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CHEAT SHEET

CFA® Program Level I

Financial Statement Analysis Cheat Sheet

2027 curriculum · 12 readings · 95 formulas

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CredGuild · CFA® Program Level I · Financial Statement Analysis Cheat Sheet
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CFA® PROGRAM LEVEL I · CHEAT SHEET

Financial Statement Analysis

Exam weight 11–14% · 12 readings · 95 formulas

27 Introduction to Financial Statement Analysis

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

28 Analyzing Income Statements

MODULE 28.1 · REVENUE RECOGNITION

- Under IFRS 15 and ASC 606, revenue is recognized when (or as) control of a promised good or service passes to the customer, at the amount the firm expects to be entitled to.
- The five steps are: identify the contract with the customer; identify its performance obligations; determine the transaction price; allocate that price to the obligations; and recognize revenue when (or as) each obligation is satisfied.
- Cash received before goods or services are delivered is recorded as a liability, unearned (deferred) revenue, and becomes revenue as the delivery takes place.
- Variable consideration such as a bonus enters the transaction price only to the extent that a significant later reversal is highly unlikely.

- With an input measure of progress, cumulative revenue equals cumulative cost to date divided by total expected cost, times the transaction price, and the period's revenue is that figure less revenue already recognized.
- A principal controls the good before transfer and reports gross revenue with the cost as an expense; an agent only arranges the sale and reports its net fee or commission.

EXAM SHORTCUTS

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

MODULE 28.2 · EXPENSE RECOGNITION

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

MODULE 28.3 · NONRECURRING ITEMS

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

MODULE 28.4 · EARNINGS PER SHARE

- Basic EPS equals net income minus preferred dividends, divided by the weighted average number of common shares outstanding; common dividends are not subtracted.
- Stock dividends and stock splits are applied retroactively to all shares outstanding before the event, as if it had happened at the start of the year, and shares issued or repurchased after the event are not adjusted.
- Exam convention: a company with a simple capital structure reports basic EPS only. Current practice: that is the US GAAP rule, while IFRS requires every company within its scope to present both basic and diluted EPS.
- Under the if-converted method, diluted EPS adds back convertible preferred dividends and convertible debt interest × (1 – t) to the numerator and adds the conversion shares to the denominator.
- Under the treasury stock method, options and warrants add $(\bar{P} - X)/\bar{P} \times N$ shares, where $\bar{P}$ is the average market price, and they are dilutive only when $X < \bar{P}$.

- A security that would raise EPS or reduce a loss per share is antidilutive and is excluded, so diluted EPS can never exceed basic EPS.

EXAM SHORTCUTS

- A convertible is dilutive when its per-share effect (preferred dividends, or interest × (1 – t), divided by the shares on conversion) is below basic EPS, so each convertible can be tested without computing diluted EPS with and without it.
- Options or warrants whose exercise price is not below the average market price are not dilutive, so they can be dropped before applying the treasury stock method.
- When a company reports a net loss available to common shareholders, every potential share is antidilutive and diluted EPS equals basic EPS, so no dilution test is needed.

MODULE 28.5 · RATIOS AND COMMON-SIZE INCOME STATEMENTS

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

EXAM SHORTCUTS

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

FORMULAS

Revenue over time (long-term contracts)	$\text{Cumulative revenue}_t = \dfrac{\text{Cumulative cost to date}}{\text{Total expected cost}} \times \text{Transaction price}$
Depreciation methods	$\text{Straight-line} = \dfrac{\text{Cost} - \text{Salvage}}{\text{Useful life}}$
Capitalized interest	$\text{Adjusted coverage} = \dfrac{\text{EBIT} + \text{Depreciation of capitalized interest}}{\text{Interest expense} + \text{Interest capitalized}}$
Basic EPS	$\text{Basic EPS} = \dfrac{\text{Net income} - \text{Preferred dividends}}{\text{Weighted average number of common shares outstanding}}$
Diluted EPS and the if-converted method	$\text{Diluted EPS} = \dfrac{\text{NI} - \text{Pref. div.} + \text{Conv. pref. div.} + \text{Conv. debt int}}{\text{Wtd. avg. shares} + \text{Shares from conv. pref.} + \text{Shares from conv. debt}}$ $\text{Incremental shares} = N - \dfrac{N \times X}{\bar{P}} = \dfrac{\bar{P} - X}{\bar{P}} \times N$
Testing for dilution	$\text{Conv. preferred: } \dfrac{\text{Preferred dividends}}{\text{Shares on conversion}}$ $\text{Conv. bonds: } \dfrac{\text{Interest} \times (1 - t)}{\text{Shares on conversion}}$

