COST VOLUME PROFIT ANALYSIS

(A Case Study of Salt Trading Corporation Limited)

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RECOMMENDATION

This is to certify that the thesis

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(A Case Study of Salt Trading Corporation Limited)

has been prepared as approved by this Department in the prescribed format of the Faculty of Management. This thesis is forwarded for examination.

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VIVA-VOCE SHEET

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And found the thesis to be the original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for the degree of

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DECLARATION

I hereby declare that the work reported in this thesis entitled **"Cost Volume Profit Analysis (A Case Study of Salt Trading Corporation Limited) "** submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the degree of Master of Business Studies (MBS) under the supervision of **Dr. Shankar Thapa** of St. Xavier's College T.U.

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TABLE OF CONTENTS

CHAPTER-V: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

%	:	Percentage
BEP	:	Breakeven Point
CVP	:	Cost Volume Profit
FC	:	Fixed Cost
i.e	:	That Is
MBS	:	Master of Business Studies
MOS	:	Margin of Safety
STCL	:	Salt Trading Corporation Limited
VP	:	Variable Cost

CHAPTER-I
INTRODUCTION

1.1 Background of the Study

Nepal is a South Asian, land locked, least developed country situated in north hemisphere. This country is surrounded by two big countries India and China. These two countries are big in the sense of population, land coverage, economic development and others. Nepal is small in size but rich in different natural resources and cultural diversity like: powerful river rush out of the Himalaya beautiful temples, culture and festivals. For a small territory, the Nepali landscape is uncommonly diverse, ranging from the humid Terai in the south to the lofty Himalayas in the north. Nepal boasts eight of the world's top ten highest mountains, including Mount Everest on the border with China. Nepal has been made famous for its tourism, trekking, hiking, camping, mountain biking, national wildlife parks, jungle safaris, river rafting, sport fishing, and its many beautiful temples and places of worship. Kathmandu is the capital and largest city. The other main cities include Pokhara, Biratnagar, Lalitpur (Patan), Bhaktapur, Birendranagar, Bharatpur, Siddhartanagar (Bhairahawa), Birgunj, Janakpur, Nepalgunj, Hetauda, Dharan and Mahendranagar.

After multiparty system of 2046 B.S., Nepal is being fully liberal for implementing government policy through general public is the result of increment of different pub private company for production of goods and services and distribution of these products among require people with country and outside country. And also now after constitution assembly of 2064 B.S. many of the foreign investors invest in different sector in Nepal. In Nepalese public enterprise the objectives are mainly social welfare or they are for fulfilling the social obligation. Basically objectives of most of the public enterprise is social welfare, profit is less emphasized. But they cannot survive only with social concern so have commercial obligation too. In this case corporation should earn profit also. Therefore cost-volume-profit analysis is the most important part of every business organization to achieve their goals whether they are manufacturing or non-manufacturing and public or private enterprises.

CVP analysis can be used in profit planning because it provides the information about the behavior and relation of cost, volume and profit. It also provides the information about sensitivity of profit due to variation in projected amount of output or sales. CVP analysis is an important tool to look into effects on profit on profit form variation in cost and sales and to take appropriation decisions. CVP analysis is great helpful in managerial decision making especially in cost control and profit planning. Profit planning is the fundamentals aspect of the overall management functions.

1.2 Introduction of Salt Trading Corporation

Public enterprises are the establishment of a business character, managed and owned 51 percent or more by the government for providing services to people. Most of the public enterprises are established not for gaining or earning profit but for providing services or fulfillment of most public concerns. Salt trading corporation limited is also one of the public enterprises of Nepal, which was established in 2020 B.S. (1963 A.D.) through the joint efforts of His Majesty Government Nepal and private sector to ensure proper supply of consumer's items throughout the country. Its first task was to makes edible salt readily available. The irregularities in the distribution have to correct through organized supply and delivery system. The salt trading corporation limited was not only able to meet the demand but also maintain quality and later was able to provide lionized salt to prevent goiter a diseases that once plagued the Nepalese society.

Salt trading corporation has equity in many pioneering and leading industries in the country such as Khaddhya Udyog Ltd. Spinning Mills Ltd. Gorachakali Rubber Udyog Ltd. Morang Sugar Mills Ltd and Gharelu Hastakala Udyog Ltd. Nepal Vegetables Ghee Udyog Ltd. The organization has also been assigned the responsibility of implementing the Nepal India Goiter Control project. The groups turn over exceeds NRs 2 billion and investment in fixed assets in close to NRs 1.5 billion. Salt trading corporation limited a major catalyst in bringing about the desired economic changes and growth in Nepal, signing of the first salt contract between the representatives of STCL and state trading corporation of India on 14th July 1965. The organization's accessibility to these remote areas have been turned out to be very rewarding and fruitful as it also provides the opportunities to procure commodities

that are locally produced in different part of the country. STCL has been playing a very significant role in procuring goods from different parts of the country and supplying them in areas where they derive optimum value.

The organization began its trading activities by dealing in salt and now it imports produces and supplies good of vast diversities. Industrial products, agricultural products and industrials raw materials are the major components of its. Salt trading corporation limited deals with importing products and distributing or taking it to public reach through sales. Sales, cost profit analysis is very important tool of profit planning and control. This tool examines the behavior of total revenue, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit and fiscal cost of a product. It is an analytical technique for studying the relationship between volume, cost, prices and profits. It is used to determine the profit planning process of the firm. It is a simple but powerful tool for planning of profit and therefore, of operations. It provides an answer to" what if" theme-telling the volume required producing a target amount of profit. For a coordination approach towards achieving production and profit goals, it has grown into a basic technique with a focus on future. It has gained greater utility and respectability.

1.3 Statement of the Problems

Salt Trading Corporation is one of the trading corporations, large amount is invested from various sectors, and therefore, the successful operation of the industry is very much important. The success of the industry will not only attract the foreign investment in the country but also increase the private sector within the country. But financial performance of the industry is not satisfactory.

How the business is being operated largely depends on how the business operation is planned. Poor performance is the outcome of poor planning, controlling ad decision-making. Profit just doesn’t happen by chance, it is to be managed. CVP analysis is a supplementary tool of planning for profit. CVP analysis is immensely helpful for developing alternative strategies in sales planning and cost estimation. This study is basically designed to solve the following problems by taking into account the budget's role in planning the profit.

- Is the company practicing the appropriate budgeting system?
- Is the company practicing CVP analysis for its profit planning?
- Are there any difficulties facing by the STCL in the application of the CVP analysis?
- What is the impact of CPV analysis profitability?

1.4 Objectives of the Study

The general objectives of this study are to examine cost-volume-profit used by Salt Trading Corporation. The major objectives of this study are highlighted as below:

- To study cost-volume-profit trend of Salt Trading Corporation Limited.
- To assess the impact of CVP analysis on profitability.
- To examine the sensitivity analysis of Salt Trading Corporation.
- To provide recommendations and suitable suggestions to the corporation.

1.5 Significance of the Study

This research's work is based mainly on cost-volume-profit analysis and its effectiveness in Salt Trading Corporation. This is one of the public enterprises. The finding can be equally important to other public enterprises too. Many other organization taking care of profit planning and control in their management also can be benefited from it. Cost-volume-profit analysis and other information of the study can be useful for further research to university students and others too. Lastly the suggestion and recommendation will serve the concerned people while making analyzing cost-volume-profit.

1.6 Limitation of the Study

This study is based solely on Salt Trading Corporation. The study goes through cost-volume-profit analysis but still has some limitations.

- This study is based on data and trend of only 5 years period of 2064/65 to 2068/69.
- Analysis is concentrated in some managerial financial and accounting aspects and it doesn't cover the other area of the enterprise.

- This is based on secondary data provided by the management of Salt Trading Corporation.
- The study is a case study of the corporation. Findings, recommendation and suggestions are not for directing Salt Trading Corporation Limited.
- The study only concerns with the partial requirement in the fulfillment of the master of business studies. (MBS)

1.7 Organization of the Study

As specified format of the research study, this study also comprises of five major chapters. They are:

Chapter-I: Introduction

This chapter includes focus of study on scenario of STL, statement of problem, objectives of study, significance of study and limitation of study.

Chapter-II: Review of Literature

This chapter concerns about the concepts of PPC, cost-volume-profit and review of related thesis to highlight the related terms and to present the available information about previous related studies.

Chapter-III: Research Methodology

This chapter includes introduction, research design, sources and nature of data, data gathering instruments, statistical tools used for the study.

Chapter-IV: Data Presentation and Analysis

Various data are gathered from the application of the different methods and presented and tabulated as required by the research objectives. Data are interpreted and analyzed with the help of various analytical tools and technique.

Chapter -V: Summary, Conclusions and Recommendations

This chapter includes summary and conclusion of the study. It also includes recommendation on the basis of the study.

At the end of the study, bibliography and appendix are also incorporated.

CHAPTER-II
REVIEW OF LITERATURE

2.1 Cost Volume Profit Analysis

Cost volume profit analysis is a supplementary tool of planning for profit. It is immensely helpful for developing alternative strategies in sales planning and the cost estimation.

"Cost volume profit analysis examines the behavior of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit and the fixed cost of a product" (Horngren et al., 2003).

The analysis of relationship between cost, volume and profit is known as cost-volume-profit analysis. It is an analytical tool. For studying the relationship between volumes, cost, price and profit. Cost-volume-profit analysis is great helpful in managerial decision making. Specially, cost control and profit planning is possible with the help of cost-volume-profit analysis.

