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CFA LEVEL I

Detailed Formula Sheet



Financial Statement Analysis

Topic 3 of 10 • Fully Explained

💡 Plain-English explanations • 📊 Worked examples • 🧠 Memory hooks • ⚠️ Exam traps

Statement Foundations

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Cash Flow Statement

10,000+

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★ Mentored by Deepak Goyal — CFA, FRM ★

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👋 **Welcome to the heart of CFA Level I!** Financial Statement Analysis is the most **formula-rich** topic — but every ratio tells a story. This sheet gives the formula, a **plain-English meaning**, a worked example, and **memory hooks** for the classic traps (rising prices, cash-flow classification, n-1, and more). 📄

💡 **In Plain English**

📊 **Worked Example**

🧠 **Memory Hook**

⚠️ **Watch Out**

📌 **Key Fact**

1 📄 Financial Statement Foundations

⚖️ The Accounting Equation

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

$$\text{Equity} = \text{Contributed Capital} + \text{Retained Earnings}$$

💡 In Plain English

Everything a company **owns** (assets) is financed either by **borrowing** (liabilities) or by **owners** (equity). The balance sheet must always balance. ⚖️

📊 Worked Example

Assets = \$500, Liabilities = \$300 → Owners' Equity = **\$200**.

🔄 Retained Earnings & Cash from Customers

$$\text{Ending RE} = \text{Beginning RE} + \text{Net Income} - \text{Dividends}$$

$$\text{Cash collected} = \text{Beginning A/R} + \text{Revenue} - \text{Ending A/R}$$

💡 In Plain English

Retained earnings is the running total of profits kept in the business. The links between statements (e.g. A/R changes) let you convert accrual figures into cash.

📊 Worked Example

Beginning RE \$100 + Net income \$50 – Dividends \$20 = **\$130** ending RE.

📐 Common-Size Analysis

$$\text{Income statement items} \div \text{Revenue} \bullet \text{Balance sheet items} \div \text{Total Assets}$$

💡 In Plain English

Convert every line into a **percentage** so you can compare companies of different sizes and spot trends (vertical common-size). It's how you read a giant and a startup on the same scale. 📊

2 ⚡ Activity (Efficiency) Ratios

🔄 Turnover & Days

$$\text{Inventory T/O} = \frac{\text{COGS}}{\text{Avg inventory}} \quad | \quad \text{DOH} = \frac{365}{\text{Inventory T/O}}$$

$$\text{Receivables T/O} = \frac{\text{Revenue}}{\text{Avg receivables}} \quad | \quad \text{DSO} = \frac{365}{\text{Receivables T/O}}$$

$$\text{Payables T/O} = \frac{\text{Purchases}}{\text{Avg payables}} \quad | \quad \text{Days Payables} = \frac{365}{\text{Payables T/O}}$$

$$\text{Total Asset T/O} = \text{Revenue} \div \text{Avg total assets}$$

💡 In Plain English

Turnover = how many times per year you cycle through an asset. Convert any turnover into **days** by dividing 365 by it. Higher turnover (fewer days) usually means more efficient operations.

📊 Worked Example

COGS \$600, avg inventory \$100 → Inventory turnover = **6.0×**; DOH = $365/6 = \mathbf{60.8 \text{ days}}$.

⚠️ Watch Out

COGS drives inventory turnover (not revenue), and **Revenue** drives receivables turnover. Don't mix them up!

🔄 Cash Conversion Cycle

$$\text{CCC} = \text{DOH} + \text{DSO} - \text{Days Payables}$$

💡 In Plain English

The number of days cash is **tied up** in operations: days holding inventory + days waiting for customers – days you take to pay suppliers. **Shorter is better** (cash comes back faster).

📊 Worked Example

DOH 60.8 + DSO 45.6 – Days payables 36.5 = **69.9 days**.

🧠 Memory Hook

"**Stuff in + Customers owe – You owe.**" You want to **collect fast and pay slow.** 💡

3 Liquidity Ratios

Current, Quick & Cash Ratios

$$\text{Current} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick} = \frac{\text{Cash} + \text{ST Marketable} + \text{Receivables}}{\text{Current Liabilities}}$$

$$\text{Cash} = \frac{\text{Cash} + \text{ST Marketable}}{\text{Current Liabilities}}$$

In Plain English

All measure the ability to pay short-term bills. Moving from Current → Quick → Cash, each one strips out the **less-liquid** assets (Quick removes inventory; Cash removes receivables too) — getting stricter each step.

Worked Example

CA \$300, CL \$150 → Current = **2.0**. (Cash 50 + ST 30 + Recv 70)/150 → Quick = **1.0**.

