

Mid Term Exam Review

Someone looking at a company and considering purchasing it is not going to be too impressed with the company paying out large dividends. Those dividends will go to the investors, the current owners. The person buying the company would rather see that money stick around in the company so it can be acquired.

Some investors buy a stock solely based on the dividend. In theory people on fixed income want a high dividend. The other side of that is the investor who does not want to incur taxes on the dividend income. Would rather see that money reinvested in the company (capital appreciation) which would increase the value of the shares.

Significant increases in sales puts a further burden on capital equipment, requires reinvesting.

Dear John had a large part of their net income came from the gain on the sale of assets and was then directed to dividends. This bad for bad quality of earnings. They were liquidating their assets, milking. The volumes were going up 200% per year but their margins were declining. Making no profit except that made on sale of assets. No R&D investment, no asset investment. Keeping payables down, while aggressive with receivables. They are selling their machines and then trying to get double the work out of the remaining equipment. They probably sold at a low margin to get the increases in sales they saw. So the new owner may be faced with re-educating the customer as to why they have to pay more for the product.

Many companies in the 80's used this milking philosophy to extract money from the company and then sell it off to someone else.

Once you analyze the numbers you want to step back and try to decipher the message the management is sending. What is their philosophy.

When to pay dividends: want to make sure that if the organization has projects that will yield a rate of return greater than what the investors could achieve if you gave them the money, then you should reinvest the money internally. But if you do not have projects which will yield a rate of return greater than your investors could make elsewhere, you should pay out a dividend. The theory is that you owe them the money so they can invest it and make a return.

A constant COGS while at the same time sales is increasing does not necessarily mean the company has lowered it's cost. Just means the ratio between sales and COGS (price to cost ratio) has remained the same. They could be experiencing the same costs but lowering the prices (decreased margin).

Say you notice a particular category, such as R&D investment, jumps up significantly. Maybe it is in support of increased sales, you don't really know. But look around, should be able to find something your getting in return for that large investment / expenditure.

It's not enough to say a company is spending a lot of money on R&D and that must be good. Have to know what they are investing in and weather of not their R&D is nimble enough to keep up with market trends.

Three things which could be improved in the Beebumble company:

- 1) New Accounts, need better working capital management
- 2) Examine/Lower the R&D spending. Make sure it is going to pay off.
- 3) Make sure your not overspending on PP&E.

Inventory

How is Inventory costed? At this point we are discussing either merchandising or manufacturing. Say we bought some books, we're a book store. In the fall we buy 50 books at one price and in the spring we buy another 50 at a different price. Further, in the spring we still have 25 books bought at the fall price left. Now when we extract a book from inventory for sale we must break out the related cost of goods related to that specific book. How do we know how much that particular book costs? There are 4 ways of approaching this.

- LIFO: Last In First Out
- FIFO: First In First Out
- Weighted Average Cost per Book
- Specific Identification, mark each book

(specific identification is useful for large cost items like jewelry, cars)

Consider the below set of facts regarding inventory and purchasing.

Facts

<u>July</u>	<u>Units</u>	<u>Cost/Unit</u>
Beginning Inventory	10,000	\$ 5.00
Sale	2,000	
Purchase	4,000	\$ 6.00
Purchase	1,000	\$ 6.50
Sale	8,000	
<u>Aug</u>		
Sale	2,000	
Purchase	7,000	\$ 7.00
Sale	5,000	

We can see from our set of facts that we are considering a period of raising prices. Lets see how these raising prices are reflected in the various methods on inventory.

Note: we will only be studying the PERIODIC method. The other method is the PERPETUAL method but not covered in this class. Use periodic method in all homework.

