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# CPA BAR Study Guide

Business Analysis & Reporting — chapter-by-chapter review

**2026 CPA Exam Blueprint · US GAAP & GASB**

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# How to Use This Guide and the BAR Exam Format

This guide is a chapter-by-chapter review of the **Business Analysis and Reporting (BAR)** discipline section of the Uniform CPA Examination. It follows the same seventeen chapters as the BAR practice bank on UPractice.org, so you can read a chapter and then immediately drill the matching multiple-choice questions and simulations.

BAR builds on FAR. FAR asks whether you can record and report ordinary transactions; BAR goes deeper into the technical areas that FAR only touches (complex revenue contracts, stock compensation, business combinations, derivatives, lessor accounting, EPS and governments) and adds a large block of **business analysis**: ratios, budgeting, cost and managerial accounting, capital budgeting, economics and valuation. If you enjoy numbers and analysis, BAR rewards that.

## The BAR section at a glance

The CPA Exam has three core sections (AUD, FAR, REG) plus one discipline section of your choice (BAR, ISC or TCP). BAR is the reporting-and-analysis discipline.

| Feature | BAR (2026 Blueprints) |
|---|---|
| Testing time | 4 hours |
| Multiple-choice questions (MCQs) | 50, in two testlets of 25 |
| Task-based simulations (TBSs) | 7, in three testlets (2, 3 and 2) |
| Total testlets | 5 |
| Standardized break | 15 minutes, offered after testlet 3 (does not count against your time) |
| Score weighting | MCQs 50%, TBSs 50% |
| Score scale / passing score | 0–99 / 75 |
| Skill levels | Remembering and understanding 10–20%; Application 45–55%; Analysis 30–40% |

BAR has fewer MCQs than FAR, so each MCQ carries more weight, and the analysis share (30–40%) is the highest of the discipline sections. Expect to interpret data, build schedules and compare alternatives rather than recite definitions.

### Content areas and weights

| Blueprint area | Weight | Chapters in this guide |
|---|---|---|
| I. Business Analysis | 40–50% | 1–9 |
| II. Technical Accounting and Reporting | 35–45% | 10–16 |
| III. State and Local Governments | 10–20% | 17 |

Area I covers financial statement analysis, non-GAAP and non-financial performance measures, cost and managerial accounting, variance analysis, budgeting and forecasting, data analytics, capital budgeting, economics, risk management and valuation. Area II covers indefinite-lived intangibles and goodwill, software and R&D, complex revenue recognition, stock compensation, business combinations and consolidations, derivatives and hedging, lessor accounting, and public company reporting (SEC filings, EPS, segments, interim reports). Area III covers governmental funds, the government-wide statements, and the conversion between them.

> **Exam tip:** Area I is the largest block and is almost entirely computational. Formulas you can apply quickly and accurately (variances, CVP, NPV, WACC, ratios) are the fastest points on the exam. Make them automatic first.

## Which standards this guide uses

The guide follows **US GAAP as codified by the FASB** (ASC 606 revenue, ASC 350 intangibles, ASC 718 stock compensation, ASC 805/810 business combinations and consolidation, ASC 815 derivatives, ASC 842 leases, ASC 260 EPS, ASC 270 interim reporting, ASC 280 segments, ASC 820 fair value) and **GASB standards** for state and local governments (the GASB 34 reporting model as amended, including GASB 54 fund balance, GASB 33 nonexchange transactions and GASB 65 deferred inflows and outflows).

The AICPA's policy is that new accounting pronouncements become eligible for testing in the testing period beginning six months after the pronouncement's effective date, or six months after issuance when early application is permitted (in which case both the old and new rules can be tested until the old rule is superseded). Where a recent change matters, the chapter says so: for example, the expanded segment disclosures of ASU 2023-07 (Chapter 16) and the reporting model improvements of GASB Statement No. 103 (Chapter 17).

> **Watch out:** The tax law changes of the One Big Beautiful Bill Act affect only REG and TCP. Where BAR uses a tax rate (after-tax cash flows, WACC, deferred taxes on stock compensation), the rate is given in the question.

## How each chapter is organized

Every chapter follows the same pattern:

1. **Plain-language explanation** of each rule that the bank tests.
2. **Formula and key-number tables** you can copy onto a scratch sheet.
3. **Worked examples** with every step shown. Each figure was computed in code and re-checked before it was printed here.
4. **Journal entries** shown as tables with Account, Debit and Credit columns.
5. **Exam tips, traps and memory tricks** in colored boxes.
6. **Key takeaways** — a short summary to reread the night before the exam.

Callout boxes use four colors: green for exam tips, blue for worked examples, red for common traps and purple for memory tricks.

Present-value factors in examples are rounded to four decimals, and answers are computed from the rounded factors, which is how exam items are built.

## A study plan that works

1. **Start with the calculation chapters of Area I** (1–7). Practice each formula until you can set it up without looking.
2. **Then economics and valuation** (8–9). These mix concepts with short computations (elasticity, CAPM, WACC, bond prices).
3. **Study technical accounting in order** (10–16): revenue, intangibles, stock compensation, business combinations, derivatives, lessor leases, then EPS and SEC reporting. Each chapter leans on journal entries; write them out by hand.
4. **Give governments dedicated time** (17). Learn the fund types, the two measurement focuses, and the reconciliation from fund balance to net position until you can do it from memory.
5. **Read, then drill immediately.** After each chapter, do a timed set of 20–30 MCQs from the matching bank chapter, then at least one simulation.
6. **Take full timed mocks** in the last two weeks and review every missed row by chapter.

## Test-day strategy

- **Budget your time.** About 1.5 minutes per MCQ (roughly 75 minutes for 50 questions) leaves well over two hours for seven simulations.
- **Read the simulation requirement first**, then the exhibits. You will know which numbers matter and can skip distractor data.
- **Write the formula before the numbers.** NPV, DOL, WACC, EPS and variance formulas have sign and base traps; writing the formula first prevents most of them.

- **Label units.** Variances need "per unit of input" versus "per unit of output"; CVP needs units versus dollars; ratios need year-end versus average balances.
- **Answer every cell.** Simulations give credit row by row; a blank earns nothing and there is no penalty for guessing.
- **Use the calculator and spreadsheet tools** in the exam software for long schedules, but keep the structure on your scratch sheet.

> **Memory trick:** "Read the ask, then the facts." In simulations, the question tells you which exhibit matters; the exhibits are full of data you will never use.

## Key takeaways

- BAR: 4 hours, 50 MCQs (2 × 25) and 7 TBSs (2, 3, 2), 50/50 weighting, passing score 75.
- Areas: Business Analysis 40–50%, Technical Accounting and Reporting 35–45%, State and Local Governments 10–20%.
- Skill mix is application- and analysis-heavy; practice computations, not just definitions.
- Each chapter: explanation, formula tables, worked examples, journal entries, tips and traps, takeaways. Read a chapter, then drill the matching bank chapter right away.

# 1. Financial Statement Analysis and Ratios

Ratio analysis converts raw financial statement amounts into measures that can be compared across years, against budgets and against competitors. BAR tests three skills: computing ratios correctly, explaining what a change in a ratio means, and predicting how a transaction moves a ratio. You will also see horizontal and vertical (common-size) analysis and questions on non-GAAP and non-financial measures.

## The five ratio families

| Family | Question it answers | Typical users |
|---|---|---|
| Liquidity | Can the company pay obligations due within a year? | Suppliers, short-term lenders |
| Solvency (leverage) | Can it meet long-term obligations and survive a downturn? | Long-term lenders, bondholders |
| Activity (efficiency) | How quickly do assets turn into sales and cash? | Management, lenders |
| Profitability | How much profit does it earn on sales, assets and equity? | Investors, management |
| Market | How does the market price the shares relative to earnings, dividends and book value? | Equity investors |

**Exam tip:** Before computing anything, name the family. A question about a short-term lender points to liquidity; a question about a bondholder points to solvency; a question about stockholders points to profitability or market ratios.

## Balance conventions

- **Point-in-time ratios** (current, quick, debt ratios) use **year-end balances**.
- **Flow-to-stock ratios** (turnovers, return on assets, return on equity) divide a full-year income-statement amount by the **average** balance, (beginning + ending) ÷ 2, unless the question says otherwise.

## Liquidity ratios

| Ratio | Formula |
|---|---|
| Current ratio | Current assets ÷ current liabilities |
| Quick (acid-test) ratio | (Cash + marketable securities + net receivables) ÷ current liabilities |
| Cash ratio | (Cash + marketable securities) ÷ current liabilities |
| Working capital | Current assets − current liabilities (a dollar amount, not a ratio) |
| Operating cash flow ratio | Cash flow from operations ÷ current liabilities |

The quick ratio leaves out inventory and prepaid expenses because they are not quickly converted to cash. The quick ratio can never exceed the current ratio.

> **Memory trick:** "Quick" assets are **CMR**: Cash, Marketable securities, Receivables.

## Activity ratios and the cash conversion cycle

| Ratio | Formula |
|---|---|
| Receivables turnover | Net credit sales ÷ average net receivables |
| Days sales outstanding (DSO) | 365 ÷ receivables turnover |
| Inventory turnover | Cost of goods sold ÷ average inventory |
| Days inventory outstanding (DIO) | 365 ÷ inventory turnover |
| Payables turnover | Purchases (or COGS, if told) ÷ average accounts payable |
| Days payables outstanding (DPO) | 365 ÷ payables turnover |
| Cash conversion cycle | DSO + DIO − DPO |
| Total asset turnover | Sales ÷ average total assets |

Purchases are rarely given directly: **purchases = COGS + ending inventory − beginning inventory**. Some questions use a 360-day year; use whatever the item states.

## Solvency ratios

| Ratio | Formula |
|---|---|
| Debt ratio | Total liabilities ÷ total assets |
| Debt-to-equity | Total liabilities ÷ total equity |
| Equity multiplier | Total assets ÷ total equity |
| Times interest earned | EBIT ÷ interest expense |
| Fixed charge coverage | (EBIT + fixed charges such as lease payments) ÷ (interest + fixed charges) |

## Profitability and market ratios

| Ratio | Formula |
|---|---|
| Gross margin | Gross profit ÷ net sales |
| Operating margin | Operating income ÷ net sales |
| Net profit margin | Net income ÷ net sales |
| Return on assets (ROA) | Net income ÷ average total assets |
| Return on equity (ROE) | Net income ÷ average equity (use common equity and income available to common if preferred stock exists) |
| Earnings per share | (Net income − preferred dividends) ÷ weighted-average common shares |
| Price-earnings ratio | Market price per share ÷ EPS |
| Dividend payout | Common dividends per share ÷ EPS |
| Dividend yield | Dividends per share ÷ market price per share |
| Book value per common share | (Total equity − preferred liquidation value − preferred dividends in arrears) ÷ common shares outstanding |

## Worked example: a full ratio set

**Example:** Larkspur Co. reports (all sales on credit):

| Item | Beginning | Ending |
|---|---|---|
| Cash | | $40,000 |
| Marketable securities | | $20,000 |
| Accounts receivable | $70,000 | $90,000 |
| Inventory | $100,000 | $120,000 |
| Prepaid expenses | | $10,000 |
| Total assets | $700,000 | $800,000 |
| Current liabilities | | $140,000 |
| Accounts payable | $50,000 | $60,000 |
| Total liabilities | | $350,000 |
| Total equity | $400,000 | $450,000 |

Sales $1,200,000; COGS $720,000; EBIT $150,000; interest $25,000; tax rate 25%; preferred dividends $3,750; 50,000 common shares; price $27.

1. Current assets = 40,000 + 20,000 + 90,000 + 120,000 + 10,000 = $280,000. Current ratio = 280,000 ÷ 140,000 = **2.0**.
2. Quick ratio = (40,000 + 20,000 + 90,000) ÷ 140,000 = **1.07**.
3. Receivables turnover = 1,200,000 ÷ 80,000 = **15.0**; DSO = 365 ÷ 15 = **24.3 days**.
4. Inventory turnover = 720,000 ÷ 110,000 = **6.55**; DIO = 365 ÷ 6.545 = **55.8 days**.
5. Purchases = 720,000 + 120,000 − 100,000 = $740,000. Payables turnover = 740,000 ÷ 55,000 = **13.45**; DPO = **27.1 days**.
6. Cash conversion cycle = 24.3 + 55.8 − 27.1 = **about 53 days**.
7. Net income = (150,000 − 25,000) × 75% = $93,750. EPS = (93,750 − 3,750) ÷ 50,000 = **$1.80**; P/E = 27 ÷ 1.80 = **15**.
8. Times interest earned = 150,000 ÷ 25,000 = **6.0**. Debt-to-equity = 350,000 ÷ 450,000 = **0.78**; debt ratio = 350,000 ÷ 800,000 = **0.44**.

## DuPont analysis

DuPont breaks ROE into three drivers so you can see **why** ROE changed:

**ROE = Net profit margin × Total asset turnover × Equity multiplier** = (NI ÷ Sales) × (Sales ÷ Average assets) × (Average assets ÷ Average equity)

The first two terms multiply to ROA. The equity multiplier shows how much leverage magnifies ROA into ROE.

**Example:** Using Larkspur: net profit margin = 93,750 ÷ 1,200,000 = 7.8125%; asset turnover = 1,200,000 ÷ 750,000 = 1.60; equity multiplier = 750,000 ÷ 425,000 = 1.7647.

ROA = 7.8125% × 1.60 = **12.5%**. ROE = 12.5% × 1.7647 = **22.06%**, which equals 93,750 ÷ 425,000 directly.

**Memory trick:** DuPont = "**Profit × Speed × Leverage**."

**Exam tip:** If ROE rose but margin and turnover were flat, the increase came from more leverage (a higher equity multiplier), which also means more financial risk.

## How transactions move ratios

Change both sides of the ratio and recompute; do not reason in your head.

| Transaction | Current ratio above 1.0 | Current ratio below 1.0 |
|---|---|---|
| Pay a current liability with cash (equal decrease to both) | Increases | Decreases |
| Borrow short-term cash (equal increase to both) | Decreases | Increases |
| Collect a receivable | No change | No change |
| Buy inventory on account | Decreases | Increases |
| Buy equipment for cash | Decreases | Decreases |
| Issue long-term debt for cash | Increases | Increases |
| Reclassify long-term debt as current | Decreases | Decreases |
| Write off a receivable against the allowance | No change | No change |

**Example:** Larkspur's current ratio is 280,000 ÷ 140,000 = 2.0. It pays $40,000 of accounts payable with cash: (280,000 − 40,000) ÷ (140,000 − 40,000) = 240,000 ÷ 100,000 = **2.4**. Had the starting ratio been 80,000 ÷ 100,000 = 0.8, the same payment would give 40,000 ÷ 60,000 = **0.67**.

**Watch out:** Adding the same amount to both sides moves a ratio **toward 1.0**; subtracting the same amount from both sides moves it **away from 1.0**. The direction therefore depends on whether the ratio starts above or below 1.0. The safe rule: recompute.

## Book value per common share

**Example:** Total stockholders' equity is $900,000. Preferred stock: 1,000 shares, $100 par, 6% cumulative, liquidation value $105 per share, dividends two years in arrears. 60,000 common shares outstanding.

1. Preferred liquidation value = 1,000 × $105 = $105,000.
2. Dividends in arrears = 2 × (6% × $100,000) = $12,000.
3. Common equity = 900,000 − 105,000 − 12,000 = $783,000.
4. Book value per common share = 783,000 ÷ 60,000 = **$13.05**.

## Horizontal and vertical analysis

- **Horizontal analysis** compares the same line across periods: % change = (current − base) ÷ base. Trend analysis indexes several years to a base year of 100.
- **Vertical (common-size) analysis** expresses each line as a percentage of a base in the same period: sales on the income statement, total assets on the balance sheet. It allows comparison of companies of different sizes.

**Example:** Sales grew from $1,000,000 to $1,150,000 (+15.0%) while COGS grew from $600,000 to $713,000 (+18.8%). Common-size gross margin fell from 40% to (1,150,000 − 713,000) ÷ 1,150,000 = **38%**. Costs grew faster than sales, so the margin was squeezed.

## Non-GAAP and non-financial measures

- **EBITDA** (earnings before interest, taxes, depreciation and amortization) and **adjusted EBITDA** are non-GAAP measures that approximate operating cash generation. **Free cash flow** is usually operating cash flow minus capital expenditures (definitions vary).
- When a registrant presents a non-GAAP measure, SEC rules (Regulation G and Item 10(e) of Regulation S-K) require the most directly comparable GAAP measure to be presented and a reconciliation to it. In filings, the GAAP measure must be shown with equal or greater prominence.
- **Non-financial measures** (customer retention, defect rates, on-time delivery, employee turnover) are leading indicators; they often change before financial results

do. They connect to the balanced scorecard (Chapter 4).

## Limitations of ratio analysis

- Different accounting methods (FIFO vs. LIFO, depreciation methods) distort comparisons.
- Year-end balances may be window-dressed or seasonal.
- Inflation and historical cost reduce comparability over time.
- A ratio has meaning only against a benchmark: prior years, budget, industry averages or competitors.

## Common traps

- Using sales instead of COGS for inventory turnover.
- Using year-end instead of average balances for turnovers and returns (or the reverse for liquidity ratios).
- Including inventory or prepaids in the quick ratio.
- Leaving preferred dividends in the EPS numerator, or forgetting dividends in arrears in book value per share.
- Assuming an equal change to both sides always raises (or lowers) the current ratio.

## Key takeaways

- Identify the ratio family first; liquidity uses year-end balances, turnovers and returns use averages.
- Cash conversion cycle = DSO + DIO − DPO; purchases = COGS + ending inventory − beginning inventory.
- ROE = margin × turnover × equity multiplier; ROA × equity multiplier = ROE.
- For transaction effects, change both sides and recompute.
- Book value per common share deducts the preferred liquidation value and any cumulative dividends in arrears.
- Non-GAAP measures need reconciliation to the most comparable GAAP measure.

# 2. Budgeting, Forecasting and Data Analytics

Budgets translate strategy into numbers, and forecasts estimate what will happen next. BAR tests the mechanics of the master budget (production, purchases, cash collections, the cash budget), flexible budgets, cost-estimation methods (high-low and regression) and the vocabulary of data analytics.

## The master budget

The master budget is a set of linked budgets. Almost everything flows from the **sales forecast**.

| Order | Budget | Key formula or content |
|---|---|---|
| 1 | Sales budget | Units × price; drives everything else |
| 2 | Production budget | Sales + desired ending finished goods − beginning finished goods |
| 3 | Direct materials budget | Production needs + desired ending materials − beginning materials = purchases |
| 4 | Direct labor budget | Production × hours per unit × rate |
| 5 | Manufacturing overhead budget | Variable rate × activity + fixed overhead |
| 6 | Ending inventory and COGS budgets | Unit costs × units |
| 7 | Selling and administrative budget | Variable and fixed S&A |
| 8 | Cash budget | Collections and disbursements; financing needed |
| 9 | Budgeted income statement and balance sheet | Pulls the pieces together |

The sales budget, production budget and the other operating budgets make up the **operating budget**; the cash budget, capital expenditures budget and budgeted balance sheet make up the **financial budget**.

> **Memory trick:** Every inventory budget follows "**Need + End − Begin**."

### Production and purchases

**Example:** Corbel Co. expects to sell 10,000 units in Q1, 12,000 in Q2 and 15,000 in Q3. Desired ending finished goods equal 20% of next quarter's sales; Q1 begins with 2,000 units. Each unit needs 3 pounds of material at $2 per pound. Desired ending materials equal 25% of next quarter's production needs; Q1 begins with 7,000 pounds.

1. Q1 production = 10,000 + (20% × 12,000) − 2,000 = **10,400 units**.
2. Q2 production = 12,000 + (20% × 15,000) − 2,400 = 12,600 units.
3. Q1 materials needed = 10,400 × 3 = 31,200 pounds.
4. Desired ending materials = 25% × (12,600 × 3) = 9,450 pounds.
5. Q1 purchases = 31,200 + 9,450 − 7,000 = **33,650 pounds**, costing 33,650 × $2 = **$67,300**.

**Watch out:** Materials purchases are based on **production**, not sales. And the ending-materials target uses next quarter's **production** needs, which requires you to compute next quarter's production first.

### Cash collections

Write the collection pattern down by month of sale, and remember that uncollectible amounts are never collected.

**Example:** Sales are January $100,000, February $120,000 and March $150,000. Customers pay 30% in the month of sale, 60% in the following month and 8% in the second month after sale; 2% is uncollectible.

| Source | March collections |
|---|---|
| March sales: 30% × $150,000 | $45,000 |
| February sales: 60% × $120,000 | $72,000 |
| January sales: 8% × $100,000 | $8,000 |
| Total | **$125,000** |

Disbursements for purchases work the same way (for example, 40% paid in the month of purchase and 60% the next month). Discounts taken reduce the cash paid.

### The cash budget

| Line | |
|---|---|
| Beginning cash balance | |
| + Cash collections | |
| = Cash available | |
| − Cash disbursements (purchases, wages, overhead, S&A, taxes, capital expenditures, dividends) | Exclude depreciation and other noncash expenses |
| = Excess (deficiency) before financing | |
| + Borrowing / − repayments and interest | Keep the minimum balance; borrow in required increments |
| = Ending cash balance | |

**Example:** Beginning cash is $15,000, collections are $125,000 and cash disbursements are $148,000 (depreciation of $6,000 is excluded). Policy requires a $10,000 minimum balance; borrowing is in multiples of $5,000.

1. Cash before financing = 15,000 + 125,000 − 148,000 = **−$8,000**.
2. Needed to reach the minimum = 10,000 − (−8,000) = $18,000.
3. Round up to the next $5,000 multiple: borrow **$20,000**.
4. Ending cash = −8,000 + 20,000 = **$12,000**.

## Static versus flexible budgets

A **static budget** is prepared for one planned activity level. A **flexible budget** restates revenues and costs at the **actual** activity level: variable items are scaled to actual volume and fixed items stay the same (within the relevant range). Comparing actual results with a flexible budget isolates spending and efficiency, rather than mixing them with volume.

**Example:** The static budget assumed 10,000 units with variable costs of $12 per unit and fixed costs of $50,000 (total $170,000). Actual output was 11,000 units and actual costs were $186,000.

