

Module 4: Short-Term Assets

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Lesson 4-1: Overview

Lesson 4-1.1: Introduction

Agenda

Accounting for accounts receivables

Accounting for inventories



Hello. Welcome to Module for a Financial Accounting Foundations here at University of Illinois. In this module, we are going to talk about short-term assets. In particular, we will cover accounting for accounts receivables and accounting for inventories.

Introduction

Why short-term?

Accounts receivables and inventories are generally converted into cash within a year.



What's a short-term asset? By short-term assets, we mean assets on the balance sheet, which can be converted into cash within a year. In accounting, we generally assume that account receivables and inventories are short-term assets because most of the time, but not all, they are converted into the cash within a year.

Lesson 4-2: Fundamental Accounting Concepts

Lesson 4-2.1. Accounts Receivables: Cash Discounts

Accounts Receivables: Valuation

Accounts receivables

are not valued at face value on the balance sheet

but are valued at **net realizable value** (NRV).

NRV = Face value *less* cash discounts, sales returns, and bad debts



How do we value account receivables on the balance sheet? Account receivables are not valued at face value on the balance sheet, but are valued at net realizable value, NRV. NRV is equal to face value, less cash discounts, sales returns, and bad debts. We will now give some examples to show how account receivables are valued.

Accounts Receivables: Cash Discounts

Discounts given over sale price if the customer pays in a certain time period to encourage early payment



Cash discounts are given over sales price if the customer pays in a certain time period to encourage early payment.

Accounts Receivables: Cash Discounts - Example

Illini Supermarket sells goods worth \$2,000 to a customer on credit on January 1, 2024 (terms 3/15, n/30). Customer makes the payment on January 10, 2024.

	Assets		SHE
	Cash	AR	IS
Sale		2,000	2,000
Cash collection	1,940	(2,000)	(60)

2,000 – 60 = 1,940
It is net cash collection.

2000 * 3% = 60
It is a reduction from sales.

Here is a cash discount example. Illini Supermarket sells goods worth \$2,000 to a customer on credit on January 1st, 2024. Terms, 3/15, n/30. This means that if the customer pays in 15 days, the customer will get 3% discount. Otherwise, credit needs to be paid in 30 days. Customer makes a payment on January 10, 2024. We will start by

recording the sale. Account receivable increases by 2,000. The other side of this transaction is a revenue recorded on the income statement with the same amount. Customer makes the payment on January 10. Since the payment is made within 15 days of the sale, the customer gets 3% discount and pays 1,940 instead of \$2,000. Since the customer makes the payment, we remove account receivable of \$2,000, and finally, we record minus \$60 on income statement to balance the accounting equation. This reduction from income statement is recorded as a revenue reduction. This question shows that the value of account receivable is face value, which is \$2,000 minus cash discounts, which is \$60.

Lesson 4-3: Accounts Receivables: Sales Returns

Lesson 4-3.1: Accounts Receivables: Sales Returns

Accounts Receivables: Sales Returns I

Some firms allow customers to return goods up to a certain time period.

Firms need to estimate sales returns and record a **provision** for sales returns when the sales are made.

This provision is called **sales returns allowance**.

A contra asset

Netted against accounts receivable in the balance sheet

The second reason why there is a difference between face value of account receivables versus the value of account receivables is sales returns. Sales returns occur whenever customers return their goods within a certain time period. And when they return in this time period, they are entitled to a full refund. But how do we do accounting for sales returns? Firms need to estimate expected amount of sales returns at the time of the sale and they need to create a provision for this. This provision is called sales return allowance. Sales return allowance is a contra asset account. What does this mean? It's an asset account because it is very much associated with account receivable. But it is a contra one, meaning that it has a negative value on the balance sheet. When sales return allowance is reported, it is netted against account receivable balance.

Accounts Receivables: Sales Returns - Example



Illini Supermarket makes total sales of \$50,000 in January 2024. Customers are allowed to return the goods within 30 days. Illini Supermarket expects 5% of goods to be returned based on past experience.

	Assets			SHE
	Cash	AR	Sales returns allowance	IS
Sale		50,000		50,000
Provision			(2,500)	(2,500)

↑ Contra asset ↑ It is a reduction from sales.

Here is a sales return example. Illini supermarket makes a total sales of \$50,000 in January 2024. Customers are allowed to return the goods within 30 days. Illini supermarket expects 5% of the goods to be returned based on some past experience, we start by recording the sales account receivable increases by 50,000. We also record the revenue on the income statement with the same amount. As soon as revenue is recorded, the firm needs to record sales return allowance. Its amount is 5% of 50,000, which is 2500. Sales return allowance is an asset account with a balance of -\$2500. Income statement is also reduced by 2500. This reduction from income statement is recorded under sales, so it is recorded as sales reduction. Please note that sales return allowance is an asset account with a negative value. Therefore, it's a contra asset account. When it is reported, it is netted against account receivable. In this example, net account receivable is 47,500.

Accounts Receivables: Sales Returns - Example

Illini Supermarket customers return goods worth \$1,000 in the first week of February 2024.

	Assets			SHE
	Cash	AR	Sales returns allowance	IS
Sale		50,000		50,000
Provision			(2,500)	(2,500)
Sales returns		(1,000)	1,000	

The question continues as Illinis supermarket customers return goods worth \$1,000 in the first week of February 2024. When customers make returns, we reduce the balance of account receivables by \$1,000. This is because customers do not owe the credit amount for the returned items. The other side of this transaction is reduction of \$1,000 from sales return allowance. Please note that sales return allowance is a contra asset account. Reduction of sales return allowance is adding positive \$1,000 on this account. In this example, we created a provision namely sales return allowance at the time of sales to absorb future sales returns. When future sales returns are materialized, we use sales return allowance rather than income statement.

Lesson 4-4: Accounts Receivables: Bad Debts

Lesson 4-4.1: Accounts Receivables: Bad Debts

Accounts Receivable: Bad Debts

Bad debts occur when debtors do not pay.

Bad debts

Reduce the amount of accounts receivable
on the balance sheet

Create a loss in the income statement



The third reason why there is a discrepancy between the value of account receivable versus the face value of account receivable is bad debts. Bad debts occur whenever customers cannot pay. What is the impact of bad debts? Bad debts reduce the amount of account receivable on the balance sheet and create a loss in the income statement.

Accounts Receivable: Provision for Bad Debts

Just like sales returns, a provision for bad debts is created when sales are made.

Bad debt provisions are calculated according to Current Expected Credit Loss Model (CECL). Firms can consider factors like customer specific information and current economic environment to estimate bad debts.

We will use the percentage of sales method to estimate bad debts for simplicity.



Just like sales returns, a provision for bad debts is created when sales are made. Bad debt provisions are calculated according to current expected credit loss model. Firms can consider factors like customer specific information and current economic environment to estimate bad debts. We will use the percentage of sales method to estimate bad debts for simplicity in this class.

Provision for Bad Debts: Percentage-of-Sales Method

Provision for bad debts is equal to a certain percentage of the credit sales.

The percentage comes from either past experience or the bad debt rate of other firms in the same industry.



How do we calculate bad debts under the percentage of sales methods? Under this method, provision is a certain percentage of total amount of credit sales. Where is this percentage coming from? It can come from firms own experience or it can come from some industry practices.

Provision for Bad Debts: Percentage-of-Sales - Example

Illini Supermarket made total credit sales of \$700,000 in year 2024. Illini Supermarket collected \$500,000 by December 31, 2024. Expected bad debt rate is 5% of credit sales.



Here's an example about bad debt expenses. Illini Supermarket made total credit sales of \$700,000 in year 2024. Illini Supermarket collected \$500,000 by December 31st, 2024. Expected bad debt rate is 5% of credit sales.

Provision for Bad Debts: Percentage-of-Sales - Example

	Assets			SHE	
	Cash	AR	Provision for doubtful accounts	IS	RE
Sales		700		700	
Collection	500	(500)			
Provision		$700 * 5\% = 35$	→(35)	(35)	

1. This expense is called bad debt expense.
 2. It is a part of administrative expenses.
 3. It does not reduce sales.

First, we record the sale, both account receivables and income statement increased by \$700,000. Next, we record the cash collected from customers. Cash increases by \$500,000 and account receivables decreased by \$500,000. We then create provision for doubtful accounts, also known as allowance for doubtful accounts for possible uncollectable receivables. The size of this provision is 5% times credit sales, which is \$700,000, resulting in \$35,000. The other side of this transaction is to record an expense on the income statement with the same amount. Please note that these expense is called bad debt expense. It is recorded under administrative expenses, and it is not deducted from sales.

