Chapter 7

Reporting and Interpreting Cost of Goods Sold and Inventory

商品销货成本和存货的报告与解释

Learning Objectives

After studying this chapter, you should be able to:

7-1 Apply the cost principle to identify the amounts that should be included in inventory and the cost of goods sold for typical retailers, wholesalers, and manufacturers.

7-2 Report inventory and cost of goods sold using the four inventory costing methods.

7-3 Decide when the use of different inventory costing methods is beneficial to a company.

7-4 Report inventory at the lower of cost or net realizable value.

7-5 Evaluate inventory management using the inventory turnover ratio.

7-6 Compare companies that use different inventory costing methods.

7-7 Understand methods for controlling inventory, analyze the effects of inventory errors on financial statements, and analyze the effects of inventory on cash flows.

7-2

Understanding the Business

Primary Goals of Inventory Management

- To have sufficient quantities of high-quality inventory available to serve customers' needs足够的高质量存货满足消费者需求
- To minimize the costs of carrying inventory (production, storage, obsolescence, and financing)最小化存货持有成本

7-3

Exhibit 7.1
Income Statement and Balance Sheet Excerpts

HARLEY-DAVIDSON, INC.
Consolidated Statements of Income (In thousands)*

Years Ended December 31,	2017	2016	2015
Net Sales	$5,647,224	$5,996,458	$5,995,402
Cost of Goods Sold	3,261,683	3,419,710	3,356,284
Gross Profit	$2,385,541	$2,576,748	$2,639,118

HARLEY-DAVIDSON, INC.
Consolidated Balance Sheets (In thousands)*

	2017	2016
Assets		
Current Assets		
Cash and cash equivalents	$ 687,521	$ 759,984
Marketable securities	-	5,519
Accounts receivable, net	329,986	285,106
Finance receivables, net	2,105,662	2,076,261
Inventories	538,202	499,917
Other current assets	223,371	227,065
Total current assets	$3,884,742	$3,853,852

** Harley-Davidson's statements have been simplified for purposes of our discussion.*

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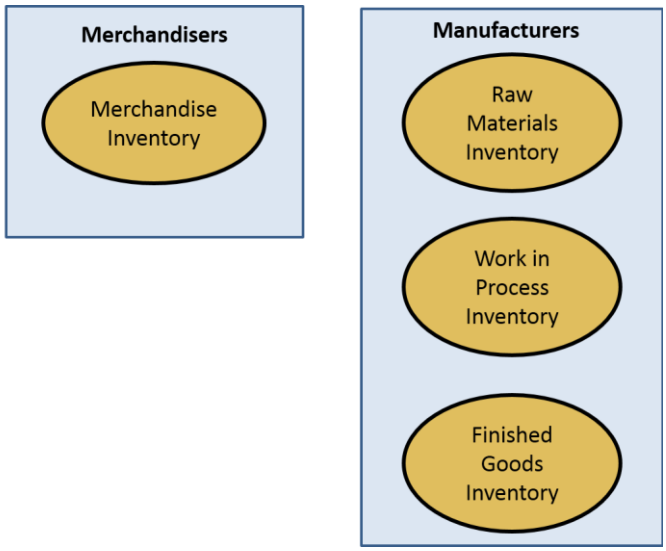
Learning Objective 7-1

7-1 Apply the cost principle to identify the amounts that should be included in inventory and the cost of goods sold for typical retailers, wholesalers, and manufacturers.

7-5

Items Included in Inventory存货项目



7-6

Costs Included in Inventory Purchases存货采购成本

Inventory is initially recorded at cost. 存货基于成本计价
Inventory cost includes the costs to bring an article to usable or salable condition and location.存货达到可使用/销售状态前的成本

+ Invoice price发票价格
+ Freight-In运费 *(freight charges to deliver items to company warehouse)*
+ Inspection costs验收费用
+ Preparation costs准备费用
− Purchase returns and allowances采购退货与折让
− Purchase discounts采购折扣
= Total inventory cost

Company should cease accumulating purchase costs when the raw materials are **ready for use** or when the merchandise inventory is **ready for shipment**. 原材料可使用/存货可发货后，不再归集采购成本
Costs related to selling the inventory should be included in selling, general, and administrative expenses.

7-7

Applying the Materiality Constraint in Practice
重要性原则的应用

FINANCIAL ANALYSIS

Incidental costs, such as inspection and preparation costs, do not have to be assigned to the inventory cost if they are not material. Therefore, many companies record inspection and preparation costs as an expense.

Most companies report inventory cost as:	
Invoice Price	XX
Less Returns	−XX
Less Discounts	−XX
Total Inventory Cost	XX

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Exercise 7-1

Based on its physical count of inventory in its warehouse at year-end, December 31 of the current year, Hitech Company planned to report inventory of $36,000. During the audit, the independent CPA developed the following additional information:

a. Goods from a supplier costing $900 are in transit with SPG Deliveries on December 31 of the current year. The terms are FOB shipping point (explained in the "Required" section). Because these goods had not yet arrived, they were excluded from the physical inventory count.

b. Hitech delivered samples costing $2,000 to a customer on December 27 of the current year, with the understanding that they would be returned to Hitech on January 15 of the next year. Because these goods were not on hand, they were excluded from the inventory count.

7-9

c. On December 31 of the current year, goods in transit to customers, with terms FOB shipping point, amounted to $8,500 (expected delivery date January 10 of the next year). Because the goods had been shipped, they were excluded from the physical inventory count.

d. On December 31 of the current year, goods in transit to customers, with terms FOB destination, amounted to $3,500 (expected delivery date January 10 of the next year). Because the goods had been shipped, they were excluded from the physical inventory count.

***Required*:**

Hitech's accounting policy requires including in inventory all goods for which it has title.

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Correct ending inventory = $36,800 + $900 + $2,000 + $8,500 by the company = $42,400 Correct ending inventory = $36,800 + $900 + $2,000 + $3,500 = $43,200

	Item		Amount	Explanation	Action Required
a.	Goods from a supplier costing $900	$900		As per "FOB shipping point" in the sales contract, title changes hands at shipment and the buyer normally pays for shipping. In this case, goods are in transit from suppliers, and terms are "FOB shipping point". Hence, the goods have to be included in ending inventory.	Add to ending inventory
b.	Hitech delivered samples costing $2,000	$2,000		According to Hitech's accounting policy, all goods for which it has title should be included in inventory. These goods were sent as samples and thus not considered as sales. Since the title of the goods still vest with Hitech, the goods have to be included in ending inventory.	Add to ending inventory
c.	On December 31 of the current year, goods in transit to customers, with terms FOB shipping point	$8,500		As per the term "FOB shipping point" in the sales contract, title changes hands at shipment and the buyer normally pays for shipping. In this case, goods are in transit to customers, and the terms are "FOB shipping point". Therefore, the goods have to be excluded from the ending inventory.	No action required, as it is already excluded
d.	On December 31 of the current year, goods in transit to customers, with terms FOB destination	$3,500		As per the term "FOB destination" in the sales contract, title changes hands on delivery and the seller normally pays for shipping. In this case, goods are in transit to customers and terms are "FOB destination". Hence, the goods have to be included in ending inventory.	Add to ending inventory

