Financial Accounting
Recitation 3

MIT Sloan School of Management

Finance at MIT
Where ingenuity drives results

Recitation Agenda

Inventory: LIFO vs FIFO

PPE & Depreciation

Balance Sheet

Assets

Cash & Short Term Inv

Accounts Receivable

Allowance - Doubtful Accts.

Inventory

Property & Equipment

Intangible Assets

Other Investments

Deferred Tax Assets

Liabilities

Short Term Debt

Long Term Debt

Deferred Tax Liabilities

Leases

Owner's Equity

Common Stock

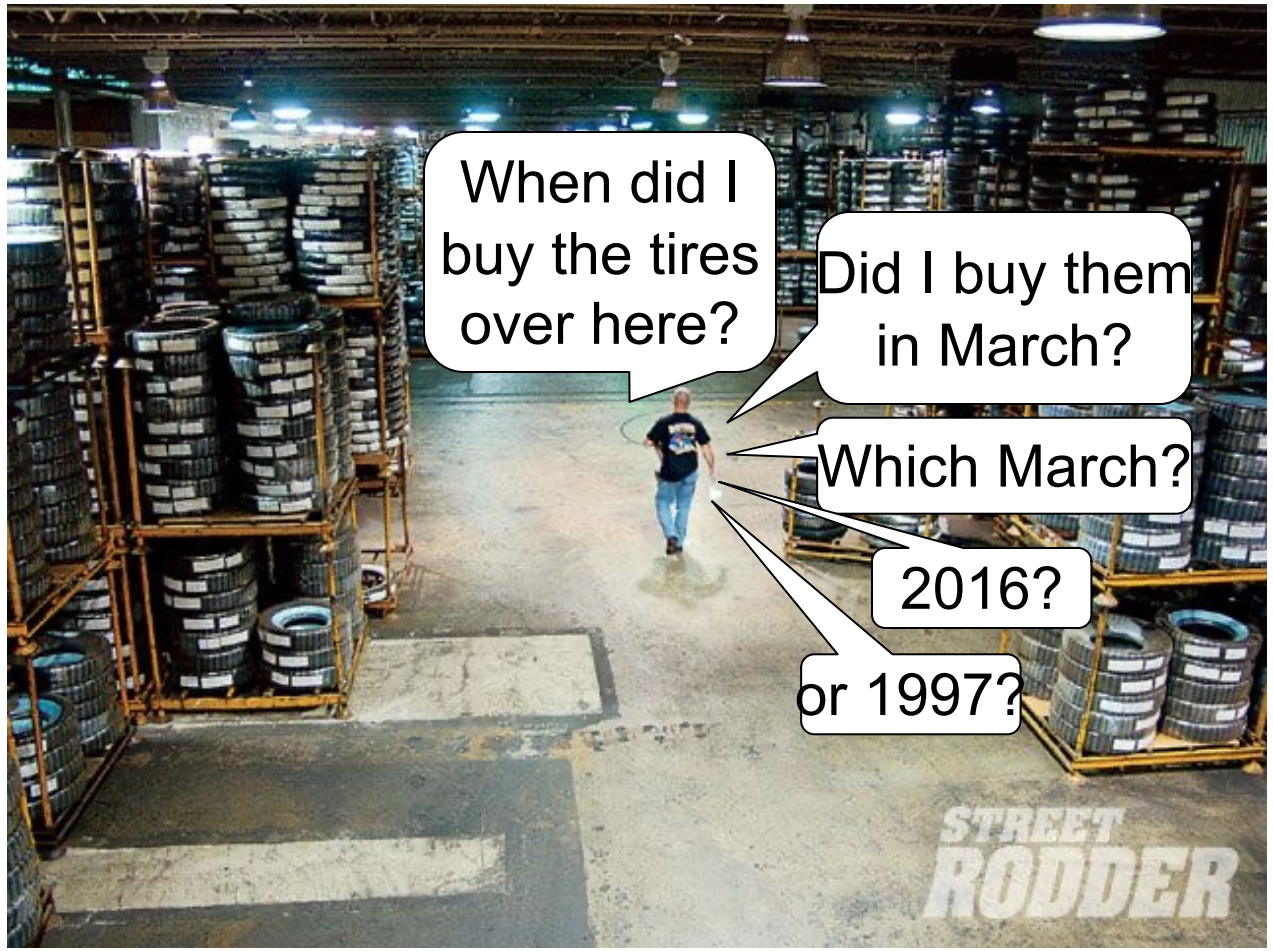
Preferred Stock

Additional Paid-in Capital

Treasury Stock