Provision for Bad Debts: Percentage-of-Sales - Example

	Assets			SHE	
	Cash	AR	Provision for doubtful accounts	IS	RE
Sales		700		700	
Collection	500	(500)			
Provision			(35)	(35)	
Transfer to RE				(665)	665
Ending Balance	500	200	(35)		665

At the end of the year, the net balance on income statement is reflected on retained earnings. The net balance on income statement is \$700,000-\$35,000, which is equal to \$665,000. Retained earnings increased by \$665,000 and we record -\$665,000 on income statement to balance the fundamental accounting equation. We can then calculate ending balances. Please note that ending balance of provision for doubtful accounts is \$35,000.

Provision for Bad Debts: Percentage-of-Sales - Example

Illini Supermarket collects \$100,000 from debtors in year 2025. In addition, debtors who owe \$20,000 go into bankruptcy. Illini Supermarket is able to get \$5,000 from these bankrupt debtors.



The example continues as follows. Illini Supermarket collects \$100,000 from debtors in year 2025. In addition, debtors who owe \$20,000 going into bankruptcy, Illini Supermarket is able to get \$5,000 from these bankrupt debtors.

Provision for Bad Debts: Percentage-of-Sales - Example

I

	Assets			SHE	
	Cash	AR	Provision for doubtful accounts	IS	RE
Beginning balance	500	200	(35)		665
Collection	100	(100)			
Collection	5	(20)	15		
Transfer to RE					
Ending Balance	605	80	(20)		665

We start by recording beginning balance of 2025 in the transaction worksheet, which come from ending balances of 2024. The first transaction we record is collection of 100,000, cash increases by 100,000, and we reduce account receivables by 100,000. Next, we record the collection from the bankrupt customer. Cash increases by \$5,000. We remove this customer's total account receivable of \$20,000 as we do not expect to collect any more receivable from this customer. The difference between \$20,000, which is what the customer owes, and \$5,000, which is what the customer pays is a credit loss, and is recorded under provision for doubtful accounts. Please note that since provision for doubtful accounts is a contra-asset account, the credit loss is recorded as a positive number to reduce the amount of the provision. At the end of the year, Illini Supermarket needs to reflect the net balance of income statement on retained earnings. There is no activity affecting income statement in year 2025, and therefore, there is nothing to reflect on retained earnings. The firm then closes accounts, and calculate ending balances of accounts. For example, ending balance of provision for doubtful accounts is 20,000.

Lesson 4-5: Accounts Receivables of Walmart

Lesson 4-5.1: Revenue Recognition



Walmart's Assets 2023

	2023	2022
<i>(Amounts in millions)</i>		
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 8,625	\$ 14,760
Receivables, net	7,933	8,280
Inventories	56,576	56,511
Prepaid expenses and other	2,521	1,519
Total current assets	75,655	81,070
Property and equipment, net	100,760	94,515
Operating lease right-of-use assets	13,555	13,758
Finance lease right-of-use assets, net	4,919	4,351
Goodwill	28,174	29,014
Other long-term assets	20,134	22,152
Total assets	\$ 243,197	\$ 244,860

How do we record account receivables in real life? Here is Walmart's 2023 balance sheet. The value of account receivables net of provision for sales returns and doubtful accounts is 7,933. Please note that provisions are not written separately, they are netted against account receivables resulting in net account receivables.

Walmart: Exercise

1. Suppose that total provisions for sales returns is \$100 and doubtful accounts is \$400. What is the percentage of total accounts receivable Walmart does not expect to collect in year 2023?

$$\text{Provisions / Total AR} = 500 / (7,933 + 500) = 6.3\%$$

\$8,433



Here is an exercise about Walmart's account receivables. Suppose that total provisions for sales returns is 100 and doubtful accounts is 400. What is the percentage of total account receivables Walmart doesn't expect to collect in year 2023? In this example, the amount of total provisions is 100, plus 400 which is equal to 500. What is the amount of account receivables? It is net account receivables, which is 7,933, plus total provisions which is equal to 8,433. If we divide 500 by 8,433, we will find that Walmart doesn't expect to collect 6.3% of its account receivables. The trick of this question is to add back the provisions to net account receivables to find account receivable balance.

Walmart: Exercise

2. Suppose that provision for doubtful accounts was \$510 at the end of year 2022 and the amount of bad debt expense was \$20 in year 2023. What is the amount of accounts receivable written off?

	Provision for doubtful accounts
Beginning balance	(510)
Bad debt expense	(20)
Write-offs	?
Ending Balance	(400)



Here is another example about Walmart's account receivables. Suppose that provision for doubtful accounts was 510 at the end of year 2022 and the amount of bad debt expense was 20 in year 2023. What is the amount of account receivables written off? This is a question that could be solved by going through the framework for provision for doubtful accounts. Beginning provision plus bad debt expense minus account receivables write offs is equal to ending provision. Just to be clear, provision for doubtful accounts is a contra set account. When we say its balance has increased, we mean there is more provision created and another negative number is added. In this framework, provisions increase when we have new bad debt expense. Provisions decrease when there is an account receivable write off. Beginning amount of provision for doubtful accounts is 510 as given in the question. Ending balance of provision for doubtful accounts is 400 as given in the previous question about Walmart's account receivables. The question also mentions that the amount of bad debt expense was 20 in year 2023. We can then solve this equation with one unknown $-510 - 20 + x = -400$. If we solve for x, we will find that the amount of write-offs is 130. Please do not forget that provision for doubtful accounts is a contra set account. Its value increases and it becomes much more negative when there is bad debt expense. Its value decreases and its value becomes smaller in absolute value when there is account receivable write-offs.

References

Walmart Inc. (2023). *2023 annual report*.
<https://corporate.walmart.com/content/dam/corporate/documents/esgreport/reporting-data/tcfd/walmart-inc-2023-annual-report.pdf>

Lesson 4-6: Inventories

Lesson 4-6.1: Inventories

Inventories

Types:

Manufacturing companies:

- Raw materials

- Work-in-progress

- Finished goods

Retail companies:

- Goods available for sale



The second group of short term assets we will discuss is inventories, for manufacturing companies inventories consist of raw materials work in progress. These are inventories not fully finished and not available for sale, and finished goods available for sale. For retail companies, goods available for sale are inventories.

Inventory Valuation

Inventories are valued on the balance sheet as the lower of

cost or

net realizable value (NRV): sale price – selling costs.

Inventory values cannot be marked up over the cost.



How do we value inventories? Inventories are valued as the lower of cost, which is how much it costs to the business to buy the inventory, or net realizable value, which is how much a business will get if it sells this inventory to outsiders. Net realizable value for an inventory is calculated as sales price- selling costs. Just to be clear, inventory values cannot be higher than the cost. Cost is the upper value of inventories on the balance sheet.

Inventory Write-Downs

Inventory write-down is needed when NRV is less than the cost.

Inventory write-down

Decreases the value of inventory account on the balance sheet

Creates a corresponding expense on the income statement

Is not reversible



What happens if net realizable value is less than the cost of the inventory? Then we have an inventory write-down. Inventory write-downs decreases the value of inventory on the balance sheet and creates a corresponding expense on the income statement and is not reversible. Inventory write-downs are an example of accounting conserve what is in principle.

Lesson 4-7: Cost Flow Assumptions

Lesson 4-7.1: Cost Flow Assumptions

Cost of Goods Sold (COGS)

Retail Firm

Cost of goods sold	
	Beginning inventory
+	Purchases over the period
-	Ending inventory

Manufacturing Firm

Cost of goods sold	
	Beginning finished goods inventory
+	Transfer from WIP
-	Ending finished goods inventory

A very important account, which is very much associated with inventory's cost of goods sold. Cost of goods sold is an income statement number. How do we calculate cost of goods sold? For a retail firm, cost of goods sold is equal to beginning amount of inventory. This is how much inventory the firm has at the beginning of the year plus purchase of new inventory minus the amount of ending inventory. For example, suppose that at the beginning of the year, a car dealer has 10 cars to sell. During the year, the car dealer buys five more cars to sell. At the end of the year, it turns out that the dealer has two cars left. It looks like the amount of cost of goods sold needs to be cost of 10 cars plus five cars minus two cars, which is equal to 13 cars. For a manufacturing firm, it is calculated quite similarly. The firm starts with beginning amount of finished goods, plus, there is a transfer from work in progress. You can view work-in-progress inventory as not fully finished items, and minus we have ending amount of finished goods.

