

Cost Analysis for Expenditure Control

Cost Mgt: is the process of continually reducing and controlling costs without reconciling with quality reduction

Cost Mgt Information System: It is an accounting information subsystem that is primarily concerned with producing outputs for internal users using inputs and processes needed to satisfy mgt objectives. The cost Mgt Information system has three broad objectives

- To provide information for costing out services, products, and other objects of interest to mgt
- To provide information for decision making
- To provide information for planning and control

Cost Planning and Control System

Budgeting plays a crucial role in planning and control. Budgets are the qualitative expression of these plans. When used for planning, a budget is a method for translating the goals and strategies of an organization into operational terms.

Budgets can also be used in control. Control is the process of setting standards, receiving feedback on actual performance, and taking corrective action whenever actual performance deviates from planned performance. Thus, budgets can be used to compare actual outcomes with planned outcomes and they can steer operations back on course.

Cost information is the base for preparing the budgets, which will in turn become the controlling mechanism. The success of the budget preparation and execution depends on the way costs are determined, planned and controlled.

Break-Even Analysis

A number of target levels of operation are set on the basis of a thorough BE analysis which has a heavy impact in the budget prepared. This concept can be effectively used in many of the public sector decisions that necessitates for budgeting. It can also indicate the impact on operations that a budget cut make.

Standard Costing

A standard is a carefully predetermined amount. A standard cost is a cost per unit that the organization should try to achieve if the results of operations are to be desired

Unit standards are the base or foundation on which a budget is built. Unit standards are also the building elements for a standard cost system.

To determine the standard cost for a particular input, two decisions must be made. (1) how much of the input must be used per unit of output (the quantity decision) and (2) how much should be paid for the quantity of the input to be used (pricing decision). The quantity decision produces quantity standards and the pricing decision produces price standards. Multiplying the quantity standards with the price standard gives the standard cost.

Sources of standards

Standards are developed through different means. Historical experience, engineering studies, and input from operating personnel are three potential sources to be carefully used. The input-output relationship of the past may not be very reliable. Engineered standards are very reliable, but too rigid. Since operating personnel are accountable for meeting the standards, they will have significant input in setting standards.

Types of standards

Std's are classified as either ideal or currently attainable. Ideal standards are std's that demand maximum efficiency and can be achieved only if everything operates perfectly. No breakdowns of machines, or lack of skill are allowed. Currently attainable standards can be achieved under efficient operating conditions. Allowance is made for normal breakdowns, interruptions, and imperfect skills etc. These standards are demanding but achievable

If standards are too tight and never achievable, workers become frustrated and performance level declines. However, challenging but achievable standards can lead to higher performance levels.

Why standard cost systems are adopted?

Standard costing systems enhance planning and control and improve performance measurement. Budgetary control systems compare actual costs with budgeted costs for the actual level of activity. By developing standards, variances can be computed. E.g. by developing unit price and quantity

standards, an overall variance can be decomposed into a price variance and a usage or efficiency variance

Variance Analysis

A variance is the difference between the actual result and its corresponding budgeted amount.

Variances assist managers in planning and control. A variance analysis will give the managers an early warning on the corrective and preventive measures to be taken. Variance indicates the performance of an organization and performance of each individual manager. Sometimes variance forces the managers to change the whole strategy.

Price variance is the difference between the actual and standard unit price of an output multiplied by the number of inputs used. Usage variance is the difference between the actual and the standard quantity of inputs multiplied by the standard unit price of the input

Illustration of Price and Efficiency Variance

The Educational Materials Production and distribution agency furnishes you with the following information for producing chalk

Material:

Std input allowed per packet of chalk :2Kg

Std cost of input per unit :Birr 4

Std cost of material per unit of output: Birr 8

Labor:

Std labor hours allowed per packet of chalk : 1.5hrs

Std cost per hour :Birr 2

Std cost per unit of output :Birr 3

Variable Overhead:

Std VOH allowed per packet of chalk :Birr 5 per chalk

(Total MOH) = 50000

machine hrs 10000

Budgeted machine hours ; 10 hrs

The following are the actual results, for the actual output of 1000 packets

Materials

Direct materials used :3000kgs

Direct materials costs :Birr 9000

Labor

Direct labor used : 1400hrs
 Labor cost : Birr 4200

Variable O/H

Variable overhead per machine hr Birr 5000
 Actual machine hrs used 1250

Material Price variance =

(Actual Price of input – Budg. Price) X Actual qty of input
 (3-2) 3000 = 3000U

Labor rate variance=

(3-4) 1400 = 1400F

Variable O/H Spending variance

(Actual VOH per unit of cost allo.base - Bud VOH per unit of cost allo.base) X Actual Qty of VOH cost alloc.base for actual output

