

CHAPTER -I

INTRODUCTION

1.1 Background of the Study

Nepal is located in the South Asia Region. It is land- locked between its two large neighbors, India and China. It is a small country with a land of 147,181 km square inhabited by about more than 25 million people. It is surrounded by mountain and hills geographically. Nepal is divided into three regions on the basis of physical feature, i.e. Himalayan region covers 15% area with 7.39% population, and hilly region covers 68% area with 44.5% population and Terai region covers 17% area with 44.3% population. Population of Himalayan and Hilly region is decreasing trend and Terai region is increasing trend due to internal conflict and security, lack of physical infrastructure, education, transportation, market, health as well as scarcity of agricultural land. 14.25% population stays at urban area and remains at remote area. Literacy rate above 6 year is 61% in Nepal. “Nepal, the steepest country in the world, descends from the height of Everest to the tiger prowling jungles below. Between are valleys rich in more than 2500 years of culture where Hinduism and Buddhism have met and created undreamed of glories of spiritualism through stone, brick and metal for eye to behold and for the soul to experience. The most beautiful Himalayan Kingdom Country, discover the world of mountains, rivers, jungle and culture in the world of Nepal (Visit Nepal, 1998).

The total population of the country is 23151423 (census 2002) and growth rate is 2.24% per annum. Nepal presents an example of being united in diversity over the history and has maintained its pride to be an independent and sovereign state.

In the context of world economy Nepal is in a very weak position and least developing country. Nepal’s inflation rate has reached 12% with the sharp rise in commodity prices, highest in the past 6 months. The country’s economy has registered a growth of more 3.9%, half of the target in 2008 according to the Economic Survey 2009 published by the government. The agriculture sector grew by 2.1% in 2008 while non agriculture sector grew by 4.8%. However the GDP per capita income reached USD 473 in 2008 despite

the poor performance of other sectors of the economy which was possible due to the increasing remittance (financialexpress.com).

The above statistical data are very less than that of the two neighbors India and china. For the development of nation there should be good situation of political, legal, socio-cultural, science and technological and economic environment. Good governance has prior responsibility towards the people. The basic needs should be provided and facilitated to the people by the government in cheap price and easy way. Primary needs of people like education, health, communication, water, sanitation, electricity, health, communication, water, sanitation, electricity, transportation, security etc should facilitate. For that government make various policies, rules, regulation, law etc. Economic or Political policy may differ country to country. For servicing to the citizens, government opens various public enterprises. In the words of World Bank, State owned enterprises are financially autonomous and legally distinct entities wholly or partly owned by central or sub national government.

PEs is autonomous bodies which are owned and managed by the government & which provides goods or services for a cheap price. The ownership of the government should be 51% or more that in PEs (Nanin, 1988:42). Thus the government can play a major role in establishing different kinds of public enterprises.

Public enterprises help many areas such as balanced regional development, public welfare to generate employment opportunities, export – promotion, etc. Again public enterprises play a major role in achieving the twin objectives of social and economic envisaged in national policy. The role of PE is stimulating and augmenting the pace of economic growth in developing countries can hardly be estimated. Different public enterprises have different set of objectives. Some public enterprises are manufacturing where as some are public utilities. Public enterprises have maintained proper balance between profit oriented and service oriented.

Public enterprises in Nepal constitute a vital instrument for socio-economic development of our country. It enjoys a strategic and crucial position in our mixed economy. PEs were rapidly established after the advent of the democracy and launching of five year development plan period. Nepal Bank Limited was the first PE which was established prior to the launching of the planned development policy in 1956 AD. Therefore, virtually no development of PEs took place during the period. Nepalese economy was characterized by lack of basic industries and so on. The country lacked resources both financial as well as non financial including sufficient skilled human resources for the proper socio-economic development of the country. Majorities of the Nepalese are still depending on agriculture.

Nepal has adopted mixed economic system where contribution of private and public sectors are co-existed in harmonious and collective way most of Nepalese PEs is suffering from regular operating loss by observing the past annual budget, economic surveys studies of the running projects. Therefore, they are obliged to depend on their budget to the government. They are unable to sustain return from their investment and contribution to the nation by providing expected return as dividend or tax. They are creating a huge amount of liabilities to the government and considered the public revenue is misusing in unproductive sectors. So, after the restoration of democracy, the government has adopted a policy to privatize and dissolve the PEs which is operating at loss or financial burden to the government except the public utilities. Most public enterprises are creating a large amount of liabilities to the government as financial burden. The causes behind loss of public enterprises are various. Management has its five functions planning, organizing, staffing and human resource management, leading and interpersonal influence and controlling. Organization cannot run without profit whether it is private or public, lack of proper plan, management and control system. Public enterprises in Nepal are suffering from loss. Lack of business experts, management system and standard accounting rules are not applied properly.

Although, Nepal is a poor country, development is based virtually in the hand of the foreign aids or policy, government has established various PEs in different fields such as

public utility, manufacturing enterprises, trading enterprises, financial enterprises etc. Among them, DDC is one of the public concerned established to bring improvement in production, processing, presentation, sales and distribution of milk and milk products i.e. cheese, butter, ghee, yoghurt etc.

The population of our country is increasing day by day. Therefore, the importance of milk and milk products has increased. The increasing trend of population is shown in Table 1.1.

Table 1.1
Growth of Population

Year in AD	Population “000”	Growth rate
1911	5639	-
1921	5574	0.13
1930	5533	0.07
1940	6284	1.16
1952-1954	8473	2.3
1961	9413	1.65
1971	11556	2.07
1981	15023	2.66
1991	18491	2.08
2001/202	2270	2.2

Source: CBS (2002) Statistical Pocket Book, 2002

The demand of the agricultural products including milk for consumption purposes has increased due to increase in population and also urbanization made the demand for milk and milk products high. The farmers, who lived near city, were supplying milk and milk products without consideration of nutrition and hygienic value, thereby affecting the health of the people.

Therefore, with the rising demand or market and to control the water mixing practice, government realized to install the dairy program inside the country after 2009 B.S. As a result, Dairy Development Commission was converted into Dairy Development Board in 2019 B.S. (1962 A.D.).

Before 2007 B.S. the environment was also not favorable to develop the industrial sector and the government had no vision about this matter. After democracy, 5 year passed keeping the nation in political inconsistency.

From 2013 B.S. the government started 5 years development plans which are also running now and the government has been operating the development works according to these plans.

1.2 Introduction of DDC

Dairy Development Corporation (DDC) was established in B.S. 2026 (1969) under the corporation act, B.S. 2021 (1964). Under the corporation are to provide guarantee market and fair price to the rural milk producers and to supply hygienic pasteurized milk and other standard dairy products to the urban customers. Prior to the establishment of the corporation a separate Dairy Development Board was constituted to carry out the task of dairy development in Nepal in wider scale. The dairy development activities in Nepal started in Tusal village of Kavre district B.S. 2009 (1952) on experimental basis with a small scale milk processing plant under the Development of agriculture. In the year B.S. 2010/011 at the initiative of Dairy Development Board, the central Dairy Plant was established and it started milk collection, processing and marketing activities from the year B.S. 2014 (1957).

1.2.1 Objectives of DDC

-) Provide a guaranteed market for milk to the rural farmers with fair price.
-) Supply pasteurized milk and milk products to urban customers.
-) Develop organized milk collection system to meet increasing demand for pasteurized milk and milk products.
-) Develop an organized marketing system for milk and milk products.

1.2.2 Organization of DDC

The Board of Directors formed by government of Nepal governs the corporation. Under the board of directors the corporation has been revising its organizational structure according to the changing need at the central level as well as at the regional level.

DDC have been collecting cow, buffalo and nak/chauri milk from more than 40 districts of Nepal. Milk is collected through the farmers owned organization, milk producers' association (MPA) and milk producers' co-operative society (MPCS). Its present milk collection network has spread from Panchthar in the East to Surkhet in the West.

There is a mini processing plant established under the Lumbini Milk Supply Scheme few years ago. Thus the scheme has started selling pasteurized milk in local market. Since the sales volume is small, the scheme is transshipping the cow milk to KMSS and PMSS to cater the demand of those areas.

Hetauda Milk Supply (HMS) scheme also supports KMSS by supplying excess milk that is above their local requirement, whereas Biratnagar milk supply scheme manufactures skimmed milk powder from its excess milk and that of other milk supply schemes as well. C has been playing a special role in the contribution to uplift the economic status of the rural farmers. Thus this dairy has been recognized as effective tool for poverty alleviation in the past years. DDC purchased about 162,600 liters of milk per day from farmers.

In the pas few years' milk production in the milk- shed areas of the DDC has increased to a great extent. Consequently, the DDC couldn't buy all the milk offered by the farmers, especially during the flush season. As a result, it had to introduce milk Holiday on certain days during the flush season. On the other hand during the lean period DDC had to import skimmed milk powder to meet customers' demands. To mitigate this problem in accordance with the ten year Dairy Development plan prepared with the assistance of Danish Government project for establishing a skimmed milk powder plant was initiated in 2048 (1994) and is in operation since December 1994. Capacity of this powder plant is 30 mt. of powder per day.

1.2.3 Donors

World Food Program (WFP) had supported DDC for about a decade in the early years. The New Zealand and Danish Government had contributed toward the establishment and

rehabilitation of milk processing plants. USAID and Danish Government have been the major donors.

1.3 Statement of the Problems

Success is not a matter of chance and profit does not happen. Profits are planned and managed and profit planning and control is a tool that can handle organizations' present situation smoothly. Cost-Volume-Profit analysis under the profit planning and control provides the techniques of profit planning framework.

DDC being the leading dairy with government subsidy and lots of heavy resources has no dearth of market for its products. However, it has suffered losses year after year and fluctuation of profit/loss in past recent years. The inconsistent sales revenue, low contribution margin having high fluctuating variable and fixed cost, low productivity of DDC, compelled and excited me to find out the causes of such losses and fluctuations and thus, writing my thesis on this topic.

Besides this, DDC has generated profit of Rs. 4203559 in F/Y 2060/61 and Rs 2430753 in F/Y 2063/64, which is a grant leap of improvement as compare to the past continuous losses. This research also deals and provides the reason for such achievement.

1.4 Objectives of the Study

The main objectives of this study is to examine "Cost-Volume-Profit analysis of DDC" to determine the relationship between cost, volume and profit and profitability of the DDC.

The following sub-objectives have been set to achieve the main objectives:

-) To study the relationship between cost, volume and profit as a tool of budgeting.
-) To evaluate the profitability and sensitivity of DDC in relation to sales.
-) To analyze the productivity of the labor by using different productivity ratios.
-) To analyze the cost-volume-profit of the corporation and it's impact on its profit planning.
-) To provide necessary suggestions and recommendations wherever necessary based on findings.

1.5 Significance of the Study

This research work is the study of the practice of CVP analysis of DDC. This study will be useful to various stakeholders of DDC on various way and those are seated below.

-) It examines the application of the corporation.
-) It provides necessary theoretical as well as contemporary situational conceptions to make appropriate decisions for DDC.
-) It may also help DDC to take corrective measures to the related department of the corporation.
-) It is also useful for interested parties, loan investors, foreign donors, suppliers etc.
-) It provides literature to the researchers, who want to perform further research on this field.

1.6 Limitation of the Study

The efforts of this research have been made to present and analyze the clearly, truly and within the boundary. Every research has some limitation. Basically, not availability of the required and useful data and information would be major limitations of the study. The study is confined only to CVP analysis as a tool of profit Planning and control (Budgeting).

The following factors will limit the study:

-) The study will cover the last five fiscal years data of DDC i.e. F/Y 2059/60 to F/Y 2063/64.
-) The data of F/y 2064/65 were not available as it was in the auditing process.
-) The study is based on primary and secondary data (inclusive if discussion and financial statements collected from the corporation.
-) This thesis has been confined to the data provided by the personnel of the corporation.
-) This study only focuses on CVP analysis.

1.7 Organization of the Study

This study has divided into five major chapters.

Chapter – I Introduction

This chapter deals with background, evaluation of industrial development in Nepal, a brief overview of Dairy Development Corporation, statement of the problem, objectives of the problem, significance of the study and limitation of the study.

Chapter – II Literature Review

The second chapter “literature review” deals with the review of related literatures and available studies written and conducted by different experts and researchers in the field of CVP.

Chapter – III Research Methodology

The third chapter “research methodology” presents the methodology used in this study. It deals with research design, sources of data, procedures employed and financial and statistical tools used for the study.

Chapter – IV Data Presentation and Analysis

This part of the study includes presentation and analysis of financial figures of DDC. This presentation and analysis helps to come to the ultimate conclusion of the study. This part also contains the list of major findings derived from the analysis.

Chapter – V Summary, Conclusion and Recommendations

The fifth chapter summarized the whole study. Moreover, it draws the conclusions and forwards the recommendations better utilization of cost volume profit analysis.

The bibliography, appendix will be included in the last of the thesis.

CHAPTER -II

REVIEW OF LITERATURE

2.1 Conceptual Framework

CVP analysis plays a vital role in profit planning. CVP analysis segregates the total cost into two parts: fixed and variable costs. Up to a limited level of production, the fixed cost remains unchanged but variable cost increases and decreases with respect to the increment and decrement of volume of production. Therefore, in order to make profit, it is necessary to examine that whether the capacity is fully utilized or not or if there is any part to reduce cost. Because a minor change in cost may result in high differences in profit whereas the efficient use of resources may reduce the cost and it may give the opportunity to make more profits.

CVP analysis is effective in respect of short-term planning. It enables to study the effect of business activities on the expenses. Understanding of the aforementioned relationship plays a considerable role in correct prospective business planning and budgeting. CVP analysis helps managers to see in advance the effect of different strategies and decisions on business activities. With the result of the analysis, managers will be able to answer the following questions:

-) What should be the level of sales to cover all expenses?
-) What should be the volume of sold products enabling to get the required profit?
-) How the increased business activities would effect precedes expenses and profit?
-) And many other questions.

CVP analysis can be used for the whole organization and its small units, departments, sections and production lines. CVP analysis studied the interrelation of units. During the analysis we estimate these interrelations and, therefore, the organization's margin of profit in a single product organization, when cost behavior is accurately explained by a fixed-variable framework, CVP analysis is undoubtedly a precise, valuable tool for decision making. Unfortunately, this scenario rarely reflects reality. Most organizations

are multi-product and activity base costing (ABC) would indicate that cost behavior is generally more complex than a simple fixed-variable framework would suggest.

The constant sales mix concept underlying most textbook treatments of multi-product CVP assumes that fixed costs should be allocated between products based on their share of total weighted contribution margin.

This implicitly supposes that each fixed cost is incurred for the benefit of all products. The ABC methodology suggests that this assumption is unlikely to be appropriate when products consume differing levels of overhead resources. Using more detailed analysis of fixed costs between product lines, 'direct' break-even points for individual products can be calculated.

Accountants and managers need to have a clear understanding of the assumptions underlying CVP models which they use for decision making purposes and need to use the model which is most appropriate for the decision at hand.

2.1.1 Assumptions of CVP Analysis

It is essential that anyone preparing or interpreting CVP information should be aware of the underlying assumptions on which the information has been prepared. If these assumptions are not incorrect conclusions may be drawn from the analysis. They are as follows: (Drury, 2000: 248-253)

1. All Other Variables Remain Constraint

It is assumed that all variables other than the particular one under consideration have remained constraint throughout the analysis. In other words, it is assumed that volume is the only one factor that will cause cost and revenues to change. However, changes in other variables such as production efficiency, sales mix, price levels and production methods can have an important influence on sales revenue and cost. If significant changes in these other variables occur, the CVP analysis presentation will be incorrect.

2. Simple Products or Constant Sales Mix

CVP analysis assumes that either a single product is sold or, if a range of products is sold, that sales will be in accordance with a predetermined sales mix. When a predetermined sales mix is used, it can be depicted in the CVP analysis by assuming average revenues and average variable costs for a given sales mix.

BEP is not a unique number; it varies depending on sales mix. It is different from the budgeted sales mix, the actual average unit contribution is different from that used in the budgeted BEP calculations.

Thus, the BEP and the expected profits or losses at various output levels will also change. Any CVP analysis must therefore be interpreted carefully if the initial product mix assumptions do not hold.

3. Complexity-related fixed cost does not change

CVP analysis assumes that complexity-related cost will remain unchanged. Cooper and Kaplan illustrate that many so-called fixed costs vary not with the volume of items manufactured but with the range of items produced (i.e. the complexity of the production process). Complexity-related costs do not normally vary significantly in the short run with the volume of production. If a change in volume does not alter but if volume stays constant and the range of items produced changes then support department fixed cost will eventually change because of the increase or decrease in product complexity.

CVP analysis assumptions will be violated if a firm seeks to enhance profitability by product proliferation, i.e. by introducing new variants of products based on short-term contribution margins. The increased product diversity, however, will cause complexity-related fixed cost to increase in future periods and there is a danger which long-term profits may decline as a result of product proliferation. The CVP analysis incorporates the fixed cost required to handle the diversity and complexity with the current product range, but the costs will remain fixed only if diversity and complexity are not increased further.

Thus, CVP analysis will not capture the changes in complexity-related costs arising from changes in the range of items produced.

4. Profits are Calculated on a Variable Costing Basis

The analysis assumes that the fixed costs incurred during the period are charged as an expense for that period. Therefore, variable costing profit calculations are used, it is necessary to assume that production equals to sales for the analysis to predict absorption costing profits. If this situation does not occur, the inventory levels will change and the fixed overheads allocated for the period will be different from the amount actually incurred during the period. Under absorption costing, only when production equals sales will the amount of fixed overheads incurred are equals to the amount of fixed overheads charged as expenses.

5. Total costs and the Total Revenues are Linear Functions of Output

The analysis assumes that unit variable cost and selling price are constant. This assumption is only likely to be valid within the relevant range of production.

6. Analysis applies to Relevant Range Only

CVP analysis is appropriate only for decisions taken within the relevant production range and that it is incorrect to project cost and revenues figures beyond the relevant range.

7. Cost can be accurately divided into their Fixed and Variable Elements

CVP analysis assumes that costs can be accurately analyzed into their fixed and variable elements. Even though, separations of semi-variable costs into fixed and variable elements are extremely different in practice. Nevertheless, a reasonably accurate analysis is necessary, if CVP analysis is to provide relevant information for decision-making.

8. The analysis applies only to a Short-Term Time Horizon

In the short-term, the costs of providing a firm's operating capacity such as property taxes and the salaries to senior managers are likely to be fixed in relation to the change in activity. Decisions on the firms intended future potential level of operating capacity

would determine the amount of capacity costs to be incurred. These decisions will have been made; they cannot be easily being reversed in short-term. It takes time to significantly expand the capacity of plant and machinery or reduce capacity. Furthermore, plant investment and abandonment decisions should not be based on short-term fluctuations in demand within a particular year. Instead, they should be reviewed periodically as part of the long-term planning process and decisions based on predictions of long-run demand over several years. Thus, capacity costs will tend to be fixed in relation to changes in activity within short-term periods such as one year. However, over long-term period significant changes in volume or product complexity will cause fixed cost to change.

It is therefore assumed that in the short-term, some costs will be fixed and unaffected by changes in volume. In the short-term, volume is the most important variable influencing total revenue, costs and profits. For this reason, volume is given special attention in the form of CVP analysis. However, in the long-run, other variables besides, volume will cause costs to change. Therefore, the long-term analysis should incorporate other variables, besides volume and recognizes that fixed cost will increase or decrease in steps in response to change in the explanatory variables.

2.1.2 Terms used in CVP Analysis

Variable Cost

The cost, which varies according to the level of production or output, is called variable cost. It fluctuates in total amount but tends to remain unchanged per unit as production activity changed. Material cost, direct cost etc are variable cost. There is a linear relationship between the volume and variable cost i.e. the cost increases or decreases as the volume increases or decreases.

Fixed Cost

The cost, which remains unchanged to an entire range of production or output, is called fixed cost. Thus, fixed cost is the costs which remain constant in respect to the changes in

the output within a relevant range. The main characteristic of fixed cost is that it is fixed within a range whereas in per unit cost, it will change. For example rent, insurance etc.

Semi-Variable Cost

Semi-variable cost is the cost, which remains fixed to a certain range of output and varies thereafter in accordance with the change in capacity. In other words, the cost, which has characteristics of fixed and variable cost, is called semi-variable cost. It is even called mixed cost. For example, lighting, indirect material, indirect labor, cost of overtime, repair and maintenance, etc.

Step Fixed Cost

It is the cost, which remains constant up to certain level of capacity. After meeting the capacity, there is an increment in the fixed cost by certain amount. Regularly, the fixed cost will increase up to the point, where the cost meets its existing capacity.

Break-Even Analysis

Break-even analysis is a logical extension of marginal costing. It is based on the same principle of classifying the operating expenses into fixed and variable. Now a day, it has become a powerful instrument in the hands of policy makers to maximize profit.

The B/E analysis is a specific way of presenting and studying the enter-relationship between the cost, volume and profit. It provides information to management in the most precise manner.

The B/E analysis established a relation between the revenues and cost with respect to the volume. It indicates the level of sales at which cost and revenue are in equilibrium. The equilibrium point is normally called BEP.

Break-Even Point (BEP)

The BEP can be defined as that point of sales at which the total revenue is equal to total cost. For BEP to occur, it is necessary that firm have same variable and fixed cost. If all

the cost of the firm is variable, no profit no loss or BEP would be at zero sales volume. On the other hand, if all costs were fixed, the BEP would occur at a point where revenue is equal to total fixed cost. The BEP can be computed in terms of units as well as rupees.

$$\text{BEP (units)} = \frac{\text{Total Fixed Cost}}{\text{Unit Selling Price} - \text{Unit Variable Cost}}$$

$$\text{BEP (Rs)} = \frac{\text{Total Fixed Cost}}{1 - \left(\frac{\text{Unit Variable Cost}}{\text{Unit Selling Price}} \right)}$$

In order to understand the B/E analysis, the following three concepts should be understood.

1. Contribution Margin
2. P/V Ratio
3. Margin of Safety

1. Contribution Margin

It is the difference between the sales and the marginal/variable cost of sales and it contributes towards fixed expenses and profit.

$$\text{Contribution Margin} = \text{Selling Price} - \text{Variable Cost}$$

For example,

$$\begin{aligned} \text{Selling price} &= \text{Rs. 25 per unit} \\ \text{Less: Variable cost} &= \text{Rs. 15 per unit} \\ \text{Contribution Margin} &= \text{Rs. 10 per unit} \end{aligned}$$

2. P/V Ratio

It is an important tool in studying the profitability of a business. It establishes relationship between contribution and the sales volume.

It can be also found from the relationship between the changes in the contribution and change in the sales. It is written in the form of percentages (%).

Example:

In above case, if the fixed expenses is Rs. 100000/- and sales unit is 20000, the contribution will be Rs. 200000/- (i.e. 20000*10), which is sufficient to meet fixed expenses and profit left is Rs. 100000/-. And if the output (sales) is 10000 units then the contribution will be Rs. 100000/- (i.e. 10000*10), which is just sufficient to bear the fixed expenses. And, if the output is 5000 units, contribution will be Rs.50000/-, which is not sufficient to meet even fixed expenses and the result is a loss of Rs. 50000/-.

Thus, contribution will first go to meet the fixed expenses and to profit.

$$C/M \text{ ratio or P/V ratio} = \frac{CMPU}{SPPU} \text{ or } \frac{CM}{\text{Sales Revenue}}$$

Where:

CM = Contribution Margin

P/V = Profit Volume

CMPU = Contribution Margin per Unit

SPPU = Selling Price per Unit

3. Margin of Safety:

It is the difference between the actual sales and BEP sales. One of the assumptions of marginal costing is that the production or the output will coincide to the sales. So, margin of safety is also the excess of production over BEP output. Sales or output above BEP is known as margin of safety because it given same profit whereas at BEP only fixed expenses is recovered.

$$\text{Margin of Safety} = \text{Actual Sales} - \text{BE Sales} \text{ or } \frac{\text{Profit}}{\text{P/V Ratio}}$$

For Example,

If present sales is Rs. 400000 and BE sales is Rs. 300000, margin of safety (MOS) will be

$$\text{Rs } 100000/- \text{ (i.e. Rs. } 400000 - \text{ Rs. } 300000) \text{ or } 25\% \text{ (i.e. } \frac{100000}{400000} * 100\% \text{)}$$

2.1.3 Sensitivity of CVP Analysis

Sensitivity of CVP analysis is the study of the CVP analysis in the different stages or in the different situation in which the related terms of CVP, cost (fixed and Variable), volume and profit changes. If changed occur in one term, such as in cost (variable and fixed cost independently), we studied its effect or changes, which may be positive or negative, on profit, on sales volumes, on contribution margin, on selling price, etc. respectively. It helps the company to maintain its original BEP in the change situation.

Small changes in one factor of CVP can change the BEP or profit or in other words, BEP or profit is influence in response to the changes in selling price, variable cost and fixed cost. When changes are expected on selling price, in ratio of variable cost factors, or in the amount of fixed cost, an analysis of the cost-volume –profit relationship can determine the effect of such changes on period's profit and BEP.

2.1.4 Methods of Segregating Mixed or Semi-Variable Costs

CVP analysis requires the segregation of all costs in to fixed and variable. So, the semi-variable costs should also be segregation of the semi-variable cost is done through one of the following methods:

1. Levels of output compared to levels of Expenses Methods

According to this method, the output at two different levels in compared with corresponding level of expenses. Since, the fixed cost remain, the variable overheads are arrived at by the ratio of change in expenses to changes in output.

$$\text{Variable Elements} = \frac{\text{Change in Amount of Expenses}}{\text{Change in Activity or Quantity}}$$

2. Range Method

This method is similar to levels of output compared to level of expenses except that only the highest and lowest points of output are considered out of various levels. This method is also called High and Low Method

Procedure:

- Select the highest pair and the lowest pair
- Compare the variable rate 'b' using the following formula

$$\text{Variable Rate} = \frac{\text{Difference in Cost "Y"}}{\text{Difference in Activity "X"}}$$

- Compute the fixed cost as:

Fixed Cost Position = Total Semi-Variable Cost – Variable Cost

3. Degree of Variability Method (DOV)

In this method, the degree of variability is noted for each of semi-variable expenses. Some may have 70% variability while others may have 30% variability. The method is easy to apply but difficulty is faced in determining the degree of variability.