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 the effect of different strategies and decisions on business activities. With the results of the analysis managers will be able to answer the following:

- What should be the levels of sales to cover all expenses?
- What should be the volume of 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 productions lines. CVP analysis studies the interrelation of units. During

the analysis we estimate these interrelations and, therefore, the organization's margin of profit.

2.1.1 Basic Features of Cost-Volume-Profit Analysis Information

- Sales revenue: Total sales revenue fluctuates in direct proportion to the units sold. Revenue per unit is assumed to remain constraint.
- Variable costs: Total variables costs change in the same proportion and in the same direction as the volume of output changes, and the per unit variable costs remain fixed.
- Fixed costs: Total fixed costs remain unchanged for the same period of time whatever may be the level of output within the relevant range. Per unit fixed costs are variable.
- Semi-variable costs: Those costs, which are neither constant in total amount nor constant. Per unit are mixed or semi-variable costs.

CVP analysis required a separation between fixed and variable costs. Semi-variable or mixed costs can be segregated into variable and fixed components by applying any of the cost segregation methods as: visual fit methods, high-low point method or least square regression analysis method.

2.1.2 Utility of Cost-Volume Profit

Cost-volume-profit 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 of CVP analysis lies in the following advantages:

- It is a simple device to understand accounting data.
- It is a useful diagnostic tool.
- It provides basic information for future profit improvement studies.
- It is useful method for considering the risk implication of alternative actions.
- It helps to determine most profitable and least profitable product.

2.1.3 Assumptions of CVP Analysis

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

- **All other Variables Remain Constant**

It is assumed that all variables other than the particular one under consideration have remained constant throughout the analysis. In other words, it is assumed that volume is the only factor that will cause cost 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 revenues and costs. If significant changes in these other variables occur, the CVP analysis presentation will be incorrect.

- **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 depict in the CVP analysis by assuming average revenues and average variables costs for a gives sales mix.

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

Thus, the BEP and the expected profit 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.

- **Complexity- Related Fixed Cost does not Change**

CVP analysis assumes that complexity related cost remain unchanged. Cooper and Kaplan illustrate that many so-called fixed cost vary not with the volume of items manufactured but the range of items produced (i.e. complexity of the production process). Complexity - related costs do not normally vary significant in the short run with the volume of production. If a change in volume does not alter the range of production then it is likely that complexity - relates fixed costs will not after 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 assumption will e violated if a firms seek to enhance profitability by production proliferation, i.e. by introducing new variants of products based on short-term contribution margins. The CVP analysis will show that profits will increases a sales volume increase and fixed cost remains constant in the short term. The increased product diversity, however, will case complexity-related fixed cost to increase in future periods and there is a danger –which long- term profits may decline as result of products proliferation. The CVP analysis incorporate the fixed cost requires handling the diversity and complexity within 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- relate arising from changes in the range of items produced.

- **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 profit calculations are assumed. If absorption-costing 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.

- **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.

- **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 costs and revenue figures beyond the relevant range.

- **Cost can be Accurately Divided into their Fixed 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 difficult in practice. Nevertheless, a reasonably accurate analysis is necessary, if CVP analysis relevant information for decision - making.

- **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 the senior managers are likely to be fixed relation to the change in activity. Decisions on the firms intended future potential level of operating capacity would determine the amount of capacity cost to be incurred. These decisions will have been made previously as part of the long term planning process.

Once these decisions will have been made, they cannot be easily reversed in short term. It takes time to significantly expand the capacity of plant 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 a 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 causes fixed costs to change.

It is therefore, assumed that is the short term, some costs will be fixed and unaffected by changes in volume. In the short term, volume is the most important variable inflecting total revenue, costs and profits. For this reasons, 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 changes in the explanatory variables.

2.2 Approaches to Cost-Volume-Profit Analysis

The CVP relationships can be analyzed through different approaches which are (Dhakal, 2004: 54).

2.2.1 Contribution Margin Approach

Contribution margin reflects the revenue remaining after certainty all variable costs. In managerial accounting language, contribution margin is the excess of sales revenue over variable costs. So contribution margin means how much is left form sales revenue over variable costs. So contribution margin means how much is left from sales revenue, after covering variable expenses that are contributed toward the covering of fixed expense and then toward profit for the period. If the contribution margin is not sufficient to cover the fixed expense, then a loss occurs for the period. Basically contribution margin indicates why operating income changes as the volume of sales changes:

It can be expressed as:

Contribution margin = Sales – Variable cost

Or

Contribution margin = Fixed cost + Profit

Contribution margin is usually expressed as a percentage sales which is known as contribution margin ratio or profit volume ratio. That is:

$$\text{CM Ratio or P/V Ratio} = \frac{\text{Contributi on margin}}{\text{Sales}}$$

$$= 1 - \frac{VC}{SP}$$

2.2.2 Formula Approach

The most popularly practice approach to the breakeven point and cost volume profit analysis is to formula, also known as the equation, ti is particularly because the equation provides the most general and the easiest to remember – approach uses an algebraic equation to calculate the breakeven point. The answer provides by solving the equation may sometimes, need to be rounded to whole number of units or lots sizes. The rounding of break even points is always done upward because this will

provide a small profit rather than the small loss that would be shown form rounding downward (Chaibon, Barfield and Kinney, 1993).

The calculation in the equation approach is similar to that of the contribution margin statement approach. The equation is merely a restatement of the other.

BE sales value = FC + VC I profit

BE sales unit x SPPU = FC + (BE sales unit x VCPU) + 0

Contribution Margin Approach	Symbol or Equation
Sales volume (units)	Q
Selling price per unit	P
Sales revenue (Rs.)	Q x P
Less variable costs	Q x VCPU
Contribution margin	Q x P – Q x VCP
Less fixed costs	FC
Net profit	Q x P-Q x VCPU- FC

Source: Profit Planning and Control (Geoit,20009:112-119)

2.3 The Graphic Approach to CVP Analysis

A break even chart is used to graphically depict the relationship among revenues, variable costs, fixed cost and profit (or losses). The no profit, no loss point (the breakeven point) is located at the point where the total cost and total revenue lines cross. Below this point, the firm, losses, and above this point, the firm earns profit (Bajracharya et al., 2004: 231-232).

In the graph given below the fixed costs remain constraint within the relevant range; the fixed cost curve is parallel to 'ox' axis. Variable cost slope downward from the origin to right but the slope depends on variable cost ratio. The total costs curve parallels the variable cost curve. So the angle 'o' equals the angle 'v', it is because total cost = total fixed costs plus total variable costs at volume 'Q'.

Total costs = TFC + Q x VCPU

At volume 'Q +N'

Total costs = TFC + (Q +N) x VCPU

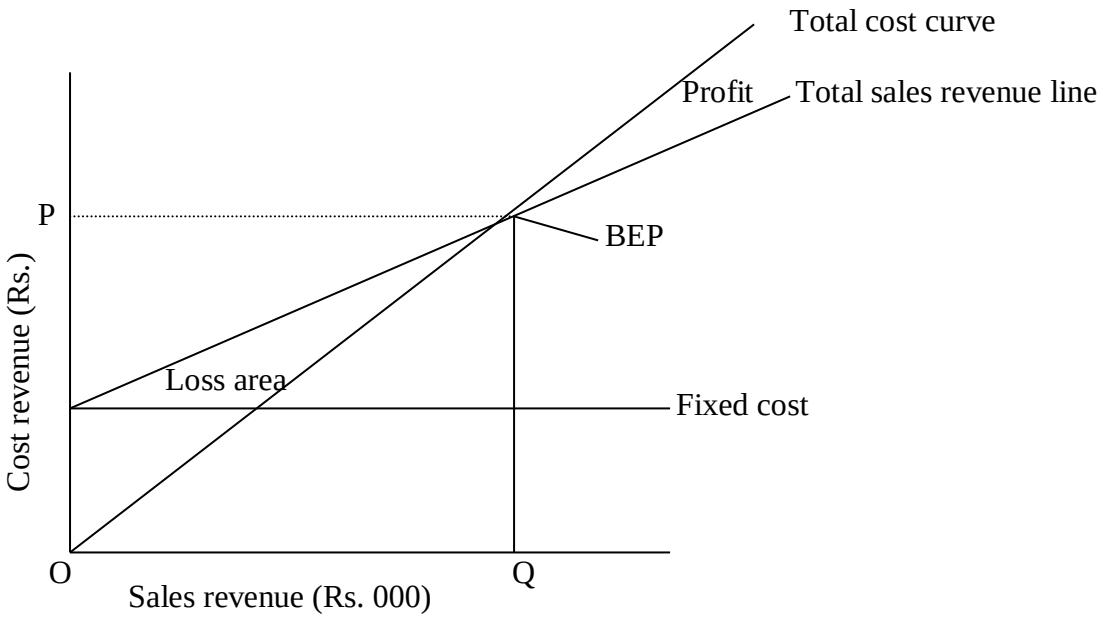
Total costs = O + n x VCPU

Total Cost = Variable Costs

That's why the slope of the total cost curve equals the slope of variable costs curve.

Figure 2.1

Graphical Approach to CVP



The above graph clearly shows that of the company can reach the point of BEP it can generate sufficient revenue to cover all its operating expenses. At this point, the total revenue equal the total cost. Here, the revenue curve breaks up (intersects) the total cost curve, that's why this point is called breakeven point. In short, breakeven point is the point where, total sales revenue = total cost.

2.4 Terms Used In CVP Analysis

Mostly used terms are as follows: *(Fago; 2003: 253-258).*

- **Variable Cost**

The cost, which varies according to the level of production or output, is called variable cost. It fluctuation in total amount but total to retain unchanged per units as production activity changed. Material cost, direct cost, etc are variables cost. There is a linear relationship between the volume and variable cost i.e., the cost increase or decrease as the volume increased or decreases.

