.** A tax holiday is temporary, so it is a sporadic item. Its termination date is the main thing the analyst needs to find out.
- **B.** Nothing suggests the holiday's benefit is routinely offset by home-country taxes. The analyst's focus is the end date and any taxes that become payable then.

Key takeaway A tax holiday is a sporadic item. Find its end date and any catch-up tax.

Practice questions

Question 4

Which of the following is *most likely* to cause a deferred tax asset to be created?

- A** Accelerated tax depreciation.
- B** Unearned revenue.
- C** A decrease in the enacted tax rate.

Question 5

Lochmere Outfitters has built up large tax loss carryforwards. Its deferred tax balances at the start of the year, measured at the 24% income tax rate then enacted, are shown below.

Lochmere Outfitters: deferred tax balances at the start of the year (measured at 24%)

Deferred tax item	Balance (\$ thousands)
Deferred tax asset (tax loss carryforwards and warranty provisions)	360
Deferred tax liability (accelerated tax depreciation)	150

During the year the legislature enacts an increase in the income tax rate to 28%, applying from next year onward, when all of these differences are expected to reverse. No temporary differences arise or reverse during the year. As a result of the rate change, Lochmere's income tax expense for the year will:

- A** increase by \$25,000.
- B** remain unchanged.
- C** decrease by \$35,000.

Answers: 4. B · 5. C

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/deferred-tax-liability/. The full bank has 41 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 36

Financial Reporting Quality

What you'll learn

LOS 36.a Contrast financial reporting quality with the quality of reported results (earnings, cash flows and balance sheet items).

LOS 36.b Describe a spectrum that ranks financial reports from highest to lowest quality.

LOS 36.c Distinguish conservative accounting from aggressive accounting.

LOS 36.d Describe the motivations and conditions that lead managers to issue low-quality or fraudulent financial reports.

LOS 36.e Describe the mechanisms that discipline financial reporting quality and their limitations.

LOS 36.f Describe presentation choices, including non-GAAP measures, that can be used to sway an analyst's view.

LOS 36.g Describe accounting choices and estimates that can be used to manage earnings, cash flows and balance sheet items.

LOS 36.h Describe accounting warning signs and ways to detect manipulation of financial report information.

MODULE 36.1

Reporting Quality

This reading separates financial reporting quality from earnings quality, ranks reports on a quality spectrum, and covers conservative and aggressive accounting, the conditions behind low-quality reporting, the mechanisms that discipline it and the use of non-GAAP measures. It then shows the choices and estimates management can use to manage earnings, cash flows and balance sheet items, and the warning signs an analyst looks for.

LOS 36.a — Reporting quality versus earnings quality

Two different questions are asked about any set of financial statements.

- 1. Financial reporting quality** asks how good the reports themselves are. The first test is compliance with **generally accepted accounting principles (GAAP)** in the firm's jurisdiction. Compliance alone is not enough, because GAAP leave room for choices of methods and estimates. High-quality reporting must also be **decision useful**, which requires two characteristics:
 - **Relevance**: the information could change a user's decision. Relevant items must also be **material**.
 - **Faithful representation**: the information is **complete**, neutral (unbiased) and **free from error**.
- 2. Quality of earnings** asks how good the performance described in the reports is. More broadly, it covers the quality of reported results: earnings, cash flows and balance sheet values. It is judged on two dimensions:
 - **Sustainability**: how much of this period's earnings can be expected to recur. Profit from higher efficiency or a growing market share tends to persist; a one-time gain on selling a long-held asset or a favorable currency move does not.
 - **Level (adequacy)**: earnings must be high enough to keep the business going and to give investors an **adequate return** on the capital they supplied.

Sustainable earnings are expected to continue, so one dollar of high-quality earnings adds more to firm value (the present value of expected future earnings) than one dollar of a one-off gain. Balance sheet and cash flow items feed into earnings quality too. Under-accrued liabilities or overstated asset values inflate current earnings and make them less sustainable.

KEY CONCEPT

Question asked	Financial reporting quality	Quality of earnings
What is judged?	The financial reports	The results reported
Main criteria	GAAP compliance; relevance; faithful representation	Sustainability; adequate level

Reporting quality and earnings quality combined

	Earnings quality high	Earnings quality low
Reporting quality high	Best case: useful reports of sustainable, adequate earnings	Useful reports of earnings that are not sustainable or not adequate
Reporting quality low	Earnings quality cannot be judged reliably	Earnings quality cannot be judged reliably

The two dimensions are linked in one direction. If the reports are of low quality, a user cannot reliably assess earnings, cash flows or balance sheet values. The reverse does not hold: a firm can report a mostly one-time gain transparently, which gives high reporting quality and low earnings quality.

Example. Tallis Marine reports net income of \$25 million, of which \$18 million is a disclosed gain from selling a warehouse. The reports are compliant and transparent (high reporting quality), but only about \$7 million looks recurring (low earnings quality).

Common exam traps

- Relevance, completeness and neutrality describe reporting quality. Sustainability and adequacy describe earnings quality.
- Earnings that are lower than last year are not automatically "low quality". The tests are sustainability and adequacy.
- Non-compliance with GAAP does not make earnings low quality by definition. It makes their quality hard or impossible to evaluate.

LOS 36.b — The quality spectrum

Combining both dimensions gives a **spectrum** of financial report quality, from best to worst:

KEY CONCEPT

Rank	GAAP?	Description
1 (best)	Compliant	Decision useful; earnings sustainable and adequate
2	Compliant	Decision useful, but earnings quality is low (not sustainable or not adequate)
3	Compliant	Earnings quality low and reporting choices and estimates are biased
4	Compliant	Earnings are actively managed (to increase, decrease or smooth them)
5	Not compliant	Numbers still reflect the firm's actual economic activities
6 (worst)	Not compliant	Numbers are fictitious or fraudulent

Departures from GAAP make earnings quality harder to judge, and the analyst must rely more on the underlying economic activity. Only at the bottom of the spectrum, where the numbers are fictitious or fraudulent, does an assessment of earnings quality become impossible.

Common exam traps

- Compliant, decision-useful reporting of unsustainable earnings (rank 2) still ranks above compliant reporting with biased choices (rank 3).

LOS 36.c — Conservative versus aggressive accounting

Ideally reporting is **neutral** (unbiased). Biased choices within GAAP are of two kinds:

- **Conservative accounting** consists of choices that decrease reported earnings and the financial position for the current period. They tend to raise later-period earnings.
- **Aggressive accounting** consists of choices that increase reported earnings, revenues, operating cash flows or the financial position for the current period. They tend to reduce later-period earnings.

KEY CONCEPT

Aggressive choice	Conservative choice
Capitalize current-period costs	Expense current-period costs
Longer estimated useful lives	Shorter estimated useful lives
Higher salvage value estimates	Lower salvage value estimates
Straight-line depreciation	Accelerated depreciation
Delay recognition of impairments	Recognize impairments early
Smaller reserves for bad debt	Larger reserves for bad debt

Aggressive choice

Smaller valuation allowances on deferred tax assets

Conservative choice

Larger valuation allowances on deferred tax assets

The effect on later periods runs the other way because most of these choices shift an expense between periods rather than change its total. Capitalizing a cost or using a longer useful life, for example, moves expense out of the current year and into later years.

Both biases can be used, in different periods, for **earnings smoothing**, because volatile earnings tend to lower share value. In a strong year management over-accrues a liability or reserve (conservative) to hold back earnings. In a weak year it releases the excess (aggressive) to meet targets. A reserve used to store earnings this way is called a **cookie jar reserve**.

Bias can also appear in presentation. Statements can be transparent, or they can give minimal disclosure that highlights good news and hides bad news.

Conservatism is not good by default. Any bias departs from neutrality and faithful representation and makes reports less decision useful.

Some standards are conservative in themselves because they demand stronger evidence for gains than for losses:

- **Research costs** are expensed as incurred, while related revenues come later.
- **Litigation losses** are accrued once probable; gains face a stricter test.
- Under US GAAP, inventory is written down when impaired, but increases are not recognized until sale.

Conservatism can have benefits: lower litigation risk, lower current taxes (where tax and book deductions coincide), and protection for less-informed parties such as lenders.

Common exam traps

- "Aggressive" does not mean "non-GAAP". Aggressive choices usually comply with GAAP but are biased and less decision useful.

LOS 36.d — Motivations and conditions for low-quality reporting

Managers may bias reports for several reasons:

- Meeting or beating an earnings benchmark: prior management **guidance**, **consensus analyst expectations**, or earnings for the **same period of the prior year**.
- **Career concerns** and reputation.
- **Incentive compensation** tied to the share price or earnings.
- Credibility with equity investors, and the way customers and suppliers view the firm.
- Avoiding a breach of **debt covenants**, especially at highly leveraged, unprofitable firms.
- Earnings that are running above benchmarks motivate the conservative, cookie-jar choices described under LOS 36.c.

Three conditions are typically present when reporting quality is low:

Element	Meaning	Examples
Motivation	An incentive to misreport	Earnings targets, bonuses, stock options, debt covenants
Opportunity	Circumstances that make misreporting possible	Weak internal controls , inadequate board oversight , wide range of acceptable accounting treatments, weak penalties for fraud
Rationalization	A mindset that justifies the behavior	"I'll reverse it next quarter", "Everyone does it"

Common exam traps

- Weak controls are an opportunity, not a motivation.
- Pressure to meet expectations is a motivation, not an opportunity.

LOS 36.e — Mechanisms that discipline reporting quality

Three mechanisms discipline financial reporting quality: securities regulators, auditors and private contracts.

1. **Securities regulators**, such as the SEC in the United States and the **FCA** in the UK, coordinate internationally through **IOSCO**. IOSCO has more than 200 members, drawn from stock exchanges, regional authorities and national securities regulators. **ESMA** is a regional member; it coordinates the securities regulators of EU countries. Typical requirements everywhere are:
 - registration of new public securities and regulatory review;
 - disclosure and periodic financial statements with notes;
 - an **independent audit**;
 - management commentary;
 - a **signed statement** by the person responsible for preparing the reports.
 Enforcement tools include fines, suspension from issuing or trading, public disclosure and criminal prosecution.
2. For US-traded securities, management must also report its own evaluation of how well the firm's internal controls work, on top of the auditor's opinion.
3. **Auditors**. A clean (**unqualified**) **audit opinion** offers only **reasonable assurance** that the statements are fairly presented under GAAP. The opinion is no guarantee that the statements are free of error or fraud. Independence is also imperfect, because the audited company chooses and pays its own auditor.
4. **Private contracts**. Lenders and other **counterparties** specify how covenant measures are calculated and have an incentive to insist on high-quality reports. Covenants therefore cut both ways: they give the borrower's managers a motivation to manipulate, and they give the lender a reason to police the reports.

Accounting **standard-setting bodies** (IASB, FASB) write standards but do not enforce compliance. Securities regulators enforce them, and auditors and contract counterparties add further discipline.

Common exam traps

- Independent audits and signed preparer statements are typical requirements of securities regulators generally. The management assessment of internal control is an extra requirement for US-traded securities.

LOS 36.f — Presentation choices and non-GAAP measures

Firms often present **non-GAAP measures**, such as "adjusted EBITDA" or **pro forma** earnings, that exclude items described as one-time, nonoperating, non-cash, or "for comparability". These exclusions usually make performance look better. Firms that stress such measures are trying to steer which metrics they are judged on and to draw attention away from the GAAP figures, so a strong management focus on them is a warning sign.