4. Scatter-Graph Method

In this method, the given data are plotted on graph paper and line of best fit is drawn, whereas semi-variable expenses is plotted in the vertical axis (Y-axis) and activity measures is plotted in the horizontal axis (X-axis).

Procedure

-) The volume of production is plotted on the horizontal axis and the costs are plotted in the vertical axis.
-) Corresponding to each volume of production costs is then plotted on the paper, thus, several points are shown on it.
-) A straight line of best fit is then drawn through the points plotted. This is the total cost line. The point where this line intersects the vertical axis is taken to be the amount of fixed elements.
-) A line parallel to the horizontal axis is drawn from the point where the line of best fit intersects the vertical axis. This is the fixed cost line.

J) The variable cost at any level can be known by nothing difference between fixed and total cost lines.

The Scatter-graph method is relatively easy to use and simple to understand. However, it should be used with extreme caution, because it does not provide an objective test for assuring that the regression line drawn is the most accurate fit for the underlying assumptions.

5. Least Square Method

One of the popular for CVP analysis is regression analysis. Regression analysis is a statistical procedure for estimating mathematically, the average relationship between the dependent variable (Y) and the independent variable (X). The regression method does include all the observed data and attempts to mind a line of best fit. To find the line of best fit, a technique called least-squares method is used.

It is based on the mathematical technique of fitting an equation with the help of a number of observations. The linear equation can be assumed as:

$Y = a + b.X$ and the various sub-equations shall be,

$$Y = n.a + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Similarly, the equation can be fitted for any number of order or degree depending upon the number of observations available and accuracy desired.

Unit variable cost and fixed cost can be computed by using the following formula:

$$b = \frac{\sum XY - \frac{\sum X \cdot \sum Y}{N}}{\sum X^2 - \frac{(\sum X)^2}{N}}$$

$$a = \frac{\sum Y - \frac{\sum Y \cdot \sum X}{N}}{N}$$

Where,

Y = Total Cost

a = Fixed Cost

b = Unit Variable Cost

N = Number of Series

X = Production units

= Sum of

2.1.5 Special Problems in CVP Analysis

CVP analysis is applied to individual products or parts of a business and to company as a whole. In the latter case, there are three special problems may be encountered.

) The Activity Base

When two or more products or activities are combined for BEP analysis, the activity base is usually in amount. Product unit is used for single product. The activity base is must be in additive units using a common denominator of volume or output in multiple products. Therefore, for the company as a whole, net sales amount are usually the only satisfactory common denominator because manufacturing, selling and administrative activities are expressed in combinations.

) The Change in Inventory

Normally, the budgeted changes in inventories (i.e. finished goods and work-in-progress) are immaterial in amount and thus may be disregarded in CVP analysis. On the other hand, when the changes in budgeted inventory are significant; it should be included in analysis. Including the effect of inventory changes in CVP analysis requires subjective judgments about what management might do (about making inventory changes at different volume and the conceptual precise is desired. Management considers two practical approaches or policies in inventory changes often used:

- a. Disregard the inventory changes.
- b. Include the inventory changes.

J **The Non-Operating Incomes and Expenses**

Non-operating income (gains) and extraordinary gains and losses, if materials in amount, cause another problem in CVP analysis. The basic issue is whether they should be included or excluded. Extraordinary gains and losses are non-recurring and unusual; therefore, they should be excluded. Non-operating incomes and expenses are recurring but they are not related to ongoing operations. Management consider the policy may be to:

- a. Include the non-operating incomes and expenses.
- b. Exclude the non-operating incomes and expenses.

2.1.6 Utility of CVP or B/E Analysis

Break-even analysis is the most useful technique of profit planning and control. It is a device to explain the relationship between cost, volume and profits. The utility if the break-even analysis lies in the following advantages:

- J It is a simple device to understand accounting data.
- J It is a useful diagnostic tool.
- J It provides basic information for considering the risk implications of alternative actions.
- J The break-even analysis is a simple concept to comprehend and interpret the accounting data. Many business executives and others are unable to understand accounting data combined in financial statements and reports. When these data are presented through break-even charts, it becomes very easy to grasp and interpret them. However, the executives using break-even analysis should remember the limitations of this device and should not attach too much volume to it.

The break-even analysis is a useful diagnostic tool. It indicates to management the causes if increasing break-even point and falling profits. The analysis if these causes will reveal to management what actions should be taken. As a practical matter, knowledge o where the break-eve point lies can be quite useful to management on determining the need for action. However, an increasing break-even point should not always be a matter if alarm to management. The important information to be analyzed is break-even as a percentage of

capacity. If the break-even point as a percentage of capacity is increasing, it indicates unfavorable conditions. It is this kind of situation which needs immediate action. It is possible that due to plant expansion absolute break-even point may increase, but overall capacity may be increased. This situation, where the break-even point as a percentage of capacity does not increase, is not unfavorable.

In the break-even analysis, we compute BEP and P/V ratio, prepare break-even charts and P/V graphs and analyze and report the effect of changing factors on profits. This whole set of information is important to evaluate the reasonableness and usefulness of profit plans and other budgets and forecasts prepared by management. The break-even analysis, thus, provides the basic information for profit improvement studies and it is a useful starting point for detailed investigations.

The desirability of an action should be considered on the basis of its profit as well as risks. Profit alone is considered, a firm may commit to a risky action. The break-even analysis, to some extent, is a useful method for considering the risk implications of alternative actions. Considering the effects of the alternative actions on the break-even point can approach the problem of risk evaluation. From one alternative, a firm may expect higher profit and also a higher break-even point, while another alternative may produce comparatively lower profit but may also entail a lower break-even point. In taking a decision, the firm should not only consider the profits expected from the alternative but also the probability of reaching the BEP. If the probability of achieving the BEP sales is low, the firm should prepare the second alternative where the BEP will be reached earlier.

2.1.7 Limitations of CVP or B/E Analysis

The BEP or CVP analysis is a simple and useful concept. But it is based on certain assumptions, which have been discussed earlier. These assumptions limit the utility and general applicability of the B/E analysis.

Therefore, the analysis should recognize these limitations and adjust data, wherever possible, to get meaningful results. The CVP analysis suffers from the following limitations:

-) It is difficult to separate costs into fixed and variable components.
-) It is not correct to assume that the total fixed cost would remain unchanged over the entire range of volume.
-) The assumption of constant selling price and unit variable cost is not valid.
-) The B/E analysis is a short-term concept and has a limited use in long range planning.
-) The B/E analysis is a static tool.

2.1.8 Approaches of Calculating Break-Even Point

There are two approaches to calculating the break-even point for a firm:

1. Contribution-Margin approach.
2. The Equation approach.

Contribution-Margin Approach

I. Based on amount of Profit Contributed

This approach is based on the concept of the contribution margin, or the amount that each unit contributes toward covering fixed expenses and generating profit. Mathematically, the contribution margin per unit is calculated as follows:

$$\text{Contribution Margin per Unit} = \text{Selling Price per Unit} - \text{Variable Cost per Unit}$$

II. Break-even is where Fixed Expenses are Covered

If the contribution margin is the amount that each unit contributes toward covering the fixed expenses, the break-even point in units, or the point where the fixed expenses are covered can be found in the following manner:

$$\text{Break-Even Sales (in units)} = \frac{\text{Fixed Expenses}}{\text{Contribution Margin Per Unit}}$$

III.

Break-even in Rupees

To find the break-even point on Rupees simply multiplies the break-even point in units by the selling price. Alternatively, one can use the contribution margin ratio, which is the contribution margin expressed as a percentage of the selling price. Thus:

$$\text{Break-Even Sales (in rupees)} = \frac{\text{Fixed Expenses}}{\text{Contribution Margin Ratio}}$$

The Equation approach:

$$\text{Sales} - \text{Total Variable Expenses} - \text{Total Fixed Expenses} = \text{Profit}$$

$$\text{Break-even Sales (in Rs.)} = \text{Total Variable Expenses} + \text{Total Fixed Expenses}$$

$$\text{Sales (in Units)} = \frac{\text{Fixed Expenses} + \text{Target Net Profit}}{\text{Contribution Margin Per Unit}}$$

$$\text{Sales (in Rs.)} = \text{Total Variable Expenses} + \text{Total Fixed Expenses} + \text{Target Net Profit}$$

2.1.9 CVP Analysis with Multiple Products

I. Multiple Products Require Weighted Sales Mix

Most firms have more than one product line, and CVP analysis may be adapted for these firms. The same basic equations are used; however, the sales mix must weight the contribution margin. The sales mix is the number of units sold of a given product relative to the total units sold by the firm.

Example:

If a company sales 8000 units of product A and 2000 units of product B, the sales mix is 80% A and 20% B.

II. Weighted-average Contribution really a Market Basket

A weighted-average unit contribution margin is calculated by multiplying a product's contribution margin by its sales mix percentage, and then summing the results for individual products. The result is often divided into fixed expense (as before) to arrive at

the break-even point in units. In this case, however, the units are really a market basket of the various goods in the sales-mix percentage.

III. Final Step

As a final step, the sales mix percentage is multiplied by the number of 'units' to calculate the individual product sales to break-even. It should be evident that a change in a firm's sales mix will alter the company's break-even point.

2.1.10 CVP Relationship with the Income Statement

➤ Traditional Includes Cost of Goods Sold

The traditional income statement for a manufacturer includes a cost of goods sold figure that combines variable costs and fixed manufacturing overhead. The statement's format does not group costs by behavior but rather by function, thus making CVP analysis difficult.

➤ Contribution Highlights Cost Behavior

The contribution income statement is presented in a format that highlights cost behavior. Variable expenses are subtracted from sales to produce a total contribution margin. Next fixed expenses are subtracted to yield the period's net income. This format is used for variable costing.

2.1.11 Cost Structure and Operating Leverage

Cost structure refers to the relative proportion of fixed and variable costs existing in an organization. An automated manufacturing plant would have a high proportion of fixed costs whereas a direct labor-intensive plant would have a high proportion of variable costs. Any organization has some choice as to its cost structure.

A company's cost structure has a significant effect on the way in which profits fluctuate in response to changes in sales volume. The greater the proportion of fixed costs in a firm's structure, the greater will be the impact on profit from a given percentage change

on sales revenue. This result from the fact that firm with relatively higher fixed cost (and relatively lower variable costs) will have a higher contribution margin ratio.

Operating leverage is a measure of how sensitive net income is to percentage changes in sales. Operating leverage is greatest in companies, which have a high proportion of fixed costs relative to variable costs. A firm with high fixed costs and low variable costs has high operating leverage, the ability to highly increase net income from an increase in sales revenue. In other words, after the break-even point has been reached, a larger amount of contribution margin will fall to the bottom line in a high fixed cost structure than if the cost structure had been comprised mostly of continuing high variable costs, which continue to eat away to net income after the break-even point is

$$\text{Degree of Operating Leverage} = \frac{\text{Contribution Margin}}{\text{Net ncome}}$$

2.2 Review of Related Studies

Many studied have been conclude in the profit planning in the context of Nepalese business firms and public enterprises. But in the must, CVP analysis has given less priority than others or it can be said that only few studies are mainly focused on CVP analysis. And whatever few researches have been made, are not also in depth. Mostly CVP analysis is done only under the heading of Profit Planning and Control in Nepal.

Few researches have been reviewed under the topic of profit planning and control and cost-volume-profit analysis in Nepal related with Dairy Development Corporation.

Badu (1996) had tried to point out some features and problems of profit planning in Nepalese manufacturing public enterprises and he selected Dairy Development Corporation (DDC) as a base for study.

His main objectives:

-) To analyze the various functional budgets adopted in those enterprises.

-) To examine the capacity utilization of DDC.
-) To assess the financial performance of DDC using BEP analysis.

His research covered the time period of five year from F/Y 2049/50 to 2053/54. Research methodology was mostly through secondary procedure and only for some information, primary data were used.

His major Findings:

-) DDC has practice short term planning rather than long term planning.
-) Lack of segregation of cost into fixed and variable.
-) DDC has problem of maintaining the quality of the products.
-) No proper management to supply milk in the urban areas because of the difficulties in collecting surplus milk from rural market.
-) Financial position of the DDC is not good.

His major Recommendations:

-) DDC should from long term planning on specific and practicable basis.
-) DDC should develop its specific goals for coming budget. Such goals may be profit on sales, net profit on capital employed, sales revenue etc. without such goals, the operation of the company may not be effective.
-) The storing system if milk should be made more effective.
-) The pricing system of the milk and milk product should be in consistent with cost.
-) At decision-making level, competent and capable persons should be involved for this political interference should be avoided.
-) There should be good transportation system for collecting rural milk.

Dumre (1997) has submitted the thesis on the topic “*Profit Planning Practice in Nepalese Public Enterprises: A case study of DDC*”. The study was mainly concerned with the appraisal of DDC and examines that in what extent, the company is applying PPC system.

His major Findings:

- J DDC has not been clearly defined its main objectives in annual goal or target.
- J The production plan depends upon sales plan but in case of DDC, the production plan is the basic plan of sales plan as supply side is given more importance.
- J The reasons of failure to raise profit in Nepalese manufacturing PEs are lack of knowledge about the market situation and lack of systematic planning.
- J Costing is done by traditional method and there is no segregation of cost into fixed and variable.
- J No proper planning for cost control mechanism and performance reporting.
- J Lack of budgeting experts, skilled planner and entrepreneurship. Planning department has no adequate authority to decide and create new ideas to formulate various plans.
- J Commercial performance of DDC is poor. So, DDC can't afford to finance into research and increase plant capacity by internal fund.

His major Recommendations:

- J DDC should maintain proper co-ordination within the organization. Line and staff authorities and responsibilities should be clearly defined.
- J A separate costing department should be established in DDC.
- J There should be systematic planning and should also create the post of profit planning director to improve performance of DDC because PPC is new concept for Nepalese manufacturing PEs.
- J DDC should make every effort to run the existing plants and utilize the idle equipments and addition of capital and manpower should be done with a well-defined purpose to relate closely with the production.
- J DDC should consider about the product line to improve its profit. Market studies on demand, supply and pricing of milk and other dairy products should be carried out.
- J DDC should have a proper financing and investment strategy based on its long range planning.

Aryal (2000) has submitted the thesis on the topic “*Profit Planning of Manufacturing Enterprises: A case study of DDC*”. The study mainly focused on the appraisal of DDC and examined that in what extent the corporation is applying with PPC.

His major Findings:

-) There is substantial gap between sales target and achievement of each year.
-) Regression line about sales of DDC indicates a positive trend.
-) DDC has not satisfactorily achieved its specific goals.

Following are the main causes:

-) Under capitalization.
-) Over staffing.
-) Not fully autonomy.
-) Corruption

DDC shows the following strengths and weaknesses:

A. Strengths

-) No problem of sales.
-) Foreign donors.
-) Experienced staff.
-) Local milk.
-) High quality products.

B. Weaknesses

-) Political jurisdiction.
-) Competition with other private dairy.
-) Lack of skilled manpower.
-) No sufficient stock/sales in summer season
-) Autonomy is a blank paper.

His major Recommendations:

- J DDC should develop its specific goals for the coming budgets; such goals may be net profit margin, net profit on capital employed, etc.
- J Planning committee of the company has prepared production and sales budget as ad-hoc basic but they must analyze relevant internal and external variables and other possible impact in future production and sales.
- J It should make sales promotion by different media in Nepal.
- J DDC should prepare systematic periodic performance reports.
- J The management of the corporation must define the costs: variable costs, semi-variable costs and fixed costs, which makes reports reliable.
- J To increase the financial performance of DDC, capital manpower, assets should be utilized to the fullest rather than to increase their volume.

Thapa (2000) has submitted thesis on the topic “*Problems of Profit Planning in Manufacturing Public Enterprises: A Comparative Study of DDC and SitaRam Dairy*”. He has tried to dig out some features and problems of profit planning in the context of Nepalese manufacturing enterprises.

His major Findings:

- J DDC has concentrated its whole efforts on the survival of the company.
- J Employees are not more careful of their duties in DDC comparatively with SRD.
- J Sales figures (target and achievement) of SRD are more consistent than of DDC.
- J SRD has highly been successful to maintain co-ordination than DDC.
- J Both companies have positive correlation between actual and target sales in both industries.
- J DDC has been producing 11 types of products and SRD has been producing only 3 types of products.
- J Both companies have not proposed PPC except sales and production plan.
- J DDC and SRD have been suffering from operating losses for many years. The main causes are low contribution margin ratio, high fixed cost and under utilization of capacity.
- J Both companies pricing methods are cost plus pricing and standard cost pricing.

His major Recommendations:

- J The promotion of personnel is felt necessary to boost up their moral. Time to time training is essential to develop their performing skills and activities.
- J DDC and SRD should follow marginal cost pricing also in addition to cost plus pricing. Adopting cost pricing, both companies can retain all their potential customers.
- J Long-term objectives should be clearly formulated so as to take a clear distinction between profit motive and social motive and entrepreneurship is the first requirement for any business success.
- J These companies are facing the problem of under capitalization by which production is affected, so as to enhance the production.
- J Responsibility center should be clearly defined. Reward and punishment system for the performance of related responsibility center should be maintained and it should be operated on purely commercial basis.
- J Collection of raw milk should be increased and removing and hindrances in this regard and creating provision of motivational prices for the raw milk and providing regular supply for fodder for cattle and adequate veterinary services etc.

Kharel (2003) has submitted thesis on the topic “*Comprehensive Budgeting Process in Public Corporation in Nepal: A case study of DDC*”. He had tried to examine profit planning and control system applied by DDC by using statistical tools like percentages, mean, standard deviation, variation, correlation and financial tools like various analysis, CVP analysis have been used to analyze the data.

His major Findings:

- J DDC has planned only short term or for coming fiscal period.
- J DDC has not separate planning department and planning experts.
- J DDC has not collected all milk offered by the farmers. It has not been able to grant the loan to the farmer’s requirement.
- J The government interferes to the pricing of raw milk and milk products. The board of DDC lies as a showpiece.

- J DDC has not applied any inventory policy. The inventory has increasing trend.
- J The gap between actual production and actual sales are high.
- J The actual sales are lower than BEP sales.
- J DDC has suffering the political pressure on employee's selection. Almost employees are appointed by the government directly rather than evaluation of candidate's ability.

His major Recommendations:

- J DDC defined short-term and long-term plan of its programs, strategies, goals etc.
- J DDC should encourage the middle and lower level employee for planning and decision making task.
- J DDC should consider B/E analysis on the time of planning.
- J The candidates should be appointed in the basis of his/her ability.
- J DDC should operate on commercial basis. It should be revised and study of its products and if there id any loss-oriented product immediately drop them. DDC should revise the price of its products.
- J DDC should cut down the unproductive expenses.
- J DDC should consider the sales plan on the time of planning production.
- J DDC should consider its assets. High assets are the idle investment .DDC should invest its capital on returnable sectors.

Adhikari (2004) had submitted thesis on the topic “*Profit Planning in Manufacturing Enterprises: A case study of DDC*”. The followings are the specific objectives of his study:

- J To analyze the functional budgets on sales and production sector of DDC.
- J To analyze various accounting ratios, measure the profitability and efficiency of DDC.
- J To analyze the budget target and its achievement along with the reasons of decisions, if any.

His major Findings:

-) DDC has practiced short-term planning rather than long-term planning.
-) Production and sales of DDC is increasing annually although the growing rate is fluctuated.
-) DDC has no. proper practice in segregating the cost into fixed and variable.
-) Most of the budgeted figures are higher than actual figures.
-) DDC has prepared direct labor budget only based on technical and administration. It has not prepared according to time and rate.
-) Capacity utilization is very high but the productivity ratio is low.
-) CVP analysis shows that DDC is operating below BEP sales.
-) Timely accounting and auditing works are not maintained.
-) Financial statement and accounting system are out of the financial rules.

His major Recommendations:

-) DDC should clearly define its broad objectives. Duties and responsibilities should be identified in clear-cut way for the employees.
-) Entrepreneurship should be developed within the enterprise and it should be operated on commercial basis. Right person should be placed at right place.
-) It should eliminate the red-Taoism, political justification, government intervention and unnecessary formalities.
-) A systematic approach should be made towards comprehensive profit planning. This can considerably contribute to the increase in profitability of DDC and all Nepalese public enterprises.
-) Collection and processing cost is very high, so it should control according to profit plans.
-) DDC must segregate its variable cost and fixed cost.
-) The management or the planning committee of DDC must analyze relevant internal and external variables and their possible impact in future production and sales in profit planning.

- J Proper motivational program and reward and punishment system must be conducted for effective execution of profit planning. They must open a separate profit planning and control unit.
- J Deviation from budgeted must be analyzed and necessary corrective steps have to be taken based on actual sales and productions.

2.3 Research Gap

There is a gap between the present research and the previous researches. The previous research study dealt with profit planning and control, as a whole. And mostly, all the researches applied are mostly similar-some financial tools, statistical tools and also results and recommendations also resembles very much.

Since DDC has been incurring losses year after year, in-depth analysis should be done to find out the major causes of such losses. Broad profit planning and control techniques would not be effective to dig out the real causes.

So, CVP analysis, as being the major tool to find out the profitability if the short-term tactical plan, that's why, this study has been performed. In fact, it is a kind of full-fledged research work.

So, this study paper is designed to highlight the major causes of continuous losses and recent improvement's reasons, which remained different from previous researches.

CHAPTER -III

RESEARCH METHODOLOGY

3.1 Research Design

Research design provides the overall framework or plan for the activities to be undertaken during the research study. Since, this study revolves around the relationship between cost, volume and profit intensive analysis of historical and descriptive research design is used to analyze the performance of past five years from F/Y 2059/60 to 2063/64. To fulfill the objectives of this study, primary and secondary data are used. It also focuses on the effect on profit due to change in volume and cost.

3.2 Resources of Data

The source of data is both primary and secondary collected from the central office of DDC through the accountant Shree Ram Shrestha. The primary data are collected through discussion with the concern authority. The secondary data are taken from annual reports, balance sheet, profit and loss accounts, cost sheets and unpublished previous thesis relating with the DDC and other published data etc.

3.3 Population and Sample

DDC is itself population and sample as well, as this study is based on the revenue planning. CVP analysis focused wholly on DDC and not centered to particular branch of DDC or product. Hence there is no difference between sample and population in this case.

3.4 Data Collection and Analysis

Collecting data is the connecting link to the world of reality for the researcher (Wolff and Panta, 2005).

Primary data are collected from the concerning the differentiation of fixed and variable costs and other related elements of the P/L a/c from the concerned authority of central office of DDC. And since, they are not using CVP analysis, a through discussion with

them provide a legitimate estimation of fixed and variable cost. Secondary data are collected from annual reports, Sinhabalokan, auditor's report, balance sheet and P/L a/c, cost sheets and other thesis concerned mostly with the DDC.

The analysis if data are done by using different tools such as, averages, percentages and all the CVP related ratios are used to find out the relationship among the three elements: cost, volume and profits. All the findings are presented in categorized, systematic,

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

Profit planning and control helps in facilitating effective performance of management systems. It is the ultimate objective of management to maximize profit over the long-term, consistent with its social responsibility.

In order to make profit, it is necessary to examine whether the capacity is utilized or not or if there is any part to reduce cost because minor changes in cost may result high differences in profit, whereas, the efficient use of resources may reduce the cost and it may give opportunity to make more profits. And CVP analysis can be the most important technique to utilize the cost in effective and efficient way. CVP analysis is a way to quickly answer a number of important questions about the profitability of a company's products or services or company as a whole.

In the Nepalese market, there is high demand of cheaper goods. To produce cheaper goods, maintaining the profit, Cost Volume Profit relation of the firm should be properly analyzed. There are only two possible ways to get higher profit; one is to increase the price and the other is to reduce the cost of production. Increasing the price of the product would reduce the demand, which eventually reduces the profit. So, increasing the price has synergic effects. The second alternative is to make possible reduction in the cost. This is determined by the CVP analysis. It finds out the ways to reduce the cost and increase the profit. CVP analysis is not only deals with the relationship of cost, volume and profit, but also helps in utilizing the resources in a better way to get the maximum return.

So, taking into account of these reasons, this study mainly focuses on the CVP analysis of the DDC. This chapter presents the data analysis and interprets the collected data. The data are presented in systematic manner and presented and tabulated in meaningful ways.

4.1 Sales Plan of DDC

The first step in developing budgeting process of an organization begins with the presentation of sales budget. The sales planning is a necessary component of PPC because,

- A. It provides for the basic management decision about marketing and
- B. Based on those decisions, it is an organized approach for developing a comprehensive sales plan.

If the sales plan is unrealistic, most if not all of the other portions of the overall profit plan also will be unrealistic.

DDC is the market leader in the dairy industry. Now, after the establishment of the dairy in private sector, DDC is gradually losing its market share and now it covers about 60% of the total milk market, according to the DDC, DDC produces large varieties of products such as Pouch Milk, Skimmed Milk, Milk Powder, Curd, Ghee, Butter, Cheese, different varieties of Ice-creams, Panner, etc.

Table 4.1
Sales Description

(In Rs.)

Products	2059/60	2060/61	2061/62	2062/63	2063/64
Milk	1,30,15,51,686	1,24,49,29,547	1,30,09,37,690	1,25,33,13,814	1,33,28,81,473
Butter	5,06,72,761	4,42,20,143	4,94,81,254	3,21,67,220	4,09,90,592
Ghee	15,52,92,752	14,16,04,903	13,76,85,226	13,96,99,221	17,01,44,190
Curd	3,61,50,472	3,96,77,502	3,71,74,131	4,62,18,545	6,30,73,307
Ice-cream	39,77,954	57,14,044	64,22,710	63,29,959	87,27,412
Panner	1,11,08,901	1,28,49,768	1,03,14,551	1,09,65,665	1,35,46,086
Cheese	3,43,82,253	3,65,90,446	3,58,58,632	3,54,32,752	3,74,65,816
Cream	17,78,189	22,94,090	18,43,547	13,56,027	14,75,863
Peda	----	24,97,691	26,20,208	27,38,557	28,46,892
Rasbari	9,59,675	41,93,183	41,27,533	44,51,022	46,18,255
Lalmohan	----	12,05,029	21,28,739	30,07,147	42,58,027
Lassi	28,819	19,343	7,854	10,444	31,230
Mohi	----	4,356	3,51,142	2,38,821	2,56,055
Gudpaak	----	6,841	3,13,435	1,86,471	34,856
Bay	3,250	3,575	2,701	1,06,809	----
Ledykeni	----	----	1,38,012	1,18,092	3,627
Balushahi	----	----	1,36,110	1,06,809	----
Skimmed Milk Powder	----	----	1,20,000	----	----
Total	1,59,59,06,712	1,53,58,10,462	1,58,96,63,476	1,56,33,40,564	1,68,03,53,680

Source: Annual Report of DDC 2059/60 to 2063/64

The table no. 4:1 shows the sales trend on yearly basis of different products produced by DDC.

