15.516x Financial Accounting

Inventories / Property, Plant, and Equipment

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Finance at MIT
Where ingenuity drives results

Introduction

Last Class:

- Finish Peters Company financial statements
- Revenue recognition
- Allowance accounting

This Class:

- Inventories
- Property, Plant, and Equipment (PPE)

Balance Sheets - Common Size (% of total assets)

	Walmart 2016		Amazon 2016	
Assets:	$	%	$	%
Cash	8,705	4%	19,334	23%
Receivables	5,694	3%	8,576	10%
Less: Allowance	(70)	0%	(237)	0%
Inventory	44,469	22%	11,461	14%
Other Current Assets	1,441	1%	6,647	8%
Total Current Assets	60,239	30%	45,781	55%
Property, Plant, & Equipment	176,958	89%	37,230	45%
Less: Accum Dep.	(66,787)	-33%	(8,116)	-10%
Goodwill	16,695	8%	3,784	5%
Other Assets	12,476	6%	4,723	6%
Total Assets	199,581	100%	83,402	100%

Motivation

Why do firms have inventory?

Want goods available to sell to customers

How do firms determine how much inventory to hold?

Firms trade-off benefits and costs:

Benefits:

- Have goods available to sell to customers

Costs:

- More inventory means less cash ; storage costs
- Inventory can go bad, become obsolete, or be stolen

Two Main Issues

Inventory accounting has two fundamental components:

1) Product Costing Decision

What costs are included in each product's inventory account?

- Raw materials
- Labor
- Indirect costs like factory depreciation

(Product costing is discussed in depth in managerial accounting)

2) Cost Flow Decision: (LIFO/FIFO)

Once costs are in the inventory account (i.e., on the Balance sheet), what costs are transferred to the Income Statement?

(The focus of this class)

The Inventory Equation

Assume that inventory accounts are updated at the end of fiscal period, as opposed to after every sale/purchase

Inventory Equation (application of BASE):

Beginning Inventory + Additions = Cost of goods sold + Ending Inventory

This is known from prior period

This is tracked within a period

Cost Flow Assumptions allocate the sum of Beg. Inv. and Additions between COGS & End Inv.

Total Costs Available

Recall the BASE equation

Every balance sheet account uses the same BASE equation:

<u>**B**</u>eginning balance (beginning inventory)

\+ <u>**A**</u>dditions (purchases)

\- <u>**S**</u>ubtractions (cost of goods sold)

= <u>**E**</u>nding balance

A giant gumball machine

LIFO vs. FIFO

The giant gumball machine contains 100,000 gumballs, and there are rising gumball prices.

What is the value of ending inventory of the gumballs in the machine?

You need a cost flow assumption!

LIFO: Last in, First out (How you shop for milk, eggs, produce)

FIFO: First in, First out (How grocery stores wish you would shop)

Note: In practice, the cost flow assumption is ***independent*** of physical flow.

Physical flows – LIFO or FIFO?

LIFO vs. FIFO - Example

Consider the following transactions:

Year 1

1. Begin firm operations by issuing stock for $100 cash
2. Purchase 7 tires for $8 each for cash
3. Sell 3 tires for $10 each for cash

Year 2

1. Purchase 5 tires for $10 each for cash
2. Sold 4 tires for $12 each for cash

Accounting for Inventory

	Year 1 units	**Year 1 inv**	**Year 2 units**	**Year 2 inv**
Beg. Units	0	0		
+ Purchases	7 units @$8	56		
= Goods Available	7 units @$8	56		
– Goods Sold	3 units @$8	24		
= Ending Inventory	4 units @$8	32		

Purchase 7 units @ $8 per unit

Does FIFO or LIFO matter in the first year?

Accounting for Inventory

	Year 1 units	**Year 1 inv**	**Year 2 units**	**Year 2 inv**
Beg. Units	0	0	4 @$8	32
+ Purchases	7 units @$8	56	5 @$10	50
= Goods Available	7 units @$8	56	9 units	82
– Goods Sold	3 units @$8	24		
= Ending Inventory	4 units @$8	32		

We sold four tires. Which costs do we allocate to the sale?