US (SEC) requirements for non-GAAP measures

Show the most comparable GAAP measure with **equal prominence**

Explain why management thinks the measure is useful

Reconcile it to the most comparable GAAP measure

Disclose other purposes for which the firm uses it

Treatment of items likely to recur (see below)

IFRS requirements for non-IFRS measures

Define the measure and **explain its relevance**

Reconcile it to the most comparable IFRS measure

Exam convention: a US non-GAAP measure must include items that are likely to recur, even if the financial statements treat them as nonrecurring, unusual or infrequent. Current practice: in SEC filings, Item 10(e) of Regulation S-K prohibits adjusting a performance measure to remove an item labeled "nonrecurring", "infrequent" or "unusual" when a similar charge or gain is reasonably likely within two years or occurred within the prior two years. Regulation G, which covers all public disclosures, prohibits non-GAAP measures that are misleading and requires a reconciliation to the most comparable GAAP measure.

Exam convention: the two IFRS requirements in the table are the only ones, so showing the measure for every period presented is not required. Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, treats subtotals of income and expenses that management uses in public communications as management-defined performance measures. They are disclosed together in one note, which explains why each measure is useful and how it is calculated, reconciles it to the most comparable IFRS subtotal and gives comparative information.

Common exam traps

- Growth in operating cash flow or asset turnover is not in itself a warning sign. Heavy emphasis on pro forma earnings is.
- The SEC rule on recurring items concerns labeling. Calling a recurring charge "nonrecurring" and removing it is prohibited, but an adjustment for a recurring item is not banned as long as the measure is not misleading.

BOTTOM LINE

- Financial reporting quality concerns the reports themselves: compliance with GAAP plus decision usefulness, which requires relevance (including materiality) and faithful representation (complete, neutral and free from error).
- Earnings quality concerns the results reported and is judged by their sustainability and by whether their level is adequate to keep the business going and give investors an adequate return.
- Low reporting quality means earnings, cash flows and balance sheet values cannot be reliably assessed, but high reporting quality can go together with low earnings quality.
- Conservative choices decrease current-period earnings and financial position and tend to raise later earnings, while aggressive choices increase current-period earnings, revenues, operating cash flows or financial position and tend to reduce later earnings; either bias departs from neutrality.
- Low-quality reporting typically involves motivation, such as earnings targets or debt covenants, opportunity, such as weak internal controls or inadequate board oversight, and rationalization.
- For a non-GAAP measure, the SEC requires the closest GAAP measure to be shown with equal prominence and reconciled to it, while IFRS requires the measure to be defined, its relevance explained and a reconciliation to the most comparable IFRS measure.

QUICK CHECK**Question 1**

An analyst concludes that Fenwick Brewing's financial reports are of high quality. Fenwick's reported earnings *could* still be:

- A** of low quality, because they are not sustainable.
- B** smoothed through management's choice of estimates.
- C** overstated because asset impairments were recognized late.

Answer: A

Reporting quality is about whether the reports give decision-useful information that faithfully represents what happened. Earnings quality is about the underlying results: whether earnings are sustainable and adequate. A company can report a weak or one-off year accurately, so high-quality reporting can sit alongside low-quality earnings.

Why the other options are wrong

- **B.** Earnings smoothed through chosen estimates do not faithfully represent performance, so the reports would not be high quality.
- **C.** Delaying impairments overstates assets and earnings; that is a bias in the reporting, which rules out high reporting quality.

Key takeaway High reporting quality says the reports are faithful and useful; it does not guarantee that the earnings they show are sustainable or adequate.

MODULE 36.2

Accounting Choices and Estimates

LOS 36.g — Choices and estimates used to manage earnings, cash flows and balance sheet items

Revenue recognition

- Shipping terms. Under **FOB shipping point**, title passes at the seller's dock, so revenue is recognized earlier than under **FOB destination**.
- Timing of shipments. A firm can accelerate shipments (with discounts or special financing) to boost the current period, or hold them back when the period is already strong.
- **Channel stuffing** means loading distributors with more goods than they would normally sell in the period.
- In a **bill-and-hold** transaction, the customer is invoiced but the goods stay at the seller. Fictitious bill-and-hold sales inflate current revenue, since the goods are really still inventory, and reduce future revenue when real orders are filled.

Reserves and allowances (contra accounts)

- **Allowance for uncollectible accounts**. Lowering the estimate raises net receivables and net income; raising it does the reverse. If the estimate is too low, a later catch-up expense reduces income.
- **Warranty reserves** work the same way.
- **Valuation allowance** on deferred tax assets. A smaller allowance raises the net deferred tax asset and net income; a larger one lowers both. Understating the allowance overstates the asset, and later adjustments can smooth earnings.
- All of these reserves can serve the earnings smoothing described under LOS 36.c.

Depreciation, amortization and impairment

- **Accelerated depreciation** gives higher expense and lower income early in the asset's life than **straight-line** depreciation, and a lower carrying value.
- A longer **useful life** or a higher **salvage value** lowers depreciation expense and raises net income and carrying value. If the salvage value is set above the eventual sale price, a loss appears when the asset is sold.
- Amortization of purchased intangible assets involves the same choices of method, life and residual value as depreciation of tangible assets.
- **Goodwill** is not amortized but is tested for **impairment**. Delaying an impairment charge raises current earnings.
- Under IFRS, an upward **revaluation** of PP&E above depreciated cost goes to a revaluation surplus in other comprehensive income. It reaches profit or loss only to the extent it reverses a loss previously taken to profit or loss. The higher carrying amount then raises later depreciation.

KEY CONCEPT

$$\text{Annual depreciation (straight-line)} = \frac{\text{cost} - \text{salvage value}}{\text{useful life}}$$

Example. Equipment costs \$900,000 with a 6-year life and \$60,000 salvage value. Depreciation is $(900,000 - 60,000)/6 = \$140,000$. Raising the salvage estimate to \$150,000 cuts it to $(900,000 - 150,000)/6 = \$125,000$, adding \$15,000 to pretax income each year.

Inventory

- When prices are rising, **FIFO** gives lower COGS and higher gross profit and inventory than **weighted-average cost**; the opposite holds when prices are falling. FIFO inventory is closer to current replacement cost, so FIFO gives the more relevant balance sheet value. Weighted-average COGS is closer to current cost, so gross profit and margins under weighted-average cost better reflect economic reality; FIFO gross profit includes holding gains when prices rise (or losses when they fall). Reports that explain clearly how the chosen method affects the income statement and balance sheet are of higher quality.
- LIFO is permitted under US GAAP only. Selling more units than are bought or produced (**LIFO liquidation**) runs old, low costs through COGS when prices are rising and raises current earnings unsustainably.

Related-party transactions

Prices charged by a management-controlled private supplier can shift profit into or out of the public company.

Capitalization versus expensing

Capitalizing a cost creates an asset and spreads the expense through depreciation or amortization, so current earnings rise and future earnings fall. Capitalizing more research and development spending likewise pulls income forward into the current period.

Example. A \$2.4 million software implementation cost amortized over 4 years reduces this year's pretax income by only \$0.6 million instead of \$2.4 million, which lifts current pretax income by \$1.8 million. A \$1.8 million asset remains to be amortized over the next three years.

Capitalization also moves the cash outflow from **cash flow from operations (CFO)** to **cash flow from investing (CFI)**, so reported CFO is higher by the full amount. Capitalized interest has the same effect.

Other cash flow management

- Stretching payables**, that is, delaying payments to suppliers past period-end, raises current CFO and lowers next period's CFO. It has no effect on reported earnings because the expense was already recognized.
- Exam convention: under IAS 7, a company may report interest and dividends paid in either CFO or CFF, and interest and dividends received in either CFO or CFI, which gives management another lever on reported CFO. Current practice: IFRS 18, effective for annual periods beginning on or after 1 January 2027, removes most of this choice for companies whose main business is not investing or financing.

Covenant-driven manipulation

An **interest coverage ratio** covenant (EBIT / interest expense) is most easily met by overstating earnings. Asset values do not enter the ratio.

Common exam traps

- Capitalizing an expense raises CFO and lowers CFI; total cash is unchanged.

- A LIFO liquidation raises earnings only when prices are rising; with falling prices the old layers carry higher costs and earnings fall.

EXAM SHORTCUTS

- An interest coverage covenant (EBIT / interest expense) is most easily met by overstating earnings; asset values do not enter the ratio, so manipulation of asset values can be ruled out as the route.

BOTTOM LINE

- Revenue is recognized earlier under FOB shipping point than under FOB destination, and channel stuffing and fictitious bill-and-hold sales inflate current revenue.
- A lower allowance for uncollectible accounts, a smaller warranty reserve or a smaller valuation allowance on deferred tax assets raises net income, and such reserves can be used to smooth earnings.
- A longer useful life or a higher salvage value lowers depreciation and raises net income and carrying value, and delaying a goodwill impairment raises current earnings.
- Capitalizing a cost raises current earnings and lowers future earnings, and it moves the outflow from CFO to CFI, so reported CFO is higher by the full amount.
- Stretching payables raises current CFO and lowers next period's CFO, with no effect on reported earnings.
- When prices are rising, a LIFO liquidation (possible under US GAAP only) runs old, low costs through COGS and raises current earnings unsustainably.

QUICK CHECK

Question 2

The management of Orsini Fabrication wants to use its accounting discretion to raise operating income in the coming period. Which of the following actions is it *most likely* to take?

- A Raise the estimated residual values of its plant and equipment.
- B Shorten the estimated useful lives of its plant and equipment.
- C Revalue its plant and equipment upward from depreciated cost to fair value.

Answer: A

A higher residual (salvage) value reduces the depreciable base, so annual depreciation expense falls and operating income rises.

$$\text{Depreciation} = \frac{\text{cost} - \text{residual value}}{\text{useful life}}$$

A higher residual value shrinks the numerator, which lowers expense. A shorter life shrinks the denominator, which raises expense.

Why the other options are wrong

- **B.** Shorter useful lives spread the cost over fewer periods, which increases depreciation expense and lowers operating income.

- **C.** Under IFRS, a revaluation above depreciated cost is not recognized in profit (it goes to a revaluation surplus) unless it reverses a loss previously recognized. The higher carrying amount also increases depreciation in later periods, which lowers operating income.

Key takeaway Aggressive depreciation choices: longer lives and higher salvage values. Both lower depreciation and raise income.

MODULE 36.3

Warning Signs

LOS 36.h — Accounting warning signs and detection of manipulation

A **warning sign** is not proof of fraud or manipulation. It calls for more analysis to find out whether a real business reason exists. If satisfactory answers are not available, especially when several signs appear together, avoiding the investment is a reasonable choice.