Table 4.2
Milk and Ghee's Percentage to Overall Sales of DDC

(In Rs.)

Details	2059/60	2060/61	2061/62	2062/63	2063/64
Milk	1,30,15,51,686	1,24,49,29,547	1,30,09,37,690	1,25,33,13,814	1,33,28,81,473
Ghee	15,52,92,752	14,16,04,903	13,76,85,226	13,96,99,221	17,01,44,190
Total	1,45,68,44,438	1,38,65,34,450	1,43,86,22,916	1,39,30,13,035	1,50,30,25,663
Sales	1,59,59,06,712	1,53,58,10,462	1,58,96,63,476	1,56,33,40,564	1,68,03,53,680
Percentage	91.29	90.28	90.49	90.67	89.45

Source: Table: 4.1

Milk and Ghee constitutes almost 90% of total sales revenue in each year. Milk constitutes 81.55% in F/Y 2059/60, 81.06% in F/Y 2060/61, 81.84% in F/Y 2061/62, 81.58% in F/Y 2062/63 and 79.32% in F/Y 2063/64. And Ghee constitutes 9.73% in F/Y 2059/60, 9.22% in F/Y 2060/61, 8.66% in F/Y 2061/62, 9.09% in F/Y 2062/63 and 10.12% in F/Y 2063/64 of total sales.

Milk, being the dominant product, although revenue generated from it is increasing, overall percentage of milk to total sales revenue was decreased to 79.32% in F/Y 2063/64 after being constant 81% (approx) in last four F/Y.

Ghee's demand was 8 to 10 % (approx) in five years and its contribution to sales revenue was increased to 10.12% in F/Y 2063/64. This seems like Ghee will be the major contributor sales revenue in the future too along with milk. Other products like Cheese, Butter, Curd, Ice-cream, etc constitute only 10% to the total sales revenues.

The following table: 4.3 present the budgeted and actual sales achievement from the fiscal year 2059/60 to 2063/64.

Table 4.3
Budgeted Sales and Actual Sales Achievements

(In Rs.)

Fiscal Year	Budgeted Sales*	Actual Sales	Achievement
2059/60	1,67,27,57,000	1,59,59,06,712	95.41%
2060/61	1,75,48,10,857	1,53,58,10,462	87.52%
2061/62	1,76,00,00,000	1,58,96,63,476	90.32%
2062/63	1,66,99,35,396	1,53,63,40,564	92.00%
2063/64	1,80,68,31,914	1,68,03,53,680	93.00%

Source: Annual report of DDC 2059/60 to 2063/64

**According to Accountant of DDC (Shreeram Shrestha)*

The above table 4.3 shows the comparison between the budgeted annual sales and actual sales revenues of DDC.

The budgeted and actual sales are in increasing trend, however, the percentages of increase is fluctuating. The difference in budgeted sales and actual sales was not more than 10%. The trend show that the achievements of actual sales towards budgeted sales are increasing.

The following table shows Mean, Standard Deviation with Co-efficient of Variation and Correlation Co-efficient to analyze the relationship between the actual sales with Budgeted sales. Regression analysis to not only analyzes the relationship between both variables but also predicts the future actual sales from the regression equation.

Table 4.4
Calculation of Different Statistical Tools

Statistical Tools	Budgeted Sales (X)	Actual Sales (Y)
Mean (\bar{X}, \bar{Y})	1,73,28,67,033	1,58,76,14,979
Standard Deviation (u)	53408127	52888920
Co-efficient of Variation (C.V.)	3.08%	3.33%
Correlation Co-efficient (r)	0.6023	
Probable Error of Correlation [P. E.(r)]	0.1922	

Source: Appendix-7

The above table 4.4 shows the Co-efficient of Variation of budgeted and actual sales. The distribution with similar C. V. is considered to be more homogeneous or less variable or uniformly distributed. And in this calculation, budgeted sales are more homogeneous or less variable than actual an annual sale, which indicates the low efficiency of planning department. The actual annual sales were more heterogeneous or with 3.33% C.V. more variable than budgeted sales having 3.08% C.V.

The widely-used statistical tool “Correlation of Co-efficient” has used to analyze the degree of relationship between the budgeted and actual sales. Karl Pearson’s Correlation Co-efficient is most used in practice for calculating correlation co-efficient between the two variables, X and Y, and is usually denoted by “r”.

For calculating “r”, budgeted sales are denoted by X (independent variables) and actual sales are denoted by Y (dependent variables). It is assumed that there will be linear relationship between budgeted sales and actual sales.

The probable error (P.E.) of the Correlation Co-efficient (r) is an old measure of asserting the reliability of the value of Pearsonian Co-efficient of Correlation. It is used to test whether the calculated value of sample Correlation Coefficient is significant or not if,

- A. $r < P.E. (r)$, then the value of r is not significant.
- B. $r > P.E. (r)$, then the value of r is definitely significant.
- C. In other situation, nothing can be concluded.

The value of r is greater than P.E. (r) (i.e. $0.6023 > 0.1922$). It means the value of r is very highly significant. So, it can be said that actual sales will go in the same direction as budgeted sales.

The Regression line can also be fitted to show the degree of relationship between budgeted and actual sales. The correlation analysis refers to the degree of relationship between the variables. But it does not say about which the variable is cause and which the

effect, while, regression analysis establishes the nature of relationship between two or more variables and then estimate the unknown variables (dependent variables) with the help of known variables (independent variables).

For this, actual sales have assumed to be dependent upon the budgeted sales, as independent.

So, regression line is actual sales “Y” on budgeted sales “X” is as follows:

$$Y - \bar{Y} = \frac{r \sum XY}{\sum X^2} (X - \bar{X})$$

$$\text{OR, } Y - 1587614979 = \frac{0.6023 \mid 52888920}{53408127} (X - 1732867033)$$

$$\text{OR, } Y - 1587614979 = 0.5964 (X - 1732867033)$$

$$\text{OR, } Y = 0.5964X - 1033481898 + 1587614979$$

$$\text{OR, } Y = 0.5964X + 554133081$$

It shows positive relationship between the budgeted sales and actual sales. With this equation, we can forecast the likelihood of actual achievement of the year 2064/65.

Budgeted sales (X) for 2064/65 = Rs 1,85,00,00,000

We have,

$$Y = 0.5964X + 554133081$$

$$\text{Or, } Y = (0.5964 \times 1850000000) + 554133081$$

$$\text{Or, } Y = 11033400000 + 554133081$$

$$\text{Or, } Y = 1,65,74,73,081$$

4.2. Cost Structure of DDC

Cost is defined as an expenditure that is entirely recorded as an asset and becomes an expense when it is “used up” in the future.

Cost can be controllable and non-controllable. In short run, all the variable expenses are controllable and all the fixed expenses are non-controllable.

Cost planning and control focuses not only on reducing the costs but also considering the effect of breakdown of machines, frustrating employees, lower quality of productions, etc caused by reduction of cost. Efficient and effective utilization of cost is the major demand and purpose of cost planning.

The cost or expenses of DDC are categories into four sectors:

-) Collection Expenses.
-) Processing Expenses.
-) Selling and Distribution Expenses.
-) Administration Expenses.

All the expenses are collected and analyze with support from the DDC personnel regarding the cost behavior and distributed as below into fixed, variable and semi-variable cost. Since, they weren't practicing CVP analysis, there were no distinction among cost into fixed or variable, so degree of variability method is used to distinguish the semi-variable cost into fixed and variable cost.

Semi-variable cost are distributed according to the degree of variability (30%:70%), since, DDC hasn't been practicing CVP analysis and being so vast product line distributed in different regions and branches, degree of variability seems appropriate to distribute semi-variable cost into fixed and variables.

Collection Expenses

Collection expenses includes all the expenses related with collecting milk from various milk farmers, and the cost relating to it, such as, purchase of milk, porters' wages and transportation expenses, salaries, provident fund, gratuity expenses of those workers engaged in the collection of milk and necessary raw materials. The detailed distributions of collection expenses are presented in the following table 4.5, distributing the cost into fixed and variable and semi-variable expenses are distributed according the Degree of Variability method, popularly as 70:30 basis of separation.

Table 4.5

Distribution of Collection Expenses into Fixed, Variable and Semi-Variable cost

Variable Cost	Fixed Cost	Semi-Variable Cost (Allocation Basis: DOV(70:30))	Ratio
Purchase of Milk	Salary	Porters' wages and Transportation	FC=70% VC=30%
Allowance	Provident Fund	Water & Electricity	FC=30% VC=70%
Traveling Expenses	House and Land Rent	Stationary & Printing	FC=70% VC=30%
Fuel and Other Provision	Bank Commission	Ticket, Wire, Telephone	FC=30% VC=70%
Fuel for Boiler Generator	Insurance	Motor Repairs	FC=70% VC=30%
Chemicals and Detergents	Taxes and Charges	Machine Repairs	FC=70% VC=30%
Other Dairy Goods	Gratuity Expenses	Building Repairs	FC=70% VC=30%
Cleaning & Sanitation		Other Repairs	FC=70% VC=30%
Other Transportation		Non-Durable office Goods	FC=70% VC=30%
		Prize Given to Farmers	FC=70% VC=30%
		Rebate, Discount, Adjustment Expenses	FC=30% VC=70%

Processing Expenses

Processing expenses is a part of production cost which relates with raw materials, packaging, chemicals and detergents, fuel and other provision, water expenses, electricity expenses, repairs of machines, motors, buildings, etc., salaries, provident fund, etc of the workers associated with the processing of milk and milk products. The detailed distributions of processing expenses are presented in the following table 4.6.

Table 4.6

Distribution of Processing Expenses into Fixed, Variable and Semi-Variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost (Allocation Basis: DOV(70:30))	Ratio
Skimmed Milk Powder Expenses	Salary	Transportation of Butter, Cheese, etc	FC=70% VC=30%
Raw Material and others	Provident Fund	Water & Electricity	FC=30% VC=70%
Traveling Expenses	House and Land Rent	Stationary & Printing	FC=70% VC=30%
Fuel and Other Provision	Bank Commission	Ticket, Wire, Telephone	FC=30% VC=70%
Allowance	Insurance	Motor Repairs	FC=70% VC=30%
Chemicals and Detergents	Taxes and Charges	Machine Repairs	FC=70% VC=30%
Other Dairy Goods	Gratuity Expenses	Building Repairs	FC=70% VC=30%
Feed Purchased		Other Repairs	FC=70% VC=30%
Processed Milk Loss		Non-Durable office Goods	FC=70% VC=30%
Packaging Goods		Powder Transportation Expenses	FC=70% VC=30%

Selling and Distribution Expenses

Selling expenses or Distribution expenses includes all the costs relating to selling, distribution and delivery of products to customers. It includes salaries, provident fund, insurance and gratuity expenses of the marketing staffs of the DDC and also traveling Expenses, milk and milk product loss etc. The detailed distribution of selling and distribution expenses is presented in the following table 4.7.

Table 4.7
Distribution of Selling and distribution Expenses
Into Fixed, Variable and Semi-Variable cost

Variable Cost	Fixed Cost	Semi-Variable Cost (Allocation Basis: DOV(70:30))	Ratio
Milk and Milk Product Commission	Salary	Milk Transportation Expenses	FC=70% VC=30%
Milk and milk Product Loss	Provident Fund	Water & Electricity	FC=30% VC=70%
Traveling Expenses	House and Warehouse Rent	Stationary & Printing	FC=70% VC=30%
Fuel and Other Expenses	Gratuity Expenses	Business Promotion Expenses	FC=70% VC=30%
Allowance	Insurance	Motor Repairs	FC=70% VC=30%
Dealer's Facilities	Taxes and Charges	Rebate, Discount, Adjustment	FC=30% VC=70%
		Building Repairs	FC=70% VC=30%
		Other Repairs	FC=70% VC=30%
		Non-Durable office Goods	FC=70% VC=30%

Administration Expenses

Administration expenses include those expenses other than manufacturing and distribution. They are incurred in the responsibility centers that provides supervision of and service of all functions of all the enterprises, rather than in the performance of any one function. Salaries, Allowance, Provident Funds, Employees Training Expenses, Employees Welfare Expenses, Insurance, etc, are included under this sector. The detailed distribution of Administration expenses are presented in the following table 4.8.

Table 4.8
Distribution of Administration Expenses into Fixed, Variable and
Semi-Variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost (Allocation Basis: DOV(70:30))	Ratio
Association Development Expenses	Salary	Recruitment Expenses	FC=70% VC=30%
Allowance	Provident Fund	Water & Electricity	FC=30% VC=70%
Traveling Expenses	House and Land Rent	Stationary & Printing	FC=70% VC=30%
Fuel and Other Provision	Bank Commission	Ticket, Wire, Telephone	FC=30% VC=70%
Donation	Insurance	Motor Repairs	FC=70% VC=30%
Deferred Expenses	Taxes and Charges	BOD Meeting Expenses	FC=70% VC=30%
Examination Expenses	Gratuity Expenses	Building Repairs	FC=70% VC=30%
Loss on sale of Assets	Membership Charges	Other Repairs	FC=70% VC=30%
Guest Entertainment Expenses	Office Equipment Expenses	Non-Durable office Goods	FC=70% VC=30%
Adjustment Expenses	Employee Welfare Expenses	Annual Day Expenses	FC=30% VC=70%
	Employee Training Expenses	Business Promotion Expenses	FC=70% VC=30%
	Auditor's Expenses	Meeting Expenses	FC=70% VC=30%
	Sub-Committee Fees		
	Advisory Cost		
	Advertisement		
	Publicity		
	Funeral Expenses		
	Sanitation Expenses		
	Bus Fair		
	Legal Expenses		
	Newspaper & Magazines		
	Software Expenses		

DDC Classified its total cost of collection, processing, selling and administration Expenses into fixed and variable cost for CVP analysis and sensitivity analysis. According to the data, costs are classified as under:

4.2.1 Variable Cost of DDC

Variable expenses vary in direct proportion to changes in output or activity in a responsibility center. Variable expenses are activity based because they are incurred as a direct result of output, productive activity, or work done. They would not exist if not for performance of some activity. Variable expenses increases or decreases directly with changes in outputs, therefore, if output is doubled, the variable expenses is doubled; or output decreases by 10%, the variable expenses decreased by 10%.

All the variable costs of collection, processing, selling and administration expenses of DDC are depicted in below table 4.9 to table 4.12.

Table 4.9
Variable Collection Expenses

(In Rs.)

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Purchase of Milk	1112413152	1045469721	1038124379	1044700126	1101355622
Porters' Wages & Transportation	3795	1017	1549	150	-
Fuel and Other Provision	27812759	28993318	30691414	36270112	38613927
Chemicals & Detergents	677457	654579	659516	756270	966237
Other Dairy Goods	575861	593229	631608	656785	626628
Water & Electricity	4702010	4480573	3994356	3725188	3984737
Allowance	2442173	2644598	5985895	3836178	5623213
Machine Repairs	431080	495095	712678	949811	969983
Buildings Repairs	91415	64524	167151	143082	203299
Motor Repairs	3287033	3055237	3027872	3196441	3595505
Other Repairs	44752	47281	43554	50972	64415
Stationary and Printing	90589	90870	99695	96232	128629
Traveling Expenses	3166983	3368772	3935705	3641507	4620131
Ticket, Wire, Telephone	113832	110303	109505	102856	129401
Non-durable Office Goods	30605	27411	30374	45192	51329
Prize to Farmers	21193	23307	23534	20356	-
Other Transportation Expenses	6400	-	-	22980	1000
Sanitation Expenses	11360	18210	28590	56995	87975
Fuel Boiler Generator	-	-	2518863	3915982	5146345
Rebate, Discount, Adjustment	-	-	2213	-	-
Total	1155922449	1090138045	1090788451	1102287215	1166168376

Source: Extracted from Appendix- 3 to 6

The variable collection expenses decreased to Rs 1090138045 in F/Y 2060/61 from Rs 1155922449 in F/Y 2059/60 (i.e. Rs -65784404 or -5.69%) and then slightly increased to Rs 1090788451 in F/Y 2060/62 from Rs 1090138045 in 2060/61 (i.e. Rs 650407 or 0.054%), then increased to Rs 1102287215 in 2062/63 from Rs 1070788451 (i.e. Rs 11498764 or 1.05%) and reached Rs 1166168376 in 2063/64 (i.e. Rs 63881161 or 5.79%)

Table 4.10
Variable Processing Expenses

(In Rs.)

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Skimmed milk powder Exp.	52816397	39656569	98229166	69683186	566143902
Raw Materials and Others	1060880	1892398	2729605	3674319	4460992
Packaging Goods	69971099	60355588	63035827	68795056	73933332
Chemicals & Detergents	2475824	2982761	3592866	3475776	4048949
Other Dairy Goods	1330852	1275887	1188624	1474300	1611326
Cheese, Butter Transportation	176129	278149	474817	465727	498404
Water & Electricity	21753969	20779538	19529343	18170517	17950999
Fuel and Other Provision	30668196	33126214	36135760	42234275	45466232
Allowance	4814565	4519830	8819809	6674837	9431594
Motor Repairs	296979	277330	122649	-	-
Machine Repairs	2680493	3014998	2583591	4312538	3764051
Building Repairs	202877	377985	190146	454860	599976
Other Repairs	141430	141416	128971	172449	167956
Traveling Expenses	1173997	985453	1017243	901279	945116
Stationary and Printing	76676	85637	93758	95810	138338
Non-durable Office Goods	39991	36786	47304	67789	65183
Processed Milk Loss	6934397	6642117	7866090	-	-
Fodder Purchased	20623	19042	-	-	-
Ticket, Wire, Telephone	51827	44478	41320	35786	45296
Powder Transportation Exp.	141213	269912	198426	5974	-
Rebate, Discount, Adjustment	-	-	30415792	-	-
Total	196828414	176762088	276441107	220694478	219571646

Source: Extracted from Appendix- 3 to 6

The table: 4.10 show the variable processing expenses of the DDC. Variable processing expenses decreased from Rs 196828414 in F/Y 2059/60 to Rs 176762088 in F/Y 2060/61 (i.e. Rs -20066326 or -10.19%) and then dramatically increased to Rs 276441107 in F/Y 2061/62 from Rs 176762088 in F/Y 2061/62 (i.e. Rs 99679019 or 56.39%) then fall to Rs 220694478 in F/Y 2062/63 from Rs 276441107 in F/Y 2161/62 (i.e. Rs -55746629 or -20.16%) and again decreased to Rs 219571641 in F/Y 2063/64 from Rs 220694478 in F/Y 2062/63 (i.e. Rs – 1122837 or 0.5%).

Table 4.11
Variable Selling Expenses

(In Rs.)

Selling Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Allowance	2166846	2174864	4512406	3423905	4482024
Stationery and Printing	71387	79841	90610	98189	124421
Water & Electricity	108954	107678	105107	164823	210303
Fuel and Other Provision	5042548	3450546	3426593	4123125	4757910
Motor Repairs	700838	601108	548642	772548	953789
Building Repairs	938	139920	1230	17832	11003
Other Repairs	3139	3978	6501	18378	16735
Milk Transportation Expenses	4453565	5003642	4491311	4867488	4981259
Traveling Expenses	136572	88446	92254	75484	109282
Business Promotion Expenses	52235	18529	35112	49815	80915
Milk & Milk Product Loss	130313	115573	200290	74763	113771
Non-durable Office Goods	20363	33733	19282	27078	32167
Dealer Facilities	85238	74414	33513	-	-
Rebate, Discount, Adjustment	-	10302	-	-	-
Total	1,29,72,936	1,18,28,158	1,35,62,851	1,37,13,428	1,58,73,579

Source: Extracted from Appendix- 3 to 6

Variable selling expenses decreased from Rs 12972936 in F/Y 2059/60 to Rs 11828158 in F/Y 2060/61 (i.e. – 1144778 or – 8.82%) then increased to Rs 13562851 in F/Y 2061/62 from Rs 11828158 in F/Y 2060/61 (i.e. Rs 1734693 or 14.66%) and increased to Rs 13713428 in F/Y 2062/63 from Rs 13562851 in F/Y 2061/62 (i.e. Rs 150577 or 1.11%) and reached to Rs 15873579 in F/Y 2063/64 from Rs 13713428 in F/y in F/Y 2062/63 (i.e. Rs 2160151 or 15.75%).

Table 4.12
Variable Administration Expenses

(In Rs.)

Administration Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Allowance	4332339	3827860	7550380	5501121	7434392
Water & Electricity	14503	17200	15001	14146	16703
Ticket, Wire, Telephone	847392	819523	718697	862757	10594461
Stationery & Printing	294347	324024	3403226	326543	387672
Fuel & Other Provision	2560869	1649188	1800388	1595306	1806690
Motor Repairs	335894	290486	413456	240158	323911
Building Repairs	183609	74672	63950	85185	89965
Other Repairs	57369	57476	56486	55473	78928
Traveling Expenses	1455522	1362236	1695272	1809266	1682457
Entertainment Expenses	956136	1064828	1245946	1339430	1335763
BOD Meeting Fees	29000	47100	69900	56400	68100
Recruitment Cost	2544	6312	12311	38250	269728
Non-Durable Office Goods	79631	32919	118657	103262	136706
Donation	114655	179900	281000	427648	471327
Examination Expenses	-	-	-	-	400705
Annual Day Expenses	413299	349633	646527	568543	614405
Rebate, Discount, Adjustment	23479	196960	356047	62012	80583
Business Promotion Expenses	128802	399619	516012	373678	404498
Deferred Expenses	2826500	2826500	-	-	-
Meeting Expenses	36467	32430	4294561	49163	50925
Total	1,46,92,357	1,35,88,866	2,01,94,917	1,35,08,941	1,67,12,919

Source: Extracted from Appendix- 3 to 6

In table: 4.12, variable administration expenses decreased from Rs 1,46,92,357 in F/Y 2059/60 to Rs 1,35,88,866 in F/Y 2060/61 (i.e. Rs -1103491 or -7.51%) and then increased to Rs 2,01,94,917 in F/Y 2061/62 from Rs 1,35,88,866 in F/Y 2060/61 (i.e. Rs 6606051 or 48.61%) and decreased to Rs 1,35,08,941 in F/Y 2062/63 from Rs

2,01,94,917 in F/Y 2061/62 (i.e. Rs -6685976 or -33.17%) then increased to Rs 1,76,12,919 in F/Y 2063/64 from Rs 1,35,08,941 in F/Y 2062/63 (i.e. Rs 3203978 or 23.71%)

Variation in variable cost or expenses is due to the various factors affecting the cost to fluctuate. It can be changes in sales volume, cost of production, inflation, competition, difference in the tastes and preferences of customers, elasticity of demand, etc.

4.2.2 Fixed Cost of DDC

Fixed expenses are those that do not vary with output or productive activity. They accrue primarily with the passage of time, i.e., they are time expenses. They remain constant in amount for a given short-time period with in a relevant range of activity. Fixed expenses are caused by the holding of assets and the other factors of production in a state of readiness to produce; therefore, they are frequently called capacity cost. Fixed costs are of two types.

1. Executive management decisions establish commitments to certain fixed expenses, e.g. depreciation, tax, insurance etc.
2. Some fixed expenses are set by management discretion on a short-term basis, e.g. salaries, advertisement, and research expenses.

They may fluctuate by reason of changes in the basic structure of the business, operating methods, and discretionary changes in management policy.

The following table shows the different fixed cost under collection, processing, selling and administration expenses headings.

Table 4.13
Fixed Collection Expenses

(In Rs.)

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Porters' Wages & Transportation Expenses	8856	2374	2517	350	-
Water & Electricity	2015147	1920246	1711867	1639366	1707744
Salaries	22489966	21066452	21963708	24480597	23964201
Provident Fund	1403410	1321992	1290949	1436564	1436201
Machine Repairs	1005855	1155221	1662915	2216225	2263293
Building Repairs	213301	150556	390020	324859	474364
Motor Repairs	7669744	7128887	7065033	7458362	8389512
Other Repairs	104421	110323	101627	118933	150300
House and Land Rent	913708	982488	985415	1006814	1020991
Stationery & Printing	211374	212029	232620	224541	300134
Tax and Charges	1144431	940162	1169040	1360627	1314683
Bank commission Charges	972517	1573257	1286809	1341277	1436360
Ticket, Wire, Telephone	48785	47273	46930	44081	55457
Insurance	694494	496203	225612	606675	708967
Non-Durable Office Goods	71413	63960	70873	105447	119768
Gratuity Expenses	3542542	249124	2869168	-	-
Prize to Farmers	49452	54151	54912	47496	-
Funeral Expenses	-	10000	-	-	-
Rebate, Discount, Adjustment	-	-	664	-	-
Total	4,25,59,416	3,74,84,698	4,11,30,679	4,24,12,214	4,33,41,975
Add/Less: Additional/ Excess Gratuity Expenses	(453103)	17327787	1205149	-	-
Net Total	4,21,06,313	3,92,17,485	4,23,35,828	4,24,12,214	4,33,41,975

Source: Extracted from Appendix-1, 3 to 6

In table: 4.13, Fixed collection expenses have decreased to Rs 3,92,17,485 in F/Y 2060/61 from Rs 4,21,06,313 in F/Y 2059/60 (i.e. Rs -28,88,828 or -6.86%) and then increased to Rs 4,23,35,828 in F/Y 2061/62 from Rs 3,92,17,485 in F/Y 2060/61 (i.e. Rs 3118343 or 7.95%) and Rs 4,24,12,214 in F/Y 2062/63 from Rs 4,23,35,828 in F/Y 2061/62 (i.e. Rs 76386 or 0.18%) and finally reached to Rs 4,33,41,975 in F/Y 2063/64 from Rs 4,24,12,214 in F/Y 2062/63 (i.e. Rs 99761 or 2.19%)

Table 4.14
Fixed Processing Expenses

(In Rs.)

