Financial Statement Analysis

Inventory Valuation

Exam Focus

- Inventory carrying values
- Write-downs
- Cost flow methodology and price change
- Analysis of disclosures
- Ratios

Impact on Financial Statements

beg. inv + purchases – end inv = COGS

Matching Concept

Beginning inventory (BI)	X
Purchases (P)	X
Available for sale	X
Ending inventory (EI)	(X)
Cost of goods sold (COGS)	X

Taken to B/S as a current asset

beg. inv + purchases – COGS = end inv

Carrying Value: B/S

Lower of: cost and NRV

Merchandising companies
- FIFO
- Average cost
- LIFO (not IFRS)
- Specific ID

Manufacturing companies
- Direct material and labor
- Transportation costs including insurance
- Production overhead
- Any costs for storage required during the production process

Costs expensed as incurred (not included in inventory)
- Costs of any production inputs from abnormal waste
- Storage costs for finished goods
- Selling and administrative costs

Lower of Cost and NRV

- All firms **except** U.S. GAAP firms using LIFO or retail inventory cost methods
- Cost > NRV write-down of inventory to NRV
- Write-down = unusual and infrequent item (if material) or COGS; reduces net income
- Reversals of write-downs allowed under IFRS but not under U.S. GAAP

Estimated selling price	X
– estimated cost of completion	(X)
– selling costs	(X)
NRV	X

Lower of Cost and Market Value

U.S. GAAP under LIFO or retail inventory methods

Market = current replacement cost within limits:

(current replacement cost)

- Upper limit = NRV
- Lower limit = (NRV – normal profit margin)

Reversal of write-downs prohibited

Carrying Value: Example

The following information is for Perla Corp.:
Inventory at cost = €8.45 million
Completion costs = €1.4 million
Expected sales price = €9.55 million
Selling expenses = 4%
Normal profit margin = 12%
If Perla reports under IFRS, its inventory value is:
A. 7.77 million.
B. 8.45 million.
C. 9.17 million.

Effects of Inventory Write-Down

Assuming write-down is added to COGS:

- Ending inventory decreases, COGS increase
- Positive effect on activity ratios:
  - Inventory decreases, inventory turnover increases, days on hand decreases
- Negative effect on profitability, liquidity, and solvency ratios:
  - Current ratio decreases, margins decline (gross, operating, net)

Inventory: Example

Hatsumei Enterprises, a hypothetical company, manufactures computers and prepares its financial statements in accordance with IFRS.

In 2017, the cost of ending inventory was €5.2 million, but its net realizable value was €4.9 million.

The current replacement cost of the inventory is €4.7 million. This figure exceeds the net realizable value less a normal profit margin.

In 2018, the net realizable value of Hatsumei's inventory was €0.5 million greater than the carrying amount.

Inventory: Example

What was the effect of the write-down on Hatsumei's 2017 financial statements? What was the effect of the recovery on Hatsumei's 2018 financial statements?

2017:

IFRS: Lower of cost and NRV

Cost NRV = write-down = =

2018: Cost NRV: NRV – cost =

Reversal of write-down =

-4

Inventory: Example

Under U.S. GAAP, if Hatsumei used the LIFO method, what would be the effects of the write-down on Hatsumei's 2017 financial statements and of the recovery on Hatsumei's 2018 financial statements?

2017:

U.S. GAAP: lower of cost and

= =

2018: reversals of write-downs

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Inventory: Example

What would be the effect of the recovery on Hatsumei's 2018 financial statements if Hatsumei's inventory were agricultural products instead of computers?

2018:

Inventory recorded at

=

Cost Flow Methodology

Assuming rising prices

4 Methods	Description	Ending Inv.	COGS
FIFO	EI most recent purchases	Highest	Lowest
LIFO (U.S. GAAP)	EI oldest purchases	Lowest	Highest
Average cost (AVCO)	Average cost of units available	Middle	Middle
Specific identification	Use cost of specific items		

FIFO, Average Cost, & LIFO: Example

Assume beginning inventory consisted of two units costing $10 each. During the current period, three more units were purchased at $12 each, and then two units were purchased at $14 each. Three units were sold for $17 each.

Calculate COGS, gross profit, and ending inventory using FIFO, LIFO, and average cost.

FIFO: Solution

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory		
Cost of goods sold		
Gross margin		

Note purchase prices rising: $10 > $12 > $14

Gross margin = =

Ending Inventory	$
Total (4 units)	

Cost of Goods Sold	$
Total (3 units)	

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LIFO: Solution

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory		
Cost of goods sold		
Gross margin		

Note purchase prices rising: $10 > $12 > $14

Gross margin = =

Ending Inventory	$
Total (4 units)	

Cost of Goods Sold	$
Total (3 units)	

LIFO: Average Cost

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory		
Cost of goods sold		
Gross margin		

Note purchase prices rising: $10 > $12 > $14

Gross margin = =

Average Cost
Average =
Ending inventory
Cost of goods sold

LIFO vs. FIFO: Inflationary Environment

		LIFO	FIFO
Income statement	COGS	Higher	Lower
	EBT	Lower	Higher
	Taxes	Lower	Higher
	Net income	Lower	Higher
	Profit margins	Lower	Higher
Balance sheet	Inventory	Lower	Higher
	Working capital	Lower	Higher
	Retained earnings	Lower	Higher
Cash flow statement	CFO	Higher	Lower

Inventory Cost Flow and Price Changes

When prices are **rising** (as in the example):

1. FIFO provides an artificially low value of COGS and a better estimate of inventory.
2. LIFO provides an artificially low value of ending inventory and a better estimate of COGS.

