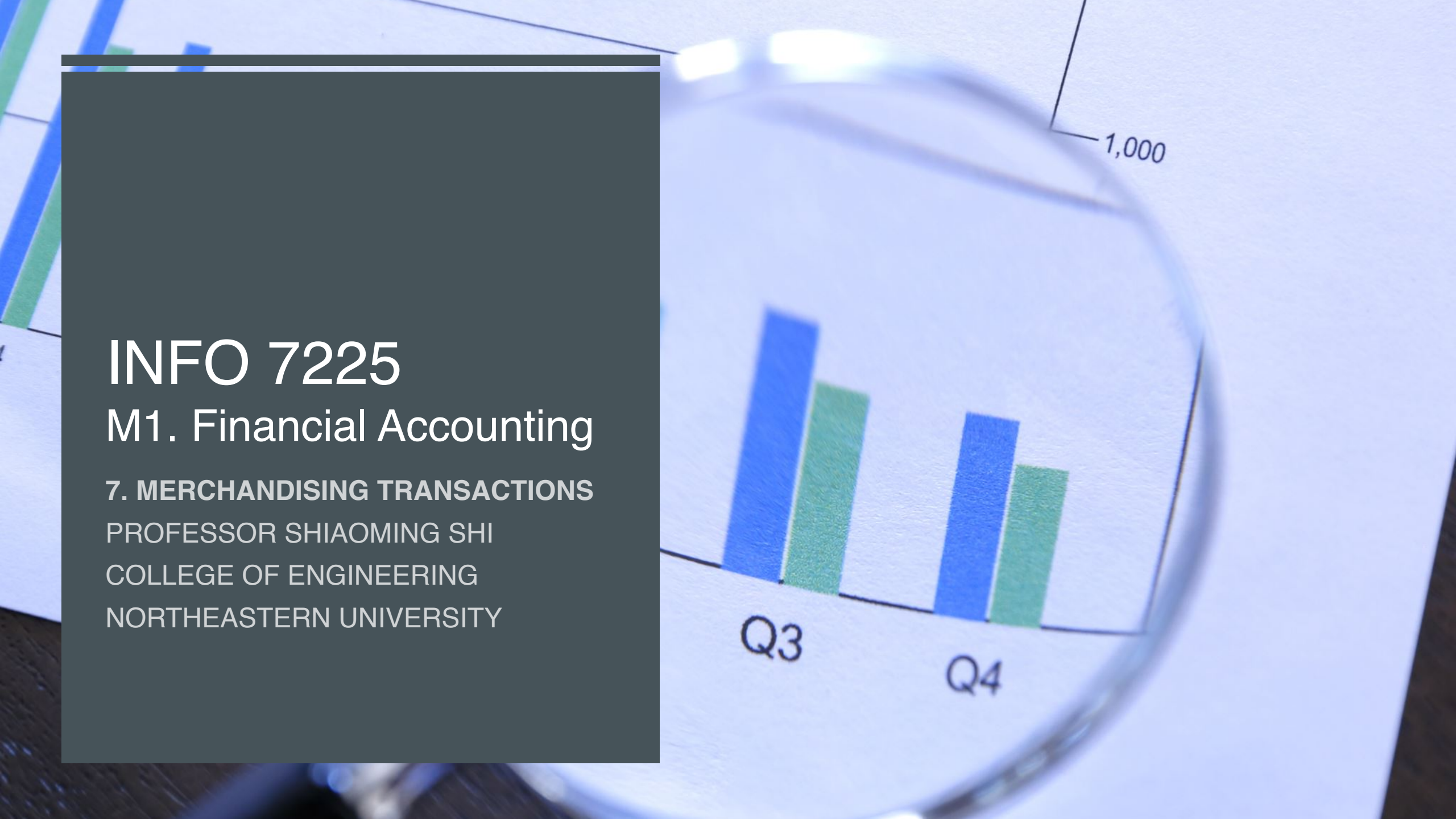


INFO 7225

M1. Financial Accounting

7. MERCHANDISING TRANSACTIONS

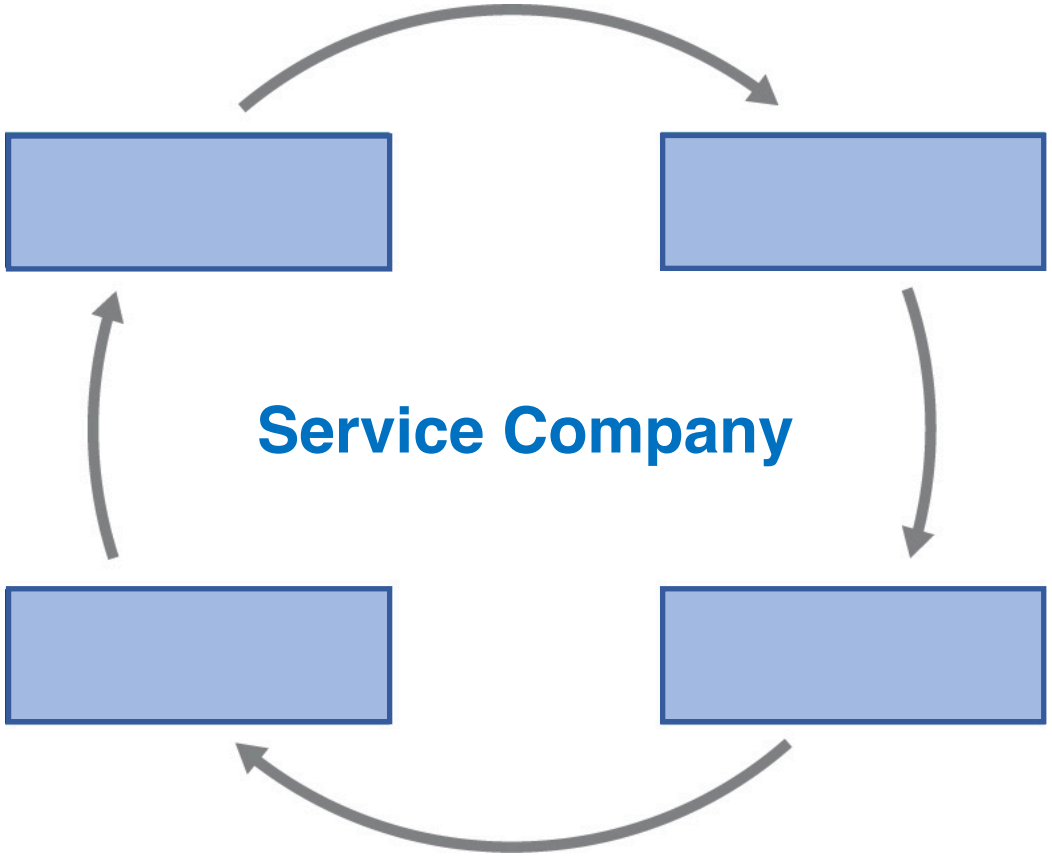
PROFESSOR SHIAOMING SHI
COLLEGE OF ENGINEERING
NORTHEASTERN UNIVERSITY

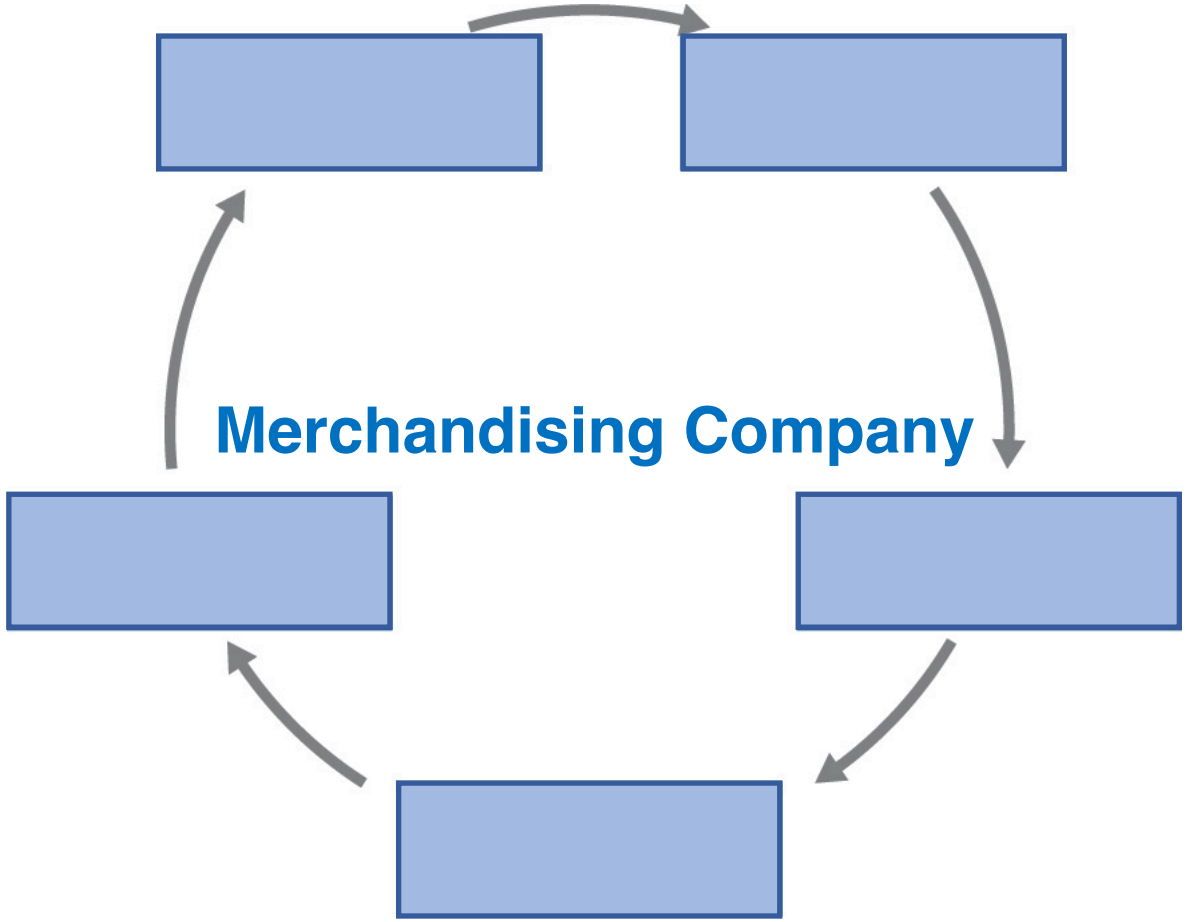
LEARNING OBJECTIVES

After completing this session, you should be able to

1. **Explain the difference between the two systems/methods that are used in merchandise inventory accounting: perpetual system and periodic system;**
2. **Describe the two cost flow assumptions commonly used in merchandise inventory accounting: first-in, first-out (FIFO) and last-in, first-out (LIFO);**
3. **Analyze revenues (sales), cost of goods sold (COGS), ending inventory, and gross profit using FIFO and LIFO.**

TYPICAL OPERATING CYCLE FOR A _____:





Differences Between the Income Statements of a Service Company and a Merchandising Company

Walmart Inc. (WMT) Balance Sheet

All numbers in thousands

Breakdown	1/31/2022	1/31/2021	1/31/2020	1/31/2019
Total Assets	244,860,000	252,496,000	236,495,000	219,295,000
Current Assets	81,070,000	90,067,000	61,806,000	61,897,000
Cash, Cash Equivalents & S...	14,760,000	17,741,000	9,465,000	7,722,000
Receivables	8,280,000	6,516,000	6,284,000	6,283,000
Inventory	56,511,000	44,949,000	44,435,000	44,269,000
Prepaid Assets	1,519,000	20,861,000	1,622,000	3,623,000
Total non-current assets	163,790,000	162,429,000	174,689,000	157,398,000
Total Liabilities Net Minority Int...	152,969,000	164,965,000	154,943,000	139,661,000
Total Equity Gross Minority Inte...	91,891,000	87,531,000	81,552,000	79,634,000

https://finance.yahoo.com/quote/WMT/balance-sheet?p=WMT

Walmart Inc. (WMT)

Income Statement

All numbers in thousands

Breakdown	TTM	1/31/2022	1/31/2021	1/31/2020	1/31/2019