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Cheese, Butter etc.	410966	649015	1107907	1086695	1162944
Transportation Expenses					
Water & Electricity	9323130	8905516	8369719	7787364	7693285
House and Land Rent	326038	375494	396567	434453	414985
Salaries	34532145	33589010	33443627	39239185	38753232
Provident Fund	1930955	1830992	1799554	2103395	2126094
Motor Repairs	692952	647103	286181	-	-
Machine Repairs	6254485	7034994	6028380	10062590	8782784
Building Repairs	473381	881966	443673	1061339	1399944
Other Repairs	330004	329970	300931	402380	391896
Insurance	749429	241526	438078	524000	360225
Stationery & Printing	178911	199819	218769	223555	322790
Tax and Charges	42751	80969	131015	230714	2269
Non-Durable Office Goods	93312	85835	110377	158174	152095
Ticket, Wire, Telephone	22212	19062	17709	15337	19412
Gratuity Expenses	18766338	1549559	3268485	-	-
Powder Transportation Exp.	329498	629793	462994	13938	-
Bank commission Charges	27897	27330	24930	33973	46717
Funeral Expenses	-	5000	-	-	-
Rebate, Discount, Adjustment	-	-	13035340	-	-
Total	7,44,84,404	5,70,82,953	6,98,84,236	6,33,77,092	6,16,50,554
Add/Less: Additional/ Excess Gratuity Expenses	(2401285)	10777134	1372874	-	110556
Net Total	7,20,83,119	6,78,60,087	7,12,57,110	6,33,77,092	6,17,61,110

Source: Extracted from Appendix-1, 3 to 6

In table 4.14, Fixed Processing expenses decreased to Rs 67860087 in F/Y 2060/61 from Rs 72083119 in F/Y 2059/60 (i.e. Rs -4223032 or -5.85%) and then increased to Rs 71257110 in F/Y 2061/62 from Rs 67860087 in F/Y 2060/61 (i.e. Rs 3397023 or 5.0%) and decreased to Rs 63377098 in F/Y 2062/63 from Rs 71257110 in F/Y 2061/62 (i.e. Rs 7880018 or 11.05%) and finally fallen to Rs 61761110 in F/Y 2063/64 from Rs 63377092 in F/Y 2062/63 (i.e. Rs -1615982 or 2.55%)

Table 4.15
Fixed Selling Expenses

(In Rs.)

Selling Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	12095550	12007907	11663447	13775715	14279916
Provident Fund	736849	717090	683578	778817	818059
House and Land Rent	331081	293735	256452	341535	366635
Stationery & Printing	166569	186297	211424	229108	290316
Water & Electricity	46695	46148	45046	70638	90130
Motor Repairs	1635289	1402485	1280164	1802613	2225506
Building Repairs	2187	326480	2870	41609	25673
Other Repairs	7325	9282	15170	42881	39047
Milk Transportation Expenses	10391650	11675163	10479724	11357473	11622936
Business Promotion Expenses	121882	43205	81928	116235	188802
Insurance	231744	134531	171524	68747	102376
Tax and Charges	210767	234672	324858	279461	439320
Non-Durable Office Goods	47513	78710	44992	63182	75057
Gratuity Expenses	1907128	240155	2269411	-	-
Total	2,79,32,229	2,73,95,960	2,75,30,588	2,89,68,014	3,05,63,773
Add/Less: Additional/ Excess Gratuity Expenses	(243855)	1669967	953030	-	-
Net Total	2,76,88,374	2,90,65,927	2,84,83,618	2,89,68,014	3,05,63,773

Source: Extracted from Appendix-1, 3 to 6

In table: 4.15, Fixed Selling expenses increased to Rs 29065927 in F/Y 2060/61 from Rs 27688374 in F/Y 2059/60 (i.e. Rs 1377553 or 4.97%) and then decreased to Rs 28483618 in F/Y 2061/62 from Rs 29065927 in F/Y 2060/61 (i.e. Rs -582309 or -2.0%) and again increased to Rs 28968014 in F/Y 2062/63 from Rs 28483618 in F/Y 2061/62 (i.e. Rs 484396 or 1.7%) and finally reached to Rs 30563773 in F/Y 2063/64 from Rs 28968014 in F/Y 2062/63 (i.e. Rs 1595759 or 5.5%).

Table 4.16
Fixed Administration Expenses

(In Rs.)

Administration Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	29013593	27120786	25427879	33329987	30936837
Provident Fund	1812310	1733783	1718294	2024968	2022504
House and Land Rent	103900	84000	84000	96000	96000
Water & Electricity	6216	7372	6429	6062	7159
Ticket, Wire, Telephone	363170	351224	308013	369753	454055
Stationery & Printing	686809	756055	794095	761932	904567
Motor Repairs	783751	677801	964732	560368	755793
Building Repairs	428422	174236	149215	198764	209918
Other Repairs	133861	134111	131801	129207	184166
Office Equipment Repairs	146049	123564	166892	229207	434024
Employees Welfare Exp.	99079	64514	98501	126106	94899
Employees Training Exp	230011	510195	474731	614835	1989950
BOD Meeting Fees	67666	109900	163100	131600	158000
Auditor's fees	90000	82462	180000	99000	364535
Recruitment Cost	5936	14728	28724	89250	629365
Sub-Committee Cost	312312	282000	396250	619175	526500
Advisory Cost	102450	183200	180768	449635	207054
Advertisement	1243021	1478774	1880644	1852142	3535119
Bank Commission Charges	75673	65482	87901	65078	72026
Non-Durable Office Goods	185804	146811	276866	240945	318981
Newspaper & Magazines	140850	145877	117329	122814	149260
Tax and Charges	159654	803020	683718	506384	1913606
Sanitation Expenses	280540	276613	283354	335806	436020
Insurance	8981124	8740206	8551673	9158078	10850535
Membership Charges	6400	10000	28460	37977	31353
Gratuity Expenses	17393165	470036	-	5091128	3184627
Annual Day Expenses	177128	149843	277083	243661	263317
Business Promotion Expenses	300539	932445	1204029	871916	943830
Bus Fair	1400916	1324520	1170264	789208	835982
Funeral Expenses	10000	5000	-	-	-
Legal Expenses	21893	-	111188	17500	-
Meeting Expenses	75091	75671	10020643	114712	118825
Software Expenses	89100	318860	80000	261557	119050
Emergency Expenses	-	104678	165520	318891	-

Seminar Expenses	-	-	-	130556	712921
Rebate, Discount, Adjustment	10063	84412	152592	26577	34535
Total	65306496	47542179	56384688	60021008	63495313
Add/Less: Additional/ Excess Gratuity Expenses	(2226113)	3270134	-	53753235	16147742
Net Total	63080383	50812313	56384688	113774243	79643055

Source: Extracted from Appendix-I, 3 to 6

In table: 4.16, Fixed Administration expenses decreased from Rs 63080383 in F/Y 2059/60 to Rs 50812313 in F/Y 2060/61 (i.e. Rs 12268070 or -19.45%) and then, increased to Rs 56384688 in F/Y 2061/62 from Rs 50812313 in F/Y 2060/61 (i.e. Rs 5572375 or 10.97%) and dramatically increased to Rs 113774243 in F/Y 2062/63 from Rs 56384688 in F/Y 2061/62 (i.e. Rs 57389555 or 101.78%) and finally decreased to Rs 79643055 in F/Y 2063/64 from Rs 113774243 in F/Y 2062/63 (i.e. Rs -34131188 or -30%).

Fixed Administration Expenses increased more than 100% in the year 2062/63 from Rs 56384688 to Rs 113774243 because of the additional gratuity expenses.

Variation in fixed costs are due to the different level of outputs, changes in number of products produced, change in its price rate, behavior of employees, proportion of distribution costs, etc.

4.2.3 Semi-Variable Expenses of DDC

Semi-Variable costs are those cost that are neither fixed nor variable because they possess some characteristics of both. As output changes, semi-variable expenses change in the same direction but not in the same proportion to the changes in output.

The variability of semi-variable expenses is caused by the combined effect of:

- a. Passage of Time.
- b. Activity or Output.
- c. Discretionary Management Decision.

Semi-variable expenses frequently represent a significant portion of company expenses. As the DDC is not practicing CVP analysis, they didn't made separation of the cost into fixed and variable. While considering the situation of the DDC, Degree of Variability method seems to be the appropriate method to separate semi-variable cost into fixed and variable.

Separations of semi-variable cost are made according to degree of variability method. The determinations of degree of variability (popularly 30%:70% proportion) are done with considering the view of account department personnel, nature of expenses and own intuition judgment.

The use of other methods to differentiate fixed and variable from semi-variable cost seems almost impossible as the DDC is not practicing CVP analysis and its market spread over among different districts and wide varieties of products.

All the semi-variable cost is distributed to fixed cost and variable cost and these costs are presented in their respective fixed cost and variable cost.

Like, all the semi-variable cost of collection expenses are separated into fixed and variable cost and included in fixed collection expenses and variable collection expenses. Likewise, all the other sectors expenses are allocated in their respective expenses.

And the basis of separating the different cost into fixed and variable is done on the basis as shown in the collection, processing, selling and administration expenses of DDC in table above (Table: 4.5 to 4.8).

The following table shows the difference of semi-variable cost in different departments.

Table 4.17
Separation of Semi-Variable Cost of Collection Expenses into Fixed and Variable Cost
(F/Y 2059/60 & 2060/61)

(In Rs.)

Collection Expenses	2059/60			2060/61		
	Total	Fixed	Variable	Total	Fixed	Variable
Porter's wage (7:3)	12651	8856	3795	3391	2374	1017
Water & Electricity (3:7)	6717157	2015147	4702010	6400819	1920246	4480573
Machine Repairs (7:3)	1436935	1005855	431080	1650316	1155221	495095
Building Repairs (7:3)	304716	213301	91415	215080	150556	64524
Motor Repairs (7:3)	10956777	7669744	3287033	10184124	7128887	3055237
Other Repairs (7:3)	149173	104421	44752	157604	110323	47281
Stationery & Printing (7:3)	301963	211374	90589	302899	212029	90870
Ticket, Wire, Telephone (3:7)	162617	48785	113832	157576	47273	110303
Non-Durable Office Goods (7:3)	102018	71413	30605	91371	63960	27411
Prize to Farmers (7:3)	70645	49452	21193	77358	54151	23207
Total	20214652	11398348	8816304	19240538	10845020	8395518

Table 4.18**Separation of Semi-Variable Cost of Collection Expenses into Fixed and Variable Cost (F/Y 2061/62 – 2063/64)**

(In Rs.)

Collection Expenses	2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Porter's wage (7:3)	3596	2517	1079	500	350	150	-	-	-
Water & Electricity (3:7)	5706223	1711867	3994356	5464534	2216225	949811	3233276	2263293	969983
Machine Repairs (7:3)	2375593	1662915	712678	3166036	2216225	949811	3233276	2263293	969983
Building Repairs (7:3)	557171	390020	167151	476941	324859	143082	677663	474364	203299
Motor Repairs (7:3)	10092905	7065033	3027872	10654803	7458362	3196441	11985017	8389512	3595505
Other Repairs (7:3)	145181	101627	43554	169905	118933	50972	214715	150300	64415
Stationery & Printing (7:3)	332315	232620	99695	320773	22454	96232	428763	300134	128629
Ticket, Wire, Telephone (3:7)	156435	46930	109505	146937	44081	102856	184858	55457	129401
Non-Durable Office Goods (7:3)	101247	70873	30374	150639	105447	45192	171097	119768	51329
Prize to Farmers (7:3)	78446	54912	23534	67852	47496	20356	-	-	-
Total	19549112	11339314	8209798	20618920	11977573	8430280	22587870	13460572	9127298

Table 4.19
Separation of Semi-Variable Cost of Processing Expenses into Fixed and Variable Cost
(F/Y 2059/60 & 2060/61)

(In Rs.)

Processing Expenses	2059/60			2060/61		
	Total	Fixed	Variable	Total	Fixed	Variable
Butter, Cheese Transportation Exp. (7:3)	587095	410966	176129	927164	649015	278149
Powder Transportation Expenses (7:3)	470711	329498	141213	899705	629793	269912
Water & Electricity (3:7)	31077099	9323130	21753969	29685054	8905516	20779538
Motor Repairs (7:3)	989931	692952	296979	924433	647103	277330
Machine Repairs (7:3)	8934978	6254485	2680493	10049992	7034994	3014998
Building Repairs (7:3)	676258	473381	202877	1259951	881966	377985
Other Repairs (7:3)	471434	330004	141430	471386	329970	141416
Stationery & Printing (7:3)	255587	178911	76676	285456	199819	85637
Non-Durable Office Goods (7:3)	133303	93312	39991	122621	85835	36786
Ticket, Wire, Telephone (3:7)	74039	22212	51827	63540	19062	44478
Total	43670435	18108851	25561584	44689302	19383073	25306229

Table 4.20
Separation of Semi-Variable Cost of Processing Expenses into Fixed and Variable Cost
(F/Y 2061/62 – 2063/64)

(In Rs.)

Processing Expenses	2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Butter, Cheese Transportation Exp. (7:3)	1582724	1107907	474817	1552422	1086695	465727	1661348	1162944	498404
Powder Transportation Expenses (7:3)	661420	462994	198426	19912	13938	5974	-	-	-
Water & Electricity (3:7)	2789906 2	8369719	19529343	25957881	7787364	18170517	25644284	7693285	17950999
Motor Repairs (7:3)	408830	286181	122649	-	-	-	-	-	-
Machine Repairs (7:3)	8611971	6028380	2583591	14375128	10062590	4312538	12546835	8782784	3764051
Building Repairs (7:3)	633819	443673	190146	1516199	1061339	454860	1999920	1399944	599976
Other Repairs (7:3)	429902	300931	128971	574829	402380	172449	559852	391896	167956
Stationery & Printing (7:3)	312527	218769	93758	319365	223555	95810	461128	322790	138338
Non-Durable Office Goods (7:3)	157681	110377	47304	225963	158174	67789	217278	152095	65183
Ticket, Wire, Telephone (3:7)	59029	17709	41320	51123	15337	35786	64708	19412	45296
Total	40756965	17346640	23410325	44592822	20811372	23781450	43155353	19925150	23230203

Table 4.21
Separation of Semi-Variable Cost of Selling Expenses into Fixed and Variable Cost
(F/Y 2059/60 & 2060/61)

(In Rs.)

Selling Expenses	2059/60			2060/61		
	Total	Fixed	Variable	Total	Fixed	Variable
Stationery & Printing (7:3)	237956	166569	71387	266138	186297	79841
Water & Electricity (3:7)	155649	46695	108954	153826	46148	107678
Motor Repairs (7:3)	2336127	1635289	700838	2003693	1402585	601108
Building Repairs (7:3)	3125	2187	938	466400	326480	139920
Other Repairs (7:3)	10464	7325	3139	13260	9282	3978
Milk Transportation Expenses (7:3)	14845215	10391650	4453565	16678805	11675163	5003642
Business Promotion Expenses (7:3)	174117	121882	52235	61764	43205	18529
Non-Durable Office Goods (7:3)	67876	47513	20363	112443	78710	33733
Total	17830529	12419110	5411419	19756329	13767870	5988429

Table 4.22
Separation of Semi-Variable Cost of Selling Expenses into Fixed and Variable Cost
(F/Y 2061/62 – 2063/64)

(In Rs.)

Selling Expenses	2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Stationery & Printing (7:3)	302034	211424	90610	327297	229108	89189	414737	290316	124421
Water & Electricity (3:7)	15153	45046	105107	235460	70638	164823	300433	90130	210303
Motor Repairs (7:3)	1828806	1280164	548642	2575161	1802613	772548	3179295	2225506	953789
Building Repairs (7:3)	4100	2870	1230	59441	41609	17832	36676	25673	11003
Other Repairs (7:3)	21671	15170	6501	61259	42881	18378	55782	39047	16735
Milk Transportation Expenses (7:3)	14971035	10479724	4491331	16224961	11357473	4867488	16604195	11622936	4981259
Business Promotion Expenses (7:3)	117040	81928	35112	166050	116235	49815	269717	188802	80915
Non-Durable Office Goods (7:3)	64274	44992	19282	90260	63182	27078	107224	75057	23167
Total	17459113	12161318	5297795	19739890	13723739	6016151	20968059	14557467	6401592

Table 4.23
Separation of Semi-Variable Cost of Administration Expenses
Into Fixed and Variable Cost (F/Y 2059/60 & 2060/61)

(In Rs.)

Administration Expenses	2059/60			2060/61		
	Total	Fixed	Variable	Total	Fixed	Variable
Water & Electricity (3:7)	20719	6216	14503	24572	7372	17200
Ticket, Wire, Telephone (3:7)	1210568	363170	847398	1170747	351224	819523
Stationery & Printing (7:3)	981156	686809	294347	1080079	756055	324024
Motor Repairs (7:3)	1119645	783751	335894	968287	677801	290486
Building Repairs (7:3)	612031	428422	183609	248908	174236	74672
Other Repairs (7:3)	191230	133861	57369	191587	134111	57476
DOB Fees (7:3)	96666	67666	29000	157000	109900	471008480
Recruitment Fees (7:3)	8480	5936	2544	21040	14728	6312
Non-Durable Office Goods (7:3)	265435	185804	79631	209730	146811	62919
Annual Day Expenses (3:7)	590427	177128	413299	499476	149843	349633
Business Promotion Expenses (7:3)	429341	300539	128802	1332064	932445	399619
Rebate, Discount, Adjustment (3:7)	33542	10063	23479	281372	84412	196960
Meeting Fees (7:3)	121558	85091	36467	108101	75671	32430
Total	5680798	3234456	2446342	6292963	3614609	2678354

Table 4.24
Separation of Semi-Variable Cost of Administration Expenses
Into Fixed and Variable Cost (F/Y 2061/62 – 2063/64)

(In Rs.)

Administration Expenses	2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Water & Electricity (3:7)	21430	6429	15001	20208	6062	14146	237159	7159	16703
Ticket, Wire, Telephone (3:7)	1026710	308013	718697	1232510	369753	862757	1513516	454055	1059461
Stationery & Printing (7:3)	1134421	794095	340326	1088475	761932	326543	1292239	904567	387672
Motor Repairs (7:3)	1378188	964732	413456	800526	560368	240158	1079704	755793	323911
Building Repairs (7:3)	213165	149215	63950	283949	198764	85185	299883	209918	89965
Other Repairs (7:3)	188287	131801	56486	184909	128436	55473	263094	184166	78928
BOD Fees (7:3)	233000	163100	69900	188000	131600	56400	227000	158000	68100
Recruitment Fees (7:3)	41035	28724	12311	127500	89250	38250	899093	629365	269728
Non-Durable Office Goods (7:3)	395523	276866	118657	344207	240945	103262	455687	318981	136706
Annual Day Expenses (3:7)	923610	277083	646527	812204	243661	568543	877722	263317	614405
Business Promotion Expenses (7:3)	1720041	1204029	516012	1245594	871916	373678	1348328	943830	404498
Rebate, Discount, Adjustment (3:7)	508639	152592	356012	88589	26577	62012	115118	34535	80583
Meeting Fees (7:3)	14315204	10020643	4294561	163875	114712	49163	169750	118825	50925
Total	22099253	14477322	7621931	6580546	3744976	2835570	8564996	4982511	3581585

4.3 Difference of Gratuity Expenses

The difference in the gratuity expenses stated in the profit and loss A/C of DDC are distributed to the different sectors according to the percentage of gratuity expenses incurred in their respective sectors.

Table 4.25

Distribution of Difference in Gratuity Expenses To Different Cost Structure

(In Rs.)

Gratuity expenses in Years	Expenses				
	Total	Collection	Processing	Selling	Administration
F/Y 2059/60	41609173	3542542	18766338	1907128	17393165
Percentage (%)	100%	8.51	45.10	4.58	41.81
Less: Excess Gratuity Expenses	(5324356)	(453103)	(2401285)	(243855)	(2226113)
F/Y 2060/61	2508874	249124	1549559	240155	470036
Percentage (%)	100%	9.93	61.76	9.57	18.74
Add: Additional Gratuity Expenses	17450023	1732787	10777134	1669967	3270134
F/Y 2061/62	8407064	2869168	3268485	2269411	-
Percentage (%)	100%	34.13	38.88	26.99	-
Add: Additional Gratuity Expenses	3531055	1205149	1372874	953032	-
F/Y 2062/63	5091128	-	-	-	5091128
Percentage (%)	100%	-	-	-	100
Add: Additional Gratuity Expenses	53753235	-	-	-	53753235
F/Y 2063/64	3206510	-	21883	-	3184627
Percentage (%)	100%	-	0.68	-	99.32
Add: Additional Gratuity Expenses	16258298	-	110556	-	16147742

Source: Extracted from Appendix-I

Gratuity expenses are allocated to according to above table in their appropriate fixed collection expenses, fixed processing expenses, fixed selling expenses and fixed administration expenses.

4.4 Sundry Incomes of DDC

Sundry incomes of DDC constitutes the following incomes generated by the DDC in there respective years. It constitutes interest received from investment, interest from bank, goods auctioned, fines and deposit forfeiture and other incomes.

Table 4.26
The Detailed Sundry Incomes From 2059/60 to 2063/64

(In Rs.)

Particulars	2059/60	2060/61	2061/62	2062/63	2063/64
Interest Income	7415693	6384266	3894226	4146607	6149506
Interest on Investment	1525617	396477	2577434	1449953	1587706
Tender Forms Sales	451980	414805	526365	368798	376356
Goods Auctioned	249970	1015624	530132	1420644	4051
Fines and Deposit Forfeited	207308	322869	423800	2478217	182078
Other Incomes	2856766	2132355	3393398	3978633	18690
Reduced Transportation Cost	843251	874340	1298421	1032087	4121922
Sales of Skimmed Milk	-	5000	1372698	1209017	22454
Total	13550585	11545735	13141374	16939056	12462763
Increase/Decrease (%)	21.99	(14.79)	13.82	28.90	(26.43)

Source: DDC Annual Report F/Y 2059/60 – 2063/64

4.5 Inventory Consideration of DDC

Almost never are the volume of production and that of sales the same for any given period of a company's activity. Either sales will exceed production, or vice versa. The term inventory includes the stock in hand of raw materials, work-in-progress, finished products, etc. The main reason for holding inventories by the company is to supply goods regularly without delays and continue their work effectively and efficiently. In general, investment in inventory is considered to be burden of cost. So, investment in inventory is necessary only up to certain limit, beyond which, it is unnecessary and extra burden of cost.

Sales, Production and Inventory are interrelated with each other. Finished Goods inventory brings the gap between the production and sales.

If the sales exceed production, then inventory covers the deficit and if production exceeds sales, then the overproduction is stocked as inventory.

Table 4.27
Detailed of Inventory Balance From 2059/60 to 2063/64

(In Rs.)

Particular	2059/60	2060/61	2061/62	2062/63	2063/64
Milk	6308120	6734193	6837732	6606228	6713381
Butter	12892883	21162973	17420379	39263929	23157732
Cheese	6293952	5263599	7975324	10065015	10996557
Ghee	2568609	3227548	5289455	9753385	5866524
Curd	217982	258221	331799	362653	406837
Ice-Cream	179754	457404	294017	26220	574479
Cream	314917	173719	281036	281292	453036
Paneer	56330	71242	81311	116980	163124
Skimmed Milk Powder	35951066	7640827	2521940	31598208	42484341
Rasbari	11164	14747	20600	34883	108241
Lassi	40	358	-	-	885
Peda	-	119299	40627	49079	115502
Lalmohan	-	38115	24410	26208	153954
Fresh Milk	-	26062	14276	29018	92045
Mohi	-	162	11930	10703	8229
Balushahi	-	-	5299	-	-
Ledikeni	-	-	6566	4023	-
Khuwa	-	-	25695	12487	-
Gudpaak	-	-	1593	3473	875
Choco-Bar	-	-	-	4989	-
Total Closing Inventory	64731817	45188469	41183989	98248773	91296744
Less: Opening Inventory	38870266	64731817	45188469	57064784	6952029
Increase/Decrease in Inventory	25861551	(19543348)	(4004480)	57064784	(6952029)

Source: DDC Annual Report F/Y 2059/60 – 2063/64

The above table presents the inventory level of different products in different years. The overall increases in inventory from F/Y 2059/60 are Rs 25861551 or 66.53% and then decrease to Rs 19543348 or -30.19% in F/Y 2060/61 then to Rs 4004480 or -8.86% and then increased to Rs 57064784 or 138.56% and finally decrease to Rs 6952029 or 7.07%.

It seems like there was no inventory policy by the DDC. There a wide fluctuation in the inventory level of DDC.

4.6 Capacity Utilization of DDC

Capacity utilization is of the factor to improve the financial performance of any organization. Large sum of money is being spent and invested in the acquired fixed assets. So, proper utilization of the fixed assets is possible with efficient utilization of the fixed assets.

Under utilization increases the cost of productions and over utilization of capacity reduces the life o the plant and machinery.

DDC has a total production capacity of 25000 liters holding capacity and per shift production capacity (in 5 hrs) of DDC is of Follows:

Table 4.28
Capacity Utilization of DDC

S. No.	Place	Production Capacity/Hours	Holding Capacity/Hours	Per shift Production Capacity (5 hrs)
1.	Kathmandu	15000	135000	75000
2.	Hetauda	3000	60000	15000
4.	Biratnagar	5000	90000	15000
4.	Pokhara	2000	21000	10000
Total		25000	306000	115000

In the case of skimmed milk plant, it has a capacity of maximum of 40000 Liters of milk processed per shift and can produce 3 metric tones of milk powder.

Table 4.29
Capacity Utilization of DDC

Fiscal Year	Production (in Lakhs)	Capacity Utilization
2059/60	678.34	148.68%
2060/61	708.74	155.34%
2061/62	726.78	159.29%
2062/63	763.44	167.33%
2063/64	767.43	168.20%

$$\text{Capacity Utilization} = \frac{\text{Production} \times 100}{\text{Capacity (456.25)}}$$

The above table provides the information that DDC has been over utilizing the capacity of the fixed assets. Over utilization of the machines reduces its life and also increases the cost of repairs and maintenance for the machines. Moreover, there is a great chance of breakdown of machine that will result in not meeting the demand of the customers which leads to loss of loyal customers. So, DDC should install more machines according to the need of the demands.