7-11

Exhibit 7.2
Flow of Inventory Costs存货成本流转

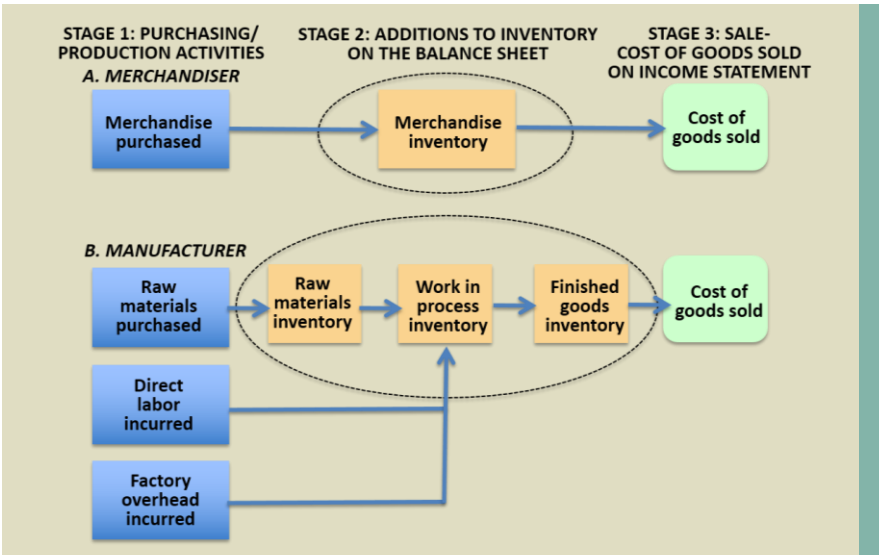

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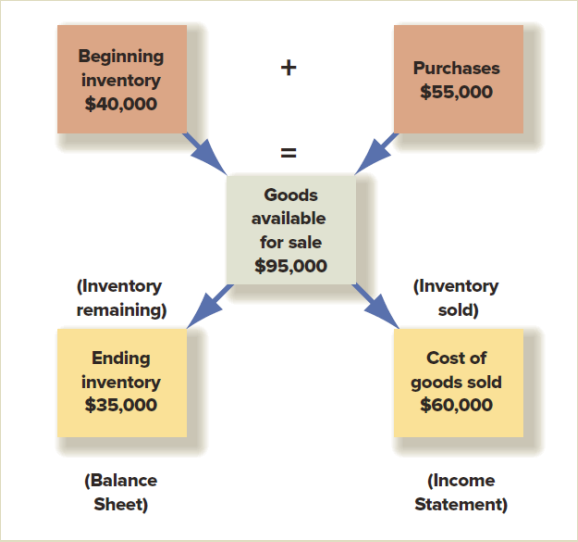
Exhibit 7.3 (1)
Cost of Goods Sold for Merchandise Inventory商品存货的销货成本



7-13

Exhibit 7.3 (2)
Calculating Cost of Goods Sold销货成本的计算

	Beginning inventory
+	Purchases of merchandise during the year
	Goods available for sale可供销售存货
−	Ending inventory
	Cost of goods sold

Cost of goods sold equation: BI + P − EI = CGS

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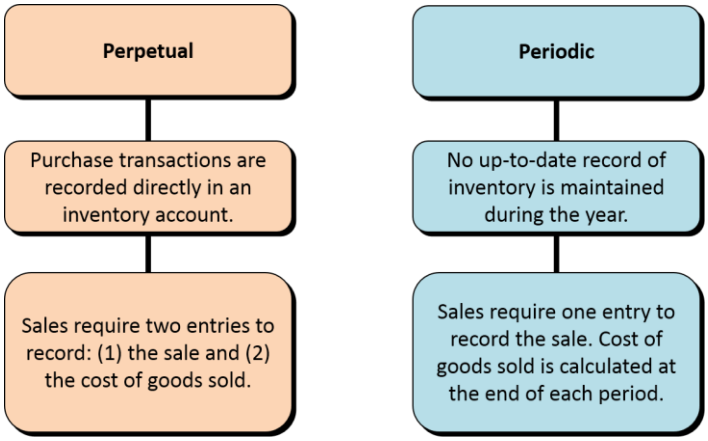
Perpetual and Periodic Inventory Systems永续盘存制与定期盘存制

The amount of cost of goods sold and ending inventory can be determined by using one of two different inventory systems: perpetual or periodic.



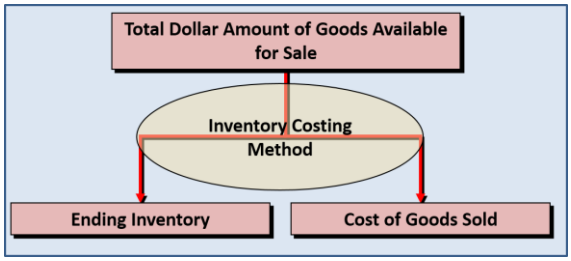
7-15

Learning Objective 7-2

7-2 Report inventory and cost of goods sold using the four inventory costing methods.

7-16

Inventory Costing Methods存货成本计价方法



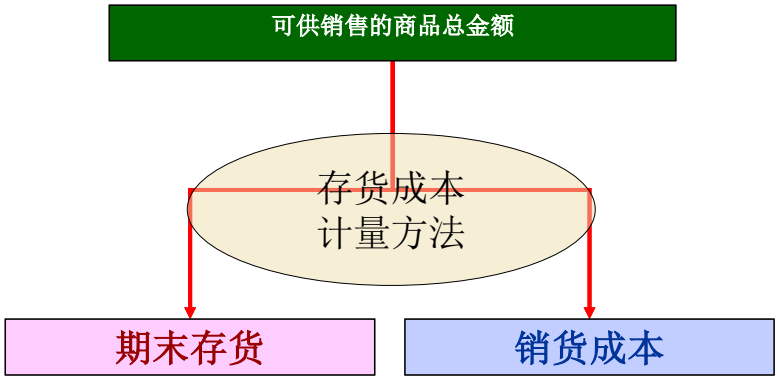
Inventory Costing Methods

1. **Specific identification个别认定法**
2. **First-in, first-out (FIFO)先进先出法**
3. **Last-in, first-out (LIFO)后进先出法**
4. **Average cost平均成本法**

The four inventory costing methods are alternative ways to assign the total dollar amount of goods available for sale between ending inventory and cost of goods sold.
将可供销货成本在期末存货和销货成本之间分摊

7-17

存货成本计价方法

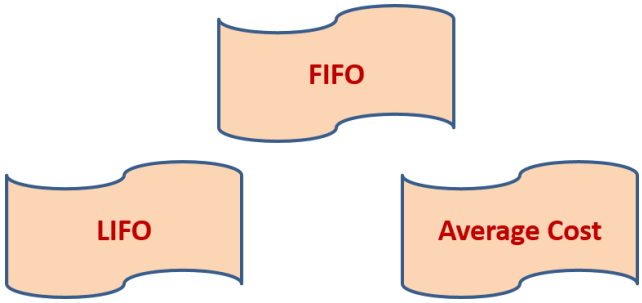


7-18

Cost Flow Assumptions成本流转假设

The choice of an inventory costing method is **not based on the physical flow** 不是实物流转 of goods on and off the shelves.

That is why they are called **cost flow assumptions.**



7-19

Inventory example

Assume that a Harley-Davidson dealer had the indicated inventory on hand and transactions during January as follows:

Jan. 1 Had beginning inventory of two units of a Model A leather jacket at $70 each.

Jan. 12 Purchased four units of the Model A leather jacket at $80 each.

Jan. 14 Purchased one unit of the Model A leather jacket at $100.

Jan. 15 Sold four units of the Model A leather jacket for $120 each.