> Total Revenue	576,013,000	572,754,000	559,151,000	523,964,000	514,405,000
Cost of Revenue	432,575,000	429,000,000	420,315,000	394,605,000	385,301,000
Gross Profit	143,438,000	143,754,000	138,836,000	129,359,000	129,104,000
> Operating Expense	119,087,000	117,812,000	116,288,000	108,791,000	107,147,000
Operating Income	24,351,000	25,942,000	22,548,000	20,568,000	21,957,000
> Net Non Operating Interest Inc...	-1,719,000	-1,836,000	-2,194,000	-2,410,000	-2,129,000
> Other Income Expense	-4,879,000	-5,410,000	210,000	1,958,000	-8,368,000
Pretax Income	17,753,000	18,696,000	20,564,000	20,116,000	11,460,000

https://finance.yahoo.com/quote/WMT/balance-sheet?p=WMT

Walmart Inc. (WMT)

Cash Flow

All numbers in thousands

Breakdown	TTM	1/31/2022	1/31/2021	1/31/2020	1/31/2019
> Operating Cash Flow	17,565,000	24,181,000	36,074,000	25,255,000	27,753,000
> Investing Cash Flow	-16,423,000	-6,015,000	-10,071,000	-9,128,000	-24,036,000
> Financing Cash Flow	-12,114,000	-22,828,000	-16,117,000	-14,299,000	-2,537,000
> End Cash Position	11,922,000	14,834,000	17,788,000	9,515,000	7,756,000

https://finance.yahoo.com/quote/WMT/balance-sheet?p=WMT

Merchandise Inventory Accounting: Two Different Systems/Methods

	Perpetual System	Periodic System
Inventory purchase transaction:		
Sales transaction:		

Merchandising Company: Revenue, Cost of Goods Sold (COGS), and Ending Inventory Computation

Q1			Q2			Q3			Q4			t	
Beg. Inv.	Buy			Buy			Buy			Buy			
10	10			10			10			10		units	
$100	$110			$120			$130			$140		per unit	
		Sell			Sell			Sell			Sell		
		10			10			10			5	units	
		$150			$160			$170			$180	per unit	
Rev.	= $			= $			= $			= $			
Perpetual System:													
		COGS			COGS			COGS			COGS	Ending Inv.	
FIFO:													
LIFO:													