1. Flexible budget = 11,000 × $12 + $50,000 = **$182,000**.
2. Flexible-budget variance = 186,000 − 182,000 = **$4,000 unfavorable**.
3. A static comparison (186,000 − 170,000 = $16,000 unfavorable) wrongly blames the manager for the cost of producing 1,000 more units.

### Budgeting approaches

| Approach | Description |
|---|---|
| Incremental | Prior year plus or minus a change; quick but carries forward inefficiencies |
| Zero-based | Every expense justified from zero each period |
| Activity-based | Budget built from activities and their cost drivers |
| Continuous (rolling) | A new period is added as each period ends, so the budget always covers, for example, 12 months ahead |
| Kaizen | Builds continuous improvement (cost reductions) into the budget |
| Participative | Managers who must meet the budget help prepare it; better buy-in, risk of budgetary slack |

## Cost estimation

### High-low method

1. Choose the periods with the **highest and lowest activity** (not the highest and lowest cost).
2. Variable cost per unit of activity = (cost at high − cost at low) ÷ (high activity − low activity).
3. Fixed cost = total cost at either point − variable rate × activity at that point.

**Example:** Maintenance cost data:

| Month | Machine hours | Cost |
|---|---|---|
| March | 3,000 (lowest activity) | $52,000 |
| April | 7,000 (highest activity) | $72,000 |
| May | 5,500 | $78,000 (highest cost) |

1. Variable rate = (72,000 − 52,000) ÷ (7,000 − 3,000) = **$5.00 per machine hour**.
2. Fixed cost = 72,000 − (5.00 × 7,000) = **$37,000** per month.
3. Predicted cost at 6,000 hours = 37,000 + 5.00 × 6,000 = **$67,000**.

May is ignored even though it has the highest cost: high-low uses the activity extremes.

### Regression analysis

Least-squares regression fits **y = a + bx** using all data points. In a cost model, **a** (the intercept) estimates fixed cost and **b** (the slope) estimates the variable cost per unit of the driver.

| Output | Meaning |
|---|---|
| Intercept (a) | Estimated fixed cost (cost when activity is zero, within the relevant range) |
| Slope coefficient (b) | Change in cost for a one-unit change in the driver |
| $R^2$ (coefficient of determination) | Share of the variation in y explained by x; 0 to 1, higher is a better fit |
| Correlation coefficient (r) | Strength and direction of the linear relationship; −1 to +1 |
| Standard error / t-statistic / p-value | Reliability of a coefficient; a t-statistic above about 2 (p-value below 0.05) suggests the coefficient is significant |

Multiple regression uses more than one independent variable ($y = a + b_1x_1 + b_2x_2 \ldots$). Correlation does not prove causation, and predictions outside the relevant range are unreliable.

> **Example:** Regression output: cost = \$24,500 + \$3.20 × direct labor hours, $R^2 = 0.86$. At 5,000 hours, predicted cost = 24,500 + 3.20 × 5,000 = **\$40,500**. Labor hours explain 86% of the variation in cost.

### Other forecasting tools

- **Learning curve:** each time cumulative output doubles, the cumulative average time per unit (cumulative average model) falls to a fixed percentage of its previous level. With an 80% curve, if the first unit takes 100 hours, the average for 2 units is 80 hours and for 4 units 64 hours.
- **Time-series methods:** moving averages, exponential smoothing and trend lines project past patterns; they assume the pattern continues.
- **Sensitivity analysis and scenario analysis** test how outputs change when key assumptions change.

## Data analytics

| Type | Question answered | Example |
|---|---|---|
| Descriptive | What happened? | Monthly sales dashboard |
| Diagnostic | Why did it happen? | Drill-down showing a region drove the drop |
| Predictive | What is likely to happen? | Regression forecast of next quarter's demand |
| Prescriptive | What should we do? | Optimization model recommending a price |

> **Memory trick:** The analytics ladder climbs from **What → Why → What next → What to do**.

Good analysis also depends on data quality (accuracy, completeness, timeliness, consistency) and on choosing the right visualization: line charts for trends over time, bar charts for comparing categories, scatter plots for relationships between two variables, and histograms for distributions.

## Common traps

- Picking the highest- and lowest-cost months in high-low instead of the activity extremes.
- Basing material purchases on sales instead of production.
- Scaling fixed costs up or down in a flexible budget.
- Including depreciation or other noncash expenses in the cash budget.
- Collecting the uncollectible percentage.
- Borrowing only the exact shortfall when the policy requires increments.

## Key takeaways

- Master budget order: sales → production → materials, labor, overhead → cash budget → budgeted statements.
- Inventory budgets: need + desired ending − beginning.
- Flexible budgets scale variable costs to actual output; fixed costs stay the same.
- High-low uses activity extremes; regression's intercept is fixed cost, slope is the variable rate, $R^2$ measures fit.
- Analytics types: descriptive, diagnostic, predictive, prescriptive.

# 3. Cost Accounting: Job, Process and ABC

Cost accounting assigns manufacturing costs to products so that inventory and cost of goods sold can be measured and pricing decisions can be made. BAR tests overhead application, job-order and process costing (weighted-average and FIFO equivalent units), activity-based costing, absorption versus variable costing, joint products, spoilage and the cost of goods manufactured schedule.

## Cost vocabulary

| Term | Meaning |
|---|---|
| Direct materials (DM) | Materials traceable to the product |
| Direct labor (DL) | Labor traceable to the product |
| Manufacturing overhead (MOH) | All other production costs (indirect materials, indirect labor, factory rent, utilities, depreciation) |
| Prime cost | DM + DL |
| Conversion cost | DL + MOH |
| Product (inventoriable) cost | DM + DL + MOH; expensed as COGS when sold |
| Period cost | Selling and administrative costs; expensed when incurred |
| Relevant range | Activity range over which cost behavior (fixed vs. variable) holds |

## Cost of goods manufactured and sold

| Step | Amount |
|---|---|
| Beginning raw materials + purchases − ending raw materials | = Direct materials used |
| + Direct labor | |
| + Manufacturing overhead applied | |
| = Total manufacturing costs added this period | |
| + Beginning WIP − ending WIP | = Cost of goods manufactured (COGM) |
| + Beginning finished goods − ending finished goods | = Cost of goods sold (before overhead adjustment) |

**Example:** Beginning materials $15,000, purchases $120,000, ending materials $20,000; direct labor $90,000; overhead applied $75,000; beginning WIP $30,000, ending WIP $25,000; beginning finished goods $40,000, ending finished goods $45,000.

1. Materials used = 15,000 + 120,000 − 20,000 = $115,000.
2. Total manufacturing costs = 115,000 + 90,000 + 75,000 = $280,000.
3. COGM = 280,000 + 30,000 − 25,000 = **$285,000**.
4. COGS = 285,000 + 40,000 − 45,000 = **$280,000**.

## Applying overhead

Overhead is applied during the year with a **predetermined overhead rate** set at the start of the year:

**Predetermined rate = budgeted overhead ÷ budgeted activity (cost driver)**
**Applied overhead = predetermined rate × actual activity**

| Result | Meaning | Typical disposition |
|---|---|---|
| Actual > applied | **Underapplied** overhead | Debit (increase) COGS if immaterial |
| Applied > actual | **Overapplied** overhead | Credit (decrease) COGS if immaterial |

If material, the difference is prorated among WIP, finished goods and COGS.

**Example:** Budgeted overhead is $600,000 and budgeted direct labor hours are 40,000, so the rate is **$15 per DLH**. Actual hours are 42,000 and actual overhead is $615,000.

1. Applied = 42,000 × $15 = $630,000.
2. Applied exceeds actual by **$15,000: overapplied**. If immaterial, COGS is reduced by $15,000.

| Account | Debit | Credit |
|---|---|---|
| Manufacturing overhead | 15,000 | |
| Cost of goods sold | | 15,000 |

## Job-order costing

Job-order costing is used when products are distinct (custom furniture, audits, construction). Each job's cost sheet collects DM, DL and applied overhead.

**Example:** Job 17 used $8,000 of materials and 400 direct labor hours at $22 per hour. Overhead is applied at $15 per DLH. The job produced 200 units.

| Cost | Amount |
|---|---|
| Direct materials | $8,000 |
| Direct labor (400 × $22) | $8,800 |
| Applied overhead (400 × $15) | $6,000 |
| Total job cost | **$22,800** |
| Cost per unit (÷ 200) | **$114** |

## Process costing

Process costing is used for homogeneous units moving through departments (chemicals, beverages). Costs are averaged over **equivalent units (EU)**: the number of complete units that the work done represents.

### The five steps

1. Track physical units (units to account for = beginning WIP + started).
2. Compute equivalent units for each cost category (materials and conversion separately, because they are added at different points).
3. Compute cost per equivalent unit.
4. Assign costs to units completed and to ending WIP.
5. Reconcile costs assigned with costs to account for.

### Weighted-average versus FIFO

| | Weighted-average | FIFO |
|---|---|---|
| Equivalent units | Units completed + EU in ending WIP | Units completed + EU in ending WIP − EU already in beginning WIP |
| Costs used | Beginning WIP cost + current costs | Current-period costs only |
| Meaning | Blends last period's and this period's work | Measures only this period's work and cost |

**Memory trick:** FIFO = weighted-average EU **minus the work done last period** on beginning WIP.

**Example:** Department A adds materials at the **start** of the process. Beginning WIP: 2,000 units, 60% complete for conversion, costs DM $10,000 and conversion $6,600. Started 18,000 units; completed 16,000; ending WIP 4,000 units, 25% complete. Current costs: DM $90,000, conversion $163,400.

**Weighted-average**

| | Materials | Conversion |
|---|---|---|
| Completed | 16,000 | 16,000 |
| Ending WIP (4,000 × 100% / 25%) | 4,000 | 1,000 |
| Equivalent units | 20,000 | 17,000 |
| Costs (beginning + current) | $100,000 | $170,000 |
| Cost per EU | $5.00 | $10.00 |

Completed: 16,000 × $15.00 = **$240,000**. Ending WIP: 4,000 × $5 + 1,000 × $10 = **$30,000**. Total $270,000 equals all costs to account for (10,000 + 6,600 + 90,000 + 163,400).

**FIFO**

| | Materials | Conversion |
|---|---|---|
| Weighted-average EU | 20,000 | 17,000 |
| − EU in beginning WIP (2,000 × 100% / 60%) | (2,000) | (1,200) |
| FIFO equivalent units | 18,000 | 15,800 |
| Current costs | $90,000 | $163,400 |
| Cost per EU | $5.00 | $10.3418 |

Completed: beginning WIP cost $16,600 + conversion to finish it (2,000 × 40% = 800 EU × $10.3418 = $8,273) + 14,000 started and completed × $15.3418 ($214,785) = **$239,658**. Ending WIP: 4,000 × $5 + 1,000 × $10.3418 = **$30,342**. Total $270,000.

**Watch out:** When materials are added at the start, ending WIP is 100% complete for materials regardless of its conversion percentage. Do not apply the conversion percentage to materials.

### Transferred-in costs and spoilage

- Costs transferred in from a prior department are treated like materials added at the start (100% complete).

- **Normal spoilage** (expected under efficient operations) is a product cost absorbed by good units. **Abnormal spoilage** (beyond expected levels) is a **period loss**, recognized separately.

## Activity-based costing (ABC)

Traditional costing uses one plant-wide driver (labor or machine hours). ABC assigns overhead to **activity cost pools** and uses a separate **cost driver** for each: number of setups, inspections, purchase orders, machine hours.

| Activity level | Examples |
|---|---|
| Unit-level | Machine power, inspection of every unit |
| Batch-level | Setups, purchase orders, material handling per batch |
| Product-sustaining | Product design, engineering changes |
| Facility-sustaining | Plant management, building depreciation (often not assigned to products) |

**Example:** Overhead of $500,000 is pooled into setups $200,000 (100 setups), inspections $120,000 (600 inspections) and machining $180,000 (9,000 machine hours). Standard: 10,000 units, 20 setups, 100 inspections, 6,000 MH. Deluxe: 2,000 units, 80 setups, 500 inspections, 3,000 MH.

Activity rates: $2,000 per setup, $200 per inspection, $20 per MH.

| | Standard | Deluxe |
|---|---|---|
| Setups | 20 × 2,000 = $40,000 | 80 × 2,000 = $160,000 |
| Inspections | 100 × 200 = $20,000 | 500 × 200 = $100,000 |
| Machining | 6,000 × 20 = $120,000 | 3,000 × 20 = $60,000 |
| Total ABC overhead | $180,000 | $320,000 |
| Per unit | **$18.00** | **$160.00** |

Under a single machine-hour rate ($500,000 ÷ 9,000 = $55.56 per MH), Standard would get $333,333 ($33.33 per unit) and Deluxe $166,667 ($83.33 per unit). Traditional costing overcosts the high-volume product and undercosts the low-volume, complex one.

**Exam tip:** ABC typically shifts overhead **toward low-volume, complex products**, because batch- and product-level costs do not vary with units.

## Absorption versus variable costing

| | Absorption (GAAP, tax) | Variable (direct) costing (internal) |
|---|---|---|
| Fixed manufacturing overhead | Product cost (inventoried) | Period cost (expensed) |
| Income statement format | Gross margin | Contribution margin |
| Effect on income | Depends on production and sales | Depends only on sales |

**Absorption income − variable income = (change in inventory units) × fixed MOH per unit**

When production exceeds sales, inventory rises and absorption income is higher; when sales exceed production, variable income is higher.

**Example:** Production 10,000 units, sales 8,000 units at $50. Variable manufacturing cost $18 per unit, variable selling $2 per unit, fixed MOH $200,000 ($20 per unit produced), fixed S&A $60,000. No beginning inventory.

| Variable costing | | Absorption costing | |
|---|---|---|---|
| Sales | $400,000 | Sales | $400,000 |
| Variable costs (8,000 × $20) | (160,000) | COGS (8,000 × $38) | (304,000) |
| Contribution margin | 240,000 | Gross margin | 96,000 |
| Fixed MOH | (200,000) | Variable selling | (16,000) |
| Fixed S&A | (60,000) | Fixed S&A | (60,000) |
| Operating income | **($20,000)** | Operating income | **$20,000** |

Difference = 2,000 units added to inventory × $20 = **$40,000**, the fixed overhead deferred in ending inventory under absorption costing.

**Throughput (super-variable) costing** treats only direct materials as inventoriable; all other costs are period costs.

## Joint products and by-products

Joint costs are incurred before the **split-off point**. They are allocated (for inventory valuation only) using:

- **Physical units**, **relative sales value at split-off**, or **net realizable value (NRV)** = final sales value − separable costs after split-off.

**Example:** Joint cost is $60,000. Product A: 4,000 units, sales value after processing $100,000, separable costs $30,000 (NRV $70,000). Product B: 6,000 units, NRV $80,000.

| Method | A | B |
|---|---|---|
| NRV (70,000 / 80,000 of 150,000) | **$28,000** | **$32,000** |
| Physical units (40% / 60%) | $24,000 | $36,000 |

By-products have small sales value. They are usually accounted for by reducing the joint cost (or cost of goods sold) by their NRV, or by recognizing revenue when sold.

## Common traps

- Applying the conversion percentage to materials added at the start.
- Mixing weighted-average and FIFO (using beginning WIP costs in FIFO, or subtracting beginning WIP EU in weighted-average).
- Using purchases instead of materials used in COGM.
- Calling actual > applied "overapplied."
- Treating abnormal spoilage as a product cost.
- Using joint cost allocations in sell-or-process-further decisions (Chapter 6).

## Key takeaways

- Predetermined rate = budgeted OH ÷ budgeted activity; applied = rate × actual activity.
- Weighted-average EU = completed + ending WIP EU; FIFO subtracts beginning WIP EU and uses current costs only.
- ABC uses multiple drivers and usually raises the cost of low-volume, complex products.
- Absorption − variable income = change in inventory units × fixed MOH per unit.
- Joint costs: physical units, relative sales value or NRV; normal spoilage is a product cost, abnormal is a period loss.

# 4. Variance Analysis and Performance Measures

Standard costing compares actual results with predetermined standards so that managers can see **where** and **why** results differ from plan. BAR tests the materials, labor and overhead variances, sales variances, and the performance measures used to evaluate managers and divisions: ROI, residual income, EVA, the balanced scorecard and transfer pricing.

## Standards and the variance framework

A **standard cost** is what a unit of output should cost: standard quantity of input per unit × standard price per input. Every input variance splits into a **price** part and a **quantity** part.

| Column | Actual quantity × Actual price | Actual quantity × Standard price | Standard quantity allowed × Standard price |
|---|---|---|---|
| | AQ × AP | AQ × SP | SQ × SP |
| Variance between columns | ← Price (rate, spending) → | ← Quantity (usage, efficiency) → | |

- **Price variance = (AP − SP) × AQ**
- **Quantity variance = (AQ − SQ) × SP**
- **SQ (standard quantity allowed) = actual output × standard input per unit.** Always use **actual output**, never budgeted output.

Positive results are **unfavorable** (actual exceeds standard); negative results are **favorable**.

> **Memory trick:** "Price uses Actual quantity; Quantity uses Standard price." The price variance is measured at what you actually bought or used; the quantity variance is measured at standard cost so price effects do not leak into it.

## Direct materials

The materials price variance is usually isolated **at purchase** (AQ purchased), while the quantity variance uses AQ **used**.

**Example:** Standard: 4 pounds per unit at $3.00 per pound. Actual output 5,000 units. Purchased 22,000 pounds at $3.10; used 21,000 pounds.

1. Materials price variance = ($3.10 − $3.00) × 22,000 = **$2,200 U**.
2. SQ allowed = 5,000 × 4 = 20,000 pounds.
3. Materials quantity variance = (21,000 − 20,000) × $3.00 = **$3,000 U**.

Journal entry at purchase (materials carried at standard):

| Account | Debit | Credit |
|---|---|---|
| Raw materials (22,000 × $3.00) | 66,000 | |
| Materials price variance | 2,200 | |
| Accounts payable (22,000 × $3.10) | | 68,200 |

Journal entry when materials are used:

| Account | Debit | Credit |
|---|---|---|
| Work in process (20,000 × $3.00) | 60,000 | |
| Materials quantity variance | 3,000 | |
| Raw materials (21,000 × $3.00) | | 63,000 |

## Direct labor

- **Labor rate variance = (AR − SR) × AH**
- **Labor efficiency variance = (AH − SH) × SR**

**Example:** Standard: 2 hours per unit at $20 per hour. Actual output 5,000 units; actual hours 9,800; actual payroll $205,800 (AR = $21.00).

1. SH allowed = 5,000 × 2 = 10,000 hours.
2. Rate variance = ($21 − $20) × 9,800 = **$9,800 U**.
3. Efficiency variance = (9,800 − 10,000) × $20 = **$4,000 F**.
4. Total labor variance = 205,800 − (10,000 × $20) = $5,800 U (= 9,800 U − 4,000 F).

A **mix and yield** analysis splits the efficiency variance when inputs can substitute for each other (for example, senior and junior staff).

## Variable overhead

Variable overhead is applied on a driver (here DLH), so its variances mirror labor:

- **VOH spending variance = actual VOH − (AH × standard VOH rate)**
- **VOH efficiency variance = (AH − SH) × standard VOH rate**

**Example:** Standard VOH rate $6 per DLH; actual VOH $60,500; AH 9,800; SH 10,000.

1. Spending variance = 60,500 − (9,800 × $6 = 58,800) = **$1,700 U**.
2. Efficiency variance = (9,800 − 10,000) × $6 = **$1,200 F**.

**Exam tip:** The VOH efficiency variance says nothing about overhead itself; it simply reflects how efficiently the **driver** (labor hours) was used. If labor efficiency is favorable, VOH efficiency is favorable too.

## Fixed overhead

Fixed overhead does not change with output, so it has no efficiency variance. Instead:

- **Budget (spending) variance = actual FOH − budgeted FOH**
- **Volume (production-volume) variance = budgeted FOH − applied FOH**, where applied = SH allowed for actual output × standard FOH rate, and the rate = budgeted FOH ÷ denominator (normal) activity.

**Example:** Budgeted FOH $240,000 at a denominator of 12,000 DLH, so the rate is **$20 per DLH**. SH allowed for actual output 10,000; actual FOH $246,000.

1. Applied FOH = 10,000 × $20 = $200,000.
2. Budget variance = 246,000 − 240,000 = **$6,000 U**.
3. Volume variance = 240,000 − 200,000 = **$40,000 U**.

The volume variance arises only because actual output differed from the denominator level. It measures **capacity utilization**, not spending control, and it disappears under variable costing.

| Overhead analysis | Variances included |
|---|---|
| Four-way | VOH spending, VOH efficiency, FOH budget, FOH volume |
| Three-way | Spending (VOH spending + FOH budget), efficiency (VOH), volume |
| Two-way | Controllable (budget) variance = all except volume; volume variance |

## Sales variances

- **Sales price variance = (actual price − budgeted price) × actual units sold**

- **Sales volume variance = (actual units − budgeted units) × budgeted contribution margin per unit**

> **Example:** Budget: 10,000 units at $50 with a standard CM of $20. Actual: 9,500 units at $52.
>
> 1. Sales price variance = ($52 − $50) × 9,500 = **$19,000 F**.
> 2. Sales volume variance = (9,500 − 10,000) × $20 = **$10,000 U**.

With several products, the sales volume variance splits into a **sales mix variance** and a **sales quantity variance**; the quantity variance can be split further into market size and market share variances.

## Responsibility accounting

| Center | Manager is responsible for | Typical measure |
|---|---|---|
| Cost center | Costs | Flexible-budget variances |
| Revenue center | Revenues | Sales variances |
| Profit center | Revenues and costs | Segment margin, controllable margin |
| Investment center | Revenues, costs and invested capital | ROI, residual income, EVA |

Managers should be evaluated only on **controllable** items. A segmented income statement separates contribution margin, controllable fixed costs, traceable (direct) fixed costs and allocated common costs.