Vertical common-size income statement	$\text{Common-size line item} = \frac{\text{Line item}}{\text{Revenue}}$ $\text{Effective tax rate} = \frac{\text{Income tax expense}}{\text{Pretax income}}$
Margin ratios	$\text{Gross profit margin} = \frac{\text{Revenue} - \text{COGS}}{\text{Revenue}}$ $\text{Operating profit margin} = \frac{\text{Operating profit (EBIT)}}{\text{Revenue}}$ $\text{Pretax margin} = \frac{\text{Earnings before tax}}{\text{Revenue}}$ $\text{Net profit margin} = \frac{\text{Net income}}{\text{Revenue}}$

29 Analyzing Balance Sheets

MODULE 29.1 · INTANGIBLE ASSETS AND MARKETABLE SECURITIES

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

EXAM SHORTCUTS

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

MODULE 29.2 · COMMON-SIZE BALANCE SHEETS

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

EXAM SHORTCUTS

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

FORMULAS

Goodwill	$\text{Goodwill} = \text{purchase price} - \text{fair value of identifiable net assets acquired}$
Vertical common-size balance sheet	$\text{Common-size item} = \dfrac{\text{balance sheet item}}{\text{total assets}}$
Liquidity ratios (short-term obligations)	$\text{current ratio} = \dfrac{\text{current assets}}{\text{current liabilities}}$ $\text{quick ratio} = \dfrac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{current liabilities}}$ $\text{cash ratio} = \dfrac{\text{cash} + \text{marketable securities}}{\text{current liabilities}}$
Solvency ratios (long-term obligations)	$\text{long-term debt-to-equity} = \dfrac{\text{long-term debt}}{\text{total equity}}$ $\text{total debt-to-equity} = \dfrac{\text{total debt}}{\text{total equity}}$ $\text{debt ratio} = \dfrac{\text{total debt}}{\text{total assets}}$ $\text{financial leverage ratio} = \dfrac{\text{total assets}}{\text{total equity}}$

30 Analyzing Statements of Cash Flows I

MODULE 30.1 · CASH FLOW INTRODUCTION AND DIRECT METHOD CFO

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

EXAM SHORTCUTS

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

MODULE 30.2 · INDIRECT METHOD CFO

- Under the indirect method, CFO equals net income plus noncash charges minus the investment in working capital.

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

EXAM SHORTCUTS

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

MODULE 30.3 · INVESTING AND FINANCING CASH FLOWS AND IFRS/US GAAP DIFFERENCES

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

EXAM SHORTCUTS

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

FORMULAS

Why a separate cash flow statement?	$\text{CFO} + \text{CFI} + \text{CFF} = \Delta\text{Cash}; \quad \text{Beginning cash} + \Delta\text{Cash} = \text{Ending cash}$
Timing differences show up on the balance sheet	$\text{Beginning AR} + \text{Sales} - \text{Cash collected} = \text{Ending AR}$

The direct method	$\text{Cash collected} = \text{Net sales} - \Delta\text{AR} + \Delta\text{Unearned revenue}$ $\text{Purchases} = \text{COGS} + \text{Ending inventory} - \text{Beginning inventory} = \text{COGS} + \Delta\text{Inventory}$ $\text{Cash paid to suppliers} = \text{Purchases} - \Delta\text{AP} = \text{COGS} + \Delta\text{Inventory} - \Delta\text{AP}$ $\text{Cash paid for wages} = \text{Wage expense} - \Delta\text{Wages payable}$ $\text{Cash paid for interest} = \text{Interest expense} - \Delta\text{Interest payable}$ $\text{Cash paid for insurance} = \text{Insurance expense} + \Delta\text{Prepaid insurance}$ $\text{Cash taxes paid} = \text{Tax expense} - \Delta\text{Taxes payable} - \Delta\text{Deferred tax liability} + \Delta\text{Deferred tax asset}$
Starting point: net income	$\text{CFO} = \text{NI} + \text{NCC} - \text{WC}_{\text{INV}}$
Investing activities (CFI)	$\text{Proceeds} = \text{Carrying value of asset sold} + \text{Gain (or} - \text{Loss)}$ $\text{Gross cost of disposals} = \text{Beginning gross PP\&E} + \text{Purchases} - \text{Ending gross PP\&E}$ $\text{Accumulated depreciation removed} = \text{Beginning AD} + \text{Depreciation expense} - \text{Ending AD}$ $\text{Carrying value disposed} = \text{Beginning net PP\&E} - \text{Depreciation} + \text{Purchases} - \text{Ending net PP\&E}$
Financing activities (CFF)	$\text{CFF} = (\text{New borrowing} - \text{Principal repaid}) + (\text{Stock issued} - \text{Stock repurchased}) - \text{Cash dividends paid}$ $\text{Dividends declared} = \text{Beginning retained earnings} + \text{Net income} - \text{Ending retained earnings}$ $\text{Dividends paid} = \text{Dividends declared} - \Delta\text{Dividends payable}$