FIFO, first-in, first-out; LIFO, last-in, first-out

Merchandising Company: Revenue, Cost of Goods Sold (COGS), and Ending Inventory Computation

Q1			Q2			Q3			Q4			t	
Beg. Inv.	Buy			Buy			Buy			Buy			
10	10			10			10			10		units	
$100	$110			$120			$130			$140		per unit	
		Sell			Sell			Sell			Sell		
		10			10			10			5	units	
		$150			$160			$170			$180	per unit	
Rev.	= $			= $			= $			= $			
Perpetual System:													
		COGS			COGS			COGS			COGS	Ending Inv.	
FIFO:													
LIFO:													

FIFO, first-in, first-out; LIFO, last-in, first-out

Merchandising Company: Revenue, Cost of Goods Sold (COGS), and Ending Inventory Computation

Q1			Q2			Q3			Q4			t
Beg. Inv.	Buy			Buy			Buy			Buy		
10	10			10			10			10		units
$100	$110			$120			$130			$140		per unit
		Sell			Sell			Sell			Sell	
		10			10			10			5	units
		$150			$160			$170			$180	per unit
Rev.	= $			= $			= $			= $		
Periodic System:												
		COGS			COGS			COGS			COGS	Ending Inv.
FIFO:												
LIFO:												

FIFO, first-in, first-out; LIFO, last-in, first-out

Merchandising Company: Revenue, Cost of Goods Sold (COGS), and Ending Inventory Computation

Q1			Q2			Q3			Q4			t
Beg. Inv.	Buy			Buy			Buy			Buy		
10	10			10			10			10		units
$100	$110			$120			$130			$140		per unit
		Sell			Sell			Sell			Sell	
		10			10			10			5	units
		$150			$160			$170			$180	per unit
Rev.	= $			= $			= $			= $		
Periodic System:												
		COGS			COGS			COGS			COGS	Ending Inv.
FIFO:												
LIFO:												

FIFO, first-in, first-out; LIFO, last-in, first-out

Perpetual System:		
	FIFO	**LIFO**
COGS		
Ending Inventory		

Periodic System:		
	FIFO	**LIFO**
Beginning Inventory		
Purchases		
Ending Inventory*		
COGS		

*Ending inventory: from physical count at the end of an accounting period.

FIFO		
LIFO		

SUMMARY

- A perpetual inventory system inventory updates merchandise inventory and sales records constantly.
- A periodic inventory system only records updates to inventory and costs of sales at scheduled times throughout the year, not constantly. Merchandise Inventory and Cost of Goods Sold are updated at the end of a period.
- FIFO:
- LIFO:

INFO 7225

M1. Financial Accounting

8. ACCOUNTING FOR LONG-TERM ASSETS

PROFESSOR SHIAOMING SHI
COLLEGE OF ENGINEERING
NORTHEASTERN UNIVERSITY

LEARNING OBJECTIVES

After completing this session, you should be able to

1. **Distinguish between tangible and intangible assets;**
2. **Analyze and classify capitalized costs versus expenses;**
3. **Explain and apply different depreciation methods to allocate capitalized costs;**
4. **Describe accounting for intangible assets and record related transactions;**
5. **Describe some special issues in accounting for long-term assets.**

Distinguish between Tangible and Intangible Assets

- Assets are items a business owns.
- For accounting purposes, assets are categorized as *current* versus *long term*, and *tangible* versus *intangible*.
- Long-term assets
  - ➢ Assets that are expected to be used by the business for more than one year are considered long-term assets.
  - ➢ They are **not** intended for resale and are anticipated to help generate revenue for the business in the future.
  - ➢ Some common long-term assets are computers and other office machines, buildings, vehicles, software, computer code, and copyrights.
  - ➢ Although these are all considered long-term assets, some are tangible and some are intangible.

Tangible Assets

- An asset is considered a tangible asset when it is an economic resource that has physical substance—it can be seen and touched.

Short term, such as inventory and supplies

Long term, such as land, buildings, and equipment (aka fixed asset)

1) Be used in the normal operation of the business for more than one year
2) not near the end of its useful life, and
3) the company must have no plan to sell the item in the near future

Intangible Assets

- Companies may have other long-term assets used in the operations of the business that they do not intend to sell, but that do not have physical substance; these assets still provide specific rights to the owner and are called intangible assets.
- These assets typically appear on the balance sheet following long-term tangible assets.
- Examples of intangible assets:
  - ➢ Patents, copyrights, franchises, licenses, goodwill, sometimes software, and trademarks.
- Because the value of intangible assets is very subjective, it is usually **not** shown on the balance sheet until there is an event that indicates value objectively, such as the purchase of an intangible asset.

Useful Life of Intangible Assets

Asset	Useful Life
Patents	Twenty years
Trademarks	Renewable every ten years
Copyrights	Seventy years beyond death of creator
Goodwill	Indefinite

APPLE INC.
Consolidated Balance Sheets
(in millions)

Assets	**2017**	**2016**
Current Assets:		
Cash and Cash Equivalents	$ 20,289	$ 20,484
Short-term Marketable Securities	53,892	46,671
Accounts Receivable, Allowances of $58 and $53, respectively	17,874	15,754
Inventories	4,855	2,132
Vendor Nontrade Receivables	17,799	13,545
Other Current Assets	13,936	8,283
Total Current Assets	128,645	106,869
Long-term Marketable Securities	194,714	170,430
Property, Plant, and Equipment, net	33,783	27,010
Goodwill	5,717	5,414
Acquired Intangible Assets, net	2,298	3,206
Other Noncurrent Assets	10,162	8,757
Total Assets	$375,319	$321,686

LEARNING OBJECTIVES

After this class, you should be able to

✅ 1. Distinguish between tangible and intangible assets;

2. **Analyze and classify capitalized costs versus expenses;**
3. Explain and apply depreciation methods to allocate capitalized costs;
4. Describe accounting for intangible assets and record related transactions;
5. Describe some special issues in accounting for long-term assets.

Important Concepts: Expense vs. Depreciation

Two types of business expenditures

- **EXPENSES:** Expenditures such as labor, services, materials are examples of items that are fully deducted from current year taxable income;
- **DEPRECIATION:** Expenditures for capital assets, on the other hand, cannot be fully deducted from taxable income in the year in which they occur; instead, they must be spread out or distributed over some allowable recovery period.

Capitalized Costs on PPE

Property, plant, and equipment (PPE)

- Used in the business operations
- Useful life > 1 year

The asset is typically capitalized.  ("Capitalization")

Matching principle

The historical cost of the long-term asset is recorded on the balance sheet when the asset is acquired.

Its allocated costs are expensed on the income statement over *the asset's economic life.*

Distinguish between PPE and Investment

When a business purchases a long-term asset (used for more than one year), it classifies the asset based on whether the asset is used in the business's operations.

Property, plant, and equipment (PPE)

- **Used in the business operations.**
- For example, if a business owns land on which it operates a store, warehouse, factory, or offices, the cost of that land would be included in property, plant, and equipment.

Investment

- Long-term assets that are **not** used in daily operations
- If a business owns a vacant piece of land on which the business conducts no operations (and assuming no current or intermediate-term plans for development), the land would be considered an investment.