## ROI, residual income and EVA

| Measure | Formula |
|---|---|
| Return on investment (ROI) | Operating income ÷ average operating assets = margin (income ÷ sales) × turnover (sales ÷ assets) |
| Residual income (RI) | Operating income − (required rate × operating assets) |
| Economic value added (EVA) | After-tax operating income (NOPAT) − (WACC × invested capital) |

**Example:** A division earns operating income of $360,000 on operating assets of $2,400,000 and sales of $3,000,000. The required rate is 12%.

1. ROI = 360,000 ÷ 2,400,000 = **15%** (margin 12% × turnover 1.25).
2. Residual income = 360,000 − 12% × 2,400,000 = **$72,000**.
3. A new project costs $500,000 and earns $70,000 (14%). Divisional ROI with the project = 430,000 ÷ 2,900,000 = **14.83%**, which is lower, so an ROI-evaluated manager may reject it.
4. Project RI = 70,000 − 12% × 500,000 = **+$10,000**, so RI encourages accepting a project that beats the company's required return.

**Watch out:** ROI can cause **suboptimization**: a manager with a high current ROI rejects projects that earn more than the cost of capital but less than the current ROI. Residual income avoids this, but it favors large divisions in absolute dollars.

## The balanced scorecard

The balanced scorecard links strategy to measures in four perspectives:

| Perspective | Question | Example measures |
|---|---|---|
| Financial | How do we look to shareholders? | ROI, EVA, revenue growth, operating margin |
| Customer | How do customers see us? | Satisfaction, retention, market share, on-time delivery |
| Internal business process | What must we excel at? | Defect rate, cycle time, throughput |
| Learning and growth | How do we keep improving? | Training hours, employee retention, information system capability |

Learning and growth measures are leading indicators that drive internal process, customer and, finally, financial results. Quality-cost categories are also tested: **prevention** and **appraisal** (costs of conformance) versus **internal failure** and **external failure** (costs of nonconformance).

## Transfer pricing

Transfer prices are charged between divisions of the same company. The general rule:

**Minimum transfer price (selling division) = variable cost per unit + opportunity cost per unit (contribution margin lost on outside sales)**

**Maximum transfer price (buying division) = the price at which it can buy outside**

> **Example:** Division A makes a component with a variable cost of $30 and sells it outside for $50. Division B can buy the component outside for $50.
>
> 1. **Idle capacity:** no outside sales are lost, so A's minimum = **$30**. Any price between $30 and $50 benefits the company.
> 2. **Full capacity:** each internal unit displaces an outside sale worth $20 of CM, so A's minimum = $30 + $20 = **$50**. If $2 of selling cost is avoided on internal sales, the minimum is $48.

Methods include market-based, cost-based (variable or full cost, possibly plus a markup), negotiated and dual pricing. Multinational transfer prices must also satisfy tax rules on arm's-length pricing.

## Common traps

- Using budgeted output instead of actual output to compute standard quantities or hours.
- Using AQ used for the price variance when the item says the price variance is recognized at purchase.
- Treating the fixed overhead volume variance as a spending problem.
- Reversing favorable and unfavorable signs.
- Using market price as the minimum transfer price when there is idle capacity.
- Accepting the higher-ROI answer when the question asks which choice is best for the company as a whole.

## Key takeaways

- Price variance = (AP − SP) × AQ; quantity variance = (AQ − SQ) × SP; SQ uses actual output.
- VOH: spending and efficiency; FOH: budget (actual − budget) and volume (budget − applied).
- Sales price variance uses actual units; sales volume variance uses budgeted CM per unit.
- ROI = margin × turnover; RI = income − required rate × assets; EVA uses NOPAT and WACC.
- Balanced scorecard: financial, customer, internal process, learning and growth.
- Minimum transfer price = variable cost + opportunity cost.

# 5. Cost-Volume-Profit and Breakeven

Cost-volume-profit (CVP) analysis shows how profit responds to changes in price, volume, variable cost and fixed cost. Every CVP question rests on one idea: each unit sold contributes its **contribution margin** toward fixed costs and then toward profit. BAR tests breakeven in units and dollars, target profit (before and after tax), margin of safety, operating leverage, multiple-product breakeven and indifference points.

## Building blocks

| Term | Formula |
|---|---|
| Contribution margin (CM) per unit | Selling price − variable cost per unit |
| Contribution margin ratio | CM per unit ÷ price (= 1 − variable cost ratio) |
| Operating income | (CM per unit × units) − fixed costs |
| Breakeven | Total CM = fixed costs (operating income = 0) |

Key assumptions: costs are cleanly split into fixed and variable; price and variable cost per unit are constant within the relevant range; the sales mix is constant; production equals sales (no inventory change).

## Formula sheet

| Goal | Formula |
|---|---|
| Breakeven units | Fixed costs ÷ CM per unit |
| Breakeven sales dollars | Fixed costs ÷ CM ratio |
| Units for a target pre-tax profit | (Fixed costs + target pre-tax profit) ÷ CM per unit |
| Pre-tax profit needed for an after-tax target | After-tax profit ÷ (1 − tax rate) |
| Margin of safety (units or $) | Expected (actual) sales − breakeven sales |
| Margin of safety ratio | Margin of safety ÷ expected sales |
| Degree of operating leverage (DOL) | Contribution margin ÷ operating income |
| % change in operating income | DOL × % change in sales |
| Indifference point (units) | Difference in fixed costs ÷ difference in variable cost per unit |

## Worked example: single product

**Example:** Halyard Co. sells a product for $80 with variable cost of $48. Fixed costs are $640,000 per year. The tax rate is 25% and expected sales are 25,000 units.

1. CM per unit = 80 − 48 = $32; CM ratio = 32 ÷ 80 = 40%.
2. Breakeven units = 640,000 ÷ 32 = **20,000 units**.
3. Breakeven dollars = 640,000 ÷ 0.40 = **$1,600,000** (= 20,000 × $80).
4. Target after-tax profit of $150,000 → pre-tax = 150,000 ÷ (1 − 0.25) = $200,000. Units = (640,000 + 200,000) ÷ 32 = **26,250 units**.
5. Margin of safety = 25,000 − 20,000 = **5,000 units** ($400,000), or 5,000 ÷ 25,000 = **20%**.

**Watch out:** Gross up an after-tax target by **dividing by (1 − t)**. Multiplying by (1 + t) gives $187,500 instead of $200,000 and is a classic wrong answer.

**Memory trick:** Breakeven units divide by **CM per unit**; breakeven dollars divide by the **CM ratio**. Never divide fixed costs by the variable cost ratio.

## Operating leverage

Operating leverage measures the sensitivity of operating income to sales. Firms with high fixed costs and low variable costs have high DOL: profits rise quickly when sales grow and fall quickly when sales decline.

**Example:** At 25,000 units Halyard's CM = 25,000 × 32 = $800,000 and operating income = 800,000 − 640,000 = $160,000.

1. DOL = 800,000 ÷ 160,000 = **5.0**.
2. A 10% sales increase raises operating income by 5.0 × 10% = **50%**, to $240,000.
3. Check: 27,500 units × $32 − 640,000 = **$240,000**.

DOL is not constant: it is highest just above breakeven and falls as sales rise. The margin of safety ratio is the reciprocal of DOL (20% = 1 ÷ 5.0).

**Degree of financial leverage (DFL)** = EBIT ÷ (EBIT − interest) and **degree of total (combined) leverage** = DOL × DFL measure the extra sensitivity added by fixed financing costs.

## Effects of changes

| Change | Breakeven point | Margin of safety |
|---|---|---|
| Fixed costs increase | Rises | Falls |
| Selling price increases | Falls | Rises |
| Variable cost per unit increases | Rises | Falls |
| Sales volume increases | No change | Rises |

When a question changes several variables at once ("price falls 10%, volume rises 15%, advertising rises $50,000"), recompute operating income in full under the new assumptions instead of trying to combine percentages.

## Multiple products

With more than one product, use a **composite unit** (a bundle in the sales mix proportion) or the **weighted-average CM**.

**Example:** Products A and B sell in a 3:2 unit mix. A's CM is $10 and B's CM is $25. Fixed costs are $400,000.

1. Composite unit = 3 A + 2 B; composite CM = 3 × 10 + 2 × 25 = $80.
2. Breakeven composite units = 400,000 ÷ 80 = 5,000.
3. Breakeven = **15,000 units of A** and **10,000 units of B**.
4. Equivalent check: weighted-average CM = 80 ÷ 5 = $16 per unit; 400,000 ÷ 16 = 25,000 total units, split 3:2.

**Watch out:** A simple average of the CMs ($17.50) ignores the mix and gives the wrong answer. If the mix shifts toward the lower-CM product, the breakeven point rises even if total units stay the same.

For a dollar-based mix, compute the weighted-average **CM ratio** (each product's CM ratio × its share of sales dollars) and divide fixed costs by it.

## Indifference (cost comparison) point

Two cost structures produce the same total cost where:

$$\textbf{Fixed}_1 + \textbf{VC}_1 \times Q = \textbf{Fixed}_2 + \textbf{VC}_2 \times Q \rightarrow Q = (\textbf{Fixed}_2 - \textbf{Fixed}_1) \div (\textbf{VC}_1 - \textbf{VC}_2)$$

**Example:** Machine X has fixed costs of $100,000 and variable cost of $12 per unit; Machine Y has fixed costs of $160,000 and variable cost of $9 per unit.

1. Indifference point = (160,000 − 100,000) ÷ (12 − 9) = **20,000 units**.
2. Above 20,000 units choose Y (lower variable cost); below 20,000 units choose X (lower fixed cost).

## Graphs and the relevant range

- The **CVP (breakeven) chart** plots total revenue and total cost lines; they cross at breakeven. The area between them to the right is profit.
- The **profit-volume graph** plots operating income against volume; it crosses zero at breakeven, and its slope is the CM per unit. The intercept at zero volume equals minus fixed costs.
- Outside the **relevant range**, fixed costs may step up and variable costs per unit may change, so CVP results should not be extrapolated.

## Common traps

- Dividing fixed costs by the variable cost ratio or by the price instead of the CM ratio.
- Multiplying the after-tax target by (1 + t) instead of dividing by (1 − t).
- Using a simple average CM in multi-product problems.
- Forgetting that the margin of safety uses **expected** sales, not breakeven.
- Treating DOL as constant across sales levels.

## Key takeaways

- Breakeven units = fixed costs ÷ CM per unit; breakeven dollars = fixed costs ÷ CM ratio.
- Target units = (fixed costs + pre-tax target) ÷ CM per unit; pre-tax target = after-tax target ÷ (1 − t).
- Margin of safety = expected − breakeven sales; MOS ratio = 1 ÷ DOL.
- DOL = CM ÷ operating income; %Δ operating income = DOL × %Δ sales.
- Multi-product: use the sales mix (composite unit or weighted CM).
- Indifference point = Δ fixed costs ÷ Δ variable cost per unit.

# 6. Relevant Costing and Decision Making

Short-term decisions compare alternatives using only **relevant** amounts: future revenues and costs that **differ** between the alternatives. BAR tests special orders, make-or-buy, keep-or-drop, sell-or-process-further, constrained resources and pricing. The method is always the same: list the incremental revenues, avoidable costs and opportunity costs, and ignore everything else.

## What is relevant?

| Relevant | Not relevant |
|---|---|
| Future costs that differ between alternatives | **Sunk costs** (already incurred: book value of old equipment, past R&D) |
| Avoidable fixed costs (eliminated if an alternative is chosen) | Unavoidable fixed costs and allocated common costs |
| Opportunity costs (benefit given up from the next-best use of a resource) | Future costs that are the same under every alternative |
| Incremental (differential) revenues | Joint costs incurred before split-off (for process-further decisions) |

> **Exam tip:** Fixed costs are not automatically irrelevant. The test is **avoidability**: will this cost disappear (or appear) if we choose this alternative? Allocated corporate overhead almost never disappears.

Qualitative factors also matter: quality, supplier reliability, employee morale, customer relationships and the risk that a low special-order price undermines regular prices (and pricing-law issues such as the Robinson-Patman Act).

## Special orders

**Idle capacity:** accept if the special price exceeds the **relevant variable cost** of the order (plus any incremental fixed costs). **Full capacity:** also subtract the **contribution margin lost** on regular sales that the order displaces.

**Example:** Brindle Co. has capacity of 50,000 units and normally sells 40,000 units at $60. Variable manufacturing cost is $30 and variable selling cost is $4 per unit; fixed overhead is $10 per unit at normal volume. A customer offers to buy 8,000 units at $36; only $1 per unit of variable selling cost would be incurred on this order.

1. Relevant cost per unit = 30 + 1 = $31. Fixed overhead is ignored because it does not change.
2. Incremental income = (36 − 31) × 8,000 = **+$40,000**. Accept, because there is enough idle capacity (10,000 units).

Now suppose the order were for 15,000 units. Only 10,000 are idle, so 5,000 regular units with a CM of 60 − 34 = $26 are displaced.

3. Order CM = 15,000 × $5 = $75,000; lost regular CM = 5,000 × $26 = $130,000.
4. Net effect = 75,000 − 130,000 = **−$55,000**. Reject (or negotiate a smaller order).

**Minimum acceptable price** for a special order = relevant variable cost + any incremental fixed cost per unit + opportunity cost per unit.

## Make or buy (outsourcing)

Compare the **purchase price** with the **avoidable cost of making** plus any **opportunity cost** of the capacity used to make.

**Example:** Brindle makes 20,000 units of a part. Costs per unit: DM $6, DL $8, variable OH $4, fixed OH $10. Forty percent of the fixed overhead ($4 per unit) would be avoided if the part were bought. An outside supplier charges $21.

| | Make | Buy |
|---|---|---|
| Variable costs (6 + 8 + 4) × 20,000 | $360,000 | |
| Avoidable fixed OH (4 × 20,000) | 80,000 | |
| Purchase price (21 × 20,000) | | $420,000 |
| Total relevant cost | $440,000 | $420,000 |

1. Buying saves **$20,000**.
2. If the freed space could be rented out for $30,000 a year, that opportunity cost is added to "make," and the advantage of buying grows to **$50,000**.
3. The unavoidable $6 per unit of fixed overhead ($120,000) is incurred either way and is ignored.

## Keep or drop a segment

Dropping a product line, store or customer loses its **contribution margin** but saves only its **avoidable fixed costs**. Allocated common costs are reassigned to the remaining segments.

**Example:** A product line reports sales $500,000, variable costs $320,000, direct fixed costs $150,000 (of which $120,000 are avoidable) and allocated common costs $80,000, for a reported loss of $50,000.

1. If dropped: CM lost = $180,000; avoidable fixed costs saved = $120,000.
2. Company income **falls by $60,000**. Keep the line.

**Watch out:** A segment showing a loss after allocated costs may still be worth keeping. Look at the **segment margin** (CM − traceable fixed costs) and, more precisely, at the avoidable costs. Also consider **complementary effects**: dropping one line can reduce sales of others.

## Sell at split-off or process further

Process further only if **incremental revenue > incremental (separable) processing cost**. Joint costs are sunk at the split-off point and are irrelevant.

**Example:** 10,000 units can be sold at split-off for $12 each, or processed further at a total cost of $45,000 and sold for $16 each.

1. Incremental revenue = (16 − 12) × 10,000 = $40,000.
2. Incremental cost = $45,000.
3. Processing further **reduces income by $5,000**; sell at split-off.

## Constrained resources

When one resource (machine hours, labor hours, materials) limits output, rank products by **contribution margin per unit of the constrained resource**, not by CM per unit.

**Example:** 14,000 machine hours are available.

| Product | CM per unit | Machine hours per unit | CM per machine hour | Maximum demand |
|---|---|---|---|---|
| P | $30 | 3 | $10 | 3,000 units |
| Q | $24 | 2 | $12 | 4,000 units |

1. Q ranks first ($12 per hour): 4,000 units use 8,000 hours; CM = $96,000.
2. Remaining 6,000 hours go to P: 6,000 ÷ 3 = 2,000 units; CM = $60,000.
3. Total CM = **$156,000**.
4. Ranking by CM per unit (P first) would give 3,000 P (9,000 hours, $90,000) + 2,500 Q (5,000 hours, $60,000) = $150,000, which is $6,000 worse.

With two or more constraints, linear programming finds the optimal mix: the objective function maximizes total CM subject to the constraint inequalities, and the optimum lies at a corner point of the feasible region.

### Theory of constraints (TOC)

TOC focuses on the **bottleneck**: identify it, exploit it, subordinate everything else to it, elevate it (add capacity), and repeat. **Throughput contribution = sales revenue − direct materials**; TOC treats other costs as fixed in the short run. Drum-buffer-rope scheduling sets the pace of the whole plant by the bottleneck.

## Pricing decisions

| Approach | Price |
|---|---|
| Cost-plus | Cost base (variable, absorption or full cost) × (1 + markup) |
| Target costing | Target cost = market price − desired profit; design the product to meet it |
| Life-cycle costing | Considers all costs from R&D to customer support over the product's life |
| Peak-load pricing | Higher prices when demand presses on capacity |
| Penetration vs. skimming | Low launch price to win share vs. high launch price for early adopters |

In the long run, prices must cover **all** costs (including fixed) and provide a return. In the short run, any price above relevant variable and opportunity costs adds to income.

## Common traps

- Including allocated fixed overhead or sunk costs in the analysis.
- Treating all fixed costs as avoidable (or none of them).
- Forgetting opportunity costs at full capacity or for freed-up space.
- Ranking products by CM per unit when a constraint binds.
- Including joint costs in sell-or-process-further decisions.
- Dropping a segment because it shows a loss after allocations.

## Key takeaways

- Relevant = future and different; sunk and unavoidable costs are ignored.
- Special orders: idle capacity → price vs. relevant variable cost; full capacity → also subtract lost CM.
- Make or buy: purchase price vs. avoidable cost of making + opportunity cost.
- Drop a segment: lose its CM, save only avoidable fixed costs.
- Process further when incremental revenue exceeds incremental cost; joint costs are irrelevant.
- Constrained resource: rank by CM per unit of the scarce resource.

# 7. Capital Budgeting

Capital budgeting evaluates long-term investments such as new equipment, plant expansions and product launches. BAR tests the after-tax cash flows of a project and the decision methods that use them: net present value, internal rate of return, profitability index, payback (including discounted payback) and the accounting rate of return.

## Methods at a glance

| Method | Uses time value of money? | Uses cash flows? | Decision rule |
|---|---|---|---|
| Net present value (NPV) | Yes | Yes | Accept if NPV ≥ 0 |
| Internal rate of return (IRR) | Yes | Yes | Accept if IRR ≥ hurdle rate |
| Profitability index (PI) | Yes | Yes | Accept if PI ≥ 1.0; rank by PI when capital is rationed |
| Payback period | No | Yes | Accept if shorter than the maximum allowed |
| Discounted payback | Yes | Yes | Same, using discounted flows |
| Accounting rate of return (ARR) | No | No (accounting income) | Accept if above a target |

**Memory trick:** "**NIP** discount, **PA** don't": NPV, IRR and PI use discounting; Payback and ARR do not (except discounted payback).

## Identifying relevant cash flows

| Timing | Typical cash flows |
|---|---|
| Initial (time 0) | Purchase price, shipping and installation; investment in working capital; after-tax proceeds from selling the old asset |
| Operating (each year) | After-tax cash revenues and savings; depreciation tax shield |
| Terminal (final year) | After-tax salvage value; recovery of working capital |

**After-tax operating cash flow = pre-tax cash flow × (1 − t) + depreciation × t**

Depreciation is not a cash flow, but it reduces taxes; the **depreciation tax shield** (depreciation × tax rate) is a cash benefit.

**After-tax salvage = selling price − tax rate × (selling price − tax basis)**. A gain is taxed; a loss gives a tax saving.

Sunk costs (feasibility studies already paid) are ignored. Financing costs (interest) are not deducted from cash flows, because the discount rate already reflects the cost of capital.

## NPV

**NPV = PV of all future cash flows − initial investment**

**Example:** Marlin Co. would buy equipment for $300,000 with a five-year life, no salvage and straight-line depreciation ($60,000 per year). It saves $100,000 a year in pre-tax cash operating costs. It also requires $20,000 of working capital, recovered at the end of year 5. The tax rate is 25% and the required return is 10% (PV of an ordinary annuity, 10%, 5 years = 3.7908; PV of $1, 10%, 5 years = 0.6209).

1. After-tax savings = 100,000 × 0.75 = $75,000.
2. Depreciation tax shield = 60,000 × 0.25 = $15,000.
3. Annual after-tax cash flow = **$90,000**.
4. PV of annual flows = 90,000 × 3.7908 = $341,172.
5. PV of working capital recovered = 20,000 × 0.6209 = $12,418.
6. Initial investment = 300,000 + 20,000 = $320,000.
7. NPV = 341,172 + 12,418 − 320,000 = **$33,590**. Accept.
8. Profitability index = (341,172 + 12,418) ÷ 320,000 = **1.105**.

**Watch out:** Discount the salvage value and the working capital recovery with the **single-sum** factor for the final year, not the annuity factor, and never add them at face value.

## IRR

The IRR is the discount rate that makes NPV = 0. With **even** cash flows:

**PV annuity factor at the IRR = initial investment ÷ annual cash flow**

Find the factor in the table for the project's life; the corresponding rate is the IRR (interpolate if needed).

**Example:** A project costs $250,000 and returns $70,000 a year for 5 years.

1. Factor = 250,000 ÷ 70,000 = **3.5714**.
2. The 5-year annuity factor is 3.6048 at 12% and 3.4331 at 14%, so the IRR lies between them.
3. Solving precisely gives an IRR of about **12.4%**. If the hurdle rate is 12%, accept.

### NPV and IRR conflicts

For independent projects, NPV and IRR give the same accept/reject decision. For **mutually exclusive** projects of different size or timing they can rank differently, because IRR assumes cash flows are reinvested at the IRR, while NPV assumes reinvestment at the cost of capital. **Choose the higher NPV.**

**Example:** At a 10% cost of capital, Project A costs $100,000 and returns $130,000 in one year (IRR 30%); Project B costs $300,000 and returns $375,000 in one year (IRR 25%).

1. NPV A = 130,000 ÷ 1.10 − 100,000 = **$18,182**.
2. NPV B = 375,000 ÷ 1.10 − 300,000 = **$40,909**.
3. IRR favors A, but B adds more value; choose **B**.

