



Chapter 9 deals with 2 different basis of accounting. Deals with Internal Accounting formats versus External Accounting formats. It also deals with Absorption Costing versus Variable Costing. Why is this important. If you are trying to analysis the financial dynamics of a company you would want a Variable Costing Income Statement because this statement allows you to see variable costs separately from fixed costs and enables you to do what is called Cost Volume Profit Computations at a detailed level. This is what we did in chapter 3, CVP financial statements using the Contribution Margin Format Income Statements which is a mutli-step income statement broken down by cost behavior patterns, variable costs grouped together, fixed costs grouped together, which allows us to see the movement of these costs over changes in volume. But that financial statement is **NOT GAAP** for external reporting purposes. This statement is for internal reporting only.

Traditional Format Income Statement IS GAPP. That is the format we use for external reporting. The difference between these two is not only format, the Traditional says sales minus costs of goods sold give gross profit minus operating expenses gives operating income. That is GAPP as a format. The other contribution margin format we have been working with, sales minus variable costs gives contribution margin minus fixed costs gives operating income, is an internal financial statement. The other difference in what we call Inventorialble Manufacturing Costs.

In the Traditional we said that all factory costs are considered inventorial, direct material, direct labor, and overhead, if it comes out of the factory it is inventorial. We can move it through raw material, work in process, finished goods inventory. That IS GAPP. This method is called ABSORPTION COSTING because all of the costs of the factory are absorbed into the units that are produced out of the factory.

This differs from VARIABLE COSTING which we use in the contribution margin format. In the contribution margin format the only factory costs that are used as inventorial are the variable

costs out of the factory. Only the Variable Costs out of the factory under direct or variable costing are inventorial.

(text, page 324)

9-23 Comparison of actual-costing methods. The Rehe Company sells its razors at \$3 per unit. The company uses a first-in, first-out actual costing system. A fixed manufacturing cost rate is computed at the end of each year by dividing the actual fixed manufacturing costs by the actual production units. The following data are related to its first two years of operation:

	2006	2007
Sales	1,000 units	1,200 units
Production	1,400 units	1,000 units
Costs:		
Variable manufacturing	\$ 700	\$ 500
Fixed manufacturing	700	700
Variable operating	1,000	1,200
Fixed operating	400	400

1. Prepare income statements based on variable costing for each of the two years.
2. Prepare income statements based on absorption costing for each of the two years.
3. Prepare a numerical reconciliation and explanation of the difference between operating income each year under absorption costing and variable costing.
4. Critics have claimed that a widely used accounting system has led to undesirable buildups of inventory levels. (a) Is variable costing or absorption costing more likely to lead to such buildups? (b) What can be done to counteract undesirable inventory buildups?

The company manufactures and sells razor blades at \$3.00 per unit. Uses fifo but we will only use the **WEIGHTED AVERAGE COSTING SYSTEM**. We will compute weighted average costs at the **AVAILABLE** line (not actual fixed MFG costs divided by actual production units like it says in the problem above).

We will compare and contrast the various ways of looking at this data. We will begin with the Absorption Costing Format.

ABSORPTION COSTING

	2006	2007
Sales	1,000 units	1,200 units
Production	1,400 units	1,000 units
Costs:		
Variable manufacturing	\$ 700	\$ 500
Fixed manufacturing	700	700
Variable operating	1,000	1,200
Fixed operating	400	400

(TRADITIONAL / INCOME STATEMENT)

Absorption Costing Format

	2006			2007		
	Units	\$ / Unit	Total \$	Units	\$ / Unit	Total \$
Sales	1,000	3.00	3,000	1,200	3.00	3,600
COGS						
Opening Inventory	-	-	-	400		400
+ Var. MFG	1,400		700	1,000		500
+ Fixed MFG	- *		700	-		700
Units Available	1,400 **	1.000000 ***	1,400	1,400	1.142857 ***	1,600
- Ending Inventory	(400)	1.000000	(400)	(200)	1.142857	(229)
= COGS	1,000		1,000	1,200		1,371
Gross Profit			2,000			2,229
Operating Expenses						
Var. Operating			1,000			1,200
Fixed Operating			400			400
Total Operating Exp			1,400			1,600
Operating Income			600			629

- * Fixed costs are not influenced by # of units
- ** Ending Inventory is carried forward to next years Opening Inventory
- *** This is the one we solve by division.

Basically this is the **Traditional Format Income Statement** (manufacturers prefer multi-step)(Traditional is GAAP) where COGS and Operating Expenses have there variable and fixed costs broken out. COGS also breaks out units available and units in ending inventory. As for the columns, we examine Units and Cost/Unit to get Total Costs instead of just looking at total costs. Now we can compare from year to year and show the number of units carried forward from one to the next.