31 Analyzing Statements of Cash Flows II

- The statement of cash flows helps an analyst assess a firm's liquidity, solvency and financial flexibility.
- Cash generated by collecting receivables faster, running down inventory or paying suppliers more slowly is classified as operating cash flow, but it is not a sustainable source of cash.
- For a mature firm whose working capital is not growing, CFO normally exceeds net income; net income that persistently runs well ahead of CFO may point to aggressive or improper accounting choices.
- Common-size cash flow statements come in two formats: every line divided by net revenue, or inflows divided by total inflows and outflows divided by total outflows.
- FCFF equals CFO + Int × (1 – t) – FCInv, or NI + NCC + Int × (1 – t) – FCInv – WCInv, where FCInv is cash paid for fixed assets less cash proceeds from fixed assets sold.
- FCFE equals CFO – FCInv + net borrowing, where net borrowing is debt issued minus debt repaid.
- When interest paid is classified in financing activities under IFRS, CFO already excludes it, so no after-tax interest is added back in FCFF and no interest is added back in the interest coverage ratio.
- Performance ratios, such as cash flow-to-revenue and cash-to-income, measure how well operations generate cash, while coverage ratios, such as debt coverage and the reinvestment ratio (CFO / cash paid for long-term assets), measure the ability to meet obligations and fund spending from CFO.

EXAM SHORTCUTS

- When FCFF is already known, FCFE follows directly as FCFF − Int × (1 − t) + net borrowing, without starting again from CFO.

FORMULAS

Free cash flow to the firm (FCFF)	$FCFF = NI + NCC + [Int \times (1 - t)] - FC_{INV} - WC_{INV}$ $FCFF = CFO + [Int \times (1 - t)] - FC_{INV}$
Free cash flow to equity (FCFE)	$FCFE = CFO - FC_{INV} + \text{net borrowing}$ $FCFE = FCFF - [Int \times (1 - t)] + \text{net borrowing}$

32 Analysis of Inventories

MODULE 32.1 · INVENTORY MEASUREMENT

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

EXAM SHORTCUTS

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

MODULE 32.2 · INFLATION IMPACT ON FIFO AND LIFO

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

EXAM SHORTCUTS

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

MODULE 32.3 · PRESENTATION AND DISCLOSURE

- Inventory disclosures include the cost flow method, carrying value by class, the cost expensed, write-downs, reversals (IFRS only) and inventory pledged as collateral.
- Rising raw materials and work in progress suggest management expects higher demand; finished goods growing faster than sales suggest weak demand or obsolete inventory.

- Inventory turnover = COGS ÷ average inventory, and days of inventory on hand equal 365 divided by that turnover.
- Low turnover points to slow-moving or obsolete inventory; high turnover with sales growth below the industry points to too little inventory.