KEY CONCEPT

Area	Warning signs
Revenue recognition	Changes in revenue recognition methods; bill-and-hold, barter or rebate programs that need estimates; little transparency on how parts of an order become revenue; revenue growth out of line with peers; receivables turnover falling over several periods; falling total asset turnover , especially with growth by acquisition; nonoperating or one-time sales included in revenue
Inventories	Declining inventory turnover ; LIFO liquidations (US GAAP only; see LOS 36.g)
Capitalization	Capitalizing costs that industry peers normally expense
Earnings vs. cash flow	Ratio of operating cash flow to net income persistently below one or falling
Other	Depreciation methods, useful lives or salvage values out of line with peers; a fourth-quarter earnings pattern (unusually high or low) not explained by industry or company seasonality; significant related-party transactions (with entities controlled by management); expenses labeled nonrecurring that appear regularly; gross or operating margins well above peers; minimal disclosure; emphasis on non-GAAP measures and aggressive use of special or nonrecurring designations for charges; heavy growth by acquisition (many chances to set asset values and future depreciation/amortization, and prior-period comparisons become unreliable)

Linking the signs to what is being manipulated

- Aggressive estimates (longer lives, higher salvage values), aggressive revenue recognition and LIFO liquidation change net income. Apart from any tax effects (a LIFO liquidation, for example, also raises taxable income), they leave the amount and classification of cash flows unchanged.

- Capitalizing costs that peers expense raises current earnings and also raises CFO, because the outlay moves to investing activities (LOS 36.g). Stretching payables changes CFO alone. A jump in **days payables** well above historical levels suggests stretched payables. CFO is then higher but not sustainably so, which puts the **quality of the cash flow statement** in doubt. Earnings are unaffected, and higher payables reduce net working capital, other things equal.

$$\text{Days payables} = \frac{\text{accounts payable}}{\text{COGS (or purchases)}/365}$$

Cash flow versus earnings

KEY CONCEPT

$$\text{CFO-to-net-income ratio} = \frac{\text{cash flow from operations}}{\text{net income}}$$

A ratio persistently below 1.0 means reported earnings are not being converted into cash, which suggests that accruals are inflating income. A ratio above one is not, by itself, a warning sign.

Example. Net income of \$80 million and CFO of \$52 million give a ratio of 0.65. If this is repeated year after year, the earnings deserve scrutiny.

Restructuring and impairment charges

Large restructuring or impairment charges partly correct past understated expenses and overstated assets. Analysts should not treat them as good news. Instead, they should consider spreading the charges over prior periods and restating earlier earnings to see the true trend.

Common exam traps

- Inappropriate capitalization understates current expenses. It does not overstate revenue or understate liabilities.
- Channel stuffing shows up as rising **days of sales outstanding** (falling receivables turnover). Payables are not involved.

EXAM SHORTCUTS

- Channel stuffing shows up as rising days of sales outstanding (falling receivables turnover), so an answer pointing to payables can be ruled out.

BOTTOM LINE

- A warning sign is not proof of manipulation; it calls for more analysis to find out whether there is a real business reason.
- Revenue warning signs include changes in revenue recognition methods, revenue growth out of line with peers, receivables turnover falling over several periods, falling total asset turnover and nonoperating or one-time sales included in revenue.

- A ratio of CFO to net income persistently below 1.0 suggests that accruals are inflating income, while a ratio above one is not by itself a warning sign.
- Aggressive estimates, aggressive revenue recognition and LIFO liquidation change net income but, apart from tax effects, leave the amount and classification of cash flows unchanged; capitalizing costs that peers expense raises both earnings and CFO.
- A jump in days payables well above historical levels suggests stretched payables, which make CFO higher but not sustainably so while leaving earnings unaffected.
- Large restructuring or impairment charges partly correct past understated expenses and overstated assets, so analysts consider spreading them over prior periods to see the true trend.

QUICK CHECK

Question 3

Which of the following observations about Sandhurst Industrial, a diversified manufacturer, is *most likely* to signal that management is manipulating how its results are perceived?

- A Sandhurst adopted a new lease accounting standard in the year it became mandatory for all companies.
- B Sandhurst's ratio of operating cash flow to net income has stayed between 1.1 and 1.3 for five years.
- C Sandhurst has reported large restructuring charges labeled nonrecurring in five of the last six years.

Answer: C

Expenses that are classified as nonrecurring but appear year after year are a warning sign. Labeling ordinary costs as one-time charges again and again lowers the credibility of the category and invites investors to exclude real, recurring costs when they judge sustainable profitability.

Why the other options are wrong

- **A.** Adopting a new standard when it becomes mandatory is required of every company. It reflects no management choice, so it does not by itself signal manipulation.
- **B.** The warning sign is a ratio of operating cash flow to net income that is persistently below one or falling. A stable ratio above one suggests that earnings are well backed by cash.

Key takeaway Watch for nonrecurring charges that recur, heavy emphasis on non-GAAP earnings and aggressive use of special-charge labels. They can distort the picture of sustainable earnings.

Practice questions

Question 4

A review of an accounting scandal concludes that the company's managers had both the motivation and the opportunity to misreport. Which third factor typically completes the set of conditions behind low-quality financial reporting?

- A Weak internal controls.
- B Rationalization of the actions.
- C Pressure to beat earnings expectations.

Question 5

The management of Pellworth Chemicals is worried that the company will breach a bank-loan covenant that sets a minimum interest coverage ratio. If management manipulates its financial reporting to avoid the breach, it is *most likely* to:

- A overstate earnings.
- B understate assets.
- C capitalize leases.

Answers: 4. B · 5. A

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/financial-reporting-quality/. The full bank has 38 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 37

Dupont Analysis

What you'll learn

LOS 37.a Describe the tools and techniques of financial analysis (ratio, common-size, graphical and regression analysis) and their uses and limitations.

LOS 37.b Calculate and interpret activity, liquidity, solvency and profitability ratios.

LOS 37.c Describe relationships among ratios and evaluate a company using ratio analysis.

LOS 37.d Apply DuPont analysis to decompose return on equity and interpret the effects of changes in its components.

LOS 37.e Describe the uses of industry-specific ratios, including ratios for financial institutions and measures of business risk.

LOS 37.f Describe how ratio analysis and other techniques are used to model and forecast earnings.

MODULE 37.1

Introduction to Financial Ratios

This reading covers the tools of financial analysis, the activity, liquidity, solvency and profitability ratios and the relationships among them, DuPont analysis of return on equity, industry-specific ratios, and the use of ratios in modeling and forecasting. A candidate must be able to calculate and interpret each ratio, decompose ROE into three or five parts, and judge a company's position from a set of ratios.

LOS 37.a — Tools and techniques of financial analysis

Raw financial statement numbers are hard to compare. A large firm has larger receivables, larger debt and larger profits than a small one simply because of its size. Step 3 of the financial statement analysis framework therefore converts the (adjusted) data into comparable forms, such as ratios, common-size statements and graphs, and may add statistical work such as regression. The four tools are **ratio analysis**, **common-size analysis**, **graphical analysis** and **regression analysis**.

Uses of ratio analysis

A ratio relates one statement item to another (for example, net income to revenue), which removes the effect of size. Ratios are most useful for raising questions that the analyst then investigates; a ratio seldom answers a question by itself. Ratios help an analyst to:

- forecast future earnings and cash flow;
- judge the firm's flexibility, meaning its ability to grow and to meet obligations when something unexpected happens;
- rate how well management has performed;
- track how the firm and its industry change over time;
- compare the firm with its industry competitors.

Comparisons run in two directions. **Cross-sectional analysis** compares a firm's ratios with those of other firms (peers, industry averages) for the same period. **Time-series analysis** (trend analysis) compares a firm's ratios with its own past values.

Limitations of ratio analysis

- A ratio viewed in isolation says little. It is informative only against peers or the firm's own history.
- Different accounting treatments (methods, estimates, IFRS versus US GAAP) distort comparisons, so the analyst may need to adjust the data first.
- Comparable industry ratios are hard to find for a company that operates in multiple industries (a conglomerate).
- No conclusion should rest on a single ratio; ratios must be read together.
- Deciding on the target or comparison value takes judgment. The benchmark is usually a range of acceptable values rather than one number.
- Ratios must be read in context: prior results, stated strategy, analyst expectations, the stage of the business cycle and peers.
- Definitions vary between analysts and data providers (for example, total liabilities versus interest-bearing debt in leverage ratios). What matters is using a definition consistently and knowing how published ratios were built.
- Reasonable values differ across industries. A grocer's asset turnover, for example, is far higher than a utility's.

Common-size analysis

Common-size statements express every line item relative to a common base so that firms of different size, or one firm across years, can be compared.

KEY CONCEPT

Format	Base (divisor)	Typical use
Vertical common-size income statement	Revenue (sales) of the same year	Trends in costs and margins
Vertical common-size balance sheet	Total assets of the same date	Asset mix and financing mix
Horizontal common-size statement	Each item's own value in a base year (set to 1.0 or 100%)	Growth of each item over time

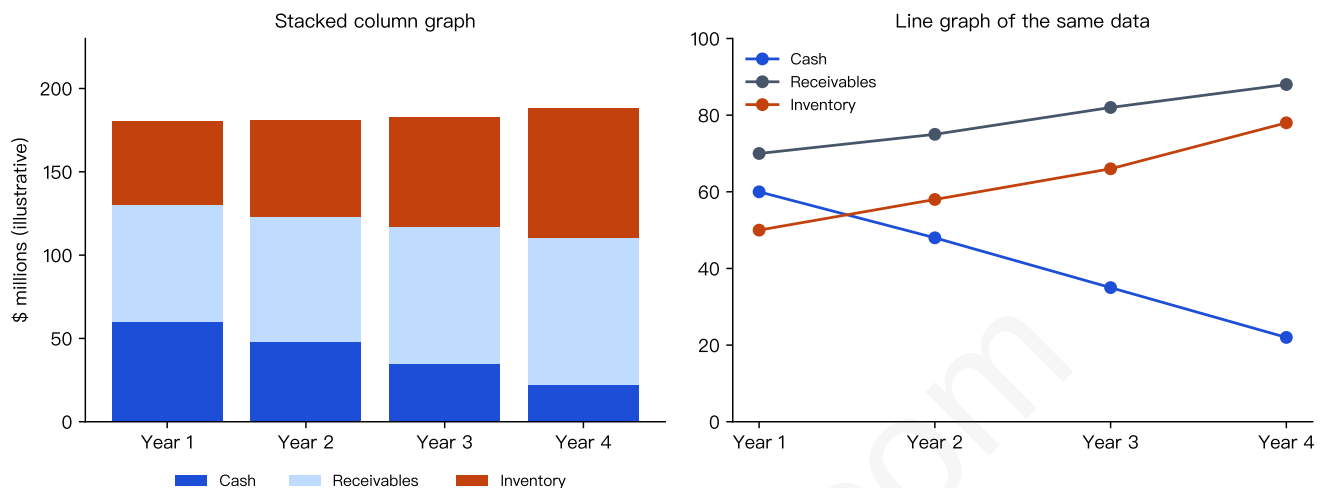
Every income statement line is divided by revenue, so a vertical common-size income statement shows the **gross profit margin**, **operating profit margin** and **net profit margin** directly. It also shows which cost lines drive a change in margin. A vertical common-size balance sheet shows ratios such as long-term debt to total assets at a glance.

Example. Kestrel Outfitters reports revenue of \$640, cost of goods sold of \$416, SG&A of \$128 and net income of \$48. Vertically, COGS is $416/640 = 65\%$ of revenue, gross margin is 35%, SG&A is 20% and the net profit margin is $48/640 = 7.5\%$. Horizontally, if inventory was \$90 in the base year and \$117 two years later, it is shown as $117/90 = 1.30$, a 30% increase since the base year.

Check the column order in any exhibit: some put the most recent year on the left, others on the right.