- **Fixed Cost**

The cost, which remains unchanged to an entire range of production or out put, is called fixed cost. Thus, fixed cost is the cost, which remains constant in respect to the changes in the output within a relevant rage. The main characteristics of fixed costs are that it is fixed within a rage 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 inactivity. 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 fixed 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 in 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 same 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 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 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 all cost. For BEP to occur, it is necessary that firm 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 cost. The BEP can be computed in terms of units as well as Rupees.

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

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

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

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

Contribution Margin

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

Contribution Margin = Selling-Variable Cost

For e.g.

Selling Price	Rs.25/-
Less: Variable cost per unit	Rs.15
Contribution margin	Rs.10

P/V Ratio

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

It van be also found the relationship between the change in the contribution and change in the sales. It is written in the form of percentage.

Example, in above case, if the fixed expenses is Rs. 100,000/- and sales unit is 20,000, the contribution will be Rs 20,000/- (20000×10), which is sufficient to meet fixed expenses and profit left is Rs. 100000/- . And if the output is 10000, 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 fixed expenses and the result is a loss of Rs.50000.
Thus, contribution will first go to meet fixed expenses and then to profit.

Margin of Safety

It is difference between the actual sales and the BEP sales. One of the assumptions of marginal costing is that the production or the output will coincide 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 = $\frac{\text{Profit}}{\text{P/V Ratio}}$

For e. g.

If present sales is Rs.40, 0000 and BE sale is Rs. 300000, margin of safety (MOS) will be Rs 100000(i.e. Rs 400000- Rs 300000) or 25% (i.e.$\frac{100000}{400000}\times 100$)

2.5 Cost-Volume Profit Analysis for a Multi-Product Firm

Sales mix can be defined as the relative combination of two or more products represented in total. It is not only the sales revenue that makes profit. The proportion of the sales contributed by different products greatly changes the amount of profit. Managers try to achieve that combination, or mix, that will yield the greatest amount of profit. If a company sells more than one product, these may not be equally profitable. So, the company's profit will depend upon the ratio of each products sale to total sales revenue. Profit will be greater if high margin items make up a relatively large proportion of total sales than of sales consist mostly of low margin items. Changes in sales mix can cause great variation in a company's profit. A shift to low-margin items to high margin items can cause the reverse effect-total profit may increase even through total sales decrease (Bajracharya, Ojha, and Sharma, 2004: 260).

Following procedures are followed to calculated BEP for sales mix or multi-product:
Calculated contribution margin or profit-volume ratio for each product.

Calculated proportion of sales mix in units or values as follows:

$$\text{Sales mix} = \frac{\text{Individual products sales unit or value}}{\text{Total of all products sales units or value}}$$

Calculated weighted average for all products as follows:

Weighted average = [Sales x (units) x Unit C.M.]

= [Sales mix (value) x P/V ratio]

Calculated break-even point (BEP)

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Weighted Average}}$$

2.6 Segregation of Semi-Fixed (Mixed) Costs

Cost-Volume-Profit analysis requires segregation of all costs between two parts fixed and variable. This means that the semi-variable costs will have to be segregation into fixed and variable elements. This may be done by any of the following methods:

1. Level of Output Compared to Levels of Expenses Method:

According to this method, the output at two different levels in compared with corresponding level of expenses. Since the fixed expense remains constant, the variable overheads are arrived at by the ratio of change in expenses to change in output whereas;

Variable Elements = [Change in amount of expenses/change in activity or quality]

2. Range Method

This method is similar to levels of output compared to level of expenses method expect that only the highest and lowest points of output are considered out of various level. This method is also designated as "High and Low" method. The high-low method is explained, step by step, as follows:

- Select the highest pair and the lowest pair

- Compute the variable rate 'b' using the formula, variable rate = Difference in cost 'y'/Difference in activity 'x'.
- Compute the fixed cost portion as,

Fixed cost portion = Total semi-variable cost – variable cost.

3. Degree of Variability Method

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

4. Scatter-Graph Method

In this method, the given data are plotted on a graph paper and line of best fit is drawn, whereas semi-variable expenses are plotted on the vertical axis (x-axis). 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 object test for assuring that the regression line drawn is the most accurate fit for the underlying observation.

5. Least Square Regression Method

Management must have some way of estimating fixed and variable costs. Also the financial analyst would like to know how much of a firm's given costs are fixed and how much are variable. Among the approaches to cost estimation, the Least Square Regression method, a statistical technique, is considered as more objective and precise approach of estimating fixed and variable costs. Regression analysis starts by assuming that a linear relationship exists between the dependent variable and the independent variable. Also supplies information about the reliabilities and the confidence that can have in the estimate. The method uses mathematical formulas to fit the regression line and takes all of the data into account when estimating the cost formula (Munankarmi, 2002:27).

2.7 Impact of Changes on Profits

Profit is the function of a variety of factors. It is affected by changes in volume, cost and prices; profit may be affected by the changes in the following factors.

- **Effect of Price Changes**

An increase in the selling price will increase the PV ratio and, as a result, will lower the break-even point. On the contrary, a decrease in selling price will reduce the P/V ratio and therefore, result in a higher break-even point.

- **Effect of Volume Changes**

A change in volume, not accompanied with a change in the selling price and/or costs, will not affect P/V ratio. As a result, the break-even point remains unchanged. Profit will increase with an increase in volume and will be reduced with a decrease in volume.

- **Effect of Price and Volume Changes**

A change is price invariably affects volume. A price reduction may increase in demand of the product and consequently, may result in increased volume. On the other hand, increase in price may adversely affect the demand and thus, reduce volume. The impact on profits under these circumstances is not obvious. Profit may increase with a price reduction if volume increases substantially. Similarly, a price rise may reduce profits if there is material fall in volume.

- **Effect of Changes in Variable Costs**

The impact of the changes in variable costs on profits is straight forward if it does not cause any change in selling price and/or volume. An increase in variable costs will lower P/V ratio, push up the BEP and reduce profits. On the other hand, if the variable costs decline P/V ratio will increase, BEP will be lowered and profit would rise.

- **Effect of Changes in Fixed Costs**

A change in fixed cost does not influence P/V ratio. Other factors remaining unchanged, a fall in the fixed costs will, however, lower the BEP and raise profits. An increase in fixed costs caused either due to some external factors or due to some

changes in the management policy, will raise the BEP. Increase in factory rent or insurance and taxes are examples of external factors, while increased in depreciation or salaries of managers may be the result of management decision.

- **Effect of Changes in a Combination of Factors**

The financial manager or the management accountant, evaluating the profit plans or budgets, must realize that a change in one factor leads to a change in other factor or factors. Therefore, all such changes should be carefully visualized and their net impact on profit must be seen (Pandey, 1999:203-208).

2.8 Limitations of CVP Analysis

- According to the assumption of break-even-point, total cost can be divided into only fixed and variable costs, which is not practical in real life. There are some costs, which are neither fixed nor variable. Those costs are described as semi-fixed or semi variable costs.
- The assumption that fixed cost always remains constant is not true. Sometimes it can be increased, especially in that situation, when production or operation technique is changed.
- The assumption that variable cost per unit always remains constant cannot be entirely true.
- Constant selling price is also not true. In case of increase in sales volume, some modification can be made in selling price by considering the nature of demand for the goods.
- The assumption that either the firm produces only a single product or product mix ratio remains constant is also obviously quite unrealistic. An industry producing several types of goods has to bring about modification in the product mix ratio time to time.
- The assumption that the production level and sales level should be equal is another drawback of break-even point. Such a condition is hardly found in practice.
- The capital investment in business is also a significant element of profit planning & control. However, it is not given a place in break-even point.
- It also ignores the non-operating income & non-operating expenses.

2.9 Review of Previous Related Thesis

The research topic of this study is cost-volume profit analysis as a tool to measure effectiveness of profit planning and control. Most of the researches are in the area of profit planning and control. Out of the previous research studies only few researches is conducted to analyze the cost-volume profit of private enterprise and the study is limited by various constraints.

Bhattarai (2005), has submitted the thesis on the topic "*Cost-Volume-Profit Analysis as Tools to Measure Effectiveness of Profit Planning and Control: A Case Study of NEBICO Private Limited*". The study is mainly concerned with the application of CVP as a profit planning tool in the NEBICO private limited. Mr. Rudra has covered the data of five years. In his research paper he has used both primary data and secondary data by various sources. He has listed the following major findings:-

- The company's sales trend has fluctuated, but not satisfactory trend of increasing.
- The company's variable cost is high proportion than fixed cost in total cost amount.
- The company has high fixed costs.
- In Nepalese manufacturing company, especially in NEBICO, there is no any plan to reduce cost.
- There is lack of effective cost control programmers or techniques.
- The profit trend of the company is not satisfactory.
- The company has no detailed any systematic expenses plan.
- The goal and objectives of the company are not clearly communicated to operating level of management.
- In the company, there is no effective inventory policy.
- The company does not apply any appropriate and effective sales forecasting techniques.
- There is not any special system of taking corrective action for the re-planning.
- Especially in NEBICO Pvt. Ltd., the Board of Directors is the main authority in price fixing.
- Wages structure is based on accordance with the level of skill.

Dahal (2006), has studied on the topics of "*Cost volume Profit Analysis as a tool to Measure the Effectiveness of Profit Planning with Special Reference to Dubar Nepal Ltd*". This was submitted to Nepal Commerce Campus, T.U in Partial fulfillment of Master's Degree in the year 2006. He found given findings and recommendation on his study.