FIFO

FIFO (First In First Out)

<u>July</u>	<u>Units</u>	<u>Cost/Unit</u>	<u>Total Cost</u>
Opening Inventory	10,000	\$ 5.00	\$ 50,000
Additions	4,000	\$ 6.00	\$ 24,000
	1,000	\$ 6.50	\$ 6,500
Available for Sale	15,000		\$ 80,500
COGS _[10,000]	(10,000)	\$ 5.00	\$ (50,000)
Ending Inventory	5,000		30,500
<u>August</u>	<u>Units</u>	<u>Cost/Unit</u>	<u>Total Cost</u>
Additions	7,000	\$ 7.00	\$ 49,000
Available for Sale	12,000		79,500
COGS _[7,000]	(4,000)	\$ 6.00	\$ (24,000)
	(1,000)	\$ 6.50	\$ (6,500)
	(2,000)	\$ 7.00	\$ (14,000)
Sub Total - COGS	(7,000)		(44,500)
End Inventory	5,000		35,000

On a First In First Out basis the first units that were in will be the first units that are coming out. We make a subscript note under COGS for the number of units we are trying to cost out. In this case we are taking out 10,000 units from inventory. Costs wise these will be the first 10,000 units which went in, here \$5 (notice that this clears out the units bought at \$5.00). Now our ending inventory for July is 5000 units at worth \$30,500.

Next we go to August where we add 7000 units at \$7.00 per unit and we have 7000 units sold. In the FIFO method we will first extract from our previously remaining inventory and we will do so in the order in which they were added to our inventory. That is reflected in the below extract from the worksheet:

COGS [7,000]	(4,000)	\$	6.00	\$	(24,000)
	(1,000)	\$	6.50	\$	(6,500)
	<u>(2,000)</u>	\$	7.00	\$	<u>(14,000)</u>

First we use the 4000 at \$6.00, then we take out the next 1000 at \$6.50 and finally the remaining 2000 from the \$7.00 per unit inventory.

Now we sub-total our COGS.

EXAM

He will ask for the ending inventory number, and what was the COGS number for July and August both in units and in dollars. Meaning he wants the subtotals.

Couple of Points to Remember:

- 1) This is the Periodic Method. We will only cover this method. In this method at the end of each month they determine what their ending inventory is, what their COGS is.
- 2) The other method is the Perpetual Method where we take inventory after each purchase and after each sale. We do not cover this method. This method requires the proper technology, such as a supermarket where each specific item of inventory is kept track of.

LIFO

LIFO (Last In First Out)

July	Units	Cost/Unit	Total Cost
Opening Inventory	10,000	\$ 5.00	\$ 50,000
Additions	4,000	\$ 6.00	\$ 24,000
	1,000	\$ 6.50	\$ 6,500
Available for Sale	<u>15,000</u>		<u>\$ 80,500</u>
COGS _[10,000]	(1,000)	\$ 6.50	\$ (6,500)
	(4,000)	\$ 6.00	\$ (24,000)
	<u>(5,000)</u>	\$ 5.00	<u>\$ (25,000)</u>
Sub Total - COGS	(10,000)		(55,500)
Ending Inventory	<u>5,000</u>		<u>25,000</u>
August	Units	Cost/Unit	Total Cost
Additions	7,000	\$ 7.00	\$ 49,000
Available for Sale	<u>12,000</u>		<u>74,000</u>
COGS _[7,000]	(7,000)	\$ 7.00	\$ (49,000)
Sub Total - COGS	<u>(7,000)</u>		<u>(49,000)</u>
End Inventory	<u>5,000</u>		<u>25,000</u>

In the LIFO method the last ones in (MOST RECENT IN, DO NOT CONFUSE THIS) are the first ones out. Our extractions from inventory are working backwards.

So in this example we want to extract 1000 units from July's inventory. We start by using up the 1,000 units bought at \$6.50. Then add to that the 4,000 units bought at \$6.00, and finally take the remaining 5,000 units from the inventory purchased at \$5.00.

COGS _[10,000]	(1,000)	\$ 6.50	\$ (6,500)
	(4,000)	\$ 6.00	\$ (24,000)
	<u>(5,000)</u>	\$ 5.00	<u>\$ (25,000)</u>

Now create a subtotal:

COGS _[10,000]	(1,000)	\$ 6.50	\$ (6,500)
	(4,000)	\$ 6.00	\$ (24,000)
	<u>(5,000)</u>	\$ 5.00	<u>\$ (25,000)</u>
Sub Total - COGS	(10,000)		(55,500)

And the ending inventory for July:

COGS _[10,000]	(1,000)	\$ 6.50	\$ (6,500)
	(4,000)	\$ 6.00	\$ (24,000)
	<u>(5,000)</u>	\$ 5.00	<u>\$ (25,000)</u>
Sub Total - COGS	(10,000)		(55,500)
Ending Inventory	<u>5,000</u>		<u>25,000</u>

[DO NOT FORGET TO BRING FORWARD THE PREVIOUS MONTHS REMAINING]

Now the additions for August added to the remaining of July (5,000):

Ending Inventory	5,000	25,000
August	Units	Cost/Unit Total Cost
Additions	7,000	\$ 7.00 \$ 49,000
Available for Sale	12,000	74,000

The 5,000 brought forward from July is what gives us 12,000 available for sale in August.

