ACCT 101: Inventory and Merchandizing

Session 5

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Frontmatter



Quiz 1

- 7.5% of overall grade
- 1 hour to complete
 - When finished, revise or turn in at the front
- 15 minute break after
- Class will resume after the break



Homework 2 review

- Grades are on eLearn
- We'll have more practice with annual reports later in the course
 - Week 12: Using these reports to understand companies' activities



Learning objectives



Starting part 2 of the course

Deep dive into transactions

Inventory (Chapter 6)

- 1. Understand the nature of inventory operations
- 2. Record inventory transactions
- Determine inventory and COGS value

Nature of firms



What is inventory?

Inventories are assets, held for sale in the ordinary course of business, or in the process of production for such sale, or in the form of materials or supplies to be consumed in the production process or in the rendering of services. (FRS2-6)

Unsold inventory is an asset

Sold inventory is converted to COGS (expense)

Importance of inventory

- Why hold inventory?
 - Supply can be erratic
 - No inventory could mean missed sales
 - Can buy more in low cost periods
 - Low costs from shipping, production, purchasing, etc.
- Drawbacks of inventory
 - Cost of holding
 - Warehousing, electricity, ...
 - Liquidity Cash tied up as inventory
 - Inventory obsolescence
 - Adverse price changes
 - Buy low, sell lower

Firm types

- Service firms
 - 1. Have little to no inventory
- Merchandisers
 - 1. Get inventory items
 - 2. Sell them at a higher price
 - Than inventory cost + overhead
- Manufacturers
 - 1. Get raw materials
 - 2. Transform raw materials into *finished goods*
 - 3. Sell them at a higher price
 - Than raw materials + transformation + overhead



TANGS

CREATIVE

How to account for it?

- 1. Inventories recorded at cost of purchase
 - Will need a price and quantity
- Add any conversion costs (manufacturing)
- 3. Add delivery fees
- 4. Subtract any discounts received
- 5. Make sure the above is higher than the selling price
 - If it's not, decrease the value to selling price
 - Like with treasury stock and retained earnings, the decrease in value can be reversed later

The above works for individual items, but we'll need a way to track items purchased and used.

Inventory systems



Inventory systems

	Perpetual	Periodic
Inventory cost	Any	Low cost only
How?	Maintain a running total of all goods bought, sold, and available	Primarily through counts
Counting frequency	At least once per year	At least once per year, usually more often
Used by	Large businesses	Small businesses
Best for	Keeping an accurate account of inventory and COGS	Keeping tracking costs low



Perpetual inventories

- Usually barcode based.
 - Allows efficient tracking
- Record two entries per transaction
 - DR Cash or A/R (↑), CR Revenue (↑)
 - DR COGS (↑), CR Inventory (↓)

Example: Perpetual inventory

	A REAL PROPERTY AND A REAL			
Date	Account	DR	CR	
20YY.MM.DD	Cash	100		
	Revenue		100	
Made a \$100 sale for cash				
20YY.MM.DD	COGS	50		
	Inventory		50	
Used \$50 of inventory to make the sale				



Periodic inventory

- Relies on counts for data
- Simpler, but less efficient
- One entry to record revenue
 - DR Cash or A/R (↑), CR Revenue (↑)
- Adjusting entry at end of year
 - DR COGS (↑), CR Inventory (↓)

Not practical for businesses needing close tracking of inventory



Inventory Purchasing



Simple case

Buying on cash or A/PPaying full amount

Example: Buying inventory, simple, cash

Date	Account	DR	CR	
20YY.MM.DD	Inventory	100		
	Cash		100	
Purchased \$100 of inventory on cash				

Example: Buying inventory, simple, A/P

Date	Account	DR	CR	
20YY.MM.D1	Inventory	100		
	A/P		100	
Purchased \$1	Purchased \$100 of inventory on A/P			
20YY.MM.D2	A/P	100		
	Cash		100	
Paid A/P for inventory in full				

Shipping

If there are shipping costs to receive the inventory, we add those to the inventory value itself

- Debit inventory
- Credit cash

Date	Account	DR	CR
20YY.MM.01	Inventory	100	
	A/P		100
Purchased \$100 of inventory on A/P			
20YY.MM.15	A/P	100	
	Cash		100
Paid for inventory			

