CHARTA LEARNING · LESSON NOTES

Inventories

CFA Level I · Financial Statement Analysis

You will learn: Apply the cost flow methods, convert LIFO to FIFO with the LIFO reserve, write inventory down to net realisable value, and trace the method's effect on ratios.

Running example: Worked examples follow one made-up company, Kestrel Hardware (dollars). Opening 100 boxes at $10, March 200 at $12, August 200 at $14: 500 boxes available at $6,200. It sells 350 boxes at $20 (revenue $7,000) and has 150 left.

1. What inventory costs and where the cost goes

- Inventory is goods held for sale, or materials being turned into them: a current asset at cost. Cost is purchase price after discounts, duties, freight in, and production labour and overhead. Abnormal waste, storage of finished goods, administrative and selling costs are expensed at once. IFRS and US GAAP agree.
- The cost of goods available ends up in one of two places: cost of goods sold (COGS, an expense) for boxes sold, and ending inventory (an asset) for boxes unsold. The total is the same under every method. A higher expense always means a lower asset.

Goods available = COGS + ending inventory

2. FIFO and weighted average

- First in, first out (FIFO) assumes the oldest goods are sold first. In rising prices it gives the lowest COGS and highest profit, and inventory closest to current replacement cost.
- Weighted average cost gives every unit the same price: total cost available ÷ total units available. COGS = units sold × average; ending inventory = units left × average. It lands between the extremes. If prices fall, every effect reverses.
- Neither method is better: check which each company uses. Weight the prices: the simple average of $10, $12 and $14 is $12, but the weighted average is $12.40.

Average cost = cost available ÷ units available

KESTREL UNDER FIFO AND WEIGHTED AVERAGE

FIFO COGS	1,000 + 2,400 + 50 × 14 (700)	**4,100**
FIFO ending inventory	150 × 14	**2,100**
FIFO gross profit	7,000 − 4,100	**2,900**
Average cost	6,200 ÷ 500	**$12.40**
Average COGS / ending inventory	350 × 12.40 / 150 × 12.40	**4,340 / 1,860**
Average gross profit	7,000 − 4,340	**2,660**

Watch out: Averaging prices without weighting.

3. LIFO, the reserve and conversion

- Last in, first out (LIFO) sells the newest costs first. In rising prices COGS is higher, profit lower, and inventory stuck at old prices. IFRS prohibits LIFO. US GAAP allows it. Both allow FIFO, weighted average and specific identification (actual cost of each item).
- The US LIFO conformity rule requires LIFO in published statements if used for tax, so many keep it: less profit, less tax, more cash. A LIFO liquidation (selling more than is bought) dips into old cheap layers: a one-time gain that will not repeat.
- The LIFO reserve (in the notes) = FIFO inventory − LIFO inventory. It grows as prices rise; a shrinking one suggests liquidation. To convert, add the reserve to inventory, subtract the change in reserve from COGS, and add reserve × (1 − tax rate) to equity..

FIFO COGS = LIFO COGS − (end reserve − start reserve); FIFO equity = LIFO equity + reserve × (1 − t)

KESTREL UNDER LIFO AND THE CONVERSION (RESERVE 500, NONE AT START, TAX 25%)

LIFO COGS	200 × 14 + 150 × 12	**4,600**
LIFO ending inventory	100 × 10 + 50 × 12	**1,600**
FIFO inventory	1,600 + 500	**2,100**
FIFO COGS	4,600 − 500	**4,100**
FIFO equity	3,800 + 500 × (1 − 25%)	**4,175**
Profit, other costs 1,500: FIFO vs LIFO tax	(1,400 − 900) × 25%	**LIFO saves 125**
Net income FIFO / LIFO	1,400 − 350 / 900 − 225	**1,050 / 675**

Watch out: Thinking LIFO is allowed under IFRS; subtracting the whole reserve from COGS instead of the change; forgetting tax on the equity adjustment.