Distinguish between PPE and Investment

A long-term tangible asset is acquired.

Used in the day-to-day operations of the business?

Yes

The cost is capitalized and then depreciated over the useful life of that asset.

No

Purchased for investment purposes; will be considered an investment asset:

- short term (can be converted to cash in one year) or
- long term (held for over a year)

Costs Incurred on Service of PPE

Is the useful life of the asset extended?

Yes

Capitalized and then depreciated.

No

Expensed during current reporting period.

Expenditures Are Either Capitalized Or Expensed

1. Assets: PPE or investment?
    1) Land next to the production facility held for use next year as a place to build a warehouse _____
    2) Land held for future resale when the value increases _____
    3) Equipment used in the production process _____
2. Expenditures: capitalized or expensed?
    1) Normal repair and maintenance on the manufacturing facility _____
    2) Cost of taxes on new equipment used in business operations _____
    3) Shipping costs on new equipment used in business operations _____
    4) Cost of a minor repair on existing equipment used in business operations _____

Analyze and Classify Capitalized Costs versus Expenses

- Capitalization is the process by which
  - ➢ a long-term asset is recorded on the balance sheet, and
  - ➢ its allocated costs are expensed on the income statement over *the asset's economic life.*

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Machine	5,000	
	Cash		5,000

JOURNAL			
Date	**Account**	**Debit**	**Credit**

LEARNING OBJECTIVES

After this class, you should be able to

1. ✅ Distinguish between tangible and intangible assets;
2. ✅ Analyze and classify capitalized costs versus expenses;
3. **Explain and apply depreciation methods to allocate capitalized costs;**
4. Describe accounting for intangible assets and record related transactions;
5. Describe some special issues in accounting for long-term assets.

Apply Depreciation Methods to Allocate Capitalized Costs

A long-term asset is acquired.

The historical (initial) cost, including any costs to acquire the asset and get it ready for use, is recorded on B/S ("capitalization")

The capitalized cost is allocated over its anticipated economic (useful) life → I/S

There are 3 methods to allocate the cost.

Depreciation: the process of allocating the cost of using a long-term asset over its economic life.

Three Methods to Calculate Depreciation

Depreciation Method	Calculation
Straight line	(Cost – salvage value)/Useful life
Units of production	(Cost – salvage value) × (Units produced in current period/Estimated total units to be produced)
Double declining balance	Book value × Straight-line annual depreciation percentage × 2

Terminologies

The following items are important in determining and recording depreciation:

- **Cost basis**
  - Historical (initial) cost of the fixed asset, including any costs to acquire the asset and get it ready for use
- **Salvage (residual) value**
  - The price the asset will sell for or be worth as a trade-in when its useful life expires.
  - Often, the salvage value is estimated based on past experiences with similar assets
- **Useful life**
  - The length of time the asset will be productively used within operations
- **Book value**
  - The asset's original cost less accumulated depreciation.

Three Methods to Calculate Depreciation

Cost basis = P; salvage value = F; useful life = n

Straight-line method

Units-of-production method

Double-declining-balance method

Calculating and Recording Depreciation Costs

- Liam buys his silk screen machine for $10,000. He estimates that he can use this machine for five years or 100,000 presses, and that the machine will only be worth $1,000 at the end of its life. He also estimates that he will make 20,000 clothing items in year one and 30,000 clothing items in year two. Determine Liam's depreciation costs for his first two years of business using the following method and record the journal entries:
  - ➢ straight-line method
  - ➢ units-of-production method, and
  - ➢ double-declining-balance method

Calculating and Recording Depreciation Costs

- Liam buys his silk screen machine for $10,000. He estimates that he can use this machine for five years or 100,000 presses, and that the machine will only be worth $1,000 at the end of its life. He also estimates that he will make 20,000 clothing items in year one and 30,000 clothing items in year two. Determine Liam's depreciation costs for his first two years of business using the following method and record the journal entries:
  - ➢ **Straight-line method**

JOURNAL			
Date	**Account**	**Debit**	**Credit**

Calculating and Recording Depreciation Costs

- Liam buys his silk screen machine for $10,000. He estimates that he can use this machine for five years or 100,000 presses, and that the machine will only be worth $1,000 at the end of its life. He also estimates that he will make 20,000 clothing items in year one and 30,000 clothing items in year two. Determine Liam's depreciation costs for his first two years of business using the following method and record the journal entries:
  - ➢ **Units-of-production method**

Calculating and Recording Depreciation Costs

- Liam buys his silk screen machine for $10,000. He estimates that he can use this machine for five years or 100,000 presses, and that the machine will only be worth $1,000 at the end of its life. He also estimates that he will make 20,000 clothing items in year one and 30,000 clothing items in year two. Determine Liam's depreciation costs for his first two years of business using the following method and record the journal entries:
  - ➢ **Double declining balance method**

Double-declining-balance (DDB) Method

- Declining percentage p =
- DDB, p =
- Two features:
  1. Salvage value is not used in calculation of depreciation expense
  2. Assets are not allowed to depreciate below their SVs

Year	Depreciation Expense	Accumulated Depreciation	Book Value

Allocate Costs for Natural Resources and Intangible Assets

PPE (long-term tangible; fixed assets)

→ **Depreciation**

Natural resources:

- Tangible assets occurring in nature that a company owns, which are consumed when used

→ **Depletion**

- Natural resources are depleted over the life of the asset
- Use a units-consumed method
- Depletion; contra account: accumulated depletion

Intangible assets:

Amortized over the life of the asset

→ **Amortization**

- No salvage value
- Straight-line method
- No contra account required

Fundamentals of Depletion of Natural Resources

Natural resources:

- Tangible assets occurring in nature that a company owns, which are consumed when used
- Examples include lumber, mineral deposits, and oil/gas fields

- These assets are considered natural resources while they are still part of the land
- As they are extracted from the land and converted into products, they are then accounted for as inventory (**raw materials**)

Depletion

B/S:

- Natural resources are recorded on the company's books like a fixed asset, at cost
  - ➢ with total costs including all expenses to acquire and prepare the resource for its intended use

I/S:

- As the resource is consumed (converted to a product), the cost of the asset must be expensed (income statement)
  - ➢ This process is called **depletion**

Fundamentals of Depletion of Natural Resources

- As with depreciation of non-natural resource assets, a contra account called **accumulated depletion**, which records the total depletion expense for a natural resource over its life, offsets the natural resource asset account.
- Depletion expense is typically calculated based on the number of units extracted from cutting, mining, or pumping the resource from the land, similar to the units-of-production method.

- For example, assume a company has an oil well with an estimated 10,000 gallons of crude oil.
- The company purchased this well for $1,000,000, and the well is expected to have no salvage value once it is pumped dry.

- The depletion cost per gallon
  = $ / = $
- If the company extracts 4,000 gallons of oil in a given year,
  depletion expense = $

LEARNING OBJECTIVES

After this class, you should be able to

✅ 1. Distinguish between tangible and intangible assets;

✅ 2. Analyze and classify capitalized costs versus expenses;

✅ 3. Explain and apply depreciation methods to allocate capitalized costs;

4. **Describe accounting for intangible assets and record related transactions;**

5. Describe some special issues in accounting for long-term assets.

Fundamentals of Amortization of Intangible Assets

- Recall that intangible assets are recorded as long-term assets at their cost.
- As with tangible assets, many intangible assets have a finite (limited) life span so their costs must be allocated over their useful lives
  - ➢ This process is **amortization**
- Depreciation and amortization are similar in nature but have some important differences.