Other IRR drawbacks: projects with alternating cash-flow signs can have multiple IRRs, and IRR ignores scale. The **modified IRR (MIRR)** assumes reinvestment at the cost of capital.

## Profitability index and capital rationing

**PI = PV of future cash flows ÷ initial investment**

When funds are limited, rank independent projects by PI (value per dollar invested), then choose the combination with the highest total NPV within the budget.

## Payback and discounted payback

**Payback (even flows) = initial investment ÷ annual cash flow**

With uneven flows, accumulate the cash flows year by year until the investment is recovered.

**Example:** Marlin's equipment ($300,000) produces $90,000 a year: payback = 300,000 ÷ 90,000 = **3.33 years** (3.56 years if the $20,000 working capital is included in the investment).

A different project costs $200,000 and returns $60,000, $80,000 and $90,000 in years 1–3. After two years $140,000 is recovered; the remaining $60,000 takes 60,000 ÷ 90,000 = 0.67 of year 3. Payback = **2.67 years**.

Payback measures liquidity and risk but ignores the time value of money (except the discounted version) and all flows after the payback date. **Discounted payback** accumulates discounted cash flows, so it is always longer than simple payback.

## Accounting rate of return

**ARR = average annual accounting (net) income ÷ initial investment** (some questions use average investment = (initial + salvage) ÷ 2).

**Example:** Marlin's annual net income from the project = (100,000 − 60,000 depreciation) × 0.75 = $30,000. ARR on initial investment = 30,000 ÷ 300,000 = **10%**; on average investment (300,000 ÷ 2 = $150,000) = **20%**.

ARR uses accrual income, so depreciation is subtracted; it ignores the timing of cash flows.

## Risk in capital budgeting

- **Sensitivity analysis:** change one input (sales, cost, discount rate) and observe NPV.
- **Scenario analysis:** best, base and worst cases together.
- **Risk-adjusted discount rate:** add a premium for riskier projects instead of using the company-wide WACC.
- **Certainty equivalents, simulation (Monte Carlo) and decision trees.**
- **Real options:** the option to expand, abandon or delay adds value that a static NPV misses.

## Common traps

- Treating depreciation as a cash outflow (it is noncash; only its tax shield matters).
- Using accounting income in NPV or cash flow in ARR.
- Adding salvage or working capital recovery at face value instead of discounting them.
- Forgetting to tax the gain (or recognize the tax saving on the loss) on salvage.
- Deducting interest from project cash flows.
- Choosing the higher IRR for mutually exclusive projects when NPV says otherwise.

## Key takeaways

- After-tax cash flow = pre-tax cash flow × (1 − t) + depreciation × t.
- NPV = PV of inflows − investment; accept if ≥ 0; choose the highest NPV among mutually exclusive projects.
- Even-flow IRR: factor = investment ÷ annual flow; look up the rate for the project life.
- PI = PV of future flows ÷ investment; rank by PI under capital rationing.
- Payback and ARR ignore the time value of money; ARR uses accounting income.

# 8. Economic Concepts

BAR tests the economic ideas that drive business decisions: supply and demand, elasticity, costs and market structures, the business cycle, national income measures, inflation and unemployment, monetary and fiscal policy, international trade and exchange rates. Most items are conceptual, with short computations for elasticity, GDP, real values, unemployment, the multiplier and foreign-currency gains and losses.

## Supply and demand

The **law of demand**: as price rises, quantity demanded falls (a downward-sloping curve). The **law of supply**: as price rises, quantity supplied rises. Equilibrium is where the curves cross.

A change in the good's **own price** causes a **movement along** the curve (a change in quantity demanded or supplied). Anything else **shifts** the curve.

| Demand shifts right (increases) when | Supply shifts right (increases) when |
|---|---|
| Income rises (normal goods) or falls (inferior goods) | Input costs fall |
| Price of a substitute rises | Technology improves |
| Price of a complement falls | Number of sellers rises |
| Tastes favor the product; population grows | Government subsidies rise (taxes fall) |
| Consumers expect higher future prices | Producers expect lower future prices |

| Equilibrium effect | Price | Quantity |
|---|---|---|
| Demand increases | Up | Up |
| Demand decreases | Down | Down |
| Supply increases | Down | Up |
| Supply decreases | Up | Down |

A **price ceiling** below equilibrium (rent control) causes a **shortage**; a **price floor** above equilibrium (some minimum wages, farm price supports) causes a **surplus**.

## Elasticity

**Price elasticity of demand = % change in quantity demanded ÷ % change in price** (stated as an absolute value). The **midpoint (arc) method** uses averages as the base:

$\%\Delta Q = (Q_2 - Q_1) \div [(Q_1 + Q_2) \div 2]$; $\%\Delta P = (P_2 - P_1) \div [(P_1 + P_2) \div 2]$

| Elasticity | Description | Price cut → total revenue |
|---|---|---|
| Greater than 1 | Elastic | Rises |
| Equal to 1 | Unit elastic | Unchanged |
| Less than 1 | Inelastic | Falls |

**Example:** A store cuts the price of a product from $10 to $8, and weekly quantity rises from 1,000 to 1,300 units.

1. $\%\Delta Q = 300 \div 1{,}150 = 26.09\%$.
2. $\%\Delta P = -2 \div 9 = -22.22\%$.
3. Elasticity = 26.09 ÷ 22.22 = **1.17 (elastic)**.
4. Revenue check: $10 × 1,000 = $10,000 before; $8 × 1,300 = **$10,400** after. Revenue rises, as expected for elastic demand.

Demand is more elastic when there are many substitutes, the item is a large share of the budget, it is a luxury, and consumers have more time to adjust.

| Other elasticities | Formula | Interpretation |
|---|---|---|
| Income elasticity | %ΔQ ÷ %Δ income | Positive = normal good (above 1 = luxury); negative = inferior good |
| Cross elasticity | %ΔQ of good X ÷ %Δ price of good Y | Positive = substitutes; negative = complements |
| Price elasticity of supply | %ΔQ supplied ÷ %Δ price | More elastic over longer time periods |

**Memory trick:** Cross elasticity: "**Plus = Pick one** (substitutes), **Minus = Match** (complements)."

## Costs and market structures

In the short run some inputs are fixed. Marginal cost eventually rises because of diminishing marginal returns. Every firm maximizes profit where **marginal revenue = marginal cost**. In the short run a firm keeps operating at a loss as long as price covers **average variable cost**; below AVC it should shut down.

| Feature | Perfect competition | Monopolistic competition | Oligopoly | Monopoly |
|---|---|---|---|---|
| Number of firms | Very many | Many | Few | One |
| Product | Identical | Differentiated | Identical or differentiated | Unique, no close substitutes |
| Entry barriers | None | Low | High | Very high |
| Pricing power | None (price taker) | Some | Considerable; interdependent | Significant (price maker) |
| Long-run economic profit | Zero | Zero | Can be positive | Can be positive |

An oligopoly faces a **kinked demand curve** (rivals match price cuts but not increases), which makes prices sticky. Porter's **five forces** (rivalry, threat of new entrants, threat of substitutes, buyer power, supplier power) and the **generic strategies** (cost leadership, differentiation, focus) appear in strategy items.

## Macroeconomic measures

**GDP (expenditure approach) = C + I + G + (X − M)**: consumption, gross private investment, government purchases, and net exports. GDP counts the market value of **final** goods and services **produced in the country** during the period.

Excluded from GDP: transfer payments (Social Security, unemployment benefits), purely financial transactions (buying stocks), used goods, intermediate goods and non-market activity.

> **Example:** C $14,000; I $3,500; G $4,000; exports $2,500; imports $3,200; transfer payments $2,000 (in billions).
>
> GDP = 14,000 + 3,500 + 4,000 + (2,500 − 3,200) = **$20,800 billion**. The transfer payments are excluded.

| Measure | Formula / meaning |
|---|---|
| Real GDP | Nominal GDP ÷ (GDP deflator ÷ 100) |
| Real interest rate | ≈ nominal rate − expected inflation |
| Unemployment rate | Unemployed ÷ labor force (employed + unemployed actively seeking work) |
| Natural rate of unemployment | Frictional + structural (no cyclical) |
| CPI | Price of a fixed consumer basket relative to a base period |

**Example:** Nominal GDP is $24,000 and the deflator is 120: real GDP = 24,000 ÷ 1.20 = **$20,000**. A 7% nominal rate with 3% inflation gives a real rate of about **4%** (precisely 1.07 ÷ 1.03 − 1 = 3.88%). With 152 million employed, 8 million unemployed and 100 million not in the labor force, the unemployment rate is 8 ÷ 160 = **5%** (not 8 ÷ 260).

### Business cycle, inflation and unemployment

The cycle runs **expansion → peak → contraction (recession) → trough → recovery**. Leading indicators (building permits, initial unemployment claims, stock prices, new orders) turn before the economy; coincident indicators (industrial production, personal income) move with it; lagging indicators (unemployment rate, average duration of unemployment, prime rate, inventories-to-sales ratio) turn after.

- **Demand-pull inflation** comes from aggregate demand exceeding output; **cost-push inflation** from rising input costs. **Stagflation** combines inflation with stagnant growth and high unemployment.
- Unemployment types: **frictional** (between jobs), **structural** (skills mismatch, technology), **cyclical** (recession), **seasonal**.
- Inflation hurts lenders and holders of fixed-dollar assets and helps borrowers with fixed-rate debt; deflation does the reverse.

## Monetary and fiscal policy

| | Monetary policy | Fiscal policy |
|---|---|---|
| Who | Federal Reserve | Congress and the President |
| Tools | Open market operations, interest on reserve balances, discount rate, reserve requirements | Government spending and taxes |
| Expansionary action | Buy securities; lower rates | Raise spending; cut taxes |
| Contractionary action | Sell securities; raise rates | Cut spending; raise taxes |

The **spending multiplier = 1 ÷ (1 − MPC)**. With an MPC of 0.8, the multiplier is 5, so a $10 billion increase in spending can raise GDP by up to $50 billion. Expansionary fiscal policy financed by borrowing can **crowd out** private investment by raising interest rates.

The **yield curve** normally slopes upward; an **inverted** curve (short rates above long rates) has often preceded recessions.

## International trade and exchange rates

- **Comparative advantage:** a country should produce the good it makes at the **lower opportunity cost**, even if another country is better at producing everything (absolute advantage).
- Tariffs and quotas raise domestic prices, help domestic producers and hurt consumers and users of the protected goods.
- A **stronger dollar** makes U.S. exports more expensive abroad and imports cheaper at home; a weaker dollar does the reverse.
- Exchange rates are influenced by relative interest rates (higher U.S. rates attract capital and strengthen the dollar), relative inflation (**purchasing power parity**: high-inflation currencies depreciate), trade flows and political stability.
- **Interest rate parity:** forward rate = spot rate × (1 + domestic rate) ÷ (1 + foreign rate). With a spot rate of $1.10 per euro, a U.S. rate of 4% and a euro rate of 2%, the one-year forward rate is 1.10 × 1.04 ÷ 1.02 = **$1.1216**.

### Foreign-currency transactions (ASC 830)

A receivable or payable **denominated in a foreign currency** is remeasured at each balance sheet date at the current (spot) rate, and the change is a **transaction gain or loss in net income**.

**Example:** On November 15, a U.S. company sells goods for €100,000 when the spot rate is $1.08; payment is due January 15. The rate is $1.10 on December 31 and $1.07 on January 15.

| Date | Account | Debit | Credit |
|---|---|---|---|
| Nov 15 | Accounts receivable (€) | 108,000 | |
| | Sales revenue | | 108,000 |
| Dec 31 | Accounts receivable (€) | 2,000 | |
| | Foreign currency transaction gain | | 2,000 |
| Jan 15 | Cash | 107,000 | |
| | Foreign currency transaction loss | 3,000 | |
| | Accounts receivable (€) | | 110,000 |

Revenue stays at $108,000; the rate changes after the sale date are gains and losses, not revenue adjustments.

**Exam tip:** A U.S. company with a foreign-currency **receivable** gains when the foreign currency **strengthens**; with a foreign-currency **payable**, it loses when the foreign currency strengthens.

## Common traps

- Including transfer payments, used goods or stock purchases in GDP.
- Dividing the unemployed by the total population instead of the labor force.
- Confusing monetary policy (Fed) with fiscal policy (Congress and the President).
- Treating a change in a good's own price as a shift in demand.
- Calling a negative cross elasticity "substitutes."
- Adjusting revenue for exchange-rate changes after the transaction date.

## Key takeaways

- Own price → movement along the curve; other factors → shift. Ceilings cause shortages, floors surpluses.
- |E| > 1 elastic: price cut raises revenue. Cross elasticity: positive substitutes, negative complements.
- Profit maximization: MR = MC; shut down if price < AVC.
- GDP = C + I + G + (X − M); real GDP = nominal ÷ deflator; unemployment = unemployed ÷ labor force.

- Fed: open market operations and rates; fiscal: taxes and spending; multiplier = 1 ÷ (1 − MPC).
- Foreign-currency receivables and payables are remeasured at spot; differences go to income.

# 9. Risk, Valuation and Time Value of Money

This chapter collects the finance tools BAR uses to value cash flows, securities and whole businesses: present and future value, risk and return (expected value, standard deviation, beta and CAPM), the cost of capital, bond and stock valuation, business valuation approaches and the ASC 820 fair value framework. It also covers risk-management responses and enterprise risk management.

## Time value of money

| Concept | Formula |
|---|---|
| Future value of $1 | $FV = PV \times (1 + r)^n$ |
| Present value of $1 | $PV = FV \div (1 + r)^n$ |
| PV of an ordinary annuity (payments at period end) | $PMT \times [1 - (1 + r)^{-n}] \div r$ |
| PV of an annuity due (payments at period start) | Ordinary annuity factor × (1 + r) |
| Effective annual rate (EAR) | $(1 + \text{nominal rate} \div m)^m - 1$ |
| Perpetuity | PMT ÷ r |

**Example:** Use these factors (rounded to four decimals):

1. PV of $50,000 due in 4 years at 8%: factor 0.7350 → 50,000 × 0.7350 = **$36,750**.
2. PV of $10,000 a year for 5 years at 6%, ordinary annuity: factor 4.2124 → **$42,124**.
3. Same payments as an annuity due: factor 4.2124 × 1.06 = 4.4651 → **$44,651**.
4. FV of $20,000 in 10 years at 5%: factor 1.6289 → **$32,578**.
5. A 12% nominal rate compounded monthly has an EAR of $(1.01)^{12} - 1$ = **12.68%**.

**Exam tip:** Higher rates and longer periods lower present values. An annuity due is always worth more than an ordinary annuity with the same payments because each payment arrives one period sooner.

## Risk and return

| Measure | Formula / meaning |
|---|---|
| Expected return | Σ (probability × outcome) |
| Variance and standard deviation (σ) | Σ probability × (outcome − expected)²; σ = √variance |
| Coefficient of variation (CV) | σ ÷ expected return; risk per unit of return, used to compare investments of different size |
| Beta (β) | Sensitivity to market movements (systematic risk); market β = 1.0 |
| Portfolio beta | Weighted average of individual betas |

**Example:** An investment returns 20% with probability 0.3, 10% with probability 0.5 and −5% with probability 0.2.

1. Expected return = 0.3 × 20 + 0.5 × 10 + 0.2 × (−5) = **10%**.
2. Variance = 0.3 × (10)² + 0.5 × (0)² + 0.2 × (−15)² = 30 + 0 + 45 = 75; σ = **8.66%**.
3. CV = 8.66 ÷ 10 = **0.87**.

**Systematic (market) risk** affects all securities (interest rates, recessions) and cannot be diversified away. **Unsystematic (firm-specific) risk** can be reduced by diversification; combining assets that are less than perfectly positively correlated lowers portfolio risk. Other risks: credit (default), liquidity, interest-rate, reinvestment, purchasing-power (inflation), exchange-rate and political risk.

### CAPM

**Required return = risk-free rate + β × (market return − risk-free rate)**

The term in parentheses is the **market risk premium**. The security market line (SML) plots required return against beta.

**Example:** Risk-free rate 4%, market return 10%, β = 1.3. Required return = 4% + 1.3 × (10% − 4%) = **11.8%**.

**Watch out:** Multiply beta by the **market risk premium** (rm − rf), not by the market return itself. 4% + 1.3 × 10% = 17% is a common wrong answer.

## Cost of capital

| Component | Cost |
|---|---|
| Debt | Pre-tax yield × (1 − t), because interest is deductible |
| Preferred stock | Preferred dividend ÷ net issue price |
| Common equity | CAPM, dividend growth model ($D_1 \div P_0 + g$) or bond yield plus a risk premium |

**WACC = w_d × k_d × (1 − t) + w_p × k_p + w_e × k_e**, using **market-value** weights (or target weights).

**Example:** Market values: debt $400,000 at a 7% pre-tax cost; preferred $100,000 at 8%; common equity $500,000 at 11.8% (from CAPM). Tax rate 25%.

| Source | Weight | After-tax cost | Weighted |
|---|---|---|---|
| Debt | 0.40 | 7% × 0.75 = 5.25% | 2.10% |
| Preferred | 0.10 | 8.00% | 0.80% |
| Common | 0.50 | 11.80% | 5.90% |
| WACC | | | **8.80%** |

WACC is the discount rate for projects with the firm's average risk. Riskier projects need a higher rate. The marginal cost of capital rises when the firm must raise more expensive new capital.

## Valuing securities

### Bonds

**Bond price = coupon payment × PV annuity factor + face value × PV of $1**, both at the **market** rate. Bond prices move inversely to market yields. A bond sells at a **discount** when the market rate exceeds the coupon rate and at a **premium** when it is below. Longer maturities and lower coupons mean higher **duration**, so greater price sensitivity.

**Example:** A $100,000, 5-year bond pays a 6% annual coupon when the market rate is 8% (5-year annuity factor 3.9927; PV of $1 = 0.6806).

1. PV of coupons = 6,000 × 3.9927 = $23,956.
2. PV of face = 100,000 × 0.6806 = $68,060.
3. Price = **$92,016**, a discount because 8% > 6%.

### Stock (dividend growth / Gordon model)

**Value = $D_1 \div (r - g)$**, where $D_1$ = next year's dividend = $D_0 \times (1 + g)$.

> **Example:** The last dividend was $2.00, growth is 4% and the required return is 10%. $D_1 = 2.00 \times 1.04 = \$2.08$; value = $2.08 \div (0.10 - 0.04)$ = **$34.67**.

## Business valuation

| Approach | Method | Examples |
|---|---|---|
| Income | Discounts or capitalizes expected future cash flows or earnings | Discounted cash flow (DCF), capitalization of earnings, excess earnings |
| Market | Uses prices of comparable companies or transactions | Guideline public company multiples (P/E, EV/EBITDA), precedent transactions |
| Cost (asset) | Replacement or reproduction cost of the assets, less obsolescence | Adjusted net asset value |

**Enterprise value (EV)** is the value of operations to all capital providers. **Equity value = EV − debt + cash** (EV − net debt).

> **Example:** Comparable companies trade at 8 × EBITDA. Target EBITDA is $12 million, debt $30 million, cash $6 million, and 4 million shares.
>
> 1. EV = 12 × 8 = $96 million.
> 2. Equity value = 96 − 30 + 6 = **$72 million**.
> 3. Value per share = 72 ÷ 4 = **$18.00**.

A DCF projects free cash flows for an explicit period and adds a **terminal value** (often FCF in the final year × (1 + g) ÷ (WACC − g)), discounting both at WACC. Valuations of private or minority interests may apply a **discount for lack of marketability** or a **discount for lack of control**; a controlling interest may carry a **control premium**.

## Fair value under ASC 820

Fair value is the **exit price**: the price received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, in the **principal** market (or, if none, the most advantageous market). Transaction costs are not part of fair value; transport costs are.

| Level | Inputs | Example |
|---|---|---|
| Level 1 | Quoted prices in active markets for **identical** assets or liabilities | Exchange-traded stock |
| Level 2 | Other **observable** inputs | Quoted prices for similar assets; observable interest-rate curves |
| Level 3 | **Unobservable** inputs | Entity's own cash flow projections in a DCF |

Fair value is based on the **highest and best use** for nonfinancial assets, from a market participant's point of view. Level 3 measurements require the most disclosure (including a roll-forward of balances).

## Risk management and ERM

| Response | Meaning | Example |
|---|---|---|
| Avoid | Stop the activity | Exit a risky market |
| Reduce (mitigate) | Lower likelihood or impact | Add controls; diversify suppliers |
| Share (transfer) | Shift risk to another party | Insurance, hedging, outsourcing |
| Accept | Retain the risk | Self-insure small losses |

The COSO **Enterprise Risk Management — Integrating with Strategy and Performance** framework (2017) has five components: governance and culture; strategy and objective-setting; performance; review and revision; and information, communication and reporting. **Risk appetite** is the amount of risk an entity is willing to accept in pursuit of value; **tolerance** is the acceptable variation in performance.

## Common traps

- Multiplying beta by the whole market return in CAPM.
- Using book-value weights or the pre-tax cost of debt in WACC.
- Using $D_0$ instead of $D_1$ in the dividend growth model.
- Stopping at enterprise value when equity value (or value per share) is asked.
- Discounting bond cash flows at the coupon rate instead of the market rate.
- Treating an entity-specific value or an entry price as fair value.

## Key takeaways

- $PV = FV \div (1 + r)^n$; annuity due = ordinary annuity $\times (1 + r)$; $EAR = (1 + r/m)^m - 1$.
- CV = σ ÷ expected return; diversification removes unsystematic risk only.

- CAPM: r = rf + β(rm − rf). WACC uses after-tax debt cost and market-value weights.
- Bond price = coupon × PVA + face × PV1 at the market rate; Gordon value = $D_1 \div (r - g)$.
- Equity value = EV − debt + cash. Valuation approaches: income, market, cost.
- ASC 820: exit price; Level 1 identical quoted, Level 2 observable, Level 3 unobservable.

# 10. Revenue Recognition: Complex Areas

FAR covers the basics of ASC 606. BAR goes into the areas where judgment and computation are heavier: allocating the transaction price, variable consideration, rights of return, principal-versus-agent, customer options and breakage, significant financing components, contract modifications, revenue recognized over time and loss contracts.