4.7 CVP Analysis of DDC

CVP enables to study the effect of business activities on the expenses. Understanding of the aforementioned relationship plays a considerable role in correct prospective business planning and budgeting. CVP analysis helps managers to see in advance the effect of different strategies and decisions on business activities. It is an analytical technique used to study the behavior of profit in response to the changes in volume, cost and prices. It is a device used to determine the usefulness of the profit planning process of the firm. In fact, the entire field of profit planning has become associated with the CVP interrelationships. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. As an ultimate objective, it helps management in seeking the most profitable cost and volume. A dynamic management, therefore, use CVP analysis to predict and evaluate the implications of its short-run decisions about fixed cost, variable cost, volume and selling price for its profit plans on a continuous basis. CVP analysis is away to quickly a number of important questions about the profitability of a company's products or services. CVP analysis can be used with either a product or service.

DDC hasn't been practicing CVP analysis. So, while analyzing CVP analysis, constant care has been taken to differentiate the various cost into fixed and variables. Here, we find out the different important ratios to dig out the reasons for the losses of DDC.

Under this headings,

1. Contribution Margin.

2. P/V Ratio or C/M ratio.
3. BEP with four assumptions:
 - A. Omit inventory change and include other sundry incomes.
 - B. Omit both inventory change and other sundry incomes.
 - C. Include inventory change but omit other sundry incomes.
 - D. Include both inventory change and other sundry incomes.
4. Margin of safety with four different BEP, etc. are analyze here.

The below table: 4.30, table: 4.31 and 4.32 are the income statement for the CVP analysis of DDC from F/Y 2059/60 to F/Y 2063/64.

Table 4.30
Income Statement for CVP Analysis
F/Y 2059/60

(In Rs.)

Particular	Total	Fixed Cost	Variable Cost
Sales	1595906712		
Less: Manufacturing cost :			
Collection Exp.	1198028762	42106313	1155922449
Processing Exp.	268911533	72083119	196828414
Total manufacturing expenses	1466940295	114189432	1352750863
Percentage (%)	100%	7.78%	92.22%
Add/Less: Decrease/Increase in Inventory	(25861551)	(2012029)	(23849522)
Cost of Goods Sold	1441078744	112177403	1328901341
Gross Margin	154827968		
Less: Selling and Administration Expenses:			
Selling Expenses	40661310	27688374	12972936
Administration Expenses	77772740	63080383	14692357
Depreciation	29428739	29428739	
Interest on Loan	11583888	11583888	
Total Selling and Administration Expenses	159446677	131781384	27665293
Operating Profit/Loss	(4618709)		
Add: Non-operating Sundry Income	13550585		
Net Income	8931876		
TFC & TVC excluding Inventory Change		245970816	1380416156

Table 4.31
Income Statement for CVP analysis
F/Y 2060/61 & 2061/62

(In Rs.)

Particular	F/Y 2060/61			F/Y 2061/62		
	Total	Fixed Cost	Variable Cost	Total	Fixed Cost	Variable Cost
Sales	1535810462			1589663476		
Less: Manufacturing Cost :						
Collection Exp.	1129355530	39217485	1090138045	1133124279	42335828	1090788451
Processing Exp.	244622175	67860087	176762088	347698217	71257110	276441107
Total manufacturing expenses	1373977705	107077572	1266900133	1480822496	113592938	1367229558
Percentage (%)	100	7.79	92.21	100	7.67	92.33
Add/Less: Decrease/Increase in Inventory	19543348	1522427	18020921	4004480	307144	3697336
Cost of Goods Sold	1393521053	108599999	1284921054	1484826976	113900082	1370926894
Gross Margin	142289409					
Less: Selling and Administration Expenses:						
Selling Expenses	40894085	29065927	11828158	42046469	28483618	13562851
Administration Expenses	64401179	50812313	13588866	76579605	56384688	20194917
Depreciation	29993612	29993612				
Interest on Loan	4319401	4319401				
Total Selling and Administration Expenses	139608277	114191253	25417024	152554486	118796718	33757768
Operating Profit/Loss	2681132			(47717986)		
Add: Non-operating Sundry Income	11545735			13141374		
Net Income	14226867			(34576612)		
TFC & TVC excluding Inventory Change		221268825	1292317157		232389656	1400987326

Table 4.32
Income Statement for CVP analysis
F/Y 2062/63 & 2063/64

(In Rs.)

Particular	F/Y 2062/63			F/Y 2063/64		
	Total	Fixed Cost	Variable Cost	Total	Fixed Cost	Variable Cost
Sales	153640564			1680353680		
Less: Manufacturing cost :						
Collection Exp.	1144699429	42412214	1102287215	1209510351	43341975	1166168376
Processing Exp.	284071570	63377092	220694478	281331756	61761110	219571646
Total manufacturing expenses	1428770999	105789306	1322981693	1490843107	105103085	1385740022
Percentage (%)	100%	7.41%	92.59%	100%	7.05%	92.95%
Add/Less: Decrease/Increase in Inventory	(57064784)	(4228500)	(52836284)	6952029	490118	6461911
Cost of Goods Sold	1371706215	101560806	1270145409	1497795136	105593203	1392201933
Gross Margin	164634349			182558544		
Less: Selling and Administration Expenses:						
Selling Expenses	43581442	29868014	13713428	46437352	30563773	15873579
Administration Expenses	127283184	113774243	13508941	96355974	79643055	16712919
Depreciation	31778505	31778505		34209864	34209864	
Interest on Loan	4663760	4663760		3614719	3614719	3414719
Total Selling and Administration Expenses	207306891	180084522	17222369	180617909	148031411	32586498
Operating Profit/Loss	(42672542)			1940635		
Add: Non-operating Sundry Income	16939056			12462763		
Net Income	(25733486)			14403398		
TFC & TVC excluding Inventory Change		285873828	1350204062		253134496	1418326520

4.7.1 Contribution Margin of DDC

Contribution margin is the difference between the sales and the marginal/variable cost of sales and it contributes towards fixed expenses and profit.

Contribution Margin = Selling Price – Variable Cost

For F/Y 2059/60

$$= 1595906712 - (1380416156 - 23849522)$$

$$= 1595906712 - 1356566634$$

$$= \text{Rs } 239340078$$

Even though, contribution margin were increasing from F/Y 2061/62, it is still unsatisfactory. Higher the contribution margin, greater is the chance to meet fixed cost and earn a margin for the non-operating expenses, and create reserve and pay dividend, etc.

4.7.2 P/V Ratio of DDC

It is an important tool in studying the profitability of a business. It establishes relationship between contribution margin and sales volume.

It can be also found from the relationship between the change in the contribution margin and change in the sales. It is written in the form of percentages.

It is also known as contribution margin ratio (C/M Ratio).

$$\text{P/V Ratio} = 1 - \frac{b}{p}$$

Where,

b = Variable Cost

p = Sales

For F/Y 2059/60

$$= 1 - \frac{1356566634}{1595906712} = 1 - 0.85 = 0.15 \text{ or } 15\%$$

The contribution margin of DDC was too low. Higher the contribution margin ratio, higher will be the profit. DDC should try to reduce the variable cost or increase the sales volume to get higher C.M. ratio or P/V ratio to result in higher profit.

4.7.3 Break-Even Analysis of DDC

Break-even analysis is a logical extension of marginal costing. It is based on the same principle of classifying the operating expenses into fixed and variable. Now a days, it has become a powerful instrument on the hands of policy makers to maximize profit.

The B/E analysis is a specific way of presenting and studying the inter-relationship between the cost, volume and profit. It provides information to management in the most precise manner.

The B/E analysis established a relation between the revenues and cost with respect to the volume. It includes the level of sales at which cost and revenue are in equilibrium. The equilibrium point is normally called BEP.

The BEP can be defined as that point of sales at which the total revenue is equal to total cost. For BEP to occur, it is necessary that firm have same variable and fixed cost. If all the cost of the firms is variable, no profit no loss or BEP would be at zero

sales volume. On the other hand, if all costs were fixed, the BEP would occur at a point where revenue is equal to total fixed cost. The BEP can be computed in terms of units as well as Rupees.

$$\text{BEP (units)} = \frac{\text{Total Fixed Cost}}{\text{Unit Selling Price} - \text{Unit Variable Cost}}$$

$$\text{BEP (Rs)} = \frac{\text{Total Fixed Cost}}{1 - \frac{\text{Unit Variable Cost}}{\text{Unit Selling Price}}}$$

This formula is appropriate when there is a stable inventory and there are no other sources of incomes.

Keeping in view about that, BEP can be calculated considering the following four assumptions:

Assumption 1: Omit inventory change and include Other Sundry Incomes

$$\text{BEP} = \frac{\text{Fixed cost excluding inventory change} - \text{Other sundry incomes}}{1 - \frac{(\text{Variable cost consistent with sales}) \text{ or } \text{P/V Ratio}}{\text{Sales}}}$$

Assumption 2: Omit both inventory change and Other Sundry Incomes

$$\text{BEP} = \frac{\text{Fixed cost excluding inventory change}}{1 - \frac{(\text{Variable cost consistent with sales}) \text{ or } \text{P/V Ratio}}{\text{Sales}}}$$

Assumption 3: Include inventory change but Omit Sundry Incomes

$$\text{BEP} = \frac{\text{Fixed cost including inventory change} - \text{Other sundry incomes}}{1 - \frac{(\text{Variable cost consistent with sales}) \text{ or } \text{P/V Ratio}}{\text{Sales}}}$$

Assumption 4: Include both inventory change but include Other Sundry Incomes

$$\text{BEP} = \frac{\text{Fixed cost including inventory change} - \text{Other sundry incomes}}{1 - \frac{\text{Variable cost consistent with sales for F/V Ratio}}{\text{Sale}}}$$

For F/Y 2059/60

Assumption 1: Omit inventory change and include Other Sundry Incomes

$$\text{BEP Sales} = \frac{245970816Z13550585}{0.15} = \frac{232420231}{0.15} = 1549468207$$

Assumption 2: Omit both inventory change and Other Sundry Incomes

$$\text{Break-Even Sales} = \frac{\text{Fixed Cost}}{\text{C.M. ratio}} = \frac{245970816}{0.15} = 1639805440$$

Assumption 3: Include inventory change but Omit Sundry Incomes

$$\begin{aligned} \text{Break-Even Sales} &= \frac{\text{Fixed Cost Z Increase In Inventory}}{\text{C.M. ratio}} \\ &= \frac{245970816Z2012029}{0.15} = \frac{243958787}{0.15} = 1626391913 \end{aligned}$$

Assumption 4: Include both inventory change but include Other Sundry Incomes

$$\begin{aligned} \text{Break-Even Sales} &= \frac{\text{Fixed Cost Z Increase In Inventory Z Other Sundry Incomes}}{\text{C.M. ratio}} \\ &= \frac{245970816Z2012029Z13550585}{0.15} = \frac{230408202}{0.15} = 1536054680 \end{aligned}$$

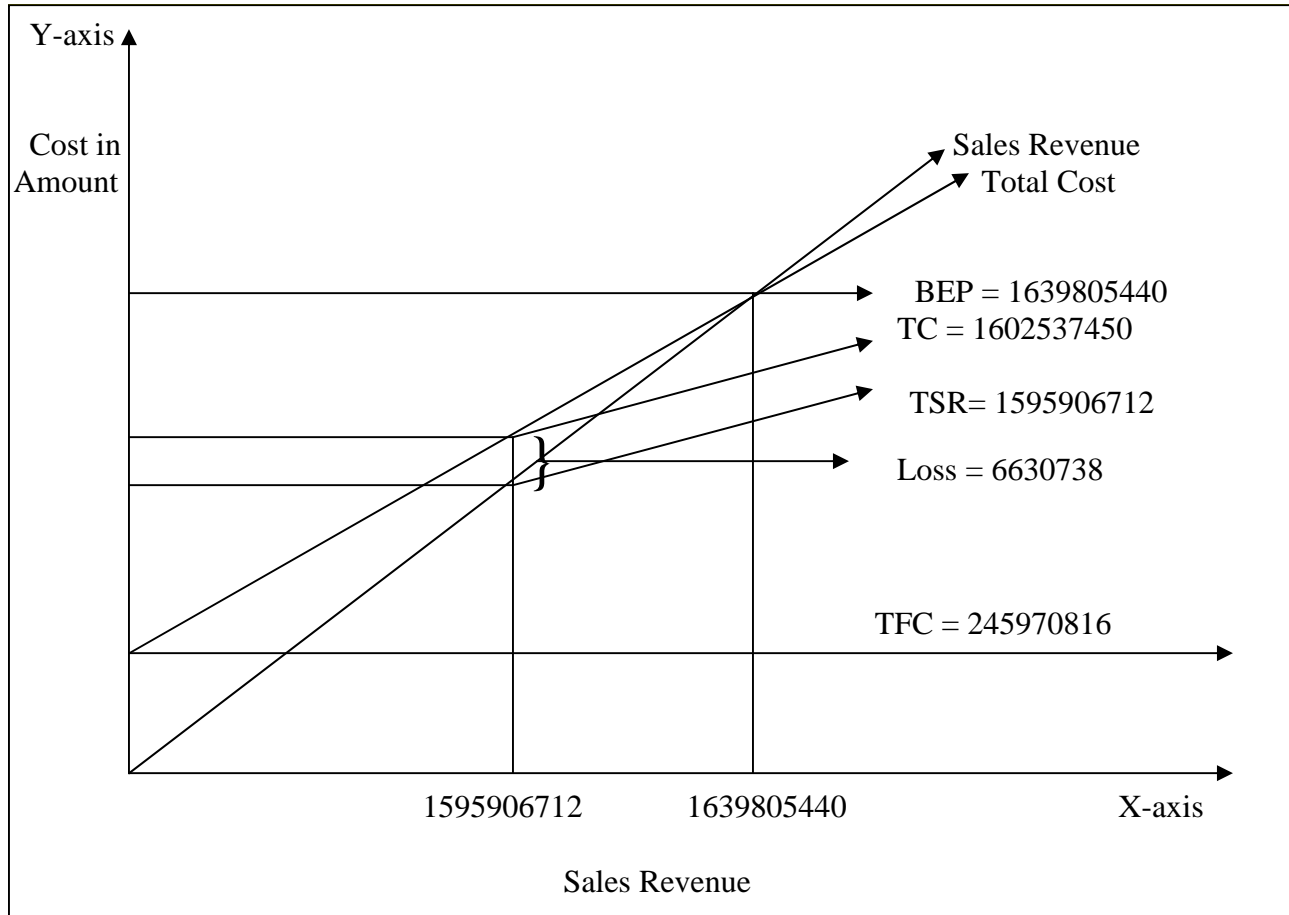
Table 4.33
Calculation of BEP Sales under Different Assumptions
From 2059/60 to 2063/64

(In Rs.)

Assumptions	2059/60	2060/61	2061/62	2062/63	2063/64
1	1549468207	1428631403	1883576306	1728372571	1582325661
2	1639805440	1507280824	1996474708	1837235398	1664263616
3	1626391913	1517651580	1999113402	1810059949	1667485957
4	1536054680	1439002159	1886215000	1701197121	1585548001

Source: Appendix-8

Figure 4.1
Break-Even Chart of DDC F/Y 2059/60



Break-Even Chart of DDC F/Y 2059/60

The above graph is presented to point out the BEP sales, considering no change in inventory and no sundry incomes. In this, X-axis is treated as sales revenue and Y-axis is graphed as cost in amount. Since, fixed cost is constant over a year, so, fixed cost curve is parallel to X-axis. The total cost increases with the increases in sales revenues. So, total cost curve slope upward to right side. Total cost curve starts from fixed cost of Rs 2459970816. The Rs 245970816 are also total cost when sales revenue is zero. Sales revenue curve starts from zero as sales revenue will be zero, when sales volume is zero. This chart also shows that sales revenue is also slopping upward to the right. The point at which the sales revenue and total cost lines intersect is the BEP sales. Here in F/Y 2059/60 when inventory change and other sundry incomes are not considered, BEP sales are Rs 1639805440. if actual sales are more than BEP, then the profit will occur otherwise, if actual sales are less than BEP sales, loss will incur. Here, actual sales (1595906712) are less than total cost (16025374450), which leads to an operating loss of Rs 6630738.

4.7.4 Margin of Safety

It is the difference between the actual sales and the BEP sales. One of the assumptions of marginal costing is that the production or the output will coincides the sales. So, margin of safety is also the excess of production over BEP output. Sales or output above BEP is known as margin of safety because it gives some profit whereas at BEP only fixed expenses are recovered.

Margin of Safety = Actual Sales – BE Sales

$$= \frac{\text{Profit}}{P/VRatio}$$

For F/Y 2059/60

Assumption 1: Omit inventory change and include Other Sundry Incomes

$$\begin{aligned}\text{Margin of Safety} &= \text{Actual Sales} - \text{Break-Even Sales} \\ &= 1595906712 - 1549468207 \\ &= 46438505\end{aligned}$$

Assumption 2: Omit both inventory change and Other Sundry Incomes

$$\begin{aligned}\text{Margin of Safety} &= \text{Actual Sales} - \text{Break-Even Sales} \\ &= 1595906712 - 1639805440 \\ &= - 43898728\end{aligned}$$

Assumption 3: Include inventory change but Omit Sundry Incomes

$$\begin{aligned}\text{Margin of Safety} &= \text{Actual Sales} - \text{Break-Even Sales} \\ &= 1595906712 - 1626391913 = - 3048520133\end{aligned}$$

Assumption 4: Include both inventory change but include Other Sundry Incomes

$$\begin{aligned}\text{Margin of Safety} &= \text{Actual Sales} - \text{Break-Even Sales} \\ &= 1595906712 - 1536054680 \\ &= 59852032\end{aligned}$$

Table 4.34
Calculation of MOS Under Different Assumptions
From 2059/60 to 2063/64

(In Rs.)

Assumptions	2059/60	2060/61	2061/62	2062/63	2063/64
1	46438505	107179059	-293912830	-192032007	98028019
2	-43898728	28529638	-406811232	-300894834	16090064
3	-3048520133	18158882	-409449926	-273719385	12867723
4	59852032	96808303	-296551524	-164856557	94805679

Source: Appendix-8

4.7.5 Statement of Overall CVP Analysis

Profit planning of the DDC hasn't been successful, as they didn't practice CVP analysis. There is no proper practice of segregating different costs into fixed and variables, resulting in low contribution margin, high variable cost, high fixed cost to recover from contribution margin. The detailed descriptions have been presented below in year-wise.

Table 4.35
Overall Statement of CVP analysis Under Four Assumptions
2059/60

(In Rs.)

Statement	Assumptions			
	1	2	3	4
Sales	1595906712	1595906712	1595906712	1595906712
Less: Variable cost	1356566634	1356566634	1356566634	1356566634
Contribution Margin	239340078	239340078	239340078	239340078
Less: Fixed Cost	245970816	245970816	243958787	243958787
Operating Income/Loss	-6630738	-6630738	-4618709	-4618709
Add: Sundry Incomes	13550585	-	-	13550585
Net Incomes/Loss	6919847	-6630738	-4618709	8931876
P/V Ratio	0.15	0.15	0.15	0.15
BEP	1549468207	1639805440	1626391913	1536054680
MOS	46438505	-43898728	-30485201	59852032
V/V Ratio	0.85	0.85	0.85	0.85
% of FC to Sales	15.41%	15.41%	15.29%	15.29%

Source – Appendix

In the above table, shows the overall statement considering the four different assumptions:

Assumption 1: Omit inventory change and include other sundry incomes.

Assumption 2: Omit both inventory change and other sundry incomes.

Assumption 3: Include inventory change but omit sundry incomes.

Assumption 4: Include both inventory change but include other sundry incomes.

The contribution margin in F/Y2059/60 was Rs 239340078 or contribution margin ratio of 15%, which is too low to cover the fixed cost which is 15.41% to sales, in considering assumption 1 and 2 and 15.29% in consideration of assumption 3 and 4. DDC has incurred profit of Rs 6919847 when excluding inventory change and including other sundry incomes (assumption 1), incurred loss of Rs 43898728 when omitting both inventory change and other sundry incomes (assumption 2), incurred loss of Rs 30485201 while considering only inventory change (assumption 3) and incurred a profit of Rs 8931876 when including both inventory change and other sundry incomes (assumption 4). This proves that other sundry incomes also contribute a lot to DDC overall revenue.

Therefore, BEP sales for F/Y 2059/60 considering four assumptions are Rs 154968207, Rs 1639805440, Rs 1626391913 and Rs 1536054680. And MOS in this case, yield an amount of Rs 46438505 considering assumption 1 and Rs 59852032 Considering assumption 4.

Table 4.36
Overall Statement of CVP analysis Under Four Assumptions
2060/61

(In Rs.)

Statement	Assumptions			
	1	2	3	4
Sales	1535810432	1535810432	1535810432	1535810432
Less: Variable cost	1310338078	1310338078	1310338078	1310338078
Contribution Margin	225472384	225472384	225472384	225472384
Less: Fixed Cost	221268825	221268825	222791252	222791252
Operating Income/Loss	4203559	4203559	2681132	2681132
Add: Sundry Incomes	11545735	-	-	11545735

Net Incomes/Loss	15749294	4203559	2681132	14226867
P/V Ratio	14.68%	14.68%	14.68%	14.68%
BEP	1428631403	1507280824	1517651580	1439002159
MOS	107179059	28529638	18158882	96808303
V/V Ratio	85.32%	85.32%	85.32%	85.32%
% of FC to Sales	14.41%	14.41%	14.51%	14.51%

Source - Appendix

The contribution margin in F/Y2060/61 was Rs 225472384 or contribution margin ratio of 14.68%, which is sufficient to cover the fixed cost which is 14.41% to sales, in considering assumption 1 and 2 and 14.51% in consideration of assumption 3 and 4, leading to a profit of Rs 15749294, Rs 4203559, Rs 2681132 and Rs 14226876 under four respective assumptions. Therefore, BEP sales for F/Y 2060/61 considering four assumptions are Rs 1428631403, Rs 1507280824, Rs 1517651580 and Rs 1439002159, which is less than sales value i.e. Rs 1535810462. And MOS is also positive in considering all the four assumptions.

Table 4.37
Overall Statement of CVP analysis under Four Assumptions
2061/62

(In Rs.)

Statement	Assumptions			
	1	2	3	4
Sales	1589663476	1589663476	1589663476	1589663476
Less: Variable cost	1404684662	1404684662	1404684662	1404684662
Contribution Margin	184978814	184978814	184978814	184978814
Less: Fixed Cost	232389656	232389656	232696800	232696800
Operating Income/Loss	-47410842	-47410842	-47717986	-47717986

Add: Sundry Incomes	13141374	-	-	13141374
Net Incomes/Loss	-34269468	-47410842	-47717986	-34576612
P/V Ratio	11.64%	11.64%	11.64%	11.64%
BEP	1883576306	1996474708	1999113402	1886215000
MOS	-293912830	-406811232	-409449926	-296551524
V/V Ratio	88.36%	88.36%	88.36%	88.36%
% of FC to Sales	14.62%	14.62%	14.64%	14.64%

Source - Appendix

The contribution margin in F/Y2061/62 was Rs 184978814 or contribution margin ratio of 11.64%, which is too low to cover the fixed cost which is 14.62% to sales, in considering assumption 1 and 2 and 14.64% in consideration of assumption 3 and 4, leading to a loss of Rs 34269468, Rs 47410842, Rs 47717986 and Rs 34576612 under four respective assumptions.

Therefore, BEP sales for F/Y 2061/62 considering four assumptions are Rs 1883576306, Rs 1996474708, Rs 1999113402 and Rs 1886215000, which is more than sales value i.e. Rs 1589663476. And MOS is also negative in considering all the four assumptions.

Table 4.38
Overall Statement of CVP analysis Under Four Assumptions
2062/63

(In Rs.)

Statement	Assumptions			
	1	2	3	4
Sales	1536340564	1536340564	1536340564	1536340564
Less: Variable cost	1297367778	1297367778	1297367778	1297367778
Contribution Margin	238972786	238972786	238972786	238972786
Less: Fixed Cost	285873828	285873828	281645328	281645328
Operating Income/Loss	-46901042	-46901042	-42672542	-42672542
Add: Sundry Incomes	16939056	-	-	16939056
Net Incomes/Loss	-29961986	-46901042	-42672542	-25733486
P/V Ratio	15.56%	15.56%	15.56%	15.56%
BEP	1728372571	1837235389	1810059949	1701197121
MOS	-192032007	-300894834	-273719385	-164856557
V/V Ratio	84.44%	84.44%	84.44%	84.44%
% of FC to Sales	18.61%	18.61%	18.33%	18.33%

Source - Appendix

The contribution margin in F/Y2062/63 was Rs 238972786 or contribution margin ratio of 15.56%, which is too low to cover the fixed cost which is 18.61% to sales, in considering assumption 1 and 2 and 18.33% in consideration of assumption 3 and 4, leading to a loss of Rs 29961986, Rs 46901042, Rs 42672542 and Rs 25733486 under four respective assumptions. Therefore, BEP sales for F/Y 2062/63 considering four assumptions are Rs 1728372571, Rs 1837235389, Rs 1810059949 and Rs

1701197121, which is more than sales value i.e. Rs 1536340564. And MOS is also negative in considering all the four assumptions.

Table 4.39
Overall Statement of CVP analysis Under Four Assumptions
2063/64

(In Rs.)

Statement	Assumptions			
	1	2	3	4
Sales	1680353680	1680353680	1680353680	1680353680
Less: Variable cost	1424788431	1424788431	1424788431	1424788431
Contribution Margin	255565249	255565249	255565249	255565249
Less: Fixed Cost	253134496	253134496	253624614	253624614
Operating Income/Loss	2430753	2430753	1940635	1940635
Add: Sundry Incomes	12462763	-	-	12462763
Net Incomes/Loss	14893516	2430753	1940635	14403398
P/V Ratio	15.21%	15.21%	15.21%	15.21%
BEP	1582325661	1664263616	1667485957	1585548001
MOS	98028019	16090064	12867723	94805679
V/V Ratio	84.79%	84.79%	84.79%	84.79%
% of FC to Sales	15.06%	15.06%	15.09%	15.09%

Source - Appendix

The contribution margin in F/Y2063/64 was Rs 255565249 or contribution margin ratio of 15.21%, which is sufficient to cover the fixed cost which is 15.06% to sales, in considering assumption 1 and 2 and 15.09% in consideration of assumption 3 and 4, leading to a profit of Rs 14893516, Rs 2430753, Rs 1940635 and Rs 14403398 under four respective assumptions.