Note: Three units remain in ending inventory at the end of the period

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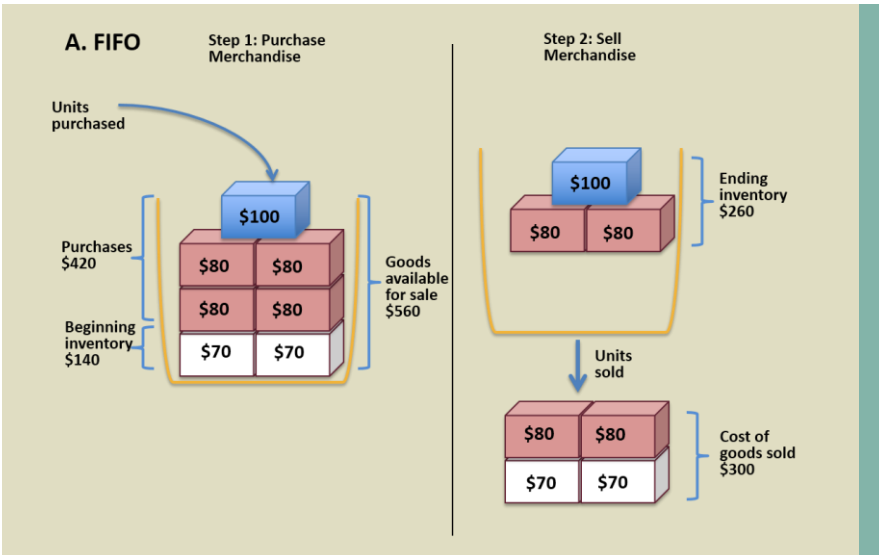
Exhibit 7.4 (1)
FIFO Inventory Flows



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First-In, First-Out Method [1]

Harley-Davidson Model A Leather Jacket Inventory			
Date	**Units**	**$/Units**	**Total**
Beginning Inventory	2	$70	$140
Purchases:			
Jan. 12	4	$80	$320
Jan. 14	1	$100	$100
Goods Available for Sale	7		$560

This chart provides information about purchases for the Model A leather jacket inventory for Harley-Davidson. We will use these data throughout our inventory examples so we can compare our results at the end.

Additional Information:

✓During the period, Harley-Davidson sold four units

✓Three units remain in ending inventory at the end of the period

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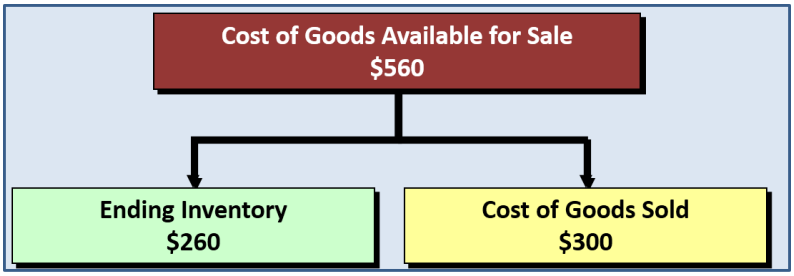
First-In, First-Out Method 2

Cost of Goods Sold Calculation (FIFO)		
Beginning inventory	(2 units at $70 each)	$140
+ Purchases	(4 units at $80 each)	320
	(1 unit at $100)	100
Goods available for sale		560
− Ending inventory	(2 units at $80 each and 1 unit at $100)	260
Cost of goods sold	(2 units at $70 each and 2 units at $80 each)	$300



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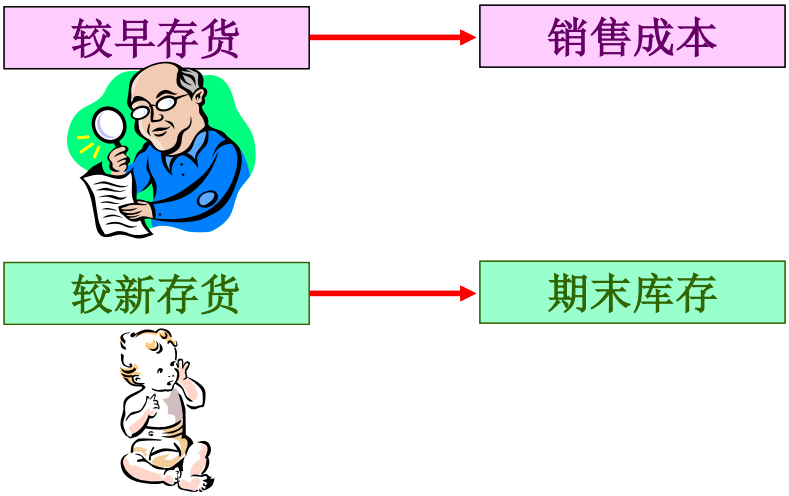
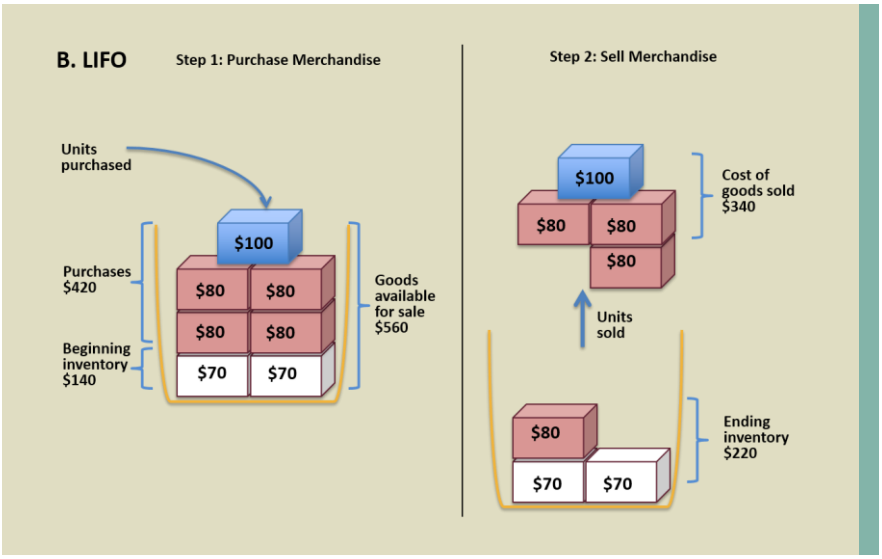
先进先出法



7-24

Exhibit 7.4 (2)
LIFO Inventory Flows



7-25

Last-In, First-Out Method [1]

Harley-Davidson Model A Leather Jacket Inventory			
Date	**Units**	**$/Units**	**Total**
Beginning Inventory	2	$70	$140
Purchases:			
Jan. 12	4	$80	$320
Jan. 14	1	$100	$100
Goods Available for Sale	7		$560

This chart provides information about purchases for the Model A leather jacket inventory for Harley-Davidson. We will use these data throughout our inventory examples so we can compare our results at the end.

Additional Information:

✓During the period, Harley-Davidson sold four units

✓Three units remain in ending inventory at the end of the period

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Last-In, First-Out Method 2

Cost of Goods Sold Calculation (FIFO)		
Beginning inventory	(2 units at $70 each)	$140
+ Purchases	(4 units at $80 each)	320
	(1 unit at $100)	100
Goods available for sale		560
– Ending inventory	(2 units at $70 each and 1 unit at $80)	220
Cost of goods sold	(3 units at $80 each and 1 unit at $100)	$340

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Average Cost Method 1

Harley-Davidson Model A Leather Jacket Inventory			
Date	Units	$/Units	Total
Beginning Inventory	2	$70	$140
Purchases:			
Jan. 12	4	$80	$320
Jan. 14	1	$100	$100
Goods Available for Sale	7		$560

This chart provides information about purchases for the Model A leather jacket inventory for Harley-Davidson. We will use these data throughout our inventory examples so we can compare our results at the end.