Cost Flow Assumptions

Firms cannot always keep track of goods purchased or sold.

Cost flow assumptions are needed:

Last-in-first-out method (LIFO)

First-in-first-out method (FIFO)

Weighted average cost method



Please remember that firms need to know the value of beginning and ending inventories to calculate cost of goods sold. However, firms cannot always keep track of goods purchased or sold. Firms need to make some assumptions on which inventories are sold. The three common cost flow assumptions are last-in, first-out, LIFO, first-in, first-out, FIFO, and weighted average cost methods. Under LIFO, we assume that firms sell first their newest units. Under FIFO, firms sell first their oldest units. Under weighted average cost method, the cost of the inventory sold is the weighted average of all inventories firms own in a period, which is typically a year. Let me please emphasize that these are just assumptions. Firms can sell, in reality, any inventory units they want. We just assume that they are using one of these methods to conduct inventory accounting.

Exercise: Cost Flow Assumptions

Calculate the cost of goods sold and ending inventory using LIFO, FIFO, and weighted average methods.

	Units	Unit cost	Unit price
Beginning inventory	100	\$5	
January sale	(80)		\$8
February purchase	30	\$6	
March purchase	40	\$7	
Ending inventory	90		

Here's an exercise about inventory cost flow assumptions. We need to calculate the cost of goods sold and ending inventory using LIFO, FIFO, and weighted average methods. The firm starts the fiscal year with 100 units of inventory with a cost of \$5 each. The firm sells 80 units of inventory in January. The firm purchases 30 units of inventory from \$6 each in February. The firm purchases 40 more units of inventory in March with a cost of \$7 each. Therefore, the ending inventory is $100-80+30+40$, which is equal to 90 units of inventory.

Exercise: Cost Flow Assumptions

FIFO

Cost of goods sold:

$80 * \$5 = \400 (It all comes from beginning inventory)

Ending inventory:

$20 * \$5$ (Remaining beginning inventory)
+ $30 * \$6$ (February purchase)
+ $40 * \$7$ (March purchase)
= $\$560$



Under FIFO, we assume that the firm sells first all these units. Therefore, cost of 80 units of inventory sold will come from the beginning inventory of 100 units. Cost of goods sold is the number of units sold, which is 80 units, times cost per unit of the beginning inventory, which is \$5. This will give us \$400 as cost of goods sold under FIFO. Ending inventory will be the value of remaining unsold inventory. Therefore, ending inventory is 20 units of beginning inventory times cost per unit of beginning inventory, which is \$5, plus 30 units of inventory from \$6 each purchased in February, plus 40 more units of inventory purchased in March with a cost of \$7 each. This will give us an ending inventory of 560 under FIFO.

Exercise: Cost Flow Assumptions

LIFO

Cost of goods sold:

$$\begin{aligned} & 40 * \$7 \text{ (March purchase)} \\ & + 30 * \$6 \text{ (February purchase)} \\ & + 10 * \$5 \text{ (Beginning inventory)} \\ & = \$510 \end{aligned}$$

Ending inventory:

$$90 * \$5 = \$450 \text{ (Remaining beginning inventory)}$$



Under LIFO, we assume that the firms sell first their newest units. The firm sold 80 units. The newest 80 units are 40 units of inventory from March purchase with a unit price of \$7, and 30 units of inventory from February purchase with a unit price of \$6. There is 10 more units of inventory needed, which will come from the beginning inventory with a unit price of \$5. If we sum all these inventory costs, we will get cost of goods sold under LIFO is 510. Ending inventory will be the value of all remaining unsold inventory. The only remaining unsold inventory is 90 units of beginning inventory with a unit price of \$5. Therefore, ending inventory balance is 450. It is quite normal under LIFO that beginning inventory is kept unsold for many years, as we assume that firms sell their newest inventories first.

Exercise: Cost Flow Assumptions

Weighted average

Average unit cost:

Total purchase cost / Total number of units purchased = \$5.65

Total purchase cost:

100 * \$5 (Beginning inventory)

+ 30 * \$6 (February purchase)

+ 40 * \$7 (March purchase)

Total number of units purchased: $100 + 30 + 40$

Cost of goods sold = $80 * \$5.65 = \452

Ending inventory = $90 * \$5.65 = \508



Under weighted average cost method, the cost of the inventory sold is the weighted average of all inventories firms own in a period. There are three groups of inventories the firm has in this accounting period. They are, 100 units of inventory with a cost of \$5 each from the beginning inventory, 30 units of inventory from \$6 each purchased in February, and 40 units of inventory purchased in March with a cost of \$7 each. How do we calculate weighted average cost of these inventories? Total cost of these inventories is 100 units times 5+30 units times 6+40 units times 7, which is equal to 960. The total number of inventory units available for sale is $100+30+40$, which is equal to 170 units. Therefore, average inventory cost per unit is $960/170$, which is equal to \$5.65 after rounding. We can then calculate cost of goods sold and ending inventory. The firm sold 80 units of inventory in the accounting period. Therefore, its cost of goods sold is 80 units times 5.65, which is equal to \$452. The firm finished the accounting period with 90 units of unsold inventory. Therefore, the value of ending inventory is 90 units times 5.65, which is equal to \$508.

Effects of Cost Flow Assumptions

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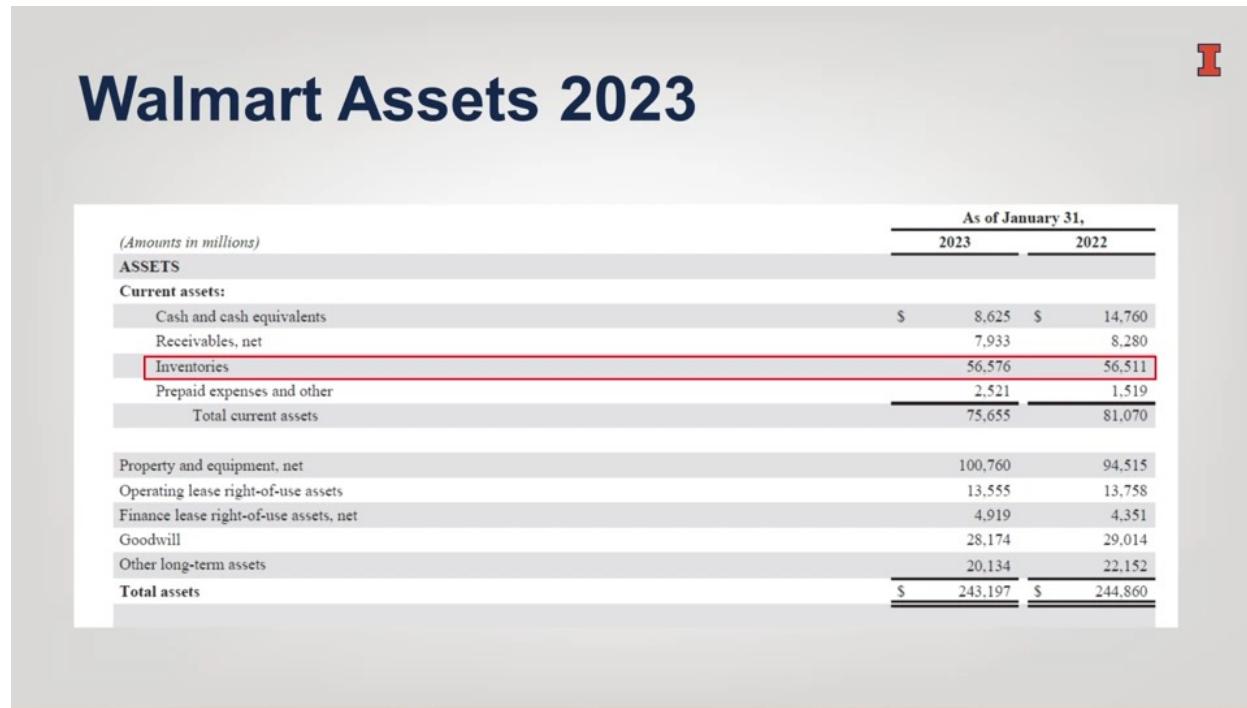
Under increasing prices