Therefore, BEP sales for F/Y 2063/64 considering four assumptions are Rs 1582325661, Rs 1664263616, Rs 1667485957 and Rs 1585548001, which is less than sales value i.e. Rs 1680353680. And MOS is also positive in considering all the four assumptions.

4.8. Sensitivity of CVP Analysis

Sensitivity of CVP analysis is the study of the CVP analysis in the different stages or in the different situation in which the related terms of CVP, cost (fixed and variable), volume and profit changes. Of changes occur in one term, such as in cost (variable and fixed cast independently), its effect or changes, which may be positive or negative, on profit, on sales volumes, on contribution margin, on selling price, etc. respectively. It helps the company to maintain its original BEP in the change situation.

Small changes in one factor of CVP can change the BEP or profit or in other words, BEP or profit is influence in response to the changes in selling price, variable cost and fixed cost. When changes are expected in selling price, in ratio of variable cost factors, or in the amount of fixed cost, an analysis of the cost-volume-profit relationship can determine the effect of such changes on period's profit and BEP.

Change Effects of Sales Value

The increase in the sales value will results in increase in profit-volume ratio (P/V Ratio or C.M. Ratio), which result in lowering of BEP sales. On the contrary, a decrease in sales value will reduce or decrease the P/V Ratio, thereby, increasing the BEP sales. If sales value is increase and decrease by 10% with other factors remaining constant or assumed to be same, it result like below for F/Y 2059/60, using only assumption 4 i.e. include both inventory change and other sundry incomes.

Table 4.40

Effect of 10% Increases or Decreases in Sales Value

F/Y 2059/60

(In Rs.)

Statement	Change in Sales Value		
	Actual	10% Increase	10% Decrease
Sales	1595906712	1755497383	1436316041
Less: Variable Cost	1356566634	1356566634	1356566634
Contribution Margin	239340078	398930749	79749407
Less: Fixed Cost	243958787	243958787	243958787
Operating Profit/Loss	-4618709	154971962	-164209380
Add: Other Sundry Incomes	13550585	13550585	13550585
Net Profit/Loss	8931876	168522547	-150658795
P/V Ratio	0.15	0.2272	0.0555
BEP= $\frac{\text{Fixed Cost} + \text{Other Sundry Incomes}}{P/V \text{ Ratio}}$	1536054680	1014120607	4151499135

Above table shows that with 10% increases in sales, the break-even point is reduced to Rs 1014120607 from Rs 1536054680 (i.e. R 521934073 or 33.99%). Similarly, with 10% decrease in sales value, BEP increased to Rs 4151499135 from Rs 1536054680 (i.e. Rs 261544455 or 170.27%). This shows the inverse relationship between the sales and BEP.

Change Effects of Variable Costs

The increase in variable cost, if it doesn't cause change in selling price or volume, will lower the P/V ratio and push up BEP and reduce profit and decrease in variable cost increase the P/V ratio, thereby, increase profit by reducing the BEP sales. The impact of 10% increase or decrease on Variable cost on other factor is shown below, considering the assumption 4 (including both inventory change and other sundry incomes)

Table 4.41
Effect of 10% Increases or Decreases in Variable Cost
F/Y 2059/60

(In Rs.)

Statement	Change in Sales Value		
	Actual	10% Increase	10% Decrease
Sales	1595906712	1595906712	1595906712
Less: Variable Cost	1356566634	1492223297	1220909970
Contribution Margin	239340078	103686415	374996742
Less: Fixed Cost	243958787	243958787	243958787
Operating Profit/Loss	-4618709	-140275372	131037955
Add: Other Sundry Incomes	13550585	13550585	13550585
Net Profit/Loss	8931876	-126724787	144588540
P/V Ratio	0.15	0.0649	0.2349
BEP= $\frac{\text{Fixed Cost} + \text{Other Sundry Incomes}}{\text{P/V Ratio}}$	1536054680	3550203421	980877829

Above table shows that with 10% increase in variable cost, BEP has increased from Rs 1536054680 to Rs 3550203421 (i.e. Rs 2014148741 or 131.12%). And with 10% decrease in variable cost, BEP has decreased to Rs 980877829 (i.e. Rs 555176851 or 36.14%) which shows that variable cost, and BEP sales are positively related but not proportionately.

Change Effects of Fixed Costs

A change in fixed cost doesn't influence P/V ratio. So, if other factors remain constant, then in fixed cost reduces the BEP and increases the profit.

They may fluctuate by reason of changes in the basic structure in management policy and due to some changes in the external factors.

The below table represents, the impact of 10% increase or decrease in fixed cost in BEP and profit.

Table 4.42
Effect of 10% Increases or Decreases in Fixed Cost
F/Y 2059/60

(In Rs.)

Statement	Change in Sales Value		
	Actual	10% Increase	10% Decrease
Sales	1595906712	1595906712	1595906712
Less: Variable Cost	1356566634	1356566634	1356566634
Contribution Margin	239340078	239340078	239340078
Less: Fixed Cost	243958787	268354666	219562908
Operating Profit/Loss	-4618709	-29014588	19777170
Add: Other Sundry Incomes	13550585	13550585	13550585
Net Profit/Loss	8931876	-15464003	33327755
P/V Ratio	0.15	0.15	0.15
BEP= $\frac{\text{Fixed Cost} + \text{Other Sundry Incomes}}{\text{P/V Ratio}}$	1536054680	1698693873	1373415487

The above table presents the 10% increase in fixed cost, increases the BEP by Rs 1626391933, which is 10% (approx). And 10% decrease in fixed cost, reduce the BEP by Rs 162639193, which is 10% (approx). The 10% increase in fixed cost increase the BEP by 10% and reduction of 10% of fixed cost will end up reducing the BEP by 10%. The slight variation is because of decimal differences. It can be conducted that BEP and fixed cost are proportionately related.

4.9 Operating Leverage of DDC

Operating leverage is a measure of how sensitive net income is to percentage changes in sales. Operating leverage is greatest in companies, which have a high proportion of fixed costs relative to variable costs. A firm with fixed costs and low variable costs has high operating leverage, the ability to highly increase net income from an increase in sales revenue. In other words, after the break-even point has been reached, a larger amount of contribution margin will fall to the bottom line in a high fixed cost structure than if the cost structure had been comprised mostly of continuing high variable costs. Which continue to eat away at net income after the break-even point is reached. Of course, the risk is also greater because if the break-even point is not reached, losses will be greater in the firm with high operating leverage.

$$\text{Degree of Operating Leverage} = \frac{\text{Contribution Margin}}{\text{Net Income}}$$

$$\text{DOL for DDC for F/Y 2059/60} = \frac{239340078}{8931876} = 26.8 \text{ times}$$

The greater the DOL, greater is the business risk. DOL of DDC for the year 2059/60 was 26.8 times, which means, if sales are increased by 100%, the net income will increase by 12680 times. It is clear that DDC has absorbed more fixed cost to aim to gain more profit. It indicates return efficiency area covers capital structure.

4.10. Manpower Distribution of DDC

DDC is employing manpower on two departments, i.e. administration and technician. The table below shows the manpower in yearly basis without considering the indirect employment provided by DDC.

From the table below, figure shows that there has been constant effort to layoff of the inefficient administrative staff to avoid the unnecessary extra cost on the staffs. Administrative staffs were increased to 398 from 132 in F/Y 2059/60 and technicians were reduced for deduction of fixed cost. Before F/Y 2059/60, there were 1147 technicians but from F/Y 2061/62 608 old technicians were dismissed and in F/Y 2063/64, 32 new technicians were introduced or employed in the DDC, totaling 969 in the F/Y 2063/64.

It seems like DDC is moving towards right direction in reducing the extra burden of cost. It has reduced its employees from 1279 to 969 which is, 24.24% reduction of the unwanted or inefficient employees.

Table 4.43
Number of Employees Working in DDC
Distributed to Administration and Technician

Fiscal Year	Departments or Nature of Employee	No. of Employees	Percentage of Employment
2059/60	Administration	132	10.32
	Technician	1147	89.68
Total	-	1279	100%
2060/61	Administration	132	10.32
	Technician	1147	89.68
Total	-	1279	100%

2061/62	Administration	318	37.11
	Technician	539	62.89
Total	-	857	100%
2062/63	Administration	318	37.11
	Technician	539	62.89
Total	-	857	100%
2063/64	Administration	398	41.07
	Technician	571	58.93
Total	-	969	100%

4.11. Ratios that Measures Productivity of DDC

Productivity refers to the relationship between the inputs and outputs. It is the technique that measures efficiency and effectiveness of organization.

Productivity ratios used here is to analyze the productivity of the labor of DDC.

The following ratios are used:

- A. Sales per employee.
- B. Net added value per employee.
- C. Labor equipment ratio.
- D. Wage distribution ratio.
- E. Wage base.

$$\text{A. Sales per employee} = \frac{\text{Net Sales}}{\text{No.Of Employee}}$$

$$\text{For F/Y 2059/60} = \frac{1598906712}{1279} = 1247777$$

In F/Y 2059/60, sales per employee is 1247777, in F/Y 2060/61 is 1200790, in F/Y 2061/62 is 1854916, in F/Y 2062/63 is 1792696 and in F/Y 2063/64 is 1734111.

Sales per employee are not satisfactory, however, there is a little hope seeing the trend that it is increasing. It should either increase the sales or reduce the number of unproductive employees to further increase the sales per employee.

$$\text{B. Net added value per employee} = \frac{\text{Net Added Value}}{\text{No. of Employee}}$$

Where,

$$\text{Net Added Value} = \text{Sales} - (\text{opening inventory of raw material} + \text{raw material} - \text{ending inventory of raw material})$$

Opening inventory of raw material and ending inventory of raw material is zero in case of DDC.

$$\begin{aligned} \text{Net Added Value per employee} &= \frac{\text{Sales} - \text{Material Cost}}{\text{No.of Employee}} \\ &= \frac{\text{Net Added Value}}{\text{No.of Employee}} \end{aligned}$$

$$\text{For F/Y 2059/60} = \frac{367961424}{1279} = 287695$$

The net added value per employee for F/Y 2059/60 is 287695, in F/Y 2060/61 were 299465, in F/Y 2061/62 were 442825, in F/Y 2062/63 were 391419 and in F/Y 2063/64 were 443032. Net added value per employee is also very low. DDC has high material cost. DDC should try to reduce the material cost, increase sales and reduce the unproductive employees to increase the productivity of the labor.

Table 4.44
Calculation of Net Added Value

	(In Rs.)				
Particular	2059/60	2060/61	2061/62	6062/63	2063/64
Sales	1559506712	1535810462	1589663476	153640564	1680353680
Less: Material Cost:					
COLLECTION:					
Milk purchased	1112413152	1045469720	1038124379	1044700126	1101355622
Fuel & other provision	27812759	28993318	3091414	36270112	38613927
Chemicals & Detergents	677457	654579	659516	756270	966237
PROCESSING:					
Skimmed milk powder	52816397	39656569	98229166	69783186	5643902
Raw materials & others	1060880	1892398	2729605	3674319	4460992
Chemicals & Detergents	2475824	2982761	3592866	3475776	4048949
Fuel & other provision	30668196	33126214	36135760	42234275	45466232
Fodder purchased	20623	19042	-	-	-
Total material cost	1227945288	1152794601	1210162706	1200894064	1251055861
Net Added value	367961424	383015861	379500770	335446500	429297819

No. of Employee	1279	1279	857	857	969
------------------------	------	------	-----	-----	-----

Extracted from Appendix-1 and Appendix 3-6

$$\text{C. Labor Equipment Ratio} = \frac{\text{Net Fixed Assets}}{\text{No.of Employees}}$$

$$\text{For F/Y 2059/60} = \frac{275075176}{1279} = 215071$$

Labor equipment ratio for F/Y 2059/60 is 215071, in F/Y 2060/61 were 229360, in F/Y 2061/62 were 306792, in F/Y 2062/63 were 302909 and in F/Y 2063/64 were 262274.

DDC has distributed fixed assets into:

- presently in use
- purchased but not installed and used

Here, only presently in use fixed assets are considered labor equipment ratio is also very low.

$$\text{D. Wage Distribution Ratio} = \frac{\text{Gross Wage}}{\text{Net Added Value}}$$

$$\text{For F/Y 2059/60} = \frac{154055519}{367961424} = 0.4187 \text{ or, } 41.87\%$$

Wage distribution ratio for F/Y 2059/60 is 41.87%, for F/Y 2060/61 is 34.59%, for F/Y 2061/62 is 36.05%, For F/Y 2062/63 is 58.26% and for F/Y 2063/64 is 37.38%.

Table 4.45
Calculation of Gross Wages

(In Rs.)

Particular	2059/60	2060/61	2061/62	6062/63	2063/64
COLLECTION:					
Salaries	22489966	21066452	21963708	24480597	23694201
Allowance	2442174	2644598	5985895	3836178	5623213
Provident Fund	1403410	1321992	1290949	1436564	1436201
Gratuity Expenses	3542542	249124	2869168	-	-
PROCESSING:					
Salaries	34532145	33589010	33443627	39239185	38753232
Allowance	4814565	4519830	8819809	6674837	9431594
Provident Fund	1930955	1830992	1799554	2103395	2126094
Gratuity Expenses	18766338	1549559	3268485	-	21883
SELLING:					
Salaries	12095550	12007908	11663447	13775715	14279916
Allowance	2166846	2174864	4512406	3423905	4482025
Provident Fund	736849	717090	683578	778817	818059
Gratuity Expenses	1907128	240155	2269411	-	-
ADMINISTRATION:					
Salaries	29013593	27120786	25427879	33329987	30936837
Allowance	4332339	3827860	7550380	5501121	7434392
Provident Fund	1812310	1733783	1738294	2024968	2022504
Gratuity Expenses	17393165	470036	-	5091128	3184627
Add/Less: Additional/ Excess Gratuity Expenses	(5324356)	17450023	3531055	53753235	16258298

Total	154055519	132514062	136817645	195449632	160503076
-------	-----------	-----------	-----------	-----------	-----------

Extracted from Appendix 3-6

The percentage of wage cost to value added is very high in F/Y 2062/63. After that, DDC seems to have noticed the excess cost on wages and unproductive employees and reduced the number of employees. However, the wages distribution ratio is not very satisfactory.

$$E. \text{ Wage Base} = \frac{\text{Gross Wage}}{\text{No.of Employee}}$$

$$\text{For F/Y 2059/60} = \frac{154055519}{1279} = 120450$$

Wage base for F/Y 2059/60 is 120450, for F/Y 2060/61 is 103607, for F/Y 2061/62 is 159647, For F/Y 2062/63 is 228062 and for F/Y 2063/64 is 165638. However, with deduction to Rs 165638 in F/Y 2063/64, it is still very high enough.

The overall productivity of labor isn't that satisfactory, DDC should focus more on the productivity of labor in the coming year as, is constitutes major cost in the overall expenses of DDC.

4.12. Profitability Ratios in Relation to Sales of DDC

Profit is essential for the growth and survival of the business. Without which, no business can stay for too lang. hence, it is regarded as the lifeblood of the business. It is the engine that drives the business and indicates economic progress.

Profitability ratios are calculated to measure the overall efficiency of the business. Profitability ratios are calculated with either in relation to sales or in relation to investment.

Hence, the profitability ratios in relation to sales are considered. Under which, three ratios are calculated.

1. Gross Margin Ratio
2. Net Profit Margin
3. Operating Ratio

1. Gross Margin Ratio

Gross profit margin is the commonest ratios in operating analysis. It is calculated of gross profit as a percentage of net sales. It expresses the relationship between gross profit and sales and usually expressed on percentage.

$$\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$$
$$\text{For F/Y 2059/60} = \frac{154827968}{1595906712} = 0.097 \text{ or } 9.7\%$$

Gross profit margin for F/Y 2059/60 is 9.7%, for F/Y 2060/61 is 9.26%, for F/Y 2061/62 is 6.59%, for F/Y 2062/63 is 10.71% and F/Y 2063/64 is 10.86%.

Higher the gross margin ratio better is the organization's management as it implies that the cost of production of the firm is relatively low. Since DDC has very low gross profit ratio, it is definitely a danger sign to analyze the detailed for such cause.

2. Net Profit Margin

Net profit ratio is the ratio of net profit to net sales. It measures the overall profitability of the firm by establishing the relationship between the net profit and sales. Net profit margin indicates the manager's ability to operate the business with sufficient success not only to cover the cost of production, operating expenses, and cost of borrowed fund but also to leave a margin of reasonable compensation to the owners for providing their capital at risk.

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Sales}}$$
$$\text{For F/Y 2059/60} = \frac{Z4618709}{1595906712} = -0.0029 \text{ or } -0.29\%$$

Net profit ratio for F/Y 2059/60 is -0.29%, for F/Y 2060/61 is 0.17%, for F/Y 2061/62 is -3.0%, for F/Y 2062/63 is -2.78% and F/Y 2063/64 is 0.11%, without considering the other sundry incomes.

Higher the net profit margin, greater is the organization's ability to withstand the adverse economic conditions. Since DDC is operating in negative Net Profit Margin, it should consider the detailed reasons responsible for it.

However, it seems DDC is on right track, since F/Y 2062/63; there has been improvement in net profit ratio from -2.78% to 0.11%. It seems from F/Y 2064/65, the corporation will be generating good amount of profit, according the improvement trend of Net Profit Ratio of DDC.

3. Operating Ratio

It is the ratio of operating cost to sales. Operating cost include cost of goods sold and operating expenses. Operating expenses includes all the selling and administration expenses with the interest on borrowed fund, discount allowed and bad debts, etc.

$$\text{Operating Ratio} = \frac{\text{Operating Expenses}}{\text{Sales}}$$

$$\text{For F/Y 2059/60} = \frac{1600525421}{1595906712} = 1.0029 \text{ or } 100.29\%$$

Operating Ratio for F/Y 2059/60 is 100.29%, for F/Y 2060/61 is 99.82%, for F/Y 2061/62 is 103.0%, for F/Y 2062/63 is 102.78% and F/Y 2063/64 is 99.78%.

Lower the operating ratio, higher is the operating profit available for non-operating expenses and funds to pay dividend, create reserve, etc. DDC has been incurring higher operating ratio more than 100% in three fiscal years except F/Y 2060/61 and 2063/64. However, there has been gradual decrease in operating ratio, which is a good sign for DDC.

However, the overall profitability of the DDC is very weak. And management should focus on all the possible causes and reasons for such situations.

4.13 Major Findings

The well planned and well presented is half-job done. And if the work were put into process effectively, the findings would be clear, correct and accurate. The findings of this study based on the analysis of data (Primary and Secondary) are presented below:

- J Sales: The Corporation's sales trend is in fluctuating but it is in increasing trend. The value of 'r' is greater than P.E. (r) that shows that there is a positive correlation between the budgeted and actual sales. The corporation has no effective sales forecasting techniques, leading to differences between budgeted and actual sales.

- J Segregation of fixed and variable costs: DDC hasn't been practicing CVP analysis till now and there is no method adopted to segregate fixed and variable cost.

- J Variable cost: Even though, DDC hasn't been segregating fixed and variable cost, care has been taken in this research to differentiate fixed cost and variable cost with the help of Degree of Variability methods (70:30). The variable costs are too high compared to actual sales. It constitutes 85% in F/Y 2059/60, 85.32% in F/Y 2060/61, 88.36% in F/Y 2061/62, 84.44% in F/Y 2062/63 and 84.79% in F/Y 2063/64.

- J Fixed cost: The corporation has high fixed costs, be it salaries, or depreciation, interest on loan, provident fund, gratuity expenses, etc. having maximum of P/V ratio, among the five fiscal years, fixed cost to sales percentage under four different assumptions in five years are: **Assumption 1: Omit inventory change and include other sundry incomes.** **Assumption 2: Omit both inventory change and other sundry incomes:** percentage of FC to sales in F/Y 2059/60 considering assumption 1 and 2 is 15.41%, in F/Y 2060/61 is 14.41% in F/Y 2061/62 is 14.62% in F/Y 2062/63 is 18.61% and in F/Y 2063/64 is 15.06%. **Assumption 3: Include inventory change but omit sundry incomes.** **Assumption 4: Include both inventory change but include other sundry incomes.** And considering assumption 3 and 4, percentage of fixed cost to sales for F/Y 2059/60 is 15.29%, for F/Y 2060/61 is 14.51%, for F/Y 2061/62 is 14.64%, for F/Y 2062/63 is 18.33% and for F/Y 2063/64 is 15.09%. It should be at least 20% P/V ratio to recover the FC.

- J Profitability of labor: DDC has high wages and either availability of manpower is more than requirement of inefficiency of the workers resulting in low productivity of labor.

- J Inventory policy: The Corporation has no effective inventory policy. Whatever left over of production is considered as inventory. The inventory production ratio is not constant. The wider fluctuation are seen during the five fiscal year, there were Rs 2586551 increase in F/Y 2059/60, Rs 19543348 decrease in inventory in F/Y 2060/61, Rs 4004480 decrease in inventory in F/Y 2061/62, Rs 57064784 is increase in inventory in F/Y 2062/63 and in F/Y 2063/64, there is Rs 6952029 decrease in inventory.

- J Capacity utilization: The overall-utilization of capacity of machines also couldn't cover the fixed cost and backfired by resulting in high repairs and maintenance cost, etc.

- J Profitability in relation to sales: Profitability in relation to sales is also too low in the five fiscal years (F/Y 2059/60 to F/Y 2063/64). Gross margin is also too low. Net profit margin is negatively and positively low. Operating cost constitutes more than the sales value in all the five years.

- J Break-Even sales: The break-even sales were more than sales in F/Y 2061/62 and 2062/63 considering all the four assumptions. In F/Y 2059/60, while excluding inventory change and including sundry incomes (assumption 1) and including both inventory change and other sundry incomes (assumption 4) is less than sales. In F/Y 2063/64 BEP were less than sales under all four assumptions. Hence, DDC had net profit in that fiscal year.

CHAPTER -V

SUMMARY, CONCLUSIONS & RECOMMENDATIONS

5.1. Summary

Profit planning and control is an important approach developed for facilitating effective performance of management system mainly in profit-oriented enterprises. And management is the key element, which controls overall aspects of the organization for the overall efficiency.

It is the ultimate objectives of management to maximize profit over the long term, consistent with its social responsibility.

CVP analysis is among the most important tool in the profit planning and control process. It is a device used to determine the usefulness of the profit planning process of the firm. In fact, the entire field of profit planning has become associated with the CVP interrelationships. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. As an ultimate objective, it helps management in seeking the most profitable cost and volume. A dynamic management, therefore, use CVP analysis to predict and evaluate the implications of its short-run decisions about fixed cost, variable cost, volume and selling price for its profit plans on a continuous basis. CVP analysis is a way to quickly answer a number of important questions about the profitability of a company's products or services.

The performance of almost all public enterprises is not satisfactory. They are incurring losses year after year and DDC is not apart from this. The main causes of losses are:

-) Ambiguous goals and objectives.

-) Inadequate knowledge and use of PPC.
-) Government intervention in decision making.
-) Lack of co-ordination and communication between departments.

DDC, being public enterprises, started with the aim of providing services to the urban peoples by producing and supplying milk and dairy products and also improving the economic conditions of rural people by promoting livestock occupation.

The main objective of the present research is to analyze CVP analysis in relation to DDC. It has observed that, even though, holding the 60% of the market shares, DDC has been incurring losses year after year, except in F/Y 2060/61 and F/Y 2063/64.

As per study, primary and secondary data are analyze with historical and descriptive approach for sales, cost, inventory, productivity ratios, profitability ratios, contribution margin analyses, P/V ratio analysis, BEP analysis, etc, are used. The data are evenly distributed, tabulated, wherever necessary.

From the analysis, it shows that DDC has low contribution margin, low P/V ratio, high BEP sales (less than actual sales), except in 2060/61 and 2063/64. the sensitivity analysis shows that increase in cost, increases BEP while decrease in cost, decreases BEP which shows that cost and BEP are positively correlated whereas the relationship of sales to BEP are negatively correlated.

DDC profit situation is very poor. Only in the year 2060/61 and 2063/64, DDC has generated profit which is very low percentage of sales.

The distribution if operation of Dairy in various districts and lack of detailed information regarding the cost structure and wide varieties of products with little knowledge of PPC seems to the main causes of not practicing CVP analysis by the DDC.

5.2. Conclusions

On the basis of the different analysis, observations, and informal discussions, etc, resulted in the following conclusions:

-) DDC has been planning only on short-term basis.
-) The goals and objectives of the corporation are ambiguous to the lower level of employees, which results in wide fluctuation in the targeted sales and actual achievements.
-) The practice of CVP analysis has not been used yet.
-) There is no practice of segregating cost into fixed and variables.
-) Over-utilization of capacity resulting in increasing operation and maintenance cost every year.
-) DDC has low contribution margin with high variable cost.
-) DDC has also high fixed cost with low contribution margin, resulting in high BEP sales.
-) There is no effective inventory policy. If production exceeds sales, then it is considered as inventory. Otherwise, there is no such inventory policy followed which result in high fluctuation in inventory.
-) The availability of manpower is more than its requirement, resulting in overstaffing, and confuses of delegation of authority and responsibility, which caused low productivity of labor.
-) The profitability of the DDC is also very poor.
-) The strengths of the DDC are foreign donors, government subsidy, and public trust in products, goodwill, local milk, sufficient resources, and experienced staffs.
-) All the levels of management are not involved in profit planning and decision making of the corporation.
-) All these causes are affecting DDC leading to loss year after year.