1. First, amortization is typically only done using the straight-line method.
2. Second, there is usually no salvage value for intangible assets because they are completely used up over their life span.
3. Finally, an accumulated amortization account is **not** required to record yearly expenses (as is needed with depreciation); instead, the intangible asset account is written down each period.

Example of Amortization

- For example, a company called Patents-R-Us purchased a product patent for $10,000, granting the company exclusive use of that product for the next twenty years.
- Therefore, unless the company does not think the product will be useful for all twenty years (at that point the company would use the shorter useful life of the product), the company will record amortization expense of:

- The amortization expense per year
  = $ = $
- Assuming that it was placed into service on October 1, 2019, amortization expense for year 2019 will be:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 1, 2019	*To record amortization on patent for period*		

LEARNING OBJECTIVES

After this class, you should be able to

✅ 1. Distinguish between tangible and intangible assets;

✅ 2. Analyze and classify capitalized costs versus expenses;

✅ 3. Explain and apply depreciation methods to allocate capitalized costs;

✅ 4. Describe accounting for intangible assets and record related transactions;

5. **Describe some special issues in accounting for long-term assets.**

Revision of Remaining Life or Salvage Value

Example:
- Kenzie has a press worth $58,000
- Its salvage value was originally estimated to be $10,000
- Its economic life was originally estimated to be five years
- Kenzie uses straight-line depreciation

After three years, Kenzie determines that the estimated useful life would have been more accurately estimated at eight years, and the salvage value at that time would be $6,000. The revised depreciation expense is calculated as shown:

- Original cost
- Depreciation previously taken
- Book value at beginning of year 4
- Revised salvage value
- Revised remaining depreciable cost

- Revised remaining useful life
- Revised depreciation (straight-line method)

Sale of an Asset

- When an asset is sold, the company must account for its depreciation up to the date of sale.
- This means companies may be required to record a depreciation entry before the sale of the asset to ensure it is current.

1. Gain
2. Loss
3. Breakeven

Sale of an Asset: Calculating Gain or Loss

Example:
- Kenzie has a press worth $58,000.
- Its salvage value was originally estimated to be $10,000.
- Its economic life was originally estimated to be five years.
- Kenzie uses straight-line depreciation.
- Kenzie sells the press at the end of the third year:

Selling price = $31,000

Cost of Press
Less: Accumulated Depreciation: Printing Press
= Book Value

Sales Price
Less: Book Value
= _____ on Sale of Printing Press

Selling price = $27,100

Cost of Press
Less: Accumulated Depreciation: Printing Press
= Book Value

Sales Price
Less: Book Value
= _____ on Sale of Printing Press

Sale of an Asset: Recording the Sale

Selling price = $29,200
Gain = $

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019			

Selling price = $31,000
Gain = $1,800

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019			

Selling price = $27,100
Loss = $2,100

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019			

Summary
Tangible versus Intangible Assets

Tangible assets:

- Tangible assets are assets that have physical substance.
- Long-term tangible assets are assets used in the normal course of operation of businesses that last for more than one year and are not intended to be resold.
  - Examples of long-term tangible assets are land, building, and machinery.

Intangible assets:

- Intangible assets lack physical substance but often have value and legal rights and protections, and therefore are still assets to the firm.
  - Examples of intangible assets are patents, trademarks, copyrights, and goodwill.

Summary
Capitalized Costs versus Expenses

Costs incurred to purchase a long-term asset

(Expenditures such as labor, services, materials are examples of items that are fully deducted from current year taxable income - "**EXPENSES**")

Used in the day-to-day operations of the business?

Yes

Capitalized and then depreciated over the useful life of that asset

No

was purchased for investment purposes/will be considered an investment asset:

- ➢ short term (can be converted to cash in one year) or
- ➢ long term (held for over a year)

Summary
Apply Depreciation Methods to Allocate Capitalized Costs

Overview

- Fixed assets are recorded at the historical (initial) cost, including any costs to acquire the asset and get it ready for use.
- Depreciation is the process of allocating the cost of using a long-term asset over its anticipated economic (useful) life.
- To determine depreciation, one needs the fixed asset's historical cost, salvage value, and useful life (in years or units).

Methods

- There are three main methods to calculate depreciation:
  1) the straight-line method
  2) units-of-production method, and
  3) double-declining-balance method

- Natural resources are tangible assets occurring in nature that a company owns, which are consumed when used.
- Natural resources are depleted over the life of the asset, using a _____ method.

Summary
Accounting for Intangible Assets

With finite life:

- Finite intangible assets are typically amortized using the straight-line method over the useful life of the asset.
- This is similar to depreciation but is credited to the intangible asset rather than to a contra account.

With infinite life:

- Intangible assets with an indefinite life are not amortized.
- They are assessed yearly for **impairment**.

Summary
Some Special Issues in Accounting for Long-Term Assets

Adjustments to asset's useful life or to its SV:

- Because estimates are used to calculate depreciation of fixed assets, sometimes adjustments may need to be made to the asset's useful life or to its salvage value.
- To make these adjustments, the asset's net book value is updated, and then the adjustments are made for the remaining years.

Sale of an Asset:

- Assets are sometimes sold before the end of their useful life.
- These sales can result in a gain, a loss, or neither, depending on the cash received and the asset's net book value.

LEARNING OBJECTIVES

After this class, you should be able to

✅ 1. **Distinguish between tangible and intangible assets;**

✅ 2. **Analyze and classify capitalized costs versus expenses;**

✅ 3. **Explain and apply depreciation methods to allocate capitalized costs;**

✅ 4. **Describe accounting for intangible assets and record related transactions;**

✅ 5. **Describe some special issues in accounting for long-term assets.**

Key Terms

1. accumulated depletion
2. accumulated depreciation
3. amortization
4. capitalization
5. contra account
6. copyright
7. current expense
8. depletion
9. depreciation
10. double-declining-balance depreciation method
11. fixed asset
12. functional obsolescence
13. goodwill
14. intangible asset
15. investment
16. long-term asset
17. natural resources
18. patent
19. physical obsolescence
20. salvage (residual) value
21. straight-line depreciation
22. tangible asset
23. trademark
24. units-of-production depreciation method
25. useful life