Additional Information:

✓During the period, Harley-Davidson sold four units

✓Three units remain in ending inventory at the end of the period

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Average Cost Method 2

Cost of Goods Sold Calculation (FIFO)		
Beginning inventory	(2 units at $70 each)	$140
+ Purchases	(4 units at $80 each)	320
	(1 unit at $100)	100
Goods available for sale	(7 units at $80 average cost each)	560
− Ending inventory	(3 units at $80 average cost each)	240
Cost of goods sold	(4 units at $80 average cost each)	$320

Weighted Average Cos

$$\frac{\$560}{7} = \$80 \text{ per unit}$$

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LIFO and International Comparisons

International Perspective

While U.S. GAAP allows companies to choose among FIFO, LIFO, and weighted average inventory methods, IFRS currently prohibit the use of LIFO.

GAAP also allows different inventory accounting methods to be used for different types of inventory items.

IFRS requires that the same method be used for all inventory items that have a similar nature and use.

These differences can create comparability problems when one attempts to compare companies across international borders.

7-30

Exhibit 7.5 (1)
Financial Statement Effects of Inventory Costing Methods

	FIFO	LIFO	Average Cost
Effect on the Income Statement			
Sales	$480	$480	$480
Cost of goods sold	300	340	320
Gross profit	180	140	160
Other expenses	80	80	80
Income before income taxes	100	60	80
Income tax expense (25%)	25	15	20
Net income	$75	45	$60
Effect on the Balance Sheet			
Inventory	$260	$220	$240

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Exhibit 7.5 (2)
Financial Statement Effects of Inventory Costing Methods

Increasing Costs: Normal Financial Statement Effects		
	FIFO	**LIFO**
Cost of goods sold on income statement	Lower	Higher
Net income	Higher	Lower
Income taxes	Higher	Lower
Inventory on balance sheet	Higher	Lower
Decreasing Costs: Normal Financial Statement Effects		
	FIFO	**LIFO**
Cost of goods sold on income statement	Higher	Lower
Net income	Lower	Higher
Income taxes	Lower	Higher
Inventory on balance sheet	Lower	Higher

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Exercise 7-2

Edmond Company uses a periodic inventory system. At the end of the annual accounting period, December 31 of the current year, the accounting records provided the following information for product 2:

		Units	Unit Cost
Inventory, December 31, prior year		4,000	$ 10
For the current year:			
Purchase, April 15		10,000	12
Purchase, June 10		8,000	17
Sales ($60 each)		11,000	
Operating expenses (excluding income tax expense)	$200,000		

Required:

1. Prepare a separate income statement through pre-tax income that details cost of goods sold for (a) Case A: FIFO and (b) Case B: LIFO. For each case, show the computation of the ending inventory and cost of goods sold.
2. Compare the pre-tax income and the ending inventory amounts between the two cases. Explain the similarities and differences.
3. Which inventory costing method may be preferred for income tax purposes? Explain.

7-33

Required:

1. Prepare a separate income statement through pretax income that details cost of goods sold for (a) Case A: FIFO and (b) Case B: LIFO. For each case, show the computation of the ending inventory and cost of goods sold.

		Units	Unit Cost
Inventory, December 31, prior year		4,000	$ 10
For the current year:			
Purchase, April 15		10,000	12
Purchase, June 10		8,000	17
Sales ($60 each)		11,000	
Operating expenses (excluding income tax expense)	$200,000		

Cost of Goods Sold Calculation		FIFO	LIFO
Beginning inventory	(4,000 units at $10 each)	$ 40,000	$ 40,000
+ Purchases	(10,000 units at $12 each)	120,000	120,000
	(8,000 units at $17 each)	136,000	136,000
Goods available for sale	(22,000 units)	296,000	296,000
− Ending inventory	(3,000 units at $12 each, 7,000 units at $12 each)	172,000	124,000
Cost of goods sold	(8,000 units at $17 each, 3,000 units at $12 each)	$124,000	$172,000

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		Units	Unit Cost
Inventory, December 31, prior year		4,000	$ 10
For the current year:			
Purchase, April 15		10,000	12
Purchase, June 10		8,000	17
Sales ($60 each)		11,000	
Operating expenses (excluding income tax expense)	$200,000		

Income statement	FIFO	LIFO
Sales	$660,000	$660,000
Cost of goods sold	124,000	172,000
Gross profit	536,000	488,000
Operating expenses	200,000	200,000
Income before income taxes	$336,000	$288,000

7-35

Required:

2. Compare the pretax income and the ending inventory amounts between the two cases. Explain the similarities and differences.

	FIFO	LIFO
Pretax income	$ 336,000	$ 288,000
Ending inventory	$ 172,000	$ 124,000

The methods differ only in the dollar amount of goods available for sale, allocated to cost of goods sold versus ending inventory. For this reason, the method that gives higher ending inventory amount also gives lower cost of goods sold, higher gross profit, income tax expense, net income amounts, and vice versa.

3. Which inventory costing method may be preferred for income tax purposes? Explain.

When unit costs are rising, LIFO produces lower net income and a lower inventory valuation than FIFO, resulting in less tax liability. In circumstances where inventory cost is decreasing, the FIFO method—in which the oldest, most expensive goods become cost of goods sold—produces higher cost of goods sold and lower pretax earnings, thus resulting in lower income tax liability.

So, the costing method may be preferred depending on the trend of the cost of inventories. However, in the long run, costs are inflationary in nature and therefore the most preferable costing method for income tax purposes is LIFO.

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Learning Objective 7-3

7-3 Decide when the use of different inventory costing methods is beneficial to a company.

Managers' Choice of Inventory Methods [1]

What motivates companies to choose different inventory costing methods? Most managers choose accounting methods based on two factors:

Net Income Effects
Managers prefer to report higher earnings for their companies.

Income Tax Effects
Managers prefer to pay the least amount of taxes allowed by law as late as possible.

Any conflict between the two motives is normally resolved by choosing one accounting method for external financial statements and a different method for preparing tax returns. **HOWEVER: If last-in, first-out is used to compute taxable income, it must also be used to calculate inventory and cost of goods sold for financial statements.** This is called the **LIFO Conformity Rule.**

管理层对存货方法的选择

净利润效应
管理层倾向于为公司报告更高的利润

所得税效应
管理层倾向于支付法律允许范围内的最低税额，且越晚支付越好

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Managers' Choice of Inventory Methods 2

Increasing Cost Inventories

LIFO is used on the tax return because it normally results in lower income taxes

Decreasing Cost Inventories

FIFO is most often used for both the tax return and financial statements. FIFO produces the lowest tax payments for companies with decreasing cost inventories.

REMINDER: Regardless of the physical flow of goods, a company can use any of the inventory costing methods. Also, companies are not required to use the same costing method for all inventory items. However, they must apply the accounting method consistently from year to year.

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LIFO and Conflicts between Managers' and Owners' Interests

$$$

QUESTION OF ETHICS

Company managers may have an incentive to select a method that is not consistent with the owners' objectives.