Example: Purchased inventory on account, no transportation costs

Example: Inventory on account, \$10 transportation costs in cash

Date	Account	DR	CR
20YY.MM.01	Inventory	110	
	A/P		100
	Cash		10
Purchased \$1	00 of inventory on A/P; paid \$	10 for delivery	
20YY.MM.15	A/P	100	
	Cash		100
Paid for inventory			

Returns

- Sometimes inventory needs to be returned
 - Wrong or faulty/broken items
- To record:
 - Directly credit the inventory account for the amount returned
 OR: Credit "Purchase returns," a contra-asset to inventory
 Debit...
 - A/P if not yet paid
 - Cash if paid and receiving cash now
 - A/R if paid and receiving credit now or cash later

Date	Account	DR	CR
20YY.MM.D1	Inventory	100	
	A/P		100
Purchased \$100 of inventory on A/P			
20YY.MM.D2	A/P	50	
	Inventory		50
Returned \$50 of inventory, as it was broken upon receipt of the inventory			

Example: Returning inventory

Payment and discounts

Sometimes companies offer discounts for paying early
Standard format for discounts:



- Ex.: 2/10, n/30 =
 - Get a 2% discount if paid in 10 days
 - Pay the full amount by 30 days.

Discounts in journal entries

Record discount as a decrease in inventory
 Remember: we record assets at cost paid for them
 Can also record to a "purchase discounts" contra-asset

Situation: Purchase inventory on account for \$100 with 2/10 n/30 terms

Example: Purchase discounts, paying in discount period

Date	Account	DR	CR
20YY.MM.01	Inventory	100	
	A/P		100
Purchased \$100 of inventory on A/P with 2/10, n/30 terms			
20YY.MM.05	A/P	100	
	Cash		98
	Inventory		2
Paid for inventory within 2/10 discount period (got 2% discount)			

Example: Purchase discounts, paying outside discount period

Date	Account	DR	CR	
20YY.MM.01	Inventory	100		
	A/P		100	
Purchased \$100 of inventory on A/P with 2/10, n/30 terms				
20YY.MM.15	A/P	100		
	Cash		100	
Paid for inventory within n/30 discount period (paid full amount)				

Bringing it all together

Practice question (3 entries):

- Purchased \$200 of inventory on account with 10/5, n/45 terms
 - Also paid \$20 in shipping to DHL on delivery
- 2. \$50 of inventory was damaged, which we returned
- 3. Paid payable 3 days after receiving inventory



Practice solution

Full inventory purchasing example

Date	Account	DR	CR
20YY.MM.01	Inventory	220	
	Cash		20
	A/P		200
Purchased \$200 of inventory on A/P with 10/5, n/45 terms. Paid \$20 for delivery.			
20YY.MM.02	A/P	50	
	Inventory		50
Returned \$50	of inventory		
20YY.MM.04	A/P	150	
	Cash		135
	Inventory		15
Paid payable in during discount period (10% discount)			



Inventory sales



General case

Selling for cash or A/RReceiving full amount

Example: Selling inventory, simple, A/R

Date	Account	DR	CR
20YY.MM.D1	A/R	100	
	Revenue		100
Made \$100 sale using \$50 of inventory			
20YY.MM.D1	COGS	50	
	Inventory		50
Recorded usage of \$50 of inventory			
20YY.MM.D2	Cash	100	
	A/R		100
Received A/R payment in full			

Revenue for goods

Recognize revenue when earned

- Recall from lesson 2: Revenue recognition principle
- FOB shipping point: record when given to shipping company
- FOB destination: Record when customer receives goods
 - Since we will need to pay shipping, we will have a *Delivery expense* account, an operating expense

Example: Selling inventory, simple, A/R

Date	Account	DR	CR	
20YY.MM.D1	A/R	100		
	Revenue		100	
Made \$100 sale using \$50 of inventory				
20YY.MM.D1	COGS	50		
	Inventory		50	
Recorded usa	Recorded usage of \$50 of inventory			
20YY.MM.D1	Delivery expense	10		
	Cash		10	
Paid for shipping for sale				

Returns, revisited

- Sometimes our sales are returned
 - Wrong or faulty/broken items
- To record:
 - Debit sales returns and allowances for the amount returned
 - A contra-equity to revenue
 - Credit...
 - A/R if not yet paid
 - Cash if paid and returning cash now
 - A/P if paid and giving credit now or returning cash later