## The five steps (quick review)

| Step | Key question |
|---|---|
| 1. Identify the contract | Approved, rights and payment terms identifiable, commercial substance, collection of consideration **probable** |
| 2. Identify performance obligations | Is each promised good or service **distinct** (capable of being distinct and distinct in the context of the contract)? |
| 3. Determine the transaction price | Fixed + estimated variable consideration (constrained), adjusted for financing, noncash consideration and consideration payable to the customer |
| 4. Allocate the price | Relative standalone selling prices (SSP) |
| 5. Recognize revenue | When (or as) control of each obligation transfers — at a point in time or over time |

## Allocating on relative standalone selling prices

The transaction price is spread over the performance obligations in proportion to their SSPs. If SSP is not observable, estimate it with the **adjusted market assessment**, **expected cost plus a margin** or (only in limited cases) the **residual** approach. A bundle discount is allocated proportionally to all obligations unless there is observable evidence that it relates to only some.

**Example:** Tamarack Co. sells equipment, installation and two years of maintenance for $1,000,000. Standalone selling prices are equipment $800,000, installation $100,000 and maintenance $300,000 (total $1,200,000).

| Obligation | SSP | Allocation (SSP ÷ 1,200,000 × 1,000,000) | When recognized |
|---|---|---|---|
| Equipment | $800,000 | $666,667 | On delivery |
| Installation | $100,000 | $83,333 | When installed |
| Maintenance | $300,000 | $250,000 | Over 24 months ($10,417 a month) |
| Total | $1,200,000 | $1,000,000 | |

## Variable consideration and the constraint

Variable consideration (bonuses, penalties, discounts, rebates, refunds, price concessions) is estimated using whichever method better predicts the amount:

| Method | Best for |
|---|---|
| Expected value (probability-weighted) | Many similar contracts or many possible outcomes |
| Most likely amount | Binary outcomes (bonus earned or not) |

The estimate is then **constrained**: include it only to the extent it is **probable** that a **significant reversal** of cumulative revenue will not occur when the uncertainty is resolved. Factors that raise the risk of reversal include susceptibility to outside factors, limited experience and a broad range of outcomes. Estimates are updated each reporting date.

**Example:** A $400,000 contract includes a performance bonus of $0 (20% probability), $30,000 (30%) or $60,000 (50%). Expected value = 0.2 × 0 + 0.3 × 30,000 + 0.5 × 60,000 = **$39,000**, so the transaction price is $439,000 if the constraint is met. If the bonus were all-or-nothing ($100,000, 80% likely), the most likely amount method would include **$100,000**.

**Exam tip: Sales-based or usage-based royalties** on licenses of intellectual property are an exception: they are recognized only when the later sale or usage occurs, not estimated up front.

## Rights of return

For goods sold with a right of return, recognize:

- **Revenue** for the goods not expected to be returned;
- a **refund liability** for the consideration expected to be refunded;
- an **asset for the right to recover products** (at former carrying amount less expected recovery costs and impairments), which reduces COGS.

**Example:** Calder Co. sells 1,000 units at $100 (cost $60 each) and expects 5% to be returned.

| Account | Debit | Credit |
|---|---|---|
| Cash or accounts receivable | 100,000 | |
| Sales revenue | | 95,000 |
| Refund liability | | 5,000 |
| Cost of goods sold | 57,000 | |
| Asset for right to recover products | 3,000 | |
| Inventory | | 60,000 |

Exchanges for identical products (same type, quality, condition and price) are not returns. Restocking fees are included in the transaction price.

## Principal versus agent

A **principal** controls the good or service before it transfers to the customer and reports revenue **gross**. An **agent** arranges for another party to provide it and reports revenue **net** (its fee or commission). Indicators of control: primary responsibility for fulfillment, inventory risk, and discretion in setting the price.

**Example:** An online platform sells a $200 concert ticket for a promoter and keeps 15%. The promoter performs the concert and sets the price, so the platform is an agent: revenue per ticket = **$30**, not $200.

## Customer options, gift cards and breakage

- An option to buy additional goods at a discount is a separate performance obligation only if it gives a **material right** the customer would not get without the contract. Part of the price is allocated to it based on its SSP (the expected discount × likelihood of exercise).

- Loyalty points are typically material rights: revenue is deferred and recognized as points are redeemed or expire.
- Cash received for gift cards is a **contract liability**. **Breakage** (rights the entity expects customers not to exercise) is recognized **in proportion to the pattern of redemptions** if the entity expects to be entitled to it; otherwise only when the chance of redemption becomes remote. Unclaimed property (escheat) laws may require amounts to be remitted to the state instead.

**Example:** A retailer sells $100,000 of gift cards and expects 10% breakage, so expected redemptions are $90,000. During the year customers redeem $45,000 (half of expected redemptions).

Revenue = 45,000 + (10,000 × 45,000 ÷ 90,000) = 45,000 + 5,000 = **$50,000**. The contract liability falls to $50,000.

## Significant financing component

If the timing of payment gives the customer or the entity a significant financing benefit, adjust the price to the **cash selling price** and recognize interest separately. **Practical expedient:** no adjustment is needed if the period between transfer and payment is **one year or less**.

**Example:** Equipment with a cash selling price of $100,000 is sold for $121,000 payable in two years (implied rate 10%). Revenue at delivery is **$100,000**; interest income is $10,000 in year 1 and $11,000 in year 2.

## Contract modifications

| Situation | Accounting |
|---|---|
| Adds **distinct** goods at their **standalone selling price** | Separate new contract |
| Remaining goods are distinct, but price is not SSP | Treat as termination of the old contract and creation of a new one: **prospective**; remaining consideration spread over remaining goods |
| Remaining goods are **not distinct** (part of a single partly satisfied obligation) | **Cumulative catch-up** adjustment to revenue |

**Example:** A contract for 120 units at $100 is modified after 60 units are delivered to add 30 units at $90, which is below SSP. Under the prospective method, the remaining 90 units are recognized at (60 × $100 + 30 × $90) ÷ 90 = **$96.67 per unit**.

## Revenue recognized over time

An obligation is satisfied **over time** if any one criterion is met: (1) the customer simultaneously receives and consumes the benefits; (2) the entity's work creates or enhances an asset the customer controls; or (3) the asset has **no alternative use** to the entity **and** the entity has an **enforceable right to payment** for performance to date. Otherwise revenue is recognized at a point in time (indicators: right to payment, legal title, physical possession, risks and rewards, customer acceptance).

Progress is measured with an **input method** (cost-to-cost is most common) or an **output method** (milestones, units delivered, surveys).

**Example:** Contract price $5,000,000; cost-to-cost method.

| | Year 1 | Year 2 |
|---|---|---|
| Cumulative costs | $1,200,000 | $2,900,000 |
| Estimated costs to complete | $2,800,000 | $1,450,000 |
| Total estimated costs | $4,000,000 | $4,350,000 |
| Percent complete | 30.00% | 66.67% |
| Cumulative revenue | $1,500,000 | $3,333,333 |
| Revenue this year | **$1,500,000** | **$1,833,333** |
| Cumulative gross profit | $300,000 | $433,333 |
| Gross profit this year | **$300,000** | **$133,333** |

The change in estimate in year 2 is handled prospectively through the cumulative catch-up: compute cumulative amounts and subtract what was already recognized.

### Loss contracts

When total estimated costs exceed the contract price, the **entire expected loss** is recognized immediately (ASC 605-35 provision for losses), not just the portion for work done.

**Example:** Continuing the contract, suppose at the end of year 2 total estimated costs are instead $5,200,000. The total loss is $200,000. Because $300,000 of profit was recognized in year 1, the year 2 income statement shows a loss of 200,000 + 300,000 = **$500,000**.

## Other topics tested

| Topic | Rule |
|---|---|
| Warranties | **Assurance-type** (product works as promised) → cost accrual under ASC 460; **service-type** (extra service or sold separately) → separate obligation, revenue deferred |
| Licenses of IP | **Functional IP** (software, film) = right to use → point in time; **symbolic IP** (brand, logo) = right to access → over time |
| Bill-and-hold | Revenue only if the arrangement has a substantive reason, goods are identified as the customer's, ready for transfer and cannot be redirected |
| Consignment | No revenue when goods are shipped to the consignee; revenue when the consignee sells to an end customer |
| Consideration payable to the customer | Reduces the transaction price unless it pays for a distinct good or service |
| Contract costs | Incremental costs of obtaining a contract (sales commissions) are capitalized and amortized; practical expedient to expense if amortization period is one year or less |
| Contract balances | Contract asset when performance precedes an unconditional right to payment; receivable when the right is unconditional; contract liability when payment precedes performance |

## Common traps

- Allocating a bundle discount to only one item without evidence.
- Reporting cumulative revenue as the current-year amount in over-time contracts.
- Recognizing only a percentage of a loss on a loss contract.
- Recognizing all expected breakage at once.
- Reporting gross revenue when the entity is an agent.
- Estimating sales-based royalties on IP licenses before the sales occur.

## Key takeaways

- Allocate on relative SSP; estimate SSP when not observable.

- Variable consideration: expected value or most likely amount, limited by the significant-reversal constraint.
- Right of return: revenue net of expected returns; refund liability; asset for recovery of products.
- Principal reports gross, agent reports net; control is the test.
- Breakage is recognized in proportion to redemptions; financing components are ignored for terms of one year or less.
- Modifications: separate contract, prospective, or cumulative catch-up. Loss contracts: recognize the full loss immediately.

# 11. Intangibles, Goodwill and R&D

This chapter covers how intangible assets are measured after recognition, how goodwill and other intangibles are tested for impairment, and how research and development and software costs are accounted for. BAR emphasizes the three different impairment models, the private company goodwill alternative, R&D classification and software capitalization.

## Classifying intangible assets

| Type | Examples | Amortized? | Impairment model |
|---|---|---|---|
| Finite-lived intangible | Patents, customer lists, franchises with set terms, copyrights | Yes, over useful life (straight-line unless another pattern is reliably determinable); residual value usually zero | Long-lived asset model (ASC 360): recoverability, then fair value |
| Indefinite-lived intangible | Trademarks and broadcast licenses expected to be renewed indefinitely | No | Fair value test at least annually (ASC 350-30) |
| Goodwill | Excess of consideration over fair value of identifiable net assets in a business combination | No (public companies) | Reporting-unit test at least annually (ASC 350-20) |

**Internally generated** intangibles (brands, customer relationships, goodwill) are generally expensed as incurred; only certain costs, such as legal fees to register or successfully defend a patent, are capitalized. **Acquired** intangibles are recorded at cost (or at fair value in a business combination). An indefinite-lived intangible that becomes finite-lived is tested for impairment and then amortized prospectively.

## Impairment models compared

| | Finite-lived intangibles (and PP&E) | Indefinite-lived intangibles | Goodwill |
|---|---|---|---|
| When tested | When events indicate carrying amount may not be recoverable | Annually and when events indicate | Annually (same date each year) and when events indicate |
| Optional qualitative screen | — | Yes ("more likely than not" impaired?) | Yes (step 0) |
| Recoverability step | Yes: compare carrying amount to **undiscounted** future cash flows | No | No |
| Loss | Carrying amount − fair value | Carrying amount − fair value | Reporting unit carrying amount − reporting unit fair value, **limited to goodwill** |
| Reversal later? | No (held and used) | No | No |

> **Memory trick:** Only finite-lived assets get the **"undiscounted" gate**. Goodwill and indefinite-lived intangibles go straight to fair value.

### Goodwill impairment (ASU 2017-04)

Goodwill is assigned to **reporting units** (an operating segment or one level below). The test:

1. Optional qualitative assessment: is it more likely than not (over 50%) that the reporting unit's fair value is below its carrying amount? If not, stop.
2. Quantitative test: if the reporting unit's **carrying amount (including goodwill)** exceeds its **fair value**, recognize an impairment loss equal to the excess, **limited to the goodwill allocated to the unit**.

The former "step 2" (computing implied goodwill) was eliminated.

**Example:** A reporting unit has a carrying amount of $9,000,000, including goodwill of $1,500,000.

1. Fair value $8,200,000: impairment = 9,000,000 − 8,200,000 = **$800,000**.
2. Fair value $7,000,000: excess = $2,000,000, but the loss is **capped at $1,500,000** (goodwill is reduced to zero). Other assets of the unit are tested under their own models first.

| Account | Debit | Credit |
|---|---|---|
| Goodwill impairment loss | 800,000 | |
| Goodwill | | 800,000 |

Goodwill impairment is reported in operating income (as a separate line if material) and cannot be reversed.

### Indefinite-lived intangibles

**Example:** A trademark with an indefinite life has a carrying amount of $600,000 and a fair value of $450,000. Impairment loss = **$150,000**. No undiscounted cash flow test is applied.

### Finite-lived intangibles

**Example:** A patent has a carrying amount of $900,000. Because of a new competing technology, the company tests it for recoverability.

1. Undiscounted future cash flows = $850,000, which is less than $900,000, so the patent is **not recoverable**.
2. Fair value is $700,000: impairment loss = 900,000 − 700,000 = **$200,000**.
3. The new carrying amount ($700,000) is amortized over the remaining life.

If undiscounted cash flows had been $950,000, **no loss** would be recognized, even though fair value is below carrying amount.

Assets **held for sale** are carried at the lower of carrying amount or fair value less cost to sell, are not depreciated or amortized, and later recoveries are recognized up to the cumulative loss previously recognized.

## Private company alternatives

Private companies (and not-for-profit entities) may elect accounting alternatives:

| Alternative | Effect |
|---|---|
| Goodwill amortization | Amortize goodwill straight-line over **10 years or less** (if the entity shows a shorter life is more appropriate) |
| Simplified impairment | Test at the entity level or reporting-unit level only when a **triggering event** occurs; loss = carrying amount − fair value, limited to goodwill |
| Triggering-event evaluation | May evaluate triggering events only as of the reporting date |
| Intangibles in business combinations | Do not recognize separately customer-related intangibles (unless capable of being sold or licensed) or noncompetition agreements; they are subsumed into goodwill (requires the goodwill amortization election) |

> **Example:** A private company that elected the alternative recognizes $1,000,000 of goodwill and amortizes it over 10 years: annual amortization = **$100,000**.

## Research and development (ASC 730)

**Research** is planned search aimed at discovering new knowledge. **Development** translates research findings into a plan or design for a new or improved product or process. R&D costs are **expensed as incurred**.

| Cost | Treatment |
|---|---|
| Materials, equipment and facilities **with no alternative future use** acquired for a specific R&D project | Expense immediately as R&D |
| Equipment and facilities **with alternative future uses** | Capitalize; **depreciation** is R&D expense |
| Salaries of R&D personnel | R&D expense |
| Contract services performed by others for the entity | R&D expense |
| Reasonable allocation of indirect costs | R&D expense (general and administrative costs not clearly related are excluded) |
| Intangibles purchased from others for R&D with alternative future use | Capitalize and amortize; amortization is R&D |
| R&D performed **for others** under contract | Not R&D of the entity; cost of a contract (revenue recognition applies) |
| In-process R&D acquired in a **business combination** | Capitalize as an **indefinite-lived** intangible until completed or abandoned |
| In-process R&D acquired in an **asset acquisition** | Expense unless it has an alternative future use |

Activities that are **not** R&D include routine quality control, routine product improvements, troubleshooting during commercial production, seasonal design changes, and legal work on patents.

**Example:** During the year a company buys R&D equipment for $500,000 with alternative future uses (5-year life, straight-line), uses $80,000 of materials, pays $220,000 of R&D salaries and buys $150,000 of equipment that can be used only on one project.

| Item | R&D expense |
|---|---:|
| Depreciation on alternative-use equipment (500,000 ÷ 5) | $100,000 |
| Materials | $80,000 |
| Salaries | $220,000 |
| Single-project equipment (no alternative use) | $150,000 |
| Total R&D expense | **$550,000** |

## Software costs

### Software to be sold, leased or marketed (ASC 985-20)

| Phase | Treatment |
|---|---|
| Before **technological feasibility** (detailed program design or working model) | Expense as R&D |
| After technological feasibility until general release | **Capitalize** (coding, testing, producing product masters) |
| After release | Expense (maintenance, customer support); duplication and packaging costs are inventory |

Capitalized costs are amortized each year at the **greater of** (a) the **revenue ratio** (current revenue ÷ current + expected future revenue) × capitalized cost or (b) **straight-line** over the remaining estimated economic life. At each balance sheet date, unamortized cost is written down to **net realizable value** if lower; the write-down is not reversed.

> **Example:** Capitalized software costs are $600,000 at the start of year 1 with an estimated life of 4 years. Year 1 revenue is $400,000 and total expected revenue (current + future) is $2,000,000.
>
> 1. Revenue ratio: 400,000 ÷ 2,000,000 × 600,000 = $120,000.
> 2. Straight-line: 600,000 ÷ 4 = $150,000.
> 3. Amortization = the greater = **$150,000**.

### Internal-use software (ASC 350-40)

Under the current stage-based model:

| Stage | Treatment |
|---|---|
| Preliminary project stage (conceptual design, evaluating alternatives) | Expense |
| Application development stage (design of chosen path, coding, installation, testing) | **Capitalize** (once management commits to funding and completion is probable) |
| Post-implementation / operation stage (training, maintenance) | Expense |

Data conversion costs and general and administrative overhead are expensed. Capitalized costs are amortized straight-line once the software is ready for its intended use. Implementation costs of a **cloud computing hosting arrangement** that is a service

contract follow the same rules, but the capitalized costs are amortized over the term of the hosting arrangement and presented with the related prepaid service, not as software.

> **Watch out: ASU 2025-06** (issued September 2025) removes all references to project stages. Capitalization begins when management has authorized and committed to funding the project **and** it is probable the project will be completed and used as intended; that threshold is not met while **significant development uncertainty** remains (novel or unproven features not yet resolved through coding and testing, or significant performance requirements still unidentified or being revised). It is effective for annual periods beginning after December 15, 2027, with early adoption permitted. Exam items before then may still use stage language; both approaches lead to expensing early-phase and post-implementation costs.

## Common traps

- Applying the undiscounted cash flow test to goodwill or indefinite-lived intangibles.
- Using the old two-step goodwill model or failing to cap the loss at the goodwill balance.
- Expensing alternative-use R&D equipment in full instead of capitalizing and depreciating it.
- Capitalizing software-to-be-sold costs before technological feasibility.
- Taking the smaller of revenue-ratio and straight-line amortization.
- Amortizing goodwill for a public company.
- Reversing impairment losses on assets held and used.

## Key takeaways

- Goodwill impairment = reporting unit carrying amount − fair value, capped at goodwill (ASU 2017-04).
- Indefinite-lived intangible loss = carrying amount − fair value, no recoverability step.
- Finite-lived: recoverability with undiscounted cash flows, then loss = carrying amount − fair value.
- Private companies may amortize goodwill over 10 years or less.
- R&D is expensed; alternative-use equipment is capitalized and its depreciation is R&D. IPR&D in a business combination is capitalized as indefinite-lived.
- Software to be sold: capitalize after technological feasibility; amortize at the greater of revenue ratio or straight-line.

# 12. Stock Compensation

ASC 718 governs share-based payments to employees (and, since ASU 2018-07, to nonemployees). BAR tests the measurement of equity-classified awards (stock options and restricted stock units), changes in forfeiture estimates, accounting at exercise and expiration, liability-classified awards such as cash-settled stock appreciation rights, employee stock purchase plans and the related income tax effects.

## Core principles

| Element | Rule |
|---|---|
| Measurement basis | **Fair value** of the award |
| Equity-classified awards | Measured at **grant-date** fair value; **not remeasured** |
| Liability-classified awards | Remeasured at fair value at each reporting date until settlement |
| Grant date | Date the employer and employee reach a mutual understanding of the key terms |
| Service (vesting) period | Cost is recognized over the **requisite service period**, usually the vesting period |
| Option fair value | Option-pricing model (Black-Scholes-Merton or a lattice/binomial model) using exercise price, expected term, current share price, expected volatility, expected dividends and the risk-free rate |
| Forfeitures | Policy election: **estimate** expected forfeitures, or **account for them as they occur** |

**Total compensation cost = number of awards expected to vest × grant-date fair value per award**

The cost is debited to compensation expense (or capitalized into inventory or other assets when appropriate) and credited to APIC—stock options (equity awards) or a liability (liability awards).

**Exam tip:** Market conditions (for example, vesting if the share price reaches $60) are built into the grant-date fair value; cost is **not reversed** if the market condition is not met, provided the employee renders the service. Performance conditions (for example, an EPS target) are assessed for probability; cost is recognized only if achievement is probable.

## Stock options

**Example:** On January 1, Year 1, Juniper Corp. grants 10,000 options to executives with a grant-date fair value of $12 each. The options cliff-vest after 4 years. Juniper estimates forfeitures; at grant it expects 10% of the options to be forfeited. At the end of Year 2 it revises the estimate to 15%.

| Year | Cumulative cost | Expense this year |
|---|---|---|
| 1 | 10,000 × 90% × $12 × 1/4 = $27,000 | **$27,000** |
| 2 | 10,000 × 85% × $12 × 2/4 = $51,000 | **$24,000** |

The change in estimate is a **cumulative catch-up**: compute the cumulative cost to date with the new estimate and subtract what was already recognized.

Year 1 entry:

| Account | Debit | Credit |
|---|---|---|
| Compensation expense | 27,000 | |
| APIC — stock options | | 27,000 |

### Graded vesting

When awards vest in tranches (for example, 25% per year), the entity may elect to recognize cost on a **straight-line basis over the total service period** or on an **accelerated (tranche-by-tranche)** basis for awards with only service conditions. Under either method, cumulative cost recognized by any date must at least equal the fair value of the portion vested.

### Exercise and expiration

On exercise, cash received plus the APIC — stock options balance becomes common stock (par) and APIC — common.