5.3. Recommendations

- J On the basis of this study, the following recommendation seems to be fruitful to the management of the corporation and other concerned officers:
- J First and foremost, DDC should clearly define its objectives into long-term goals and short-term goals.
- J Secondly, the delegation of authority and responsibility should be clear among the different levels of management.
- J There should be separate planning and control department separately. The trained and qualified planning experts should be recruit or hire and all the employees should be well trained.
- J DDC should consider demand, market study and also consider the price, supply and other policies of private dairies while making the tactical plans.
- J Intervention of govt. should be limited into certain extent. BOD should not be change with change in govt.
- J DDC should also revised and study its own products. The unproductive products should be dropped or if needed, revised the price of the products.
- J Variance analysis should be made to dig out the cause if unfavorable variance and timely correct them.
- J Appropriate plan should be done by using CVP analysis as a tool of short-term planning.
- J DDC should lay off unproductive employees that are causing extra burden of cost in the form of salaries, provident fund, gratuity expenses etc.
- J DDC should also consider the variable costs. It should reduce as much as it can, so as to increase contribution margin ratio.
- J DDC should also consider in buying new production plant that might reduce the unproductive employees and over-utilization of old plant, resulting in less investment in repairs and maintenance on such assets.

BIBLIOGRAPHY

Books:

- Aryal, J.P., Adhikari, M. & Lamichhane, B. (2002). *Mathematics and Statistics for Economics*. Kathmandu: New Hira Books Enterprises.
- Bajarachaya, P., Ojha, K.P., Goet, J. & Sharma, S. (2004). *Managerial Accounting: Nepalese Perspective*. Kathmandu: Asmita Prakashan.
- Bhushan, Y.K. (1995). *Fundamentals of Business Organization & Management*. New Delhi: Sultan Chand & Sons.
- Brown, J.L. & Howard, I.R. (1969). *Principles and Practice of Management Accounting*. London: McDonalds and Evans limited.
- Day, R.A. (1996). *How to write and Publish a Scientific Paper*. U.K: Cambridge University Press.
- Decoster, D.T. & Schafer, E.F. (1979). *Management Accounting*. New York: John Wiley and Sons Limited.
- Drury, C. (2000). *Management and Cost Accounting*. U.K: Business Press, Thomson Learning.
- Fago, G. (2003). *Profit Planning and Control*. Kathmandu: Buddha Academic Enterprises Private Limited.
- Gautam, C.M. & Ojha, K.P. (2008). *Budgeting: Profit Planning and Control*. Kathmandu: Asmita Books Publishers Distributors (P) Ltd.
- Gordon, I.A., Cooper, R., Falk, N., & Miller, D. (1981). *The Pricing Decision*. New York: National Association of Accountants.
- Hilton, R. W. (1997). *Managerial Accounting*. U.S.A: McGraw Hill Company Inc.
- Regmi, L.K., Joshi, P.R., Chaudhary, A.K. & Fago, G. (2003). *Production and Operation Management*. Kathmandu: Buddha Academic Enterprises Private Limited.

Sharma, P.K. & Chaudhary, A.K. (2001). *Statistical Method*. Kathmandu: Khanal Books Prakashan.

Welsch, G.A., Hilton, R. & Gordon, P.N. (2000). *Budgeting Profit Planning and Control*. New Delhi: Prentice-Hall of India Private Limited.

Willsmore, A.W. (1960). *Business Budgets and Budgetary Control*. London: Sir Issacpitman and Sons Limited.

Wolff, H.K. & Panta, P.R. (2005). *Social Science Research and Thesis Writing*. Kathmandu: Buddha Academic Enterprises Private Limited.

Previous Research works:

Adhikari, D. (2004). *Profit Planning in Manufacturing Enterprises: A Case Study of the Dairy Development Corporation*. An Unpublished Master Degree Thesis, Shanker Dev Campus, Kathmandu.

Aryal, R. P. (2000). *Profit Planning in Manufacturing Enterprises; A case study of the Dairy Development Corporation*. An Unpublished MBA Thesis, Shanker Dev Campus, Kathmandu.

Badu, M. B. (1996). *Profit Planning in Manufacturing Company, Dairy Development Corporation*. An Unpublished MBA Thesis, Central Department, T.U. Kirtipur, Kathmandu.

Dumre, K. P.(1997). *Profit Planning Practice in Nepalese Public Enterprises: A case Study of DDC*. An Unpublished MBA Thesis, Central Department,. T.U. Kirtipur, Kathmandu

Kheral, B. (2003). *Comprehensive Budgeting Process in Public Corporation in Nepal: A case study if Sales and Production Budgeting Process of DDC*. An Unpublished Master Degree Thesis, Shanker Dev Campus, Kathmandu.

Nandak, T. (2005). *Cost-Volume-Profit Analysis of Dairy Development Corporation*. An Unpublished Master Degree Thesis, Shanker Dev Campus, Kathmandu.

Thapa, P. (2000). *Profit Planning and Control in Manufacturing Public Enterprises in Nepal: A Comparative Study of Dairy Development Corporation and Sita Ram Dairy*. An Unpublished Master Degree Thesis, Central Department, T.U. Kirtipur.

APPENDICES

Appendix-1 Comparative Profit & Loss Account From F/Y 2059/60 to 2063/64

Particular	2059/60	2060/61	2061/62	2062/63	Rs. 2063/64
INCOMES:					
Sales Revenues	1,59,59,06,712	1,53,58,10,462	1,58,96,63,476	1,53,63,40,564	1,68,03,53,680
Sundry Income Development & Exp. Aid	13550585	11545735	13141374	16939056	12462762
Total Income	1609457297	1547356197	1602804850	1553279620	1692816442
EXPENDITURES:					
Collection Expenses	1198481864	1127653155	1132317997	1144708429	1209510351
Processing Expenses	271312817	233845039	346325346	284171570	280922202
Selling Expenses	40905164	39302977	41093441	42681442	46437352
Administration Expenses	79998862	61131047	76692653	73529349	80209132
Add/Less: Additional/Excess Gratuity Exp.	(5324356)	17450023	3531055	53753235	16258298
Depreciation Expenses	29428739	29993612	29406299	31778505	34209864
Bad Debts	-	-	2826500	600034	-
Interest on Loan	11583888	4319401	4522113	4663760	3614718
Total Expenses	1626386978	1513695254	1636715404	1635886324	1671161917
Add/Less: Decrease/Increase in Inventory	(25861551)	19543348	4004480	(57064784)	6952029
Remaining Balance	1600525427	1533238602	1640719884	1578821540	1678113946
Net Profit/Loss Before Tax	8931870	14117595	(37915034)	(25541920)	14812496
Income from sales of Assets	-	-	47666060	-	-
Income Tax Paid	-	(3529400)	(2383310)	-	-
Profit/Loss after tax adjustment	8931870	10588195	7367716	(25541920)	14812496
Loss till Last Year	(227756811)	(218824939)	(208236744)	(200869028)	(226410948)
Accumulated Loss	(218824939)	(208236744)	(200869028)	(226410948)	(211598452)

Appendix-2
Comparative Balance Sheet
From F/Y 2059/60 to 2063/64

Rs.

Particular	2059/60	2060/61	2061/62	2062/63	2063/64
ASSETS:					
Fixed Assets:					
a) Presently in Use	275075176	293351328	262920675	259592819	254143382
b) Installed but not yet Used	11180431	11512831	10697865	10723578	6028960
Foreign Commodity Grant Fund Investment	1851320	1545265		1545265	-
Current Assets	450761640	463869237	497805552	541335259	558331549
Deferred Expenditure	6253034	3426534	600034	-	-
Accumulated Loss	218824939	208236745	221914559	247456480	246089470
Total Assets	963946540	981941940	993938686	1060653401	1064593361
LIABILITIES:					
Corporation Fund	418433975	549452795	549452795	550802389	550802390
Foreign Grant Capitalized Fund	1545265	1545265	1545265	1545265	-
Foreign Grant Non-Capitalized Fund	914210	914210	-	-	-
Long-term Loan	155279808	85201702	84251595	83301489	82351384
Current Liabilities & Provision	387773282	344827968	358689031	425004258	431439587
Total Liabilities	963946540	981941940	993938686	1060653401	1064593361

Appendix-3
Collection Expenses
From 2059/60 to 2063/64

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Purchase of Milk	1112413152	1045469721	1038124379	1044700126	1101355622
Porters' Wages & Transportation	12651	33904	3596	500	-
Fuel and Other Provision	27812759	28993318	30691414	36270112	38613927
Chemicals & Detergents	677457	654579	659516	756270	966237
Other Dairy Goods	575861	593229	631608	656785	626628
Water & Electricity	6717157	6400819	5706223	5464554	5692481
Salary	22489966	21066452	21963708	24480597	23964201
Allowance	2442173	2644598	5985895	3836178	5623213
Provident Fund	1403410	1321992	1290949	1436564	1436201
Machine Repairs	1436935	1650316	2375593	3166036	3233276
Buildings Repairs	304716	215080	557171	476941	677663
Motor Repairs	10956777	10184124	10092905	10654803	11985017
Other Repairs	149173	157604	145181	169905	214715
House and Land Rent	913708	982488	985415	1006814	1020991
Stationary and Printing	301963	302899	332315	320773	428763
Traveling Expenses	3166983	3368772	3935705	3641507	4620131
Tax and Charges	1144431	940162	1169040	1360627	1314683
Bank Commission Charges	972517	1573257	1286809	1341277	1436360
Ticket, Wire, Telephone	162617	157576	156435	146937	184858
Insurance	694494	496203	625612	606675	708967
Non-durable Office Goods	102018	91371	101247	150639	171097
Gratuity Expenses	3542542	249124	2869168	-	-
Prize to Farmers	70645	77358	78446	67852	-
Other Transportation Expenses	6400	-	-	22980	1000
Sanitation Expenses	11360	18210	28590	56995	87975
Fuel Boiler Generator	-	-	2518863	3915982	5146345
Rebate, Discount, Adjustment	-	-	2213	-	-
Funeral Expenses	-	10000	-	-	-
Total	1198481865	1127653156	1132317996	1144708429	1209510351

Appendix-4
Processing Expenses
From 2059/60 to 2063/64

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Skimmed milk powder Exp.	52816397	39656569	98229166	69683186	56143902
Raw Materials and Others	1060880	1892398	2729605	3674319	4460992
Packaging Goods	69971099	60355588	63035827	68795056	73933332
Chemicals & Detergents	2475824	2982761	3592866	3475776	4048949
Other Dairy Goods	1330852	1275887	1188624	1474300	1611326
Cheese, Butter Transportation	587095	927164	1582724	1552422	1661348
Water & Electricity	31077099	29685054	27899062	25957881	25644284
Fuel and Other Provision	30668196	33126214	36135760	42234275	45466232
House and Land Rent	326038	375494	396567	434453	414985
Salary	34532145	33589010	33443627	39239185	38753232
Allowance	4814565	4519830	8819809	6674837	9431594
Provident Fund	1930955	1830992	1799554	2103395	2126094
Motor Repairs	989931	924433	408830	-	-
Machine Repairs	8934978	10049992	8611971	14375128	12546835
Building Repairs	676258	1259951	633819	1516199	1999920
Other Repairs	471434	471386	429902	574829	559852
Insurance	749429	241526	438078	524000	360225
Traveling Expenses	1173997	985453	1017243	901279	945116
Stationary and Printing	255587	285456	312527	319365	461128
Tax and Charges	42752	80969	131015	230714	2270
Non-durable Office Goods	133303	122621	157681	225963	217278
Processed Milk Loss	6934397	6642117	7866090	-	-
Fodder Purchased	20623	19042	-	-	-
Ticket, Wire, Telephone	74039	63540	59029	51123	64708
Gratuity Expenses	18766338	1549559	3268485	-	21883
Powder Transportation Exp.	470711	899705	661420	19912	-
Bank Commission Charges	27897	27330	24930	33974	46717
Rebate, Discount, Adjustment	-	-	43451132	-	-
Funeral Expenses	-	5000	-	-	-
Total	271312819	233845041	346325343	284071571	280922202

Appendix-5
Selling Expenses
From 2059/60 to 2063/64

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	12095550	12007907	11663447	13775715	14279916
Allowance	2166846	2174864	4512406	3423905	4482024
Provident Fund	736849	717090	683578	778817	818059
House and Go down Rent	334081	293735	256452	341535	366635
Stationery and Printing	237956	266138	302034	327297	414737
Water & Electricity	155649	153826	150153	235461	300433
Fuel and Other Provision	5042548	3450546	3426593	4123125	4757910
Motor Repairs	2336127	2003693	1828806	2575161	3179295
Building Repairs	3125	466400	4100	59441	36676
Other Repairs	10464	13261	21671	61259	55782
Milk Transportation Expenses	14845215	16678805	14971035	16224961	16604195
Traveling Expenses	136572	88446	92254	75484	109282
Business Promotion Expenses	174117	61764	117040	166050	269717
Milk & Milk Product Loss	130313	115573	200290	74763	113771
Insurance	231744	134531	171524	68747	102376
Tax and Charges	210767	234672	324859	279461	439320
Non-durable Office Goods	67876	112443	64274	90260	107224
Gratuity Expenses	1907128	240155	2269411	-	-
Dealer Facilities	85238	74414	33513	-	-
Rebate, Discount, Adjustment	-	14717	-	-	-
Total	40905165	39302980	41093440	42681442	46437352

Appendix-6
Administration Expenses
From 2059/60 to 2063/64

Administration Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	29013593	27120786	25427879	33329987	30936837
Allowance	4332339	3827860	7550380	5501121	7434392
Provident Fund	1812310	1733783	1738294	2024968	2022504
House and Land Rent	103900	84000	84000	96000	96000
Water & Electricity	20719	24572	21430	20208	23862
Ticket Wire Telephone	1210568	1170747	1026710	1232510	1513516
Stationery & Printing	981156	1080079	1134421	1088475	1292239
Fuel & Other Provision	2560869	1649188	1800388	1595306	1806690
Motor Repairs	1119645	968287	1378188	800526	1079704
Building Repairs	612031	248908	213165	283949	299883
Other Repairs	191230	191587	188287	184909	263094
Office Equipment Repairs	146049	123564	166892	229207	434024
Traveling Expenses	1455522	1362236	1695272	1809266	1682457
Entertainment Expenses	956136	1064828	1245946	1339430	1335763
Employees Welfare Exp.	99079	64514	98501	126106	94899
Employees Training Exp	230011	510195	474731	614835	1989950
BOD Meeting Fees	96666	157000	233000	188000	227000
Auditor's fees	90000	82462	180000	99000	364535
Recruitment Cost	8480	21040	41035	127500	899093
Sub-Committee Cost	312312	282000	396250	619175	526500
Advisory Cost	102450	183200	180768	449635	207054
Advertisement	1243021	1478774	1880644	1852142	3535119
Bank Commission Charges	75673	65482	87901	65078	72026
Non-Durable Office Goods	265435	209730	395523	344207	455687
Newspaper & Magazines	140850	145877	117329	122814	149260
Tax and Charges	519654	803020	683718	506384	1913606
Sanitation Expenses	280540	276613	283354	335806	436020
Insurance	8981124	8740206	8551673	9158078	10850535
Donation	114655	179900	281000	427648	471327
Membership Charges	6400	10000	28460	37977	31353
Examination Expenses	-	-	-	-	400705
Gratuity Expenses	17393165	470036	-	5091128	3184627
Annual Day Expenses	590427	499476	923610	812204	877722
Rebate, Discount, Adjustment	33542	281372	508639	88589	115118
Business Promotion Expenses	429341	1332064	1720041	1245594	1348328

Deferred Expenses	2826500	2826500	-	-	-
Bus Fair	1400916	1324520	1170264	789208	835982
Funeral Expenses	10000	5000	-	-	-
Legal Expenses	21893	-	111188	17500	-
Meeting Expenses	121558	108101	14315204	163875	169750
Software Expenses	89100	318860	80000	261557	119050
Emergency Expenses	-	104678	165520	318891	-
Seminar Expenses	-	-	113049	130556	712921
Total	79998859	61131045	76692654	73529349	80209132

Appendix-7

Calculations by using different statistical tools

FISCAL YEARS	BUDGETED SALES(X)	ACTUAL SALES(Y)	$X = X - \bar{X}$	$Y = Y - \bar{Y}$	x^2	y^2	XY
2059/60	1672757000	1595906712	-60110033	8291733	3613216067261089	68752836143289	-498416344257189
2060/61	1754810857	1535810462	21943824	-51804517	481531411742976	2683707981603289	-1136789203453008
2061/62	1760000000	1589663476	27132967	2048497	736197898223089	4196339959009	55581801500599
2062/63	1669935396	1536340564	-62931637	-51274415	3960390935499769	2629065633592225	2336782872167355
2063/64	1806831914	1680353680	73964881	92738701	5470803621344161	8600466663167401	6859406983559581
	$X =$ 8664335167	$Y =$ 1587614979	$x = 0$	$y = 0$	$x^2 =$ 14262139934071084	$y^2 =$ 13986189454465213	$xy =$ 8506566109517338

$$\bar{X} = \frac{X}{N} = \frac{8664335167}{5} = 1732867033$$

$$\bar{Y} = \frac{Y}{N} = \frac{7938074894}{5} = 1587614979$$

$$x^2 = 14262139934071084$$

$$y^2 = 13986189454465213$$

Calculations by using Different Statistical Tools

Budgeted Sales (X)

$$\text{Mean } (\bar{X}) = \frac{X}{N} = \frac{8664335167}{5} = \mathbf{1732867033}$$

$$\text{Standard Deviation } (X_u) = \sqrt{\frac{x^2}{N}} = \sqrt{\frac{14262139934071084}{5}} = \mathbf{53408127}$$

$$\text{Co-efficient of Variation (C.V. (x))} = \frac{x_u}{\bar{X}} = \frac{53408127}{1732867033} = \mathbf{0.03082 \text{ or } 3.08\%}$$

Actual Sales (Y)

$$\text{Mean } (\bar{Y}) = \frac{Y}{N} = \frac{7938074894}{5} = \mathbf{1587614979}$$

$$\text{Standard Deviation } (Y_u) = \sqrt{\frac{y^2}{N}} = \sqrt{\frac{13986189454465213}{5}} = \mathbf{52888920}$$

$$\text{Co-efficient of Variation (C.V. (y))} = \frac{y_u}{\bar{Y}} = \frac{52888920}{1587614979} = \mathbf{0.0333 \text{ or } 3.33\%}$$

$$\begin{aligned} \text{Correlation Co-efficient (r)} &= \frac{xy}{N * x_u * y_u} \\ &= \frac{8506566109517338}{5 * 53408127 * 52888920} = \frac{8506566109517338}{14123490781264200} = \mathbf{0.6023} \end{aligned}$$

$$\begin{aligned} \text{Probable Error of 'r' (P.E. (r))} &= 0.6745 \frac{(1 Z r^2)}{\sqrt{N}} = 0.6745 * \frac{1 Z 0.3627}{\sqrt{5}} \\ &= \frac{0.4298}{2.236} = \mathbf{0.1922} \end{aligned}$$

$$\text{Co-efficient of Determination } (r^2) = (0.6023)^2 = \mathbf{0.3627}$$

Appendix-8

Calculations of Contribution Margin, BEP Analysis and Margin of Safety

For F/Y 2059/60

$$\begin{aligned}
 \# \text{ Contribution Margin} &= \text{Sales} - \text{Variable Cost} \\
 &= 1595906712 - (1380416156 - 23849522) \\
 &= 1595906712 - 1356566634 \\
 &= 239340078
 \end{aligned}$$

Note: Variable cost should be consistent with the sales, so change in variable inventory is considered here.

Break-even Sales and Margin of Safety with four assumptions.

Assumption 1: Omit inventory change but include other sundry incomes.

$$\begin{aligned}
 \# \text{ BEP Sales} &= \frac{\text{FixedCst} + \text{OtherSundryIncomes}}{(1 - \frac{\text{VariableCost}}{\text{Sales}}) \text{ or } P/V \text{ Ratio}} \\
 &= \frac{245970816 + 13550585}{0.15} = \frac{232420231}{0.15} = 1549468207
 \end{aligned}$$

$$\begin{aligned}
 \# \text{ Margin of Safety} &= \text{Actual Sales} - \text{BEP Sales} \\
 &= 1595906712 - 1549468207 \\
 &= 46438505
 \end{aligned}$$

Assumption 2: Omit both inventory change and sundry incomes.

$$\# \text{ BEP Sales} = \frac{245970816}{0.15} = 1639805440$$

$$\# \text{ Margin of Safety} = 1595906712 - 1639805440 = -43898728$$

Assumption 3: Include inventory change but omit other sundry incomes.

$$\# \text{ BEP Sales} = \frac{245970816 \text{ Z}2012029}{0.15} = \frac{243958787}{0.15} = 1626391913$$

$$\# \text{ Margin of Safety} = 1595906712 - 1626391913 \\ = - 3048520133$$

Assumption 4: Include both inventory change and other sundry incomes.

$$\# \text{ BEP Sales} = \frac{245970816 \text{ Z}2012029 \text{ Z}13550585}{0.15} = \frac{230408202}{0.15} = 1536054680$$

$$\# \text{ Margin of Safety} = 1595906712 - 1536054680 \\ = 59852032$$

For F/Y 2060/61

$$\# \text{ Contribution Margin} = \text{Sales- Variable Cost} \\ = 1535810462 - (1292317157 + 1802092) \\ = 1535810462 - 1310338078 \\ = 225472384$$

Break-even Sales and Margin of Safety with four assumptions.

Assumption 1: Omit inventory change but include other sundry incomes.

$$\# \text{ BEP Sales} = \frac{221268825 \text{ Z}11545735}{C / MRatio} = \frac{209723090}{0.1468} = 1428631403$$

$$\# \text{ Margin of Safety} = \text{Actual Sales} - \text{BEP Sales} \\ = 1535810462 - 1428631403 \\ = 107179059$$

Assumption 2: Omit both inventory change and sundry incomes.

$$\# \text{ BEP Sales} = \frac{221268825}{0.1468} = 1507280824$$

$$\# \text{ Margin of Safety} = 1535810462 - 1507280824 \\ = 28529638$$

Assumption 3: Include inventory change but omit other sundry incomes.

$$\# \text{ BEP Sales} = \frac{221268825 \Gamma 1522427}{0.1468} = \frac{222791252}{0.1468} = 1517651580$$

$$\# \text{ Margin of Safety} = 1535810462 - 1517651580 \\ = 18158882$$

Assumption 4: Include both inventory change and other sundry incomes.

$$\# \text{ BEP Sales} = \frac{221268825 \Gamma 1522427 \text{ Z}11545735}{0.1468} = \frac{211245517}{0.1468} = 1439002159$$

$$\# \text{ Margin of Safety} = 1535810462 - 1439002159 = 96808303$$

For F/Y 2061/62

$$\# \text{ Contribution Margin} = \text{Sales- Variable Cost} \\ = 1589663476 - (1400987326 + 3697336) \\ = 1589663476 - 1404684662 \\ = 184978814$$

Break-even Sales and Margin of Safety with four assumptions

Assumption 1: Omit inventory change but include other sundry incomes.

$$\# \text{ BEP Sales} = \frac{232389656 \text{ Z}13141374}{0.1164} = \frac{219248282}{0.1164} = 1883576306$$

$$\# \text{ Margin of Safety} = \text{Actual Sales} - \text{BEP Sales} \\ = 1589663476 - 1883576306 \\ = - 293912830$$

Assumption 2: Omit both inventory change and sundry incomes.

$$\# \text{ BEP Sales} = \frac{232389656}{0.1164} = 1996474708$$

$$\# \text{ Margin of Safety} = 1589663476 - 1996474708 \\ = - 406811232$$

Assumption 3: Include inventory change but omit other sundry incomes.

$$\# \text{ BEP Sales} = \frac{232389656 \Gamma 307144}{0.1164} = \frac{232696800}{0.1164} = 1999113402$$

$$\# \text{ Margin of Safety} = 1589663476 - 1999113402 \\ = - 409449926$$

Assumption 4: Include both inventory change and other sundry incomes.

$$\# \text{ BEP Sales} = \frac{232389656 \Gamma 307144 \text{ Z } 13141374}{0.146} = \frac{219555426}{0.1164} = 1886215000$$

$$\# \text{ Margin of Safety} = 1589663476 - 1886215000 \\ = - 296551524$$

For F/Y 2062/63

$$\# \text{ Contribution Margin} = \text{Sales- Variable Cost} \\ = 1536340564 - (1350204062 - 52836284) \\ = 1536340564 - 1297367778 \\ = 238972786$$

Break-even Sales and Margin of Safety with four assumptions

Assumption 1: Omit inventory change but include other sundry incomes.

$$\# \text{ BEP Sales} = \frac{285873828 \text{ Z } 16939056}{0.1556} = \frac{268934772}{0.1556} = 1728372571$$

$$\# \text{ Margin of Safety} = \text{Actual Sales} - \text{BEP Sales} \\ = 1536340564 - 1728372571 \\ = - 192032007$$

Assumption 2: Omit both inventory change and sundry incomes.

$$\# \text{ BEP Sales} = \frac{285873828}{0.1556} = 1837235398$$

$$\# \text{ Margin of Safety} = 1536340564 - 1837235398 \\ = - 300894834$$

Assumption 3: Include inventory change but omit other sundry incomes.

$$\# \text{ BEP Sales} = \frac{285873828 \text{ Z}4228500}{0.1556} = \frac{281645328}{0.1556} = 1810059949$$

$$\# \text{ Margin of Safety} = 1536340564 - 1810059949 \\ = - 273719385$$

Assumption 4: Include both inventory change and other sundry incomes.

$$\# \text{ BEP Sales} = \frac{285873828 \text{ Z}4228500 \text{ Z}16939056}{0.1556} = \frac{264706272}{0.1556} = 1701197121$$

$$\# \text{ Margin of Safety} = 1536340564 - 1701197121 \\ = - 164856557$$

For F/Y 2063/64

$$\# \text{ Contribution Margin} = \text{Sales- Variable Cost} \\ = 1680353680 - (1418326520 + 6461911) \\ = 1680353680 - 1424788431 \\ = 255565249$$

Break-even Sales and Margin of Safety with four assumptions.

