

Cost Allocation, Apportionment and Absorption of Overheads

Learning Objectives

- To understand and apply the cost concepts
 - Cost Allocation
 - Apportionment of Overheads
 - Absorption of Overheads

Introduction

*The objective of Cost Accounting is **classifying costs** and **recording an appropriate allocation of expenditure** for the **determination of the costs of products or services**, and for the **presentation of suitably arranged data** for the **purpose of control and guidance of management***

Cost Allocation

- When items of cost are identifiable directly with some products or departments such costs are charged to cost centres. This process is known as cost allocation.
- It is the charging of discrete, identifiable items of cost to cost centres or cost units.
- It is complete distribution of an item of overhead to the departments or products on logical or equitable basis is called allocation.
- Where a cost can be clearly identified with a cost centre or cost unit, then it can be allocated to that particular cost centre or unit.
- Allocation is the process by which cost items are charged directly to a cost unit or cost centre.
- Cost allocation calls for two basic factors –
 - Concerned department/product should have caused the cost to be incurred
 - Exact amount of cost should be computable.

Cost Allocation- Examples

- Electricity charges can be allocated to various departments if separate meters are installed
- Depreciation of machinery can be allocated to various departments as the machines can be identified
- Salary of stores clerk can be allocated to stores department
- Cost of coal used in boiler can be directly allocated to boiler house division.
- Wages paid to workers of service department can be allocated to the particular department.
- Indirect materials used by a particular department can also be allocated to the department.

Thus allocation is a direct process of identifying overheads to cost units or cost centres. So the term allocation means allotment of whole item of cost to a particular cost centre or cost object without any division.

Cost Apportionment

- Cost Apportionment is the allotment of proportions of items to cost centers.
- When items of cost can not directly charge to or accurately identifiable with any cost centres, they are prorated or distributed amongst the cost centres on some predetermined basis. This method is known as cost apportionment.
- Wherever possible, the overheads are to be allocated. However, if it is not possible to **charge the overheads to a particular cost centre or cost unit**, they are to be apportioned to **various departments on some suitable basis**. This process is called as 'Apportionment' of overheads.
- Items of indirect costs residual to the process of cost allocation are covered by cost apportionment.
- The predetermination of suitable basis of apportionment is very important and usually following principles are adopted- (i) Service or use (ii) Survey method (iii) Ability to bear.

Cost Apportionment

- The basis for apportionment is normally **predetermined** and is decided after a careful study of **relationships between the base and the other variables** within the organisation.
- A lot of quantitative information has to be collected and constantly updated or **periodically** reviewed to improve upon the accuracy of apportionment.
- The basis selected should be **applied consistently** to avoid faults. The basis ultimately adopted should ensure an **equitable share of common expenses for the cost centres**
- *In simple words, distribution of various items of overheads in portions to the departments or products on logical or equitable basis is called apportionment.*

Apportionment of overhead costs

- Apportionment of overhead costs means to **divide total cost of overhead among different departments or branches or cost centers of a company.**
- We need the steps of apportionment of overhead costs when there are many departments or cost centers of any company because when we know the **overhead cost of each department**, we can find **the total cost of department.**
- With this, we can **compare the revenue of each department with their total cost.**
- Then take **decisions relating to particular department.**

How to Apportion Overhead Costs

1st Step

- **To Classify the Cost Centers**
 - Cost Centers should be classified into production department and service department.

2nd Step :

- **To Divide Total Overhead on Different Basis of Apportionment**
 - One of best step to apportion overhead costs is to know the basis of apportionment of overhead expenses and then to use them.
 - All overhead will be allocated to the different department.

Basis for Overhead Apportionment

Overheads common to all these departments	Apportioned on some suitable basis
Rent, rates & taxes	Floor space occupied by each department , office, factory
Repair to Plant or Department, Depreciation on office building	Plant or Department's Value or any asset's Floor space occupied by each department
For Legal fees	No of cases handled as the basis
For Salaries of common staff	Ratio of salaries of departments as the basis
For Typist pool	No of documents typed as the basis
For General Lighting and electricity	No. of light points or Area or Units of Sub-meter in each Department
For Telephones	No. of extensions in a department
For Material handling	No. of material requisitions or Value of material issued
Power	H.P. Of Plant
Supervision, Employer's liability	No. of Employees
Fire Insurance	Value of Stock in any Department
Indirect Labour Cost	Total duty hours in any department
Canteen Service Cost and other welfare expenses	No. of Employees in Any Department
Transport Cost	No. of boxes or containers or weight of containers, hours of spending vehicle in any department