**Example:** Continuing, 8,500 options vest and are exercised at the $30 exercise price. Par value is $1. The APIC — stock options balance is 8,500 × $12 = $102,000.

| Account | Debit | Credit |
|---|---|---|
| Cash (8,500 × $30) | 255,000 | |
| APIC — stock options | 102,000 | |
| Common stock (8,500 × $1) | | 8,500 |
| APIC — common stock | | 348,500 |

If **vested** options expire unexercised, the cost is **not reversed**: debit APIC — stock options and credit APIC — expired options. If options are **forfeited before vesting** (and the entity accounts for forfeitures as they occur), previously recognized cost is reversed in the period of forfeiture.

## Restricted stock and RSUs

Restricted stock units and restricted stock are measured at the **grant-date market price of the shares** (adjusted for dividends the holder will not receive), and the cost is spread over the vesting period.

**Example:** 5,000 RSUs are granted when the share price is $40 and vest after 2 years. Total cost = 5,000 × $40 = $200,000; expense **$100,000** each year, credited to APIC.

## Liability-classified awards (cash-settled SARs)

Awards settled in cash (or that the employee can require to be settled in cash) are liabilities. The liability is remeasured to fair value at each reporting date, and the cost recognized to date equals **fair value × portion of service rendered**. Changes after vesting until settlement go fully to expense.

**Example:** On January 1, Year 1, a company grants 20,000 cash-settled SARs that vest after 3 years. Fair value per SAR is $5 at the end of Year 1, $7 at the end of Year 2 and $6 at the end of Year 3.

| Year | Liability at year-end | Expense |
|---|---|---|
| 1 | 20,000 × $5 × 1/3 = $33,333 | **$33,333** |
| 2 | 20,000 × $7 × 2/3 = $93,333 | **$60,000** |
| 3 | 20,000 × $6 × 3/3 = $120,000 | **$26,667** |

| Account | Debit | Credit |
|---|---|---|
| Compensation expense (Year 2) | 60,000 | |
| Liability for SARs | | 60,000 |

SARs settled in **shares** are equity-classified and measured at grant-date fair value like options. Nonpublic entities may elect to measure liability awards at **intrinsic value** instead of fair value.

## Modifications

A modification (for example, repricing options) is treated as an exchange of the old award for a new one. The **incremental fair value** (fair value of the modified award − fair value of the original award immediately before modification) is additional cost: recognized immediately for vested awards, or over the remaining service period for unvested awards. The original grant-date cost continues to be recognized.

## Employee stock purchase plans

An ESPP is **noncompensatory** (no expense) if: (1) substantially all full-time employees may participate on an equitable basis; (2) the purchase discount does not exceed the per-share issuance costs avoided, and a discount of **5% or less** automatically meets this; and (3) the plan has no option features other than a short enrollment window (no more than 31 days) after the price is fixed, and the price is based only on the market price at purchase. Otherwise the plan is compensatory and the discount (and any look-back feature) is compensation cost.

## Income tax effects

For awards that ordinarily produce a tax deduction (such as nonqualified options and RSUs), the employer records a **deferred tax asset** as it recognizes book compensation

cost: **DTA = cumulative book cost × tax rate**. The tax deduction is later based on the **intrinsic value** at exercise (or the share value at vesting for RSUs).

Under **ASU 2016-09**, all **excess tax benefits** (deduction > book cost) and **tax deficiencies** (deduction < book cost) are recognized in **income tax expense** in the period the award is exercised or vests, not in APIC. In the cash flow statement, excess tax benefits are operating cash flows.

**Example:** For the 8,500 options above, cumulative book cost is $102,000 and the tax rate is 25%, so the DTA is $25,500. At exercise the share price is $50, so the tax deduction is (50 − 30) × 8,500 = $170,000, worth $42,500.

| Account | Debit | Credit |
|---|---|---|
| Income taxes payable | 42,500 | |
| Deferred tax asset | | 25,500 |
| Income tax expense (excess tax benefit) | | 17,000 |

Incentive stock options (ISOs) normally provide no employer deduction, so no DTA is recorded unless a disqualifying disposition occurs.

## Disclosures

Entities disclose the nature and terms of awards, the method and assumptions used to estimate fair value, compensation cost recognized, the number and weighted-average exercise prices of options outstanding and exercisable, and unrecognized cost with the period over which it will be recognized.

## Common traps

- Remeasuring equity awards to year-end share prices.
- Reversing cost when vested options expire unexercised.
- Recording a change in forfeiture estimate only prospectively instead of as a cumulative catch-up.
- Measuring cash-settled SARs at grant-date fair value or forgetting the portion-of-service factor.
- Recording excess tax benefits in APIC (pre-2017 rule).
- Ignoring the grant-date fair value in favor of intrinsic value for public company options.

## Key takeaways

- Equity awards: units expected to vest × grant-date fair value, spread over the service period; no remeasurement.
- Estimate changes: cumulative catch-up. Vested options that expire: no reversal.
- Exercise: Dr cash and APIC — options; Cr common stock and APIC — common.
- RSUs: grant-date share price. Cash-settled SARs: liability = current fair value × portion of service rendered.
- ESPP with a discount of 5% or less, broad participation and no option features is noncompensatory.
- DTA = book cost × tax rate; excess benefits and shortfalls go to income tax expense.

# 13. Business Combinations and Consolidations

A business combination occurs when an acquirer obtains **control** of a business. ASC 805 requires the **acquisition method**; ASC 810 then requires consolidated statements that present the parent and its subsidiaries as one economic entity. BAR tests goodwill and bargain purchase computations, noncontrolling interest, measurement-period and contingent consideration rules, step acquisitions, and the eliminations for intercompany inventory, PP&E and balances.

## When to consolidate

| Model | Consolidate when |
|---|---|
| Voting interest entity | The parent holds a **controlling financial interest**, usually **more than 50%** of the voting shares (unless control does not rest with the majority owner, for example a subsidiary in bankruptcy) |
| Variable interest entity (VIE) | The reporting entity is the **primary beneficiary**: it has (1) the **power to direct the activities** that most significantly affect the VIE's economic performance and (2) the obligation to absorb losses or the right to receive benefits that could be significant |

A VIE is an entity whose equity investors lack sufficient equity at risk or lack the characteristics of a controlling financial interest. Investments of 20–50% with significant influence use the equity method instead (covered in FAR).

## The acquisition method

1. Identify the **acquirer**.
2. Determine the **acquisition date** (the date control is obtained).
3. Recognize and measure the identifiable assets acquired, liabilities assumed and any **noncontrolling interest (NCI)**, generally at **fair value**.
4. Recognize **goodwill** or a **gain from a bargain purchase**.

| Item | Treatment |
|---|---|
| Consideration transferred | Fair value of cash, other assets, equity issued and **contingent consideration** |
| Acquisition-related costs (legal, advisory, valuation) | **Expensed** as incurred |
| Costs to issue equity securities | Reduce APIC |
| Costs to issue debt | Reduce the carrying amount of the debt |
| Identifiable intangibles | Recognized separately if they arise from contractual or legal rights **or** are separable |
| In-process R&D | Recognized as an indefinite-lived intangible |
| Assembled workforce | Not separately recognized; part of goodwill |
| Exceptions to fair value | Deferred taxes (ASC 740), employee benefits, leases (acquiree as lessee), contract assets and liabilities (ASC 606, per ASU 2021-08), indemnification assets |

**Goodwill = consideration transferred + fair value of NCI + fair value of any previously held interest − fair value of identifiable net assets**

If the result is negative, the acquirer first **reassesses** whether all assets and liabilities were identified and measured correctly; any remaining excess is a **bargain purchase gain** recognized in earnings by the acquirer.

**Example:** On January 1, Pellam Corp. pays $9,000,000 cash for 80% of Strand Co. The fair value of the 20% NCI is $2,100,000. Strand's book net assets are $8,000,000 (common stock $1,000,000; retained earnings $7,000,000). Fair values exceed book values for inventory by $500,000 and for PP&E by $1,500,000 (10-year remaining life), so identifiable net assets at fair value are $10,000,000. Pellam paid $200,000 of legal and valuation fees.

1. Goodwill = 9,000,000 + 2,100,000 − 10,000,000 = **$1,100,000**.
2. The $200,000 of fees is **expensed**, not added to goodwill.

Consolidation entry at the acquisition date:

| Account | Debit | Credit |
|---|---|---|
| Common stock — Strand | 1,000,000 | |
| Retained earnings — Strand | 7,000,000 | |
| Inventory | 500,000 | |
| PP&E | 1,500,000 | |
| Goodwill | 1,100,000 | |
| Investment in Strand | | 9,000,000 |
| Noncontrolling interest | | 2,100,000 |

**Example:** If Pellam had paid $7,000,000 and the NCI's fair value were $1,800,000, the total of $8,800,000 is less than the $10,000,000 of identifiable net assets. After reassessment, Pellam recognizes a **bargain purchase gain of $1,200,000** in net income.

## Measurement period and contingent consideration

- The **measurement period** ends when the acquirer has the information it was seeking, but **no later than one year** after the acquisition date. Adjustments to provisional amounts during that period for facts that existed at the acquisition date adjust goodwill and are recognized in the period determined (no restatement of prior periods). After the period ends, changes are recognized in earnings (or as error corrections).
- **Contingent consideration** is measured at acquisition-date fair value and included in consideration transferred. Later changes that result from events after the acquisition date (meeting an earnings target, share price changes) do not adjust goodwill:

| Classification | Subsequent accounting |
|---|---|
| Liability (usually cash-settled) | **Remeasured** to fair value each reporting date; changes in **earnings** |
| Equity | **Not remeasured**; settlement accounted for within equity |

**Example:** Contingent consideration classified as a liability is recorded at $400,000. A year later, because the acquiree exceeded its targets, its fair value is $550,000. The acquirer recognizes a **$150,000 loss** in earnings; goodwill is unchanged.

## Step acquisitions

When the acquirer already held a noncontrolling stake, it **remeasures the previously held interest to fair value** at the acquisition date and recognizes the gain or loss in **earnings**. That fair value is then included in the goodwill computation. For example, a 20% stake carried at $1,500,000 with a fair value of $2,000,000 produces a **$500,000 gain**.

Changes in ownership **after** control is obtained (buying more shares or selling some without losing control) are **equity transactions**: no gain or loss, and the difference adjusts APIC. Losing control triggers deconsolidation, with a gain or loss in earnings and any retained interest remeasured to fair value.

## Noncontrolling interest

Under US GAAP the NCI is measured at **fair value** at acquisition (so goodwill is recognized in full, including the NCI's share). The NCI is reported in **equity**, separately from the parent's equity. Consolidated net income is attributed between the parent and the NCI on the face of the income statement.

**NCI share of income = NCI % × subsidiary's net income adjusted for fair value amortizations and upstream intercompany profits**

**Example:** In Year 1 Strand reports net income of $1,200,000. The inventory step-up of $500,000 is expensed as the inventory is sold, and the PP&E step-up adds 1,500,000 ÷ 10 = $150,000 of depreciation.

1. Adjusted subsidiary income = 1,200,000 − 500,000 − 150,000 = $550,000.
2. NCI share = 20% × 550,000 = **$110,000**.
3. End-of-year NCI (no dividends) = 2,100,000 + 110,000 = $2,210,000.

Losses are attributed to the NCI even if this makes its balance negative.

## Intercompany eliminations

All intercompany balances and transactions are eliminated **in full** (100%), regardless of the ownership percentage: receivables and payables, sales and purchases, interest, dividends, rent and management fees.

### Intercompany inventory

**Unrealized profit in ending inventory = intercompany sales × % still held by the buyer × gross profit rate on sales**

**Example:** Pellam sells goods to Strand for $400,000 at a 25% gross profit on sales. At year-end Strand still holds 30% of the goods.

1. Unrealized profit = 400,000 × 30% × 25% = **$30,000**.

| Account | Debit | Credit |
|---|---|---|
| Sales | 400,000 | |
| Cost of goods sold | | 400,000 |
| Cost of goods sold | 30,000 | |
| Inventory | | 30,000 |

Next year, when Strand sells the goods to outsiders, the $30,000 is realized (beginning retained earnings is debited and COGS credited).

| Direction | Who bears the unrealized profit |
|---|---|
| **Downstream** (parent → subsidiary) | Entirely the parent (controlling interest) |
| **Upstream** (subsidiary → parent) | Shared: the NCI's share of subsidiary income is reduced by its % of the unrealized profit |

### Intercompany sale of PP&E

The seller's gain is unrealized from the consolidated point of view. Eliminate it, restore the asset's original cost and accumulated depreciation, and reverse the extra depreciation each year.

**Example:** On January 1 Pellam sells equipment (cost $500,000, accumulated depreciation $200,000, carrying amount $300,000) to Strand for $360,000. Remaining life is 5 years.

1. Unrealized gain = 360,000 − 300,000 = **$60,000**.
2. Excess depreciation each year = 60,000 ÷ 5 = **$12,000**.

Year-of-sale elimination entries:

| Account | Debit | Credit |
|---|---|---|
| Gain on sale of equipment | 60,000 | |
| Equipment (500,000 − 360,000) | 140,000 | |
| Accumulated depreciation | | 200,000 |
| Accumulated depreciation | 12,000 | |
| Depreciation expense | | 12,000 |

### Intercompany bonds and dividends

If one affiliate buys the other's bonds from outsiders, the debt is **constructively retired** for consolidated purposes, and any difference between the price paid and the carrying amount of the bonds is a gain or loss in the consolidated statements. Intercompany dividends are eliminated against the investment income (or the investment account); only the NCI's share of the subsidiary's dividends reduces NCI.

## Other topics

- **Pushdown accounting** is optional for an acquired entity's separate statements when a change in control occurs; the election is made in the period control changes (or later, as a change in accounting principle).
- **Combined statements** (common control entities) and **reverse acquisitions** (the legal acquirer is the accounting acquiree) may also appear in conceptual items.
- **Common control transactions** are recorded at carrying amounts, not fair value.

## Common traps

- Adding acquisition costs to goodwill.
- Eliminating only the parent's share of intercompany profit or balances.
- Adjusting goodwill for post-measurement-period changes or for remeasurement of contingent consideration.
- Forgetting fair value amortization when computing NCI income.

- Charging downstream unrealized profit to the NCI.
- Recognizing a gain when the parent buys additional shares after control.

## Key takeaways

- Goodwill = consideration + NCI fair value + fair value of previously held interest − fair value of identifiable net assets.
- Acquisition costs are expensed; a bargain purchase is a gain after reassessment.
- Measurement period: up to one year. Liability-classified contingent consideration is remeasured through earnings.
- Previously held interests are remeasured to fair value (gain or loss in earnings).
- Eliminate 100% of intercompany transactions; upstream profits also reduce NCI income.
- Unrealized inventory profit = intercompany sales × % remaining × GP rate.

# 14. Derivatives and Hedge Accounting

ASC 815 requires every derivative to be recognized on the balance sheet at **fair value**. Where the changes in fair value go depends on whether the derivative is designated as a hedge and, if so, what kind. BAR tests the definition of a derivative, valuing options, forwards and swaps, the three hedge types, the qualifying criteria, and embedded derivatives.

## What is a derivative?

A derivative has all three characteristics:

| Characteristic | Meaning |
|---|---|
| **Underlying and notional amount** (or payment provision) | An underlying (price, rate, index) combined with a notional amount (units, shares, dollars) determines the settlement |
| **No or small initial net investment** | Smaller than would be required to buy the underlying directly |
| **Net settlement** | Can be settled net in cash, through a market mechanism, or by delivering an asset readily convertible to cash |

Common scope exceptions: regular-way securities trades, **normal purchases and normal sales** (contracts for items the entity expects to use or sell in the normal course of business, if elected and documented), certain insurance contracts, and contracts indexed to the entity's own equity and classified in equity.

| Instrument | Description |
|---|---|
| Forward | Customized agreement to buy or sell at a fixed price on a future date; usually settled at maturity |
| Futures | Standardized, exchange-traded forward with daily margin settlement |
| Option | Right, but not the obligation, to buy (call) or sell (put) at a strike price; the holder pays a premium |
| Swap | Exchange of cash flows (for example, fixed for variable interest) over time |

## Valuing derivatives

**Option fair value = intrinsic value + time value**

- Call intrinsic value = max(0, market price − strike price) × units
- Put intrinsic value = max(0, strike price − market price) × units
- Time value = fair value − intrinsic value; it declines to zero at expiration.

**Example:** A company holds call options on 1,000 shares with a strike price of $50. The share price is $56 and the options' fair value is $7,500. Intrinsic value = (56 − 50) × 1,000 = **$6,000**; time value = 7,500 − 6,000 = **$1,500**.

**Interest rate swap net settlement = notional × (difference between the fixed and variable rates)** for the period. Only the net difference changes hands, never the notional.

**Example:** Cobalt Co. has $5,000,000 of variable-rate debt. It enters a swap to receive the variable rate and pay a fixed 4.5%. For the next period the variable rate resets to 5.2%.

1. Interest on the debt = 5,000,000 × 5.2% = $260,000.
2. Swap settlement received = 5,000,000 × (5.2% − 4.5%) = **$35,000**.
3. Net interest cost = 260,000 − 35,000 = $225,000, which is 4.5%: the swap converted variable-rate debt to fixed.

A **forward contract**'s fair value is based on the change in the forward rate for the remaining term, discounted when material. For example, a contract to buy €1,000,000 at $1.10 when the forward rate for the remaining term rises to $1.13 has an undiscounted value of 1,000,000 × 0.03 = $30,000 (an asset).

## Where changes in fair value go

| Designation | Change in derivative's fair value | Hedged item |
|---|---|---|
| Not designated (speculative or economic hedge) | **Earnings** | Normal GAAP |
| **Fair value hedge** | **Earnings** | Change in fair value attributable to the hedged risk also in **earnings** (carrying amount adjusted) |
| **Cash flow hedge** | **OCI**; reclassified to earnings when the hedged transaction affects earnings | Forecasted transaction, not yet recorded |
| **Net investment hedge** (foreign operation) | **OCI** (cumulative translation adjustment) | Translation of the net investment |

> **Memory trick:** "**Fair** value hedges are **fair** to both sides: both go to earnings. **Cash** flow hedges **park** gains in OCI until the cash flow hits earnings."

### Hedged risks

| Fair value hedge (hedging an existing exposure to value changes) | Cash flow hedge (hedging variability in future cash flows) |
|---|---|
| Fixed-rate debt or investments (interest rate risk) | Variable-rate debt or investments |
| Inventory (price risk) | Forecasted purchases or sales of inventory |
| Firm commitments | Forecasted foreign-currency transactions |
| Available-for-sale debt securities | Interest on forecasted debt issuance |

Foreign currency hedges can be fair value hedges (firm commitments, recognized assets), cash flow hedges (forecasted transactions) or net investment hedges.

## Qualifying for hedge accounting

- **Formal documentation at inception**: the hedging relationship, risk management objective and strategy, the hedging instrument, the hedged item, the risk hedged and how effectiveness will be assessed.
- **Highly effective**: the derivative is expected to offset changes in fair value or cash flows of the hedged item. "Highly effective" is generally understood as offset within **80% to 125%**.
- An initial **quantitative** assessment is required unless a simplified method applies (for example, the **shortcut method** for certain interest rate swaps or the **critical terms match** method); later assessments may be qualitative.
- For a forecasted transaction, it must be **probable** of occurring.

Under **ASU 2017-12**, for cash flow and net investment hedges, the **entire** change in fair value of the hedging instrument included in the effectiveness assessment goes to OCI (ineffectiveness is no longer measured and reported separately). The earnings effect of the hedging instrument is presented in the **same income statement line** as the hedged item. Excluded components (for example, the time value of an option) can be recognized through an amortization approach.

## Fair value hedge example

**Example:** Halden Co. holds commodity inventory with a cost and fair value of $1,000,000. To protect its value, Halden sells futures contracts and designates them as a fair value hedge of the inventory's price risk. By year-end the commodity price falls: the inventory's fair value drops by $80,000 and the futures gain $78,000.

| Account | Debit | Credit |
|---|---|---|
| Futures contract (asset) | 78,000 | |
| Gain on hedge (earnings) | | 78,000 |
| Loss on hedged inventory (earnings) | 80,000 | |
| Inventory | | 80,000 |

Net effect on earnings = **$2,000 loss**. The inventory's carrying amount is adjusted to $920,000, a departure from normal cost-based inventory accounting that is allowed only because of the hedge.

## Cash flow hedge example

**Example:** In October, Ferrin Co. expects to buy 100,000 units of raw material in March. It enters a forward contract to lock in the price and designates it as a cash flow hedge. At December 31 the forward has a fair value of $50,000 because prices rose.

| Account | Debit | Credit |
|---|---|---|
| Forward contract (asset) | 50,000 | |
| Other comprehensive income | | 50,000 |

In March, Ferrin settles the forward and buys the material at the higher market price; the inventory is recorded at that price. The $50,000 stays in **accumulated OCI** until the inventory is sold, and is then reclassified to **cost of goods sold**, reducing it, so the overall cost reflects the locked-in price.

If the forecasted transaction becomes **probable of not occurring**, amounts in AOCI are reclassified to earnings immediately.

## Net investment hedges

A company with a foreign subsidiary may borrow in the subsidiary's currency (or use a forward) to hedge its net investment. Gains and losses on the hedging instrument go to the **cumulative translation adjustment** in OCI, offsetting translation gains and losses, and stay there until the subsidiary is sold or substantially liquidated.

## Embedded derivatives

An embedded derivative in a hybrid contract (for example, an equity conversion feature in a debt instrument or a commodity-indexed interest payment) is **bifurcated** and accounted for separately at fair value if all three conditions are met:

1. Its economic characteristics and risks are **not clearly and closely related** to those of the host contract;
2. The hybrid contract is **not** already remeasured at fair value through earnings; and
3. A separate instrument with the same terms **would be a derivative**.

The entity may instead elect the fair value option for the entire hybrid instrument.

## Disclosures

Entities disclose the objectives and strategies for using derivatives, the fair values and locations of derivatives in the balance sheet, gains and losses by type of hedge and their location in the income statement and OCI, credit-risk-related contingent features, and the amounts expected to be reclassified from AOCI in the next 12 months.

## Common traps

- Putting fair value hedge gains and losses in OCI.
- Reporting undesignated (speculative) derivatives in OCI.
- Treating gross interest on the notional as the swap settlement.
- Leaving cash flow hedge amounts in AOCI after the hedged item affects earnings, or reclassifying them before it does.
- Forgetting that hedge accounting requires documentation at inception (it cannot be applied retroactively).
- Calling the time value of an option "intrinsic value."