(4 - 5) - 1250 = 1250F

Efficiency variance

MEV = (Actual qty. of input used – bud. Qty. for actual Output units) X Bud. price of input
 = { 3000-(2X1000)} X4 = 4000U

LEV = { 1400-(1.5X1000)} X2 = 200F

VOHEV = (Actual qty of VOH cost allo. Base - Budgeted qty of VOH cost allo.base allowed)Budgeted VOH Cost allocation rate
 For actual output For actual output
 = { (1250 –(100X10)) X5 = 1250 U

Fixed Overhead variance

FOHV = Actual - Budgeted

Reasons for Price (U) Variance

- Purchasing officer is less skilled in negotiation
- Purchasing in smaller lot sizes than budgeted, thereby losing quantity discounts
- Unexpected increase in material price
- Budgeted prices are set without careful analysis

Reasons for efficiency (U) variance

- The personnel manager hired under skilled workers
- Mistakes in scheduling the work
- Lack of maintenance of machines
- Time standards are set without analysis

Reasons for variable overhead efficiency (U) variance

- Workers were less skilful in the use of machines
- Machines were not maintained in good condition
- Budgeted machine time standards were set without analysis
- Inefficient schedule of jobs, resulting in higher than budgeted machine usage

Decision to investigate

Rarely will actual performance exactly meet the established stds, nor does mgt expects it to. Random variations around the standard are expected. Because of this, mgt should have in mind an acceptable range of performance. When variances are within this range, they are assumed to be caused by random factors. When a variance falls outside the range, the deviation is likely to be caused by non-random factors, either factors that managers can control or factors that they cannot control. In the non-controllable case, managers need to revise the standard

Whether or not to investigate variances is a critical issue. Investigating the cause of variance and taking corrective actions have a cost. As a general principle, an investigation should be undertaken only if the anticipated benefits are greater than the expected costs. Because it is difficult to assess the costs and benefits of variance analysis, many organizations adopt the general guideline of investigating variances only if they fall outside an acceptable range. They are not investigated unless they are large enough to be of concern

Costs and Decision making

Relevance, Costs and the Decision Process

TACTICAL DECISION MAKING

Tactical decision-making consists of choosing among alternatives with an immediate or limited end in view. Accepting a special order for less than the normal selling price to utilize idle capacity and increase this year's profits is an example. The immediate objective is to exploit idle productive capacity so that short-run profits can be increased. Thus, some tactical decisions tend to be *short-run* in nature; however, it should be emphasized that short-run decisions often have long-run consequences. Consider a second example. Suppose that a company is considering the possibility of producing a component instead of buying it from suppliers. The immediate objective may be to lower the cost of making the main product. Yet this tactical decision may be a small part of the overall strategy of establishing a cost leadership position for the firm. Thus, tactical decisions are often *small-scale actions* that serve a larger purpose. In fact the overall objective of strategic decision-making is to select among alternative strategies so that a long-term competitive advantage is established. Tactical decision-making should support this overall objective, even if the immediate objective is short-run (accepting a one-time order to increase profits) or small-scale (making instead of buying a component). Thus, sound tactical decision making means that the decisions made achieve not only the limited objective but also serve a larger purpose. In fact, no tactical decision should be made that does not serve the overall strategic goals of an organization.

The Tactical Decision-Making Process

With this very important qualification, it is possible to outline the tactical decision-making process. The five steps describing the process are listed below:

1. Recognize and define the problem.
2. Identify alternatives as possible solutions to the problem, and eliminate alternatives that are not feasible.

3. Identify the predicted costs and benefits associated with each feasible alternative. Eliminate the costs and benefits that are not relevant to the decision.
4. Compare the relevant costs and benefits for each alternative, and relate each alternative to the overall strategic goals of the firm and other important qualitative factors.
5. Select the alternative with the greatest benefit, which also supports the organization's strategic objective.