Now cost out COGS for the 7,000 units sold in August. Note we use the LAST IN which is the 7,000 added in August at \$7.00 each. Show the sub-total as well:

COGS _[7,000]	(7,000)	\$ 7.00	\$ (49,000)
Sub Total - COGS	(7,000)		(49,000)

BE CAREFUL TO TAKE OUT THE LAST IN !!!

Now show the ending inventory:

Available for Sale	12,000	74,000
COGS _[7,000]	(7,000)	\$ 7.00 \$ (49,000)
Sub Total - COGS	(7,000)	(49,000)
End Inventory	5,000	25,000

WEIGHTED AVERAGE METHOD

Here we use the weighted average. Note this is not the simple average which would be $(5+6+6.5)/3$. We actually solve for the Cost/Unit by dividing Total Costs of Available for Sale by Units Available for Sale (shown in **RED** below). We then multiple that cost per unit (**BLUE**) by the units sold to find Total Cost of Units Sold.

EXAM

It's ALWAYS dollars over units in every problem. We are always trying to find out what the per unit cost is. \$/Units.

USE ALL DECIMAL PLACES IN THESE CALCULATIONS OR YOU WILL NOT BE ACCURATE. LEAVE THE FLOATING DECIMAL. FLOAT THE DECIMALS AND ROUND THE DOLLARS.

WEIGHTED AVERAGE

July	Units	Cost/Unit	Total Cost
Opening Inventory	10,000	\$ 5.00	\$ 50,000
Additions	4,000	\$ 6.00	\$ 24,000
	1,000	\$ 6.50	\$ 6,500
Available for Sale	15,000	5.36667	\$ 80,500
COGS _[10,000]	(10,000)	5.36670	\$ (53,667)
Ending Inventory	5,000		26,833
August	Units	Cost/Unit	Total Cost
Additions	7,000	7.00000	\$ 49,000
Available for Sale	12,000	6.31942	\$ 75,833
COGS _[7,000]	(7,000)	6.31943	\$ (44,236)
Sub Total - COGS	(7,000)		(44,236)
End Inventory	5,000		31,597

BRING THE PREVIOUS MONTHS ENDING INVENTORY FORWARD TO THE NEXT MONTH. THIS MEANS THE ENDING INVENTORY TOTAL COST AS WELL.

Now look at the three methods...

Notice that these three approaches give us 3 different answers with Weighted Average more or less right in the middle between LIFO and FIFO.

This example used a period of raising prices.

FIFO and LIFO give different answers because in a period of raising prices technically we are getting the last prices under LIFO in our COGS. In a period of raising prices the last prices are

going to be the highest prices. If they are the highest prices than our COGS is going to be greater under LIFO than under FIFO. Because the last units in are the most expensive (in a raising price period) and are the first coming out. This increases COGS under LIFO.

Manufacturing Inventory Costs

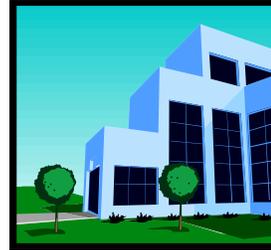
(Acct 323 talks about manufacturing inventory costs. Also fixed or variable costs)



FACTORY Product Costs

Balance Sheet as Inventory

- * Direct Material
- * Direct Labor
- * Overhead



OFFICE Operating Expense or Period Costs

Income statement as Expense

- * Marketing
- * Sales
- * Customer Support
- * General & Administrative
- * R&D

The factories primary purpose is to manufacture products for sale. This is what their entire cost structure is committed to. This is very significant. In the factory there are 3 concepts. Direct material, direct labor, and everything else (overhead).

The office is made up of administrative folks. Marketing, sales, etc (above). Note that R&D is accounted for under office because the exact future benefit of R&D cannot be determined.

