THE APPLICATION OF COST BEHAVIOUR AND ESTIMATION IN ORGANISATIONAL DECISION MAKING PROCESS

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Abstract

The issue of cost behaviour and cost estimation is vital and fundamental in tactical decision-making, planning and control. In addition, the preparation of budgets, the production of performance reports, the calculation of standard cost and the provision of relevant costs for pricing and other decisions depend on reliable estimates of costs and cost behaviour. This paper therefore examines the various cost behavioural patterns, methods of cost estimation, limitations, their implications for tactical decision making process in an organization. The paper shows that Engineering methods, inspection of the accounts, High-Low method, scattered graph and the Least square regression methods are some of the approaches that are at the disposal of the management accountant in estimating future costs of an organisation. Based on these findings, the paper recommends among others the need for the regular training of the management accountant in the modern methods of cost estimation, the need for accurate keeping of records of transactions and for long term forecasting of cost, management should rely on quantitative factors and judgment.

Keywords: Cost, behavior, estimation, organisation

Introduction

Every organization in the process of attaining its objectives incurs costs and for profit oriented organizations, the level of cost incurred has a direct relationship with the amount to be realized as profit. With this, it is necessary for management of organizations to able to plan and control costs. Determination of future Costs which are necessary for effective planning and control is one of the key challenges that confront management accountants in corporate organizations. The knowledge of the pattern of cost behavior and ways that future costs and other factors can be predicted are fundamental elements in short term planning and decision making process in an organization.

Cost behavior is associated with learning how costs change when there is a change in an organization’s level of activity. The costs that are unaffected by changes in the level of activity are classified as fixed costs. The understanding of cost behavior is very important for management’s effort to plan and control organization’s costs. Budgets and variance reports are more effective when they reflect cost behavior patterns. The understanding of cost behavior is also necessary for calculating a company’s break-even point, and for any other cost-volume-profit analysis.

The importance of accurately estimating costs and the complexity of cost behavior means that accountants must use increasingly sophisticated techniques. Advances in information technology have made it possible for more sophisticated techniques to be used for estimating costs even by small businesses. Management of organizations especially in the developing countries has limited knowledge of the important potential of mathematical and statistical techniques for estimating costs.

The major objectives of this paper are to examine the various techniques that can be used in estimating costs, the various cost behavior patterns, and to ascertain the activity measure or cost driver that exerts the major influence on the cost of a particular activity with a view to influencing managerial decision. The effect of experience on cost which is normally referred to as the learning curve will also be examined.

Literature review

The concept of cost

The term cost has been defined in various ways. A cost is defined by Chartered Institute of Management Accountants (CIIMA) as the amount of expenditure (actual or notional) incurred or attributable to a specified thing or activity. Okoye (2011) defined cost as the value of economic resources used in the production of goods and services. Mikshin (2001) views cost is the total amount of resources scarified or foregone towards achieving a stated objectives. Cost can be defined as the expenditure on goods and services required to carry out the operations of an organization.
From these definitions, it is obvious that cost has economic resources which have value and can be utilized to generate benefits. It may also represent the total amount of expenditure on manufacture of a product or rendering a service.

**The concept of cost behavior and cost estimation**

According to Brewer (2007) Cost behaviour refers to how a cost will change as the level of activity changes. Lucey (2007) states that classification of cost into fixed and variable, according to their behaviour and characteristics is an essential preliminary to be able to make any form of cost prediction and classification. A fixed cost is a cost which, within certain output limit tends to be unaffected by variations in the level of activity and a variable cost as one which tends to vary in direct proportion to variation in level of activity. According to Drury (2008) whether a cost is fixed or variable with respect to a particular activity measure or costs driver is affected by the length of the time span under considerations, stressing that the longer the time span, the more likely the cost will be variable. He measured the importance of accurately estimating cost and the complexity inherent in cost estimation and opines that accountants must use increasingly sophisticated techniques such as mathematical, statistical techniques and some non-mathematical techniques. According to Lucey (2007) cost can be classified for simplicity, emphasizing that most often a cost displays both fixed and variable characteristics and it is referred to as semi fixed or semi-variable or mixed cost. Therefore, to enhance decision making, it is important to separated mixed cost into variable and fixed element. Determining how cost will change with output or other measurable factors or activity is of importance to decision making, planning and control.