For example, during a period of rising prices, using LIFO may be in the best interest of the owners (reduce tax liability), however managers may prefer FIFO (typically higher profits) if their compensation is tied to profits.

A manager who selects an accounting method that is not optimal for the company solely to increase his or her compensation is engaging in **questionable ethical behavior**.

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广州浪奇：自曝5.72亿元存货"不翼而飞"？两年虚增存货20亿，被罚1405万

2020年9月，广州浪奇发布公告称价值5.72亿元的存货"不翼而飞"。

公司无法对存放在江苏鸿燊物流有限公司及江苏辉丰石化有限公司的货物开展正常盘点及抽样检测工作，相关存货价值高达5.72亿元。

而在沟通之后，鸿燊公司、辉丰公司均否认保管有公司存储的货物。

经过调查发现，洗衣粉消失是假，事实是广州浪奇在2018年和2019年年报中存在虚假记录，其两年虚增营收逾128亿元，虚增利润逾4亿、虚增存货逾20亿。

最终广东证监局对广州浪奇做出了行政处罚决定。

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广东证监局《行政处罚决定书》〔2021〕21号

2018年1月1日至2019年12月31日，**广州浪奇通过虚构大宗商品贸易业务、循环交易乙二醇仓单等方式，虚增营业收入、营业成本和利润。**

《2018年年度报告》虚增营业收入6,234,322,859.99元，虚增营业成本6,023,835,603.98元，虚增利润210,487,256.01元，占当期披露利润总额的518.07%。

《2019年年度报告》虚增营业收入6,651,448,598.32元，虚增营业成本6,450,009,272.10元，虚增利润201,439,326.22元，占当期披露利润总额的256.57%。2018年1月1日至2019年12月31日，**为美化报表，广州浪奇将部分虚增的预付账款调整为虚增的存货。**

通过上述方式，广州浪奇《2018年年度报告》虚增存货金额为956,423,831.44元，占当期披露存货金额的75.84%、披露总资产的13.54%、披露净资产的50.53%。《2019年年度报告》虚增存货金额为1,082,231,342.91元，占当期披露存货金额的78.58%、披露总资产的12.17%、披露净资产的56.83%。

7-43

Learning Objective 7-4

7-4 Report inventory at the lower of cost or net realizable value.

7-44

Valuation at Lower of Cost or Net Realizable Value成本与市价孰低法1

Inventories should be measured initially at their purchase cost. When the **net realizable value** of goods in ending inventory falls below cost, these goods must be assigned a unit cost equal to their net realizable value.

This rule is the **lower of cost or net realizable value** (lower of cost or market, **LCM**).

Net realizable value (NRV) = sales price less costs to sell

Lower of Cost or Net Realizable Value is based on the **conservatism constraint**, which requires companies to avoid overstating assets and income.

This is particularly important for two types of companies:

1) **High-technology companies**
2) **Companies that sell seasonal goods**

7-45

Net Realizable Value可实现净值

Under lower of cost or net realizable value, companies recognize a **"holding" loss持有损失** in the period in which the net realizable value of an item drops below original cost, rather than recording the loss in the period the item is sold.

If the net realizable value of the inventory is lower than original cost, the company would make a **"write-down" entry冲减** to reduce the inventory balance to net realizable value.

No write-down is necessary if the net realizable value is higher than the original cost. Recognition of **holding gains持有收益**on inventory is not permitted by GAAP

7-46

Valuation at Lower of Cost or Net Realizable Value 2

Assume that HP had the following items in the current period ending inventory:

Item	Quantity	Cost per Item	Net Realizable Value (NRV) per Item	Lower of Cost or NRV per Item	Total Lower of Cost or Net Realizable Value
Intel chips	1,000	$250	$200	$200	1,000 × $200 = $200,000
Disk drives	400	100	110	100	400 × $100 = 40,000

The 1,000 Intel chips should be recorded in the ending inventory at the current net realizable value ($200) because it is **lower** than the cost ($250). HP makes the following journal entry to record the write-down:

	Debit	Credit
Cost of goods sold (+E, −SE) (1,000 × $50)	50,000	
Inventory (-A)		50,000

Assets	=	Liabilities	+	Stockholders' Equity
Inventory −50,000				Cost of Goods Sold (+E) −50,000

Because the net realizable value of the disk drives ($110) is higher than the original cost ($100), no write-down is necessary. The drives remain on the books at their cost of $100 per unit ($40,000 in total).

7-47

Effects of Lower of Cost or NRV Write-Down

The write-down of the Intel chips to market produces the following effects on the income statement and balance sheet:

Effects of Lower of Cost or NRV Write-Down	Current Period	Next Period (if sold)
Cost of goods sold	Increase $50,000	Decrease $50,000
Pretax income	Decrease $50,000	Increase $50,000
Ending inventory on balance sheet	Decrease $50,000	Unaffected

7-48

Exercise 7-3

Smith Company is preparing the annual financial statements dated December 31, Year 1. Ending inventory information about the five major items stocked for regular sale follows:

ENDING INVENTORY, YEAR 1			
Item	Quantity on Hand	Unit Cost When Acquired (FIFO)	Net Realizable Value (Market) at Year-End
A	100	$ 30	$ 24
B	160	60	80
C	20	96	104
D	140	50	60
E	700	20	10

***Required*:**

Compute the valuation that should be used for Year 1 ending inventory using lower of cost or net realizable value applied on an item-by-item basis. (Hint: Set up columns for Item, Quantity, Total Cost, Total Net Realizable Value, and Lower of Cost or NRV.)

7-49

Item	Quantity	Total Cost	Total Net Realizable Value	Lower of Cost or NRV
A	100	x $ 30 = $ 3,000	x $ 24 = $ 2,400	$ 2,400
B	160	x 60 = 9,600	x 80 = 12,800	9,600
C	20	x 96 = 1,920	x 104 = 2,080	1,920
D	140	x 50 = 7,000	x 60 = 8,400	7,000
E	700	x 20 = 14,000	x 10 = 7,000	7,000
	Total	$35,520	$32,680	$27,920

Inventory valuation using lower of cost or net realizable value = $27,920

Note: The write-down to the lower of cost or net realizable value will increase cost of goods sold expense by the amount of the write-down, which is $?.

Total cost − Lower of cost or NRV = Write-down value
$35,520 − $27,920 = $?

7-50

Learning Objective 7-5

7-5 Evaluate inventory management using the inventory turnover ratio.