	FIFO	LIFO
Ending inventory balance	Higher	Lower
Cash flows	Lower	Higher
Cost of goods sold	Lower	Higher
Income before taxes	Higher	Lower
Income taxes	Higher	Lower
Net income	Higher	Lower

Cost flow assumptions can have significant effects on various financial statement numbers. Under increasing prices, in other words, when there is an inflation in a country, LIFO results in lower ending inventory and higher cash flows. Why high cash flows? Firms have higher cost of goods sold under LIFO. Higher cost of goods sold results in lower income before tax, lower income taxes, and lower net income. LIFO method is very advantageous for cash savings due to lower income tax payments. LIFO is applicable only in the US GAAP. Firms using IFRS cannot use LIFO. We observe the opposite effects for firms using FIFO. FIFO results in higher ending inventory and lower cash flows. This is because firms have lower cost of goods sold under FIFO, resulting in higher income taxes. One final note is that LIFO and FIFO will have these effects only in inflationary periods. When prices decline and when there is a deflation, we will have the opposite effects of using LIFO and FIFO.

Lesson 4-8: Inventories of Walmart

Lesson 4-8.1: Inventories of Walmart



Walmart Assets 2023

(Amounts in millions)

	As of January 31,	
	2023	2022
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 8,625	\$ 14,760
Receivables, net	7,933	8,280
Inventories	56,576	56,511
Prepaid expenses and other	2,521	1,519
Total current assets	75,655	81,070
Property and equipment, net	100,760	94,515
Operating lease right-of-use assets	13,555	13,758
Finance lease right-of-use assets, net	4,919	4,351
Goodwill	28,174	29,014
Other long-term assets	20,134	22,152
Total assets	\$ 243,197	\$ 244,860

How are inventories presented in real firms' finance statements? Here is the Walmart's assets in fiscal year 2023. Inventories are classified under current assets and their value is 56,576. Since all numbers in the balance sheet are in millions, this suggests that Walmart has more than \$56 million worth of inventory at the end of January '23 in its stores.

Walmart Income Statement 2023

	Fiscal Years Ended January 31,		
	2023	2022	2021
<i>(Amounts in millions, except per share data)</i>			
Revenues:			
Net sales	\$ 605,881	\$ 567,762	\$ 555,233
Membership and other income	5,408	4,992	3,918
Total revenues	611,289	572,754	559,151
Costs and expenses:			
Cost of sales	463,721	429,000	420,315
Operating, selling, general and administrative expenses	127,140	117,812	116,288
Operating income	20,428	25,942	22,548
Interest:			
Debt	1,787	1,674	1,976
Finance lease	341	320	339
Interest income	(254)	(158)	(121)
Interest, net	1,874	1,836	2,194
Loss on extinguishment of debt	—	2,410	—
Other (gains) and losses	1,538	3,000	(210)
Income before income taxes	17,016	18,696	20,564
Provision for income taxes	5,724	4,756	6,858
Consolidated net income	11,292	13,940	13,706
Consolidated net (income) loss attributable to noncontrolling interest	388	(267)	(196)
Consolidated net income attributable to Walmart	\$ 11,680	\$ 13,673	\$ 13,510

As we have discussed before, there is a close relationship between inventories and cost of goods sold. Walmart's 2023 income statement indicates that the total amount of cost of sales, which is another name for cost of goods sold is 463,721. An interesting question is how cost of sales for Walmart is calculated. Does Walmart use, for example, LIFO?

Walmart Inventory Footnotes 2023

Footnote 1: Summary of significant accounting policies

Inventories: Inventories are primarily accounted for under the retail inventory method of accounting ("RIM") to determine inventory cost, using the last-in, first-out ("LIFO") valuation method.



We need to look at Walmart's inventory footnotes to learn about inventory cost flow assumptions. Under Footnote 1: summary of significant accounting policies, Walmart

says that inventories are primarily accounted for under the retail inventory method of accounting to determine inventory costs using last-in, first-out; LIFO, valuation methods. It seems that Walmart is using LIFO. LIFO has the advantage of case savings due to lower income tax bill when prices of inventory increase over time. This is probably the reason why Walmart is using LIFO.

Summary

In this module, we learned:

Accounting for receivables

Accounting for inventories

In the next module, we will learn accounting for long-term assets.



In this module, we covered accounting for receivables and accounting for inventories. In the next module, we will learn accounting for long-term assets.

References

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<https://corporate.walmart.com/content/dam/corporate/documents/esgreport/reporting-data/tcfd/walmart-inc-2023-annual-report.pdf>

Lesson 4-9: Module 4 Appendix 1: LIFO - FIFO Conversion

[Lesson 4-9.1: Module 4 Appendix 1: LIFO - FIFO Conversion](#)

Cost Flow Assumptions

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As we have seen in Lesson 7, cost flow assumptions affect several financial numbers, including net income and cash flows.

This makes it harder to compare financial performance of firms using different cost flow assumptions.

Therefore, we need a framework to convert financial statement numbers under a common cost flow assumption.

As we have seen in Lesson 7, cost flow assumptions affect a number of financial numbers, including net income and cash flows. This makes it harder to compare financial performance of firms using different cost flow assumptions. For example, we cannot compare a US firm using LIFO with a European firm using FIFO even if they are in the same industry. Therefore, we need a framework to convert financial statement numbers under a common cost flow assumption. I will now introduce a framework to convert cost of goods sold numbers between LIFO and FIFO.

LIFO - FIFO Conversion

Beg. Inv. LIFO + Purchases – COGS LIFO = End. Inv. LIFO

Thus, **Purchases = End. Inv. LIFO + COGS LIFO – Beg. Inv. LIFO**

Beg. Inv. FIFO + Purchases – COGS FIFO = End. Inv. FIFO

Thus, **Purchases = End. Inv. FIFO + COGS FIFO – Beg. Inv. FIFO**

$$\text{End. Inv. LIFO} + \text{COGS LIFO} - \text{Beg. Inv. LIFO} = \text{End. Inv. FIFO} + \text{COGS FIFO} - \text{Beg. Inv. FIFO}$$

$$\begin{aligned}\text{End. Inv. LIFO} &= \\ \text{End. Inv. FIFO} - \text{End. LIFO} &\quad \text{Reserve}\end{aligned}$$

$$\begin{aligned}-\text{Beg. Inv. LIFO} &= \\ -(\text{Beg. Inv. FIFO} - \text{Beg. LIFO}) &\quad \text{Reserve}\end{aligned}$$

We will start with a firm using LIFO as a cost flow assumption. Inventory account of this firm changes as follows, beginning inventory LIFO, plus purchase of inventory, minus cost of goods sold LIFO is equal to ending inventory LIFO. If we do a little bit of algebra, we will find that purchase of inventory is equal to ending inventory LIFO, plus cost of goods sold LIFO minus beginning inventory LIFO. Now, let's repeat the same exercise for a firm using FIFO as a cost flow assumption. Beginning inventory FIFO plus purchase of inventory, minus cost of goods sold FIFO is equal to ending inventory FIFO. Again, after a little algebra, we can find that purchase of inventory is equal to ending inventory FIFO plus cost of goods sold FIFO minus beginning inventory FIFO. Please note that purchases of inventory do not change according to the inventory cost flow assumption. Therefore, the right side of both of these equations should be equal to each other. This brings us to the last equation on the slide. Ending inventory LIFO, plus cost of goods sold LIFO, minus beginning inventory LIFO is equal to ending inventory FIFO plus cost of goods sold FIFO, minus beginning inventory FIFO. We will now introduce a little trick. Suppose that we are given the difference in the value of inventories under FIFO versus under LIFO methods. Let's call this difference as LIFO reserve. Therefore, ending inventory LIFO is equal to ending inventory FIFO minus ending LIFO reserve. Similarly, beginning inventory LIFO is equal to beginning inventory FIFO minus beginning LIFO reserve.