Cost estimation is futuristic and it is concerned the process of presenting future costs with present or past cost information. In other words cost estimation is term used to describe the measurement of historical cost with a view to helping in the prediction of future cost for managerial decision making. This means that historical information is analysed to provide estimate on which to base future expectation. Dury (2008) asserts that cost estimation begins with measuring past relationships between total costs and the potential drivers of those costs. Stone (2008) opines that a reliable estimation of cost and distinguishing between fixed and variable cost at different levels of activity helps in preparation of budgets, production of performance reports, the calculation of standard cost and provision of relevant costs for pricing and other decisions. As good as these may be, cost nevertheless are not easy to predict because they behave differently under different circumstances, for instance, classifying direct labour as a variable cost or a semi-fixed costs depends on the circumstances of employment of such labour. Employing casual labour on daily basis will be classified differently from where a fixed number of people are employed and the number maintained even when level of activity reduces.

**Typical cost patterns**

According to Lucey (2007), when cost are recorded and analyzed, it is possible to see their pattern of relationship with volume of activity. For the three type of costs identified earlier, there are different patterns. Adeniyi (2004) summarized these patterns as follows:

(i) **Linear variable cost pattern:** This pattern represents costs which vary in direct proportion to the level of activity; that is doubling the level of output will double the total variable cost. In this case the relationship between variable cost and activity level is shown as a straight line. It is pertinent to note that variable cost will vary at different level of activity. Examples include direct materials, piecework labour, energy to operate the machines, sales commission etc. The average variable cost or variable cost per unit must remain constant.

![Fig. 1 A variable cost or a linear variable cost behaviour pattern.](image-url)
Curve-linear variable cost patterns: These patterns arise where costs do not vary in direct proportion to activity changes and the function is non-linear or curve-linear. Although, variable cost elements change with volume of activity, their pattern of change varies from one element to the other.

The figure below shows a convex pattern, concave and direct behavior pattern. In the convex pattern, each extra unit of output causes a less than proportional increase in cost. Labour cost element cause total costs to have this behavioral pattern.

A concave pattern results where each extra unit of output causes a more than proportionate increase in cost. Examples of elements that cause this pattern are expenses.

(ii) **Fixed Cost:** The fixed cost pattern shows a cost which is incurred for a period and which at certain output and turnover level tends to be unaffected by variations. These occur in relation to passage of time and which within definable limits tend to be unaffected by fluctuations in the volume of output.
Semi-variable/ semi-Mixed Cost: The cost contains both fixed and variable components and which is caused partly by fluctuation in the level of activity (Adeniyi 2004). According to Drury (2008) fixed cost can be separated into fixed cost and variable cost elements by the process or methods of cost estimation techniques.

The variable cost element of a semi-variable cost may be linear or curve-linear as shown in diagrams above. Examples of semi-variables cost are power and telephone charges. The linear semi-variable cost function can be represented algebraically as

\[ Y = a + bx \]

Where \( Y \) = total cost
\( a \) = fixed cost
\( x \) = volume or output in unit/hour
\( b \) = a constant representing the variable cost per unit

Methods of cost estimation

The approaches to cost estimation that will be the focus of this paper are the Engineering methods, inspection of the accounts methods, the graphical or scatter graph method, high-low method and least squares method. These approaches differ in terms of the cost of undertaking the analysis and the accuracy of the estimated cost functions. They are not mutually exclusive and different methods may be used for different cost categories.

Engineering Methods

Engineering methods of estimating cost behaviour are based on the use of engineering analyses of technological relationships between inputs and outputs. The approach is appropriate when there is a physical relationship between costs and the cost driver. The procedure when undertaking an engineering study is to make an analysis based on direct observations of the underlying physical quantities required for an activity and then to convert the final results into cost estimates. Engineers, who are familiar with the technical requirements, estimate the quantities of materials and the labour and machine hours required for various operations; prices and rates are then applied to the physical measures to obtain the cost estimates. The engineering method is useful for estimating costs of repetitive processes where input-output relationships are clearly defined. For example, this method is usually satisfactory for estimating costs that are usually associated with direct materials, labour and machine time, because these items can be directly observed and measured. However, the engineering method is not normally used for separating semi-variable costs into their fixed and variable elements.
The engineering method is applicable to manufacturing and service activities. It is not generally appropriate, however, for estimating costs that are difficult to associate directly with individual units of output, such as many types of overhead costs, since these items cannot easily be directly observed and measured.