Memory Hook

"**Quick = Current minus inventory.**" The quick ratio doubts you can sell inventory fast. ⌚

4 Solvency Ratios

Debt & Leverage Ratios

$$\text{Debt-to-Assets} = \frac{\text{Total Debt}}{\text{Total Assets}} \quad | \quad \text{Debt-to-Equity} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

$$\text{Debt-to-Capital} = \frac{\text{Total Debt}}{\text{Total Debt} + \text{Total Equity}} \quad | \quad \text{Financial Leverage} = \frac{\text{Avg Total Assets}}{\text{Avg Total Equity}}$$

In Plain English

Solvency = ability to meet **long-term** obligations. These show how much the company relies on borrowed money. Higher ratios = more leverage = more risk (and more potential return).

Worked Example

Total debt \$400, equity \$600 → D/E = **0.67**; Debt-to-capital = 400/1,000 = **0.40**.

Coverage Ratios

$$\text{Interest Coverage} = \frac{\text{EBIT}}{\text{Interest Payments}}$$

In Plain English

How many times operating profit (EBIT) covers the interest bill. **Higher = safer** — more cushion before the company can't service its debt.

Worked Example

EBIT \$240, interest \$60 → Interest coverage = **4.0x** (earns 4x its interest).

5 Profitability Ratios

Margins (all ÷ Revenue)

$$\text{Gross} = \frac{\text{Gross Profit}}{\text{Revenue}} \quad \text{Operating} = \frac{\text{EBIT}}{\text{Revenue}} \quad \text{Pretax} = \frac{\text{EBT}}{\text{Revenue}} \quad \text{Net} = \frac{\text{Net Income}}{\text{Revenue}}$$

In Plain English

Walk down the income statement: each margin keeps fewer costs out. Gross (after COGS) → Operating (after operating costs) → Pretax (after interest) → Net (after taxes). The "drop" between them shows where money leaks.

Worked Example

Gross profit \$400 on revenue \$1,000 → gross margin = **40%**; NI \$120 → net margin = **12%**.

Returns: ROA & ROE

$$\text{ROA} = \frac{\text{Net Income}}{\text{Avg Total Assets}} \quad | \quad \text{ROE} = \frac{\text{Net Income}}{\text{Avg Total Equity}}$$

In Plain English

ROA = profit earned on all assets; **ROE** = profit earned on shareholders' money. ROE exceeds ROA whenever the firm uses leverage (debt magnifies returns to equity).

Worked Example

NI \$120, avg assets \$1,000 → ROA = **12%**; avg equity \$500 → ROE = **24%**.

Watch Out

For ROE on **common** equity, subtract preferred dividends from the numerator and use average *common* equity.

6 DuPont Decomposition

Breaking ROE into Drivers

$$\text{ROE} = \text{ROA} \times \text{Financial Leverage}$$

$$\text{ROE} = \frac{\text{NI}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \quad (\text{margin} \times \text{turnover} \times \text{leverage})$$

$$\text{5-way: } \frac{\text{NI}}{\text{EBT}} \cdot \frac{\text{EBT}}{\text{EBIT}} \cdot \frac{\text{EBIT}}{\text{Revenue}} \cdot \frac{\text{Revenue}}{\text{Assets}} \cdot \frac{\text{Assets}}{\text{Equity}}$$

In Plain English

DuPont splits ROE so you can see **why** it's high or low. The 5-way version reads as: **Tax burden** × **Interest burden** × **EBIT (operating) margin** × **Asset turnover** × **Leverage**.

Worked Example

Net margin 12% × Asset turnover 1.0 × Leverage 2.0 = **24%** ROE.

5-way: $(120/160)(160/240)(240/1,000)(1,000/1,000)(1,000/500) = 0.75 \times 0.667 \times 0.24 \times 1.0 \times 2.0 = \mathbf{24\%}$.

Memory Hook

"Tax, Interest, Operate, Turn, Lever" — read the 5 factors left-to-right down the income statement, then the balance sheet.

7 Inventory Accounting

The COGS Identity & Cost Methods

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

Methods: FIFO • LIFO (US GAAP only) • Weighted Average Cost

In Plain English

FIFO sells the oldest units first (ending inventory ≈ newest, near current cost). **LIFO** sells the newest first (COGS ≈ current cost). **Weighted average** blends them.

Worked Example

Beginning inv \$100 + Purchases \$600 – Ending inv \$120 = **COGS \$580**.

Rising Prices: FIFO vs LIFO

FIFO → lower COGS, higher profit, higher inventory | LIFO → higher COGS, lower profit, lower taxes

Key Fact (rising prices)

LIFO gives **higher COGS & lower net income** → **lower taxes** (its main advantage) and a higher inventory turnover (appears more efficient) but a lower current ratio (appears less liquid).

LIFO Reserve

$\text{Inventory}_{\text{FIFO}} = \text{Inventory}_{\text{LIFO}} + \text{LIFO Reserve}$.

$\text{COGS}_{\text{FIFO}} = \text{COGS}_{\text{LIFO}} - \text{Change in LIFO reserve}$. (Used to compare a LIFO firm to FIFO peers.)