LIFO - FIFO Conversion

$$\text{End. Inv. LIFO} + \text{COGS LIFO} - \text{Beg. Inv. LIFO} = \text{End. Inv. FIFO} + \text{COGS FIFO} - \text{Beg. Inv. FIFO}$$

= End. Inv. FIFO -
End. LIFO Reserve

= - Beg. Inv. FIFO + Beg.
LIFO Reserve

$$- \text{End. LIFO Reserve} + \text{COGS LIFO} + \text{Beg. LIFO Reserve} = \text{COGS FIFO}$$

$$\text{COGS FIFO} = \text{COGS LIFO} - \text{Change in LIFO Reserve}$$

We will now focus on the left hand side of this equation. We will replace ending inventory LIFO, with ending inventory FIFO, minus ending LIFO reserve. Similarly, we will replace beginning inventory LIFO with beginning inventory FIFO minus beginning LIFO reserve. Please note that ending inventory FIFO and beginning inventory FIFO exist in both sides of the equation. Therefore, we can simplify this equation. After the simplification, we have minus ending LIFO reserve, plus cost of goods sold LIFO, plus beginning LIFO reserve is equal to cost of goods sold FIFO. We can further simplify this equation and find the last formula we need. Cost of goods sold FIFO is equal to cost of goods sold LIFO, minus change in LIFO reserve. Please note that change in accounting is always ending minus beginning. Thanks to this equation, we can now compare cost of goods sold numbers of two firms using different inventory cost flow assumptions.

Exercise: Cost Flow Assumptions

Calculate the cost of goods sold and ending inventory using LIFO and FIFO methods.

	Units	Unit cost	Unit price
Beginning inventory	100	\$5	
January sale	(80)		\$8
February purchase	30	\$6	
March purchase	40	\$7	
Ending inventory	90		

Here is an application of LIFO versus FIFO conversion. This is the same question we saw in Lesson 47 cost flow assumptions. The firm starts the fiscal year with 100 units of inventory with a cost of \$5 each. The firm sells eight units of inventory in January. The firm purchases 30 units of inventory from \$6 each in February. The firm purchases 40 more units of inventory in March with a cost of \$7 each. Therefore, ending inventory is $100 - 80 + 30 + 40$, which is equal to 90 units of inventory.

Exercise: Cost Flow Assumptions

FIFO

Cost of goods sold:

$$80 * \$5 = \$400 \text{ (It all comes from beginning inventory)}$$

Ending inventory:

$$\begin{aligned} & 20 * \$5 \text{ (Remaining beginning inventory)} \\ & + 30 * \$6 \text{ (February purchase)} \\ & + 40 * \$7 \text{ (March purchase)} \\ & = \$560 \end{aligned}$$



We have seen in Lesson 4-7 Cost Flow Assumptions is that cost of goods sold under FIFO is 400 and ending inventory under FIFO is 560.

Exercise: Cost Flow Assumptions

LIFO

Cost of goods sold:

$$\begin{aligned} & 40 * \$7 \text{ (March purchase)} \\ & + 30 * \$6 \text{ (February purchase)} \\ & + 10 * \$5 \text{ (Beginning inventory)} \\ & = \$510 \end{aligned}$$

Ending inventory:

$$90 * \$5 = \$450 \text{ (Remaining beginning inventory)}$$



We have also seen in the same lesson that cost of goods sold under LIFO is 510 and ending inventory under LIFO is 450.

Exercise: Cost Flow Assumptions

$$\text{End. Inv. FIFO} = \$560$$

$$\text{End. Inv. LIFO} = \$450$$

$$\begin{aligned} \text{End. LIFO Reserve} &= \text{End. Inv. FIFO} - \text{End. Inv. LIFO} \\ &= \$110 \end{aligned}$$

$$\text{Beg. Inv. FIFO} = \$500$$

$$\text{Beg. Inv. LIFO} = \$500$$

$$\begin{aligned} \text{Beg. LIFO Reserve} &= \text{Beg. Inv. FIFO} - \text{Beg. Inv. LIFO} \\ &= \$0 \end{aligned}$$



Let's just summarize this information. Ending inventory under FIFO is 560. Ending inventory under LIFO 450. Therefore, ending LIFO reserve, which is the difference in

inventories between FIFO and LIFO is 110. Beginning inventory under FIFO is 500. Beginning inventory under LIFO is 500. Therefore, beginning amount of LIFO reserve is zero.

Exercise: Cost Flow Assumptions

$$\text{COGS FIFO} = \text{COGS LIFO} - \text{Change in LIFO Reserve}$$

$$\begin{aligned} &= \$510 - (\$110 - \$0) \\ &= \$400 \end{aligned}$$



Can we use LIFO, FIFO conversion formula to convert cost of goods sold from LIFO to FIFO? The formula is cost of goods sold under FIFO is equal to cost of goods sold LIFO minus change in LIFO reserve. Cost of goods sold under LIFO is 510. Ending LIFO reserve is 110 and beginning LIFO reserve is 0. If we put these numbers in the formula, we will find that cost of goods sold under FIFO is 510-110, which is equal to \$400. This is the cost of goods sold under FIFO number we have seen before. How can we use this framework? First, by using LIFO reserve, we can convert the inventory numbers between FIFO and LIFO. Second, we can use this framework to convert cost of goods sold numbers. Cost of goods sold convergence will be especially useful to compare financial performance of firms using different cost flow assumptions.

Deere Inventories 2023

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13. INVENTORIES

Inventories were valued at the lower of cost or net realizable value, as follows:

	2023	2022
Raw materials and supplies	\$ 4,080	\$ 4,442
Work-in-process	1,010	1,190
Finished goods and parts	5,435	5,363
Total FIFO value	<u>10,525</u>	<u>10,995</u>
Excess of FIFO over LIFO	2,365	2,500
Inventories	<u>\$ 8,160</u>	<u>\$ 8,495</u>
Percent valued on LIFO basis	53%	57%

FIFO: Beg. Inventory = \$10,995, End. Inventory = \$10,525

LIFO: Beg. Inventory = \$8,495, End. Inventory = \$8,160

Beg. LIFO Reserve = \$2,500, End. LIFO Reserve = \$2,365

How is this framework applied in real life? Here is an inventory footnote of Deere in 2023. In 2023, total FIFO inventory is 10,525. Excess of FIFO over LIFO in adverse LIFO reserve is 2,365 in 2023. Inventories under LIFO can be found as 10,525 -2,365, which is equal to 8,160. This is the inventory number reported in the Deere's balance sheet. Please note that 2022 LIFO reserved for Deere is \$2,500. Therefore, if we were given cost of goods sold of Deere, we can convert this number to cost of goods sold under FIFO using our framework.

Lesson 4-10: Module 4 Case Video

[Lesson 4-10.1: Module 4 Case Video](#)

Question 1

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Refer to the 2022 annual report of Samsung Electronics Co., Ltd. Using the information in the statements of financial position, statements of profit or loss, and the excerpts of the notes provided below, please answer the following questions.

1. What is the amount of trade receivables as of December 31, 2022, that Samsung Electronics does not expect to collect?

Loss allowance (note 7, table A): 312,221 million Korean Won

Samsung Electronics - Accounts Receivable

In this video, we will go through three cases about short-term assets. Here is case Number 1. Refer to 2022, any report of Samsung. Using the information in the statements of financial position, statements of profit and loss, and the excerpts of notes provided below, please answer the following questions. Question 1 of case 1 asks, what is the amount of trade receivable as of December 31st, 2022, that Samsung doesn't expect to collect.

Question 1

7. Trade and Non-Trade Receivables

(A) Trade and non-trade receivables as of December 31, 2022 and 2021 are as follows:

(In millions of Korean won)	December 31, 2022		December 31, 2021	
	Trade	Non-trade	Trade	Non-trade
Receivables	36,238,032	7,051,536	41,250,034	5,572,176
Less: Loss allowance	(312,221)	(78,101)	(310,880)	(72,805)
Subtotal	35,925,811	6,973,435	40,939,154	5,499,371
Less: Non-current portion	(204,248)	(824,226)	(225,739)	(1,002,114)
Current portion	35,721,563	6,149,209	40,713,415	4,497,257

Samsung Electronics Co., Ltd., 2022

In accounting language, this question asks the balance of allowance for doubtful accounts in 2022. We will get this information from footnote 7 part A, which provides details of trade receivables. The amount of allowance for doubtful accounts, which Samsung calls as just loss allowance is 312,221.