When prices are declining, FIFO is still a better estimate of inventory, and LIFO is still a better estimate of COGS.

With stable prices, all methods result in the same COGS, gross profit, and ending inventory.

LIFO Liquidation

When a LIFO firm sells more units than it creates during a period, it is referred to as a **LIFO liquidation**:

- With rising inventory costs, the effect is to reduce COGS and increase reported earnings (not sustainable).
- The amount of the increase in gross income from LIFO liquidation must be disclosed.
- It can be intentional (earnings manipulation) or unintentional (strikes, declining demand).

Analysis of Disclosures

Condition	Possible Interpretation
Increase in raw materials and work-in-process	Expected increase in demand
Increase in finished goods alone	Decrease in demand
Finished goods growing faster than sales	Decrease in demand—may be result of excessive or obsolete inventory

Key Ratios

- Impacted by inventory:

$$\text{inventory turnover} = \frac{\text{cost of goods sold}}{\text{average inventory}}$$

$$\text{days of inventory on hand} = \frac{365}{\text{inventory turnover}}$$

$$\text{gross profit margin} = \frac{\text{gross profit}}{\text{net revenue}}$$

Analysis of Ratios

Condition	Possible Interpretation
Low turnover (high DOH)	Slow-moving or obsolete inventory
High turnover (low DOH) with low sales growth relative to industry	May be losing sales from insufficient inventory levels
High turnover (low DOH) with sales growth at or above industry average	Efficient inventory management

Solutions

Carrying Value: Example

The following information is for Perla Corp.:

Inventory at cost = €8.45 million
Completion costs = €1.4 million
Expected sales price = €9.55 million
Selling expenses = 4%
Normal profit margin = 12%

Net Realizable Value	€'m
Expected selling price	9.55
– completion costs	1.4
– selling cost €9.55 × 0.04	0.38
NRV	7.77

If Perla reports under IFRS, its inventory value is:

A. 7.77 million.
B. 8.45 million.
C. 9.17 million.

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Inventory: Example

What was the effect of the write-down on Hatsumei's 2017 financial statements? What was the effect of the recovery on Hatsumei's 2018 financial statements?

2017:

IFRS: Lower of cost and NRV

Cost > NRV = write-down = €5.2m – €4.9m = €0.3m

2018: Cost < NRV: NRV – cost = €0.5m

Reversal of write-down = €0.3m

-4

Inventory: Example

Under U.S. GAAP, if Hatsumei used the LIFO method, what would be the effects of the write-down on Hatsumei's 2017 financial statements and of the recovery on Hatsumei's 2018 financial statements?

2017:

U.S. GAAP: lower of cost and MV

Write-down = €5.2m – €4.7m = €0.5m

Market Value	€'m
Upper limit = NRV	4.9
Replacement cost	4.7
Lower = NRV – margin	4.9 – x

2018: reversals of write-downs prohibited

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Inventory: Example

What would be the effect of the recovery on Hatsumei's 2018 financial statements if Hatsumei's inventory were agricultural products instead of computers?

2018:

Inventory recorded at NRV

Mark-to-market gains taken to I/S = €0.5m

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FIFO: Solution

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory	(52)	
Cost of goods sold		32
Gross margin		19

Note purchase prices rising: $10 > $12 > $14

Gross margin = 19 / 51 = 0.37 or 37%

Ending Inventory	$
Most recent purchases 2 @ $14	28
2nd most recent purchases 2 @ $12	24
Total (4 units)	52

Cost of Goods Sold	$
Beginning inventory 2 @ $10	20
1st purchase 1 @ $12	12
Total (3 units)	32

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LIFO: Solution

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory	(44)	
Cost of goods sold		40
Gross margin		11

Note purchase prices rising: $10 > $12 > $14

Gross margin = 11 / 51 = 0.22 or 22%

Ending Inventory	$
Beginning inventory 2 @ $10	20
1st purchase 2 @ $12	24
Total (4 units)	44

Cost of Goods Sold	$
Most recent purchase 2 @ $14	28
2nd most recent purchase 1 @ $12	12
Total (3 units)	40

LIFO: Average cost

I/S	$	$
Revenue		51
Beginning inventory	20	
Purchases	64	
Available for sale	84	
Ending inventory	(48)	
Cost of goods sold		36
Gross margin		15

Note purchase prices rising: $10 > $12 > $14

Gross margin = 15 / 51 = 0.29 or 29%

Average Cost	
Available for sale	$84
Units available	7
Average = $84 / 7	$12
Ending inventory 4 × $12	48
Cost of goods sold 3 × $12	36