Assumption 1: Omit inventory change but include other sundry incomes.

$$\# \text{ BEP Sales} = \frac{253134496 \text{ Z}12462763}{0.1521} = \frac{240671733}{0.1521} = 1582325661$$

$$\# \text{ Margin of Safety} = \text{Actual Sales} - \text{BEP Sales} \\ = 1680353680 - 1582325661 \\ = 98028019$$

Assumption 2: Omit both inventory change and sundry incomes.

$$\# \text{ BEP Sales} = \frac{253134496}{0.1521} = 1664263616$$

$$\# \text{ Margin of Safety} = 1680353680 - 1664263616 = 16090064$$

Assumption 3: Include inventory change but omit other sundry incomes.

$$\# \text{ BEP Sales} = \frac{253134496 \Gamma 490118}{0.1521} = \frac{2253624614}{0.1521} = 1667485957$$

$$\# \text{ Margin of Safety} = 1680353680 - 1667485957 \\ = 12867723$$

Assumption 4: Include both inventory change and other sundry incomes.

$$\# \text{ BEP Sales} = \frac{253134496 \Gamma 490118 \text{ Z}12462763}{0.1521} = \frac{241161851}{0.1521} = 1585548001$$

$$\# \text{ Margin of Safety} = 1680353680 - 1585548001 \\ = 94805679$$

Appendix-9

Productivity Ratios

$$\# \text{ Sales per Employee} = \frac{\text{Net Sales}}{\text{No.of Employee}}$$

$$\text{For F/Y 2059/60} = \frac{1598906712}{1279} = 1247777$$

$$\text{For F/Y 2060/61} = \frac{1535810462}{1279} = 1200790$$

$$\text{For F/Y 2061/62} = \frac{1589663476}{857} = 1854916$$

$$\text{For F/Y 2062/63} = \frac{1536340564}{857} = 1792696$$

$$\text{For F/Y 2063/64} = \frac{1680353680}{969} = 1734111$$

$$\# \text{ Net Added Value per Employee} = \frac{\text{Net Added Value}}{\text{No.of Employee}}$$

Where,

Net Added Value = Sales - (opening inventory of raw material + raw material – ending inventory of raw material)

Opening inventory of raw material and ending inventory of raw material is zero in case of DDC.

$$\text{Net Added Value per employee} = \frac{\text{Sales ZMaterial Cost}}{\text{No.of Employee}}$$

$$\text{For F/Y 2059/60} = \frac{1367961424}{1279} = 287695$$

$$\text{For F/Y 2060/61} = \frac{383015861}{1279} = 299465$$

$$\begin{aligned} \text{For F/Y 2061/62} &= \frac{379500770}{857} = 442825 \\ \text{For F/Y 2062/63} &= \frac{335446500}{857} = 391419 \\ \text{For F/Y 2063/64} &= \frac{429297819}{969} = 443032 \end{aligned}$$

$$\text{\# Labor Equipment Ratio} = \frac{\text{NetFixedAssets}}{\text{No.ofEmployees}}$$

$$\begin{aligned} \text{For F/Y 2059/60} &= \frac{275075176}{1279} = 215071 \\ \text{For F/Y 2060/61} &= \frac{293351329}{1279} = 229360 \\ \text{For F/Y 2061/62} &= \frac{262920675}{857} = 306792 \\ \text{For F/Y 2062/63} &= \frac{25952819}{857} = 302909 \\ \text{For F/Y 2063/64} &= \frac{254143382}{969} = 262274 \end{aligned}$$

$$\text{\# Wage Distribution Ratio} = \frac{\text{GrossWage}}{\text{NetAddedValue}}$$

$$\begin{aligned} \text{For F/Y 2059/60} &= \frac{154055519}{367961424} = 0.4187 \text{ or } 41.87\% \\ \text{For F/Y 2060/61} &= \frac{132514062}{383015861} = 0.3459 \text{ or } 34.59\% \\ \text{For F/Y 2061/62} &= \frac{136817645}{379500770} = 0.3605 \text{ or } 36.05\% \\ \text{For F/Y 2062/63} &= \frac{195449632}{335446500} = 0.5826 \text{ or } 58.26\% \\ \text{For F/Y 2063/64} &= \frac{160503076}{429297819} = 0.3738 \text{ or } 37.38\% \end{aligned}$$

$$\text{\# Wage Base} = \frac{\text{GrossWage}}{\text{No.ofEmployee}}$$

For F/Y 2059/60	=	$\frac{154055519}{1279}$	= 120450
For F/Y 2060/61	=	$\frac{132514062}{1279}$	= 103607
For F/Y 2061/62	=	$\frac{136817645}{857}$	= 159647
For F/Y 2062/63	=	$\frac{195449632}{857}$	= 228062
For F/Y 2063/64	=	$\frac{160503076}{969}$	= 165638

Appendix-10
Profitability Ratios

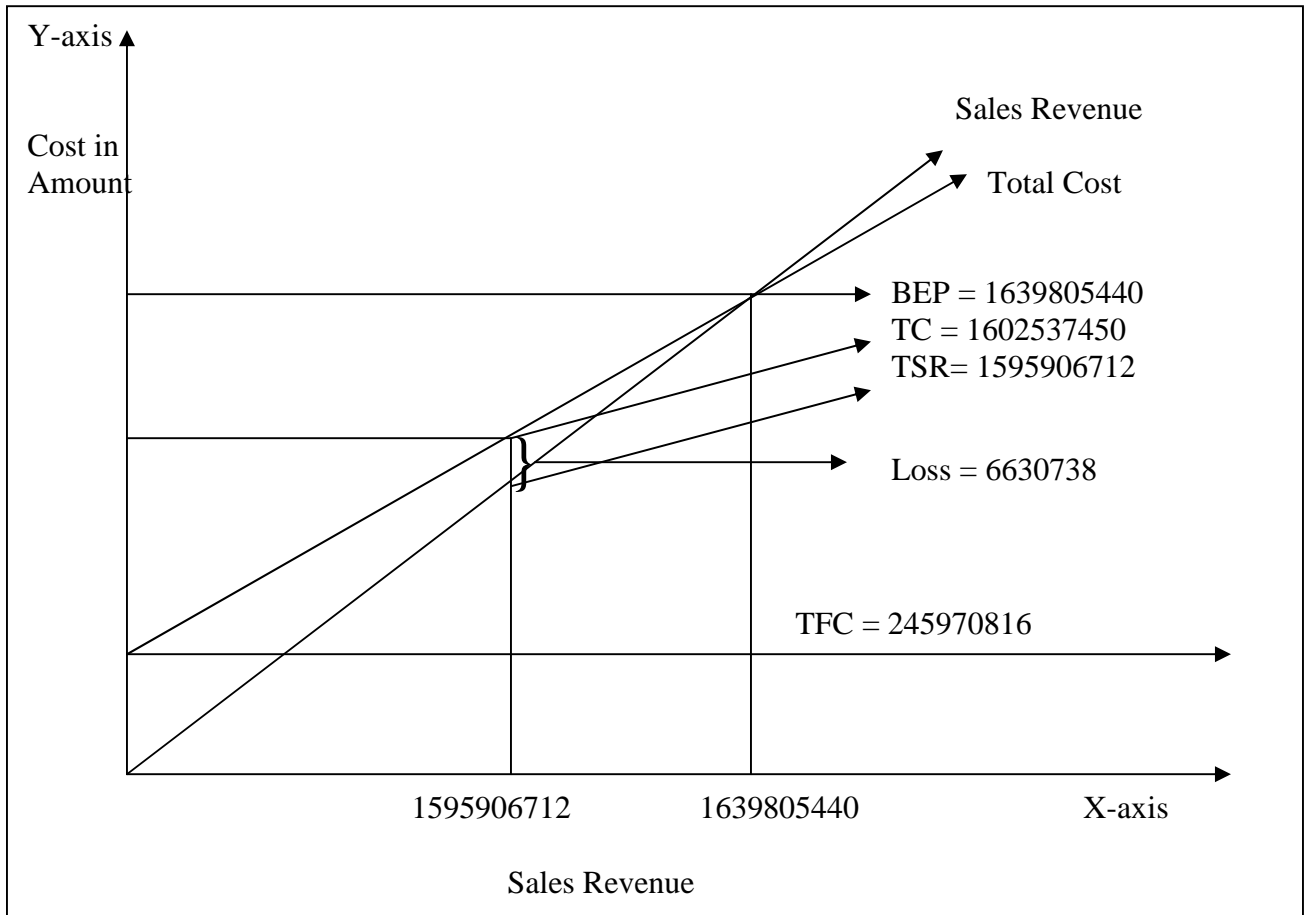
# Gross Margin Ratio	=	$\frac{\text{Gross Profit}}{\text{Sales}}$	
For F/Y 2059/60	=	$\frac{154827968}{1595906712}$	= 0.097 or 9.7%
For F/Y 2060/61	=	$\frac{142289409}{1535810462}$	= 0.0926 or 9.26%
For F/Y 2061/62	=	$\frac{104836500}{1589663476}$	= 0.0659 or 6.59%
For F/Y 2062/63	=	$\frac{164634349}{1536340564}$	= 0.1071 or 10.71%
For F/Y 2063/64	=	$\frac{182558544}{1680353680}$	= 0.1086 or 10.86%
# Net Profit Margin	=	$\frac{\text{Net Profit}}{\text{Sales}}$	
For F/Y 2059/60	=	$\frac{Z4618709}{1595906712}$	= -0.0029 or -0.29%
For F/Y 2060/61	=	$\frac{2681132}{1535810462}$	= 0.17 or 17%
For F/Y 2061/62	=	$\frac{Z47717986}{1589663476}$	= -0.03 or -3%
For F/Y 2062/63	=	$\frac{Z42672542}{1536340564}$	= -0.0278 or -2.78%
For F/Y 2063/64	=	$\frac{1940635}{1680353680}$	= 0.11 or 11%
# Operating Ratio	=	$\frac{\text{Operating Expenses}}{\text{Sales}}$	
For F/Y 2059/60	=	$\frac{1600525421}{1595906712}$	= 1.0029 or 100.29%

For F/Y 2060/61	=	$\frac{1533129330}{1535810462}$	=	0.9982 or 99.82%
For F/Y 2061/62	=	$\frac{1637381462}{1589663476}$	=	1.03 or 103%
For F/Y 2062/63	=	$\frac{1579013106}{1536340564}$	=	1.0278 or 102.78%
For F/Y 2063/64	=	$\frac{1678413045}{1680353680}$	=	0.9978 or 99.78%

APPENDIX-11

Break- even Chart with the assumption that there is no inventory change and no sundry incomes

For F/Y 2059/60



Here,

Fixed Cost = Rs 245970816

Variable Cost = Rs 1356566634

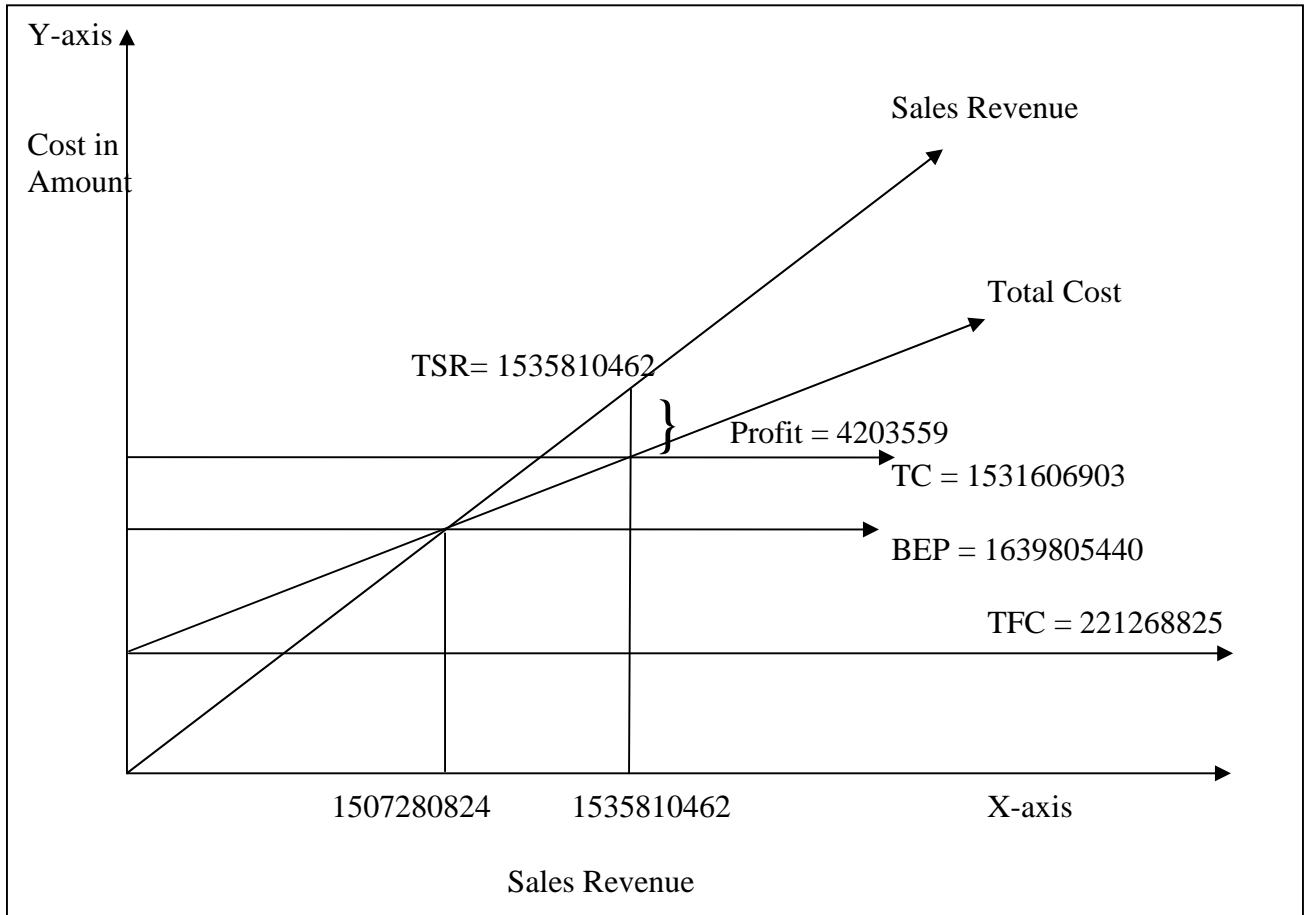
Total Cost = Rs 1602537450

Actual Sales = Rs 1595906712

BEP Sales = Rs 1639805440

Operating Loss = Rs 6630708

For F/Y 2060/61



Here,

Fixed Cost = Rs 221268825

Variable Cost = Rs 1310338078

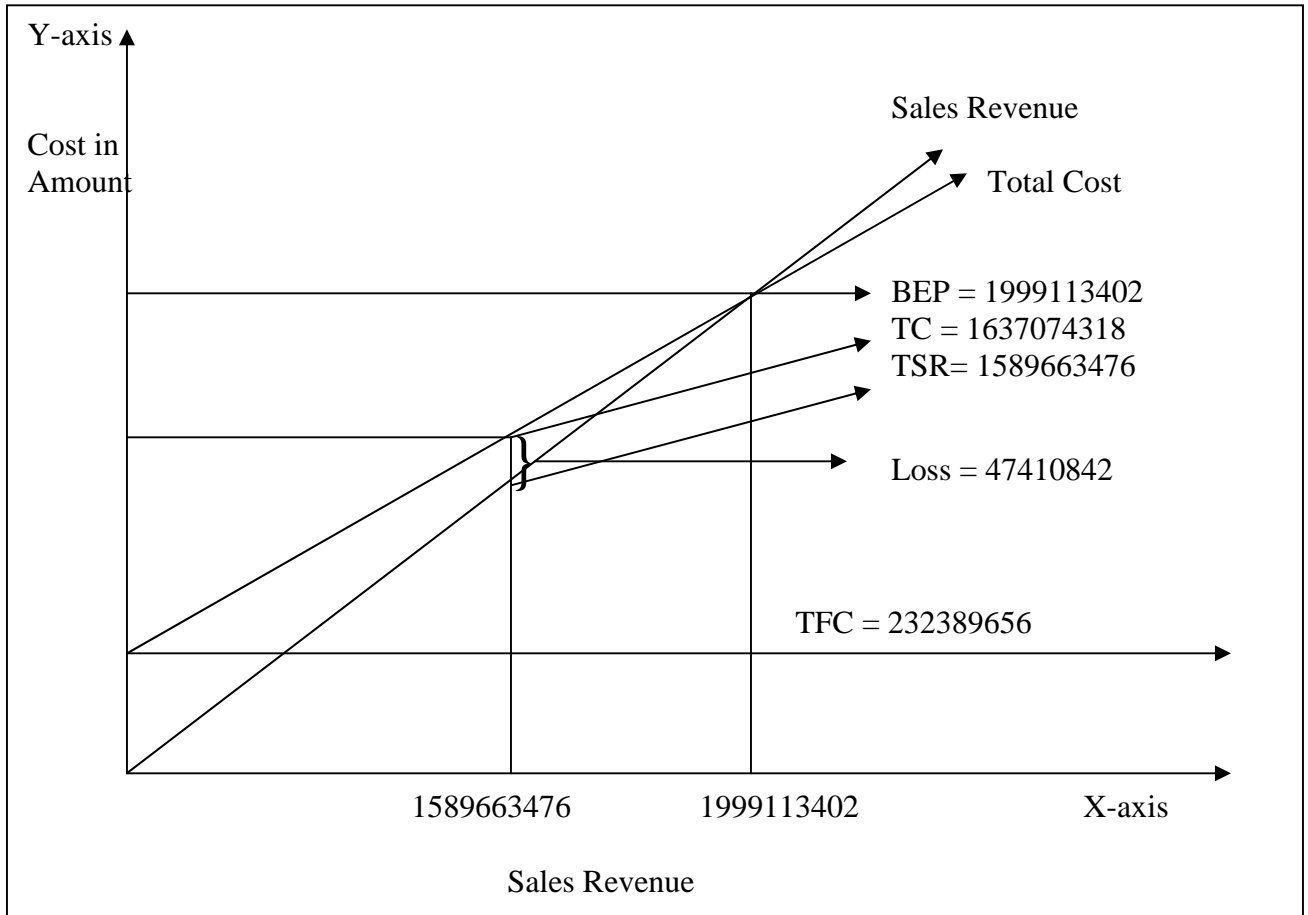
Total Cost = Rs 1531606903

Actual Sales = Rs 1535810462

BEP Sales = Rs 1507280824

Operating Profit = Rs 4203559

For F/Y 2061/62



Here,

Fixed Cost = Rs 232389656

Variable Cost = Rs 1404684662

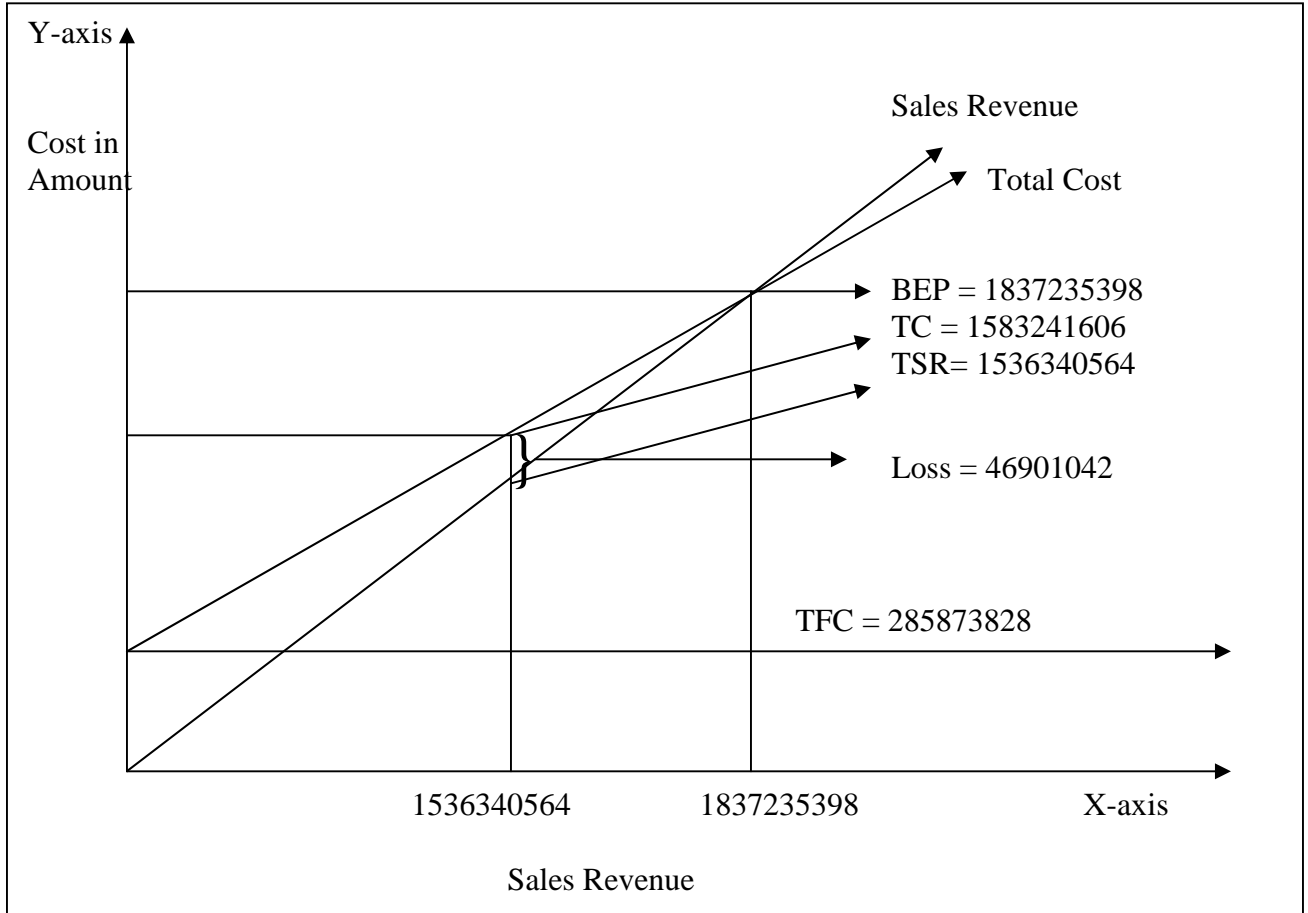
Total Cost = Rs 1637074318

Actual Sales = Rs 1589663476

BEP Sales = Rs 1999113402

Operating Loss = Rs 47410842

For F/Y 2062/63



Here,

Fixed Cost = Rs 285873828

Variable Cost= Rs 1297367778

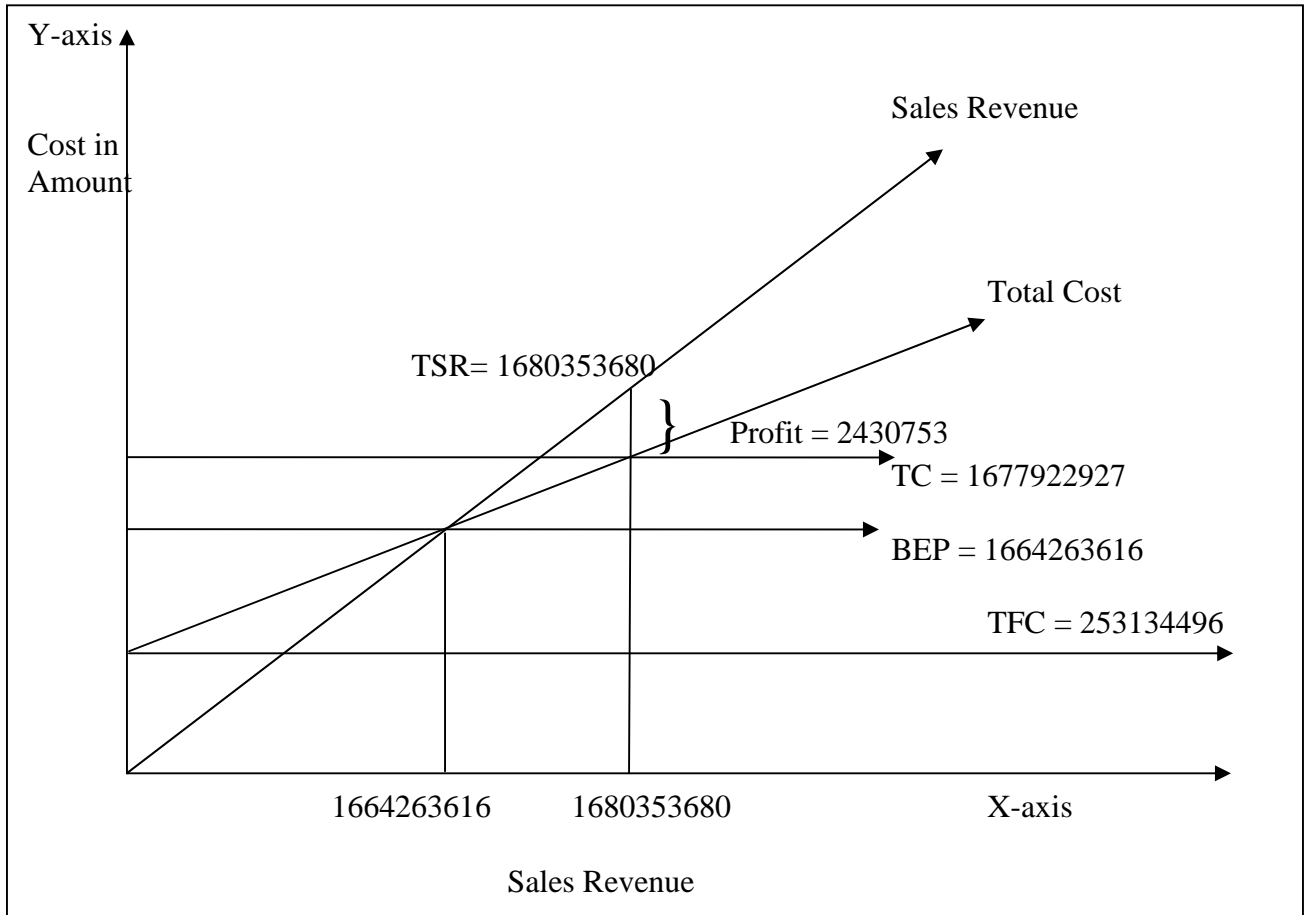
Total Cost = Rs 1583241606

Actual Sales = Rs 1536340564

BEP Sales = Rs 1837235398

Operating Loss = Rs 46901042

For F/Y 2063/64



Here,

Fixed Cost = Rs 253134496

Variable Cost = Rs 1424788431

Total Cost = Rs 1677922927

Actual Sales = Rs 1680353680

BEP Sales = Rs 1664263616

Operating Profit = Rs 2430753