- Dabur Nepal Pvt. Ltd constitutes lack of adequate inventory policy.
- No control over external factory i.e. it has poor SWOT analysis.
- Dabur Nepal Pvt. Ltd. does not prepare strategic and policies for long term.
- Dabur Nepal Pvt. Ltd is not able to co-ordinate among various departments.
- Dabur Nepal Pvt. Ltd is not prepared raw material requirement budget and raw material purchase budget systematical.

Poudel (2007), has submitted the thesis entitled "*Profit Planning and Control of Government Corporations, a Case Study of Salt Trading Corporation Limited*" He has focused his study to analyze the sales and purchase budget of salt trading corporation Ltd.

Major Findings:

- The overall financial condition of the STC is satisfactory.
- The planning process of STC is little bit ambitious the actual achievement is lower than that of targeted figure.
- STC has practiced only short term planning rather than long term planning.
- Minimum expenditure is made in advertisement. In fact most people don't know that STC deals in product other than salt.

Karki (2009), has conducted the research on the topic of "*Cost Volume Profit Analysis as a Tool of Profit Planning*" as case study of Bottler Nepal Ltd. The data and other necessary information were collected by primary as well as secondary sources. Major findings and recommendation providing by his are as follows:

- The company had not maintained the broad and long range objective periodic report and objectives were limited to the high ranking official only.
- Relevant internal and external market variables were not fully explored.

- Sales and production targets were not achieving because there was not and effective forecasting system.
- Enterprises have no financial plan; they had only sales and production plan in term of required target.
- The company had no detailed and systematic expenses plan.
- In the company there was no effective inventory policy. The inventory management, raw material handling and controlling system were not efficient and effective.
- The company had not proper practice of segregating the costs into fixed and variable or controllable and non controllable.
- Management information system was not performance based.
- There were no any proper criteria for performance evaluation for financial tools.
- Classification of expenses item as variable and fixed or controllable and non controllable must be made within specific framework of responsibility and time.

Shrestha (2010), has submitted the thesis entitled "*Comparative study of Profit Planning in Nepal water supply corporation and Nepal Telecommunication Corporation".* He has focused his study to examine the current practice and effectiveness of profit planning in NWSC and NTC .And tried to understand the practical aspects of the industry and highlight in the current practice of profit planning in NWSC & NTC.

Major Findings:

- Planning department of NTC and NWSC does not have any authority to decide and create new ideas while formulating various plan. Basically few higher level officials formulate plans, particularly decision making is not considered necessary in the corporation.
- Redtops are another main obstacle in decision making and implementation of plans and program me.
- Nepalese public enterprise lack budgeting experts and skilled planners.
- NWSC and to some extent NTC are not efficiently able to adopt new technology advancement. That's why the cost of production are too high than they should be.

- NWSC and NTC have not a practice of systematic forecasting which lack of skilled experts is.
- Cost-volume profit relationship has not been considered while developing the sales plans fixed assets purchase plan and pricing strategy.
- The leakage of drinking water which is assumed 25% should be controlled by NWSC. Rules and regulation should be strictly implemented to control leakage.

Pradhan (2011), has conducted a research entitled *"Cost Volume Profit Analysis of Public Enterprises of Nepal (*A Case Study of Dairy Development Corporation*).* The following are the specific objectives of his study.

- To analyze, profitability and sensitivity of DDC in relation to sales.
- To analyze the relationship between cost volume and profit as a tool of budgeting.
- To analyze the productivity of labor along with different productivity ratios.

Findings

- Segregation of fixed and variable cost is ignored by both enterprises. Cost volume profit analysis is not plasticizing by these enterprises no any method has been adopted to segregate to segregate cost into fixed or variable.
- Actual operating income of the DDC is increasing in fluctuation of trend.
- Variable cost of DDC is very less compare to its fixed cost and contribution margin ratio of DDC is very high.
- DDC is suffering from less. No any systematic plans have been implemented for preventing the loss and improve profit of these enterprises.
- Fixed cost of DDC is high in the comparison to variable cost. Employee cost and administration expenses are high.

2.10 Research Gap

Cost-volume profit analysis is a major tools to measure the effectiveness of profit planning and control. Cost-volume-profit analysis and the sensitivity of their variable in modern business is a current issue but these facts are rarely study. Since the former researcher have not studies the sensitivity analysis, cost volume, profit trend and its impact on profitability. The researcher is interested to research on it. The researcher

will examine the current practice of CVP analysis of STCL which will be the influential study to those interested person, parties, students, teachers, civil society, government for academically as well as policy prospective and especial STCL.

CHAPTER-III
RESEARCH METHODOLOGY

3.1 Introduction

In the previous chapter, general background and the role of the CVP analysis in the business firm has described in review of literature with possible review of relevant books, articles and research finding has also been discussed. This has equipped the researcher with the input necessary for the study and helped the researcher to make choice of research methodology to support the study in realistic terms with sound empirical analysis. "Research Methodology" refers to the various sequential steps to be adopted by a researcher in studying a problem with certain objectives in view, in other words: research methodology describes the method and process applied in the entire subject of the study.

This chapter equipped the researcher with the inputs necessary for the study and helped the researcher to make choice of research methodology to support the study in realistic terms with sound empirical analysis. “Research Methodology” refers to the various sequential steps to be adopted while studying a problem with certain objectives in view. In other words: research methodology describes the methods and process applied in the entire subject of the study. The chapter research methodology includes research design, resource of collection data and processing procedures tools for analysis, methods of analysis and presentation.

3.2 Research Design

Research design is the plan structure and strongly of investigation conceived to obtain answer of research question and control variability. The research design of the study is analytical as well as descriptive. This study attempts to show the relationship among cost-volume and profit and various functional budgets for their achievement and effective application within the conceptual framework of profit planning for solving the problems that have accused in STCL. Therefore, this study is closely related to various accounting statement as well as the actual result of the budget. This

study is not only analytical but also descriptive. In research objectives only the secondary data are used.

3.3 Research Population and Sample

The large group about which the generalization is made is called the population under study, or the universe and small portion on which the study is made is called the sample of the study. Research population would be all manufacturing company of Nepal. Due to various circumstances it would not be possible to attempt all the number of research population regarding in this dissertation. There are 36 public enterprises operating in Nepal, those are the sample of study. For this study, only Salt Trading Corporation is selected as sample.

3.4 Period Covered

The period covered by the study is five years for trend analysis and one year for the analysis of cost-volume-profit variable and related aspects. This period covered is from the fiscal year 2064/065 to 2068/069.

3.5 Nature and Source of Data

The study is based on secondary data. Secondary data and information have been taken mainly from annual reports, balance sheet auditor's report, P/L account, official records and other form published and unpublished books and booklets.

3.6 Tools and Techniques

Collected data have been analyzed by using statistical and financial tools which are: mean, standard deviation, coefficient of variation, graphs, bar diagram, percentage, ratio etc. Similarly, the accounting tools used as per necessary are: contribution margin, breakeven point, sensitivity analysis etc.

It can be expressed as:

Contribution margin = Sales – Variable cost

Or

Contribution margin = Fixed cost + Profit

Contribution margin is usually expressed as a percentage sales which is known as contribution margin ratio or profit volume ratio. That is:

$$\text{CM Ratio or P/V Ratio} = \frac{Individual\ \ products\ sales\ unit\ or\ value}{Total\ of\ \ all\ \ products\ sales\ units\ or\ value}$$

$$= 1 - \frac{VC}{SP}$$

Contribution Margin Approach
BE sales value = FC + VC I profit

BE sales unit x SPPU = FC + (BE sales unit x VCPU) + 0

The Graphic Approach to CVP Analysis

Total cost = total fixed costs plus total variable costs at volume 'Q'.

Total costs = TFC + Q x VCPU

At volume 'Q +N'

Total costs = TFC + (Q +N) x VCPU

Total costs = O + n x VCPU

Total Cost = Variable Costs

Terms Used In CVP Analysis

- Variable Cost
- Fixed Cost
- Semi- Variable Cost
- Step Fixed Cost
- Break Even Analysis

Break –Even Point (BEP)

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

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

Margin of Safety

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

Cost-Volume Profit Analysis for a Multi-Product Firm

$$\text{Sales mix} = \frac{\text{Individual products sales unit or value}}{\text{Total of all products sales units or value}}$$

Calculated weighted average for all products as follows:

Weighted average = [Sales x (units) x Unit C.M.]

= [Sales mix (value) x P/V ratio]

Calculated break-even point (BEP)

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Weighted Average}}$$

CHAPTER-IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Sales Plan of Salt Trading Corporation Limited

A sales planning process is the major part of profit planning and control because it provides the basic management decision about marketing as well as provides ground for other budgets. It is an organized approach for developing the sale plan. Sales plan should be realistic. Salt trading corporation does not have long range and short range sales plan. It hasn't properly maintained the annual sales budget. Therefore, actual sales value has been analyzed. Sales value means total monetary value of unit sold by salt trading corporation.