Qualitative Factors

While cost analysis plays a key role in tactical decision-making, it does have its limitations. Relevant cost information is not all the information a manager should consider. Other information, often qualitative in nature, is needed to make an informed decision. For example, the relationship of the alternatives being considered to the organizations strategic objectives is essentially a qualitative assessment. Other qualitative factors are also important. For example, suppose that a firm is considering whether to buy a component or to produce it internally. Assume that the cost analysis indicates that the buy alternative is less costly than the make alternative. Cost analysis can and should be viewed as only one input for the final decision. A number of qualitative factors can significantly affect a manager's decision making. In the make-or-buy decision, the firm's manager likely would be concerned with such qualitative considerations as the quality of the components purchased externally, the reliability of supply sources, the expected stability of prices over the next several years, labor relations, community image, and so on.

How should qualitative factors be handled in the decision-making process? First of all, they must be identified. Secondly, the decision maker should try to quantify them. Often, qualitative factors are simply more difficult to quantify, but not impossible. For example, possible unreliability of the outside supplier might be quantified as the probable number of days late multiplied by the labor cost of downtime in the plant. Finally, truly qualitative factors, such as the impact of late orders on customer relations, must be taken into consideration in the final step of the decision-making model the selection of the alternative with the greatest overall benefit.

Meaning of Relevance

Relevant costs are those expected future costs that differ among alternative courses of action. The key aspects of this definition are: (1) expected future costs (2) that differ among alternative courses of action.

Illustrations of relevance

Make or Buy Decisions

Organizations are often faced with **make-or-buy decisions**- decisions of whether to make or to buy components or services used in making a product or providing a service. For example, a physician can buy laboratory tests from external suppliers (hospitals or for-profit laboratories) or these lab tests can be done internally. Similarly, a PC computer manufacturer can make its own disk drives or they can be bought from external suppliers. Make-or-buy decisions are not short-run in nature, but fall into the small-scale tactical decision category. For example, the decision to make or buy may be motivated by cost leadership and/or differentiation strategies. Making instead of buying or buying instead of making may be one way of reducing the cost of producing the main product. Alternatively, choosing to make or buy may be a way of increasing the quality of the component and thus increase the overall quality of the final product (differentiating on the basis of quality).

Outsourcing is the process of purchasing goods and services from outside vendors rather than producing within the firm. Producing the same goods within the firm is called Insourcing.

If the financial factors predominate in the make or buy decision, assume the following data:

	Cost per unit	Total cost of producing 1000 units
Direct Material	10	10000
Direct Labour	20	20000
Var. Mfg. overhead	5	5000
Fixed Mfg cost of purchasing and receiving raw mat.	2	2000

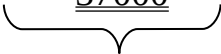
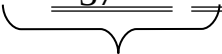
Mfg Overhead	<u>4</u>	<u>4000</u>
	41	41000

Another manufacturer offers the same part for Birr 38. Should the part be made or bought?

The unit cost may indicate that the company should buy. However, the difference in relevant costs has to be calculated. Fixed cost of 4000 is irrelevant and fixed cost of 2000 is relevant. It is relevant because these costs will not be incurred if the parts are bought. In fact, the capacity now used to make parts will become idle, but can be used for other profitable opportunities or services.

Relevant Items for Make or Buy Decisions

(Disposable Glasses for packing curd and ice-cream)

Relevant Item Cost	Total Cost		Per Unit	
	<u>Make</u>	<u>Buy</u>	<u>Make</u>	<u>Buy</u>
Outside purchase		38000		38
Direct Material	10000	-	10	-
Direct Labour	20000	-	20	-
Var. Mfg o/h	5000	-	5	-
Fixed O/h of purchasing	<u>2000</u>	<u>-</u>	<u>2</u>	<u>-</u>
Total relevant costs	<u>37000</u>	<u>38000</u>	<u>37</u>	<u>38</u>
				
Difference in favor of making	1000		1000	

The fixed cost of 4000 is irrelevant because it remains the same regardless of the decision.

Opportunity Costs

An opportunity cost is the profit foregone or lost by a firm in taking one course of action rather than another. It relates to an opportunity that is given up or sacrificed. It is not an actual cash outlay, but a cash inflow that the firm sacrifices by accepting one alternative over the other.

Assume that the above company decides to buy the part from outside and to utilize its idle capacity for making another product. The following are revenue and costs expected from producing disposable bottles.