Example: Ret	urned sales			
Date	Account	DR	CR	
20YY.MM.D1	A/R	100		
	Revenue		100	Note: we only
20YY.MM.D1	COGS	50		reverse the COGS
	Inventory		50	part of the first entry i
Made a \$100 sale, recorded \$50 inventory usage				usable.
20YY.MM.D2	Sales returns and allowances	40		Foulty not upphie
	A/R		40	Wrong item = usable
Customer retu	Customer returned 40% of sale due to faulty items before paying			

Discounts, revisited

We use the same discount terminology here
 Record any discount as a debit to *Sales discount* Another contra-equity to revenue

Situation: Sold inventory of \$50 for \$100 on account with 2/10 n/30 terms

Example: Discounts on sales

Date	Account	DR	CR				
20YY.MM.01	A/R	100					
	Revenue		100				
20YY.MM.01 COGS		50					
	Inventory		50				
Made a \$100	Made a \$100 sale, recorded \$50 inventory usage, terms are 2/10, n/30						
20YY.MM.05	Cash	98					
Sales discount		2					
	A/R		100				
Customer paid within discount period							

Example: No discount on sales

Date Account		DR	CR				
20YY.MM.01	20YY.MM.01 A/R						
Revenue			100				
20YY.MM.01 COGS		50					
Inventory			50				
Made a \$100 sale, recorded \$50 inventory usage, terms are 2/10, n/30							
20YY.MM.05 Cash		100					
A/R			100				
Customer paid after discount period ended							

Bringing it all together

Practice question (3 entries):

- Sold \$155 of inventory for \$300 on account with 10/5, n/45 terms
 - Also paid \$20 in shipping to DHL for delivery
- 2. \$50 of goods were damaged, which were returned to us
- 3. Customer Paid receivable 3 days after receiving goods



Practice solution

Full sales example

Date	Account	DR	CR				
20YY.MM.01	A/R	300					
	Revenue		300				
	COGS	155					
	Inventory		155				
	Delivery expense	20					
	Cash		20				
Sold \$155 of inventory for \$300 on 10/5, n/45 terms; paid \$20 for shipping							
20YY.MM.02 Sales returns and allowances 50							
	A/R		50				
Customer returned \$50 of inventory due to damaged goods							
20YY.MM.04	Cash	225					
	Sales discounts	25					
	A/R		250				
Received payment on A/R within the discount window (10% discount given)							





Inventory Valuation



Net Realizable value

- At the end of the day, we need our inventory to be priced below what we can make from it
 - Call this amount *net realizable value* (NRV)

NRV is the estimated selling price in the ordinary course of business, less the estimated cost of completion and the estimated costs necessary to make the sale. [IAS 2.6]

- If Inventory < NRV</p>
 - Do nothing, unless we previously wrote it down
- If Inventory > NRV
 - Need to write down to NRV

Buy low, selling lower...

Need to write down your inventory value
 If book value of inventory > *lower of cost or NRV*

Situation: Inventory is valued at \$1,500, but NRV is \$1,000

Example: Inventory write-down

Date	Account	DR	CR		
20YY.MM.DD	Inventory write-down	500			
	Inventory		500		
Wrote down inventory to NRV					

Can be reversed if the value goes back up

- Only up to the amount originally written down
- Credit gain when reversing

Note on conventions

- Using Inventory writedown is always correct
- Using COGS for inventory writedowns is fine for small adjustments
 - Usually when writing down by < 5% of inventory
 - Can use COGS for small theft
 - Do not use COGS for major price drops

Wrong in some parts of the book. Use the slides here!

When in doubt, use *Inventory writedown*.

Inventory errors

Problem in Year 1	Effect in Year 1	Effect in Year 2	Effect in Year 3
Overstated inventory (understated COGS)	I/S: Gross profit and net income overstated. B/S: Assets and equity overstated.	I/S: Gross profit and net income understated. B/S: Assets and equity back to normal.	I/S: Back to normal. B/S: No change.
Understated inventory (overstated COGS)	I/S: Gross profit and net income understated. B/S: Assets and equity understated.	I/S: Gross profit and net income overstated. B/S: Assets and equity back to normal.	I/S: Back to normal. B/S: No change.