## Key takeaways

- Derivative: underlying + notional, little or no initial investment, net settlement. Always at fair value.
- Undesignated and fair value hedges → earnings (fair value hedges also adjust the hedged item through earnings).
- Cash flow hedges → OCI, reclassified when the hedged transaction affects earnings; net investment hedges → CTA in OCI.
- Hedge accounting needs inception documentation and a highly effective relationship (about 80–125%).
- Option fair value = intrinsic value + time value. Swap settlement = notional × rate difference.

- Bifurcate embedded derivatives that are not clearly and closely related to the host.

# 15. Leases: Lessor Accounting

FAR covers lessee accounting under ASC 842 in depth; BAR concentrates on the **lessor**. A lessor classifies each lease at commencement as a **sales-type**, **direct financing** or **operating** lease. The classification decides whether the lessor keeps the asset on its books or replaces it with a receivable, and whether profit is recognized up front.

## Classification

A lease is a **sales-type lease** if **any one** of these five criteria is met at commencement:

| # | Criterion | Commonly used guideline |
|---|---|---|
| 1 | Ownership transfers to the lessee by the end of the term | — |
| 2 | The lessee has a purchase option it is **reasonably certain** to exercise | — |
| 3 | The lease term is for the **major part** of the asset's remaining economic life | **75% or more** (not used if commencement is at or near the end of the economic life, i.e., the last 25%) |
| 4 | PV of lease payments plus any residual value **guaranteed by the lessee** equals or exceeds **substantially all** of the asset's fair value | **90% or more** |
| 5 | The asset is so **specialized** that it has no alternative use to the lessor at the end of the term | — |

If none is met, the lease is a **direct financing lease** when **both**: (a) the PV of lease payments plus residual value guaranteed by the lessee **and/or any third party** equals or exceeds substantially all of the fair value, and (b) collection of the payments plus any amount needed to satisfy the residual guarantee is **probable**. Otherwise it is an **operating lease**.

**Memory trick:** Run the five tests as one chain: **Title → Option → Life → Value → Unique**. Title passes, a purchase option will be exercised, the term covers most of the life, the payments cover nearly all the value, or the asset is unique to the lessee. Any single "yes" makes it sales-type.

**Exam tip:** A third-party residual value guarantee (for example, from an insurer) cannot make a lease sales-type through criterion 4, but it can make it a **direct financing** lease. That is the main way a direct financing lease arises.

Under **ASU 2021-05**, a lessor classifies a lease with **variable payments that do not depend on an index or rate** as an **operating lease** if sales-type or direct financing classification would produce a **selling loss at commencement**.

## Key measurement terms

| Term | Meaning |
|---|---|
| Lease payments | Fixed payments (less incentives), variable payments based on an index or rate, purchase option price if reasonably certain, termination penalties, and (for the lessor) residual value guaranteed by the lessee or a third party |
| Rate implicit in the lease | The rate that makes PV of lease payments + PV of unguaranteed residual = fair value of the asset + lessor's deferred initial direct costs |
| Net investment in the lease (sales-type) | PV of lease payments (lease receivable) + PV of **unguaranteed** residual asset |
| Initial direct costs (IDCs) | Incremental costs of obtaining the lease (commissions); not internal salaries or legal fees incurred regardless |

## Sales-type leases

At commencement the lessor:

- **Derecognizes** the underlying asset;
- Recognizes the **net investment in the lease**;
- Recognizes **selling profit or loss** (revenue − cost of goods sold);
- Expenses IDCs immediately if fair value differs from carrying amount (a dealer or manufacturer lessor); otherwise they are included in the net investment.

| Amount | Formula |
|---|---|
| Sales revenue | **Lesser of** fair value of the asset or PV of lease payments (the unguaranteed residual is excluded) |
| Cost of goods sold | Carrying amount of the asset − PV of the unguaranteed residual |
| Selling profit | Revenue − COGS = net investment − carrying amount |
| Interest income | Net investment balance outstanding × implicit rate |

> **Memory trick:** The **unguaranteed** residual is kept out of **both** revenue and COGS. It lowers both by the same amount, so selling profit is unchanged.

**Example:** On January 1, Year 1, Brightwater Co. leases equipment with a carrying amount of $300,000 to a customer for 5 years. The equipment has a 6-year economic life. Payments are $88,000 per year, due at the **start** of each year. The equipment is expected to be worth $30,000 at the end of the lease, none of it guaranteed. The rate implicit in the lease is 8% (PV of an annuity due, 8%, 5 periods = 4.3121; PV of $1, 8%, 5 periods = 0.6806).

1. Classification: lease term 5 ÷ 6 = 83% of economic life ≥ 75%, so **sales-type**.
2. PV of lease payments = 88,000 × 4.3121 = **$379,465** (= sales revenue).
3. PV of unguaranteed residual = 30,000 × 0.6806 = $20,418.
4. Net investment = 379,465 + 20,418 = **$399,883** (the fair value of the equipment).
5. COGS = 300,000 − 20,418 = **$279,582**; selling profit = 379,465 − 279,582 = **$99,883**.

| Account | Debit | Credit |
|---|---|---|
| Net investment in lease | 399,883 | |
| Cost of goods sold | 279,582 | |
| Sales revenue | | 379,465 |
| Equipment | | 300,000 |
| Cash | 88,000 | |
| Net investment in lease | | 88,000 |

6. Because the first payment is made at commencement, interest for Year 1 accrues only on the remaining balance: (399,883 − 88,000) × 8% = 311,883 × 8% = **$24,951**.

| Account | Debit | Credit |
|---|---|---|
| Net investment in lease (Dec 31, Year 1) | 24,951 | |
| Interest income | | 24,951 |

The net investment at December 31, Year 1 is 311,883 + 24,951 = $336,834, just before the second payment.

**Watch out:** With payments **in advance** (annuity due), subtract the first payment **before** computing interest. Applying 8% to the full $399,883 overstates interest income.

If the residual value were **guaranteed** (by the lessee or a third party), its PV would be part of the lease payments, so it would be included in revenue, and COGS would be the full carrying amount.

### Collectibility

If collection of the lease payments is **not probable** at commencement, a sales-type lessor does **not** derecognize the asset; payments received are recorded as a deposit liability until collectibility becomes probable or the lease ends.

## Direct financing leases

The lessor derecognizes the asset and records a net investment, but **selling profit is deferred** and recognized as part of interest income over the lease term (a selling **loss** is recognized immediately). Economically, the lessor is a financer, not a seller. IDCs are included in the net investment.

## Operating leases

The lessor **keeps the asset** on its balance sheet and **continues to depreciate** it.

| Item | Treatment |
|---|---|
| Lease income | **Straight-line** over the lease term, unless another systematic basis better reflects the pattern of benefit, even if payments escalate |
| Difference between cash and straight-line income | Deferred rent receivable (or liability) |
| Initial direct costs | Deferred and expensed over the lease term on the same basis as lease income |
| Variable payments not based on an index or rate | Income when earned |

**Example:** A lessor leases office space for 5 years with annual payments of $20,000, $22,000, $24,000, $26,000 and $28,000 (total $120,000). The building's portion has a cost of $200,000 depreciated over 10 years. The lessor paid a $5,000 broker commission.

1. Straight-line lease income = 120,000 ÷ 5 = **$24,000** per year.
2. Year 1: cash $20,000; income $24,000; deferred rent receivable increases by **$4,000**.
3. Depreciation = 200,000 ÷ 10 = $20,000; IDC amortization = 5,000 ÷ 5 = $1,000.

| Account | Debit | Credit |
|---|---|---|
| Cash | 20,000 | |
| Deferred rent receivable | 4,000 | |
| Lease income | | 24,000 |
| Depreciation expense | 20,000 | |
| Accumulated depreciation | | 20,000 |
| IDC amortization expense | 1,000 | |
| Deferred initial direct costs | | 1,000 |

## Comparing the three classifications

| | Sales-type | Direct financing | Operating |
|---|---|---|---|
| Asset on lessor's books | Derecognized | Derecognized | Retained and depreciated |
| Receivable recognized | Net investment | Net investment | None (deferred rent only) |
| Selling profit at commencement | Recognized | Deferred (loss recognized) | None |
| Income over the term | Interest income | Interest income (includes deferred profit) | Straight-line lease income |
| IDCs | Expensed if dealer profit; otherwise in net investment | In net investment | Deferred and amortized |

## Other lessor topics

- **Separating components:** consideration is allocated between lease and nonlease components (such as maintenance) on relative standalone selling prices; lessors may elect, by asset class, not to separate when certain conditions are met.
- **Sale and leaseback (buyer-lessor):** if the transfer is a sale under ASC 606, the buyer-lessor records the asset purchase and accounts for the lease as a lessor; if it is not a sale, the buyer-lessor records a financial asset (a loan).
- **Lease modifications:** a modification that grants an additional right of use at a standalone price is a separate contract; others are reassessed and reclassified as needed.
- **Disclosures:** lease income by type (selling profit, interest income, operating lease income, variable payments), maturity analysis of receivables (sales-type and direct financing) and of undiscounted operating lease payments, and how residual asset risk is managed.

## Common traps

- Including the unguaranteed residual in sales revenue.
- Applying interest to the full receivable when payments are made in advance.
- Recognizing operating lease income on a cash basis when payments escalate.
- Removing the asset from the books in an operating lease, or failing to depreciate it.
- Recognizing selling profit up front in a direct financing lease.
- Using a third-party guarantee to meet criterion 4 for sales-type classification.

## Key takeaways

- Sales-type if any of five criteria (ownership, purchase option, 75% of life, 90% of fair value, specialized).
- Direct financing: none of the five, but PV including third-party guarantees ≥ substantially all fair value and collection probable.
- Net investment = PV of lease payments + PV of unguaranteed residual. Revenue = PV of lease payments; COGS = carrying amount − PV of unguaranteed residual.
- Annuity due: the first payment reduces the net investment before interest accrues.
- Operating lessor keeps and depreciates the asset; income is straight-line; IDCs are deferred.

# 16. Public Company Reporting and EPS

Public companies (SEC registrants) face reporting requirements that private companies do not: periodic SEC filings, earnings per share, segment reporting and interim financial reporting. BAR tests the filing types and deadlines, basic and diluted EPS, the segment quantitative thresholds and the interim income tax computation.

## SEC reporting framework

| Rule set | Content |
|---|---|
| **Regulation S-X** | Form and content of financial statements in SEC filings (which statements, how many years, auditor requirements) |
| **Regulation S-K** | Non-financial disclosures: business description, risk factors, MD&A, executive compensation, controls, non-GAAP measures |
| **Regulation G** | Public disclosures of non-GAAP measures (outside filings): present the comparable GAAP measure and a reconciliation |
| **Regulation FD** | Material information must be disclosed to all investors at the same time, not selectively |

### Filer categories

| Category | Public float (generally) |
|---|---|
| Large accelerated filer | $700 million or more |
| Accelerated filer | $75 million or more but less than $700 million (excluding smaller reporting companies with annual revenues under $100 million) |
| Non-accelerated filer | Below $75 million, or a smaller reporting company with revenues under $100 million |
| Smaller reporting company (SRC) | Public float under $250 million, **or** annual revenues under $100 million and public float under $700 million |

Accelerated and large accelerated filers must also have been reporting for at least 12 months and have filed at least one annual report. SRCs and emerging growth companies get scaled disclosure (for example, two years of audited income statements instead of three). The auditor's attestation on internal control over financial reporting (SOX 404(b)) is required for accelerated and large accelerated filers, not for non-accelerated filers.

### Periodic and current reports

| Form | Purpose | Deadline |
|---|---|---|
| **10-K** | Annual report: audited financial statements (generally 2 years of balance sheets, 3 years of income, comprehensive income, cash flow and equity statements), MD&A, risk factors, controls | **60 days** (large accelerated), **75 days** (accelerated), **90 days** (all others) after fiscal year-end |
| **10-Q** | Quarterly report for each of the first three quarters: reviewed (not audited) condensed statements, MD&A | **40 days** (large accelerated and accelerated), **45 days** (others) after quarter-end |
| **8-K** | Current report on significant events: entry into a material agreement, acquisitions or dispositions, bankruptcy, change in auditor, non-reliance on previously issued statements, departure of directors or officers, results of operations | Generally within **4 business days** of the event |
| **DEF 14A** | Proxy statement for shareholder meetings (executive compensation, director elections) | Before the meeting |
| **S-1 / S-3 / S-4** | Registration statements: initial or general (S-1), short-form for seasoned issuers (S-3), business combinations (S-4) | When registering securities |
| **20-F / 6-K** | Annual and current reports of foreign private issuers | 20-F within 4 months of year-end |
| **11-K** | Annual report for employee stock purchase, savings and similar plans | |

> **Memory trick:** 10-K: **60 / 75 / 90**. 10-Q: **40 / 40 / 45**. 8-K: **4** business days.

Financial statements in SEC filings must be tagged in **Inline XBRL**. MD&A discusses liquidity, capital resources, results of operations, critical accounting estimates and known trends or uncertainties.

## Earnings per share (ASC 260)

Public entities present basic and diluted EPS on the face of the income statement, for income from continuing operations and net income (discontinued operations per share may be on the face or in the notes).

### Weighted-average shares outstanding (WASO)

- Weight shares issued or reacquired by the fraction of the year they were outstanding.
- **Stock dividends and stock splits** are applied **retroactively** to all shares outstanding before the event (as if they had always been outstanding), including those in prior

periods presented. This applies even to splits that occur after year-end but before the statements are issued.

- Shares issued in a business combination are weighted from the acquisition date.

**Example:** Kinloch Corp. had 100,000 common shares on January 1. On March 1 it issued 24,000 shares; on July 1 it declared a 10% stock dividend; on October 1 it bought back 12,000 shares as treasury stock.

| Event | Shares × dividend factor × months | Weighted |
|---|---|---|
| Jan 1 outstanding | 100,000 × 1.10 × 12/12 | 110,000 |
| Mar 1 issuance | 24,000 × 1.10 × 10/12 | 22,000 |
| Oct 1 treasury purchase | −12,000 × 3/12 | (3,000) |
| WASO | | **129,000** |

The stock dividend is not weighted by months; it restates the shares that existed before it. The October purchase happened after the dividend, so it is not adjusted.

## Basic EPS

**Basic EPS = (net income − preferred dividends) ÷ WASO**

Deduct **cumulative** preferred dividends for the current year whether or not declared; deduct noncumulative preferred dividends only if declared. Dividends in arrears from prior years are not deducted again.

**Example:** Kinloch's net income is $600,000. It has $1,000,000 of 5% cumulative preferred stock; no dividends were declared this year.

Basic EPS = (600,000 − 50,000) ÷ 129,000 = **$4.26**.

## Diluted EPS

Diluted EPS adds **dilutive potential common shares**. Securities that would increase EPS (antidilutive) are excluded.

| Security | Method | Numerator adjustment | Denominator adjustment |
|---|---|---|---|
| Options and warrants | **Treasury stock method** | None | Shares issued − shares repurchased at the **average** market price (only if in the money) |
| Convertible bonds | **If-converted method** | Add back after-tax interest: interest × (1 − t) | Add shares from conversion (from the start of the year or issue date) |
| Convertible preferred | **If-converted method** | Add back preferred dividends deducted | Add shares from conversion |
| Contingently issuable shares | Included if the conditions are currently met (as if the end of the period were the end of the contingency) | | |

To decide which securities to include, compute each security's **incremental EPS** (numerator effect ÷ share effect), rank from most to least dilutive, and add them one at a time. Stop when the next one would increase EPS. The **control number** is income from continuing operations available to common shareholders: if a security is antidilutive to continuing operations, it is excluded from all diluted per-share amounts.

**Example:** Continuing with Kinloch (basic EPS $4.26, numerator $550,000, WASO 129,000), tax rate 25%:

- Options: 10,000 at an exercise price of $30; average market price $40. Treasury stock method: 10,000 × 30 ÷ 40 = 7,500 shares repurchased, **2,500 incremental shares**, incremental EPS $0.
- Convertible bonds: $1,000,000 of 6% bonds convertible into 20,000 shares. After-tax interest = 60,000 × 0.75 = $45,000; incremental EPS = 45,000 ÷ 20,000 = **$2.25**.
- The 5% preferred is convertible into 15,000 shares; dividends $50,000; incremental EPS = **$3.33**.

| Step | Numerator | Shares | EPS |
|---|---|---|---|
| Basic | $550,000 | 129,000 | $4.26 |
| + Options | $550,000 | 131,500 | $4.18 |
| + Convertible bonds | $595,000 | 151,500 | $3.93 |
| + Convertible preferred | $645,000 | 166,500 | $3.87 |

Each step lowers EPS, so all three are dilutive: diluted EPS = **$3.87**. (If the preferred's incremental EPS had been above $3.93, it would have been excluded.)

**Watch out:** The treasury stock method uses the **average** market price for the period, not the year-end price, and options are included only when the average price exceeds the exercise price.

The **two-class method** applies when participating securities (for example, unvested shares that receive nonforfeitable dividends) share in earnings with common stock.

## Segment reporting (ASC 280)

Public entities report information about **operating segments**: components that earn revenues and incur expenses, whose results are regularly reviewed by the **chief operating decision maker (CODM)**, and for which discrete financial information is available. Similar segments may be aggregated if they meet the aggregation criteria.

An operating segment is **reportable** if it meets **any one** of these 10% tests:

| Test | Threshold |
|---|---|
| Revenue | Revenue (external **and** intersegment) ≥ 10% of combined revenue of all operating segments |
| Profit or loss | Absolute profit or loss ≥ 10% of the **greater** of (a) combined profits of segments with profits or (b) combined losses of segments with losses |
| Assets | Assets ≥ 10% of combined assets of all operating segments |

Then the **75% test**: external revenue of reportable segments must be at least 75% of total consolidated external revenue; if not, add segments until it is. About **10 segments** is a practical upper limit.

**Example:** Five operating segments ($ in thousands):

| Segment | Total revenue | Profit (loss) | Assets | External revenue | Reportable? |
|---|---|---|---|---|---|
| A | 500 | 80 | 900 | 450 | Yes (all tests) |
| B | 150 | 20 | 400 | 150 | Yes (revenue, profit, assets) |
| C | 90 | (30) | 300 | 90 | Yes (loss and assets tests) |
| D | 60 | 6 | 150 | 60 | No |
| E | 200 | 4 | 250 | 200 | Yes (revenue, assets) |
| Total | 1,000 | | 2,000 | 950 | |

1. Revenue threshold = 10% × 1,000 = 100.
2. Profit/loss threshold: combined profits 110 vs combined losses 30 → 10% × 110 = 11. C's loss of 30 exceeds 11.
3. Asset threshold = 10% × 2,000 = 200. D's 150 fails; it fails every test.
4. 75% test: reportable external revenue = 950 − 60 = 890, which is 93.7% of 950 (above 75%), so no more segments are needed.

Required disclosures include each reportable segment's profit or loss and assets, a reconciliation of segment totals to consolidated amounts, and the factors used to identify segments. **ASU 2023-07** (effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024) added disclosure of **significant segment expenses** regularly provided to the CODM, an amount for **other segment items**, the **CODM's title and position** and how the CODM uses the

measures, extends annual segment disclosures to **interim** periods, and requires entities with a **single reportable segment** to give the full set of segment disclosures.

**Entity-wide disclosures** (even with one segment): revenue by product or service, revenue and long-lived assets by geographic area (domestic vs. foreign), and reliance on **major customers** — any single customer providing **10% or more** of revenue (the customer's identity need not be disclosed, but the amount and segments are).

## Interim reporting (ASC 270)

Each interim period is viewed as an **integral part of the annual period**. Generally the same accounting principles are used as in the annual statements, with some modifications:

| Item | Interim treatment |
|---|---|
| Costs that benefit several quarters (annual advertising, property taxes, bonuses) | Allocated across quarters |
| Inventory market decline expected to recover within the year | Not recognized |
| Temporary LIFO liquidation expected to be replaced by year-end | Cost of goods sold reflects the replacement cost |
| Unusual or infrequently occurring items, discontinued operations | Recognized in the quarter they occur (not allocated) |
| Income taxes | **Estimated annual effective tax rate** × year-to-date pre-tax income − tax recognized in prior quarters |
| Changes in accounting principle | Retrospective application, generally |

**Example:** Q1 pre-tax income is $200,000 and the estimated annual effective tax rate is 25%: Q1 tax = **$50,000**. In Q2, year-to-date pre-tax income is $450,000 and the estimated annual rate is revised to 24%.

1. Year-to-date tax = 450,000 × 24% = $108,000.
2. Q2 tax = 108,000 − 50,000 = **$58,000**.

Applying 24% only to Q2's $250,000 of income ($60,000) would be wrong; the revised rate is applied to the cumulative year-to-date income.

## Common traps

- Weighting stock dividends and splits by the months after distribution instead of restating retroactively.
- Including antidilutive securities, or using year-end instead of average price in the treasury stock method.
- Deducting noncumulative undeclared preferred dividends, or forgetting undeclared cumulative ones.
- Using pre-tax interest in the if-converted numerator.
- Using only external revenue for the 10% revenue test (it includes intersegment revenue) or total revenue for the 75% test (it uses external revenue).
- Applying a revised interim tax rate only to the current quarter.

## Key takeaways

- 10-K: 60/75/90 days; 10-Q: 40/40/45 days; 8-K: generally 4 business days. Large accelerated ≥ $700M float; accelerated $75M–$700M.
- Basic EPS = (NI − preferred dividends) ÷ WASO; stock dividends and splits are retroactive.
- Diluted EPS: treasury stock method (average price) and if-converted method (after-tax interest); rank by incremental EPS and exclude antidilutive securities.
- Segments: 10% of revenue, profit/loss or assets; reportable segments must cover 75% of external revenue; ASU 2023-07 adds significant segment expenses.
- Interim taxes: estimated annual rate × YTD income − tax already recognized.