Accounting for Inventory

	Year 1 units	**Year 1 inv**	**Year 2 units**	**Year 2 inv**
Beg. Units	0	0	4 @$8	32
+ Purchases	7 units @$8	56	5 @$10	50
= Goods Available	7 units @$8	56	9 units	82
– Goods Sold	3 units @$8	24		
= Ending Inventory	4 units @$8	32		

We sold four tires. Which costs do we allocate to the sale?

Accounting for Inventory – LIFO

				LIFO
	Year 1 units	**Year 1 inv**	**Year 2 units**	**Year 2 inv**
Beg. Units	0	0	4 @$8	32
+ Purchases	7 units @$8	56	5 @$10	50
= Goods Available	7 units @$8	56	9 units	82
– Goods Sold	3 units @$8	24	4 @$10	40
= Ending Inventory	4 units @$8	32	1 @$10 4 @$8	42

Under LIFO Accounting?

Accounting for Inventory – FIFO

				FIFO
	Year 1 units	**Year 1 inv**	**Year 2 units**	**Year 2 inv**
Beg. Units	0	0	4 @$8	32
+ Purchases	7 units @$8	56	5 @$10	50
= Goods Available	7 units @$8	56	9 units	82
– Goods Sold	3 units @$8	24	4 @$8	32
= Ending Inventory	4 units @$8	32	5 @$10	50

Under FIFO Accounting?

A Comparison of LIFO and FIFO Costs

	Income Statement	Balance Sheet	
FIFO	Old costs $32	New costs $50	Total costs $82
LIFO	New costs $40	Old costs $42	Total costs $82

FIFO: Costs of older/cheaper products hit current income as COGS
Newer/expensive inventory is reflected in INV on B/S

LIFO: Costs of newer/expensive products hit current income as COGS
Older/cheaper inventory is reflected in INV on B/S

A Comparison of LIFO and FIFO Costs (assuming rising prices)

	Income Statement	Balance Sheet	
FIFO	Old costs	New costs	Total costs
LIFO	New costs	Old costs	Total costs

FIFO: More accurate balance sheet

LIFO: More accurate income statement

Inventory on the Balance Sheet – Comparability

LIFO vs. FIFO over time

Under increasing input prices, ending inventory ("EInv")

	$EInv_{LIFO}$	$\leq$	$EInv_{FIFO}$
Year 2:	$42		$50

Are LIFO firms' inventories less valuable?

- No, the cost flow assumption is ***independent*** of physical flow

Inventory on the Income Statement – Comparability

LIFO vs. FIFO over time

Under increasing prices and continuous buildup of cost layers (i.e., the firm has inventories purchased at different prices)

	$COGS_{LIFO}$	$\geq$	$COGS_{FIFO}$
Year 2:	$40		$32
	Gross $profit_{LIFO}$	$<$	Gross $profit_{FIFO}$
Year 2:	$8		$16

Do profit differences signal differences in economic performance?

- No, they simply reflect differences in financial reporting

US LIFO Conformity Rule

If a firm uses LIFO for US tax purposes, it must also use LIFO for financial reporting purposes. Thus, if firm uses FIFO for financial reporting, it must use FIFO for tax purposes.

(This is a rare instance where financial reporting must be same as tax reporting.)

When prices are increasing, LIFO firms report lower profits… (and thus pay lower taxes).

What inventory method will firms choose?

One consideration is to minimize the present value of tax payments.

International Financial Reporting Standards (IFRS) vs. US GAAP (not on exam)

IFRS adopted by over 120 countries, but degree of adoption varies:

- Australia, Hong Kong - all
- Europe – almost all
- China and others – “convergence”

IFRS is in general similar to US GAAP:

- Differences usually subtle -- “advanced accounting.”
- IFRS is more focused on accurate balance sheet, whereas GAAP is more focused on accurate income statement.
- GAAP is rules-based, whereas IFRS is principles-based.
- At end of this course, you will be able to read an IFRS report just as well as a US GAAP report.