**Inspection of the accounts**

The inspection of accounts method requires that the departmental manager and the accountant inspect each item of expenditure within the accounts for a particular period, and then classify each item of expense as a wholly fixed, wholly variable or a semi-variable cost. A single average unit cost figure is selected for the items that are categorized as variable, whereas a single total cost for the period is used for the items that are categorized as fixed. For semi-variable items the departmental manager and the accountant agree on a cost function that appears to best describe the cost behaviour. The process of estimating cost with this method is illustrated below.

The following cost information has been obtained from the latest monthly accounts for an output level of 10 000 units for a cost centre.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
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<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>(N)</td>
</tr>
<tr>
<td>Direct materials</td>
</tr>
<tr>
<td>Direct labour</td>
</tr>
<tr>
<td>Indirect labour</td>
</tr>
<tr>
<td>Depreciation</td>
</tr>
<tr>
<td>Repairs and maintenance</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The departmental manager and the accountant examine each item of expense and analyze the expenses into their variable and non-variable elements. The analysis might be as follows:

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Unit total</td>
</tr>
<tr>
<td>variable non-variable</td>
</tr>
<tr>
<td>cost cost</td>
</tr>
<tr>
<td>((N)) (N)</td>
</tr>
</tbody>
</table>

Direct materials | 10.00
Direct labour    | 14.00
Indirect labour  | 30 000
Depreciation     | 15 000
Repairs and maintenance | 0.50 | 5 000
| 24.50 | 50 000 |
The repairs and maintenance have been classified as a semi-variable cost consisting of a variable element of N0.50 per unit of output plus N5,000 non-variable cost. A check on the total cost calculation indicates that the estimate of a unit variable cost of N24.50 will give a total variable cost of N245,000 at an output level of 10,000 units. The non-variable costs of N50,000 are added to this to produce an estimated total cost of N295,000. The cost function is therefore \( Y = 50,000 + 24.50x \). This cost function is then used for estimating total cost centre costs at other output levels.

It can be observed from this method that the analysis of costs into their variable and non-variable elements is very subjective. Also, the latest cost details that are available from the accounts will normally be used, and this may not be typical of either past or future cost behaviour. Whenever possible, cost estimates should be based on a series of observations. Cost estimates based on this method involve individual and often arbitrary judgments, and they may therefore lack the precision necessary when they are to be used in making decisions that involve large sums of money and that are sensitive to measurement errors.

**High-low method**

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit produced</th>
<th>Electricity Bill (cost) N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>50,000</td>
<td>100,000</td>
</tr>
<tr>
<td>2007</td>
<td>67,000</td>
<td>130,000</td>
</tr>
<tr>
<td>2008</td>
<td>20,000</td>
<td>70,000</td>
</tr>
<tr>
<td>2009</td>
<td>120,000</td>
<td>200,000</td>
</tr>
<tr>
<td>2010</td>
<td>88,000</td>
<td>104,000</td>
</tr>
<tr>
<td>2011</td>
<td>112,000</td>
<td>93,000</td>
</tr>
</tbody>
</table>

Under this situation, year 2009 is taken as 'high' since it has the highest production volume and the year 2008 as low 'low' since it has the lowest production volume. The variable cost per unit or the slope measured by the change in cost / change in unit volume \((130,000 - 70,000)/130,000\) units/N100,000=N1.3 per units. Therefore the slope (variable cost) is N1.30 per unit produced. The fixed cost can be determined by deducting the total variable cost from the total cost at either level, as follows:

\[
\text{Fixed cost} = \text{Total costs} - \text{Total Variable costs}
\]

\[
N200,000 - N1.30(120,000) = N44,000
\]

The cost function can therefore be represented as, \( Y = 44,000 + 1.30x \), which enables management to estimate future cost for any level of activity.

The high-low method of cost estimation is used to estimate variable and fixed cost rates for a specific cost (e.g., electricity bill). It utilizes information on costs from previous years of operation and takes the cost for the year with the highest volume and the cost of the year with the lowest volume and finds the slope between the two. This slope will then become the 'per unit variable cost' for the cost item. The cost function can be represented as:

\[ Y = a + bx \]

where \( Y \) is the total cost, \( x \) is the level of output, \( b \) the slope (variable cost) and the fixed cost portions (represented by \( a \)) can be determined.

The advantage of this method is that it is easy to use and implement by managers. However, the method gives inaccurate cost estimates as it ignores all cost observations other than the observations for the lowest and highest activity levels. Furthermore, cost observations at the extreme ranges of activity levels are not always typical of normal operating conditions, and therefore may reflect abnormal rather than normal cost relationships (Dury, 2008). It is therefore appropriate to incorporate all of the available observations into the cost estimates rather than use only two extreme observations.