Graphical analysis

Graphs present comparisons and the composition of statement items over time. A **stacked column graph** (also called a **stacked bar graph**) shows how each component, such as cash, receivables or inventory, contributes to a total in each year. A **line graph** plots the same items as lines and makes trends easy to see, for example rising trade payables together with falling cash, which is a possible liquidity warning.



The same current-asset data as a stacked column graph and as a line graph (illustrative values)

Regression analysis

Regression analysis identifies relationships between variables and is mainly used for forecasting. An analyst might, for example, estimate next year's sales from the historical relationship between the firm's sales and GDP.

Common exam traps

- A vertical common-size statement divides income statement items by sales and balance sheet items by total assets. Dividing by a base-year value is the horizontal format.
- Common-size analysis is a way of scaling the data, not a type of comparison. Setting a firm's ratios beside its rivals' ratios for the same year is cross-sectional analysis whatever scaling is used.
- "Calculating ratios is highly subjective" is not a valid limitation. The formulas are mechanical; judgment enters when the comparison value is chosen and the result interpreted.

BOTTOM LINE

- Financial analysis uses four tools: ratios, common-size statements, graphs and regression.
- Cross-sectional analysis compares a firm's ratios with those of other firms for the same period, while time-series analysis compares them with the firm's own past values.
- Ratios are informative only against peers or the firm's history, they are distorted by different accounting treatments, comparable industry ratios are hard to find for a conglomerate, and no conclusion should rest on a single ratio.
- A vertical common-size income statement divides each line by revenue and a vertical common-size balance sheet divides each line by total assets, while a horizontal common-size statement divides each item by its own base-year value.
- Regression analysis identifies relationships between variables and is mainly used for forecasting.

QUICK CHECK**Question 1**

Leon Varga places this year's gross profit margin, inventory turnover, and debt-to-equity ratio for Pallister Grocers next to the same ratios, for the same year, of four rival supermarket chains. Varga's approach is best described as:

- A** cross-sectional analysis.
- B** time-series analysis.
- C** common-size analysis.

Answer: A

Setting a firm's ratios beside the same ratios of rival firms (or an industry average) for the same period is cross-sectional analysis. It shows how the firm performs relative to peers.

Why the other options are wrong

- **B.** Time-series analysis compares the same company's ratios across several periods, not across different firms in one period.
- **C.** Common-size analysis restates line items as percentages of a base (sales, total assets, or a base year). Varga is comparing ratios across firms, which is a different exercise.

Key takeaway Comparing several firms at one date is cross-sectional analysis. Following one firm across dates is time-series analysis.

MODULE 37.2

Financial Ratios, Part 1**LOS 37.b — Activity, liquidity, solvency and profitability ratios**

Ratios are grouped by the question they answer. The groups overlap: **payables turnover**, for example, is an activity ratio that also says something about liquidity.

KEY CONCEPT

Category	Question it answers	Examples
Activity ratios (asset utilization, operating efficiency, turnover ratios)	How efficiently does the firm use its assets?	receivables, inventory, payables, total asset, fixed asset and working capital turnover; the "days" ratios
Liquidity ratios	Can the firm pay its short-term obligations as they come due?	current, quick and cash ratios; defensive interval; cash conversion cycle

Category	Question it answers	Examples
Solvency ratios	Can the firm meet its long-term obligations; how much financial leverage does it use?	debt-to-equity, debt-to-capital, debt-to-assets, financial leverage, interest coverage, fixed charge coverage
Profitability ratios	How well does the firm turn sales, assets and equity into profit?	gross, operating and net profit margins; pretax margin; ROA; operating ROA; ROIC; ROE

When a ratio combines an income statement flow with a balance sheet stock, it usually uses the average balance (beginning plus ending, divided by 2), unless a question specifies year-end figures. For seasonal businesses, averages of more data points (for example, quarterly) are better.

Activity ratios

$$\text{receivables turnover} = \frac{\text{revenue}}{\text{average receivables}}$$

$$\text{days of sales outstanding (DSO)} = \frac{365}{\text{receivables turnover}}$$

$$\text{inventory turnover} = \frac{\text{cost of goods sold}}{\text{average inventory}}$$

$$\text{days of inventory on hand (DOH)} = \frac{365}{\text{inventory turnover}}$$

$$\text{payables turnover} = \frac{\text{cost of goods sold}}{\text{average trade payables}}$$

$$\text{number of days of payables (DPO)} = \frac{365}{\text{payables turnover}}$$

Many analysts put **purchases** in the numerator of payables turnover instead of COGS, because payables arise from purchases. Purchases are rarely reported as a line item, but the inventory relationship gives them:

$$\text{purchases} = \text{ending inventory} - \text{beginning inventory} + \text{COGS}$$

When a question gives purchases, use them; otherwise use COGS.

$$\text{total asset turnover} = \frac{\text{revenue}}{\text{average total assets}}$$

$$\text{fixed asset turnover} = \frac{\text{revenue}}{\text{average net fixed assets}}$$

$$\text{working capital turnover} = \frac{\text{revenue}}{\text{average working capital}}$$

DSO is also called the **average collection period**, DOH the **average inventory processing period**, and days of payables the **payables payment period**. For quarterly turnover ratios, the days in the quarter replace 365.

Interpretation:

- A high **receivables turnover** points to efficient credit and collection. It can also reflect strict credit terms, a large discount for early payment or heavy penalties for late payment, and credit terms that are too strict cost sales. Comparing revenue growth with peers shows which: slower growth suggests terms are too tight, while

growth at or above the peer average suggests good credit management.

- **Inventory turnover** uses COGS, not sales. Inventory is carried at cost and COGS is also measured at cost, while revenue includes the markup and would overstate how often inventory turns over. A high value suggests good inventory management, or stock levels so low that sales are lost. A low value may indicate obsolete, slow-moving inventory.
- A high payables turnover means the firm pays quickly, perhaps without using supplier credit fully or in order to take early-payment discounts. A low value may signal cash-flow trouble or simply lenient supplier terms; liquidity ratios help decide.
- **Total asset turnover** differs greatly by industry, from around 1 for capital-intensive manufacturers to around 10 for some retailers, so it is judged against the industry norm. A value that is too low means too much capital is tied up in assets; a value that is too high suggests too few assets for potential sales, or an outdated asset base.
- **Fixed asset turnover** uses net fixed assets (net of accumulated depreciation), so firms with more recently acquired assets typically show lower turnover and firms with older, heavily depreciated assets show higher turnover. A low value suggests too much capital in fixed assets or inefficient use of them; a very high value may point to obsolete equipment or to capital spending that will soon be needed to support growing revenue.
- **Working capital turnover** shows revenue generated per dollar of working capital. When payables are as large as inventory and receivables combined, working capital is close to zero and the ratio becomes very large, unstable from period to period and less informative about efficiency.

Liquidity ratios

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

$$\text{quick ratio} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{current liabilities}}$$

$$\text{cash ratio} = \frac{\text{cash} + \text{marketable securities}}{\text{current liabilities}}$$

$$\text{defensive interval} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{average daily expenditures}}$$

$$\text{average daily expenditures} = \frac{\text{COGS} + \text{SG\&A} + \text{R\&D} - \text{noncash charges (e.g., depreciation, amortization)}}{365}$$

KEY CONCEPT

$$\text{cash conversion cycle} = \text{DSO} + \text{DOH} - \text{number of days of payables}$$

- The three balance sheet ratios differ only in which current assets they treat as available. The **quick ratio** (acid-test ratio) excludes inventory and other less-liquid current assets such as prepaid expenses. The **cash ratio** also excludes receivables. Higher values mean more liquidity. A current ratio below 1 means negative **working capital** (current assets – current liabilities), which usually signals liquidity trouble.

- The **defensive interval** ratio is the number of days the firm could pay its cash expenses from liquid assets alone. Expenditures are cash costs (COGS, SG&A, R&D). When they are estimated from income statement expense lines, noncash charges included in those lines, such as depreciation and amortization, are subtracted. Reported expenses of 100 that include depreciation of 20 mean cash expenditures of 80. Depreciation is added back only when the starting point is net income, as in the indirect-method cash flow statement.
- The **cash conversion cycle** (net operating cycle) is the time between paying suppliers and collecting from customers. $DOH + DSO$, the time from acquiring inventory to collecting cash for it, is the **operating cycle**; the cash conversion cycle subtracts the days of supplier credit from it. A long cycle ties up capital and may require short-term financing. A firm that collects before it pays (a negative cycle) can operate with a current ratio below 1.

Effect of transactions on a liquidity ratio. Consider a ratio with a positive numerator and denominator. If it is above 1, an equal decrease in numerator and denominator (for example, paying payables with cash) raises it, and an equal increase lowers it. If the ratio is below 1, the effects are reversed. Equal increases therefore pull the ratio toward 1, and equal decreases push it away from 1. Moving value between two items inside the numerator, such as collecting receivables into cash, leaves the current ratio unchanged but raises the cash ratio.

Solvency ratios

Here **total debt** means interest-bearing short-term and long-term debt, including the current portion of long-term debt. Exam convention: unless told otherwise, lease liabilities are left out of total debt. Current practice: lease liabilities bear interest and are recognized on the balance sheet under IFRS 16 and ASC 842, and many analysts and rating agencies include them in debt. Leaving them out makes leverage look low in lease-heavy industries such as airlines. Some analysts also count trade payables and other non-interest-bearing current liabilities as debt, while others subtract cash, cash equivalents and marketable securities to get **net debt**.

$$\text{debt-to-equity} = \frac{\text{total debt}}{\text{total shareholders' equity}}$$

$$\text{debt-to-capital} = \frac{\text{total debt}}{\text{total debt} + \text{total shareholders' equity}} \quad \text{debt-to-assets} = \frac{\text{total debt}}{\text{total assets}}$$

$$\text{financial leverage ratio} = \frac{\text{average total assets}}{\text{average total equity}} \quad \text{interest coverage} = \frac{\text{EBIT}}{\text{interest payments}}$$

$$\text{debt-to-EBITDA} = \frac{\text{total debt}}{\text{EBITDA}}$$

KEY CONCEPT

$$\text{fixed charge coverage} = \frac{\text{EBIT} + \text{lease payments}}{\text{interest payments} + \text{lease payments}}$$

Higher debt ratios mean more reliance on debt. The **financial leverage ratio** is also called the **equity multiplier**.

Profitability ratios

$$\text{gross profit margin} = \frac{\text{gross profit}}{\text{revenue}} \quad \text{operating profit margin} = \frac{\text{operating income}}{\text{revenue}} \text{ or } \frac{\text{EBIT}}{\text{revenue}}$$

$$\text{pretax margin} = \frac{\text{EBT}}{\text{revenue}} \quad \text{net profit margin} = \frac{\text{net income}}{\text{revenue}}$$

$$\text{ROA} = \frac{\text{net income}}{\text{average total assets}} \quad \text{adjusted ROA} = \frac{\text{net income} + \text{interest expense}(1 - \text{tax rate})}{\text{average total assets}}$$

$$\text{operating ROA} = \frac{\text{operating income (or EBIT)}}{\text{average total assets}}$$

$$\text{ROE} = \frac{\text{net income}}{\text{average total equity}} \quad \text{return on common equity} = \frac{\text{net income} - \text{preferred dividends}}{\text{average common equity}}$$

Operating profit (gross profit – SG&A and other operating costs) is usually approximated by **earnings before interest and taxes (EBIT)**. **Earnings before taxes (EBT)** equals EBIT – interest, and gross profit equals revenue – COGS. Ratios that compare sales, at the top of the income statement, with a profit figure further down are **operating profitability ratios**; each margin isolates a different group of costs.