Example

- Total rent is Rs. 5000.
- Area of production department is
 - A 100 Sq. foot.
 - B 200 Sq. foot.
 - C 700 Sq. foot.
- Now total ratio of A : B : C is 1 : 2 : 7
- Total Rent Expense of
 - A Department will be = $5000 \times \frac{1}{10} = \text{Rs. } 500$
 - B Department will be = $5000 \times \frac{2}{10} = \text{Rs. } 1000$
 - C Department will be = $5000 \times \frac{7}{10} = \text{Rs. } 3500$

So, Total overhead cost will be apportioned to different department on some basis. Basis of Rent apportionment is the area of department

Distinction between Allocation & Apportionment

- Although the purpose of both allocation and apportionment is identical, i.e to identify or allot the costs to the cost centres or cost unit, both are not the same.
- Allocation deals with the whole items of cost and apportionment deals with proportion of items of cost.
- Allocation is direct process of departmentalization of overheads, where as apportionment needs a suitable basis for sub-division of the cost.
- Whether a particular item of expense can be allocated or apportioned does not depends on the nature of expense, but depends on the relation with the cost centre or cost unit to which it is to be charged.

Principles of Apportionment of Overhead Cost

1. Services Rendered

- A production department which receives maximum services from service departments should be charged with the largest share of the overheads.
- Accordingly, the overheads of service departments are charged to the production departments.

2. Ability to Pay

- A large share of service department's overhead costs should be assigned to those producing departments whose product contributes the most to the income of the business firm.
- However the practical difficulty in this method is that, it is difficult to decide the most paying department and hence difficult to operate.

Principles of Apportionment of Overhead Cost

3. Survey or Analysis Method

- This method is used where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable.
- For example, the postage cost could be apportioned on a survey of postage used during a year.

4. Efficiency Method

- The apportionment of expenses is made on the basis of production targets.
- If the target is exceeded, the unit cost reduces indicating a more than average efficiency.
- If the target is not achieved, the unit cost goes up, disclosing there by, the inefficiency of the department.

Example

- A factory has 3 production departments (P1, P2, P3) and 2 service departments (S1 & S2). The following overheads & other information are extracted from the books for the month of January 2012.

Expense	Amount
Rent	6,000
Repair	3,600
Depreciation	2,700
Lighting	600
Supervision	9,000
Fire Insurance for stock	3,000
ESI contribution	900
Power	5,400

Particulars	P1	P2	P3	S1	S2
Area sq ft	400	300	270	150	80
No. of workers	54	48	36	24	18
Wages	18,000	15,000	12,000	9,000	6,000
Value of plant	72,000	54,000	48,000	6,000	-
Stock Value	45,000	27,000	18,000	-	-
Horse power of plant	600	400	300	150	50

Allocate or apportion the overheads among the various departments on suitable basis.

The primary distribution of overheads is as follows

Expense/Basis	Total	P1	P2	P3	S1	S2
Rent (Area sq ft)	6,000	2,000 (6000* 400/1200)	1,500 (6000* 300/1200)	1,350 (6000* 270/1200)	750 (6000* 150/1200)	400 (6000* 80/1200)
Repair (Plant value)	3,600	1,440	1,080	960	120	Nil
Depreciation (Plant value)	2,700	1,080	810	720	90	Nil
Lighting (Area sq ft)	600	200	150	135	75	40
Supervision (No of workers)	9,000	2,700	2,400	1,800	1,200	900
Fire Insurance for stock (Stock Value)	3,000	1,500	900	600	Nil	Nil
ESI contribution (Wages)	900	270	225	180	135	90
Power (Horse power of plant)	5,400	2,160	1,440	1,080	540	180
Total	31,200	11,350	8,505	6,825	2,910	1,610