Question 1

2. What is the amount of trade receivables written off in 2022?

*Receivables written off (note 7, table B): 3,557 million
Korean Won*

Samsung Electronics - Accounts Receivable

The second question of case 1 asks, what is the amount of trade receivables written off in 2022?

Question 1

(B) Movements in the loss allowance for receivables for the years ended December 31, 2022 and 2021 are as follows:

<i>(In millions of Korean won)</i>	2022		2021	
	Trade	Non-trade	Trade	Non-trade
Balance as of January 1	310,880	72,805	318,731	59,487
Bad debt expense (reversal)	8,784	7,312	17,990	9,009
Write-off	(3,557)	(6,154)	(19,095)	(2,424)
Other	(3,886)	4,138	(6,746)	6,733
Balance as of December 31	312,221	78,101	310,880	72,805

Samsung Electronics Co., Ltd., 2022

Footnote 7, panel B describes in detail the movements in loss allowance for receivables? This footnote explicitly states that account receivable write-offs is 3,557.

Question 1

3. Suppose that during 2022 Samsung Electronics has collected 150,000,000 million Korean Won worth of trade receivables. What is your estimate of the amount of credit sales that Samsung Electronics has recognized in fiscal year 2022?

(Hint: Use the movement in gross trade receivables to estimate credit sales.)

Samsung Electronics - Accounts Receivable

The third question of case 1 is as follows, suppose that during 2022, Samsung has collected 150 million Korean won worth of trade receivables. What is your estimate of the amount of credit sales that Samsung has recognized in fiscal year 2022. The

question expressly states that we should use the movement in gross trade receivables to estimate credit sales to solve this question.

Question 1

Gross Trade Receivables (T/R)

BB: 41,250,034 (note 7, table A)

EB: 36,238,032 (note 7, table A)

$$EB \text{ (Gross T/R)} = BB \text{ (Gross T/R)} + Credit \text{ Sales} - Collections - Write-Offs$$

$$36,238,032 = 41,250,034 + Credit \text{ Sales} - 150,000,000 - 3,557$$

$$Credit \text{ Sales} = 144,991,555 \text{ million Korean Won}$$

Samsung Electronics - Accounts Receivable

Why gross receivables? The difference between gross and net receivables is the allowance for doubtful accounts. I would like to highlight that receivables classified in allowance for doubtful accounts are still collectable receivables. It is just that there is some uncertainty in their collectability. Therefore, we use gross rather than net receivables to solve these questions. Gross receivables account change as follows. Beginning gross receivables plus credit sales minus collections minus write-offs is equal to ending gross receivables.

Question 1

7. Trade and Non-Trade Receivables

(A) Trade and non-trade receivables as of December 31, 2022 and 2021 are as follows:

(In millions of Korean won)	December 31, 2022		December 31, 2021	
	Trade	Non-trade	Trade	Non-trade
Receivables	36,238,032	7,051,536	41,250,034	5,572,176
Less: Loss allowance	(312,221)	(78,101)	(310,880)	(72,805)
Subtotal	35,925,811	6,973,435	40,939,154	5,499,371
Less: Non-current portion	(204,248)	(824,226)	(225,739)	(1,002,114)
Current portion	35,721,563	6,149,209	40,713,415	4,497,257

Samsung Electronics Co., Ltd., 2022

Beginning and ending gross receivables come from footnote 7 panel A. Beginning gross trade receivables is 41,250,034. Ending gross trade receivables is 36,238,032. Please note that these are gross trade receivable amounts because the effect of loss allowance is not reflected on these amounts.

Question 1

(B) Movements in the loss allowance for receivables for the years ended December 31, 2022 and 2021 are as follows:

(In millions of Korean won)	2022		2021	
	Trade	Non-trade	Trade	Non-trade
Balance as of January 1	310,880	72,805	318,731	59,487
Bad debt expense (reversal)	8,784	7,312	17,990	9,009
Write-off	(3,557)	(6,154)	(19,095)	(2,424)
Other	(3,886)	4,138	(6,746)	6,733
Balance as of December 31	312,221	78,101	310,880	72,805

Samsung Electronics Co., Ltd., 2022

The amount of trade receivables write-offs in 2022 is 3,557, according to Table 7 panel B.

Question 1

Gross Trade Receivables (T/R)

BB: 41,250,034 (note 7, table A)

EB: 36,238,032 (note 7, table A)

$$EB \text{ (Gross T/R)} = BB \text{ (Gross T/R)} + Credit \text{ Sales} - Collections - Write-Offs$$

$$36,238,032 = 41,250,034 + Credit \text{ Sales} - 150,000,000 - 3,557$$

$$Credit \text{ Sales} = 144,991,555 \text{ million Korean Won}$$

Samsung Electronics - Accounts Receivable

The question explicitly tells us that the amount of cash collections from customers is 150 million. If you put all these numbers in the framework for how gross trade receivables change, the only missing number is credit sales. If we do the algebra, we can find that the amount of credit sales is 144,991,555.

Question 1

4. Suppose that in 2022 Samsung Electronics was considering recording a higher (than currently) recorded provision for impairment of trade receivables by 13,000 million Korean Won. How would the following financial reporting items have changed had Samsung Electronics taken the additional charge of 13,000 million Korean Won? (Ignore any income tax effects.)

Total assets as of December 31, 2022: *Lower by 13,000 million*

Net income for fiscal 2022: *Lower by 13,000 million*

Samsung Electronics - Accounts Receivable

The last question of case 1 asks, suppose that in 2022, Samsung was considering recording a higher than currently recorded provision for impairment of trade receivables by 13,000 Korean won. How would the following financial reported items have changed had Samsung had taken additional charge of 13,000 Korean won. Ignore any income tax effects. If a firm creates more provisions for impairment of trade receivables, this increases the amount of allowance for doubtful accounts, which is a contra asset account. Therefore, total assets will decrease by 13,000. The other side of this transaction will be creation of extra bad debt expense of 13,000, which will reduce net income.

Question 2



Please consider the excerpts from Marathon Petroleum Corporation's annual report for fiscal year 2022 below and answer the following questions.

1. What inventory cost flow assumption(s) does Marathon Petroleum Corporation (Marathon) use to determine the cost of inventories?

Primarily LIFO

Marathon Petroleum - Inventory

Case 2 is about inventories. Please consider the excerpts of Marathon's any report for fiscal year 2022 below and answer the following questions. Question 1 of case 2 asks, what inventory cost flow assumptions does Marathon use to determine the cost of inventories?

Question 2

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Notes to Consolidated Financial Statements

2. Summary of Principal Accounting Policies

Inventories – Inventories are carried at the lower of cost or market value.

Cost of inventories is determined primarily under the LIFO method. Costs for crude oil, refinery feedstocks, and refined product inventories are aggregated on a consolidated basis for purposes of assessing if the LIFO cost basis of these inventories may have to be written down to market value.

Marathon Petroleum Corporation, 2022

We need to look at footnote 2 of Marathon's annual report. This footnote describes principal accounting policies. Inventory section of this footnote mentions that inventories are carried at the lower of cost or market value. Cost of inventories is determined primarily under LIFO methods. Marathon is a US firm, and US firms use LIFO to increase their cash flows by minimizing their tax bills.

Question 2

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2. What is the value of inventory write-downs in fiscal year 2022?

\$0 million

Marathon Petroleum - Inventory

The second question of case 2 asks, what is the value of inventory write-downs in fiscal year 2022?

Question 2

15. Inventories

	December 31,	
	2022	2021
(Millions of dollars)		
Crude oil	\$ 3,047	\$ 2,639
Refined products	4,748	4,460
Materials and supplies	1,032	956
Total	<u>\$ 8,827</u>	<u>\$ 8,055</u>

The LIFO method accounted for 88 percent of total inventory value at both December 31, 2022 and 2021. Current acquisition costs were estimated to exceed the LIFO inventory value by \$3.72 billion as of December 31, 2022. There was \$2.84 billion excess of replacement or current cost over our stated LIFO cost at December 31, 2021.

The cost of inventories of crude oil and refined products is determined primarily under the LIFO method.

Marathon Petroleum Corporation, 2022

Inventory write-downs happen when market value of the inventory becomes less than the inventory cost. In these instances, the value of the inventory is marked down to the current market value of the inventory. We learn from two sources, whether the firm had any inventory write-down. The first source is footnote 15 about inventories. In this footnote, we will search for any phrase which indicates that the firm reduced the value of inventory because, for example, the inventory became obsolete or market price of the inventory significantly decreased. We don't see such a statement in footnote 15.