Table 4.1

Sales Revenue

Fiscal Year	Sales Revenue	% Change
2063/064	1916218180	-
2064/065	2138957424	11.62
2065/066	3190432746	49.16
2066/067	3366335450	5.51
2067/068	3874061721	15.08
2068/069	4619853406	19.25
Mean	3437928149.4	
S.D.	817418404.40	
C.V.%	23.78	

Source: Annual Report of STCL

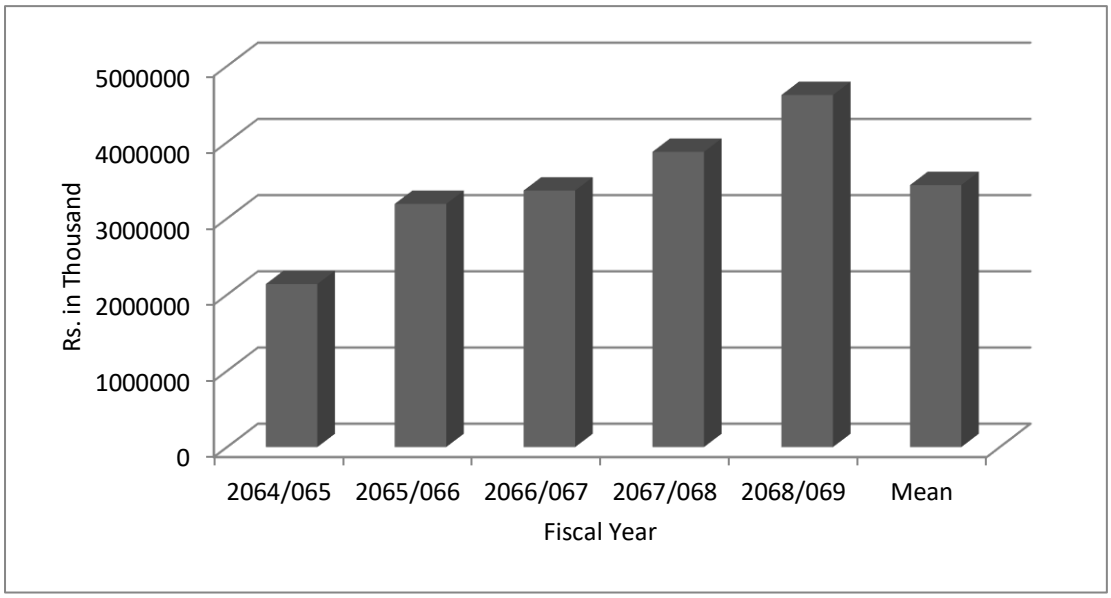
The above table shows the sales revenue of salt trading corporation during the fiscal year 2063/064 to 2068/069. The sales value of salt trading corporation limited has increasing from the fiscal year 2063/64 to 2068/069 but we can see sales percentage has been fluctuating over the five fiscal year.

In the fiscal year 2064/065 the total revenue collection by salt trading corporation is Rs. 2138957424 which is increased by 11.62% of previous year of 2063/064. But in the year 2065/066 sales revenue collected by salt trading corporation is increased by 49.15%. After that the sales value of salt trading is increased continuously by 5.51%, 15.08% and 19.25% as respectively in the fiscal year 2066/067, 2067/068 and

2068/069. Therefore the above mentioned fact clearly shows that the sales revenue of the corporation is unstable. There are various reasons which cause the variation on sales revenue. The significant factors responsible for the variation in sales revenue are demand condition of the product, cost of products, political conflict, transitional period & socio-political condition of the country, government policy, tough competition with imported product etc. National and international reason also causes for fluctuating sales value. The presentation of the above total sales figure will be more effective by following graphs.

Figure 4.1

Sales Revenue



Source: Table 4.1

4.2 Variable Cost Analysis of Salt Trading Corporation Limited

Variable costs which increase directly and proportionately with the increment in production unit are called variable costs. A variable cost is changed in the same proportion due to change into production volume. If other thing remains constant, variable cost per unit is not changed. The detailed distributions cost into fixed and variable and semi-variable expenses are distributed according to the degree of variability method, popularly as 70:30 basis of separation for the semi variable cost.

Table 4.2

Variable Costs Analysis of STCL

Details	2063/064	2064/065	2065/066	2066/067	2067/068	2068/069
1. Cost of Sales	1644540991	1837630785	2813514025	2846981343	3223898614	4074791857
Total Cost of Sales (a) (70%)	1151178694	1286341550	1969459818	1992886940	2256729030	2852354300
2. Administration Cost (b)						
Salaries and allowance (70%)	25221645	34354233	37091508	47858044	53023755	59117955
TADA	6133277	5030640	10472556	10682336	11073027	7524493
Ticket and telephone	2941791	3059448	3170962	3532961	3890676	2572600
Stationery expenses	1849461	1636773	1395578	2074648	2948347	2624566
Petrol expenses	3042708	2952908	3858293	4024889	4582361	5139173
Cloths allowances	386573	358933	2246027	2107700	2419400	3348230
Anniversary expenses	301218	414438	460937	549660	764779	767781
Books and newspaper	495199	775511	263481	273254	340913	346979
Charity expenses	1352938	1570970	2846820	4179416	5829878	4046206
Consultancy fees	539718	2283496	1170886	2821736	1259389	2009700
Bank Commission	539781	647488	1032970	2982957	2694166	1589990
Training expenses	0	680324	208635	803684	664546	44000
General assembly	0	125909	126246	313772	490014	264725
Meeting allowances	1991277	1644618	1930776	2636794	1352465	1657759
Worshipping expenses	1084478	366125	534300	330170	762070	893352
Water and electricity (70%)	1237728	1114871	1143381	1403522	2070917	1286803
Misc. expenses	1237728	465672	334295	49530	221995	2380957
Overwriting	5630634	0	0	7278200	2460000	185824736
Fees and tax	2566177	914678	2866997	3769565	2910273	2075259
Exchange Loss	0	0	0	0	38391	0
Total Administration Cost	**57305880**	**58397035**	**71154648**	**97672838**	**99758971**	**283515264**
Total (a+b)	**1208484574**	**1344738585**	**2040614466**	**2090559778**	**2356488001**	**3135869564**
Change %	-	11.27	51.75	2.45	12.72	32.98

Source: Annual Report of STCL

The above table shows the variable cost analysis of salt trading corporation during the fiscal year 2064/065 to 2068/069. The table shows that there is increasing trends of variable cost of sales and different administrative cost of salt trading corporation. In the above table also shows that salaries and allowances, petrol expenses, ticket and telephone, stationary expenses, consultancy fees, meeting allowances, charity expenses, water and electricity expenses, fees and tax, books and newspaper cost contribute to increase amount of variable administrative cost for almost every year and others are variable cost are fluctuating trends. Similarly variable cost of sales also contributes to increase amount of variable cost every year.

Similarly, the percentage changes in variable cost are in fluctuating trends but are in positive. Total variable cost amount is increase by 11.27%, 51.5%, 2.45%, 12.72% and 32.98% in the fiscal years 2064/065, 2065/066, 2066/067, 2067/068 and 2068/069 respectively than the last based years. Mainly, cost of sales contributes to increase amount of total variable costs.

4.3 Fixed Costs Analysis

Those costs which do not change due to changing in to production units is known as fixed costs. Such costs remain constant in total amount and are unaffected by changing into production units. Main features of fixed costs are:

- The fixed costs are not changed due to change into production unit.
- Fixed cost per unit is changeable due to change into production units.
- Fixed cost cannot be controlled by the manager.

But fixed cost in total may vary for different fiscal year. The fixed cost of STCL is presented in the table below:

Table 4.3
Fixed Costs Analysis

Details	**2063/064**	**2064/065**	**2065/066**	**2066/067**	**2067/068**	**2068/069**
Cost of Sales	1644540991	1837630785	2813514025	2846981343	3223898614	4074791857
Cost of Sales 30% (a)	493362297	551289236	844054207.5	854094402.9	967169584.2	1222437557
Administration cost (b)						
Salaries & allowance (30%)	10809277	14723242	15896360	20510590	22724466	25336266
Medical expenses	2478910	3379939	4180938	6125540	7672547	9036764
Maintenance expenses	1970729	3512649	3983071	5030400	7233847	5994029
Water & Electricity (30%)	371318	334461	343014	421056	887535	551487
House rent	5013838	5779363	7022272	9050352	7801225	7170330
House & land tax	626188	1155936	951632	870317	2121565	498374
Insurance	5919969	9789776	14889497	17114649	21106634	23498417
audit fees	161500	177650	195500	215050	215050	225000
Bribe expense	44100		12546014	20902989	62203358	7170880
Total (b)	27395829	38853016	60008298	80240943	131966227	79481547
Selling % Distribution cost (c)						
Advertisement	495199	775511	1134246	1788552	3207162	1969173
sales promotion	5670476	5375836	8459469	12024866	12544199	8455924
Total (c)	6165675	6151347	9593715	13813418	15751361	10425097
Other fixed cost (d)						
Depreciation	4275438	5169703	7064647	7719126	7287132	6835193
Interest	161188663	152956369	197195114	260201790	294577494	310039338
Total (d)	165464101	158126072	204259761	267920916	301864626	316874531
Total Fixed Cost	**692387902**	**754419671**	**1117915982**	**1216069680**	**1416751798**	**1629218732**
% Change	-	8.96	48.18	8.78	16.50	15.00

Source: Annual Report of STCL

The above table shows the fixed cost composition of salt trading corporation during the fiscal year 2064/065 to 2068/069. In the above table there is increasing in fixed costs. This variation is caused by the variation of cost of sales, administrative cost, selling and distribution cost and other fixed costs namely depreciation and interest.

The above table reveals, administrative cost is increased in the fiscal year 2064/065 to 2068/069 continuously. Selling and distribution cost is on decreasing trends in the fiscal year 2065/066 as compared with previous year and then after from year from 2066/067 is in increasing trend. The other fixed costs namely depreciation and interest are also increasing trend except in fiscal year 2064/065. The total fixed cost is Rs.754419671 in the fiscal year 2064/065 and it has reached to Rs. 1629218732. Similarly, the percentage change in fixed cost of salt trading corporation is in positive fluctuating trends. The fixed cost is increased by 8.96% in fiscal year 2064/065 as compared to previous year. Total fixed cost amount is increase by 48.18%, 8.78%, 16.50% and 15.00% in the fiscal years 2065/066, 2066/067, 2067/068 and 2068/069 respectively than the last based years.