Cost Absorption

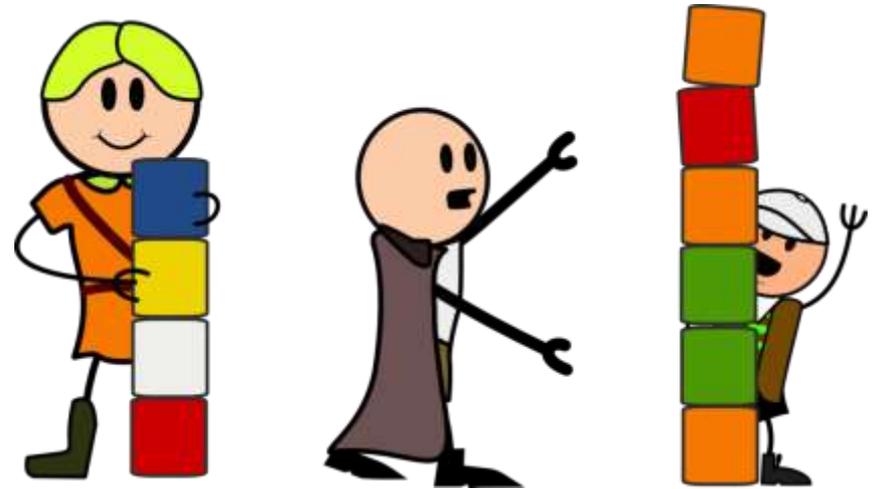
- The ultimate aim of Overhead Accounting is to **absorb them in the product units produced by the firm.**
- Thus, **the indirect costs or overhead** will have to be **distributed over the final products** so that **the charge is complete.**
- This process is known as cost absorption or 'Absorption' of overheads
- It means **costs is absorbed by the production (or product units)during the period or charging each unit of a product with an equitable share of overhead expenses.**
- Usually any of the following methods are adopted for cost absorption-
 - **Direct Material Cost Percentage**
 - **Direct Labour Cost Percentage**
 - **Prime Cost Percentage**
 - **Direct Labour Hour Rate Method**
 - **Machine Hour Rate, etc.**

Absorption' of overheads

- Accurate absorption will help in arriving at **accurate cost of production**.
- Overheads are indirect costs and hence there are **numerous difficulties in charging the overheads** to the product units.
- The basis should be selected after careful maximum accuracy of **Cost Distribution to various production units**.
- The basis should be **reviewed periodically** and corrective action whatever needed should be taken for improving upon the accuracy of the absorption.

Under-absorption and Over-absorption of Overhead

- Certain expenses may be direct expenses for certain costs centres but they are indirect for the production departments. These do not form part of prime cost, but absorbed as overheads.
- The amount of overhead absorbed in costs is the sum total of the overhead costs allotted to individual cost units by application of the overhead rate.



When a predetermined rate worked out on the basis of anticipated or budgeted overhead and base is applied to the actual base, the amount absorbed may not be identical with the amount of overhead expenses incurred if either the actual base or the actual expenses or both deviate from the estimates or the budget.

Under-absorption and Over-absorption of Overhead

Under-absorption

- If the **amount absorbed** is **less than** the **amount incurred**, the difference denotes under-absorption.
- It is also termed as 'under recovery'
- It may be due to
 - Actual expenses exceeding the estimate; and / or
 - Output or the hours worked may be less than the estimate

Over-absorption

- If the **amount absorbed** is **more than** the **expenditure incurred** this would indicate over-absorption, which goes to inflate the costs.
- Over-absorption is also formed as 'over recovery'.
- It may be due to
 - Expense being less than estimate; and / or
 - Output or hours worked may be exceeding the estimate

Under Costing and Over Costing

- Restaurant bill for most recent get together

Items	Annie	Joe	Paula	James	Total	Average
Pizza	110	200	150	140	Rs 600	Rs150
Dessert	0	80	40	40	160	Rs 40
Drinks	40	140	80	60	320	80
Total	150	420	270	240	1080	270

- Product under Absorption: A product consumes a high level of resources but is reported to have a low cost per unit (Joe's Dinner)
- Product Over Absorption: A product consumes a low level of resources but is reported to have a high cost per unit (Annie's Dinner)

Causes of Under or Over Absorption of Overhead

Error in estimating overhead expenses.

Error in estimating the level of production, i.e the base.

Major unanticipated changes in the methods of production.

