



Absorption Costing - Overview

1. Overview of Absorption costing and Variable Costing
2. Review how costs for Manufacturing are transferred to the product
3. Job Order Vs. Process Costing
4. Overhead Application
 - Under applied Overhead
 - Over applied overhead
5. Problems with Absorption Costing
6. Concluding Comments



Absorption Costing

The focus of this class is on how to allocate manufacturing costs to the product.

- Direct Materials
- Direct Labor
- Overhead

Absorption costing is a process of tracing the variable costs of production and the fixed costs of production to the product.

Variable Costing traces only the variable costs of production to the product and the fixed costs of production are treated as period expenses.



Absorption Costing

There are three different types of Absorption Costing Systems:

- Job Order Costing
- Process Costing
- ABC Costing

In Job Order Costing costs are assigned to the product in Batches or lots.

- Printing
- Furniture manufacturing
- Bicycle Manufacturing

In Process Costing, costs are systematically assigned to the product, since there are no discrete batches to assign costs.

- Oil Distilling
- Soda Manufacturing

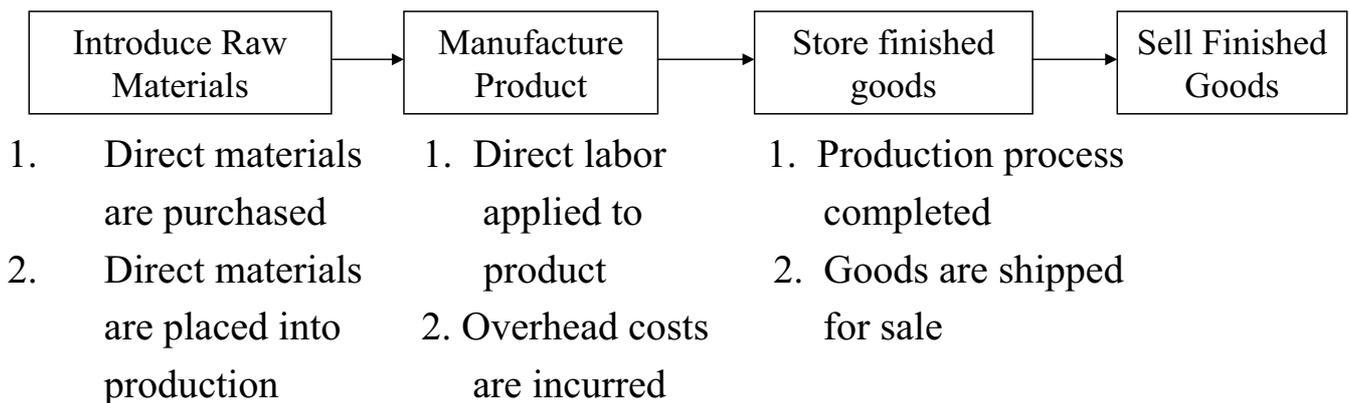
ABC Costing assigns cost from cost centers to the product

- Best in a multi product firm, where there are different volumes



Absorption Costing

A simplified view of Production:





Absorption Costing

How do we account for the production process?

1. Direct materials are purchased and recorded as an asset.
2. As direct materials are placed into production, their cost is transferred from the raw materials account to the Work-in-Process account (an asset)
3. As direct labor costs are incurred they are recorded in a labor expense account. Throughout the year they are transferred from the labor expense account to Work-in-process account (an asset).



Absorption Costing

4. Overhead costs are initially accumulated in expense accounts (electricity, depreciation, etc.). Throughout the year they are transferred to Work-in-process.

5. When goods are completed, their costs (direct materials, direct labor and overhead) are transferred out of Work-in-process, and into Finished Goods.

6. When goods are sold, their costs are transferred out of finished goods inventory (an asset) and into Cost of goods sold (an expense).



Absorption Costing

Important points to take away from how we account for manufacturing costs:

1. Initial expenditures on raw materials, direct labor, and overhead are CAPITALIZED (recorded as assets) in Work in process and finished goods inventory.

2. They are transferred to expense accounts when the finished goods are sold (they go to cost of goods sold).

3. Generally the cost of goods manufactured, (the costs incurred in manufacturing the product) will not equal the cost of goods sold.

- This means that in any year some of the costs associated with manufacturing the product will not flow through the income statement as an expense, they will remain in the inventory accounts as assets!



Absorption Costing

Consider the following example:

A company is formed to manufacture computers. It starts the year with \$2000 in cash and equity. During the year the company incurs \$500 in payroll costs, \$500 in rent for the plant, and \$500 in raw materials. During the year he makes 100 computers.

What will his profits (or loss) be if he sells no computers?

What will his profits be if he sells all 100 computers at \$20 per computer?



Job Order Costing

Job Order Costing is one method of allocating the costs of manufacturing to the product.

In Job order costing the manufacturing costs are allocated to the product by batch.

Job order costing is appropriate when the firm makes products in small batches, and each batch consumes different amounts of direct labor, direct materials, and processing time/energy.