IFRS vs. US GAAP and Taxes
(not on exam)

Some differences in IFRS related to this course:

- Inventory — Under IFRS, LIFO cannot be used.
- PPE can be re-valued upward in IFRS.
- Development costs can be capitalized under IFRS, but are expensed under US GAAP.

For a more in-depth comparison, see *optional* readings on web.

The US Securities and Exchange Commission (SEC) has been evaluating IFRS, but seems unlikely to approve.

If IFRS is required for US firms, what do you think the tax implications are?

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 earlier, 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).

In order to Compare firms: Adjusting LIFO to FIFO – The LIFO Reserve

Different “cost layers” of Inventory at the end of Year 2:

LIFO	FIFO
1@$10	5@$10
4@$8	
$42	**$50**

If companies are using LIFO, they are required to disclose the *current cost* of their LIFO inventory in their footnotes

The difference between current cost and LIFO inventory value is referred to as the LIFO Reserve

Most companies will disclose the following:

$$\text{LIFO Reserve} = \text{Ending Inv}_{FIFO} - \text{Ending Inv}_{LIFO}$$

What is Exxon-Mobil's Inventory under FIFO?
Exxon-Mobil – Inventory Footnote

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The aggregate replacement cost of inventories was estimated to exceed their LIFO carrying values by $25.6 billion and $21.3 billion at December 31, 2011, and 2010, respectively.

Crude oil, products and merchandise as of year-end 2011 and 2010 consist of the following:

	2011	2010
	(billions of dollars)	
Petroleum products	$ 4.1	$3.5
Crude oil	4.8	3.8
Chemical products	2.3	2.1
Gas/other	0.5	0.5
Total	$11.7	$9.9

LIFO Reserves

Inventory under LIFO

2011 FIFO value?

$11.7 + 25.6 = $37.3

If Exxon-Mobil switched to FIFO at end of 2011, what would be the effect on income taxes?

Reworded:

How large is Exxon-Mobil's cumulative tax savings by using LIFO?

Assume a tax rate of 30%.

LIFO reserve at 12/31/11:

$25.6 billion

This number represents the additional amount charged to COGS since the firm began using LIFO.

Tax effect:

30% of $25.6 billion = $7.7 billion in cumulative tax savings

What is Exxon-Mobil's COGS under FIFO?
Exxon-Mobil Income Statement

	2011	2010	2009
		(millions of dollars)	
Total revenues and other income	$ 486,429	$ 383,221	$ 310,586
Costs and other deductions			
Cost of goods sold	$ 306,802	$ 233,751	$ 185,833
Selling, general and administrative	14,983	14,683	14,735
Depreciation and depletion	15,583	14,760	11,917
Exploration expenses	2,081	2,144	2,021
Interest expense	247	259	548
Sales-based taxes	33,503	28,547	25,936
Other taxes and duties	39,973	36,118	34,819
Total costs and other deductions	$ 413,172	$ 330,262	$ 275,809
Income before income taxes	$ 73,257	$ 52,959	$ 34,777

What is Exxon-Mobil's COGS under FIFO? To compute, adjust $LIFO_{COGS}$ to $FIFO_{COGS}$

$EInv_{FIFO} = BInv_{FIFO} + Additions - COGS_{FIFO}$

$EInv_{LIFO} = BInv_{LIFO} + Additions - COGS_{LIFO}$

The amount of additions does not depend upon the choice of LIFO/FIFO

$(EInv_{FIFO} - EInv_{LIFO}) = (BInv_{FIFO} - BInv_{LIFO}) + COGS_{LIFO} - COGS_{FIFO}$

$(\text{End LIFO Reserve}) = (\text{Beg LIFO Reserve}) + COGS_{LIFO} - COGS_{FIFO}$

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

The change in LIFO Reserve tells us the difference in COGS between LIFO and FIFO

Exxon-Mobil – Reconciliation between LIFO and FIFO

Change in LIFO Reserve = $COGS_{LIFO}$ - $COGS_{FIFO}$

Rearranging:

$COGS_{FIFO}$	=	$COGS_{LIFO}$	–	Change in LIFO Reserve
	=	306.8	–	(25.6 – 21.3)
	=	306.8	–	4.3
	=	302.5		

Under FIFO, COGS would be $302.5 billion

Financial Statement Analysis Issues: Ratios Involving Inventory

I. Inventory Turnover = COGS / Average Inventory

Measure of how fast the firm is able to sell its inventory. Higher turnover, faster sales of inventory.