Inventory Turnover存货周转率

KEY RATIO ANALYSIS

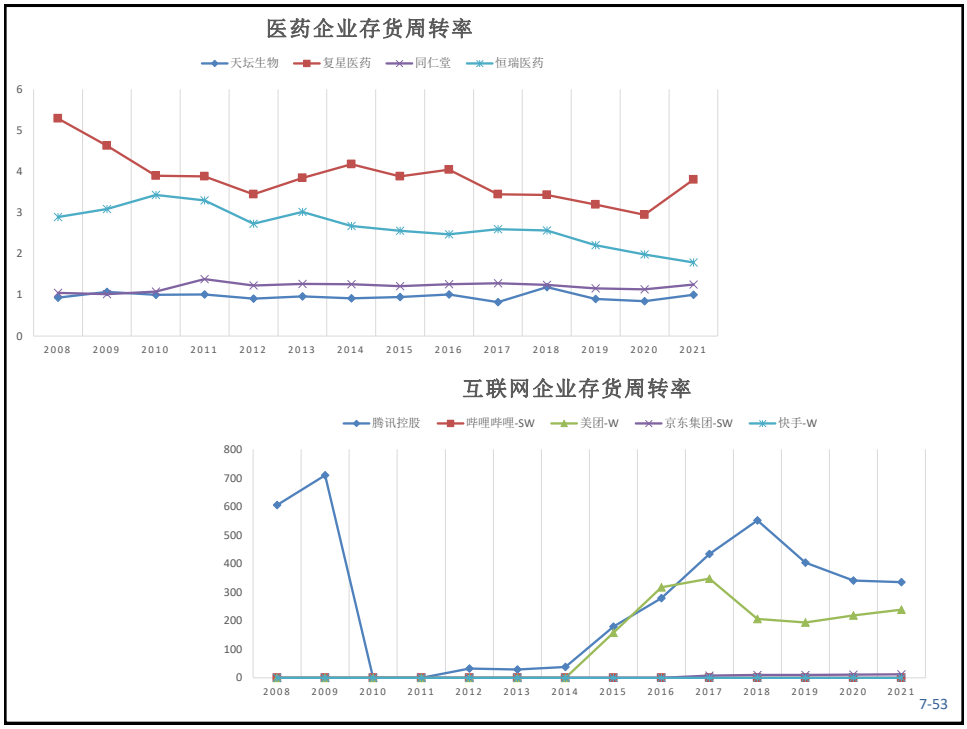
How efficient are inventory management activities?

$$\text{Inventory turnover ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Average Inventory is

(Beginning Inventory + Ending Inventory) ÷ 2

The ratio reflects **how many times average inventory was produced and sold during the period**. A higher ratio indicates that inventory moves more quickly through the production process to the customer, thus reducing storage and obsolescence costs.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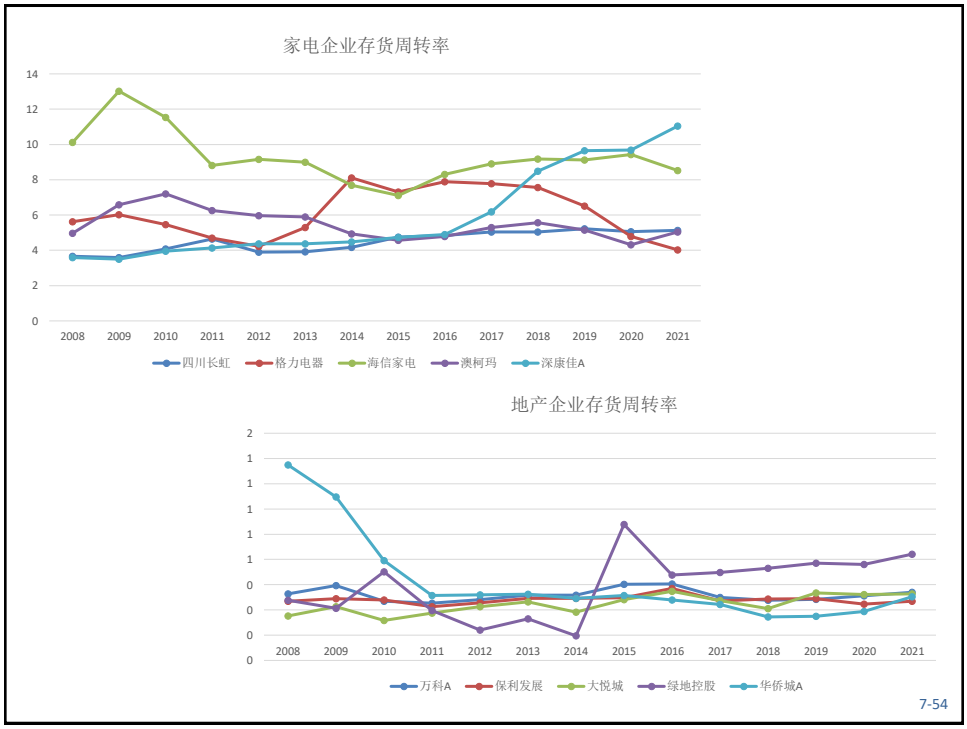
复星医药
同仁堂
恒瑞医药
互联网企业存货周转率
腾讯控股
哔哩哔哩-SW
美团-W
京东集团-SW
快手-W
7-53


家电企业存货周转率
四川长虹
格力电器
海信家电
澳柯玛
深康佳A
地产企业存货周转率
万科A
保利发展
大悦城
绿地控股
华侨城A
7-54

Average Days to Sell Inventory

KEY RATIO ANALYSIS

$$\text{Average Days to Sell inventory} = \frac{365}{\text{Inventory turnover ratio}}$$

This ratio reflects the average time in days it takes a company to produce and deliver inventory to its customers.

7-55

Exercise 7-4

Prado Inc. is the leading manufacturer of personal computers. In a recent year, it reported the following in dollars in millions:

Net sales revenue	$210,400
Cost of sales	167,150
Beginning inventory	5,080
Ending inventory	5,340

Required:

1. Determine the inventory turnover ratio and average days to sell inventory for the current year. 2. Explain the meaning of each number.

$$\text{Inventory turnover ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

$$\text{Average Inventory} = \frac{\text{Beginning inventory} + \text{Ending inventory}}{2}$$

$$= \frac{\$5{,}080 + \$5{,}340}{2}$$

$$= \$5{,}210$$

$$\text{Inventory turnover ratio} = \frac{\$167{,}150}{\$5{,}210}$$

$$= 32.08 \text{ times}$$

7-56

- The turnover ratio of Prado Inc. for the year was 32.08 times, meaning Prado produced and sold the average inventory 32.08 times during the year.
- The average for Prado was 11.38, meaning it took an average of 11.38 days to produce and deliver inventory to customers.

$$\text{Average Days to Sell inventory} = \frac{365}{\text{Inventory turnover ratio}}$$

$$= \frac{365}{32.08}$$

$$= 11.38 \text{ days}$$

7-57

Learning Objective 7-6

7-6 Compare companies that use different inventory costing methods.

7-58

Inventory Methods and Financial Statement Analysis - Converting the Income Statement to FIFO

The choice of a cost flow assumption affects how goods available for sale are allocated to ending inventory and cost of goods sold.

It does not affect the recording of purchases.

Ending inventory will be different under the alternative methods, and, because last year's ending inventory is this year's beginning inventory, beginning inventory also will be different:

	Beginning inventory	**Different**
+	Purchases of merchandise during the year	**Same**
−	Ending inventory	**Different**
	Cost of goods sold	**Different**

7-59

LIFO Reserve or "Excess of FIFO over LIFO"

If we know the differences between a company's inventory valued at LIFO and FIFO for both beginning and ending inventory, we can compute the difference in cost of goods sold.

LIFO reserve (or "Excess of FIFO over LIFO) refers to the differences between LIFO and FIFO values for beginning and ending inventory.

LIFO Reserve 后进先出准备is a **contra-asset** for the excess of FIFO over LIFO Inventory.

The LIFO Reserve is disclosed by LIFO users in their inventory footnotes.

You can adjust the inventory amounts on the balance sheet to FIFO by substituting the FIFO values in the note for the LIFO values.

Alternatively, you can add the LIFO reserve to the LIFO value on the balance sheet to arrive at the same numbers.