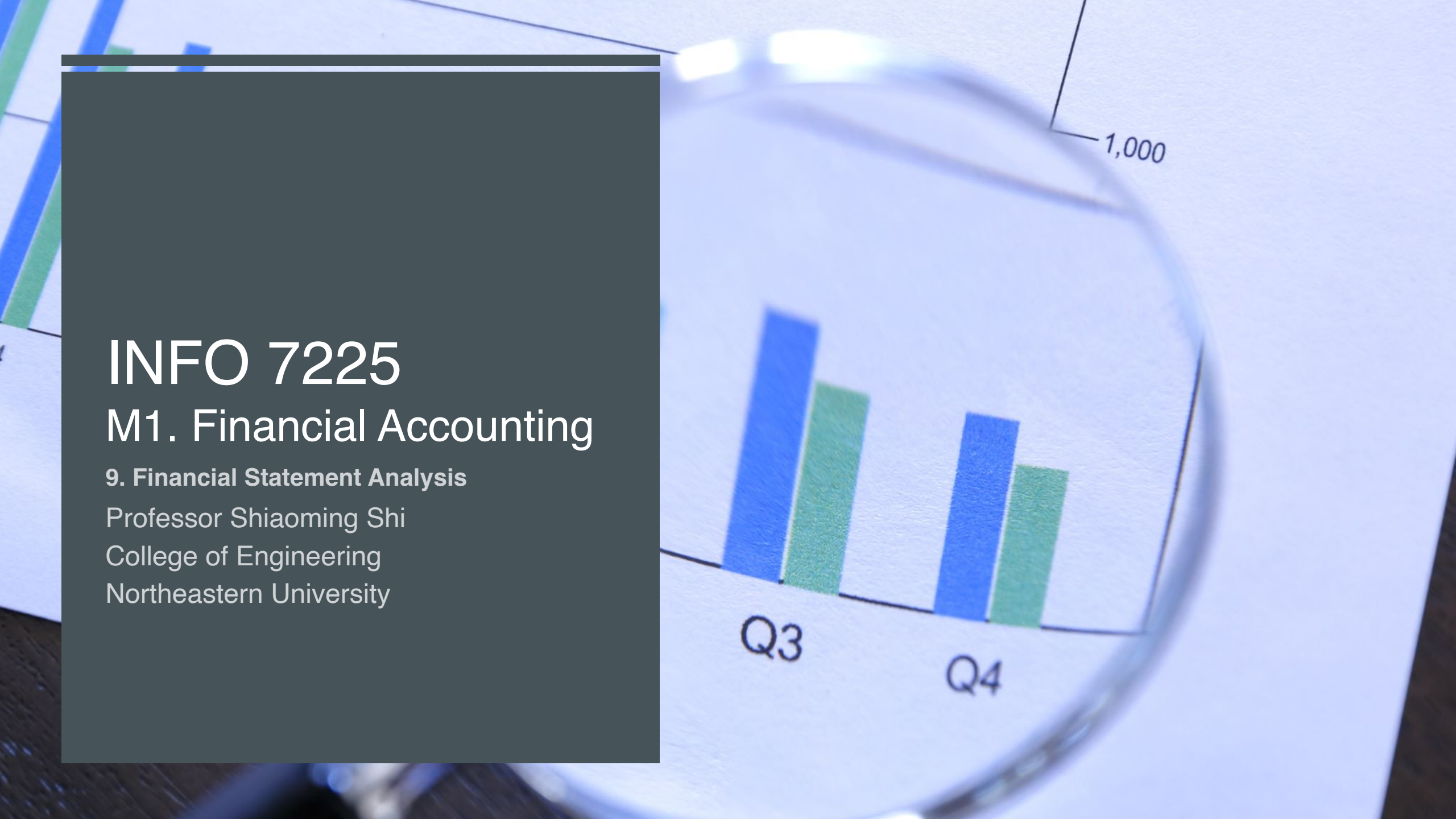
1. contra account that records the total depletion expense for a natural resource over its life
2. contra account that records the total depreciation expense for a fixed asset over its life
3. allocation of the costs of intangible assets over their useful economic lives; also, process of separating the principal and interest in loan payments over the life of a loan
4. process in which a long-term asset is recorded on the balance sheet and its allocated costs are expensed on the income statement over the asset's economic life
5. account paired with another account type, has an opposite normal balance to the paired account, and reduces the balance in the paired account at the end of a period
6. exclusive rights to reproduce and sell an artistic, literary, or musical asset
7. cost to the business that is charged in the current period
8. expense associated with consuming a natural resource
9. process of allocating the costs of a tangible asset over the asset's economic life
10. accelerated depreciation method that accounts for both time and usage, so it takes more expense in the first few years of the asset's life
11. tangible long-term asset
12. reduction of an asset's value to the company, not including physical obsolescence
13. value of certain favorable factors that a business possesses that allows it to generate a greater rate of return or profit; includes price paid for an acquired company above the fair value of its identifiable net assets
14. asset with financial value but no physical presence; examples include copyrights, patents, goodwill, and trademarks
15. short-term and long-term asset that is not used in the day-to-day operations of the business
16. asset used ongoing in the normal course of business for more than one year that is not intended to be resold
17. assets a company owns that are consumed when used; they are typically taken out of the earth
18. contract providing exclusive rights to produce and sell a unique product without competition for twenty years
19. reduction in the value of an asset to the company based on its physical deterioration
20. price that the asset will sell for or be worth as a trade-in when the useful life is over
21. depreciation method that evenly splits the depreciable amount across the useful life of the asset
22. asset that has physical substance
23. exclusive right to a name, term, or symbol a company uses to identify itself or its products
24. depreciation method that considers the actual usage of the asset to determine the depreciation expense
25. time period over which an asset cost is allocated

INFO 7225

M1. Financial Accounting

9. Financial Statement Analysis

Professor Shiaoming Shi
College of Engineering
Northeastern University



Financial Statement Analysis: Overview

Three common analysis tools

1. Horizontal analysis (trend analysis)

2. Vertical analysis (common size FS analysis)

3. Financial ratios:
   1) Liquidity ratios
   2) Solvency ratios
   3) Efficiency ratios
   4) Profitability ratios

Objectives:
1) Budgeting
2) Where to cut costs
3) How to increase revenues
4) Future capital investments

BARRY'S SUPERSTORE
Comparative Year-End Income Statements

	Prior Year	Current Year
Net Sales	$100,000	$120,000
Cost of Goods Sold	50,000	60,000
Gross Profit	50,000	60,000
Rent Expense	5,000	5,500
Depreciation Expense	2,500	3,600
Salaries Expense	3,000	5,400
Utility Expense	1,500	2,500
Operating Income	38,000	43,000
Interest Expense	3,000	2,000
Income Tax Expense	5,000	6,000
Net Income	$ 30,000	$ 35,000

BARRY'S SUPERSTORE
Comparative Year-End Balance Sheets

	Prior Year	Current Year
Assets:		
Cash	$90,000	$110,000
Accounts Receivable	20,000	30,000
Inventory	35,000	40,000
Short-Term Investments	15,000	20,000
Total Current Asstes	160,000	200,000
Equipment	40,000	50,000
Total Assets	$200,000	$250,000
Liabilities:		
Accounts Payable	$ 60,000	$ 75,000
Unearned Revenue	10,000	25,000
Total Current Liabilities	70,000	100,000
Notes Payable	40,000	50,000
Total Liabilities	110,000	150,000
Stockholder Equity		
Common Stock	75,000	80,000
Ending Retained Earnings	15,000	20,000
Total Stockholder Equity	90,000	100,000
Total Liabilities and Stockholder Equity	$200,000	$250,000

BARRY'S SUPERSTORE
Comparative Year-End Income Statements
Horizontal Analysis

	Prior Year	Current Year	Dollar Change	% Change
Net Sales	$100,000	$120,000	$20,000	20%
Cost of Goods Sold	50,000	60,000	$10,000	20%
Gross Profit	50,000	60,000	$10,000	20%
Rent Expense	5,000	5,500	$ 500	10%
Depreciation Expense	2,500	3,600	$ 1,100	44%
Salaries Expense	3,000	5,400	$ 2,400	80%
Utility Expense	1,500	2,500	$ 1,000	67% *
Operating Income	38,000	43,000	$ 5,000	13% *
Interest Expense	3,000	2,000	($ 1,000)	(33%)*
Income Tax Expense	5,000	6,000	$ 1,000	20%
Net Income	$ 30,000	$ 35,000	$ 5,000	17% *

*Rounded to nearest whole percent

Horizontal Analysis (Trend Analysis)

- Looks at **trends over time** on each financial statement line item.
- A company will look at one period (usually a year) and compare it to another period.
- The year being used for comparison purposes is called the ***base year*** (usually the prior period).