II. Days inventory = 365 / Inventory Turnover

Measure of the average period (in days) that inventory is held before being sold.

CFOs turn capital to cash quicker (WSJ 6/26/19)

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U.S. companies' working-capital efficiency reached a six-year high in 2018 as finance chiefs increasingly prioritize managing inventories to more quickly convert the capital into cash.

The top-performing companies:

- paid suppliers almost three weeks slower in 2018 than typical companies and
- collected cash from customers almost three weeks quicker—
- while holding less than half the inventory.

As we will talk about in the cash flow class, working capital items like A/R and inventories tie up cash, whereas unpaid A/P are a source of cash.

Ratios for Exxon Mobil

Inventory Turnover = COGS / Average Inventory

INV Turnover (LIFO) = $COGS_{LIFO}$ / Avg Inv_{LIFO}

= 306.8 / ((11.7 + 9.9)/2)

= 28.4

If on FIFO:

INV Turnover (FIFO) = $COGS_{FIFO}$ / Avg Inv_{FIFO}

= 302.5 / (((11.7 + 25.6) + (9.9 + 21.3))/2)

= 8.8

Take-Away Slide

- Valuing inventory requires a cost flow assumption
- LIFO results in a more accurate income statement ; FIFO results in a more accurate balance sheet
- Why is understanding LIFO/FIFO important?
  - Comparability across firms
  - Adjusting for the LIFO reserve is crucial for comparability

Remaining Agenda - PPE

1. Understand transactions underlying property, plant, and equipment (PPE)
   - Acquisition
   - Depreciation
   - Change in estimate
   - Sale

2. Hertz case

How Do We Record An Acquisition of PPE?

- If a company purchases a car for $20,000 in cash, what transaction does it record?

Assets				**Liab**	**S/E**	
Cash	A/R	PPE	=		CC	R/E
–20,000		20,000				

- At the time of the acquisition, the cost of a fixed asset does not enter the income statement. Why?

  Not yet used to generate revenues (Matching)

- When does the cost enter the income statement?

  When used to generate revenues

- What happens when we sell the asset?

  We will address this in this class

To account for PPE one must answer the following four questions

1. What is the acquisition cost?
2. How much is the estimated salvage value?

Amount to be depreciated

3. What is the expected useful service life?
4. What is the depreciation pattern?

How the amount is depreciated

Useful life and salvage value

1. Useful life:
   - Time period over which asset will be used
   - Not the same as the *physical* life of the asset

2. Salvage value:
   - Estimate of value at disposal, net of selling costs
   - Longer useful life typical implies lower salvage value

Note that both these estimates require managerial judgment

Example: Consider two types of car owners:

	Sunday driver	Drive till it dies
Miles per year	2,000	20,000
Trade-in?	Every 2 years	no
Useful life	2 years	10-15 years
Salvage value	High	$0

GAAP Depreciation Methods

Straight-line Depreciation

- Used by overwhelming majority of US firms
- Straightforward to calculate
- Constant allocation of the cost of an asset from the balance sheet to the income statement
- This is our focus for this part of course

Accelerated Depreciation

- Mostly confined to tax reporting – we will talk about this in class on taxes

Aside: How is accounting depreciation related to economic depreciation?

- Many assets exhibit accelerated depreciation in early years.
- Consider a car: Once you have driven home from dealer, car is worth 25% less.

Calculating Depreciation Expense

- The "Straight Line Method" Depreciation expense per year =

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

- Depreciation is a cost allocation process intended to match the asset costs with the benefits in each period

Example of Calculating Depreciation

On 1/1/2006, Zsa Zsa Co buys a car for $20,000 in cash.

It plans to use the car for 5 years (useful life).

Zsa Zsa Co estimates the salvage value will be 25% of the purchase price.