From revenue to net income: the profit line behind each margin

Income statement line	Margin that uses it (÷ revenue)
Revenue	—
– Cost of goods sold	
= Gross profit	Gross profit margin
– Operating expenses (SG&A and other)	
= Operating profit (approximated by EBIT)	Operating profit margin
– Interest expense	
= Earnings before taxes (EBT)	Pretax margin
– Income taxes	
= Net income	Net profit margin
– Preferred dividends	
= Income available to common shareholders	(Used in return on common equity)

Example. Pellworth Hardware has revenue of \$900, COGS of \$540, operating expenses of \$198, interest expense of \$27 and a 25% tax rate. Average receivables are \$75 and average inventory is \$90. Gross margin is $360/900 = 40\%$. EBIT is 162, so the operating margin is 18%. EBT is 135 and net income 101.25, a net margin of 11.25%. Interest coverage is $162/27 = 6.0$. Receivables turnover is $900/75 = 12$, giving a DSO of 30.4 days, and inventory turnover is $540/90 = 6$, giving a DOH of 60.8 days.

WORKED EXAMPLE: CASH CONVERSION CYCLE AND DEFENSIVE INTERVAL

A distributor reports revenue of \$7,300, COGS of \$4,380 and SG&A of \$1,095; the expense lines include depreciation of \$365. Average receivables are \$600, average inventory \$720 and average trade payables \$420. At year-end it holds cash of \$150, marketable securities of \$90 and receivables of \$600. Using COGS for payables turnover and a 365-day year, find the operating cycle, the cash conversion cycle and the defensive interval.

Step 1. Receivables turnover = $7,300/600 = 12.17$, so DSO = $365 \times 600/7,300 = 30.0$ days.

Step 2. Inventory turnover = $4,380/720 = 6.08$, so DOH = $365 \times 720/4,380 = 60.0$ days.

Step 3. Payables turnover = $4,380/420 = 10.43$, so days of payables = $365 \times 420/4,380 = 35.0$ days.

Step 4. Operating cycle = $30.0 + 60.0 = 90.0$ days; cash conversion cycle = $30.0 + 60.0 - 35.0 = 55.0$ days.

Step 5. Average daily expenditures = $(4,380 + 1,095 - 365)/365 = 5,110/365 = 14.0$. The depreciation is subtracted because it is a noncash charge inside the expense lines.

Result. Defensive interval = $(150 + 90 + 600)/14.0 = 60.0$ days. Inventory is left out of the numerator.

Common exam traps

- Receivables turnover uses revenue, not COGS, because receivables are recorded at selling prices. Days ratios are $365 \div \text{turnover}$, so the turnover itself is not a number of days. For Pellworth, using COGS gives a turnover of 7.2 and a DSO of 50.7 days instead of 12 and 30.4 days.
- In the cash conversion cycle, days of payables are subtracted.
- Inventory is not in the numerator of the defensive interval.
- Marketable securities stay in the quick ratio and in the cash ratio.
- Interest coverage uses EBIT. EBT and net income are the wrong numerators. For Pellworth, EBT gives 5.0 and net income gives 3.75 instead of 6.0.
- When only common-size percentages are given, convert them to amounts (percentage $\times$ total assets or $\times$ sales) before combining items from different statements.

EXAM SHORTCUTS

- For a ratio with a positive numerator and denominator, an equal decrease in both raises the ratio if it is above 1 and lowers it if it is below 1, and an equal increase does the opposite, so paying payables with cash raises a current ratio that is above 1.
- Collecting receivables into cash moves value inside the numerator of the current ratio, so the current ratio is unchanged while the cash ratio rises.

BOTTOM LINE

- Receivables turnover is revenue divided by average receivables, inventory turnover is COGS divided by average inventory, payables turnover is COGS (or purchases) divided by average trade payables, and each days ratio is 365 divided by the turnover.
- The cash conversion cycle equals DSO + DOH – days of payables, and the operating cycle equals DOH + DSO.
- The defensive interval equals cash, marketable securities and receivables divided by average daily cash expenditures, from which noncash charges in the expense lines are removed.
- Interest coverage is EBIT divided by interest payments, and fixed charge coverage is (EBIT + lease payments) divided by (interest payments + lease payments).
- Exam convention: total debt is interest-bearing short- and long-term debt with lease liabilities left out unless stated otherwise. Current practice: lease liabilities are on the balance sheet under IFRS 16 and ASC 842, and many analysts and rating agencies include them in debt.
- ROA is net income divided by average total assets, adjusted ROA adds interest expense $\times (1 - \text{tax rate})$ to the numerator, and ROE is net income divided by average total equity.

QUICK CHECK**Question 2**

An analyst notes that the inventory turnover of Fenmore Outdoor dropped sharply this year, although its sales and cost of goods sold were roughly unchanged. Which explanation is *most* consistent with the decline?

- A** At the start of the year, Fenmore wrote a large amount of obsolete stock down to net realizable value.
- B** A fault in a new ordering system placed duplicate orders with suppliers and built up surplus stock.
- C** Fenmore switched to a just-in-time system in which suppliers deliver goods only as they are needed.

Answer: B

Inventory turnover is cost of goods sold divided by average inventory. With cost of goods sold roughly unchanged, a sharp fall in turnover means that average inventory rose. Duplicate orders add surplus stock, which increases average inventory and lowers turnover.

Why the other options are wrong

- **A.** A write-down at the start of the year reduces the carrying amount of inventory for the whole year. Average inventory is lower, so turnover rises.
- **C.** A just-in-time system is designed to keep inventory low. Lower average inventory raises turnover.

Key takeaway Inventory turnover = $\text{COGS} / \text{average inventory}$. Low turnover relative to peers can signal slow-moving or obsolete stock; high turnover can mean efficient management or inventory kept too low to meet demand, so compare revenue growth with peers before concluding.

MODULE 37.3

Financial Ratios, Part 2

LOS 37.b — Solvency and profitability ratios: interpretation details

The formulas are in Module 37.2. This module adds interpretation points and then turns to reading ratios together (LOS 37.c).

Solvency.

- A financial leverage ratio close to 1 means the assets are financed mostly with equity; the further it rises above 1, the more debt is used, which typically raises risk for both shareholders and bondholders. If "debt" is taken as all liabilities, $A/E = 1 + L/E$.
- The lower interest coverage is, the harder it is to meet interest payments. **Debt-to-EBITDA** indicates roughly how many years of operating cash flow, with EBITDA as a proxy, would be needed to repay the debt.
- **Fixed charge coverage** is the more meaningful measure for firms that lease many of their assets, such as some airlines. It is also useful for US GAAP reporters with operating leases, because an operating lease records a single lease cost and no interest expense in the income statement, so interest coverage alone misses the lease burden. Because lease payments are added to both the numerator and the denominator, they pull the ratio toward 1. When interest coverage is above 1 (the normal case), fixed charge coverage is lower than interest coverage, and the gap widens as lease payments grow. The two are equal at 1. If interest coverage is below 1, fixed charge coverage is higher; with EBIT of 5, interest of 10 and leases of 10, it is $15/20 = 0.75$ against interest coverage of $5/10 = 0.50$.
- Firms with stable cash flows can carry more debt, so solvency ratios are judged against cash-flow variability.

Profitability.

- The **net profit margin** should be based on income from **continuing operations**, because discontinued operations will not recur.
- The **gross profit margin** rises with higher prices or lower production costs. Competition limits pricing.
- The EBIT used for the **operating profit margin** can include some nonoperating items, and some analysts add back depreciation and amortization to use EBITDA. Whichever measure is chosen should be used consistently.
- The adjusted ROA adds back after-tax interest, so the numerator reflects returns to both debt and equity holders. The add-back uses gross interest expense, because lenders earn the full interest; interest income is not netted against it.
- **Return on invested capital (ROIC)** is after-tax operating profit ÷ **average long-term capital**, where long-term capital is long-term (interest-bearing) debt + preferred equity + common equity. Exam convention: long-term capital excludes working capital, meaning non-interest-bearing current liabilities such as accounts payable are not counted as capital. Current practice: invested capital is usually total interest-bearing debt, including short-term borrowings and debt due within one year, plus equity, often net of excess cash. Analysts should be concerned if ROIC is too low.
- **ROE** (return on total equity) uses total equity including preferred stock. **Return on common equity** removes preferred dividends from the numerator and preferred equity from the denominator.

LOS 37.c — Relationships among ratios and evaluating a company

No single ratio tells the story. An analyst compares each ratio with the firm's history (time-series) and with peers (cross-sectional), then asks which combination of changes explains the picture.

Useful relationships

KEY CONCEPT

Observation	Likely explanation to test
Current ratio rising while quick ratio falls	Inventory building up (check days of inventory on hand)
DSO falling while DOH rising	Faster collections may be offsetting a cash drain from slow-moving inventory
ROE rising while net margin and asset turnover fall	Higher financial leverage : more risk, not better operations
ROA falling but ROE rising	Leverage has increased ($ROE = ROA \times \text{assets/equity}$)
Gross margin rising but net margin falling	Costs below gross profit (operating costs, interest, taxes) grew faster than sales
Interest coverage far below a peer's	Higher financial risk, even if margins are similar

Higher is not always better. Values should be close to the industry norm. An activity ratio far better than the norm, such as a collection period well below the industry's, is a question to investigate rather than a sure strength; the possible explanations for each turnover ratio are in Module 37.2. Because $DSO = 365/\text{turnover}$, a turnover below the industry average implies a collection period longer than the industry's.

Liquidity signals. Better liquidity shows up as higher current, quick and cash ratios and as faster conversion of receivables and inventory into cash (higher turnovers, shorter days). A lower balance of trade payables is ambiguous: it may reflect strong liquidity or suppliers demanding cash on delivery.

Example. Three years of data for Ferrand Glass:

	Year 1	Year 2	Year 3
ROA	9.5%	8.5%	7.5%
Average liabilities / average equity	0.90	1.40	2.00
Net profit margin	6.0%	5.5%	5.0%

$ROE = ROA \times (1 + L/E)$: Year 1 $9.5\% \times 1.9 = 18.05\%$; Year 2 $8.5\% \times 2.4 = 20.4\%$; Year 3 $7.5\% \times 3.0 = 22.5\%$. ROE improved even though ROA and margins deteriorated. The gain comes entirely from more leverage, so shareholders face more risk.

Evaluating a company against its industry. Each group of ratios is read in turn: liquidity (current ratio above or below the industry's), efficiency (asset turnover), profitability (margins, ROE) and leverage (debt ratios). A firm with a higher current ratio, lower margins and ROE, and a lower debt-to-capital ratio than its industry, for

instance, is more liquid, less profitable and less leveraged than its peers.

Common exam traps

- A firm whose margins and ROE are below the industry's is less profitable, even if its coverage ratio is higher. The higher coverage indicates lower financial risk.
- When comparing interest coverage between firms, compute both ratios before judging how much lower one is than the other.

EXAM SHORTCUTS

- When interest coverage is above 1, fixed charge coverage is lower than interest coverage, because adding lease payments to both numerator and denominator pulls the ratio toward 1.