Dollar Change =

Percent Change =

BARRY'S SUPERSTORE
Comparative Year-End Income Statements
Horizontal Analysis

	Prior Year	Current Year	Dollar Change	% Change
Net Sales	$100,000	$120,000	$20,000	20%
Cost of Goods Sold	50,000	60,000	$10,000	20%
Gross Profit	50,000	60,000	$10,000	20%
Rent Expense	5,000	5,500	$ 500	10%
Depreciation Expense	2,500	3,600	$ 1,100	44%
Salaries Expense	3,000	5,400	$ 2,400	80%
Utility Expense	1,500	2,500	$ 1,000	67% *
Operating Income	38,000	43,000	$ 5,000	13% *
Interest Expense	3,000	2,000	($ 1,000)	(33%)*
Income Tax Expense	5,000	6,000	$ 1,000	20%
Net Income	$ 30,000	$ 35,000	$ 5,000	17% *

*Rounded to nearest whole percent

BARRY'S SUPERSTORE
Comparative Year-End Balance Sheets
Horizontal Analysis

	Prior Year	Current Year	Dollar Change	% Change
Assets:				
Cash	$90,000	$110,000	$20,000	22%*
Accounts Receivable	20,000	30,000	$10,000	50%
Inventory	35,000	40,000	$ 5,000	14%*
Short-Term Investments	15,000	20,000	$ 5,000	33%*
Total Current Asstes	160,000	200,000	$40,000	25%
Equipment	40,000	50,000	$10,000	25%
Total Assets	$200,000	$250,000	$50,000	25%
Liabilities:				
Accounts Payable	$ 60,000	$ 75,000	$15,000	25%
Unearned Revenue	10,000	25,000	$15,000	150%
Total Current Liabilities	70,000	100,000	$30,000	43%*
Notes Payable	40,000	50,000	$10,000	25%
Total Liabilities	110,000	150,000	$40,000	36%*
Stockholder Equity				
Common Stock	75,000	80,000	$ 5,000	7%*
Ending Retained Earnings	15,000	20,000	$ 5,000	33%*
Total Stockholder Equity	90,000	100,000	$10,000	11%*
Total Liabilities and Stockholder Equity	$200,000	$250,000	$50,000	25%

*Rounded to nearest whole percent

Criticism of Horizontal Analysis

- Pro: allows financial statement users to easily spot trends and growth patterns.
- Con: it can be manipulated to make the current period look better if specific historical periods of poor performance are chosen as a comparison.
  - ➢ Depending on which accounting period an analyst starts from and how many accounting periods are chosen, the current period can be made to appear unusually good or bad.
  - ➢ Sometimes companies change the way they break down their business segments to make the horizontal analysis of growth and profitability trends more difficult to detect.
- Con: accurate analysis can be affected by one-off events and accounting charges.

BARRY'S SUPERSTORE
Comparative Year-End Income Statements
Vertical Analysis

			Common Size*	
	Prior Year	Current Year	Prior Year	Current Year
Net Sales	$100,000	$120,000	100%	100%
Cost of Goods Sold	50,000	60,000	50%	50%
Gross Profit	50,000	60,000	50%	50%
Rent Expense	5,000	5,500	5%	5%
Depreciation Expense - Eq.	2,500	3,600	3%	3%
Salaries Expense	3,000	5,400	3%	5%
Utility Expense	1,500	2,500	2%	2%
Operating Income	38,000	43,000	38%	36%
Interest Expense	3,000	2,000	3%	2%
Income Tax Expense	5,000	6,000	5%	5%
Net Income	$ 30,000	$ 35,000	30%	29%

*Some figures rounded to the nearest whole percent, which may alter the total percentage to +/– 1% of 100%

Vertical Analysis

- Looks at each line item as a percentage of a base figure **within the same period**.
- Line items on an income statement can be stated as a percentage of net sales, while line items on a balance sheet can be stated as a percentage of total assets or liabilities.
- Also known as ***common size*** financial statement analysis.

Common-Size Percentage =

BARRY'S SUPERSTORE
Comparative Year-End Income Statements
Vertical Analysis

	Prior Year	Current Year	Common Size* Prior Year	Common Size* Current Year
Net Sales	$100,000	$120,000	100%	100%
Cost of Goods Sold	50,000	60,000	50%	50%
Gross Profit	50,000	60,000	50%	50%
Rent Expense	5,000	5,500	5%	5%
Depreciation Expense - Eq.	2,500	3,600	3%	3%
Salaries Expense	3,000	5,400	3%	5%
Utility Expense	1,500	2,500	2%	2%
Operating Income	38,000	43,000	38%	36%
Interest Expense	3,000	2,000	3%	2%
Income Tax Expense	5,000	6,000	5%	5%
Net Income	$ 30,000	$ 35,000	30%	29%

BARRY'S SUPERSTORE
Comparative Year-End Balance Sheets
Vertical Analysis

	Prior Year	Current Year	Common Size Prior Year	Common Size Current Year
Assets:				
Cash	$90,000	$110,000	45%	44%
Accounts Receivable	20,000	30,000	10%	12%
Inventory	35,000	40,000	17.5%	16%
Short-Term Investments	15,000	20,000	7.5%	8%
Total Current Asstes	160,000	200,000	80%	80%
Equipment	40,000	50,000	20%	20%
Total Assets	$200,000	$250,000	100%	100%
Liabilities:				
Accounts Payable	$ 60,000	$ 75,000	30%	30%
Unearned Revenue	10,000	25,000	5%	10%
Total Current Liabilities	70,000	100,000	35%	40%
Notes Payable	40,000	50,000	20%	20%
Total Liabilities	110,000	150,000	55%	60%
Stockholder Equity				
Common Stock	75,000	80,000	37.5%	32%
Ending Retained Earnings	15,000	20,000	7.5%	8%
Total Stockholder Equity	90,000	100,000	45%	40%
Total Liabilities and Stockholder Equity	$200,000	$250,000	100%	100%

*Some figures rounded to the nearest whole percent, which may alter the total percentage to +/– 1% of 100%

Further Analysis

- What caused this change?
- Is this change favorable or unfavorable?

- How do the percentages of this company compare with other companies in the same industry?
- In other industries?