FORMULAS

Inventory ratios

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

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

33 Analysis of Long-Term Assets

MODULE 33.1 · INTANGIBLE LONG-LIVED ASSETS

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

MODULE 33.2 · IMPAIRMENT AND DERECOGNITION

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

EXAM SHORTCUTS

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

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MODULE 33.3 · LONG-TERM ASSET DISCLOSURES

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

EXAM SHORTCUTS

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

FORMULAS

Goodwill	$\text{Goodwill} = \text{Purchase price} - \text{Fair value of identifiable net assets acquired}$
Impairment of assets held for use: IFRS and US GAAP	$\text{IFRS loss} = CV - \max(\text{FV} - \text{costs to sell},\ \text{VIU})$ $\text{US GAAP loss} = CV - \text{FV}\ \ (\text{only if } CV > \text{undiscounted CF})$
Ratios built from the disclosures	$\text{Fixed asset turnover} = \dfrac{\text{Revenue}}{\text{Average fixed assets}}$ $\text{Average age} \approx \dfrac{\text{Accumulated depreciation}}{\text{Annual depreciation expense}}$ $\text{Total useful life} \approx \dfrac{\text{Gross (historical cost) PP\&E}}{\text{Annual depreciation expense}}$ $\text{Remaining useful life} \approx \dfrac{\text{Net PP\&E}}{\text{Annual depreciation expense}} = \text{Total useful life} - \text{Average age}$

34 Topics in Long-Term Liabilities and Equity

MODULE 34.1 · LEASES

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

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- In a finance lease the lessor derecognizes the asset, records a lease receivable equal to the net investment in the lease (present value of the lease payments plus present value of the expected residual value) and reports interest income; a sales-type lessor also recognizes the selling profit at inception.
- In an operating lease the lessor keeps the asset on its balance sheet, continues to depreciate it and reports the lease payments as income on a straight-line basis.

EXAM SHORTCUTS

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

MODULE 34.2 · DEFERRED COMPENSATION AND DISCLOSURES

- In a defined contribution plan the employee bears the investment risk and pension expense equals the employer's contribution; in a defined benefit plan the employer bears the investment risk and reports the plan's funded status on the balance sheet.
- Funded status equals the fair value of plan assets minus the PVDBO (called the PBO under US GAAP); a positive amount is a net pension asset and a negative amount a net pension liability.
- Under IFRS, service cost (including past service cost) and net interest, the discount rate times the net pension asset or liability, go to the income statement, while remeasurements go to OCI and are never recycled.
- Given the same actuarial assumptions, IFRS and US GAAP give the same total periodic cost for a defined benefit plan and differ only in how it is split between the income statement and OCI.
- Equity-settled share-based pay is measured at fair value on the grant date and expensed over the vesting period under both IFRS and US GAAP, and later share price changes do not change the expense.
- IAS 19 disclosures for a defined benefit plan explain its characteristics and risks, identify the amounts it creates in the financial statements, and describe its effect on the amount, timing and uncertainty of future cash flows.

FORMULAS

Lessee accounting	$\text{Lease liability}_0 = \sum_{t=1}^{N} \frac{PMT}{(1+r)^t} = PMT \times \frac{1-(1+r)^{-N}}{r}$
Defined contribution vs. defined benefit plans	$\text{Funded status} = \text{Fair value of plan assets} - \text{PV of the defined benefit obligation}$

35 Analysis of Income Taxes

MODULE 35.1 · DIFFERENCES BETWEEN ACCOUNTING PROFIT AND TAXABLE INCOME

- Taxes payable are computed from taxable income on the tax return, while income tax expense, the income statement charge, equals taxes payable + ΔDTL − ΔDTA.
- A DTL arises when revenues or gains reach the income statement before they are taxed, or when expenses or losses are deducted for tax before they are expensed; a DTA arises in the reverse cases and from tax loss carryforwards.
- An asset whose carrying value exceeds its tax base, or a liability whose carrying value is below its tax base, gives a DTL; the opposite cases give a DTA, equal to the absolute value of (carrying value − tax base) × tax rate.
- Permanent differences never reverse, create no DTA or DTL, and make the effective tax rate differ from the statutory rate.
- When the enacted tax rate changes, existing DTAs and DTLs are remeasured at the new rate, and the remeasurement flows through income tax expense.

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EXAM SHORTCUTS

- If a temporary difference first makes taxable income lower than pretax accounting profit, it creates a DTL; if it first makes taxable income higher, it creates a DTA.
- After an increase in the enacted tax rate, the direction of the change in income tax expense follows from the net position alone: it rises for a firm with a net DTL and falls for a firm with a net DTA.