4.4 Profitability Ratio Analysis of STCL

4.4.1 Operating Income Margin

Operating margin ratio or return on sales ratio is the ratio of operating income of a business to its revenue. It is profitability ratio showing operating income as a percentage of revenue. Operating margin ratio is calculated by the following formula:

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales Revenue}}$$

Table 4.4

Operating Income Margin

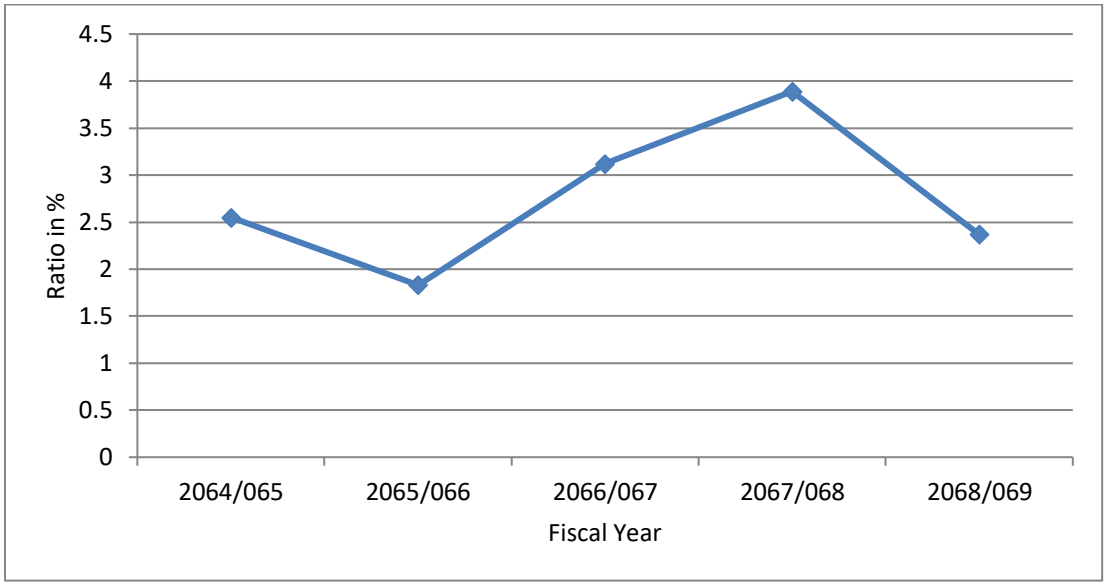
(Figure in Rs)

Fiscal Year	Net Operating Income	Sales	Ratio (%)
2064/065	54626534	2138957424	2.55
2065/066	58409685	3190432746	1.83
2066/067	104986682	3366335450	3.12
2067/068	150546510	3874061721	3.89
2068/069	109489392	4619853406	2.37
Mean			2.75
SD			0.70
CV			25.46

Sources: Annual Reports of STCL (2064/065 to 2068/069) and Appendix II

Figure 4.2

Operating Income Margin



Source: Table 4.4

The above table shows the operating income to total sales ratio of salt trading corporation during the fiscal year 2064/065 to 2068/069. The table shows that net operating income is in increasing trends except in final fiscal year and sales revenue also is in increasing trends. The net operating income to sales revenue of salt trading corporation is in fluctuating trends. The ratio is ranged from 1.83% in fiscal year 2065/066 to 3.89% in fiscal year 2067/068. In an average the operating margin ratio of salt trading corporation is 2075% and the coefficient of variation of such ratio is 25.46%. Higher the operating margin ratio indicates the higher operating profit. So, maximum percentage of operating margin ratio is preferable.

4.4.2 Gross Profit Margin Ratio

Gross profit margin ratio expresses the relationship between gross profit margin and sales amount. A firm should have a reasonable gross profit margin to ensure adequate coverage for operating expenses of the firm and sufficient return to the owners of the business. Gross profit margin ratio can be expressed by the following formula:

$$\text{Gross Profit Margin Ratio} = \frac{\text{Gross profit}}{\text{Sales}}$$

Table 4.5

Gross Profit Margin

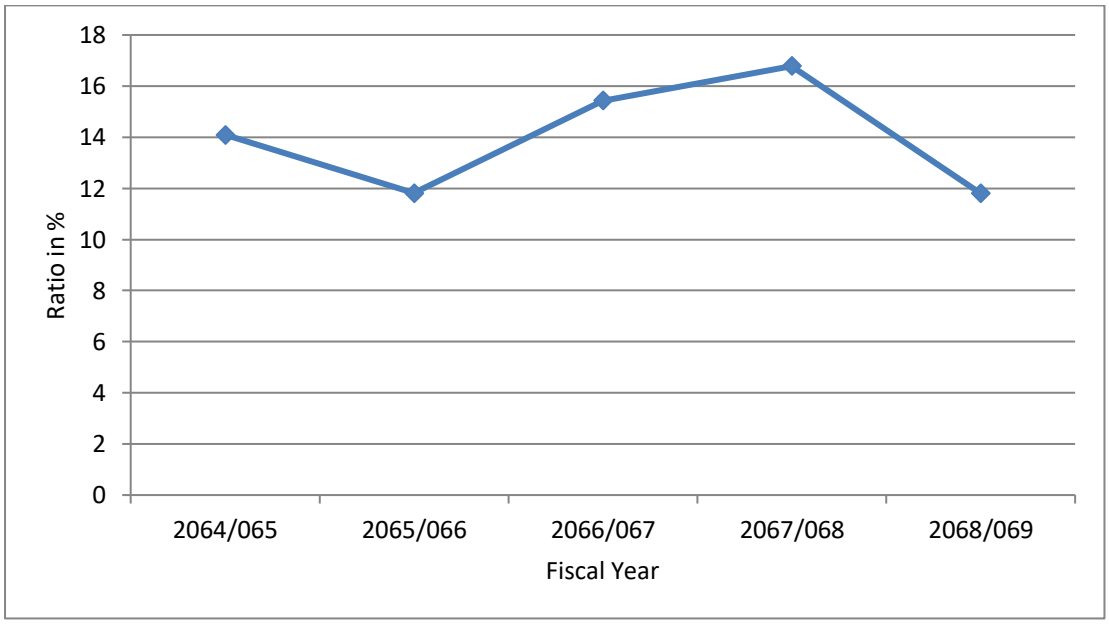
(Figure in Rs)

Fiscal Year	Gross Profit	Sales	Ratio (%)
2064/065	301326639	2138957424	14.09
2065/066	376918721	3190432746	11.81
2066/067	519354107	3366335450	15.43
2067/068	650163107	3874061721	16.78
2068/069	545061549	4619853406	11.80
Mean	478564824.6	3437928149.4	13.98
SD	124319632.6	817418404.40	1.97
CV	25.98	23.78	14.09

Sources: Annual Reports of STCL (2064/065 to 2068/069) and Appendix I

Figure 4.3

Gross Profit Margin



Source : Table No. 4.5

The above table shows the gross profit margin ratio of salt trading corporation during the fiscal year 2064/065 to 2068/069. The gross profit of salt trading is in increasing trends except in fiscal year 2068/069. The average gross profit of salt trading corporation is Rs. 478564824. The gross profit margin ratio of salt trading corporation is in fluctuating trends. The ratio is ranged from 11.80% in fiscal year 2068/069 to 16.78% in fiscal year 2067/068. The average gross profit margin of salt

trading corporation is 13.98% with the variation of 14.09%. A higher ratio is a sign of good management. A low gross profit ratio is definitely a dangerous signal, requiring a careful and detailed analysis of the factors responsible for it. Since the gross profit margin ratio of salt trading corporation is in fluctuating trends it is not a sign of good management as it implies that the cost of sales of salt trading corporation is relatively high.

4.4.2 Net Profit Margin Ratio

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

$$\text{Net Profit Margin Ratio} = \frac{\text{Net Profit After Tax}}{\text{Sales}}$$

Table 4.6

Net Profit Margin Ratio

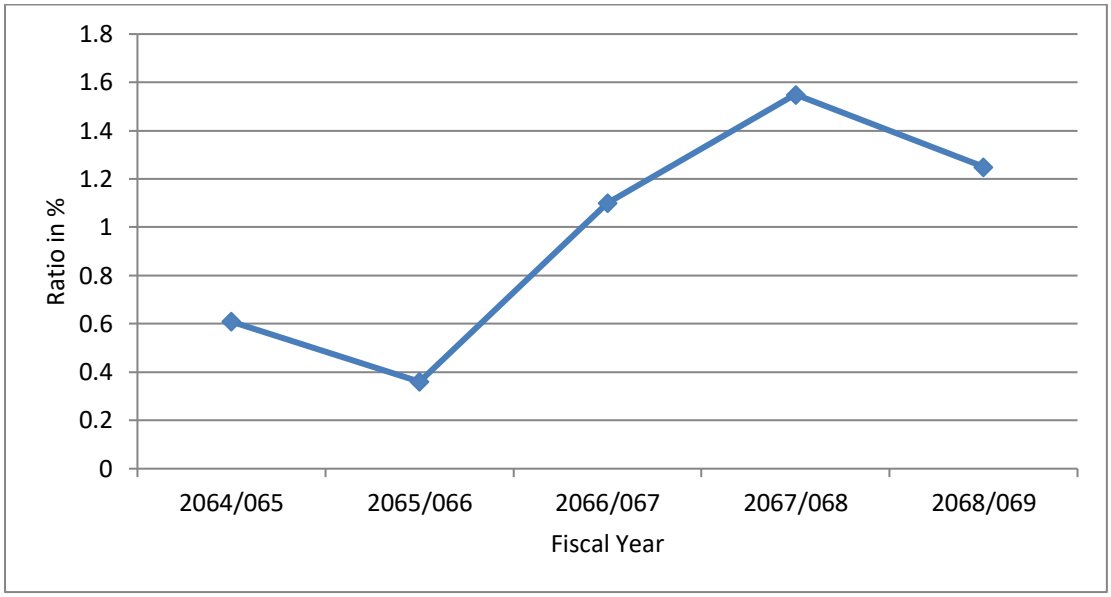
(Figure in Rs)