Incremental revenue from the			
production and sale of 1000 bottles	-	10	= 10000
Incremental variable costs		7	= <u>7000</u>
Excess of incremental revenue or costs			<u><u>3000</u></u>

Now, there are three alternatives to be considered.

1. Make disposable glasses
2. Buy disposable glasses and do not make bottles
3. Buy the glasses and make bottles using the excess capacity.

Opportunity Costs approach to Make or Buy Decision

	<u>Make glasses</u>	<u>Buy glasses</u>
Total relevant costs	37000	38000
Opportunity cost (profit foregone)	<u>3000</u>	<u>-</u>
	<u><u>40000</u></u>	<u><u>38000</u></u>

Usually, opportunity costs are not incorporated into formal financial accounting records. They do not entail cash receipts or payments. Secondly, they change according to the circumstances.

Add or Drop a product/branch/department/program

Firms are referred to as multi-product firms when they sell more than a single line of product. Often a manager needs to determine whether a segment, such as a product line, should be kept or dropped. **Keep(Add)-or-drop decisions** use relevant cost analysis to determine whether a segment of a business should be kept or dropped. In a traditional cost management system, segmented income statements, using unit based fixed or variable costs, improve the ability to make keep-or-drop decisions.

Eg: A factory produces 3 products. One of the products shows a loss as shown below:

	<u>Prod. A</u>	<u>Prod. B</u>	<u>Prod. C</u>	<u>Total</u>
Sales	50000	40000	20000	110000
V.C	<u>20000</u>	<u>25000</u>	<u>15000</u>	<u>60000</u>
CM	30000	15000	5000	50000
FC	<u>15000</u>	<u>10000</u>	<u>10000</u>	<u>35000</u>
Net Income	<u>15000</u>	<u>5000</u>	<u>(5000)</u>	<u>15000</u>

The manager wants to drop prod C because it makes a loss of 5000. What do you advise?

Before we explain, we assume that (1) FC doesn't change, (2) excess capacity will not be used in any other productive manner.

Comparative Income Statement

	<u>Keep C</u>	<u>Drop C</u>
-		
Sales	110000	90000
VC	<u>60000</u>	<u>45000</u>
CM	50000	45000
FC	<u>35000</u>	<u>35000</u>
Operating Income	15000	10000

Utilizing Excess Capacity

Assume that of the Birr10000 fixed cost of Product C, Birr2000 is for a supervisor's salary that can be eliminated if the product is dropped. Second, the production capacity of C can be used to increase the production of Product A from 50000 to 75000.

	<u>Comparative Income Statement</u>	
	<u>Keep C</u>	<u>DropC(Increase A)</u>
Sales	110000	115000
VC	<u>60000</u>	<u>55000</u>
CM	50000	60000
FC	<u>35000</u>	<u>33000</u>
Op. Income	<u>15000</u>	<u>27000</u>

$$V.C = \frac{20000}{50000} \times 75000 = 30000$$

Decision : It is advisable to drop C and increase prod. A.

Relevance, Pricing and the Decision Process

Pricing is a troublesome area for many organizations, as determination of the “right” price for a good or service is very difficult. A company that sets its prices too high will scare off customers, resulting in a deterioration of bottom-line profitability. At the other end of the continuum, prices that are set too low may lead to an increase in sales activity. Often, however, these revenues fail to cover costs, and the result once again is a bleak profit picture.

Influences of Prices

What factors do companies consider when it comes time to determine this troublesome number – the price? Generally speaking, there are four major influences on prices: customers, competitors, costs, and a variety of legal, political, and image-related issues. The strength of these influences will vary from business to business.

Customers. Managers examine pricing decisions through the eyes of a firm’s customers. Increasing prices may cause the loss of business to a competitor, or it may cause customers to choose a less expensive substitute product.

Competitors. Competitors’ reactions also influence pricing decisions. A competitor’s aggressive pricing policy may force a business to lower its prices. On the other hand, a business without a competitor has some discretion and can set high prices to take advantage of the marketplace.

Costs. The role of costs in price setting varies widely among industries. In some industries, prices are determined almost entirely by market forces. An

example is the agricultural industry, where grain and meat prices are market-driven. Farmers must meet the market price; to make a profit, they must produce at a cost below this amount.

In other industries, managers set prices at least partially on the basis of costs by adding a markup to production costs. Managers have some latitude in determining the markup, so market forces have some influence here as well. In public utilities, such as electricity and natural gas companies, and cable television, prices generally are set by a regulatory agency of the state or local government. Costs again are of prime importance in these cases.