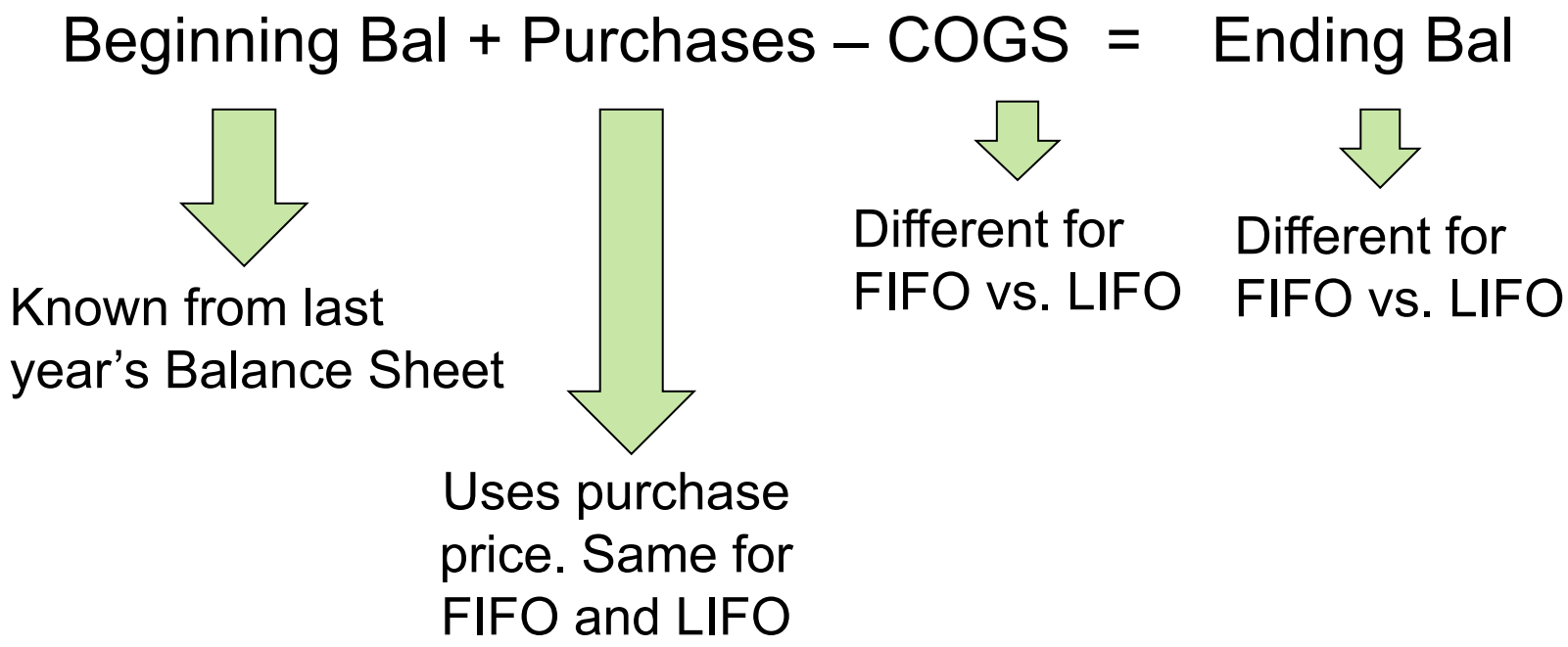
Retained Earnings

Do they know what the ending balance of inventory is?



Accounting Identity for Inventory

- Two inventory costing methods
  - Last In, First Out (LIFO)
  - First In, First Out (FIFO)



Cost flow assumption is ***independent*** of physical flow

LIFO Reserve: Linking LIFO to FIFO

What is the LIFO Reserve?

- CUMULATIVE difference between the LIFO Inventory balance and what the balance would have been if FIFO had been selected

LIFO Inventory + LIFO Reserve = FIFO Inventory

Where do you find the LIFO Reserve?