BOTTOM LINE

- A financial leverage ratio close to 1 means assets are financed mostly with equity, and if all liabilities are counted as debt, $A/E = 1 + L/E$.
- Fixed charge coverage is the more meaningful coverage measure for firms that lease many of their assets.
- Income from continuing operations is the right basis for the net profit margin, because discontinued operations will not recur.
- ROE uses total equity including preferred stock, while return on common equity removes preferred dividends from the numerator and preferred equity from the denominator.
- ROE rising while net margin and asset turnover fall, or ROA falling while ROE rises, points to higher financial leverage and more risk rather than better operations.
- Ratios should be close to the industry norm, so an activity ratio far better than the norm is a question to investigate rather than a sure strength.

MODULE 37.4

DuPont Analysis

LOS 37.d — DuPont analysis of return on equity

DuPont analysis breaks **return on equity (ROE)** into component ratios so the analyst can see why ROE is high, low or changing. It decomposes ROE; it is not a different way to measure it. When net income and equity are known, ROE is simply one divided by the other. Average or year-end equity can be used, as long as the choice is consistent.

Two-part decomposition

$$\text{ROE} = \frac{\text{net income}}{\text{average total equity}} = \underbrace{\frac{\text{net income}}{\text{average total assets}}}_{\text{ROA}} \times \underbrace{\frac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$$

Original (three-part) DuPont equation

Multiplying ROA by revenue/revenue splits it into margin and turnover:

KEY CONCEPT

$$\text{ROE} = \underbrace{\frac{\text{net income}}{\text{revenue}}}_{\text{net profit margin}} \times \underbrace{\frac{\text{revenue}}{\text{average total assets}}}_{\text{total asset turnover}} \times \underbrace{\frac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$$

The third term is the financial leverage ratio (equity multiplier, or leverage ratio) from Module 37.2. A low ROE must come from a poor **net profit margin**, poor **total asset turnover**, too little leverage, or a mix of these.

Because revenue/equity is **equity turnover**, ROE also equals net profit margin × equity turnover.

Extended (five-part) DuPont equation

The net profit margin is split into three pieces:

KEY CONCEPT

$$\text{ROE} = \underbrace{\frac{\text{net income}}{\text{EBT}}}_{\text{tax burden}} \times \underbrace{\frac{\text{EBT}}{\text{EBIT}}}_{\text{interest burden}} \times \underbrace{\frac{\text{EBIT}}{\text{revenue}}}_{\text{EBIT margin}} \times \underbrace{\frac{\text{revenue}}{\text{average total assets}}}_{\text{total asset turnover}} \times \underbrace{\frac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$$

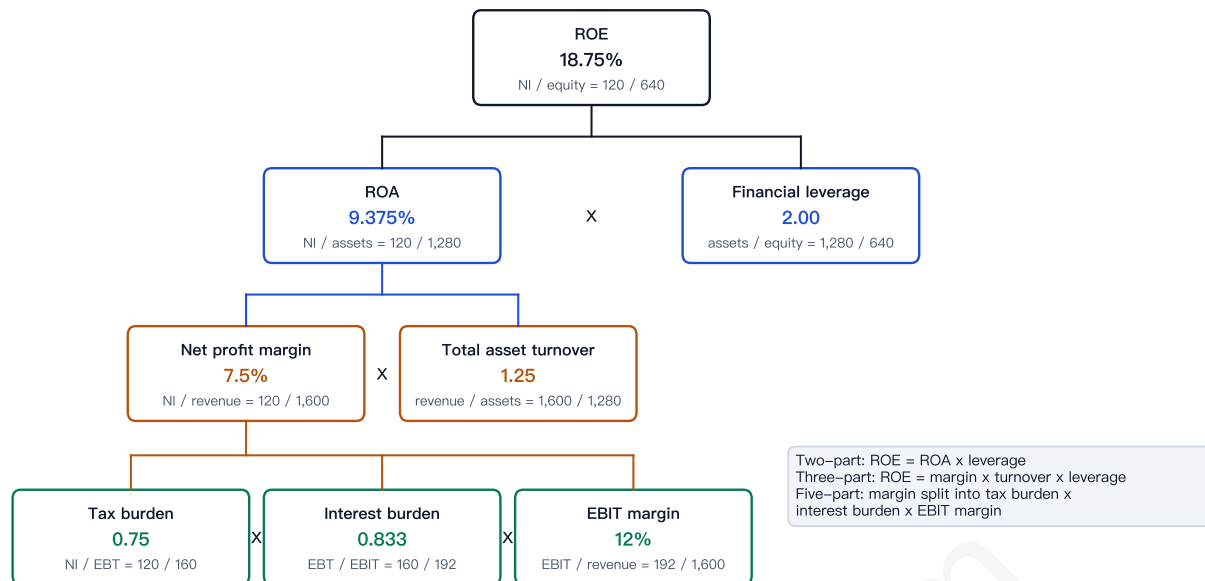
- **Tax burden** = NI/EBT = 1 – tax rate. A lower ratio means heavier taxes; with positive pretax income, higher taxes reduce ROE.
- **Interest burden** = EBT/EBIT. More interest relative to EBIT lowers the ratio, which is a heavier interest burden.
- **EBIT margin** = EBIT/revenue. If operating income replaces EBIT, the term becomes the operating margin and the interest burden term also captures nonoperating income.
- Tax burden × interest burden × EBIT margin = net profit margin, so the five-part and three-part results must agree.

Leverage cuts both ways. Borrowing helps shareholders only when the assets it funds earn more than the debt costs. Higher leverage raises the equity multiplier but also raises interest expense, which lowers the interest burden ratio. ROE rises with leverage only if the multiplier effect outweighs the fall in the interest burden ratio. For a profitable firm (positive net income and positive equity), holding all other components constant, a higher asset turnover or a higher net profit margin raises ROE. The condition matters. With a net loss, a higher asset turnover makes ROE more negative, and with zero net income it leaves ROE unchanged.

WORKED EXAMPLE

Example. Arbutus Freight reports revenue of \$1,600, EBIT of \$192, interest expense of \$32, taxes of \$40, average total assets of \$1,280 and average total equity of \$640.

- Net income = 192 – 32 – 40 = 120; EBT = 160; ROE = 120/640 = 18.75%.
- Three-part: $\frac{120}{1,600} \times \frac{1,600}{1,280} \times \frac{1,280}{640} = 0.075 \times 1.25 \times 2.0 = 18.75\%$.
- Five-part: $\frac{120}{160} \times \frac{160}{192} \times \frac{192}{1,600} \times 1.25 \times 2.0 = 0.75 \times 0.8333 \times 0.12 \times 1.25 \times 2.0 = 18.75\%$.



DuPont tree for Arbutus Freight

Comparing two firms. A firm can earn a higher ROE with less leverage if its EBIT margin and asset turnover are clearly better. The five-part decomposition shows whether tax, interest, operating margin, efficiency or leverage explains the gap.

Solving for a missing component. Rearrange the identity. For example, net profit margin = $ROE / (asset \text{ turnover} \times leverage)$, then net income = $margin \times revenue$, and equity = $net \text{ income} / ROE$.

Example. Oriel Stores and Paxton Goods both earn an ROE of 12%. Oriel has revenue of \$450, average total assets of \$300 and average total liabilities of \$120, so its average equity is \$180. Paxton has revenue of \$900, average total assets of \$900 and average total liabilities of \$600, so its average equity is \$300.

- Oriel: asset turnover = $450 / 300 = 1.50$, leverage = $300 / 180 = 1.667$, net profit margin = $0.12 / (1.50 \times 1.667) = 0.12 / 2.50 = 4.8\%$.
- Paxton: asset turnover = $900 / 900 = 1.00$, leverage = $900 / 300 = 3.00$, net profit margin = $0.12 / (1.00 \times 3.00) = 0.12 / 3.00 = 4.0\%$.

The same ROE comes from different sources. Oriel earns it with a higher margin and faster turnover; Paxton relies on more leverage.

Common exam traps

- The three components are net profit margin, total asset turnover and the equity multiplier (assets/equity). Gross margin and debt-to-equity are not components.
- EBT/EBIT is the interest burden; NI/EBT is the tax burden.
- ROE divides by equity, and net income = EBIT – interest – taxes. For Arbutus, dividing by average total assets gives 9.375%, which is ROA, instead of an ROE of 18.75%.
- When a question gives beginning and ending balances, it expects average assets and average equity; year-end balances give a different answer.

EXAM SHORTCUTS

- Tax burden $\times$ interest burden $\times$ EBIT margin equals the net profit margin, so a missing component can be solved from the identity and the five-part and three-part results must agree.

BOTTOM LINE

- ROE equals ROA times financial leverage, where financial leverage is average total assets divided by average total equity.
- In the three-part DuPont equation, ROE is the product of net profit margin, asset turnover (revenue / average total assets) and the equity multiplier (average total assets / average total equity).
- The five-part DuPont equation is $\text{ROE} = \text{tax burden (NI/EBT)} \times \text{interest burden (EBT/EBIT)} \times \text{EBIT margin} \times \text{total asset turnover} \times \text{financial leverage}$.
- Higher leverage raises the equity multiplier but lowers the interest burden ratio, so ROE rises with leverage only if the multiplier effect outweighs the fall in the interest burden ratio.
- For a profitable firm with positive equity, holding the other components constant, a higher asset turnover or a higher net profit margin raises ROE; with a net loss, higher asset turnover makes ROE more negative.

QUICK CHECK**Question 3**

A company has positive net income and positive shareholders' equity. Holding its net profit margin and its equity multiplier constant, if the company improves its total asset turnover, its return on equity will:

- A** decrease.
- B** increase.
- C** increase, decrease, or stay the same.

Answer: B

In the original DuPont equation, ROE is the product of net profit margin, total asset turnover and financial leverage. Because net income and equity are positive, the net profit margin and the equity multiplier are both positive, so with those two components fixed ROE moves in the same direction as asset turnover.

Why the other options are wrong

- **A.** Asset turnover enters ROE as a multiplier. With a positive margin and a positive equity multiplier held constant, a higher turnover cannot lower ROE. It would lower ROE only for a loss-making firm, which the stem rules out.
- **C.** The outcome is not ambiguous here: the other two components are held constant and are positive. The result would be indeterminate only without the positive-income premise (a zero margin leaves ROE unchanged; a negative margin makes ROE fall).

Key takeaway $\text{ROE} = \text{net profit margin} \times \text{total asset turnover} \times \text{financial leverage}$; for a profitable firm, raising any one component with the others fixed raises ROE.

MODULE 37.5

Industry-Specific Financial Ratios

LOS 37.e — Industry-specific ratios

Every industry has its own **key performance indicators**, so part of an analyst's skill is choosing the ratios that matter for the business being analyzed.

KEY CONCEPT

Industry	Ratio	What it shows
Service and consulting firms	Sales per employee, net income per employee	Productivity of the people who are the main "asset"
Retail, restaurants	Growth in same-store sales	Growth from existing locations only (excludes new openings): how well the firm attracts and keeps customers; a decline can mean new stores are taking customers from old ones
Retail	Sales per square foot	Productivity of selling space; useful for comparing retailers with each other
Hotels	Average daily rate = room revenue ÷ number of rooms sold	Pricing / profitability indicator
Hotels	Occupancy rate = rooms sold ÷ rooms available	Activity (utilization) indicator
Subscription services (e.g., streaming)	Average revenue per user	Monetization of the customer base
Lending institutions (banks)	Exam convention: net interest margin = interest income ÷ interest-earning assets. Current practice: net interest margin = net interest income (interest income – interest expense) ÷ average interest-earning assets. Exam questions follow the exam convention unless they name the current-practice definition.	Performance of the lending business

Regulators often require **financial institutions** to keep certain ratios above minimums or below maximums:

- **Capital adequacy** is a monetary measure of the firm's operational and financial risk relative to its equity capital. Regulators monitor it so that the firm has a buffer to absorb losses and to limit contagion across the banking system.