Memory Hook

"**FIFO = First In, Profits Out (higher)**." When prices rise, FIFO flatters profits; LIFO saves tax. 🧠

Inventory Valuation (write-downs)

IFRS: lower of Cost and Net Realizable Value (NRV) — reversals **ALLOWED**

US GAAP: lower of Cost and NRV (non-LIFO); lower of Cost or Market (LIFO/retail) — **NO** reversals

In Plain English

If inventory's value drops below cost, write it down (a hit to COGS/profit). The big difference: **IFRS lets you reverse** a write-down if value recovers; **US GAAP does not**.

Watch Out

A write-down **raises** the inventory turnover ratio (smaller denominator) — it can make a struggling firm look artificially "efficient." 🚨

8 🏗️ Long-Lived Assets & Depreciation

🔧 The Three Depreciation Methods

$$\text{Straight-Line} = \frac{\text{Cost} - \text{Salvage}}{\text{Useful Life}}$$

$$\text{Double-Declining Balance} = \frac{2}{\text{Useful Life}} \times \text{Beginning Book Value}$$

$$\text{Units of Production} = (\text{Cost} - \text{Salvage}) \times \frac{\text{Units this period}}{\text{Total expected units}}$$

💡 In Plain English

Spread an asset's cost over its life. **Straight-line** = equal each year. **DDB** = accelerated (more early on). **Units of production** = based on actual usage.

📊 Worked Example

Cost \$50,000, salvage \$5,000, life 5 yrs. Straight-line = $(45,000)/5 = \text{\$9,000/yr.}$
DDB year 1 = $(2/5) \times 50,000 = \text{\$20,000}$; year 2 = $40\% \times (50,000 - 20,000) = \text{\$12,000}$.

⚠️ Watch Out

DDB **ignores salvage value** in the formula — you simply stop depreciating once book value reaches salvage.

🏠 Capitalize vs Expense

Capitalize → asset on B/S, expensed gradually | Expense → full hit to current income

📌 Key Fact

Capitalizing raises current-year net income & assets, smooths earnings, and reports CapEx as investing (CFI) — so it boosts current CFO. Expensing does the opposite. Total lifetime expense is identical either way.

9 Earnings Per Share

Basic & Diluted EPS

$$\text{Basic EPS} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Avg Common Shares}}$$

$$\text{Diluted EPS} = \text{adjusted income} \div (\text{weighted shares} + \text{all DILUTIVE potential shares})$$

In Plain English

Basic EPS = profit available to common shareholders per share. **Diluted** EPS asks "what if all convertibles, options, and warrants became shares?" — it's always $\leq$ basic EPS.

Worked Example

NI \$500,000, preferred dividends \$50,000, weighted avg shares 100,000 → Basic EPS = $450,000/100,000 = \$4.50$.

Key Fact

Use the **treasury stock method** for options/warrants and the **if-converted method** for convertible bonds/preferred. Only include securities that are actually **dilutive** (lower EPS); ignore antidilutive ones.

10 The Cash Flow Statement

CFO via the Indirect Method

$$\text{CFO} = \text{Net Income} + \text{Non-cash charges} - \text{Gains} + \text{Losses} \pm \text{Changes in working capital}$$

In Plain English

Start from net income, add back non-cash expenses (like depreciation), then adjust for working-capital changes. **Asset** ↑ = **cash used (subtract)**; **Liability** ↑ = **cash source (add)**.

Worked Example

NI \$120 + Depreciation \$30 – Receivables ↑\$20 – Inventory ↑\$10 + Payables ↑\$15 = **CFO \$135**.

Classification: IFRS vs US GAAP

US GAAP: Interest paid → CFO | Interest/Dividends received → CFO | Dividends paid → CFF |
Taxes → CFO

IFRS: Interest paid → CFO/CFF | Interest & Div received → CFO/CFI | Dividends paid → CFO/CFF

Key Fact

US GAAP is rigid; IFRS is flexible. The one item that's always financing under US GAAP is **dividends paid**. Taxes are operating under both (IFRS can split if identifiable).

Memory Hook

"**US GAAP: only dividends PAID leave operating.**" Everything else (interest paid, interest/div received, taxes) is CFO. 🇺🇸

FREE Free Cash Flow

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1-t) - \text{FCInv} - \text{WCInv} = \text{CFO} + \text{Int}(1-t) - \text{FCInv}$$

$$\text{FCFE} = \text{CFO} - \text{FCInv} + \text{Net Borrowing}$$

In Plain English

FCFF = cash available to *all* capital providers (debt + equity) after reinvestment. **FCFE** = cash left for *shareholders* after debt cash flows. NCC = non-cash charges; FCInv = capex; WCInv = working-capital investment.

Worked Example

CFO \$135, interest \$60, tax 25%, CapEx \$80 → FCFF = 135 + 60(0.75) – 80 = **\$100**.

Net borrowing \$20 → FCFE = 135 – 80 + 20 = **\$75**.