In Inventory Reconciliation we looked at opening inventory and then had some additions. In this case our additions will be variable and fixed manufacturing costs. This gives us Available from which we will subtract our Ending Inventory which gives up COGS. Now we subtract the COGS result from Sales to get Gross Profit. Now subtract our Operating Expenses which are things like variable and fixed operating which gives total operating and then Operating Income.

This is the **Traditional Format** which assumes Absorption Costing: all the costs of the factory, fixed and variable, are being absorbed into our Inventory account and then out through COGS.

This is the key to this entire method.

From the problem data: they tell us sales are at 100 units at \$3.00 per units giving \$3,000 sales. New company so they do not have any opening inventory. They tell us variable manufacturing costs are \$700 for 2006. Now, how many units go along with the variable manufacturing costs of \$700 in 2006? The answer is 1400. But why 1400 and not 1000 which we have under sales? Because Variable Costs deal with PRODUCTION units, not sales. **When we talk about \$700 in manufacturing costs we are talking about the costs of the units in PRODUCTION.** This is the connection, manufacturing costs go with production units. Now we see that we have \$700 in fixed costs. How many units go along with the fixed costs? **NONE! Fixed costs do not change with volume so there are no units associated with it.**

Now at the Available line we have 1400 units and \$1400. we are ready to come up with a **rate per unit** which, in this case, is $\$1400/1400 \text{ units} = \1.00 .

Now we know we produced 1400 units and we sold 1000 units we must have 400 units remaining in ending inventory at \$1.00 each is \$400. This gives COGS for 1000 units of \$1000.

Now remember, the matching principle says the number of units we are costing in our COGS has to match the number of units we are reporting we sold in that period.

We now calculate Gross Profit of \$2,000. From the problem we know that variable operating costs are \$1000 and fixed costs are \$400. Result is \$1400 in total operating expenses and Operating Income of \$600.

Use a similar procedure for the 2007 side carrying over the 2006 ending inventory line.

Note on the 2007 side that variable costs under OPERATIONS increases because the unit sales increased. **UNIT SALES AFFECTS OPERATIONS VARIABLE COSTS.**

On the manufacturing side under COGS the variable costs decreased in 2007 because the number of units produced decreased. **UNITS PRODUCED AFFECTS MANUFACTURING VARIABLE COSTS UNDER COGS.**

Both are VARIABLE COSTS but they MOVE to DIFFERENT DRIVERS.

PRODUCTION (MFG) COSTS MOVE TO PRODUCTION VOLUME.

THE OPERATING COSTS MOVE TO SALES VOLUME.

VARIABLE COSTING

	2006	2007
Sales	1,000 units	1,200 units
Production	1,400 units	1,000 units
Costs:		
Variable manufacturing	\$ 700	\$ 500
Fixed manufacturing	700	700
Variable operating	1,000	1,200
Fixed operating	400	400

(CONTRIBUTION MARGIN) Variable Costing Format

	2006			2007		
	Units	\$ / Unit	Total \$	Units	\$ / Unit	Total \$
Sales	1,000	3.00	3,000	1,200	3.00	3,600
Var. Costs						
Var MFG - OPTG	-	-	-	400		200
+ Var. MFG	1,400		700	1,000		500
Units Available	1,400	0.500000	700	1,400	0.500000	700
- Ending Inventory	(400)	0.500000	(200)	(200)	0.500000	(100)
= Var. MFG Costs	1,000		500	1,200		600
+ Var. OPTG			1,000			1,200
= Total Var. Costs			1,500			1,800
Contribution Margin			1,500			1,800
Fixed Costs						
Fixed MFG			700			700
Fixed OPTG			400			400
Total Fixed			1,100			1,100
Operating Income			400			700

This is basically a **Contribution Margin Income Statement** where we are grouping our variable and fixed costs from manufacturing and operations. Note that we do solve for Contribution Margin after Variable Costs and then Operating Income after Fixed Costs.

In the Variable Costs Income Statement we use the Contribution Margin Income Statement. We know we have two kinds of operating costs, Variable Manufacturing Costs and Variable Operating Costs.

Variable MFG – OPTG = Opening Inventory

Units Available = Opening Inventory + Variable Manufacturing

Variable Manufacturing Costs = Units Available – Ending Inventory

Variable COGS = Total Var. Costs = Var. MFG Costs + Var. Operating Costs

So there are two pieces to it, the variable operating costs and the variable manufacturing costs. The Variable Manufacturing Costs is really the only one which flows through inventory and then comes out into the expensed piece of variable manufacturing.

Notice that we do not add fixed manufacturing into the inventory account, we are only costing the variable costs. In a Contribution Margin Income Statement that's how you would actually compute your profit or loss on this basis.