Here is an example concerning the electricity bill of Osunde Ltd, a factory in Benin City.
the total costs (Y) = 44,000 +1.30 (350,000)=N499,000

**Graphical or scatter graph approach**

Creating a scatter graph is another method of estimating fixed and variable costs. It provides a good visual picture of the costs at different activity levels. However, it is often hard to visualize the line through the data points especially if the data is varied. This approach requires multiple data points that incorporate all of the observations. It is likely to provide a better estimate of the cost function than a method that relies on only two observations. Cost estimation using this method requires five steps (Peters, 2009).

Step 1: Draw a graph with the total cost on the Y-axis and the activity (units) on the x-axis. Plot the total cost points for each activity points.

Step 2: Visualize and draw a straight line at an angle which is judged to be the best representative of the slope of the plotting.

Step 3: Determine variable costs per unit by observing the difference between any two points on the straight line.

Step 4: Identify where the line crosses the Y-axis. This is the total fixed cost.

Step 5: Plug your answers to steps 3 and 4 into the cost formula by replacing the slope (b) with variable cost per unit and the Y-intercept (a) with total fixed costs in the following format:

\[ y = a + bx \]

This method is illustrated below.

The total maintenance cost and machine hour for the past ten four-weekly accounting period were as follows:

<table>
<thead>
<tr>
<th>Period</th>
<th>Machine hour (x)  '000</th>
<th>Maintenance cost (Y) N’000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>400</td>
<td>960</td>
</tr>
<tr>
<td>2</td>
<td>240</td>
<td>880</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>480</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
<td>1200</td>
</tr>
<tr>
<td>5</td>
<td>320</td>
<td>800</td>
</tr>
<tr>
<td>6</td>
<td>240</td>
<td>640</td>
</tr>
<tr>
<td>7</td>
<td>160</td>
<td>560</td>
</tr>
<tr>
<td>8</td>
<td>480</td>
<td>1200</td>
</tr>
<tr>
<td>9</td>
<td>320</td>
<td>880</td>
</tr>
<tr>
<td>10</td>
<td>160</td>
<td>440</td>
</tr>
</tbody>
</table>

Source: Adapted from Durry, 2008
The total costs (maintenance costs) are presented on the Y-axis while the level of activity (machine hours) are on the X-axis. The maintenance costs are plotted for each level of activity and a straight line is drawn through the middle of the data points as closely as possible so that the distance of observations above the lines are equal to the distance of observations below the line.

The point where the straight line intersects the vertical axis i.e. N240,000 represents the fixed costs item in the regression formula \( Y = a + bx \). The unit variable cost \( b \) in the regression equation is found by observing the difference between any two points on the straight line. For observations of 160,000 and 240,000 hours level of activity and their corresponding cost of N560,000 and N720,000 respectively, the unit variable cost is determined as:

\[
\text{Difference in cost} = \text{N720,000} - \text{N560,000} = \text{N2 per unit}
\]

\[
\text{Difference in activity} = 240,000\text{hours} - 160,000
\]

This gives a cost function of \( Y = \text{N240,000} + \text{N2x} \) which can be used for forecasting total costs by inserting appropriate level of activity i.e a value for \( x \). For an activity level of 850,000 machine hours, the total costs will be calculated as,

\[
\text{Total costs} = \text{N240,000} + 2 \times (850,000) = \text{N1,940,000}
\]

**Least-squares regression analysis**

This method determines mathematically the regression line of best fit. The technique mathematically accomplishes what the analyst does visually with a scatter diagram. It is based on the principle that the sum of the squares of the vertical deviations from the line that is established using the method is less than the sum of the squares of the vertical deviations from any other line that might be drawn. The use of this method is also based on the assumption that a causal relationship exists in the data and that a linear function is appropriate. This statistical technique is used to establish values for the...
coefficients a and b representing fixed and variable cost respectively in the linear function.

\[ Y = a + bx \]

Where \( Y \) is total cost i.e. dependent variable

\( X \) is the agreed measure of activity i.e. the independent variable

The coefficients of a and b can be obtained using the following equations which in the view of (Lucey 2007) are normal equations.

\[ \sum y = an + b \sum x \quad \ldots \ldots \quad 1 \]
\[ \sum xy = a \sum x + b \sum x^2 \quad \ldots \ldots \quad 2 \]