Fiscal Year	Net Profit	Sales	Ratio (%)
2064/065	13027201	2138957424	0.61
2065/066	11555081	3190432746	0.36
2066/067	37151020	3366335450	1.10
2067/068	60003097	3874061721	1.55
2068/069	57936722	4619853406	1.25
Mean	35934624.2	3437928149.4	0.98
S.D.	20899643.4	817418404.40	0.43
C.V.	58.16	23.78	44.28

Sources: Annual Reports of STCL (2064/065 to 2068/069) and Appendix I

Figure 4.4

Net Profit Margin Ratio



Source: Table 4.6

The above table shows the net profit, sales revenue and net profit margin of salt trading corporation during the fiscal year 2064/065 to 2068/069. The net profit of salt trading corporation is in fluctuating trends during the study period. The net profit is ranged from Rs. 11555081 in the fiscal year 2065/066 to Rs.60003097 in the fiscal year 2067/068. The net profit margin of salt trading corporation is in fluctuating trends and ranged from 0.36% in fiscal year 2065/066 to 1.55% in fiscal year 2067/068. The average net profit ratio of salt trading corporation is 0.98% with 44.28% coefficient of variation. On the basis of the company's net profit margin ratio it indicates that, at present company's overall efficiency is better than previous fiscal year from the net profit margin view.

4.4.3 Operating Ratio

Operating ratio expresses the relationship between total operating expenses and sales amount. The operating ratio can be calculated by using following formula:

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

Table 4.7

Operating Ratio

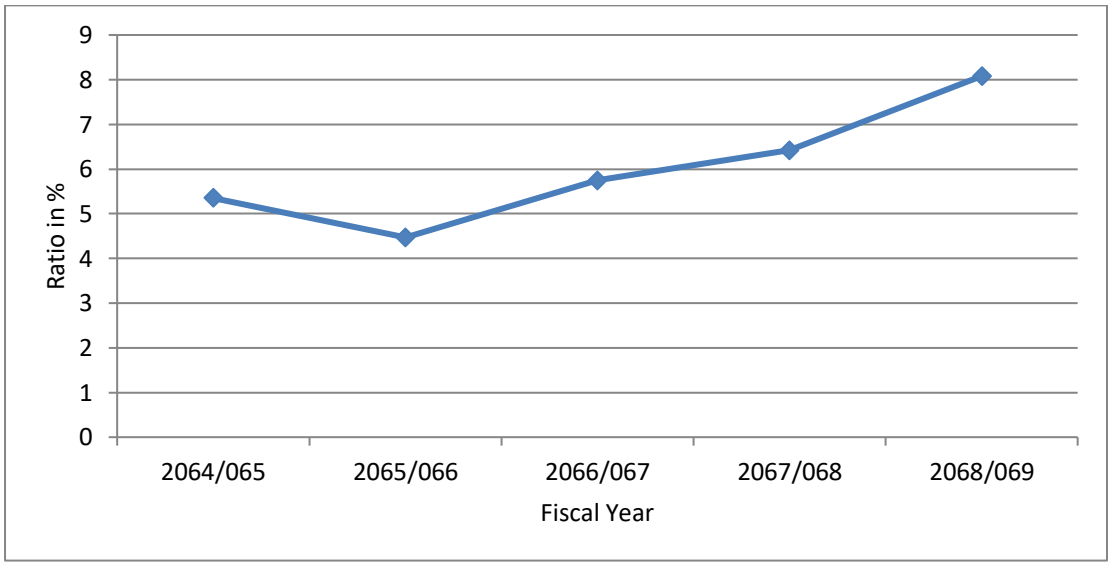
(Figure in Rs)

Fiscal Year	Total Operating Expenses	Sales	Ratio (%)
2064/065	114353837	2138957424	5.35
2065/066	142464215	3190432746	4.47
2066/067	193593038	3366335450	5.75
2067/068	248785556	3874061721	6.42
2068/069	373421808	4619853406	8.08
Mean			6.01
S.D.			1.21
C.V.			20.18

Sources: Annual Reports of STCL (2064/065 to 2068/069) and Appendix I

Figure 4.5

Operating Ratio



Source: Table 4.7

The above table shows the operating expense to total sales ratio of salt trading corporation during the fiscal year 2064/065 to 2068/069. The operating ratio of salt trading corporation is in increasing trends except in fiscal year 2064/065. The ratio is started with 5.35% in fiscal year 2064/065 and decreased to 4.47% in fiscal year 2065/066 and then increased to 8.08% in the fiscal year 2068/069. In an average operating ratio of salt trading corporation is 6.01% and the coefficient of variation of

such ratio is 20.18. Lower the operating ratio indicates the higher operating profit. So, minimum percentage of operating ratio is preferable.

4.5 Cost-Volume-Profit Analysis of Salt Trading Corporation Limited

Cost-volume-profit analysis is a management accounting tool to show the relationship between costs volume and profits with given change in cost or volume. What is the expected change in profit? While volume is a function of price, cost is a function of volume. That is, CVP technique analysis the behavior of the three key parameters of costs, volume and profits. It is thus based on cost behavior patterns – how costs respond to changes in output levels. CVP analysis provides the management with a comprehensive overview of the effects on revenue and costs of all kinds of short run financial changes. It is related to profit, sales volume and cost. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the corporation will be achieved. And this analysis is possible only when the management has information about variable cost and fixed cost and selling price of the product or sales revenue. The following table shows the income statement with CVP analysis where other income and profit from sale of assets are excluded from total revenue i.e. only sales revenue is included.

4.5.1 Analysis of Contribution Margin Ratio, BEP and Margin of Safety

An alternative approach to cost-volume profit analysis is based on the contribution margin. Contribution margin is the excess of sales price of unit of output over its variable cost. i.e. (S-V). It is the different between the portions of rupees that is left after variable expenses are deducted. Variable cost is the sum of manufacturing costs and marketing and administrative cost. Contribution margin can be written in the formula form as (margin of safety = sales revenue – variable cost). The CM approach is particularly useful in determining the break-even point and target profit breakeven point defined as the output level which evenly breaks-even the costs and revenue. Break-even sales volume is the level of sales volume in which a corporation neither makes a profit nor suffers losses. At this level of activity the sales just covers the total costs, and the profit are zero.

Table 4.8

Analysis of Contribution Margin Ratio, BEP and Margin of Safety

Particular	Fiscal Year				
	2064/065	**2065/066**	**2066/067**	**2067/068**	**2068/069**
Sales Revenue	2138957424	3190432746	3366335450	3874061721	4619853406
Contribution margin	794218839	1149818280	1275775672	1517573720	1486242408
CM ratio/PV ratio	0.3713	0.3604	0.3790	0.3917	0.3217
BE Percentage	94.99	97.23	95.32	93.36	109.62
Margin of safety	107185478	88520193	157543682	257378171	-444429289
Percentage of Margin of Safety	5.01	2.77	4.68	6.64	-9.62

Source: Appendix II

The above table shows the contribution margin, ratio, breakeven point and margin of safety ratio of salt trading corporation during the fiscal year 2064/065 to 2068/0669. From the above table, contribution margin of the corporation is in increasing trend from the fiscal year 2064/065 to 2067/068. Higher contribution margin ratio is better for the company. The contribution margin ratio of salt trading corporation is Rs. 794218839 in the fiscal year 2064/065 to Rs. 1517573720 in the fiscal year 2068/069.

Similarly, the margin of safety of salt trading corporation is in fluctuating trends. The margin of safety is ranged from 107185478 in the fiscal year 2064/065 to 257378171 in the fiscal year 2067/068.

The point at which the corporation makes neither profit nor gain is termed as BEP. At this point the total sales revenue is just sufficient to cover both variable and fixed costs. Following computation shows the BEP in Rs. for the fiscal year 2064/065 to 2068/069.