7-60

Inventory Methods and Financial Statement Analysis

Beginning LIFO Reserve (Excess of FIFO over LIFO)	$48,267
Less: Ending LIFO Reserve (Excess of FIFO over LIFO)	−52,355
Difference in Cost of Goods Sold under FIFO	($4,088)

Difference in pretax income under FIFO	$4,088
Tax rate	× .35
Difference in taxes under FIFO	$1,431

Decrease in Cost of Goods Sold Expense (Income increases)	$4,088
Increase in Income Tax Expense (Income decreases)	(1,431)
Increase in Net Income	$2,657

7-61

Exhibit 7.6
Financial Statement Effects of Inventory Costing Methods

HARLEY-DAVIDSON, INC.
Notes to Consolidated Financial Statements
2. ADDITIONAL BALANCE SHEET AND CASH FLOWS INFORMATION
Inventories, net (In thousands)

	December 31, 2017	December 31, 2016
Inventories:		
. . .		
Inventory at FIFO	$590,557	$548,184
Excess of FIFO over LIFO cost	(52,355)	(48,267) ← *LIFO reserve*
Inventory at LIFO	$538,202	$499,917 ← *Inventory reported on the balance sheet*

HARLEY-DAVIDSON, INC.
REAL WORLD EXCERPT:
Annual Report

7-62

Exercise 7-5

Snacked Incorporated manufactures energy bars. The following note was contained in its recent annual report:

NOTE 4. INVENTORIES, NET as of December 31 (in millions)		
	Current Year	Prior Year
Raw materials and supplies	$29	$28
Work in progress	18	14
Finished goods	21	20
FIFO inventories	68	62
LIFO reserve	(7)	(6)
Total inventories, net	$61	$56

Required:

1. What amount of ending inventory would have been reported in the current year if Snacked had used only FIFO?
2. The cost of goods sold reported by Snacked for the current year was $538 million. Determine the cost of goods sold that would have been reported if Snacked had used only FIFO for both years.
3. Explain why Snacked management chose to use LIFO for certain of its inventories.

7-63

NOTE 4. INVENTORIES, NET as of December 31 (in millions)		
	Current Year	Prior Year
Raw materials and supplies	$29	$28
Work in progress	18	14
Finished goods	21	20
FIFO inventories	68	62
LIFO reserve	(7)	(6)
Total inventories, net	$61	$56

1. What amount of ending inventory would have been reported in the current year if Snacked had used only FIFO?

Requirement 1:

Inventories at the year-end consisted for the following:

	Current year	Prior year
Raw materials and supplies	$ 29	$ 28
Work in progress	18	14
Finished goods	21	20
Total inventories at FIFO cost	$ 68	$ 62

7-64

Requirement 3:

When unit costs are rising, LIFO produces lower net income and a lower inventory valuation than FIFO. During a period of rising prices, using LIFO often reduces a company's tax liability. This might be the reason why Snacked management chose to use LIFO for certain of its inventories.

Requirement 2:

Beginning LIFO reserve (excess of FIFO over LIFO)	$ 6
Less: Ending LIFO reserve (excess of FIFO over LIFO)	7
Difference in cost of goods sold under FIFO	(1)
Cost of goods sold under LIFO	538
Cost of goods sold under FIFO	$537

7-65

LIFO and Inventory Turnover Ratio

FINANCIAL ANALYSIS

$$$

Consider Deere & Co., manufacturer of John Deere farm, lawn, and construction equipment.

Its inventory note lists the following values:

DEERE & COMPANY
Notes to Consolidated Financial Statements
(dollars in millions)

	2017	2016
Inventories:		
. . .		
Total FIFO value	$5,365	$4,798
Adjustment to LIFO basis	1,461	1,457
Inventories	$3,904	$3,341

7-66

LIFO and Inventory Turnover

FINANCIAL ANALYSIS

John Deere's cost of goods sold for 2017 was $19,933.5 million. If the ratio were computed using the reported LIFO inventory values for the ratio, it would be

$$\text{Inventory Turnover Ratio} = \frac{\$19,933.5}{(\$3,904 + \$3,341)/2} = 5.5$$

Converting cost of goods sold (the numerator) to a FIFO basis and using the more current FIFO inventory values in the denominator, it would be

$$\text{Inventory Turnover Ratio} = \frac{\$19,933.5 - 4}{(\$5,365 + \$4,798)/2} = 3.9$$

Note that the major difference between the two ratios is in the denominator. FIFO inventory values are roughly 40 percent higher than the LIFO values. The LIFO beginning and ending inventory numbers are artificially small because they reflect older lower costs.

7-67

Learning Objective 7-7

7-7 Understand methods for controlling inventory, analyze the effects of inventory errors on financial statements, and analyze the effects of inventory on cash flows.

7-68

Internal Control of Inventory

Separation of responsibilities for inventory accounting and physical handling of inventory.

Storage of inventory in a manner that protects it from theft and damage.

Limiting access to inventory to authorized employees.

Maintaining perpetual inventory records.

Comparing perpetual inventory records to periodic physical counts of inventory.

7-69

Errors in Measuring Ending Inventory

You can compute the effects of inventory errors on both the current year's and the next year's income before taxes using the cost of goods sold equation.

Assume that ending inventory was overstated by $10,000 due to a clerical error that was not discovered. This would effect the current year and next year.

Current Year		Next Year	
Beginning inventory		Beginning inventory	**Overstated $10,000**
+ Purchases of merchandise during the year		+ Purchases of merchandise during the year	
− Ending inventory	**Overstated $10,000**	− Ending inventory	
Cost of goods sold	**Understated $10,000**	Cost of goods sold	**Overstated $10,000**

7-70

Exercise 7-6

Charleston Corporation prepared the following two income statements (simplified for illustrative purposes):

	First Quarter Year 1		Second Quarter Year 1	
Sales revenue		$8,250		$13,500
Cost of goods sold				
Beginning inventory	$3,000		$ 2,850	
Purchases	2,250		9,750	
Goods available for sale	5,250		12,600	
Ending inventory	2,850		6,750	
Cost of goods sold		2,400		5,850
Gross Profit		5,850		7,650
Expenses		3,750		4,500
Pretax Income		$2,100		$ 3,150

During the third quarter, it was discovered that the ending inventory for the first quarter should have been $3,300.

7-71

Required:

1. What effect did this error have on the combined pretax income of the two quarters? Explain.
2. Did this error affect the EPS amounts for each quarter? Explain.
3. Prepare corrected income statements for each quarter.
4. Set up a schedule with the following headings to reflect the comparative effects of the correct and incorrect amounts on the income statement:

	1st Quarter			2nd Quarter		
Income Statement Item	**Incorrect**	**Correct**	**Error**	**Incorrect**	**Correct**	**Error**

7-72

Requirement 1

	First Quarter Year 1		Second Quarter Year 1	
Sales revenue		$8,250		$13,500
Cost of goods sold				
Beginning inventory	$3,000		$ 2,850	
Purchases	2,250		9,750	
Goods available for sale	5,250		12,600	
Ending inventory	2,850		6,750	
Cost of goods sold		2,400		5,850
Gross Profit		5,850		7,650
Expenses		3,750		4,500
Pretax Income		$2,100		$ 3,150

$3,300 − $2,850 = $450

Here ending inventory was understated by $450, which in turn overstates cost of goods sold. This also understates income before taxes by $450 in the first quarter.

An ending inventory error in the first quarter affects pretax income by the amount of the error and in the next quarter affects pretax income again by the same amount, but in the opposite direction.