Zsa Zsa Co Depreciation example

1. What is the acquisition price?

   $20,000

2. What is the salvage value?

   25% salvage value → $5,000

3. How much will be depreciated?

   20,000 – 5,000 = 15,000

4. What is the useful life of the car?

   5 years

5. What is annual depreciation expense?

   $$\frac{(20,000 - 5,000)}{5} = \$3,000$$

Zsa Zsa Co – Depreciation Expense

Contra-Asset to record reduction in PPE Values

	Assets			=	Liab	S/E
	Cash	PPE	– AccDep	=		R/E
1/1/06	–20,000	20,000				
12/31/06			3,000			–3,000
12/31/07			3,000			–3,000
.			.			.
.			.			.
12/31/10			3,000			–3,000

Note that depreciation does not affect cash. Depreciation allocates expenses to periods to match the firm's use of PPE but does not require cash outflows!

Zsa Zsa Co Depreciation Schedule

	Gross PP&E	-Accum Dep	Net Book Value	Depreciation Expense
12/31/2006	20,000	3,000	17,000	3,000
12/31/2007	20,000	6,000	14,000	3,000
12/31/2008	20,000	9,000	11,000	3,000
12/31/2009	20,000	12,000	8,000	3,000
12/31/2010	20,000	15,000	5,000	3,000

Gross PP&E does not change with depreciation

Accumulated depreciation increases by depreciation expense each year.

Zsa Zsa Co – Change in Depreciation Policy on 1/1/2007

On 1/1/2007, 1 year after purchasing the car, Zsa Zsa Co decides to keep the car an extra year (until 12/31/2011). It reduces the estimated salvage value to 20%.

Changes in useful lives or salvage value are accounted for *prospectively*. That means we re-calculate the depreciation rate using the new estimates:

Salvage value is changed to:

20% of 20,000 = 4,000

Useful life is stretched by:

1 year (5 years → 6 years)

Note: Car has been used for 1 year at time of change

The *remaining* useful life is…

(5 + 1) - 1 = 6 - 1 = 5 years

Zsa Zsa Co – Change in Depreciation Policy on 1/1/2007

Zsa Zsa Co increased the useful life by 1 year and reduced the salvage value to $4,000.

Calculations:

The amount *remaining* to be depreciated is…

Net book value = 20,000 – (3,000 * 1) = $17,000

Cumulative depreciation for 1 year.

Recall, the *remaining* useful life is…

(5 + 1) - 1 = 6 - 1 = 5 years

Therefore the depreciation expense going forward will be:

(Net book value – Salvage value) / Estimated Useful Life =

(17,000 – 4,000) / 5 = 2,600

Revised Zsa Zsa Co Depreciation Schedule

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	Gross PP&E	-Accum Dep	Net Book Value	Depreciation Expense
12/31/2006	20,000	3,000	17,000	3,000
12/31/2007	20,000	5,600	14,400	2,600
12/31/2008	20,000	8,200	11,800	2,600
12/31/2009	20,000	10,800	9,200	2,600
12/31/2010	20,000	13,400	6,600	2,600
12/31/2011	20,000	16,000	4,000	2,600

Zsa Zsa Co sells the car on 1/1/2010 for $7,000

- Accumulated Depreciation at the end of 2009:

  Calculated on prior slide: $10,800

- Net Book Value of Asset or Net PPE at the end of 2009 =

  Gross Value or Historical Cost – Accumulated Depreciation = 9,200

  20,000 10,800

- What happens when it sells the car for $7,000?

  Calculated on the next slides

Gain or Loss on Sale or Disposal of PPE

Procedure for sale or disposal of PPE

1. Record cash or the market value of the asset received for the PPE
2. Record disposal of the asset by removing the cost of the asset from PPE
3. Remove the accumulated depreciation associated with the asset
4. Calculate gain or loss as follows:

    Cash – (Cost – AccDep) = Gain (Loss)

Zsa Zsa Co – Sale of the asset

	Assets			=	Liab	S/E
	Cash	PPE	– AccDep	=		R/E
Ending Balance						
12/31/2009		20,000	10,800			
Sale Entry						
1/1/2010	7,000	–20,000	–10,800			-2,200

Effectively removes asset net book value of 9,200

This is the cash effect of transaction

Solve for the I/S effect of transaction

PPE Impairment

- Suppose instead that Zsa Zsa Co decides not to sell the car.
- Suppose that the fair value of the car on 12/31/2010 is $3,600 (vs. the net book value of $6,600).
- The fair value is $3,000 less than net book value.
- In this case, Zsa Zsa Co must impair or write down the asset.
- It does this by increasing AccDec by $3,000.