- Footnotes (sometimes in Balance Sheet, next to Inventory Line)
- Search for “inventory” in 10-k

Comparability issues

Why do some US firms use LIFO?

- Firms with rising costs want to report taxable income using LIFO
  → because taxable profits are lower
- As discussed in the lecture, LIFO results in a more accurate income statement

LIFO and FIFO firms have different accounting, so we need to adjust the accounting numbers to make them comparable.

Data is available to adjust the LIFO firm to FIFO (but not to adjust FIFO to LIFO).

LIFO vs. FIFO Illustration

		Buy 1 at 20	Sell 2
LIFO:		20	
	20	20	
	20	20	20
	10	10	10
	10	10	10
	10	10	10
LIFO Inventory:	70	90	50
LIFO COGS:			40

FIFO:		20	20
	20	20	20
	20	20	20
	10	10	10
	10	10	
	10	10	
FIFO Inventory:	70	90	70
FIFO COGS:			20
LIFO reserve:			20

Inventories: Key Equations

Key Inventory Equation:

$$\text{Ending Inventory} = \text{Begin Inventory} + \text{Purchases} - \text{COGS}$$

Adjusting LIFO to FIFO:

$$\text{Ending Inventory}_{FIFO} = \text{Ending Inventory}_{LIFO} + \text{LIFO Reserve}$$

$$\text{COGS}_{FIFO} = \text{COGS}_{LIFO} - \Delta\text{LIFO Reserve}$$

Question 1: Brown-Forman

Excerpt from 2012 Brown-Forman Form 10-K (Balance Sheet, Income Statement)

$ in millions	2012	2011	2010
Sales	$3,614	$3,404	$3,226
COGS	$928	$862	$858
Net Income	$513	$572	$449

$ in millions	2012	2011
Raw Materials Inv.	$50	$47
Finished Goods Inv.	$159	$150
WIP	$503	$450
Total Inventory	$712	$647

Excerpt from Inventory Footnote: "We state inventories at the lower of cost or market, with consolidated inventories being valued using the last-in, first-out (LIFO) method. **If we had used the FIFO method for all inventories, they would have been $204 and $213 higher than reported at April 30, 2011 and 2012, respectively.**"

Question 1 Part A: What is the Inventory Value under FIFO?

Excerpt from 2012 Brown-Forman Form 10-K (Balance Sheet, Income Statement)

$ in millions	2012	2011	2010
Sales	$3,614	$3,404	$3,226
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$ in millions	2012	2011
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WIP	$503	$450
Total Inventory	$712	$647

Inventory under FIFO in 2011:
$647 + $204 = $851m

Inventory under FIFO in 2012:
$712 + $213 = $925m

Excerpt from Inventory Footnote: "We state inventories at the lower of cost or market, with consolidated inventories being valued using the last-in, first-out (LIFO) method. **If we had used the FIFO method for all inventories, they would have been $204 and $213 higher than reported at April 30, 2011 and 2012, respectively.**"

LIFO Reserve

Question 1 Part B: What is the COGS under FIFO?

Excerpt from 2012 Brown-Forman Form 10-K (Balance Sheet, Income Statement)

$ in millions	2012	2011	2010
Sales	$3,614	$3,404	$3,226
COGS	$928	$862	$858
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FIFO COGS = LIFO COGS – ΔLIFO Reserve

ΔLIFO Reserve = $213 – $204 = $9m

FIFO COGS = $928 - $9 = $919m

Excerpt from Inventory Footnote: "We state inventories at the lower of cost or market, with consolidated inventories being valued using the last-in, first-out (LIFO) method. **If we had used the FIFO method for all inventories, they would have been $204 and $213 higher than reported at April 30, 2011 and 2012, respectively.**"

LIFO Reserve

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PP&E

Firms put PP&E on the balance sheet (capitalize it), because PP&E is believed to serve to generate future revenues → capitalization of PP&E

As firms realize benefits from PP&E, the part of cost of PP&E is transferred over time from B/S to I/S via depreciation expense → depreciation of PP&E

Depreciation is consistent with the Matching Principle!