Basically the nature of these two cost groups are different.

Factory costs are called **Product Costs** because they are incurred in the making of product.

Office costs are known as **Operating Expenses** or **Period Costs**. Because they are incurred with the passing of a period of time.

The office people get paid by the hour.

The factory costs, in theory, these costs are incurred with the making of the product.

Each of these pools have a different accounting treatment.

All of the product costs in the factory are inventorial. Inventorial means that they get to go on the balance sheet. A cost, when expended, if it has future value goes on the balance sheet.

The operating expenses in the office are expensed as incurred. These expenses go on the income statement. If the benefit of a cost has been used up or has expired then it is expensed.

It is viewed that only the products which come out of the factory have future value because they can be sold. Whereas office costs are expensed as incurred.

But what about R&D? FASB #2 says all R&D costs have to be expensed because the future benefit cannot be certainly known.

In a manufacturing operation there are 3 types of inventory...

- Raw Material
- Work in Process (labor & overhead)
- Finished Goods (ready for sale)

Buy raw materials which are issued to work in process there labor is added and overhead cost is expended. They complete the product and it flows into finished goods inventory at which point it is ready for sale. Once it is sold it flows out of finished goods inventory and flows to **COST OF GOODS SOLD** !

Now lets do an inventory analysis of these three accounts.

Manufacturing Inventory Costing

	Raw Material	Work in Progress	Finished Goods
		(labor & overhead)	(ready for sale)
Opening Balance	\$ 5,000	\$ 20,000	\$ 30,000
Additions	\$ 100,000	\$ 95,000 D/M \$ 150,000 D/L \$ 200,000 O/H	\$ 450,000
Available	<u>\$ 105,000</u>	<u>\$ 465,000</u>	<u>\$ 480,000</u>
Less End Inventory	<u>\$ (10,000)</u>	<u>\$ (15,000)</u>	<u>\$ (25,000)</u>
= Transfers Out	<u><u>\$ 95,000</u></u>	<u><u>\$ 450,000</u></u>	<u><u>\$ 455,000</u></u>
	out into next stage		
<u>Overhead (O/H)</u>			
Indirect Labor	\$ 50,000		
Indirect Material	\$ 40,000		
Factory Dependent	\$ 30,000		
Factory Utility	\$ 20,000		
Factory Insurance	\$ 60,000		
	<u><u>\$ 200,000</u></u>		

D/M = Direct Materials
D/L = Direct Labor
O/H = Overhead

result is
Cost of Goods
Manufactured

result is
Cost of Goods
Sold

Start out with \$5,000 raw material and we had started that period with \$100,000 inventory of raw material. That comes up with \$1,105,000. If at end of period we have \$10,000 left over in inventory. That means we must have used up \$95,000 out into the next stage.

Lets say we started out with \$20,000 in work in process and the transfers out of raw material comes in as an addition called direct material (D/M) to which we add \$150,000 direct labor (D/L) we also add overhead which we calculate in a side schedule (above).

The Cost of Goods Manufactured (past tense, done) are the costs of the goods which were completed in terms of there manufacturing and put into finished goods inventory.

Multiple Step Income Statement

Manufactures love Multiple Step Income Statements.

Multiple Step Income Statement

Sales	\$ 1,000,000
COGS	\$ 455,000
Gross Profit	\$ 545,000
<u>Operating Expenses</u>	
Marketing & Sales	\$ 75,000
Customer Support	\$ 50,000
General & Admin.	\$ 125,000
Research & Dev.	\$ 100,000
Total Operating Exp.	\$ 350,000
Operating Income	\$ 195,000
Other: INC <EXP> *	\$ 100,000
Pretax Income	\$ 295,000
Income Taxes	\$ (118,000)
Net Income	\$ 177,000

* establishes sign conversion

Note: in the above Income Statement that COGS is NOT bracketed. On a Financial Statement if something IS what you are CALLING it you do NOT bracket it. If it is NOT what you are CALLING it then you bracket it. COGS is normally a debit balance so if it is a cost of goods sold then you do not bracket it on a (formal) balance sheet. On a worksheet you might. If they are expenses and you are calling them expenses then no bracket. If the above COGS had a negative balance for some strange reason then it would be bracketed (it would not be what you are calling it).