MODULE 35.2 · DEFERRED TAX ASSETS AND LIABILITIES

- For a depreciable asset, the carrying value is cost less accumulated book depreciation and the tax base is cost less accumulated tax depreciation.
- Deferred tax assets and liabilities are not discounted to present value.
- Under US GAAP a DTA is kept in full and reduced by a valuation allowance when it is more likely than not that part of it will not be realized, while IFRS reduces the DTA directly; either reduction raises income tax expense.
- Because realizing a DTA is a subjective judgment, changes in the valuation allowance are a potential tool of earnings management, and a surprise reduction boosts earnings.
- A DTL expected to reverse is treated as a liability, while one not expected to reverse in the foreseeable future is treated as equity, and the analyst decides case by case.
- Reclassifying a DTL as equity lowers the debt-to-equity ratio, the financial leverage ratio and ROE, and leaves ROA unchanged.

EXAM SHORTCUTS

- Reclassifying a DTL as equity changes neither net income nor total assets, so an answer in which ROA changes can be ruled out.

MODULE 35.3 · TAX RATES AND DISCLOSURES

- The effective tax rate is income tax expense divided by pretax income, the cash tax rate is cash taxes paid divided by pretax income, and the statutory rate is set by law in the jurisdiction where the company is domiciled.
- The effective rate differs from the statutory rate because of different rates in foreign jurisdictions, permanent differences, new legislation or rate changes, and tax holidays; temporary differences typically do not cause the gap but make the cash tax rate differ from the effective rate.
- When forecasting from the rate reconciliation, an analyst includes continuous items such as foreign rate differences, tax-exempt income and nondeductible expenses, and sets aside sporadic items, for example tax holiday savings or a large asset sale.
- Accelerated tax depreciation with straight-line book depreciation creates a DTL, while impairments, restructuring charges and post-employment benefits create DTAs.
- Deferred tax assets and liabilities are classified as noncurrent under both IFRS and US GAAP.
- Income tax expense that keeps exceeding taxes payable means DTLs are growing faster than DTAs, and a decrease in the valuation allowance raises reported earnings.

EXAM SHORTCUTS

- When only temporary differences exist and the tax rate does not change, income tax expense is pretax accounting income × the tax rate, so no deferred tax schedule is needed to find it.

FORMULAS

The income tax expense equation $\text{income tax expense} = \text{taxes payable} + \Delta DTL - \Delta DTA$

36 Financial Reporting Quality

MODULE 36.1 · REPORTING QUALITY

- Financial reporting quality concerns the reports themselves: compliance with GAAP plus decision usefulness, which requires relevance (including materiality) and faithful representation (complete, neutral and free from error).

- Earnings quality concerns the results reported and is judged by their sustainability and by whether their level is adequate to keep the business going and give investors an adequate return.
- Low reporting quality means earnings, cash flows and balance sheet values cannot be reliably assessed, but high reporting quality can go together with low earnings quality.
- Conservative choices decrease current-period earnings and financial position and tend to raise later earnings, while aggressive choices increase current-period earnings, revenues, operating cash flows or financial position and tend to reduce later earnings; either bias departs from neutrality.
- Low-quality reporting typically involves motivation, such as earnings targets or debt covenants, opportunity, such as weak internal controls or inadequate board oversight, and rationalization.
- For a non-GAAP measure, the SEC requires the closest GAAP measure to be shown with equal prominence and reconciled to it, while IFRS requires the measure to be defined, its relevance explained and a reconciliation to the most comparable IFRS measure.

MODULE 36.2 · ACCOUNTING CHOICES AND ESTIMATES

- Revenue is recognized earlier under FOB shipping point than under FOB destination, and channel stuffing and fictitious bill-and-hold sales inflate current revenue.
- A lower allowance for uncollectible accounts, a smaller warranty reserve or a smaller valuation allowance on deferred tax assets raises net income, and such reserves can be used to smooth earnings.
- A longer useful life or a higher salvage value lowers depreciation and raises net income and carrying value, and delaying a goodwill impairment raises current earnings.
- Capitalizing a cost raises current earnings and lowers future earnings, and it moves the outflow from CFO to CFI, so reported CFO is higher by the full amount.
- Stretching payables raises current CFO and lowers next period's CFO, with no effect on reported earnings.
- When prices are rising, a LIFO liquidation (possible under US GAAP only) runs old, low costs through COGS and raises current earnings unsustainably.

