Basic Concepts: Assets & Liabilities

I. Accounting for Inventories & Cost of Goods Sold ("COGS")

A. Valuing Inventories & COGS

- Inventories are valued at **lower** of acquisition **cost** or **market** (**LCM**)
- **Cost**
  - ⊕ Merchandise inventories: costs of purchasing, transportation, receiving, inspecting, etc.
  - ⊕ Manufactured inventories: costs of direct materials, direct labor & manufactured overhead (i.e. all other indirect costs)
- **Market** is the current cost to replace inventory

[Example]

Which of the following methods is considered preferred for financial reporting purposes?

A. capitalization of research and development costs
B. lower of cost or market (LOCOM) for inventories
C. direct write-off of doubtful (uncollectible) accounts
D. MACRS for depreciation

Answer: B

- **Inventory Equation**

BI + P = EI + COGS

	Beginning Inventory (BI)
+	Purchases (P)
=	Cost of goods available for sale
–	Ending Inventory (EI)
=	Cost of Goods Sold (COGS)

講師提示
期初存貨 + 進貨 = 銷貨成本 + 期末存貨 為存貨會計最基礎之關係。

[Example]

Compute the COGS based on the following info:

	Beginning Inventory	**Ending Inventory**
Raw Materials	NT$1,000	NT$2,000
Work-in-Process	4,000	5,000
Finished Goods	6,000	8000
	NT$11,000	NT$15,000

During an accounting period,

Raw Material Purchases		NT$8,000
Direct Labor		10,000
Factory Overhead:		
Utilities	NT$500	
Depreciation	600	
Other	200	
Total		1,300
Freight Charges on Raw Materials		100
General Administrative Overhead		1,700
Interest Expense		400

Answer:

BI + P = EI + COGS ➔ COGS = BI + P – EI

Since BI = NT$11,000; EI = NT$15,000;

P = 8,000 + 10,000 + 1,300 + 100 = NT$19,400

COGS = BI + P – EI = 11,000 + 19,400 –15,000 = NT$15,400

[Example]

DJ Co understates its purchases by $200 & understates its ending inventory by $500.

Since COGS = BI + P – EI ➔ ΔCOGS = ΔBI + ΔP – ΔEI

= 0 + (-200) –(-500) = + 300 (overstated)

➔ Δ(reported gross profit) = –300 (understated)

- Methods of Inventory Accounting
  1. **FIFO**: typical actual flow of goods through a business where the oldest inventory is sold first (e.g. fish market)
  2. **LIFO**
  3. **Average cost**
  4. **Specific identification**

[Example]

Date	Item	# of Unit	Actual units sold	Unit cost/price	Total amount
2003/1/1	Beginning Inventory	2 units	1 unit	$2 per unit	$4
2003/1/8	Purchase	3 units	2 units	$3 per unit	$9
2003/1/28	Purchase	5 units	4 units	$5 per unit	$25
January 2003	Sales	7 units	-	-	-

P = $9 + $25 = $34 for (3 units + 5 units = 8 units)
Cost of Goods available for sale = BI + P = $4 + $34 = $38
Total # of units available for sale = BI + P = 2 units + 8 units = 10 units
Average unit cost of goods available for sale = $38/10 units = $3.8 per units
EI = BI + P – units sold = 10 units – 7 units = 3 units

FIFO: EI = 3 units x $5 per unit = $15
COGS = BI + P – EI = $38 –$15 = $23

LIFO: EI = (2 units x $2 per unit) + (1 unit x $3 per unit) = $7
COGS = BI + P – EI = $38 –$7 = $31

Average cost: EI = 3 units x $3.8 per unit = $11.4
COGS = BI + P – EI = $38 –$11.4 = $26.6

Specific identification: EI = $2 + $3 + $5 = $10
COGS = BI + P – EI = $38 –$10 = $28

The Lower-of-Cost-or-Market Principle: If FIFO is used & the fair market value of the units in the ending inventory is $12, an ***unrealized loss*** of $3 is recognized on the income statement.

B. The Influence of Inventory Valuation on Financial Statements

- Analytical implications:

⊕ If financial statements are analyzed and compared with firms using different cost flow assumptions, **adjustments** have to be made to achieve **comparability**.