Fixed Assets

What is the criterion for Capitalizing Fixed Assets?

A Fixed Assets is expenditure for an item which will have future benefit. When we say Fixed Asset (or Long Term Asset) that length of benefit from that item is greater than 1 year.

There are tangible and intangible Fixed Assets. We will be dealing with TANGIBLE FIX ASSETS for now.

Let's say that we have an asset whose cost was \$220,000 and the salvage value on it was \$20,000 so that the depreciable basis for the asset was \$200,000. Say it has a life of 5 years. And lets say we are asked to depreciate this asset. There are many ways to do this but we will learn 4.

<u>Facts</u>	
Cost	\$ 220,000
Salvage Value	<u>\$ (20,000)</u>
Depreciable Basis	\$ 200,000
Life Time (yr)	5 years

Straight Line Depreciation

In Straight Line Depreciation we begin with the Depreciable Balance.

<u>STRAIGHT LINE</u>	
<u>Year</u>	<u>Amount Dep.</u>
1	\$40,000
2	\$40,000
3	\$40,000
4	\$40,000
5	<u>\$40,000</u>
	\$200,000

$$\text{Straight Line Depreciable Rate} = \frac{1}{\text{Life of Asset (in years)}}$$

In this case each years depreciation is just:

$$\text{Straight Line Depreciable Rate} * \text{Depreciable Basis}$$

In this method depreciate only the depreciable basis which in this case is \$200,000.

Sum of the Years Digits

In Sum of the Years Digits we begin with the Depreciable Balance.

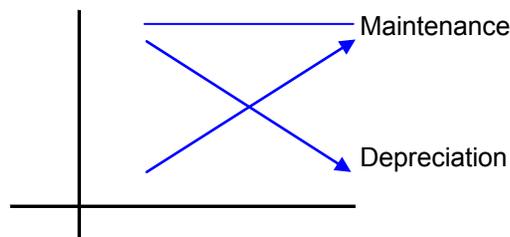
Take the sum of the digits which represent the life of the asset in years. Now start with the highest year digit and calculate that years depreciation of the depreciable basis as:

Year Number (highest to lowest) / Sum of Years Digits * Depreciable Basis

<u>SUM OF YEARS DIGITS</u>			
	1 + 2 + 3 + 4 + 5 =	15	
5 /	15 x	\$ 200,000 =	\$ 66,667
4 /	15 x	\$ 200,000 =	\$ 53,333
3 /	15 x	\$ 200,000 =	\$ 40,000
2 /	15 x	\$ 200,000 =	\$ 26,667
1 /	15 x	\$ 200,000 =	<u>\$ 13,333</u>
			<u>\$ 200,000</u>

This is a more accelerated method of depreciation because we are getting more depreciation charges in the earlier years and less in the later years. The theory is that a piece of equipment has it's greatest usefulness in the early part of it's life. As the equipment gets older the usefulness begins to decline and the maintenance costs begin to increase.

In theory as the usefulness declines and the maintenance costs increase the depreciation will start to decline as well under the Sum of the Years Digits as you maintenance costs are increasing so that the overall costs between these two will, in theory, be a straight line.



Double Declining Balance

EXAM

In Double Declining Balance we begin with the ORIGINAL COSTS.

<u>Facts</u>	
Cost	\$ 220,000
Salvage Value	<u>\$ (20,000)</u>
Depreciable Basis	\$ 200,000
Life Time (yr)	5 years

Double Declining says depreciate at DOUBLE THE STRAIGHT LINE RATE.

$$2 * \text{Straight Line Depreciable Rate} = \frac{2}{\text{Life of Asset (in years)}} = 40.0\%$$

DOUBLE DECLINING BALANCE DEPRECIATION

CANNOT DEPRECIATE BELOW THE SALVAGE VALUE OF \$20,000

<u>Opening Balance</u>	<u>Depreciation Expense (40%)</u>	<u>End Balance</u>	
\$ 220,000	\$ (88,000)	\$ 132,000	
\$ 132,000	\$ (52,800)	\$ 79,200	
\$ 79,200	\$ (31,680)	\$ 47,520	
\$ 47,520	\$ (19,008)	\$ 28,512	
\$ 28,512	\$ (8,512)	\$ 20,000	<--- Minimum Book Value (AKA: Salvage Value)
	<u>\$ (200,000)</u>		

\$ 8,512
 = 200,000 - 88,000 - 52,800 - 31,680 - 19,008

The beginning Opening Balance is the **ORIGINAL COST** of the equipment. The first year is depreciated at 40% of the ORIGINAL COST. The resulting Ending Balance is feedback to the Opening Balance of the next year.