7-73

Requirement 2

	First Quarter Year 1		Second Quarter Year 1	
Sales revenue		$8,250		$13,500
Cost of goods sold				
Beginning inventory	$3,000		$ 2,850	
Purchases	2,250		9,750	
Goods available for sale	5,250		12,600	
Ending inventory	2,850		6,750	
Cost of goods sold		2,400		5,850
Gross Profit		5,850		7,650
Expenses		3,750		4,500
Pretax Income		$2,100		$ 3,150

$3,300 − $2,850 = $450

The error caused the pre-tax income for each quarter to be incorrect; therefore, it produced incorrect EPS amounts for each quarter.

7-74

Requirement 3

	First Quarter Year 1		Second Quarter Year 1	
Sales revenue		$8,250		$13,500
Cost of goods sold				
Beginning inventory	$3,000		$ 3,300	
Purchases	2,250		9,750	
Goods available for sale	5,250		13,050	
Ending inventory	3,300		6,750	
Cost of goods sold		1,950		6,300
Gross Profit		6,300		7,200
Expenses		3,750		4,500
Pretax Income		$2,550		$ 2,700

7-75

Requirement 4

	1st Quarter			2nd Quarter		
	Incorrect	**Correct**	**Error**	**Incorrect**	**Correct**	**Error**
Beginning inventory	$3,000	$3,000	No error	$2,850	$3,300	$450 under
Ending inventory	2,850	3,300	$450 under	6,750	6,750	No error
Cost of goods sold	2,400	1,950	450 over	5,850	6,300	450 under
Gross profit	5,850	6,300	450 under	7,650	7,200	450 over
Pretax income	2,100	2,550	450 under	3,150	2,700	450 over

7-76

Inventory and Cash Flows 1

FOCUS ON CASH FLOWS

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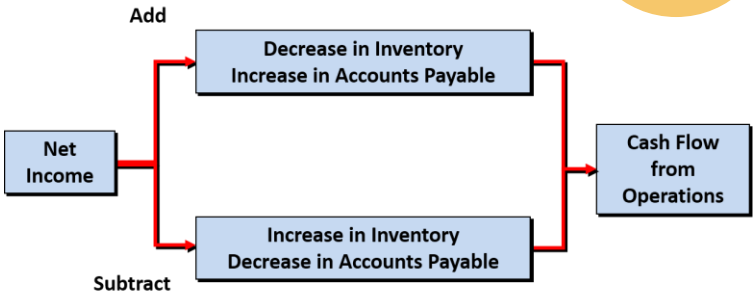


7-77

Inventory and Cash Flows 2

FOCUS ON CASH FLOWS

$$$

	Effect on Cash Flows
Operating activities (indirect method)	
Net income	$xxx
Adjusted for	
Add inventory **decrease**	+
or	
Subtract inventory **increase**	–
Add accounts payable **increase**	+
or	
Subtract accounts payable **decrease**	–

7-78

Supplement A: LIFO Liquidations

When a company using LIFO sells more inventory than it purchases or manufactures, items from beginning inventory become part of cost of goods sold.
This is called a **LIFO liquidation**.

When inventory costs are rising, these lower-cost items in beginning inventory produce a higher gross profit, higher taxable income, and higher taxes when they are sold.

Many companies avoid LIFO liquidations by purchasing sufficient quantities of inventory at year-end to ensure that ending inventory quantities are greater than or equal to beginning inventory quantities.

7-79

Supplement B: FIFO and LIFO Cost of Goods Sold under Periodic versus Perpetual Inventory Systems

FIFO	Same COGS under periodic or perpetual.
LIFO	Different COGS under periodic or perpetual.
Perpetual LIFO is complex and costly to maintain in practice.	In periods of rising prices, periodic LIFO has higher COGS and lower amount for income before taxes.

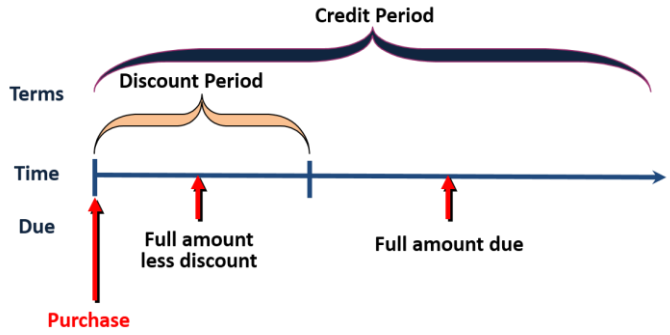
Companies keep perpetual inventory records on a FIFO basis and then make an end-of-period adjusting entry to convert inventory on the balance sheet and cost of goods sold on the income statement to a LIFO basis.

7-80

Supplement C: Additional Issues in Measuring Purchases

A purchase discount is a cash discount granted for prompt payment of an account.

Inventory may be returned to the vendor if they are unsatisfactory goods. Purchase returns and allowances require a reduction in the cost of inventory purchases and a refund to the vendor.



7-81

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P378 E7-4

P380 E7-10

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7-82

康得新：四年虚增利润总额高达115亿元，实控人终身市场禁入

2015年1月至2018年12月，**康得新通过虚构销售业务、虚构采购、生产、研发费用、产品运输费用等方式，虚增营业收入、营业成本、研发费用和销售费用**

导致2015年至2018年年度报告虚增利润总额分别为2,242,745,642.37元、2,943,420,778.01元、3,908,205,906.90元、2,436,193,525.40元，分别占各年度报告披露利润总额的136.22%、127.85%、134.19%、711.29%。康得新2015年至2018年年度报告中披露的银行存款余额存在虚假记载。

如果一家上市公司连续几年虚增利润，那么资产负债表上的某一个项目或几个项目就会虚增，例如货币资金、应收账款、存货、在建工程、固定资产、无形资产等项目的数字会注入“水分”，显得较为臃肿。

7-83

虚增利润而虚增资产类项目:财务造假的五重境界

虚增利润，撒手不管现金流，虚增的资产类项目为应收账款（应收票据）。

- 由于应收账款是流动资产，容易引起关注，会造成应收账款、应收票据的增速大于营业收入增速、收现比（销售商品收到的现金/营业收入）长期小于1甚至更低以及现金流与利润长期背离的现象，容易暴露。

虚增利润，同时虚增现金流入，虚增的资产类项目为货币资金。

- 由于虚增的货币资金无法产生利息收入的，可以通过计算利息收入和货币资金的匹配性出现异常而发现问题。

虚增利润，同时真实地增加现金流入，实增的资产项目为货币资金，虚增的资产类项目为预付账款或其他应收款（往来类科目）。

- 很难通过经营活动现金流与利润的匹配来判断，也就是说收现比和净现比都会失效。但是我们可以通过一些常识来判断，比如要警惕预付账款和其他应付款等科目余额特别高且没有合理解释的企业。

7-84

虚增利润而虚增资产类项目:财务造假的五重境界

虚增利润，同时真实地增加现金流入，实增的资产类项目为货币资金，虚增的资产类项目为存货。

- 典型特征就是存货等流动资产科目余额持续增长，然后期待一次“大洗澡”，通过计提存货减值准备，将旧账一笔勾销。

虚增利润，同时真实地增加现金流入，实增的资产类项目为货币资金，虚增的资产类项目为在建工程或固定资产。

- 在资产负债表体现的科目就不是存货类的流动资产，而是虚增了投资性现金流流出，转移到了更难以审查的非流动资产，如固定资产和在建工程。相对于银行存款和存货，固定资产和在建工程等投入资金巨大，很难说得清楚在建工程或者固定资产究竟值多少钱，自然就成了藏污纳垢的地方。这种操作的结果，虚增了大量资产，会留下不少“资产黑洞”。

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