Financial Statement Analysis: Financial Ratios

1. Horizontal analysis

2. Vertical analysis

3. Financial ratios:

1) **Liquidity ratios**
2) **Solvency ratios**
3) **Efficiency ratios**
4) **Profitability ratios**

Three common analysis tools

Ratio analysis:

1) Examine trends in performance
2) Establish benchmarks for success
3) Set budget expectations, and
4) Compare industry competitors

Financial Statement Analysis: Liquidity Ratios

1. Horizontal analysis

2. Vertical analysis

3. Financial ratios:
   - **1) Liquidity ratios**
   - 2) Solvency ratios
   - 3) Efficiency ratios
   - 4) Profitability ratios

Liquidity ratios:

1.	Working capital	= CA - CL
2.	Current ratio	= CA / CL
3.	Quick ratio	= (Cash + STI + AR) / CL

Can a company meet its short-term obligations?

CA, current assets
CL, current liabilities
STI, short-term investment
AR, accounts receivable

Ratio analysis:
1) Examine trends in performance
2) Establish benchmarks for success
3) Set budget expectations, and
4) Compare industry competitors

Current Ratio and Quick Ratio (Acid-test Ratio)

= _____ = _____

	Corp. A	*Corp. B*
Current Assets		
Cash	$ 1,000	$ 10,000
Accounts Receivable	2,000	20,000
Inventories	37,000	10,000
Total Current Assets	$ 40,000	$ 40,000
Current Liabilities	$ 20,000	$ 20,000
Current Ratio	2:1	2:1

Quick Current Assets

Cash
Short-term investments
Accounts Receivable

} These current assets are considered to be readily convertible into cash.

Non-quick Current Assets

Inventories
Prepaid Expenses

} Cash cannot be obtained either at all or easily from these current assets.

Financial Statement Analysis: Solvency Ratios

Horizontal analysis

Vertical analysis

Financial ratios:

1. Liquidity ratios
2. **Solvency ratios**
3. Efficiency ratios
4. Profitability ratios

$$\text{Debt-to-Equity Ratio} = \left(\frac{\text{Total Liabilities}}{\text{Total Stockholder Equity}}\right)$$

$$\text{Times Interest Earned} = \left(\frac{\text{Earnings before Interest and Taxes}}{\text{Interest Expense}}\right)$$

Can a company meet its long-term obligations?

Ratio analysis:

1) Examine trends in performance
2) Establish benchmarks for success
3) Set budget expectations, and
4) Compare industry competitors

Financial Statement Analysis: Efficiency Ratios

1. Horizontal analysis

2. Vertical analysis

3. Financial ratios:
   1) Liquidity ratios
   2) Solvency ratios
   3) **Efficiency ratios**
   4) Profitability ratios

Ratio analysis:
1) Examine trends in performance
2) Establish benchmarks for success
3) Set budget expectations, and
4) Compare industry competitors

- Efficiency shows how well a company uses and manages their assets.
- Areas of importance with efficiency are management of sales, accounts receivable, and inventory.
- A company that is efficient typically will be able to generate revenues quickly using the assets it acquires.

$$\text{Accounts Receivable Turnover} = \left(\frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}\right)$$

$$\text{Total Asset Turnover} = \left(\frac{\text{Net Sales}}{\text{Average Total Assets}}\right)$$

$$\text{Inventory Turnover} = \left(\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}\right)$$

$$\text{Days' Sales in Inventory} = \left(\frac{\text{Average Inventory}}{\text{Cost of Goods Sold}}\right) \times 365$$

Financial Statement Analysis: Efficiency Ratios

($000s)	Current Year	Prior Year
Net sales	$3,200	$2,800
Net credit sales	3,200	2,800
Cost of goods sold	2,500	2,150
Average AR	482	338.50
Average inventory	668	432
Average total assets	2,294	1,764.50
AR turnover		
Avg collection period		
Total asset turnover		
Inventory turnover		
Days sales in inventory		

Average AR = (beginning balance + ending balance)/2

- Efficiency shows how well a company uses and manages their assets.
- Areas of importance with efficiency are management of sales, accounts receivable, and inventory.
- A company that is efficient typically will be able to generate revenues quickly using the assets it acquires.

$$\text{Accounts Receivable Turnover} = \left(\frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}\right)$$

$$\text{Total Asset Turnover} = \left(\frac{\text{Net Sales}}{\text{Average Total Assets}}\right)$$

$$\text{Inventory Turnover} = \left(\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}\right)$$

$$\text{Days' Sales in Inventory} = \left(\frac{\text{Average Inventory}}{\text{Cost of Goods Sold}}\right) \times 365$$

Financial Statement Analysis: Profitability Ratios

1. Horizontal analysis

2. Vertical analysis

3. Financial ratios:
   1) Liquidity ratios
   2) Solvency ratios
   3) Efficiency ratios
   4) **Profitability ratios**

Ratio analysis:
1) Examine trends in performance
2) Establish benchmarks for success
3) Set budget expectations, and
4) Compare industry competitors

- Profitability considers how well a company produces returns given their operational performance.
- The company needs to leverage its operations to increase profit.

$$\text{Profit Margin} = \left(\frac{\text{Net Income}}{\text{Net Sales}}\right)$$

$$\text{Return on Total Assets} = \left(\frac{\text{Net Income}}{\text{Average Total Assets}}\right)$$

$$\text{Return on Equity} = \left(\frac{\text{Net Income}}{\text{Average Stockholder Equity}}\right)$$

DuPont Formula (Strategic Profit Model)

$$\text{Profit Margin} = \left(\frac{\text{Net Income}}{\text{Net Sales}}\right)$$

$$\text{Return on Total Assets} = \left(\frac{\text{Net Income}}{\text{Average Total Assets}}\right)$$

$$\text{Return on Equity} = \left(\frac{\text{Net Income}}{\text{Average Stockholder Equity}}\right)$$

ROE =

Financial leverage: changes in a firm's _____ structure

Company A (E = $1,000 M; L = $_____): ROE =

Company B (E = $1,000 M; L = $_____): ROE =

Company C (E = $1,000 M; L = $_____): ROE =

Advantages and Disadvantages of Financial Statement Analysis

- Financial statement analysis can show trends over time, which can be helpful in making future business decisions.
  - ➢ Converting information to percentages or ratios eliminates some of the disparity between competitor sizes and operating abilities, making it easier for stakeholders to make informed decisions.
  - ➢ It can assist with understanding the makeup of current operations within the business, and which shifts need to occur internally to increase productivity.
- Past performance does not always dictate future performance
  - ➢ Possible economic influences that could skew the numbers being analyzed
  - ➢ The way a company reports information within accounts may change over time
- A company that wants to budget properly, control costs, increase revenues, and make long-term expenditure decisions may want to use financial statement analysis to guide future operations.

Summary

Horizontal analysis is used in the review of a company's financial statements over multiple periods

- ➢ It is usually depicted as a percentage growth over the same line item in the base year
- ➢ Allows financial statement users to easily spot trends and growth patterns

Vertical analysis looks at each line item as a percentage of a base figure within the same period

- ➢ Line items on an income statement can be stated as a percentage of gross sales
- ➢ Line items on a balance sheet can be stated as a percentage of total assets or liabilities

Four categories of **financial ratios**:

- ✓ Liquidity ratios: can a company meet its short-term obligations?
- ✓ Solvency ratios: can a company meet its long-term obligations?
- ✓ Efficiency ratios: how well a company manage its resources and operation?
- ✓ Profitability ratios: how profitable is the company?

Thank you!
Questions?