The alternative approach is to transpose the normal equation and calculate the coefficients directly

\[ a = \frac{\sum y \sum x^2 - \sum x \sum xy}{n \sum x^2 - (\sum x)^2} \quad \ldots \ldots \quad 3 \]
\[ b = \frac{n \sum xy - \sum y \sum x}{n \sum x^2 - (\sum x)^2} \quad \ldots \ldots \quad 4 \]

The least-squares regression analysis is superior to both the high-low and the scatter diagram methods. It uses all available data, rather than just two observations, and does not rely on subjective judgment in drawing a line. Statistical measures are also available to determine well a least-squares equation fits the historical data. These measures are often contained in the output of spreadsheet software packages.

In addition to the vertical axis intercept and the slope, least-squares regression calculates the coefficient of determination. The coefficient of determination \( R^2 \) is a measure of the percent of variation in the dependent variable (such as total maintenance costs) that is explained by variations in the level of activity, such as machine hour.

The application of this technique is illustrated using the alternative model described above because it is easier for management to understand.

The past observations of maintenance costs of an organization are as presented below

<table>
<thead>
<tr>
<th>Hours X(000)</th>
<th>Maintenance Cost Y(N,000)</th>
<th>X (N’000)</th>
<th>XY(N’000,000)</th>
<th>Y2(N’000,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>1,500</td>
<td>8,100</td>
<td>135,000</td>
<td>2,250,000</td>
</tr>
<tr>
<td>150</td>
<td>1,950</td>
<td>22,500</td>
<td>292,500</td>
<td>3,802,000</td>
</tr>
<tr>
<td>60</td>
<td>900</td>
<td>3,600</td>
<td>54,000</td>
<td>810,000</td>
</tr>
<tr>
<td>30</td>
<td>900</td>
<td>900</td>
<td>27,000</td>
<td>810,000</td>
</tr>
<tr>
<td>180</td>
<td>2,700</td>
<td>32,400</td>
<td>486,000</td>
<td>7,290,000</td>
</tr>
<tr>
<td>150</td>
<td>2,250</td>
<td>22,500</td>
<td>337,500</td>
<td>5,062,500</td>
</tr>
<tr>
<td>120</td>
<td>1,950</td>
<td>14,400</td>
<td>234,000</td>
<td>3,802,500</td>
</tr>
<tr>
<td>180</td>
<td>2,100</td>
<td>32,400</td>
<td>378,000</td>
<td>4,410,000</td>
</tr>
<tr>
<td>90</td>
<td>1,350</td>
<td>8,100</td>
<td>121,500</td>
<td>1,822,500</td>
</tr>
<tr>
<td>30</td>
<td>1,050</td>
<td>900</td>
<td>31,500</td>
<td>1,102,500</td>
</tr>
<tr>
<td>120</td>
<td>1,800</td>
<td>14,400</td>
<td>216,000</td>
<td>3,240,000</td>
</tr>
<tr>
<td>60</td>
<td>1,350</td>
<td>3,600</td>
<td>81,000</td>
<td>1,822,500</td>
</tr>
</tbody>
</table>

\[ \sum x=1,250 \quad \sum y=19,800 \quad \sum x^2=163,800 \quad \sum xy=2,394,000 \quad \sum y^2=36,225,000 \]

Adapted from Dury,2008:602

The values of the fixed cost (a) and the unit variable cost (b) are calculated using formulas in equation 3 and 4 above.

\[ b = \frac{12(2,234,000) - (1,260,000)(19,800)}{12(163,800) - (1,260)^2} = \frac{780,000}{378,000} = N10 \]

\[ a = \frac{19,800 - (10)(1,260)}{12} = N600,000 \]
The cost function $Y = N600 + N10x$ can be used by management to predict the cost incurred at different activity levels including those for which it has no past information.

**The Effect of learning curve on cost estimation**

One important factor that affects the prediction or estimation of labour cost is the learning curve effect. A learning curve is a diagrammatic representation of the phenomenon whereby average labour time of a product falls by a specific percentage whenever output is doubled when a repetitive task is performed. The term is based upon the observation that anyone performing a task will complete the job more quickly as experience is gained through repetition. There will therefore be improvement in the speed of carrying that specific task leading to overall reduction in time spent in performing the task. (Adeniyi, 2004), (Lucey, 2007).