PPE Impairment

	Assets			**=**	**Liab**	**S/E**	
	Cash	PPE	– AccDep	=	N/P	CC	R/E
Ending Balance 12/31/2010		20,000	13,400				
Impairment entry 12/31/2010			3,000				-3,000
Ending Balance 12/31/2010		20,000	16,400				

Impairment loss

Revised net book value of asset = 20,000 – 16,400 = 3,600

Berkshire Hathaway 2002 Annual Report

Trumpeting EBITDA (earnings before interest, taxes, depreciation and amortization) is a particularly pernicious practice. Doing so implies that depreciation is not truly an expense, given that it is a "non-cash" charge. That's nonsense.

Depreciation is a particularly unattractive expense because the cash outlay it represents is paid up front, before the asset acquired has delivered any benefits to the business.

Imagine that at the beginning of this year a company paid all of its employees for the next ten years of their service (in the way they would lay out cash for a fixed asset to be useful for ten years).

In the following nine years, compensation would be a "non-cash" expense – a reduction of a prepaid compensation asset established this year. Would anyone care to argue that the recording of the expense in years two through ten would be simply a bookkeeping formality?

Hertz case

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Hertz business:

- Rental cars primarily at airport
- In your experience, how old is a typical rental car?

The restatement due to accounting problems suggests that Hertz may have been making income-increasing accounting choices.

Lower depreciation rates will make income larger.

Are they making (in)appropriate choices with depreciation?

- Trying to increase income, or
- Change in depreciation due to change in business strategies

Hertz – PP&E and Depreciation – Ex. 14

	2006	2007	2008	2009	2010	2011	2012	2013
Hertz Global Holdings, Inc.								
Revenue Earning Equipment, Gross	10,876	11,681	10,344	10,788	11,191	12,509	15,789	17,969
Depreciation Expense for Revenue Earning Equipment	1,762	1,906	2,020	1,780	1,747	1,912	2,146	2,408
Depreciation / Rev Earning Equip	16%	16%	20%	17%	16%	15%	14%	13%
Four year average				17%				14%
Pro Forma Depreciation Expense with 2006-09 average					1,918	2,144	2,706	3,079
Difference in Stated and Calculated Depreciation					-171	-231	-560	-672

Four year average depreciation rate decreased from 17% to 14%.

Hertz – PP&E and Depreciation – Ex. 14

	2006	2007	2008	2009	2010	2011	2012	2013
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Four year average				17%				14%
Pro Forma Depreciation Expense with 2006-09 average					1,918	2,144	2,706	3,079
Difference in Stated and Calculated Depreciation					-171	-231	-560	-672

The reduction in expense helps profits become positive.
Is Hertz cooking the books?

Change to useful lives

2006 useful lives on Cars

5 to 16 months (midpoint ≈ 1 year)