- **Value at risk (VaR)** is a common measure of capital risk. It estimates the size of loss that the firm will exceed only a specified percentage of the time over a specified period. This minimum loss in the worst outcomes is equivalent to the maximum loss at the stated confidence level: a 5% one-month VaR is the minimum loss in the worst 5% of months, which is also the maximum loss with 95% confidence. VaR is not the worst possible loss, because larger losses can still occur.
- **Reserve requirements** set a minimum level of eligible reserves (such as balances at the central bank) relative to a bank's reservable liabilities. Exam convention: banks are subject to minimum reserve requirements. Current practice: some central banks now set the minimum at zero.
- A **liquid asset requirement** requires a bank's liquid assets to be at least a stated proportion of certain of its liabilities.

Business risk and the coefficient of variation

The standard deviations of revenue, operating income and net income measure how variable (uncertain) a firm's results are, but they grow with firm size. The **coefficient of variation (CV)** is the size-adjusted version:

KEY CONCEPT

$$CV = \frac{\text{standard deviation of the item}}{\text{mean (expected value) of the item}}$$

A CV is variation per unit of the item, so it says nothing about the level of sales or income. Comparing CVs over time or across peers helps assess **business risk**:

- The CV of sales measures revenue stability (sales risk).
- The CV of operating income combines sales risk with the cost structure (operating leverage), which together make up business risk. On its own it cannot show whose operating costs are more volatile, because it also depends on how large costs are relative to sales.
- The CV of net income adds the effect of financial leverage (interest), taxes and nonoperating items.

Example. Operating income of Delford Mills averaged \$50 million with a standard deviation of \$12 million, so its CV is $12/50 = 0.24$. A peer averaging \$200 million with a standard deviation of \$36 million has a CV of 0.18. The peer's swings are larger in dollars but smaller in relative terms.

LOS 37.f — Ratio analysis in modeling and forecasting earnings

Pro forma (projected) statements start from a forecast of next-period revenue. Other items are then tied to revenue with ratios the analyst expects to hold:

- If COGS as a percentage of sales is expected to stay constant, the common-size COGS percentage is applied to forecast sales to get forecast COGS (and gross profit).
- Without information suggesting a change, the prior-period operating profit margin can be applied to forecast sales to estimate operating profit.
- Ratios can also be moved in a chosen direction when the analyst expects a change.

Expense items are forecast as percentages of sales, the base of the common-size income statement, and not as percentages of net income.

Instead of relying on single point estimates, the analyst can study the range of outcomes:

KEY CONCEPT

Technique	How it works
Sensitivity analysis	"What if" analysis: change one input at a time (e.g., sales growth of 3% instead of 5%) and observe the effect on the outcome
Scenario analysis	Specify a coherent set of values for several key variables at once (a scenario) and compute the outcome for each scenario
Simulation	Assign probability distributions to key variables; a computer draws values at random many times and produces a distribution of outcomes

Example. Revenue of \$80 million is forecast to grow 15%. COGS has been 55% of sales and the operating margin 12%. Forecast revenue is 92, COGS 50.6, gross profit 41.4 and operating profit $0.12 \times 92 = 11.04$ million.

Common exam traps

- Net interest margin is a ratio for lending institutions such as banks, not for insurers or subscription businesses. Exam convention: interest income ÷ interest-earning assets. Current practice: net interest income ÷ average interest-earning assets.
- CV = standard deviation ÷ mean, not mean ÷ standard deviation. For Delford, mean ÷ standard deviation gives 4.17 instead of a CV of 0.24.
- The CV of operating income relates to business risk. Financial risk comes from the capital structure, which operating income excludes.

BOTTOM LINE

- Growth in same-store sales excludes new openings; a hotel's average daily rate is room revenue divided by rooms sold, and its occupancy rate is rooms sold divided by rooms available.
- Exam convention: net interest margin is interest income divided by interest-earning assets. Current practice: it is net interest income divided by average interest-earning assets.
- Value at risk is the loss a firm will exceed only a specified percentage of the time over a specified period, and it is not the worst possible loss.
- The coefficient of variation is the standard deviation of an item divided by its mean; the CV of sales measures sales risk, the CV of operating income measures business risk, and the CV of net income adds financial leverage, taxes and nonoperating items.
- Pro forma statements start from forecast revenue and tie other items to it with ratios such as the common-size COGS percentage and the operating profit margin.
- Sensitivity analysis changes one input at a time, scenario analysis sets a coherent set of values for several variables at once, and simulation draws values from probability distributions many times.

QUICK CHECK**Question 4**

Carraway Outfitters reported sales of \$200 million for 20X5 and expects sales to grow by 9.5% in 20X6. Cost of goods sold is expected to stay at 50% of sales, and management targets an average of 50 days of inventory on hand in 20X6. Using a 365-day year, Carraway's forecast average inventory for 20X6 is *closest* to:

- A \$13.70 million.
- B \$15.00 million.
- C \$30.00 million.

Answer: B

Forecast next year's sales, apply the common-size COGS percentage, and convert the target days of inventory on hand into an inventory balance: average inventory = $\text{COGS} / 365 \times \text{days of inventory on hand}$.

$$\text{Sales}_{20X6} = 200 \times 1.095 = 219 \quad \text{COGS} = 0.50 \times 219 = 109.5$$

$$\text{Average inventory} = \frac{109.5}{365} \times 50 = 15.00 \quad (\$ \text{ millions})$$

Why the other options are wrong

- A. \$13.70 million ignores the expected 9.5% sales growth and uses 20X5 COGS of \$100 million.
- C. \$30.00 million applies the inventory days to sales instead of cost of goods sold.

Key takeaway Days of inventory on hand is based on COGS: $\text{inventory} = (\text{COGS} \div 365) \times \text{DOH}$.

Practice questions**Question 5**

An analyst wants to assess how well a manufacturer converts its sales into operating profits. Which of the following ratios is *least likely* to be one of the operating profitability ratios she would use?

- A Gross profit / net sales.
- B Net sales / total assets.
- C Net income / net sales.

Answers: 5. B

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/dupont-analysis/. The full bank has 106 questions on this reading.

FINANCIAL STATEMENT ANALYSIS · READING 38

Pro Forma Financial Statements

What you'll learn

LOS 38.a Demonstrate the development of a sales-based pro forma company model.

LOS 38.b Explain how behavioral biases affect analyst forecasts and recommend remedies.

LOS 38.c Explain how a company's competitive position under Porter's five forces affects its prices and costs.

LOS 38.d Explain how to forecast industry and company sales and costs under price inflation or deflation.

LOS 38.e Explain the choice of an explicit forecast horizon and how to project results beyond the short term.

MODULE 38.1

Financial Statement Modeling

This reading shows how to build a sales-based pro forma model, how behavioral biases distort forecasts, and how competitive forces, input-price inflation or deflation and the choice of forecast horizon shape long-term projections. A candidate must be able to project an income statement from a revenue forecast and explain the effect of each bias and each competitive force on the forecast.

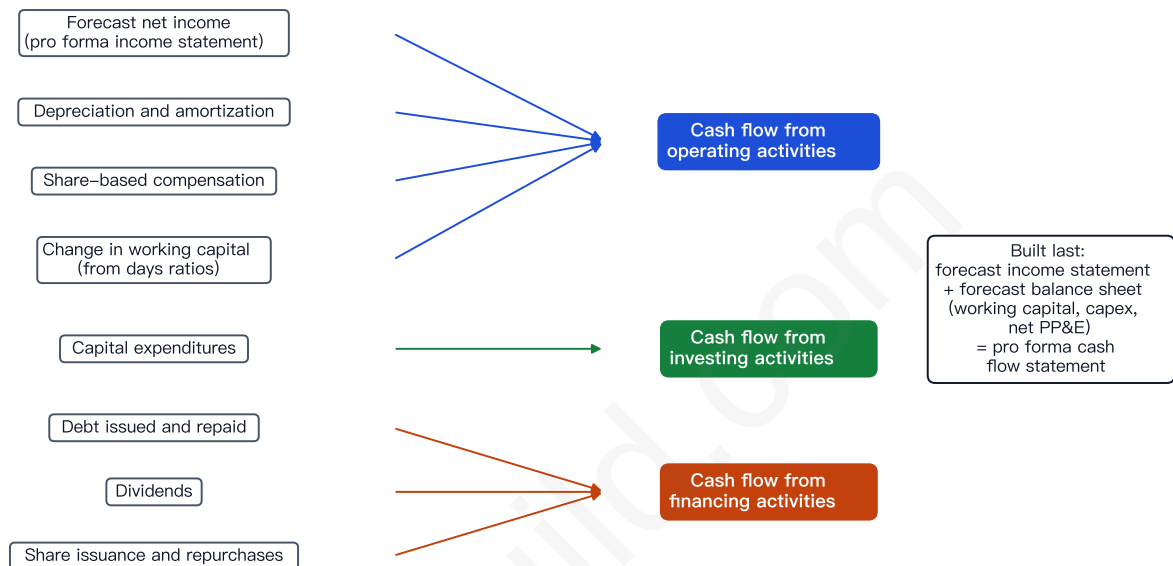
LOS 38.a — Building a sales-based pro forma model

Financial statement analysis studies a company's current and past statements. Financial statement modeling projects its future statements, which the analyst then uses to value the company and its securities. A **sales-based pro forma company model** is a set of projected financial statements driven by the analyst's forecast of future revenue. The sequence matters because each statement feeds the next:

KEY CONCEPT

Step	Task	Notes
1	Estimate revenue growth and future revenue	From market growth and market share, a trend growth rate, or growth relative to GDP
2	Estimate COGS	As a percentage of sales, or in more detail from strategy and competition; COGS need not grow exactly with sales because of fixed elements and input-price changes
3	Estimate SG&A	Fixed, growing with revenue (e.g., sales-related labor), or another method
4	Estimate financing costs	Interest rates, debt levels, planned capex and changes in financial structure
5	Estimate income tax expense and cash taxes	Historical effective rates and trends, segment/jurisdiction mix, changes in deferred tax items
6	Model the balance sheet	Working capital accounts that flow from the income statement (receivables, inventory, payables)

Step	Task	Notes
7	Estimate capital expenditures and net PP&E	From depreciation and capital expenditures (for maintenance and for growth)
8	Build the pro forma cash flow statement	Last: it is derived from the pro forma income statement and balance sheet



Building the pro forma statement of cash flows

Example. Last year Corliss Tools had revenue of \$400 million. The analyst expects 5% revenue growth, a 38% gross margin, SG&A of \$30 million fixed plus 10% of revenue, debt of \$150 million at 6% interest and a 25% effective tax rate.

1. Revenue = $400 \times 1.05 = 420$.
2. COGS = $(1 - 0.38) \times 420 = 260.4$, so gross profit is 159.6.
3. SG&A = $30 + 0.10 \times 420 = 72$, so operating profit is 87.6.
4. Interest expense = $0.06 \times 150 = 9$, so pretax income is 78.6.
5. Income tax expense = $0.25 \times 78.6 = 19.65$, so forecast net income is \$58.95 million.