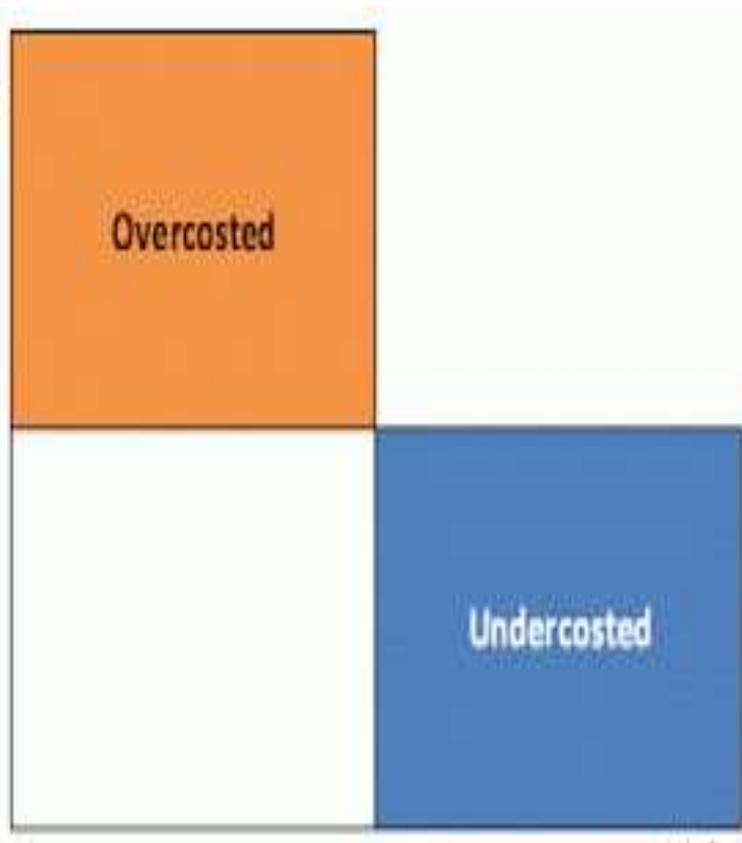
Unforeseen changes in the production capacity.

Seasonal fluctuations in the overhead expenses from period to period.

Overhead rate may be applied to the Normal Capacity which may be less than the full operating capacity of the undertaking.

- Example:
 - if the overheads absorbed on a predetermined basis are Rs. 1, 00,000
 - But the actual overheads incurred are Rs. 1, 20,000,
 - There is under-absorption to the extent of Rs.20, 000.
- Example:
 - If the overhead rate is predetermined to be \$20 per direct labor hour consumed
 - But the actual amount should have been \$18 per hour
 - Then the \$2 difference is considered to be over absorbed overhead.

What are the strategic consequences of product under costing and over costing?



- Undercosted products – Underpriced-increasing demand-lowering profits (losses)
- Overpricing-products lose market share to competitors producing similar products
- Product over-costing and under-costing leads to managerial attention to wrong products

Methods of Overhead Absorption

- **Direct Material Cost Method**
 - $\text{Actual Overhead Cost} / \text{Direct Material Cost} \times 100$
- **Direct Labour Cost Method**
 - $\text{Actual Overhead Cost} / \text{Direct Labour Cost} \times 100$
- **Prime Cost Method**
 - $\text{Budgeted Overhead Expenses} / \text{Anticipated Prime Cost}$
- **Direct Labour Hour Method**
 - $\text{Overhead Cost} / \text{Direct labour Hours}$
- **Rate Per Unit of Production Method**
 - $\text{Budgeted Overhead Cost} / \text{Budgeted Units of Production}$
- **Sales Price Method**
 - $\text{Budgeted Overhead Expenses} / \text{Sales of Units of Production}$
- **Machine Hour Rate Method**
 - $\text{Total Overhead Cost} / \text{Total Machine Hours}$



Example: Direct Material Cost Method

- The past actual direct material's cost is Rs. 10,000
- The past actual overhead cost is Rs. 2000.
- So, calculate the rate of overhead on the basis of past actual direct material and past actual overheads
- Hence, **Overhead rate** will be **20%**. ($2000/10,000*100$)
- If we have obtained any specific order for producing any product, we will include the 20% cost of overhead.
 - Example:
 - Suppose we have produced one unit for our customer for this and have used our Rs. 1000 material.
 - Our overhead cost in it will be Rs. $1000 \times 20\% =$ Rs. 200.

Example: Direct Labour Cost Method

- The past actual direct wage's cost is Rs. 10,000
- The past actual overhead cost is Rs. 2000.
- So, Overhead rate will be 20%.
- If we have obtained any specific order for producing any product, we will include the 20% cost of overhead.
- Example:
- Suppose we have produced one unit for our customer for this, we have paid Rs. 1000 to our laborers for their labour.
- Our overhead cost in it will be $\text{Rs. } 1000 \times 20\% = \text{Rs. } 200$.

Conclusion

Allocation and apportionment of overheads and then absorption of overheads helps for finding total cost of production for better decision making for cost control and cost reduction.

References

- <http://www.svtuition.org/2012/10/how-to-apportion-overhead-costs.html>
- <http://www.svtuition.org/2012/10/methods-of-overhead-absorption.html>