In most industries, both market forces and cost considerations heavily influence prices. No organization or industry can price its goods and services below cost for an indefinite period of time. And no company's management can set prices blindly at cost plus a markup without keeping an eye on the market.

Legal, political, and image-related issues: Beyond the important effects of market forces and costs on process are a range of environmental considerations. In the legal area, Managers must adhere to certain laws—laws that typically prohibit businesses from discriminating among their customers in price setting. Also prohibited is collusion, where the major firms in an industry all agree to set their prices at high levels.

Political considerations can also be relevant. For example, if the firms in an industry are perceived by the public as reaping unfairly large profits, there may be political pressure on legislators to tax those profits differentially or to intervene in some way to regulate prices.

Companies also consider their public image in the price-setting process. A firm with a reputation for top quality goods will set the price of a new product high to be consistent with its image. As many of us have discovered, the same brand-name product may be available at an outlet mall at a fraction of the price charged by a more exclusive retailer.

Pricing decisions may be taken for a short period and for a long period. Short run decisions include 1) pricing for a one time only special order and 2) adjusting product mix and volume in a competitive market.

Long run decisions include pricing a main product in a major market for a time horizon of not less than a year.

Costing and Pricing for the short-run

1. One Time Only special Order.

Gelatopia ice cream factory has a total capacity of 25000 cups. But, the current production is only 20000 cups. The price per cup of ice cream is Birr 20. The variable costs and the fixed costs (based on a production capacity of 25000 units) are as follows:

	<u>V.C per cup</u>	<u>F.C per cup</u>	<u>Total VC and FC per cup</u>
Mfg. costs			
Direct mat	5	-	5
Packaging (cup etc)	2	-	2
Direct labour	4	-	4
Mfg o/h	<u>1</u>	<u>2</u>	<u>3</u>
Total mfg costs	12	2	14
Marketing costs	<u>2</u>	<u>1</u>	<u>3</u>
Full cost	<u>14</u>	<u>3</u>	<u>17</u>

The ECSC invites a bid for supplying 1000 cups of ice cream for its graduation day.

No marketing or distribution cost is required for the special order. However a special packing material is required for the special order at 0.5 per unit. Fixed mfg costs of 2500 for additional material purchase is required for the special order.

An employee of ECSC informs you that a bid above 18 will be non-competitive. The co. knows that other ice cream producing factories will surely participate in the bid.

What price should Gelatiopia bid for the 1000 cups of ice cream?

Relevant Costs for the 1000 cups

Direct Mat	(1000 x 5)	5000
Packaging	(1000 x 2.5)	2500
Labour	(1000 x 4)	4000
Var. Mfg o/h	(1000 x 1)	1000
Fixed Mfg o/h		
Purchasing mat		2500
Total relevant costs		15000

Relevant cost per cup. $\frac{15000}{1000} =$ Birr 15/-

Any bid above 15000 will increase the profitability. However, cost data are not the only inputs for deciding the price to bid. Business rivals must also be considered.

Costing and pricing for the long run.

Alternative Pricing Approaches

After calculating the full product cost, the pricing decision can be made in two ways.

1. Market -based
2. Cost - based (also called cost plus pricing)

Market Based Pricing

In competitive markets such as the oil and gas, market-based approach is logical. The items produced are similar and the firm doesn't have any control over the price. Since the price is fixed, the firm has to have a target cost to earn a target income. In order to achieve the target cost, the firm has to strive for improving its products and processes.

1. Choose the target price
2. Derive a target cost by subtracting target profit from target price.

The firm can achieve target costs through value engineering. It is a systematic evaluation of all aspects of the value chain with an objective of reducing costs.

Cost Plus Pricing

Under the cost plus approach, price is first computed on the basis of the costs to produce and sell a product. A markup, representing a reasonable return is added to cost.

There are many pricing formulas. The general formula for setting a price is adding a markup to the cost.

Cost base (Full prod. cost)	=	50
Markup 10%		<u>5</u>
Prospective selling price		<u>55</u>

How is the markup percent determined? One approach is to earn a target return on investment. Target ROI is the target income that an organization expects to earn on invested capital.

In practice, firms choose cost bases and markup percentages on the basis of their experience in pricing products to earn a desired rate of ROI. Markup percentages can be calculated on variable cost, mfg costs, full product costs etc. However, full product cost is preferable because of its simplicity and coverage of all component costs.