EXAM SHORTCUTS

- An interest coverage covenant (EBIT / interest expense) is most easily met by overstating earnings; asset values do not enter the ratio, so manipulation of asset values can be ruled out as the route.

MODULE 36.3 · WARNING SIGNS

- A warning sign is not proof of manipulation; it calls for more analysis to find out whether there is a real business reason.
- Revenue warning signs include changes in revenue recognition methods, revenue growth out of line with peers, receivables turnover falling over several periods, falling total asset turnover and nonoperating or one-time sales included in revenue.
- A ratio of CFO to net income persistently below 1.0 suggests that accruals are inflating income, while a ratio above one is not by itself a warning sign.
- Aggressive estimates, aggressive revenue recognition and LIFO liquidation change net income but, apart from tax effects, leave the amount and classification of cash flows unchanged; capitalizing costs that peers expense raises both earnings and CFO.
- A jump in days payables well above historical levels suggests stretched payables, which make CFO higher but not sustainably so while leaving earnings unaffected.
- Large restructuring or impairment charges partly correct past understated expenses and overstated assets, so analysts consider spreading them over prior periods to see the true trend.

EXAM SHORTCUTS

- Channel stuffing shows up as rising days of sales outstanding (falling receivables turnover), so an answer pointing to payables can be ruled out.

FORMULAS

Depreciation, amortization and impairment	$\text{Annual depreciation (straight-line)} = \frac{\text{cost} - \text{salvage value}}{\text{useful life}}$
Linking the signs to what is being manipulated	$\text{Days payables} = \frac{\text{accounts payable}}{\text{COGS (or purchases)}/365}$
Cash flow versus earnings	$\text{CFO-to-net-income ratio} = \frac{\text{cash flow from operations}}{\text{net income}}$

37 Financial Analysis Techniques

MODULE 37.1 · INTRODUCTION TO FINANCIAL RATIOS

- Financial analysis uses four tools: ratios, common-size statements, graphs and regression.
- Cross-sectional analysis compares a firm's ratios with those of other firms for the same period, while time-series analysis compares them with the firm's own past values.
- Ratios are informative only against peers or the firm's history, they are distorted by different accounting treatments, comparable industry ratios are hard to find for a conglomerate, and no conclusion should rest on a single ratio.
- A vertical common-size income statement divides each line by revenue and a vertical common-size balance sheet divides each line by total assets, while a horizontal common-size statement divides each item by its own base-year value.
- Regression analysis identifies relationships between variables and is mainly used for forecasting.

MODULE 37.2 · FINANCIAL RATIOS, PART 1

- Receivables turnover is revenue divided by average receivables, inventory turnover is COGS divided by average inventory, payables turnover is COGS (or purchases) divided by average trade payables, and each days ratio is 365 divided by the turnover.
- The cash conversion cycle equals DSO + DOH − days of payables, and the operating cycle equals DOH + DSO.
- The defensive interval equals cash, marketable securities and receivables divided by average daily cash expenditures, from which noncash charges in the expense lines are removed.
- Interest coverage is EBIT divided by interest payments, and fixed charge coverage is (EBIT + lease payments) divided by (interest payments + lease payments).
- Exam convention: total debt is interest-bearing short- and long-term debt with lease liabilities left out unless stated otherwise. Current practice: lease liabilities are on the balance sheet under IFRS 16 and ASC 842, and many analysts and rating agencies include them in debt.
- ROA is net income divided by average total assets, adjusted ROA adds interest expense × (1 − tax rate) to the numerator, and ROE is net income divided by average total equity.

EXAM SHORTCUTS

- For a ratio with a positive numerator and denominator, an equal decrease in both raises the ratio if it is above 1 and lowers it if it is below 1, and an equal increase does the opposite, so paying payables with cash raises a current ratio that is above 1.
- Collecting receivables into cash moves value inside the numerator of the current ratio, so the current ratio is unchanged while the cash ratio rises.

MODULE 37.3 · FINANCIAL RATIOS, PART 2

- A financial leverage ratio close to 1 means assets are financed mostly with equity, and if all liabilities are counted as debt, A/E = 1 + L/E.
- Fixed charge coverage is the more meaningful coverage measure for firms that lease many of their assets.
- Income from continuing operations is the right basis for the net profit margin, because discontinued operations will not recur.