2013 useful lives on Cars

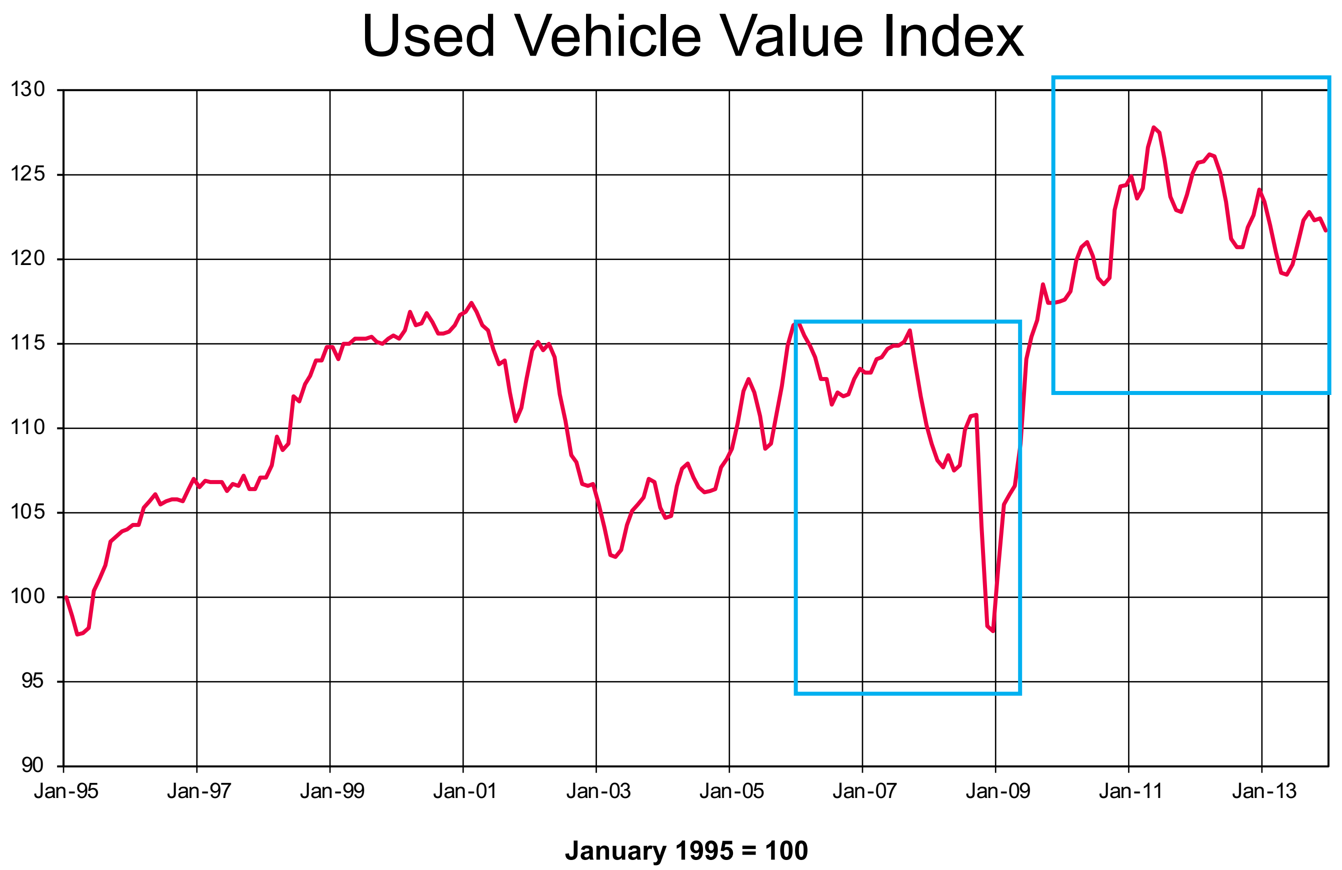
4 to 36 months (midpoint ≈ 2 years)

Holding salvage values constant, increasing the useful life of the cars lowers depreciation expense.

Why did Hertz increase the useful life of its assets?

- On one hand, could be lowering depreciation inappropriately
- On other hand, purchased Dollar Thrifty – budget cars used longer
- May be using existing assets longer

Changes in used car values



How does an increase in used car values affect depreciation?
It increases residual values, which would lower depreciation.

Gain / loss on asset sales – Ex. 14

	2006	2007	2008	2009	2010	2011	2012	2013
Hertz Global Holdings, Inc.								
Revenue Earning Equipment, Gross	10,876	11,681	10,344	10,788	11,191	12,509	15,789	17,969
Depreciation Expense for Revenue Earning Equipment	1,762	1,906	2,020	1,780	1,747	1,912	2,146	2,408
Gain/Loss on Sale of Revenue Earning Equipment	36	-21	-83	-72	-43	112	97	-37
Four year average				-35				32

On average, Hertz has gains on PPE sales from 2010-2013.
What does this tell us about their depreciation policy?