Activity Based Costing

Limitations of traditional cost accounting Systems

Traditional product costing assigns only manufacturing costs to products. Assigning the cost of direct materials and direct labor to products do not pose any challenge. Overhead costs pose a different problem. The physically observable input –output relationship that exists between direct labor, direct materials and products is simply not available for overhead. Thus, assignment of overhead must rely on driver tracing (and perhaps allocation). In a traditional cost system, only unit based activity drivers are used to assign costs to products.

Unit –based activity drivers are factors that cause changes in cost as the units produced change. These drivers assign overhead to products through the use of either plant wide or departmental rates.

Activity-Based Product Costing

The traditional overhead assignment involved two stages; first overhead costs were assigned to an organizational unit and second overhead costs were then assigned to products. An activity based cost system is one that first traces costs to activities and then to products. Thus ABC is also a two-stage process, but in the first stage, it traces overheads to activities rather than to organizational units such as the plant or depts. The second stage is assigning costs to the product.

From a managerial perspective, an ABC system offers more than just more accurate product cost information. It provides information about the cost and performance of activities and resources and it can trace costs accurately to cost objects. Other than products, for example, knowing the cost of activities allows managers to focus on those activities that might offer opportunities for cost savings.

Four general terms are sufficient for an understanding of the fundamentals of Activity Based Costing.

1. **Objects** : such as products, services, markets, customers, divisions etc
2. **Resources**: Personnel, machinery, computer

3. **Activities:** Setting up a machine, ordering raw material, bookkeeping, making an investment budget, advertising a product, designing a computer system.
Activities may be classified as Unit level, Batch level, Product level, and Facility level.
4. **Cost drivers:** No. of set ups, No. of manufacturing orders, No. of quality control inspections, No. of production runs, No. of goods received transactions

First Stage Procedure

In the first stage of ABC, activities are identified, costs are associated with individual activities and their associated costs are divided into homogenous sets. The activity identification requires a listing of all the different kinds of work such as material handling, inspection, process engineering etc. Once an activity is defined, the cost of performing the activity is determined. At this point, the firm can calculate individual activity overhead rates.

In order to reduce the number of overhead rates activities are grouped together in homogeneous sets. Costs are associated with each of these homogeneous sets by summing the costs of the individual activities belonging to the set. The collection of overhead costs associated with each set of activities is called a homogenous cost pool. Once a cost pool is defined, a pool rate can be calculated by dividing the pool cost by the activity drivers practical capacity.

Thus, the first stage produces five outcomes:

1. Activities are identified: Identifying activities must be the first step in designing an ABC system. Activity identification entails observing and listing the work performed in an organization. Generally activities are what an organization does to satisfy its customers. Activities are the building blocks for product costing. Identifying activities is as simple as asking individual managers and workers the following questions: "What work do you do?"
2. Costs are assigned to activities
3. Related activities are grouped together to form homogenous sets.

The activities are grouped together in homogeneous sets based on similar characteristics. Such a grouping will reduce the number of overhead rates. For example, purchasing materials and receiving materials may be grouped together. So also, providing utilities and providing space.

4. The costs of grouped activities are summed to define homogeneous cost pools
5. Pool (overhead) rates are computed.

E.g: Assume that a firm identifies four overhead activities namely, setups, material handling, power and inspection. The costs are:

	Prod. 1	Prod. 2	Total
Setup	60000	60000	120000
Material handling	30000	30000	60000
Power	10000	90000	100000
Inspection	8000	72000	80000

Setup and material handling are performed each time a batch of product is produced. Thus, these two activities are logically related by the more general batch level production activity. Similarly, inspection and power activities are performed each time a unit of product is produced. Thus, these two activities are logically related by the more general activity of producing a unit of products. Thus, we can reduce. For activities into two sets of activities. These two sets can make homogeneous cost pools.

The first pool is the batch level pool and the second is the unit-level pool. The pool costs are given below.

Batch level pool	
Setups	120000
Materials Handling	<u>60000</u>
	<u>180000</u>

Unit – level pool	
Power	100000
Inspection	<u>80000</u>
	<u>180000</u>

Then, a pool rate will be calculated based on activity drivers. For the batch level cost pool, the number of production runs could be the activity drivers. Since the two actively drivers have the same consumption ratios, either

driver or number of setups, will assign the same amount of overhead to both products. For the unit-level cost pool, machine hours or direct labor hours could be selected as the activity drives.