A survey in “Cost and Management Accounting Practices..” in the Management Accounting Research Centre indicate that job order costing is the primary method of costing in the following industries:

- Electorics
- Machinery
- Computers
- Furniture and fixtures



Job Order Costing

Consider a computer manufacturing company. They have a plant that receives an order for 50 computers. They need to determine how much it costs to manufacture these computers.

The batch of 50 computers starts with the introduction of direct materials:

- 50 Computer Cases
- 50 Motherboards
- 50 CD drives, and floppy drives

Individuals mount equipment, add additional memory etc, to meet the specifications of the job.

Special machines are also used to attach the disk drives.



Job Order Costing

In Job order costing the manufacturing costs are allocated to the product by batch. Thus the company allocates manufacturing costs to the 50 Computers ordered.

The Job is assigned a Lot #. Lets call this Lot # 1118.

When the Parts warehouse provides 50 motherboards, cd roms etc... to the manufacturing group, they allocate the costs of these raw Materials to LOT #1118.

The individuals that assemble these computers record the time spent assembling Lot 1118 on their time sheets. The accounting system will allocate the payroll costs at the hourly wage rate to the job.

Finally, the cost of the plant, the cost of the specialized machines, the utilities, the accounting system that tracks costs within the plant, the accountant running the system etc... must be allocated to the product. This is known as overhead allocation.



Job Order Costing

Lot # 1118

Direct Materials:

50 Motherboards @ \$200 per board	\$10,000	
50 Floppy Disk Drives @ \$50 per drive	\$ 2,500	
50 CD Rom drives @ \$20 per dirve	\$ 1,000	
50 Cases @ \$20 per case	\$ 1,000	
Total Direct Materials		\$14,500
Direct Labor and Overhead		
Employee #4323 40 hours @ \$25 per hour	\$1,000	
Overhead Allocation \$100 per direct Labor hour	\$4,000	
Total Direct Labor and Overhead		<u>\$5,000</u>
Total Cost		\$19,500



Job Order Costing

A natural question to ask with this example, is how do we determine the overhead allocation rate?

1. Estimate total Overhead for the plant for the year.
2. Select an activity base to allocate overhead costs to the product.
3. Estimate expected usage of the activity base.
4. Overhead allocation Rate =
$$\frac{\text{Estimated Overhead Costs}}{\text{Estimated Activity Base}}$$



Job Order Costing

Suppose the company estimates overhead costs for the plant to be to be \$1,000,000 and direct labor hours to be 1000 hours.

What is the overhead application rate?

What happens if the employees only work 900 hours?

What happens if the employees work 1100 hours?

What happens if the price of heating oil is greater than expected?



Job Order Costing

What happens to the under or over applied overhead?

1. Write-off directly to cost of goods sold.
2. Write off proportionately to WIP, Finished goods and Cost of goods sold.
3. Re-allocate costs to all products to “correctly” allocate overhead to WIP, Finished goods, and Cost of goods sold.



Rosen Corp (Problem 9-4)

See the exercise “Rosen Corp.”: Problem 9-4 in Zimmerman, Jerold L. *Accounting for Decision Making and Control (4th Edition)*. McGraw-Hill/Irwin, 2002, pp 478-9.



Process Costing

A process cost system is used when a manufacturing company makes large volumes of identical products. (pharmaceuticals, bottles of Pepsi, gallons of oil)

Each unit consumes the same amount of direct materials, direct labor and indirect costs (overhead)

Instead of assigning costs to jobs, then averaged across the job to get a per unit cost, process costing assigns costs to the product through each process the product goes through.



Process Costing

Consider a Cola Manufacturer

Mixing

Bottling

Distribution

Direct materials (sugar, water, coloring) are mixed.

They are poured into a bottle.

Carbonation is added.

They are capped.



Process Costing

How does process costing differ from job costing?

Survey indicates that Process costing is most often used in the following industries:

1. Oil refining (100%)
2. Chemicals
3. Pharmaceuticals
4. Food and Beverage



Absorption Costing - Problems

1. In an absorption cost system such as Job order costing, what happens to plant profitability if additional output is produced and not sold?
2. Suppose you allocate overhead using direct labor hours, and a special order comes in that requires the factory be completely recalibrated, to process the job. Will this cost be traced back to the job?



Variable Costing

Variable costing tries to reduce the incentive to over produce by charging fixed overhead costs to expense in the period they are incurred, and allocating only variable costs.

Increasing production does not allow a firm to move fixed costs out of COGS and into inventory.



First Eastern Bank (problem 9-13)

See the exercise “First Eastern Bank”: Problem 9-13 in
Zimmerman, Jerold L. *Accounting for Decision Making and
Control (4th Edition)*. McGraw-Hill/Irwin, 2002, pp 483-4.



Frames Inc (problem 9-23)

See the exercise “Frames Inc.”: Problem 9-23 in Zimmerman, Jerold L. *Accounting for Decision Making and Control* (4th Edition). McGraw-Hill/Irwin, 2002, pp 491-2.



Summary

1. Discussion of Absorption costing
 - Strengths and weaknesses
 - How is it done.
 - Potential Solutions to some of the problems.

2. Reviewed how we account for manufacturing costs Highlighted how manufacturing costs are transferred to the product

3. In depth coverage of Job Order Costing and Overhead application

4. Set up discussion of ABC costing