⊕ Most US firms use LIFO on their statements

- IRS rules state that if firms use LIFO on tax returns, they must use LIFO on general-purpose statements
- During periods of rising prices, firms have **saved money** by using LIFO on tax returns as reported net income is lower ➔ **↑ CFO**

Effect on Income, Assets, & Cash Flow

- In the absence of taxes ➔ no difference in cash flow between LIFO & FIFO
- In the periods of rising prices & stable or inventory quantities:

rising prices	**FIFO**	**LIFO**
Inventory balances	↑	↓
COGS	↓	↑
Net income(EBT & EAT)	↑	↓
Taxes	↑	↓
Working capital	↑	↓
Cash flows	↓	↑

⊕ With rising prices, LIFO is the best choice *from an economic (income) perspective*

⊕ LIFO firm liquidity measures are misleading due to understatement of working capital

⊕ FIFO firms show higher net income (all else the same)

⊕ **LIFO liquidation**: By decreasing inventory to levels below normal level, thus *dipping into old "cheap" inventory* (e.g. sells more items than purchased during the period), a firm's management can manipulate profits under LIFO. Now COGS under LIFO will be low & profit high

➔ LIFO COGS and, hence, income are distorted

➔ COGS doesn't reflect current costs

To maximize the value of a firm, the method which minimizes taxes & maximizes net cash flow is usually chosen by the management. Under normal conditions of secular inflation & real economic growth, this often leads to choosing LIFO

C. Converting LIFO Statements into FIFO equivalents

- Current cost of inventory (FIFO) = LIFO inventory **+ LIFO reserve**
- To adjust the balance sheet:

Inventory: (LIFO basis ➔ FIFO basis) **+ LIFO reserve**	**Retained Earning:** **+ (LIFO reserve) x (1-t)** **Deferred tax liability:** **+ (LIFO reserve) x (t)**

- Adjustment of COGS:

Since $COGS_{\mathbf{L}} = BI_{\mathbf{L}} + P_{\mathbf{L}} - EI_{\mathbf{L}}$

$COGS_{\mathbf{F}} = BI_{\mathbf{F}} + P_{\mathbf{F}} - EI_{\mathbf{F}}$

$\Delta COGS = COGS_{\mathbf{L}} - COGS_{\mathbf{F}}$

$= (BI_{\mathbf{L}} + P_{\mathbf{L}} - EI_{\mathbf{L}}) - (BI_{\mathbf{F}} + P_{\mathbf{F}} - EI_{\mathbf{F}})$

And, LIFO Reserve (LR) = $I_{\mathbf{F}} - I_{\mathbf{L}}$

$\Delta COGS = (EI_{\mathbf{F}} - EI_{\mathbf{L}}) - (BI_{\mathbf{F}} - BI_{\mathbf{L}})$

$= LR_{\mathbf{E}} - LR_{\mathbf{B}} = \Delta LR$

FIFO COGS = LIFO COGS – Δ LIFO Reserve

FIFO Net Income = LIFO Net Income + [Δ LIFO Reserve x (1–t)]

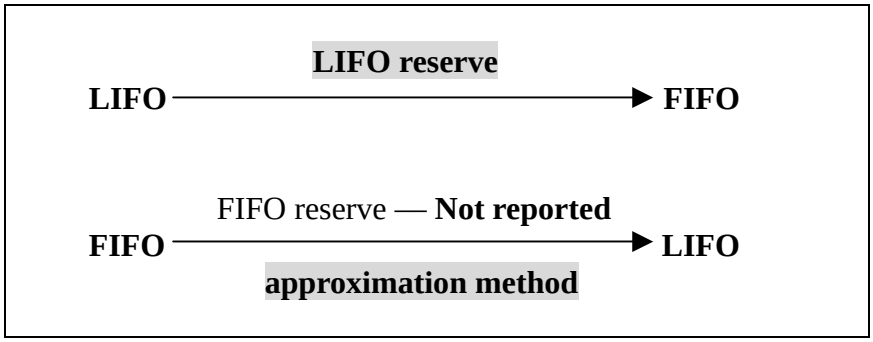
[Example]

	2002	2003
End-of-year inventory balance	$50	$70
LIFO reserve	$20	$30
COGS	-	$300

If the company uses LIFO, convert 2003 ending inventory & COGS to a FIFO-basis.