The theory states that if average time falls by 20% then learning phenomenal of 80% is present within the labor force but if the average time falls by 30% then the effect of learning will be 70%. The underline logic behind this theory is premised on the fact that human being unlike machine acquires a lot of skills, experience, exposure specialization and dexterity for performing a repetitive assignment (Oscar, 2006).

The theory disagrees with the popular notion that labour cost is variable cost and that cost per unit is constant. Drury (2008) states that learning theory was first noticed during the World War II. From the experience of aircraft production during the World War II, aircraft manufacturers found that the rate of improvement was so regular that what is required could be predicative with high degree of accuracy from a learning curve.

The learning curve can be expressed in equation form as

$$Y_x = ax^b$$

Where $Y_x$ is defined as the average time per unit of cumulative production to produce $x$ unit, $a$ is the time required to produce the first unit of output and $x$ is the number of unit of output under consideration. The exponent $b$ is defined as the ratio of the logarithm of the learning curve improvement rate divided by the logarithm of 2.

**The importance of accurate estimation of a project cost**

Estimating costs correctly is important because it helps make the right commitment to a business activity. The process takes a bit of experience, research, decision-making and judgment. However, none of these elements alone will produce a good cost estimate. It is in this respect that Charles (2008) posits that managers and analysts who practice a combined preparation of cost estimates can do so with reliable accuracy and their work can then be used to make financial decisions that affect the direction of an organization going into the future.

This assertion is also reinforced by Holt (2001) that the better the accuracy of a cost estimate, the better the planning and decision-making in predicting and adjusting for future change. This is critical when business decisions need to be made on educated guesses where a bad decision can end up in a serious loss of profit. Good cost-estimating also helps keep operating margins down by avoid unnecessary expenses.

**The challenges with inaccurate cost estimate**

Bad estimates cost a business in two ways. Obviously, underestimating expenses of a project can create a financial emergency half-way through or at an important juncture, which can put the project completion at risk (Anthony, 2007) Insufficient resources or support of labor can effectively shut a project down, making it more expensive to finish due to delay. All of this unexpected cost increase then reduces or eliminates profit. Overestimating creates fat in the project with too many resources. Valuable funds get wasted on over-consumption, again reducing revenue that could have been attributed to profit.

Cost-estimate accuracy forces a business project to stay on schedule and on track. Particularly with client projects, once an estimate is confirmed, the business has to stay within budget if it doesn't want to lose money. This has a ripple effect on all the business' activities to come in at or below budget while meeting all of the client's goals, including schedule and delivery.

Good business decisions are only as good as the data they are based on. The importance of accurate cost estimates becomes significant when decisions that can result in changes occur. Investment of funds in new directions as well as cost-cutting for savings both depend heavily on cost estimates being correct. The assumed numbers are then built into commitments, contract, budgets, procurement and accounting accruals. If the data turns out to be wrong, then further emergency changes have to be made at the last second to compensate. Avoidance of such a situation makes getting the estimates right the first time around critical.

**Conclusion**

The understanding of cost behaviour and ability to segregate mixed cost facilitate cost prediction, planning
and control. This is the reason a careful attention must be given to it. Management must understand that most costs do not assume the conventional separation to either fixed cost or variable cost, and that most costs are mixed. Efforts are to be made to separate them or else planning and costing will be distorted. On the other hand, learning-curve impacts on labour as a repetitive production process reduces the time as production doubles. The knowledge helps to forecast labour cost and to plan for efficiency.

Good cost estimates rely on past data to determine patterns of financial behavior.

The method and techniques discussed are best for short run planning and decision making purposes. This means that the relationship between costs and activity and the classification of cost are only likely to hold good over a relatively short time span i.e. between 3 months to one year period, therefore the accountant should note that over long time periods unpredictable factors are bound to occur e.g. there may be change technology and materials may become scarce so that prediction of cost behavior based on examination of historical data is likely going to be increasingly unreliable.

**Recommendations**

Based on the findings, the following recommendations are made:

(i) For long term forecasting the manager should rely on quantitative factors and judgment.

(ii) The management should allow for the projected rate of inflation particularly when considering such items as labour, material cost, selling price and bought in services.

(iii) The management accountant should be familiar with behaviour of cost as this is a basis for proper cost estimation

(iv) Management should keep proper records of transactions because inaccurate records lead inaccurate cost prediction.

(v) The management accountant should be retrained regularly on the use of modern techniques of cost estimation.

**References**