# 17. State and Local Governments

State and local governments follow standards set by the **Governmental Accounting Standards Board (GASB)**. Their financial reports have two layers: **fund financial statements** that show compliance with spending limits, and **government-wide statements** that show the full economic cost of services. BAR tests fund types, measurement focus and basis of accounting, revenue and expenditure recognition, budgetary accounting, fund balance classifications, major funds and the reconciliation from governmental funds to governmental activities.

## Fund types

| Category | Fund | Used for |
|---|---|---|
| **Governmental** | General fund | Everything not required to be accounted for elsewhere; always a major fund; only one |
| | Special revenue funds | Proceeds of specific revenue sources restricted or committed to purposes other than debt service or capital projects (for example, a state road-maintenance grant) |
| | Capital projects funds | Resources restricted, committed or assigned to acquire or build capital assets |
| | Debt service funds | Resources for principal and interest on general long-term debt |
| | Permanent funds | Resources legally restricted so that only earnings may be used to support the government's **own** programs (for example, cemetery perpetual care) |
| **Proprietary** | Enterprise funds | Activities that charge fees to **external** users (water utility, airport, transit) |
| | Internal service funds | Goods or services provided to **other departments** on a cost-reimbursement basis (motor pool, IT, self-insurance) |
| **Fiduciary** | Pension (and other employee benefit) trust funds | Resources held in trust for employee pensions and OPEB |
| | Investment trust funds | External portion of investment pools held for other governments |
| | Private-purpose trust funds | Trusts benefiting individuals, private organizations or other governments (for example, scholarships for named students) |
| | Custodial funds | Resources held for others that are not in a trust (for example, property taxes collected for a school district) |

**Memory trick:** Governmental funds: "**GRaSPP**" — **G**eneral, special **R**evenue, **S**ervice of debt, capital **P**rojects, **P**ermanent.

## Measurement focus and basis of accounting

| Statements | Measurement focus | Basis of accounting |
|---|---|---|
| Government-wide | Economic resources | Accrual |
| Governmental funds | **Current financial resources** | **Modified accrual** |
| Proprietary funds | Economic resources | Accrual |
| Fiduciary funds | Economic resources | Accrual |

Under modified accrual:

- **Revenues** are recognized when **measurable and available** to pay current-period liabilities. For **property taxes**, "available" means collected during the year or within **60 days** after year-end. Amounts not yet available are reported as **deferred inflows of resources (unavailable revenue)**.
- **Expenditures** (not expenses) are recognized when the liability is incurred, with exceptions: **principal and interest on general long-term debt are expenditures when due**; compensated absences, claims and judgments are expenditures when they will be paid with current resources.
- **Capital outlays** are expenditures; capital assets and long-term debt are not reported in governmental funds. Bond proceeds are **other financing sources**, and transfers between funds are other financing sources and uses.

### Nonexchange revenue (GASB 33)

| Type | Example | Accrual recognition (assets / revenue) |
|---|---|---|
| Derived tax revenues | Sales tax, income tax | When the underlying exchange (sale, income) occurs |
| Imposed nonexchange revenues | Property taxes, fines | Receivable when there is an enforceable claim; revenue in the period for which the taxes are levied |
| Government-mandated nonexchange | State mandate with funding | When all eligibility requirements (including time requirements) are met |
| Voluntary nonexchange | Grants, donations | When all eligibility requirements are met |

Resources received before time requirements are met are deferred inflows; resources received before other eligibility requirements are met are liabilities (unearned revenue). Purpose restrictions do not delay revenue recognition; they restrict net position.

**Example:** Maple County levies property taxes of $10,000,000 for the current year and expects 2% to be uncollectible. It collects $9,000,000 during the year and expects to collect $300,000 within 60 days after year-end, with the rest later.

| Statement | Property tax revenue |
|---|---|
| General fund (modified accrual): 9,000,000 + 300,000 | **$9,300,000** |
| Deferred inflow (unavailable revenue) in the fund: 9,800,000 − 9,300,000 | **$500,000** |
| Government-wide (accrual): 10,000,000 × 98% | **$9,800,000** |

## Budgetary accounting and encumbrances

Governments record the legally adopted budget in budgetary accounts (often in the general and special revenue funds):

| Account | Debit | Credit |
|---|---|---|
| Estimated revenues control | 12,000,000 | |
| Appropriations control | | 11,700,000 |
| Budgetary fund balance | | 300,000 |

**Encumbrances** record commitments (purchase orders) so that the same appropriation is not spent twice. When goods arrive, the encumbrance is reversed and the expenditure recorded at the **actual** amount.

**Example:** A $5,000 purchase order is issued; the supplies arrive with a $5,200 invoice.

| Account | Debit | Credit |
|---|---|---|
| Encumbrances | 5,000 | |
| Encumbrances outstanding | | 5,000 |
| Encumbrances outstanding | 5,000 | |
| Encumbrances | | 5,000 |
| Expenditures | 5,200 | |
| Vouchers payable | | 5,200 |

**Available appropriation = appropriations − expenditures − outstanding encumbrances.** Encumbrances are not expenditures or liabilities; outstanding encumbrances at year-end are reported within restricted, committed or assigned fund balance (never as a separate classification).

## Fund balance classifications (GASB 54)

| Classification | Constraint | Example |
|---|---|---|
| **Nonspendable** | Not in spendable form or legally/contractually required to be kept intact | Inventories, prepaid items, permanent fund principal |
| **Restricted** | Externally imposed (creditors, grantors, laws of other governments) or by enabling legislation | Unspent state grant for public safety; unspent bond proceeds |
| **Committed** | Formal action of the government's **highest level of decision-making authority** (council ordinance or resolution); changed only by the same action | Council ordinance setting aside resources for road repairs |
| **Assigned** | Intended use by the governing body or an official it delegates to (for example, the finance director) | Amount the finance director plans to use for technology |
| **Unassigned** | Residual; only the general fund reports a positive unassigned balance | |

**Example:** The general fund balance is $3,000,000, including inventory $100,000, a grant restricted to public safety $400,000, an ordinance commitment for roads $300,000 and the finance director's planned technology spending $200,000. Unassigned = 3,000,000 − 100,000 − 400,000 − 300,000 − 200,000 = **$2,000,000**.

**Memory trick:** Constraints get weaker from top to bottom: **N**ever-spendable, **R**ules from outside, **C**ouncil, **A**dministrator, **U**nconstrained.

## Government-wide statements

The **statement of net position** shows assets + deferred outflows − liabilities − deferred inflows = **net position**, in three components:

| Component | Computation |
|---|---|
| Net investment in capital assets | Capital assets net of accumulated depreciation − outstanding debt attributable to them (excluding unspent proceeds) |
| Restricted | Externally imposed or enabling-legislation restrictions |
| Unrestricted | Remainder |

**Example:** Capital assets net of depreciation are $40,000,000. Related bonds total $15,000,000, of which $2,000,000 of proceeds is unspent. Net investment in capital assets = 40,000,000 − (15,000,000 − 2,000,000) = **$27,000,000**.

The **statement of activities** uses a net (expense) revenue format: expenses by **function** (general government, public safety, highways) minus **program revenues** (charges for services, operating grants and contributions, capital grants and contributions) = net cost of each function. **General revenues** (all taxes, including those levied for a specific purpose, unrestricted grants, investment income) appear below. Columns separate **governmental activities**, **business-type activities** and **component units**. Fiduciary activities are **excluded** from the government-wide statements.

Internal service funds are usually reported within **governmental activities** because they mainly serve governmental departments.

## Reconciling governmental funds to governmental activities

Governmental fund balance sheets must be reconciled to net position, and the change in fund balances to the change in net position.

| Fund balances to net position | Adjustment |
|---|---|
| + Capital assets (net of accumulated depreciation) | Not current financial resources |
| − Long-term liabilities (bonds, accrued interest not yet due, compensated absences, pensions) | Not due and payable currently |
| + Unavailable revenue (deferred inflows in funds) | Recognized as revenue under accrual |
| + Internal service fund net position (serving governmental departments) | Included in governmental activities |

**Example:** Total governmental fund balances are $5,000,000. Capital assets net $40,000,000; general obligation bonds $15,000,000; accrued interest not yet due $200,000; long-term compensated absences $800,000; unavailable property tax revenue $600,000; internal service fund net position $400,000.

Net position = 5,000,000 + 40,000,000 − 15,000,000 − 200,000 − 800,000 + 600,000 + 400,000 = **$30,000,000**.

| Change in fund balances to change in net position | Adjustment |
|---|---|
| + Capital outlay expenditures − depreciation expense | Capitalize and depreciate |
| − Bond proceeds (other financing sources) | Liability, not revenue |
| + Principal repayments | Reduce liability, not expense |
| ± Change in unavailable revenue | Accrual timing |
| − Increase in accrued interest, compensated absences, other long-term accruals | Accrual expenses |
| ± Internal service fund change | Included in governmental activities |

**Example:** Net change in fund balances +$500,000; capital outlays $3,000,000; depreciation $2,000,000; bond proceeds $4,000,000; principal repaid $1,000,000; increase in unavailable revenue $100,000; increase in compensated absences $50,000.

Change in net position = 500,000 + 3,000,000 − 2,000,000 − 4,000,000 + 1,000,000 + 100,000 − 50,000 = **−$1,450,000** (a decrease).

**Watch out:** Unavailable revenue is **added** in the conversion because accrual statements recognize revenue the funds deferred. Bond proceeds are **subtracted** because they are not revenue government-wide.

## Capital projects and debt service

- Bond proceeds are reported in the capital projects fund as **other financing sources** at face amount; a premium is an additional other financing source and a discount an other financing use. Issuance costs paid from proceeds are **expenditures**. Government-wide, the bonds (plus premium) are a liability and, under **GASB 65**, issuance costs (other than prepaid insurance) are **expensed**.
- The debt service fund recognizes principal and interest **when due**; interest accrued but not due at year-end is not recorded in the fund (but is accrued government-wide).

## Major funds and required statements

A governmental or enterprise fund is **major** if the same element (assets plus deferred outflows, liabilities plus deferred inflows, revenues, or expenditures/expenses) is **both**:

1. At least **10%** of the corresponding total for all funds of that category (all governmental or all enterprise funds), **and**
2. At least **5%** of the corresponding total for all governmental **and** enterprise funds combined.

The general fund is always major, and a government may report any other fund it considers important as major. Major funds get their own columns; nonmajor funds are aggregated.

**Example:** A special revenue fund has revenues of $6,000,000; all governmental funds have revenues of $50,000,000 and all enterprise funds $30,000,000. Tests: 6 ÷ 50 = **12%** (≥ 10%) and 6 ÷ 80 = **7.5%** (≥ 5%). It is a **major fund**.

| Fund category | Required fund statements |
|---|---|
| Governmental | Balance sheet; statement of revenues, expenditures and changes in fund balances |
| Proprietary | Statement of net position; statement of revenues, expenses and changes in fund net position; **statement of cash flows** (direct method) |
| Fiduciary | Statement of fiduciary net position; statement of changes in fiduciary net position |

The **annual comprehensive financial report (ACFR)** has introductory, financial and statistical sections. The financial section contains the auditor's report, **MD&A** (required supplementary information), the basic financial statements and notes, other RSI (such as pension schedules and budgetary comparison schedules) and combining statements.

## Recent change: GASB 103

**GASB Statement No. 103, Financial Reporting Model Improvements**, applies to fiscal years beginning after June 15, 2025 (earlier application encouraged). Key changes:

- **Extraordinary and special items are replaced** by "**unusual or infrequent items**," presented separately just before the net change in resource flows.
- Proprietary funds must show a subtotal for **operating income (loss) and noncapital subsidies**, and the statement defines operating and nonoperating items more precisely.
- **Budgetary comparison** information must be presented as **RSI** (not as a basic statement), with variances between original and final budget and between final budget and actual, and explanations of significant variances.
- **MD&A** is organized into defined sections and must focus on analysis rather than boilerplate.
- Each **major component unit** is presented separately in the government-wide statements unless that reduces readability, in which case combining statements follow the fund statements.

## Common traps

- Reporting capital assets or long-term debt in governmental funds.
- Subtracting unavailable revenue in the fund-to-government-wide conversion.
- Accruing unmatured interest in the debt service fund.
- Treating bond proceeds as revenue.
- Calling a council ordinance a restriction (it creates a committed balance) or an official's intent a commitment (it is assigned).
- Treating a fund as major after it passes only one of the 10% and 5% tests.
- Including fiduciary funds in the government-wide statements.

## Key takeaways

- Governmental funds: general, special revenue, capital projects, debt service, permanent — current financial resources focus, modified accrual.
- Proprietary (enterprise, internal service) and fiduciary funds and the government-wide statements use economic resources and accrual.

- Property taxes in funds: collected + collected within 60 days; the rest is a deferred inflow.
- Fund balance: nonspendable, restricted, committed, assigned, unassigned.
- Net position = fund balances + capital assets − long-term liabilities + unavailable revenue + ISF net position.
- Major fund: ≥ 10% of the category total **and** ≥ 5% of governmental + enterprise total.

# Final Review Checklist

Use this checklist in the last week before your exam. For each line, ask yourself whether you could explain the rule and work a numeric example without notes. Anything you cannot do quickly, reread in its chapter and drill in the matching bank chapter.

## Formula sheet

| Topic | Formula |
|---|---|
| Quick ratio | (Cash + marketable securities + receivables) ÷ current liabilities |
| Cash conversion cycle | DSO + DIO − DPO |
| DuPont | ROE = margin × asset turnover × equity multiplier |
| Production budget | Sales + desired ending FG − beginning FG |
| High-low | (Cost at high activity − cost at low activity) ÷ (high − low activity) |
| Predetermined OH rate | Budgeted OH ÷ budgeted activity |
| Absorption vs. variable income | Change in inventory units × fixed MOH per unit |
| Price / quantity variance | (AP − SP) × AQ / (AQ − SQ) × SP |
| FOH budget / volume variance | Actual − budget / budget − applied |
| Residual income | Operating income − required rate × operating assets |
| Breakeven units / dollars | Fixed costs ÷ CM per unit / fixed costs ÷ CM ratio |
| After-tax target | Pre-tax = after-tax ÷ (1 − t) |
| DOL | Contribution margin ÷ operating income |
| After-tax cash flow | Pre-tax cash flow × (1 − t) + depreciation × t |
| Profitability index | PV of future cash flows ÷ initial investment |
| Midpoint elasticity | (ΔQ ÷ average Q) ÷ (ΔP ÷ average P) |
| GDP | C + I + G + (X − M) |
| CAPM | rf + β(rm − rf) |
| WACC | wd × kd(1 − t) + wp × kp + we × ke |
| Gordon model | $D_1$ ÷ (r − g) |
| Goodwill | Consideration + NCI FV + prior interest FV − FV of identifiable net assets |
| Unrealized inventory profit | Intercompany sales × % remaining × GP rate |
| Lessor net investment | PV of lease payments + PV of unguaranteed residual |
| Treasury stock method | Options − (options × exercise price ÷ average price) |
| Interim tax | Annual ETR × YTD income − tax previously recognized |

## Business Analysis (Chapters 1–9)

☐ I can compute liquidity, activity, solvency, profitability and market ratios, and I know which use averages.

☐ I can compute the cash conversion cycle, including purchases from COGS and inventory changes.

☐ I can break ROE into margin, turnover and leverage, and explain what drove a change.

☐ I can predict the effect of a transaction on the current ratio when it starts above or below 1.0.

☐ I can compute book value per common share with preferred liquidation values and dividends in arrears.

☐ I can build production, materials purchases, cash collections and cash budgets, including minimum-balance borrowing.

☐ I can prepare a flexible budget and explain why it beats a static budget for evaluation.

☐ I can apply the high-low method and interpret regression output (intercept, slope, $R^2$, t-statistic).

☐ I can name the four types of analytics and match a question to each.

☐ I can apply overhead, compute over- or underapplied overhead and dispose of it.

☐ I can compute weighted-average and FIFO equivalent units and costs, with materials added at the start.

☐ I can allocate overhead with ABC and explain why it shifts cost to low-volume products.

☐ I can reconcile absorption and variable costing income.

☐ I can allocate joint costs by physical units, sales value and NRV, and treat normal versus abnormal spoilage.

☐ I can compute all materials, labor, variable overhead and fixed overhead variances and label them F or U.

☐ I can compute sales price and sales volume variances.

☐ I can compute ROI, residual income and EVA and explain the suboptimization problem.

☐ I can name the four balanced scorecard perspectives and place measures in them.

☐ I can determine minimum and maximum transfer prices with and without idle capacity.

☐ I can compute breakeven, target profit (after tax), margin of safety, DOL and multi-product breakeven.

☐ I can compute an indifference point between two cost structures.

☐ I can analyze special orders, make-or-buy, keep-or-drop and sell-or-process-further decisions.

☐ I can rank products by CM per unit of a constrained resource.

☐ I can compute NPV, IRR (even flows), PI, payback, discounted payback and ARR.

☐ I can include working capital, salvage (after tax) and depreciation tax shields correctly.

☐ I choose the higher NPV when NPV and IRR conflict.

☐ I can compute price, income and cross elasticity and predict the revenue effect of a price change.

☐ I can describe the four market structures and the MR = MC and shutdown rules.

☐ I can compute GDP, real GDP, the real interest rate, the unemployment rate and the spending multiplier.

☐ I can distinguish monetary from fiscal policy tools and expansionary from contractionary actions.

☐ I can record foreign-currency transaction gains and losses on receivables and payables.

☐ I can compute PV, FV, annuity and annuity-due values and the effective annual rate.

☐ I can compute expected return, standard deviation, coefficient of variation and portfolio beta.

☐ I can compute CAPM, WACC, a bond price and a Gordon-model stock value.

☐ I can move from enterprise value to equity value per share.

☐ I can classify fair value inputs as Level 1, 2 or 3 and name the three valuation approaches.

☐ I can name the four risk responses and the five COSO ERM components.

## Technical Accounting and Reporting (Chapters 10–16)

☐ I can allocate a transaction price on relative standalone selling prices.

☐ I can estimate variable consideration (expected value or most likely amount) and apply the constraint.

☐ I can record a sale with a right of return (refund liability and return asset).

☐ I can decide principal versus agent and report gross or net revenue.

☐ I can recognize gift card breakage in proportion to redemptions.

☐ I can account for a contract modification as a separate contract, prospectively or by cumulative catch-up.

☐ I can compute over-time revenue and gross profit by year with cost-to-cost, including changes in estimates and loss contracts.

☐ I can distinguish assurance-type and service-type warranties and functional versus symbolic IP licenses.

☐ I can apply the three impairment models (finite-lived, indefinite-lived, goodwill) and cap the goodwill loss.

☐ I know the private company goodwill alternatives (amortization over 10 years or less).

☐ I can compute R&D expense, including alternative-use equipment and acquired IPR&D.

☐ I can compute software amortization (greater of revenue ratio or straight-line) and know the internal-use rules, including ASU 2025-06.

☐ I can compute stock option cost by year with forfeiture estimates and a cumulative catch-up.

☐ I can record option exercise and expiration, RSUs and cash-settled SARs.

☐ I can record the deferred tax asset and excess tax benefit for stock compensation.

☐ I can compute goodwill or a bargain purchase gain and record the acquisition-date elimination entry.

☐ I know acquisition costs are expensed, the one-year measurement period and contingent consideration remeasurement rules.

☐ I can compute NCI's share of income after fair value amortization and upstream profits.

☐ I can eliminate intercompany inventory profit and intercompany PP&E gains with excess depreciation.

☐ I can identify a derivative and compute option intrinsic and time value and swap settlements.

☐ I can record fair value, cash flow and net investment hedges and say where each gain or loss goes.

☐ I know the hedge documentation and effectiveness requirements and the embedded derivative bifurcation tests.

☐ I can classify a lease as sales-type, direct financing or operating from the lessor's perspective.

☐ I can compute a sales-type lease's net investment, revenue, COGS, selling profit and first-year interest (annuity due).

☐ I can record an operating lease with escalating payments on a straight-line basis.

☐ I know the 10-K, 10-Q and 8-K deadlines and the filer categories.

☐ I can compute WASO with issuances, treasury stock and retroactive stock dividends or splits.

☐ I can compute basic and diluted EPS with the treasury stock and if-converted methods and exclude antidilutive securities.

☐ I can apply the segment 10% tests and the 75% test and list the ASU 2023-07 disclosures.

☐ I can compute interim income tax expense with a revised annual effective rate.

## State and Local Governments (Chapter 17)

☐ I can classify any activity into the correct governmental, proprietary or fiduciary fund.

☐ I know the measurement focus and basis of accounting for each set of statements.

☐ I can compute property tax revenue in the general fund and government-wide, and the deferred inflow.

☐ I can apply GASB 33 recognition to derived, imposed, mandated and voluntary nonexchange revenues.

☐ I can record the budget, encumbrances and expenditures and compute the available appropriation.

☐ I can classify fund balance into nonspendable, restricted, committed, assigned and unassigned.

☐ I can compute net investment in capital assets.

☐ I can reconcile fund balances to net position and the change in fund balances to the change in net position.

☐ I can treat bond proceeds, premiums, issuance costs and debt service in funds and government-wide.

☐ I can apply the major fund 10% and 5% tests.

☐ I can list the required statements for each fund category and the ACFR sections.

☐ I know the main GASB 103 changes (unusual or infrequent items, budgetary comparisons as RSI).

## Exam-day checklist

☐ I know the format: 50 MCQs in two testlets of 25, then 7 TBSs in testlets of 2, 3 and 2; 4 hours; 15-minute standardized break after testlet 3.

☐ I will budget about 1.5 minutes per MCQ to bank time for simulations.

☐ I will read each simulation's requirement before the exhibits.

☐ I will write the formula before plugging in numbers.

☐ I will answer every cell; there is no penalty for guessing.

☐ I will check labels: units versus dollars, year-end versus average, favorable versus unfavorable, fund versus government-wide.

## Key takeaways

- Area I (40–50%) is formula-driven: make the formula sheet automatic.
- Area II (35–45%) is entry-driven: be able to write the journal entries for each topic from memory.
- Area III (10–20%) is conversion-driven: know the two bases and how to bridge them.
- Work the checklist honestly; every unchecked box points to a chapter and a bank set to drill.

## Now practice it

Every chapter in this guide has matching practice tests, simulations and mock exams at **UPractice.org**.