FIFO inventory = LIFO inventory + LIFO reserve = \$70 + \$30 = \$100

FIFO COGS = LIFO COGS – Δ LIFO Reserve = \$300 – (30–20) = \$290



- Don't have to adjust FIFO ending inventory since it is theoretically already at current cost

Declines in LIFO Reserve

- LIFO Reserve will decline if
  - Inventory quantity is falling (LIFO liquidation) ➔ need to adjust:

$$COGS_{F} = COGS_{L} - \Delta LR$$

  - Prices are falling ➔ no need to adjust

- If prices are falling or there's a LIFO liquidation, the **LIFO reserve** (LR) and **Δ LR** will be negative:

falling prices or LIFO liquidation	**FIFO**	**LIFO**
Inventory balances	↓	↑
COGS	↑	↓
Net income (EBT & EAT)	↓	↑
Taxes	↓	↑
Working capital	↓	↑
Cash flows	↑	↓

D. Effect of Inventory Accounting Choices on Key Financial Ratios

- Interpretation of Inventory

1. Inventory Balances

⊕ For **balance sheet** purposes, **inventories** based on **FIFO** are **preferable** since these values most closely resemble **current cost** & hence **current economic value**

2. Earnings

⊕ Going concern assumption implies that income should be measured in terms of profits after providing for the **replacement of inventory**

⊕ For **income statement** purposes, **LIFO** is **most informative** accounting method & provides a **better measure** of **current income**

- FIFO: better balance sheet measure ←→ LIFO: better income statement measure →→→ Restate financial statements → better analysis
- Effect on Ratios

rising prices	**FIFO**	**LIFO**
Ending Inventory balances	↑	↓
Current ratio *	↑	↓
COGS	↓	↑
Inventory turnover **	↓	↑
Net income	↑	↓
Profitability ratios	↑	↓
Taxes	↑	↓
Working capital	↑	↓
Cash flows	↓	↑

* Current ratio = current assets/ current liab.

** Inventory turnover = COGS / avg. inventory

[Example]

Balance Sheet

Assets	12/31/2002	12/31/2001
Cash	$105	$95
Accounts receivable	205	195
Inventory	310	290
Total current assets	$620	$580
Gross PP&E	1,800	1,700
Accumulated depr.	(360)	(340)
Net PP&E	1,440	1,360
Total assets	$2,060	$1,940

Liabilities and Shareholders' Equity

Accounts payable	$110	$90
Short-term debt	160	140
Current portion of long-term debt	55	45
Current liabilities	$325	$275
Long-term debt	610	690
Deferred taxes	105	95
Common stock	300	300
Additional paid-in capital	400	400
Retained earnings	320	180
Common shareholders equity	1,020	880
Total liabilities & equity	$2,060	$1,940

Income Statement

For the Year Ended December 31, 2002

Sales	$4,000
Cost of goods sold	(3,000)
Gross profit	1,000
Operating expenses	(650)
Operating profit	350
Interest expense	(50)
Pretax income	300
Income tax expense	(100)
Net Income	$200
Common dividends	$60

Footnote: The firm uses the LIFO inventory cost-flow assumption to account for inventories. The LIFO Reserve in 2002 was $100; in 2001 it was $90.

For 2001

FIFO inventory = LIFO inventory + LIFO reserve = $290 + $90 = **$380**

For 2002

FIFO inventory = $310 + $100 = **$410**

FIFO COGS = LIFO COGS – Δ LIFO Reserve = $3,000 – (100–90) = **$2,990**

Based on accounting figures that are most appropriate to compare to industry norms,

Net profit margin = net income under LIFO / sales = 200 /4000 = **5%**

Current ratio = current assets FIFO / current liabilities
= (current assets LIFO + LIFO reserve) / current liabilities
= (620 + 100) / 325 = **5%**

Inventory turnover = COGS under LIFO / average inventory under FIFO
= 3000 / [(380 = 410) / 2] = **7.6**

Debt-to-equity = long-term debt / equity under FIFO
= 610 / {1020 + [100 x (1-33%)]} = **56.12%**

講師提示
存貨分析之重點為使用「先進先出法(FIFO)」及「後進先出法(LIFO)」對資產、盈餘及各項重要財務比率之影響。