Gross profit method

- When you have a fixed margin, you can use this to determine COGS
 - Fixed margin means that COGS = constant % of sales
- Allows you to avoid counting inventory
- Example:
 - Coffee corp always sells bags of beans at a 25% markup. Revenue from selling bags of beans for the year was \$10,000. What was the COGS for selling bags of beans?
 - Gross Margin = $1 \frac{1}{1+25\%} = 20\%$
 - COGS% = 1 Margin = 80%
 - $COGS = Sales \times COGS\% = $10,000 \times 80\% = $8,000$

Practice: Gross profit method

Situation: Coffee Corp sells all of their products using fixed margins. Determine the COGS for each product below, using the given revenues.

- 1. \$50,000 worth of lattes were sold with a fixed gross margin of 70%
- 2. \$9,000 worth of travel mugs were sold at a 50% mark-up
- 3. \$1,000 worth of espresso cups were sold, comprising 50 cups each sold with \$8 profit (all cups cost the same)



Solution: Gross profit method

Situation: Coffee Corp sells all of their products using fixed margins. Determine the COGS for each product below, using the given revenues.

- 1. \$50,000 worth of lattes were sold with a fixed gross margin of 70%
- 2. \$9,000 worth of travel mugs were sold at a 50% mark-up
- 3. \$1,000 worth of demitasse (espresso cups) were sold, comprising 50 cups each sold with \$8 profit (all cups cost the same)

Solution

- 1. $COGS = $50,000 \times (1 70\%) = $15,000$
- 2. $COGS = \$9,000 \times \frac{1}{1+50\%} = \$6,000$
- 3. $COGS = \$1,000 50 \times \$8 = \$600$



Inventory costing



Inventory tracking methods

1. FIFO
First In, First Out

2. LIFO
Last In, First Out

3. Average costValue / number of items

4. Specific identificationOne-to-one tracking

LIFO *is not allowed under IFRS* – but you need to know it

First three only require minimal tracking, and are used when you have multiple orders of the same thing

Specific unit

- Only used with expensive items
 - Too costly to track individual items otherwise
- Examples
 - Cars
 - Luxury goods
 - Real estate





Record COGS with revenue

FIFO

First In, First Out

- Assumes you sell items in the order you received them
- Ex.: You buy 5 bags of coffee beans for \$10 each, and then another 5 at \$12 each. You sell 3 bags and then 4 bags.
 - The first 3:
 - \mathbf{I} 3 \times 10 = \$30
 - The next 4:
 - **2** × 10 + 2 × 12 = \$44
 - COGS: \$74 for 7 bags



LIFO

- Last In, First Out
- Assumes you sell the most recent items first
- Ex.: You buy 5 bags of coffee beans for \$10 each, and then another 5 at \$12 each. You sell 3 bags and then 4 bags.
 - The first 3:
 - **3** \times **12** = \$36
 - The next 4:
 - **2** × 12 + 2 × 10 = \$44
 - COGS: \$80 for 7 bags



Average cost

$$Price = rac{P_1 imes N_1 + P_2 imes N_2 + \cdots}{N_1 + N_2 + \cdots}$$

Assumes you sell a mix
Weighted average
P_i: price per item for order i
N_i: number of items in order i
Ex.: You buy 5 bags of coffee beans for \$10 each, and then another 5 at \$12 each. You sell 3 bags and then 4 bags.

Avg cost:

$$\frac{5 \times 10 + 5 \times 12}{5 + 5} = \$11$$

COGS: 7 × \$11 = \$77



Mixing in perpetual/periodic

Perpetual

- 1. Calculate COGS for sales up to first purchase
- 2. Add in first purchase
- 3. Calculate COGS for sales up to next purchase
- 4. Add in next purchase
- 5. Repeat 3 and 4 until done

Periodic

- 1. Write out all your inventory for the period
- 2. Determine what was sold

Comparison

- Profit depends on method choice!
 - FIFO typically leads to higher net income
 - Real effect: taxes depend on net income!
 - Use LIFO to minimize taxes?
- Choice can affect important ratios used in debt contracting
- Changing methods is allowed, but you need to report using both then
 - From our enhancing characteristic of *comparability*
- Reliability
 - FIFO leaves the most recent purchases in inventory, so the balance sheet numbers are more reliable
 - LIFO puts the most recent purchases in COGS, so the income statement numbers are more reliable
 - Average cost is between the two

Example: FIFO, Perpetual

Started with 10 bags of coffee beans at \$10 each. Then: 1) purchased 5 bags at \$12 each; 2) Sold 7 bags; 3) Bought 10 bags at \$8 each; 4) Sold 4 bags; 5) Sold 4 bags. Determine COGS.