First stage Procedure

Batch level pool:

Setup Costs	120000
Material handling costs	<u>60000</u>
Total costs	180000
Production runs	30
Pool rate (cost per run)	6000

Unit – level pool:

Power cost	100000
Direct labor fringe benefits	<u>80000</u>
Total costs	<u>180000</u>
Machine hours	50000
Pool rate (cost per machine hours)	Birr 3.60

Second – stage Procedure

In the second stage, the costs of each overhead pool are traced to products. This is done by using the pool rates computed in the first stage and measuring of the amount of resources consumed by each product. This measure is simply the quantity of the activity driver used by each product.

Applied overhead (to a product) = Pool rate x Activity usage

E.g Assume that prod. A and Prod. B have made available the following additional data.

	Prod. A	Prod. B
Production runs	20	10
Machine hours	5000	45000
Units of production	10000	100000
Prime costs	78000	738000
Overhead Costs (6000 x 20) (6000 x 10)	120000	60000
Unit level pool	<u>18000</u>	<u>162000</u>

(3.60 x 5000)		
(3.60 x 45000)		
Total mfg cost	<u>216000</u>	<u>960000</u>
Units of Production	10000	100000
Unit cost (Activity base)	<u>21.60</u>	<u>9.60</u>

Traditional Costing Vs Activity Based Costing

Sara Lamps produces two types of lamps A and B. the company recently decided to change from a unit-based, traditional costing system to an actively based costing system. The company wants to assess the effect on the product costs. The following data have been gathered.

Lamp	Quantity	Prime costs	Machine Hours	Material moves	Setups
A	400000	800000	100000	200000	100
B	100000	150000	25000	100000	50
Dollar value	----	950000	500000	850000	650000

Note: Dollar value of machine hours, 500000, is the cost of operating the production equipment.

Under the current system, the costs of operating the equipment, materials handling, and setups are assigned to the lamps on the basis of machine hours. Lamps are produced and move din batches.

Required:

1. Compute the unit cost of each lamp using the current unit-based approach.
2. Compute the unit cost of each lamp using an activity-based costing approach.

1. Total overhead is 2000000 (500000 + 850000 + 650000)

$$\text{Plant wide rate} = \frac{2000000}{100000+25000\text{machinehrs}} = \text{Birr 16 per machine hrs}$$

Overhead is assigned as follows:

$$A = 16 \times 100000 = 1600000$$

$$B = 16 \times 25000 = 400000$$

The unit cost for the two products are as follows:

$$A = \frac{800000+1600000}{400000} = \text{Birr 6 per unit}$$

$$B = \frac{150000+400000}{100000} = \text{Birr 5.50 per unit}$$

2. Activity based approach

Material moves and set up are assumed to be homogeneous. The consumption ratios are the same for material handling and setups. (The proportion of each activity consumed by a product is defined as the Consumption Rate). So, a batch level pool can be formed. The machine pool is a unit level pool (machining is performed each time a lamp is produced). Thus two overhead pools are formed. And rates for each of these pools have to be calculated as follows:

$$\text{Machining Pool: } \frac{500000}{125000} = \text{Birr 4 per machine hour}$$

Batch Pool

Material handling	=	850000
Setups	=	<u>650000</u>
Total	=	<u><u>1500000</u></u>
Number of setups		150
Rate (Total/setups)		10000 per setup

Notes: No. of could moves could have been used instead of setups. This would produce a different pool rate, but the cost assignment to the two products would be the same.

Overhead is assigned as follows:

$$\begin{array}{rcl} A & = & 4 \times 100000 = 400000 \\ & & 10000 \times 100 = \underline{1000000} \\ & & \text{Total} \quad \underline{\underline{1400000}} \end{array}$$

$$\begin{array}{rcl} B & = & 4 \times 25000 = 100000 \\ & & 50 \times 10000 = \underline{500000} \\ & & \text{Total} \quad \underline{\underline{600000}} \end{array}$$

This produces the following unit costs;

	A	B
Prime cost	800000	150000
Overhead cost	<u>1400000</u>	<u>600000</u>
Total cost	2200000	750000
Units produced	<u>400000</u>	<u>100000</u>
Unit cost	<u>5.50</u>	<u>7.50</u>