A change in expected unit sales mainly moves the working capital accounts tied to sales: accounts receivable, because credit sales change with volume, and inventory, because the number of units the firm needs on hand changes (and stock builds up or runs down if purchasing does not adjust). Prepaid expenses are payments for future-period expenses and are unrelated to purchases for resale, so they are largely unaffected.

LOS 38.b — Behavioral biases in forecasting

KEY CONCEPT

Bias	What it looks like	Remedy
Overconfidence bias	Too much faith in one's own forecasts; confidence intervals too narrow (more common in analysts who go against the consensus)	Share forecasts and invite critique; review past forecast errors; use scenario analysis to produce a range
Illusion of control bias	Overestimating what one can control: seeking "expert" opinions to justify a view, adding more and more variables (overfitting); overfitted models forecast poorly out of sample and can hide assumptions that need updating	Use only variables with known explanatory power; seek outside opinions only from those with a relevant perspective
Conservatism bias (also called anchoring)	Only small adjustments to prior forecasts when new information arrives; slow to reflect news (usually negative, sometimes positive)	Periodically evaluate forecast errors; use simpler models that are easy to update
Representativeness bias	Relying on known classifications; one form is base-rate neglect — ignoring the rate of incidence in the wider population in favor of company-specific facts	Consider both the inside view (company-specific) and the outside view (the base rate for the industry or peer group)
Confirmation bias	Seeking data that support one's view, discounting contrary evidence (including taking management's upbeat comments at face value)	Read research from analysts with opposite views; ask colleagues with no emotional stake

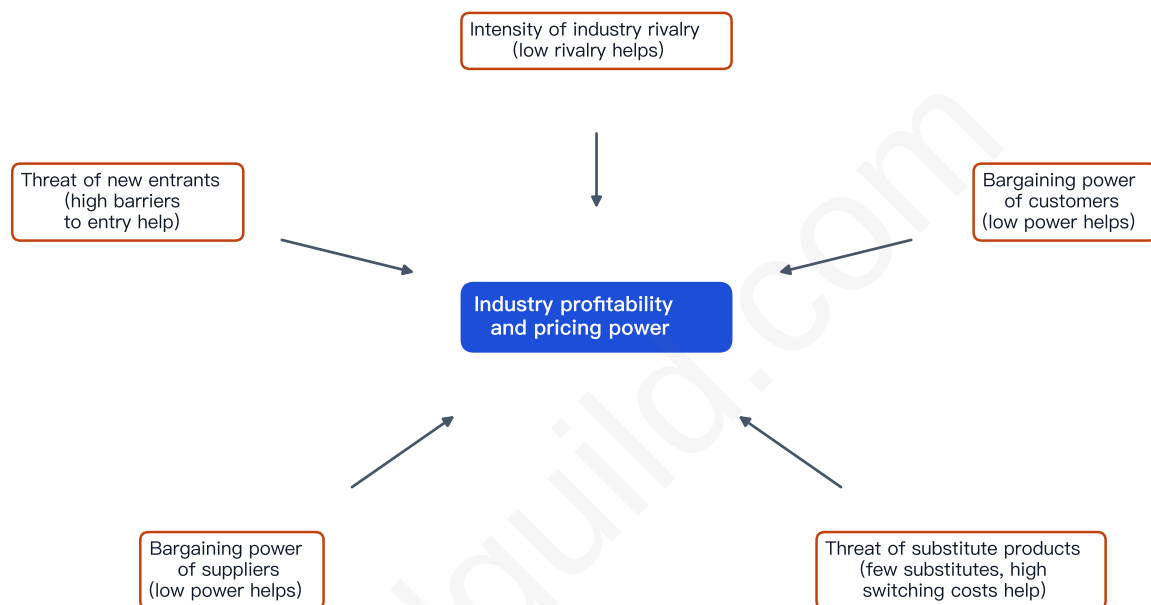
LOS 38.c — Porter's five forces, prices and costs

A firm's competitive position is probably the most important driver of its future revenue and profitability. **Porter's five forces**:

KEY CONCEPT

Force	Pricing power / margins are higher when...
Threat of substitute products	the threat is low and switching costs are high
Intensity of industry rivalry	rivalry is low (rivalry is intense with many competitors, high fixed costs and exit barriers, slow or negative growth, undifferentiated products)

Force	Pricing power / margins are higher when...
Bargaining power of suppliers	supplier power is low (less pressure on input costs; when suppliers are few, they can capture more of the value added)
Bargaining power of customers	customer power is low (not a few large buyers; high switching costs)
Threat of new entrants	the threat is low, i.e., barriers to entry are high, which lets incumbents sustain economic profits



The weaker each of the five forces, the stronger the pricing power and margins.

Porter's five forces

Favorable forces support optimistic revenue and margin forecasts.

LOS 38.d — Forecasting under input-price inflation or deflation

- Hedging with derivatives or fixed-price contracts delays and smooths the effect of input-price changes; **vertical integration** reduces exposure to input costs.
- Without either, the analyst must judge how fast and how far cost increases can be passed on to customers, and the effect of higher prices on volume. Production costs should be tracked by product category and geographic location. Input prices in turn respond to weather, to taxes and other government rules, to tariffs and to the way each input market is structured. The firm's hedging activities and its vertical structure belong in the same review.
- Firms may switch to a substitute input when one input's price rises.
- If input-cost increases are temporary (short term), cutting other costs (e.g., advertising) to protect operating margins can be sensible; for long-term increases this is not appropriate.

- **Elasticity of demand:** with elastic demand, the percentage fall in units exceeds the percentage rise in price, so a price increase reduces revenue. The main influence on elasticity is the availability of substitute products.
- A first mover on price increases loses more volume than a follower; a firm that delays may gain share but suffers lower gross margins in the meantime.

Example. A firm sells units at \$60 with unit COGS of \$36 (gross margin $24/60 = 40\%$). Unit input cost rises by \$3 and the firm raises its price by exactly \$3, with no change in volume. Gross profit per unit stays at \$24, but gross margin falls to $24/63 = 38.1\%$. Passing through the money amount of a cost increase preserves gross and operating profit if volume holds (which is unlikely), but it lowers the gross, operating and net margins because revenue is larger.

LOS 38.e — Forecast horizon and long-term projections

- **Buy-side:** the horizon can be the expected holding period. Average holding period $\approx 1 / \text{annual portfolio turnover}$ (a turnover of 20% gives about 5 years).
- **Cyclical companies:** choose a horizon that reaches at least the middle of the business cycle, so the forecast reflects midcycle sales and profits rather than the current phase. **Normalized earnings** = expected midcycle earnings (or earnings free of temporary effects).
- Acquisitions, mergers and restructurings: the horizon should be long enough for their benefits to be realized (or not). A manager may also dictate the horizon.
- Beyond the short term, a common approach assumes the prior cycle's trend revenue growth continues.
- **Terminal value:** by a multiples approach or a DCF approach. A multiple must be consistent with the expected growth rate and required return. Using a 10-year average P/E assumes the next period's growth and required return will match the past 10 years on average. In a DCF, the earnings or cash flow used should be normalized to a midcycle level free of temporary effects. The terminal value is a growing perpetuity, so small changes in the long-term growth rate have large effects on value.
- **Inflection points** are times when the future will not resemble the past: a shift in the economic environment or in the stage of the business cycle, government regulation, or technology.

COMMON EXAM TRAPS

- Conservatism bias and confirmation bias can both look like sticking to a view. Conservatism is under-reaction to news that has been acknowledged; confirmation bias is selective attention to evidence that agrees with the view.
- Seeking expert opinions to justify a forecast is illusion of control, not a remedy; the remedy is to consult only people with a directly relevant perspective.
- For a cyclical firm, the test is whether the horizon reaches midcycle, not whether it covers one or more full cycles.

BOTTOM LINE

- A sales-based pro forma model starts from the revenue forecast, estimates COGS, SG&A, financing costs and taxes, then the balance sheet and capital expenditures, and derives the pro forma cash flow statement last from the projected income statement and balance sheet.
- Overconfidence bias shows up as confidence intervals that are too narrow and is countered by inviting critique of the forecasts, reviewing past forecast errors and using scenario analysis to produce a range.

- Conservatism bias, also called anchoring, is making only small adjustments to prior forecasts when new information arrives, while confirmation bias is seeking data that support one's view and discounting contrary evidence.
- Illusion of control bias includes seeking expert opinions to justify a view and overfitting a model with ever more variables, and representativeness bias includes base-rate neglect, which is countered by weighing the outside view with the inside view.
- Under Porter's five forces, pricing power and margins are higher when the threat of substitutes, the intensity of rivalry, the bargaining power of suppliers and of customers, and the threat of new entrants are low.
- With elastic demand the percentage fall in units sold exceeds the percentage rise in price, so a price increase reduces revenue, and the main influence on elasticity is the availability of substitutes.
- Passing through the money amount of an input-cost increase preserves gross and operating profit if volume holds, but it lowers the gross, operating and net margins because revenue is larger.
- For a cyclical company the forecast horizon should reach at least the middle of the business cycle, and a terminal value is very sensitive to the long-term growth rate because it is a growing perpetuity.

QUICK CHECK

Question 1

An analyst building sales-based pro forma financial statements will *most likely* carry out which of these tasks first?

- A Building the pro forma cash flow statement.
- B Estimating SG&A expenses.
- C Forecasting capital expenditures and net PP&E.

Answer: B

The income statement is modeled first: revenue, then COGS, then SG&A, financing costs and taxes. Balance sheet items such as capital expenditures and net PP&E come after, and the cash flow statement is built last because it is derived from the pro forma income statement and balance sheet.

Why the other options are wrong

- **A.** The pro forma cash flow statement is the final step; it cannot be constructed until the income statement and balance sheet are complete.
- **C.** Capital expenditures and net PP&E are balance sheet items estimated after the income statement has been modeled.

Key takeaway The order is revenue, COGS, SG&A, financing costs and taxes, then the balance sheet (working capital, capex and PP&E), and finally the cash flow statement.

Practice questions

Question 2

Since finishing her earnings forecast for Brenton Mining, Clara Voss has seen the company announce a new product line and a reorganization of its divisions. She had anticipated some of these developments in her forecast but not others. Nonetheless, she is unwilling to revise her forecast. Voss is *most likely* displaying:

- A confirmation bias.
- B conservatism bias.
- C representativeness bias.

Question 3

Sorrel Audio sells 2,000 speakers a year at \$80 each; unit COGS is \$50 and SG&A is a fixed \$30,000. Next year the input cost per speaker will rise by \$4. Sorrel plans to raise its selling price by exactly \$4 and expects unit sales to be unaffected. Sorrel's gross margin next year is *closest* to:

- A 35.7%.
- B 37.5%.
- C 40.5%.

Question 4

When choosing an explicit forecast horizon for a company whose earnings swing sharply with the economy, an analyst should *most appropriately* extend the forecast:

- A over one year only.
- B far enough to include the middle of the business cycle.
- C far enough to include two complete business cycles.

Answers: 2. B · 3. A · 4. B

Why each answer is right and why each other option is wrong: credguild.com/cfa/level-1/notes/financial-statement-analysis/pro-forma-financial-statements/. The full bank has 23 questions on this reading.

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