You cannot depreciate below the salvage value. At the point where we would depreciate below the salvage value we make a special calculation for the depreciation. **The difference between the salvage value and the ending balance just above it will give you the last years depreciation. In this case \$28,512 – \$20,000 = \$8,512.** Now the sum of the depreciation values will total the depreciable basis (the reason for this is that our total depreciation must equal the depreciable basis).

YOU WILL GET THE WHOLE PROBLEM WRONG (ON THE EXAM) IF YOU BEGIN WITH THE OPENING BALANCE NOT EQUAL TO THE ORIGINAL COST.

KEYS TO REMEMBER:

- 1) Begin with the ORIGINAL COST
- 2) You cannot depreciate below the Salvage Value.
- 3) The year that would have depreciated below the salvage value has a special calculation of depreciation. This depreciation value is found by deduction, you subtract the other years depreciation from the DEPRECIABLE BASIS. This is the only place where the depreciable basis shows up in this method.

EXAM

Remember that the center column is the Depreciation Expense when you write down your answer.

The theory here is that we get much much more acceleration in the beginning years.

MODIFIED ACCELERATED COST RECOVERY SYSTEM

Known as: MACRS (make-ers)

EXAM

In Double Declining Balance we begin with the ORIGINAL COSTS.

This is the IRS method of doing depreciation. It use to be called the accelerated cost recovery system and it was exactly like the double declining balance. The government was losing money when people used this method. So they “modified” it.

Note: this is a 5 year depreciation and it takes 6 years (half of first year is being pushed forward). For each type of asset there is a class code and a specific number of years and set of multipliers. We will not have to memorize them for the exam.

The Original Cost, which we start with, is used in each of the years and we will multiply it by the IRS factors. Page 434 gives the MACRS factors for a 5 years depreciation.

MACRS: MODIFIED ACCELERATED COST RECOVERY SYSTEM

IN THIS METHOD IT IS ALRIGHT TO DEPRECIATE BELOW THE SALVAGE VALUE (\$20,000)

<u>Year</u>	<u>Original Costs</u>	x	<u>Factors</u>	=	<u>Depreciation</u>
1	\$ 220,000	x	0.2	=	\$ 44,000
2	\$ 220,000	x	0.32	=	\$ 70,400
3	\$ 220,000	x	0.192	=	\$ 42,240
4	\$ 220,000	x	0.115	=	\$ 25,300
5	\$ 220,000	x	0.115	=	\$ 25,300
6	\$ 220,000	x	0.058	=	\$ 12,760
					<u>\$ 220,000</u>

Note that the total depreciation is equal to the total cost of the asset. This method goes below the salvage value, is suppose to. Salvage Value is a subjective judgment and the IRS does not like subjectivity. They really don't care too much for depreciation at all. They would rather have the asset retain it's original cost. That way if there are operation goes under it does end up with tones of loss carry forwards (?). You can play that game with salvage values which the IRS does not like. This method takes the guess work out completely. No argument about salvage value.

MACRS has 6 periods of depreciation in the 5 year depreciation schedule.
The MACRS method was legislated to encourage investment in plant capital.
Can use MARCS for tax purposes and Straight Line for reporting purposes.

Homework

CH 7 pb 33 and pb 40 on pages 404 and 409.

#33: No journal entries. Reconcile the 3 inventory accounts. Solve for any missing information you may need. Set up the formats, solve for unknowns. Do income statement.

#40: assume 2 years, do a total for one year then the total for the next. Use the model we developed in class. Do not do the perpetual method.

CH 8 pb 19 pg 462.

Modifications: assume the life of the equipment is 5 years.

Do not use the 33% rate, use a rate based on a 5 year life. Don't do D but do a MARCS instead.

Change the cost of the equipment to \$55,000 and change the salvage value to \$5,000.