Marathon Petroleum Corporation Consolidated Statements of Income			
(In millions, except per share data)	2022	2021	2020
Revenues and other income:			
Sales and other operating revenues	\$ 177,453	\$ 119,983	\$ 69,779
Income (loss) from equity method investments ^(a)	655	458	(935)
Net gain on disposal of assets	1,061	21	70
Other income	783	468	118
Total revenues and other income	<u>179,952</u>	<u>120,930</u>	<u>69,032</u>
Costs and expenses:			
Cost of revenues (excludes items below)	151,671	110,008	65,733
Impairment expense	—	—	8,426
Depreciation and amortization	3,215	3,364	3,375
Selling, general and administrative expenses	2,772	2,537	2,710
Restructuring expenses	—	—	367
Other taxes	825	721	668
Total costs and expenses	<u>158,483</u>	<u>116,630</u>	<u>81,279</u>
Income (loss) from continuing operations	21,469	4,300	(12,247)
Net interest and other financial costs	1,000	1,483	1,365
Income (loss) from continuing operations before income taxes	<u>20,469</u>	<u>2,817</u>	<u>(13,612)</u>
Provision (benefit) for income taxes on continuing operations	4,491	264	(2,430)
Income (loss) from continuing operations, net of tax	<u>15,978</u>	<u>2,553</u>	<u>(11,182)</u>
Income from discontinued operations, net of tax	72	8,448	1,205
Net income (loss)	<u>16,050</u>	<u>11,001</u>	<u>(9,977)</u>
Less net income (loss) attributable to:			
Redeemable noncontrolling interest	88	100	81
Noncontrolling interests	1,446	1,163	(232)
Net income (loss) attributable to MPC	<u>\$ 14,516</u>	<u>\$ 9,738</u>	<u>\$ (9,826)</u>

Marathon Petroleum Corporation, 2022

The second source to check whether the firm involved in any inventory write-down is income statement, as inventory write-downs create a loss on the income statements. After a close inspection, we don't see any line item which indicates that Marathon involved in any inventory write-down. Therefore, we can conclude that the amount of inventory write-downs for Marathon in 2022 is 0.

Question 2

3. If the company recorded inventory write-downs, what would be the impact in 2022 on the balance sheet and on the income statement?

Balance sheet: Decreases inventory account

Income statement: Increases cost of goods sold or creates an inventory write-down expense

Marathon Petroleum - Inventory

The third question of case 2 asks, if the company recorded inventory write-downs, what would be the impact in 2022 on the balance sheet and on the income statement?

Inventory write-downs reduce the value of inventory account on the balance sheet.

Inventory write-downs create an expense on the income statement. This expense can either be included as a part of cost of goods sold or reported separately as an inventory write-down expense.

Question 2

4. What is the amount of inventory purchases in fiscal year 2022?

$$\text{End. inventory} = \text{Beg. inventory} + \text{Inventory purchases} - \text{COGS} - \text{Inventory write-downs}$$

$$8,827 = 8,055 + \text{Inventory purchases} - 151,671 - 0$$

$$\text{Inventory purchases} = \$152,443 \text{ million}$$

Marathon Petroleum - Inventory

The fourth question of case 2 asks, what is the amount of inventory purchases in fiscal year 2022? In order to answer this question, we need to apply the framework through which inventory account changes over time. Beginning inventory plus inventory purchases minus cost of goods sold minus inventory write-down is equal to ending inventory.

Question 2

Marathon Petroleum Corporation Consolidated Balance Sheets			
			December 31,
	2022	2021	
<i>(Millions of dollars, except share data)</i>			
Assets			
Cash and cash equivalents	\$ 8,625	\$ 5,291	
Short-term investments	3,145	5,548	
Receivables, less allowance for doubtful accounts of \$29 and \$40, respectively	13,477	11,034	
Inventories	8,827	8,055	
Other current assets	1,168	568	
Total current assets	35,242	30,496	
Equity method investments	6,466	5,409	
Property, plant and equipment, net	35,657	37,440	
Goodwill	8,244	8,256	
Right of use assets	1,214	1,372	
Other noncurrent assets	3,081	2,400	
Total assets	\$ 89,904	\$ 85,373	

Marathon Petroleum Corporation, 2022

According to the balance sheet, beginning inventory balance is 8,055 and ending inventory balance is 8,827.

Marathon Petroleum Corporation Consolidated Statements of Income			
	2022	2021	2020
<i>(In millions, except per share data)</i>			
Revenues and other income:			
Sales and other operating revenues	\$ 177,453	\$ 119,983	\$ 69,779
Income (loss) from equity method investments ^(a)	655	458	(935)
Net gain on disposal of assets	1,061	21	70
Other income	783	468	118
Total revenues and other income	179,952	120,930	69,032
Costs and expenses:			
Cost of revenues (excludes items below)	151,671	110,008	65,733
Impairment expense	—	—	8,426
Depreciation and amortization	3,215	3,364	3,375
Selling, general and administrative expenses	2,772	2,537	2,710
Restructuring expenses	—	—	367
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Total costs and expenses	158,483	116,630	81,279
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Net interest and other financial costs	1,000	1,483	1,365
Income (loss) from continuing operations before income taxes	20,469	2,817	(13,612)
Provision (benefit) for income taxes on continuing operations	4,491	264	(2,430)
Income (loss) from continuing operations, net of tax	15,978	2,553	(11,182)
Income from discontinued operations, net of tax	72	8,448	1,205
Net income (loss)	16,050	11,001	(9,977)
Less net income (loss) attributable to:			
Redeemable noncontrolling interest	88	100	81
Noncontrolling interests	1,446	1,163	(232)
Net income (loss) attributable to MPC	\$ 14,516	\$ 9,738	\$ (9,826)

Marathon Petroleum Corporation, 2022

We find information about cost of goods sold from income statement. The value of cost of goods sold in 2022 is 151,671.



Question 2

4. What is the amount of inventory purchases in fiscal year 2022?

End. inventory = Beg. inventory + Inventory purchases – COGS – Inventory write-downs

$$8,827 = 8,055 + \text{Inventory purchases} - 151,671 - 0$$

$$\text{Inventory purchases} = \$152,443 \text{ million}$$

Marathon Petroleum - Inventory

Since the value of inventory write-downs is 0, we can then input all information into the inventory framework. The only missing information in this framework is inventory purchases. After a little algebra, we can find that inventory purchases is 152,443.



Question 3

Please consider the excerpts from the Kroger Co. annual report for fiscal year 2022 below and answer the following questions.

1. Which cost flow assumption does Kroger use to value its inventory?

Inventories are principally stated on a LIFO basis (89% in 2022). The remaining inventory is valued using FIFO.

The Kroger Co. - Inventory

Case 3 is about Kroger's inventories. Please consider the excerpts from the Kroger annual report for fiscal year 2022 below and answer the following questions. Question 1 of case 3 asks, which cost flow assumption does Kroger use to value his inventory? The

answer is inventories are principally stated on a LIFO basis, 89% in 2022. The remaining inventory is valued using FIFO.

Question 3

The Kroger Co.

Notes to Consolidated Financial Statements

(All amounts are in millions except per share amounts.)

Note 1 - Accounting Policies

Inventories – Inventories are stated at the lower of cost (principally on a last-in, first-out “LIFO” basis) or market. In total, approximately 89% of inventories in 2022 and 91% of inventories in 2021 were valued using the LIFO method. The remaining inventories, including substantially all fuel inventories, are stated at the lower of cost (on a FIFO basis) or net realizable value.

Replacement cost was higher than the carrying amount by \$2,196 at January 28, 2023, and \$1,570 at January 29, 2022.

The Kroger Co., 2023

We find this information in footnote Number 1, accounting policies of Kroger. Inventory subsection of this footnote states that inventories are stated at the lower of cost principally on last in first out LIFO basis or market. In total, approximately 89% of the inventories in 2022 and 91% of inventories in 2021 were valued using LIFO methods. Therefore, Kroger uses LIFO for the majority of its inventory.

Question 3

2. Suppose Kroger had used FIFO as a cost flow assumption for all of their inventories. Would the book value of inventories at January 28, 2023, be higher than, lower than, or the same as the amount currently recorded? If different, by how much?