- ROE uses total equity including preferred stock, while return on common equity removes preferred dividends from the numerator and preferred equity from the denominator.
- ROE rising while net margin and asset turnover fall, or ROA falling while ROE rises, points to higher financial leverage and more risk rather than better operations.
- Ratios should be close to the industry norm, so an activity ratio far better than the norm is a question to investigate rather than a sure strength.

EXAM SHORTCUTS

- When interest coverage is above 1, fixed charge coverage is lower than interest coverage, because adding lease payments to both numerator and denominator pulls the ratio toward 1.

MODULE 37.4 · DUPONT ANALYSIS

- ROE equals ROA times financial leverage, where financial leverage is average total assets divided by average total equity.
- In the three-part DuPont equation, ROE is the product of net profit margin, asset turnover (revenue / average total assets) and the equity multiplier (average total assets / average total equity).
- The five-part DuPont equation is ROE = tax burden (NI/EBT) × interest burden (EBT/EBIT) × EBIT margin × total asset turnover × financial leverage.
- Higher leverage raises the equity multiplier but lowers the interest burden ratio, so ROE rises with leverage only if the multiplier effect outweighs the fall in the interest burden ratio.
- For a profitable firm with positive equity, holding the other components constant, a higher asset turnover or a higher net profit margin raises ROE; with a net loss, higher asset turnover makes ROE more negative.

EXAM SHORTCUTS

- Tax burden × interest burden × EBIT margin equals the net profit margin, so a missing component can be solved from the identity and the five-part and three-part results must agree.

MODULE 37.5 · INDUSTRY-SPECIFIC FINANCIAL RATIOS

- Growth in same-store sales excludes new openings; a hotel's average daily rate is room revenue divided by rooms sold, and its occupancy rate is rooms sold divided by rooms available.
- Exam convention: net interest margin is interest income divided by interest-earning assets. Current practice: it is net interest income divided by average interest-earning assets.
- Value at risk is the loss a firm will exceed only a specified percentage of the time over a specified period, and it is not the worst possible loss.
- The coefficient of variation is the standard deviation of an item divided by its mean; the CV of sales measures sales risk, the CV of operating income measures business risk, and the CV of net income adds financial leverage, taxes and nonoperating items.
- Pro forma statements start from forecast revenue and tie other items to it with ratios such as the common-size COGS percentage and the operating profit margin.
- Sensitivity analysis changes one input at a time, scenario analysis sets a coherent set of values for several variables at once, and simulation draws values from probability distributions many times.

FORMULAS

Activity ratios	$$\text{receivables turnover} = \frac{\text{revenue}}{\text{average receivables}}$$
	$$\text{days of sales outstanding (DSO)} = \frac{365}{\text{receivables turnover}}$$
	$$\text{inventory turnover} = \frac{\text{cost of goods sold}}{\text{average inventory}}$$
	$$\text{days of inventory on hand (DOH)} = \frac{365}{\text{inventory turnover}}$$
	$$\text{payables turnover} = \frac{\text{cost of goods sold}}{\text{average trade payables}}$$
	$$\text{number of days of payables (DPO)} = \frac{365}{\text{payables turnover}}$$
	$$\text{purchases} = \text{ending inventory} - \text{beginning inventory} + \text{COGS}$$
	$$\text{total asset turnover} = \frac{\text{revenue}}{\text{average total assets}}$$
	$$\text{fixed asset turnover} = \frac{\text{revenue}}{\text{average net fixed assets}}$$
	$$\text{working capital turnover} = \frac{\text{revenue}}{\text{average working capital}}$$
Liquidity ratios	$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$
	$$\text{quick ratio} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{current liabilities}}$$
	$$\text{cash ratio} = \frac{\text{cash} + \text{marketable securities}}{\text{current liabilities}}$$
	$$\text{defensive interval} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{average daily expenditures}}$$
	$$\text{average daily expenditures} = \frac{\text{COGS} + \text{SG\&A} + \text{R\&D} - \text{noncash charges (e.g., depreciation, amort}}{365}$$
	$$\text{cash conversion cycle} = \text{DSO} + \text{DOH} - \text{number of days of payables}$$