Example: LIFO, Perpetual



Example: Average cost, Perpetual

Started with 10 bags of coffee beans at \$10 each. Then: 1) purchased 5 bags at \$12 each; 2) Sold 7 bags; 3) Bought 10 bags at \$8 each; 4) Sold 4 bags; 5) Sold 4 bags. Determine COGS.



Example: FIFO, Periodic



Example: LIFO, Periodic



Example: Average cost, Periodic



Inventory: Effects on Financial statements

- Inventory goes to the balance sheet
 - Almost always a current asset
 - Slow moving inventories can be non-current assets
- Purchase discounts decrease inventory
- COGS is an expense \Rightarrow goes to income statement
- Sales returns and allowance, sales discount affect income statement
 - Decrease net revenue
- Inventory write-downs decrease net income
 - Reversals are gains \Rightarrow increase OCI



Practice

Situation: Coffee Corp started the year with 100 coffee cups for sale, each originally purchased at \$8. Determine the cost of goods sold under each inventory system given the transactions on the right.

- FIFO, Perpetual
- LIFO, Perpetual
- Average cost, Perpetual
- FIFO, Periodic
- LIFO, Periodic
- Average cost, Periodic

- 1. Sold 40 cups
- 2. Purchased 60 cups, \$10 each
- 3. Sold 90 cups
- 4. Purchased 90 cups, \$12 each
- 5. Sold 80 cups

Solutions

1. FIFO, Perpetual: \$2,000 Remaining: 40 @ \$12 2. LIFO, Perpetual: \$2,120 Remaining: 10 @ \$12, 30 @ \$8 3. Average cost, Perpetual: \$2,030 Remaining: 40 @ \$11.25 4. FIFO, Periodic: \$2,000 Remaining: 40 @ \$12 5. LIFO, Periodic: \$2,160 Remaining: 40 @ \$8 6. Average cost, Periodic: \$2,083.20 Remaining: 40 @ \$9.92

Solution: FIFO, Perpetual

	Start 100 @ \$8 each	1) Sold 40 cups	2) Bought 60 cups @ \$10 each	3) Sold 90 cups	4) Bought 90 cups @ \$12 each	5) Sold 80 cups
	100 @ \$8	60 @ \$8	60 @ \$8	30 @ \$10	30 @ \$10	40 @ \$12
			60 @ \$10		90 @ \$12	
	Inv: \$800	Inv: \$480	Inv: \$1,080	Inv: \$300	lnv: \$1,380	Inv: \$480
			Bought: \$600		Bought: \$1,080	
		COGS: \$320		COGS: \$780		COGS: \$900
(COGS = Starting Inv + Purchased - Ending Inv			COGS =	Sum of COGS	per sale
COGS = \$800 + \$600 + \$1,080 - \$480 = \$2,000			COGS = \$320 + \$780 + \$900 = \$2,000			



Solution: LIFO, Perpetual



Solution: Average Cost, Perpetual





Solution: FIFO, Periodic





Solution: LIFO, Periodic





Solution: Average cost, Periodic





For next week

- 1. Read the pages for next week
 - Chapter 7 (PP&E, Intangibles)
- 2. No homework
- 3. Practice on eLearn: Journal entries #2
 - Focus on inventory
 - Automatic feedback provided
 - Will be posted over the weekend
 - Take a few days off of studying :)



For Saturday

- 1. Read the pages for next session if you have time
- 2. Check elearn announcements tomorrow at 3:30 for details
 - There will be slides to read
 - Examples to solve
 - A quick knowledge check on elearn as a quiz
 - Take the quiz it will count for extra participation
- 3. Join the webex class at 3:30pm on Saturday.
 - Details will be on elearn under announcements
 - Attendance will count for full participation
- 4. Practices:
 - Session 5's will be posted over the weekend
 - Session 6's will be posted next week