Higher by \$2,196 million

The Kroger Co. - Inventory

Question 2 of case 3 asks, suppose Kroger had used FIFO as a cost flow assumption for all of the inventories. Would the book value of inventories at January 28th, 2023 be higher than, lower than, or the same as the amount currently recorded? If different by how much? In accounting language, this question asks about LIFO reserve.

Question 3

Note 1 - Accounting Policies

Inventories

Replacement cost was higher than the carrying amount by \$2,196 at January 28, 2023, and \$1,570 at January 29, 2022. The Company follows the Link-Chain, Dollar-Value LIFO method for purposes of calculating its LIFO charge or credit. During 2020, the Company had a LIFO liquidation primarily related to pharmacy inventory. The liquidated inventory was carried at lower costs prevailing in prior years as compared with current costs. The effect of this reduction in inventory decreased "Merchandise costs" by approximately \$76, \$58 net of tax.

The Kroger Co., 2023

We find LIFO reserve information again in footnote Number 1, accounting policies. The inventory subsection of this footnote states that replacement cost was higher than the

carrying amount by 2,196 at January 28th, 2023. If Kroger used FIFO method of inventory, it would sell old units and the inventory would consist of new units. The values of new units approximates replacement cost. Therefore, inventory values would be higher by 2,196 if FIFO method of inventory valuation had been used.

Question 3

3. What is the amount of COGS if inventory purchases is \$125,000 million in the year ended January 28, 2023?

$$\text{End. inventory} = \text{Beg. inventory} + \text{Inventory purchases} - \text{COGS} - \text{Inventory write-downs}$$

$$(9,756 - 2,196) = (8,353 - 1,570) + 125,000 - \text{COGS} - 0$$

$$\text{COGS} = \$124,223 \text{ million}$$

The Kroger Co. - Inventory

The third question of case 3 asks, what is the amount of cost of goods sold if inventory purchases is 125,000 in the year ended January 28th, 2023. We could answer this question easily if income statement was given. This is because cost of goods sold is explicitly reported in income statement. Instead, we need to go through the framework for how inventory account changes over time to answer this question. Beginning inventory plus inventory purchases minus cost of goods sold minus inventory write-downs is equal to ending inventory.

Question 3

THE KROGER CO. CONSOLIDATED BALANCE SHEETS			
(In millions, except par amounts)	January 28, 2023	January 29, 2022	
ASSETS			
Current assets			
Cash and temporary cash investments	\$ 1,015	\$ 1,821	
Store deposits in-transit	1,127	1,082	
Receivables	2,234	1,828	
FIFO inventory	9,756	8,353	
LIFO reserve	(2,196)	(1,570)	
Prepaid and other current assets	734	660	
Total current assets	12,670	12,174	
Property, plant and equipment, net	24,726	23,789	
Operating lease assets	6,662	6,695	
Intangibles, net	899	942	
Goodwill	2,916	3,076	
Other assets	1,750	2,410	
Total Assets	\$ 49,623	\$ 49,086	

The Kroger Co., 2023

Beginning and ending inventory values come from balance sheet. There is an interesting observation in Kroger's balance sheet. The values of FIFO inventory and LIFO reserve are separately reported. This is quite unusual. We normally observe these values to be added up. In our calculations, we will add up these amounts. Therefore, for example, ending amount of inventory will be 9,756-2,196, which is equal to 7,560.

Question 3

3. What is the amount of COGS if inventory purchases is \$125,000 million in the year ended January 28, 2023?

$$\text{End. inventory} = \text{Beg. inventory} + \text{Inventory purchases} - \text{COGS} - \text{Inventory write-downs}$$

$$(9,756 - 2,196) = (8,353 - 1,570) + 125,000 - \text{COGS} - 0$$

$$\text{COGS} = \$124,223 \text{ million}$$

The Kroger Co. - Inventory

Inventory purchases is given in the question as 125,000. Since inventory subsection of footnote Number 1 doesn't mention anything about inventory write-downs, we can assume that inventory write-downs is 0. We can then input all values in the inventory framework. The only missing number is cost of goods sold. After a little algebra, we can find that cost of goods sold is equal to 124,223.

Question 3

I

4. What is a LIFO liquidation? When was the last time Kroger had a material LIFO liquidation? What was the effect of that LIFO liquidation on Kroger's cost of products sold and reported profit?

The Kroger Co. - Inventory

Question 4 of case 3 asks, what is LIFO liquidation? When was the last time Kroger had a material LIFO liquidation? What was the effect of that LIFO liquidation on Kroger's cost of products sold and reported profit?

Question 3

I

There is a LIFO liquidation when a company sells more units of inventory than it buys and as a result has to sell old inventory layers, valued at a lower price.

The last time Kroger had a material LIFO liquidation was in fiscal year 2020. This liquidation decreased merchandise costs by approximately \$76 million and increased reported profit by \$58 million, net of tax.

The Kroger Co. - Inventory

There is a LIFO liquidation when a company sells more units of inventory than it buys, and as a result, it has to sell old inventory layers valued at lower prices. The last time Kroger had a material LIFO liquidation was in fiscal year 2020. This liquidation decreased merchandise costs by approximately 76 million and increased reported profit by 58 net of tax.

Question 3

I

Note 1 - Accounting Policies

Inventories

Replacement cost was higher than the carrying amount by \$2,196 at January 28, 2023, and \$1,570 at January 29, 2022. The Company follows the Link-Chain, Dollar-Value LIFO method for purposes of calculating its LIFO charge or credit. During 2020, the Company had a LIFO liquidation primarily related to pharmacy inventory. The liquidated inventory was carried at lower costs prevailing in prior years as compared with current costs. The effect of this reduction in inventory decreased "Merchandise costs" by approximately \$76, \$58 net of tax.

The Kroger Co., 2023

We find this information from inventory subsection of footnote Number 1. It seems that during 2020, the company had a LIFO liquidation primarily related to pharmacy inventory.

Question 3

I

5. If Kroger had used FIFO as a cost flow assumption for all of its inventories, recalculate the value of COGS on a FIFO basis.

$COGS\ FIFO = COGS\ LIFO - Change\ in\ LIFO\ reserve$

$$COGS\ FIFO = \$124,223\ (from\ question\ 3.3) - (2,196 - 1,570)$$

$$COGS\ FIFO = \$123,597\ million$$

The Kroger Co. - Inventory

The last question of case 3 asks, if Kroger had used FIFO as a cost flow assumption for all of its inventories, recalculate the value of cost of goods sold on a FIFO basis. We can use our formula for LIFO FIFO conversion. Cost of goods sold under FIFO is equal to cost of goods sold LIFO minus change in LIFO reserve.

Question 3

THE KROGER CO. CONSOLIDATED BALANCE SHEETS			
(In millions, except par amounts)	January 28, 2023	January 29, 2022	
ASSETS			
Current assets			
Cash and temporary cash investments	\$ 1,015	\$ 1,821	
Store deposits in-transit	1,127	1,082	
Receivables	2,234	1,828	
FIFO inventory	9,756	8,353	
LIFO reserve	(2,196)	(1,570)	
Prepaid and other current assets	734	660	
Total current assets	12,670	12,174	
Property, plant and equipment, net	24,726	23,789	
Operating lease assets	6,662	6,695	
Intangibles, net	899	942	
Goodwill	2,916	3,076	
Other assets	1,750	2,410	
Total Assets	\$ 49,623	\$ 49,086	

The Kroger Co., 2023

We can find beginning and ending LIFO reserve information from the balance sheet. Beginning LIFO reserve is 1,570 and ending LIFO reserve is 2,196.

Question 3

5. If Kroger had used FIFO as a cost flow assumption for all of its inventories, recalculate the value of COGS on a FIFO basis.

$$\text{COGS FIFO} = \text{COGS LIFO} - \text{Change in LIFO reserve}$$

$$\text{COGS FIFO} = \$124,223 \text{ (from question 3.3)} - (2,196 - 1,570)$$

$$\text{COGS FIFO} = \$123,597 \text{ million}$$

The Kroger Co. - Inventory

We calculated cost of goods sold LIFO as 124,223 in Question 3 of case 3. We can then input all these values, and after a little algebra, we can calculate cost of goods sold under FIFO as 123,597.