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Solvency ratios	$\text{debt-to-equity} = \dfrac{\text{total debt}}{\text{total shareholders' equity}}$ $\text{debt-to-capital} = \dfrac{\text{total debt}}{\text{total debt} + \text{total shareholders' equity}}$ $\text{debt-to-assets} = \dfrac{\text{total debt}}{\text{total assets}}$ $\text{financial leverage ratio} = \dfrac{\text{average total assets}}{\text{average total equity}}$ $\text{interest coverage} = \dfrac{\text{EBIT}}{\text{interest payments}}$ $\text{debt-to-EBITDA} = \dfrac{\text{total debt}}{\text{EBITDA}}$ $\text{fixed charge coverage} = \dfrac{\text{EBIT} + \text{lease payments}}{\text{interest payments} + \text{lease payments}}$
Profitability ratios	$\text{gross profit margin} = \dfrac{\text{gross profit}}{\text{revenue}}$ $\text{operating profit margin} = \dfrac{\text{operating income}}{\text{revenue}} \text{ or } \dfrac{\text{EBIT}}{\text{revenue}}$ $\text{pretax margin} = \dfrac{\text{EBT}}{\text{revenue}}$ $\text{net profit margin} = \dfrac{\text{net income}}{\text{revenue}}$ $\text{ROA} = \dfrac{\text{net income}}{\text{average total assets}}$ $\text{adjusted ROA} = \dfrac{\text{net income} + \text{interest expense}(1 - \text{tax rate})}{\text{average total assets}}$ $\text{operating ROA} = \dfrac{\text{operating income (or EBIT)}}{\text{average total assets}}$ $\text{ROE} = \dfrac{\text{net income}}{\text{average total equity}}$ $\text{return on common equity} = \dfrac{\text{net income} - \text{preferred dividends}}{\text{average common equity}}$
Two-part decomposition	$\text{ROE} = \dfrac{\text{net income}}{\text{average total equity}} = \underbrace{\dfrac{\text{net income}}{\text{average total assets}}}_{\text{ROA}} \times \underbrace{\dfrac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$
Original (three-part) DuPont equation	$\text{ROE} = \underbrace{\dfrac{\text{net income}}{\text{revenue}}}_{\text{net profit margin}} \times \underbrace{\dfrac{\text{revenue}}{\text{average total assets}}}_{\text{total asset turnover}} \times \underbrace{\dfrac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$

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Extended (five-part) DuPont equation	$\text{ROE} = \underbrace{\frac{\text{net income}}{\text{EBT}}}_{\text{tax burden}} \times \underbrace{\frac{\text{EBT}}{\text{EBIT}}}_{\text{interest burden}} \times \underbrace{\frac{\text{EBIT}}{\text{revenue}}}_{\text{EBIT margin}} \times \underbrace{\frac{\text{revenue}}{\text{average total assets}}}_{\text{total asset turnover}} \times \underbrace{\frac{\text{average total assets}}{\text{average total equity}}}_{\text{financial leverage}}$
Business risk and the coefficient of variation	$\text{CV} = \frac{\text{standard deviation of the item}}{\text{mean (expected value) of the item}}$

38 Introduction to Financial Statement Modeling

- A sales-based pro forma model starts from the revenue forecast, estimates COGS, SG&A, financing costs and taxes, then the balance sheet and capital expenditures, and derives the pro forma cash flow statement last from the projected income statement and balance sheet.
- Overconfidence bias shows up as confidence intervals that are too narrow and is countered by inviting critique of the forecasts, reviewing past forecast errors and using scenario analysis to produce a range.
- Conservatism bias, also called anchoring, is making only small adjustments to prior forecasts when new information arrives, while confirmation bias is seeking data that support one's view and discounting contrary evidence.
- Illusion of control bias includes seeking expert opinions to justify a view and overfitting a model with ever more variables, and representativeness bias includes base-rate neglect, which is countered by weighing the outside view with the inside view.
- Under Porter's five forces, pricing power and margins are higher when the threat of substitutes, the intensity of rivalry, the bargaining power of suppliers and of customers, and the threat of new entrants are low.
- With elastic demand the percentage fall in units sold exceeds the percentage rise in price, so a price increase reduces revenue, and the main influence on elasticity is the availability of substitutes.
- Passing through the money amount of an input-cost increase preserves gross and operating profit if volume holds, but it lowers the gross, operating and net margins because revenue is larger.
- For a cyclical company the forecast horizon should reach at least the middle of the business cycle, and a terminal value is very sensitive to the long-term growth rate because it is a growing perpetuity.

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