4. Write-downs: lower of cost and net realisable value

- An asset should not exceed what the company expects to recover, so inventory is carried at the lower of cost and net realisable value (NRV). If NRV is below cost, write down by cost − NRV, an expense usually in COGS. If NRV is above cost, nothing is written up.
- NRV = estimated selling price in the ordinary course − costs to complete − costs to sell (commission, delivery). The test is item by item or for similar groups.
- A recovery differs by standard. IFRS reverses a previous write-down when NRV recovers, up to original cost only, reducing COGS. US GAAP prohibits reversal: the written down value is the new cost.
- Under US GAAP, inventory on LIFO or the retail method is tested against market: the middle value of replacement cost, a ceiling of NRV and a floor of NRV − normal profit margin.

NRV = selling price − costs to complete − costs to sell; write-down = cost − NRV

KESTREL 150 BOXES AT COST $14

NRV per box (price 16, selling cost 3)	16 − 0 − 3	**$13**
Total write-down	150 × (14 − 13)	**150**
Carrying value	2,100 − 150	**1,950**
Price recovers to 17.50: NRV, capped at cost	17.50 − 3 = 14.50, cap 14	**$14**
IFRS carrying value (reversal 150)	1,950 + 150	**2,100**
US GAAP carrying value	no reversal	**1,950**
US GAAP LIFO market test	ceiling 13, floor 11, replacement 12: write-down 150 × (14 − 12)	**300**

5. Effects on ratios

- In rising prices, compared with FIFO, LIFO gives higher COGS and inventory turnover, and lower inventory, gross profit, net income, assets, equity, current ratio and return on assets. Return on equity also falls, but by less than profit alone suggests because equity falls too.
- Higher turnover under LIFO is not better efficiency: the same boxes are sold, and it is only an accounting effect. Debt to equity is higher under LIFO because equity is lower.
- If prices fall, every direction reverses. Before comparing two companies, convert them to the same basis using the reserve.

> **Inventory turnover = COGS ÷ average inventory; days of inventory = 365 ÷ turnover**

KESTREL, LIFO VS FIFO

Turnover	4,600 ÷ 1,300 vs 4,100 ÷ 1,550	**3.54 vs 2.65**
Days of inventory	365 ÷ 3.54 vs 365 ÷ 2.65	**103 vs 138**
Gross margin / net margin		**34.3% vs 41.4% / 9.6% vs 15.0%**
Return on assets	675 ÷ 6,700 vs 1,050 ÷ 6,950	**10.1% vs 15.1%**
Return on equity	675 ÷ 3,600 vs 1,050 ÷ 3,787.5	**18.8% vs 27.7%**
Current ratio	3,300 ÷ 1,200 vs 3,800 ÷ 1,200	**2.75 vs 3.17**
Debt to equity	2,000 ÷ 3,800 vs 2,000 ÷ 4,175	**0.53 vs 0.48**

Key takeaways

- Cost of goods available splits between COGS and ending inventory; the method decides the split.
- Rising prices: FIFO gives lowest COGS and highest profit; LIFO the reverse; weighted average sits between.
- LIFO is prohibited under IFRS and allowed under US GAAP.
- LIFO to FIFO: inventory + reserve; COGS − change in reserve; equity + reserve × (1 − t).
- Inventory is carried at the lower of cost and NRV; reversal is allowed under IFRS only, up to original cost.
- Convert to a common basis before comparing ratios; higher LIFO turnover is not real efficiency.

Quick check

1. Open 10 units at $5, buy 10 at $7, sell 12. COGS under FIFO and weighted average?
   Answer: FIFO 50 + 14 = 64. Average cost 6, so 12 × 6 = 72.
2. LIFO inventory 800, reserve 200, tax 30%. FIFO inventory and equity adjustment?
   Answer: Inventory 1,000. Equity rises 200 × 0.7 = 140.
3. Cost $30, price $38, selling cost $10. Carrying value? Reversal later?
   Answer: NRV 28, carry 28 (write-down 2). Reversal: IFRS only.