Balance Sheet Account Formulas and their Income Statement Components

Gross Plant, Property, & Equipment

Beginning Balance
+ Capital Expenditure
(=gross PP&E purchased)
- Gross Value of Assets Disposed of or Sold

= Ending Balance*

Capitalized cost of PP&E purchase

—

Accumulated Depreciation (Contra Asset)**

Beginning Balance
+ Depreciation Expense
- Accum. Depreciation of Disposed Assets

= Ending Balance

** Assuming there is no impairment of PP&E.*
***A Contra Asset account is used to record reductions in the value of an asset.*

Estimating Depreciation Expense

The "Straight-Line Method"

Depreciation expense per year =

$$\frac{(\text{Acquisition Cost} - \text{Salvage Value})}{\text{Estimated Useful Life}}$$

Acquisition Cost: same as gross PP&E purchased.

Salvage Value: expected realizable value of asset at end of useful life.

Depreciation Base: the portion of the cost that is depreciated

= Acquisition Cost – Salvage Value

Estimated Useful Life: period over which the asset is expected to provide economic benefits to the firm (not the same as physical life).

Effects on the Financial Statements

What financial statements are affected by depreciation?

Income Statement: Depreciation Expense

Balance Sheet: Accumulated Depreciation (contra-asset)

Statement of Cash Flows

Does depreciation affect cash? No

Question 2: Lester Corp.

Lester Corp. runs Boston's most popular yappy hour, specializing in hors d'oeuvres and drinks for dogs and the people who accompany them. Lester Corp. would like to expand beyond their location in Harvard Square to an additional location in the South End. In addition to the location, Lester Corp. will need an additional oven to bake fresh dog treats each day.

On 1/1/2014 Lester Corp purchases an oven (in cash) for the new bar location in the South End. The cost of the oven is $4,000. The company chooses to depreciate the oven over 10 years, with a salvage value of $1,000.

Question 2 Part A

Use the Balance Sheet Equation to record the purchase of the oven on 1/1/2014.

Cash	+	PP&E	=	L	+	SE	R/E Description
-4000		+4000					

Question 2 Part B

Use the Balance Sheet Equation to record the depreciation expense on the new oven in 2014.

	Assets			=	Liabilities	+	S/E	Notes
Date	PP&E	-	Accum. Deprec.	=	A/P	+	R/E	
2014			$300	=			-$300	Depreciation Expense

Question 2 Part C

At the end of 2014, the company notices that the oven is of much lower quality than expected and impairs its value to $3,000. For this question only, assume no depreciation occurred in 2014. Use the balance sheet equation to record the impairment.

	Assets			=	Liabilities	+	S/E	Notes
Date	PP&E	-	Accum. Deprec.	=	A/P	+	R/E	
2014			+$1,000	=			-$1,000	Impairment Loss

Question 3 Part A: Depreciation & Disposal

Assume that a company purchases a truck for $100,000 on January 1, 2017. The company expects the truck to last 4 years and estimates a salvage value of $20,000.

What is the annual depreciation expense?

$$\frac{100{,}000 - 20{,}000}{4} = 20{,}000$$

Transactions:

	Cash	Gross PP&E	- Accum. Dep	=	R/E	
1/1/17	-100,000	100,000				
12/31/17			20,000		-20,000	Dep. Exp.
12/31/18			20,000		-20,000	Dep. Exp.
12/31/19			20,000		-20,000	Dep. Exp.
12/31/20			20,000		-20,000	Dep. Exp.

Question 3 Part B: Depreciation & Disposal

What if the truck was sold for $30,000 on January 1, 2022?

	Cash	Gross PP&E	- Accum. Dep	=	R/E	
1/1/17	-100,000	100,000				
12/31/17			20,000		-20,000	Dep. Exp.
12/31/18			20,000		-20,000	Dep. Exp.
12/31/19			20,000		-20,000	Dep. Exp.
12/31/20			20,000		-20,000	Dep. Exp.
1/1/22	30,000	-100,000	-80,000		10,000	gain on sale of PP&E

Effectively removes asset of
net book value 20,000 (=100,000-80,000)

Tip: Procedure for disposal of PPE

1. Record cash or the market value of the asset received for the sale of PPE

2. Record disposal of the asset by removing the cost (=gross value) of the asset from PPE

3. Reverse or offset the accumulated depreciation associated with the asset

4. Calculate gain or loss as follows (such that the equation is balanced):

$$\text{Cash} - (\text{Cost} - \text{AccDep}) = \text{Gain/Loss}$$