This example has no opening inventory and we know that our variable manufacturing was for 1400 units at \$700. What's available is 1400 at \$700 which works out to \$0.50 per unit. (Dollars are always on top in these calculations). Take our ending inventory which we know to be 400 and cost it out at \$0.50 which gives 200. That will mean our variable manufacturing for 1000 units was \$500. For those same 1000 units our variable operating was \$1000. And therefore our total variable costs were \$1500.

The difference between sales and total variable costs is called the contribution margin and is \$1500, for fixed costs we have fixed manufacturing totally and completely down in the income statement. Fixed operating stays in the same place it was before. Fixed manufacturing is \$700 and fixed operating is \$400. Total fixed 1100. And Operating income is now \$400.

Now consider this. We have completed two different schedules, Absorption Costing and Variable Costing, using the same information and have come up with two different bottom lines in the year 2006. Why? Using absorption costing we ended up with \$600 while variable costing has produced only \$400. Per unit rate is different but why?

Because fixed manufacturing factors into the absorption costing format, all the units that were in inventory (we still have the same units, 400) but the cost per unit under absorption costing included fixed manufacturing whereas under variable costing it does not include fixed manufacturing.

Don't forget we are dealing with two financial statements, the Balance Sheet and the Income Statement. We're looking at the income statement and considering the piece that is going to the balance sheet. Inventory, that's going to show up on the balance sheet. So what we effectively did was incur \$1400 worth of costs but we took \$400 of that costs out of the income statement and we put it on the balance sheet. And when we put it on the balance sheet that lowered the costs down to \$1000 and lowering the costs allowed us to show profitability that much higher because we were able to defer these costs into our inventory account.

Over here we are not including the absorption of the fixed manufacturing. The fixed manufacturing is being written off entirely every period. And therefore when we deferred those 400 units into inventory we only cost them for their variable costs and as a result, the cost per unit is a lot lower, we deferred less into our inventory account by \$200 which is the difference on the bottom line.

Because it was an inventory increase the ability to defer more costs onto the balance sheet gave us an advantage. More costs were deferred because inventory went up from 0 to 400 units and the cost per unit DEFERRED was higher.

Onto the next period (2007). Fill in from problem statement. Don't forget to carry remaining inventory forward. Notice our variable cost is still \$0.50 per unit. And, of course, fixed costs remain fixed (meaning they do not change with volume/unit changes).

Now we see the bottom line for year 2007 under Variable costs is \$700 while it was only \$629 under Absorption Costing. But absorption costing is suppose to give a higher profit right? Because more costs are deferred to inventory right? Except that in this case the higher profit came with the variable costs. Why? Fixed costs are involved. We can't say it is related to the ending inventory because the ending inventory is still higher under absorption costing.

The reason: we had an inventory decrease. You see, in this period, our inventory went from 400 units to 200 units. We had an inventory decrease. So now with an inventory decrease under absorption costing, all of these costs up here (?) now are going to be reduced to this amount (?) and as a result we will be deferring less costs up in inventory than you had in the preceding period. So what is happening is we had an inventory decrease all those fixed costs that we deferred in inventory are now all going to be down in the income statement in this period. The COGS is going to be significantly higher now than the COGS under variable manufacturing. This is because here we only deferred our variable costs. If we were to take the difference between our opening inventory which is 200 and the ending inventory which is 129, that difference of 71 is the difference between 629 and 700. The difference in the opening inventory minus the difference in the ending inventory. It's the amount which was deferred in inventory under one method versus the other. The opening period versus the ending period, that difference is the difference in the bottom line.

Does that mean that generally under absorption costing in a period of rising inventories which one is going to show the higher profit? Absorption or Variable? **Absorption will show the higher profit.** When inventories go up absorption is going to differ more fixed costs into inventory so the profit is going to be bigger. When inventory goes down it will be the opposite. Because now we will have to pull those fixed costs out of inventory and they are going to hit your income statement.

HOMEWORK

Pb 9-16

EXAM 1 TOPICS

①

Inventory Reconciliation, we reconcile the three Inventory Accounts; **raw materials, work in process, finished goods**. Come up with **Cost of Goods Sold**. Put the results into a **Traditional Multi-Step Income Statement**. Will also have a question about **Over or Under Allocation**, may want to use T-accounts to determine.

②

Cost Volume Profit (CVP) Analysis, Break Even Analysis, What-If Analysis, and the iterations. If he ask for units don't get confused and put dollars (and vis-versa).

③

Process Costing

④

2 parts. **Services Costing & Pricing** problem. Like the exercises we did with the law firm and the consulting firm. **The question will be a combination of those two types of problems**. Law firm went from a **Traditional Based Costing** method to an **Activity Based Costing** method and the consulting firm went and looked at **Mark Up Rate** and **Indirect Costs Rates**.

⑤

Activity Based Costing Problem

⑥

EOQ problem.

⑦

External Pricing problem.