Gain (loss) on sale for different total depreciation amounts

From above:

Gain (loss) on sale = Sales Price - (Gross PPE – AccDep)

= AccDep - (Gross PPE - Sales Price)

= Accounting Depreciation - Economic Depreciation

From above Zsa Zsa Co example:

Sales Price	Cost	EconDep	AccDep	Gain (Loss)
7.0	20.0	13.0	10.8	-2.2
7.0	20.0	13.0	13.0	0.0
7.0	20.0	13.0	15.2	2.2

The loss means that there was too little depreciation.

The gain means that there depreciation was conservative.

Gain / loss on asset sales – Ex. 14

	2006	2007	2008	2009	2010	2011	2012	2013
Hertz Global Holdings, Inc.								
Revenue Earning Equipment, Gross	10,876	11,681	10,344	10,788	11,191	12,509	15,789	17,969
Depreciation Expense for Revenue Earning Equipment	1,762	1,906	2,020	1,780	1,747	1,912	2,146	2,408
Gain/Loss on Sale of Revenue Earning Equipment	36	-21	-83	-72	-43	112	97	-37
Four year average				-35				32

From above, Gain = Acc Dep – Econ Dep.
Gain implies conservative depreciation policy.
Suggests Hertz not depreciating too little.

Hertz vs. Avis PP&E and Depreciation – Ex. 14

	2006	2007	2008	2009	2010	2011	2012	2013
Hertz Global Holdings, Inc.								
Revenue Earning Equipment, Gross	10,876	11,681	10,344	10,788	11,191	12,509	15,789	17,969
Depreciation Expense for Revenue Earning Equipment	1,762	1,906	2,020	1,780	1,747	1,912	2,146	2,408
Depreciation / Rev Earning Equip	16%	16%	20%	17%	16%	15%	14%	13%
Four year average				17%				14%
Avis Budget Group, Inc.								
Revenue Earning Equipment, Gross	8,042	8,496	8,383	6,912	7,557	9,614	10,619	10,993
Depreciation Expense for Revenue Earning Equipment	1,362	1,565	1,639	1,391	1,277	1,395	1,438	1,678
Depreciation / Rev Earning Equip	17%	18%	20%	20%	17%	15%	14%	15%
Four year average				19%				15%

Avis four year average depreciation rate decreased even more.
Suggests that Hertz is in line with peers, not cooking the books.

Take-Away Slide - Hertz

Understanding the mechanics of how deprecation expense is calculated can give you insights into PPE intensive industries.

Hertz has likely adjusted their depreciation expense to reflect their acquisitions, changes in the used car market, and changes in their strategy (keeping cars longer).

If Hertz was engaging in “accounting shenanigans” we would see subsequent losses on sales that suggest under-depreciation.

Hertz’s restatement was related to other issues.

Effects on the Financial Statements

- What financial statements are affected by depreciation?
- Income Statement? Yes, Depreciation Expense
- Balance Sheet? Yes, Accumulated Depreciation
- Statement of Cash Flows?
  - *It does not affect cash, but...*
  - there will be an adjustment to income on the Indirect Statement of Cash Flows (as we will discuss in the class on the cash flow statement)

Take-Away Slide

Depreciation is a *cost allocation* process intended to match the asset costs with the benefits

Depreciation does not necessarily follow economic truth

Depreciation is not a transaction that affects cash!

However, depreciation policy still affects:
- Income statement (via depreciation and/or gains/losses)
- Balance Sheet (via net book values of assets)

General Terminology

- **Cost of Asset:** expenditure necessary to <u>ready the asset for intended use</u>, e.g. purchase price, installation, delivery, training, etc.
- **Estimated Salvage (Residual) Value:** predicted selling price of long-lived asset less any removal costs at the end of useful life
- **Depreciable base:** Asset Cost - Salvage value
- **Accumulated depreciation:** The cumulative amount of depreciation expense taken over the asset's useful life
  - A contra asset
  - Deducted from <u>historical cost of the asset</u>
  - Sum of past depreciation
- **Book value:** Asset's remaining unallocated cost → historical cost less accumulated depreciation