Table 4.9

Break Even Sales of STC

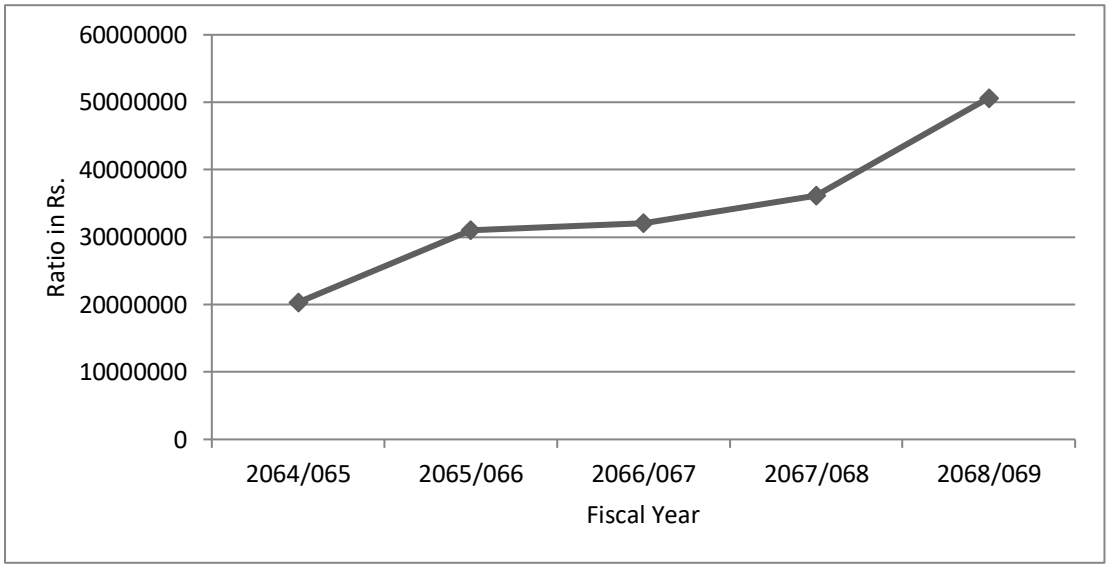
Fiscal Year	2064/065	2065/066	2066/067	2067/068	2068/069
BE Sales (Rs.)	2031771946	3101912553	3208791767	3616683550	5064282695

Source: Appendix II

The above table shows the break even sales of salt trading corporation during the fiscal year 2064/065 to 2068/069. The break even sales of salt trading corporation are in increasing trends during the study period. The break even sales revenue are ranged from Rs.2031771946 in fiscal year 2064/065 to Rs. 5064282695 in fiscal year 2068/069. This computation can be represented in the graphical form which is as follows:

Figure 4.6

Break Even Sales of STC



Source: Table 4.9

4.6 Measuring Risk: Degree of Operating Leverage (DOL)

Operating leverage tells us how profit change with the change in sales volume. Degree of operating leverage can be measured interims of 'Degree of Operating Leverage'. A DOL shows the time of percentage change in operating income to the given percentage change in sales. It may be defined as the percentage change in net operating income or EBIT associated with a given percentage change in sales.

$$\text{DOL} = \frac{\%\ \text{Change in net Operating Income } (OI)}{\text{Percentage Change in Sales}}$$

Table 4.10

Degree of Operating Leverage

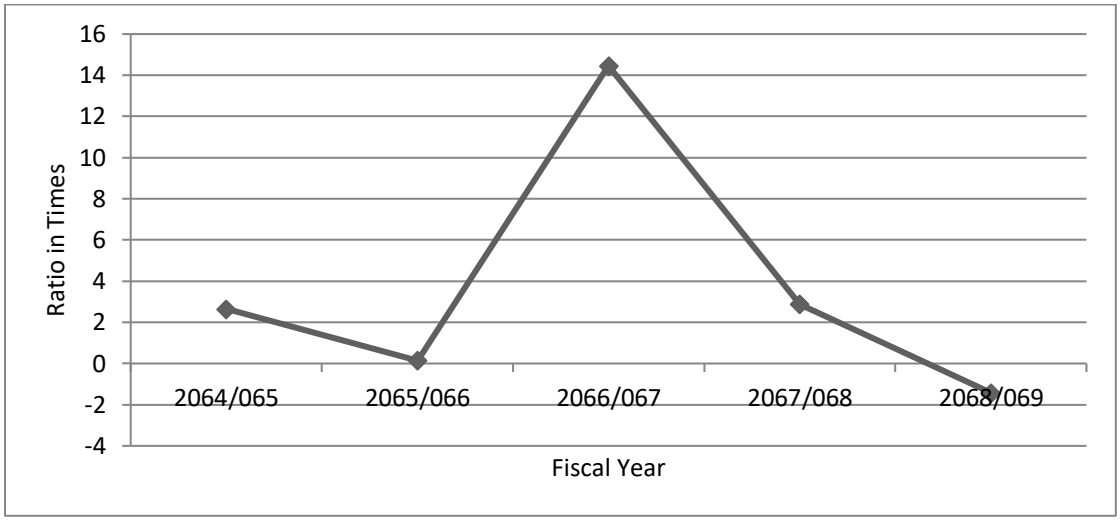
Fiscal Year	% Change in OI	% Change in Sales	DOL
2064/065	30.81	11.62	2.65
2065/066	6.93	49.16	0.14
2066/067	79.74	5.51	14.46
2067/068	43.4	15.08	2.88
2068/069	-27.27	19.25	-1.42
Mean			3.74
S.D.			5.59
C.V.%			149.45

Source: Appendix – I

The table measures the effect of sales on operating income of salt trading corporation on the basis of degree of operating leverage during the study period 2064/065 to 2068/069. The table depicts that, if the sales increases by 1%, the operating income of the salt trading corporation increases by 2.65 times in the fiscal year 2064/065, as the DOL is 2.65 times in that year. Moreover, the change in the sales has negative impact on the operating income in the fiscal year 2068/069, as the DOL is negative, -1.42 times. This indicates that salt trading corporation should give continuity in controlling the cost of goods sold to get positive impact of sales in operating income. In contrast, in other remaining years, the DOL is positive, indicating positive impact of sales on operating income. In average, the DOL is 3.74 times, indicating that 1% increase in sales leads to 3.74times increase in operating income of salt trading corporation. However, the coefficient of variation, 149.45%, shows greater inconsistency in the impact rate.

Figure 4.7

Degree of Operating Leverage



Source: Table 4.10

4.7 Sensitivity Analysis: Accessing the Impacts of Change in Cost-Volume-Profit Variables

Sensitivity analysis is the measurement of elasticity of the change in cost-volume-profit factors on breakeven point or given profit. To measure the sensitivity of cost-volume-profit factors one can see the impact of certain percentage or amount change in volume, price or cost factors on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the change in the determinant variables. As we know the profit is the function of volume, price, fixed cost, variable cost etc. Here we systematically deal with the following sensitivity analysis.

4.7.1 Assessing the Impact When Selling Price is Changed

An increase in the sales value will be the increase profit-volume-ratio and as a result, will lower the breakeven point. On the contrary a decrease in sales value will reduce the profit volume ratio and therefore, result in a higher break-even-point, if increase and decrease of sales value by 10 percent with other factors assumed to remain same; it gets following result for the fiscal year 2068/069.

Table 4.11

Income Statement with 10% Change of Sales Value

(Amount in Rs.)

Particulars	Original Sales	10% Increase	10% Decrease
Sales Revenue	4619853406	5081838747	4157868065
Less: Variable Cost	3133610998	3133610998	3133610998
Contribution Margin	1486242408	1948227749	1024257067
Less: Fixed Cost	1629218732	1629218732	1629218732
Profit/Loss	-142976324	319009016	-604961664
P/V Ratio	0.32	0.38	0.25
BEP	5064282695	4249722285	6613648812
% in BEP	109.62	83.62	159.06

Source: Appendix III

The above table shows that when sales value increases by 10%, profit also increases to 319009016 from -142976324. Similarly, profit volume ratio is increased to 0.38 from 0.32. The break even amount is decreased to 3017347953 from Rs. 3480075938.

Similarly, when the sales value is decreased by 10%, corporation becomes in loss. Profit volume ratio is only 0.25 But BEP amount is increased to Rs. 6613648812 from Rs. 5064282695.

4.7.2 Accessing the Impact When Variable Cost is Changed

If the variable cost is changed without changing the selling price and fixed cost, we can easily predict the result. When variable cost is increased profit volume ratio will be decreased as a result profit will be decreased and vice-versa when variable cost is decreased.

Table 4.12

Income Statement by 10% Change in Variable Cost

(Amount in Rs.)

Particular	Original Variable Cost	10% Increase in Variable Cost	10% Decrease in Variable Cost
Sales	4619853406	4619853406	4619853406
Less: Variable cost	3133610998	3446972098	2820249898
Contribution margin	1486242408	1172881308	1799603508
Less: Fixed costs	1629218732	1629218732	1629218732
Profit/Loss	-142976324	-456337423	170384775
P/V ratio= (CM/Sales)	0.322	0.254	0.390
BEP = FC/PV Ratio	5064282695	6417317469	4182450009
% in BEP	109.62	138.91	90.53

Source: Appendix III

From the above table, when no change is brought in variable cost, the contribution margin is Rs. 1486242408 and net loss is Rs.142976324. But when variable cost is increased by 10% the corporation insures loss more because contribution margin is not enough to cover the fixed cost. But in the other hand when variable cost is decreased by 10%, contribution margin is increased and there is profit. When the change is brought in variable cost profit volume ratio is also changed and as a result BEP sales value is also changed. The profit volume ratio of salt trading corporation is 0.32 at original variable cost. When the variable cost in increased by 10% the profit volume ratio is decreased to 0.25 times and increased to 0.39 times when the variable cost is decreased by 10%.

4.7.3 Assessing Impact When Fixed Cost is Changed

The change in fixed cost does not bring any change in contribution and P/V ratio. When only fixed cost is changed without any change in other factors, net income and BEP amount are also changed.

Table 4.13
Income Statement by 10% Change in Fixed Cost

(Amount in Rs.)

Particular	Original Fixed Cost	10% Increase in Fixed Cost	10% Decrease in Fixed Cost
Sales	**4619853406**	**4619853406**	**4619853406**
Less: Variable cost	3133610998	3133610998	3133610998
Contribution margin	1486242408	1486242408	1486242408
Less: Fixed costs	1629218732	1792140605	1466296859
Profit/Loss	-142976324	-305898197.2	19945549.2
P/V Ratio= (CM/Sales)	0.322	0.322	0.322
BEP = FC/PV Ratio	5064282695	5570710965	4557854426
% in BEP	109.62	120.58	98.66

Source: Appendix III

From above table when fixed cost is increased by 10% net profit is decreased because more amount of fixed cost is to be covered by the same amount of contribution margin. As a result BEP amount is also increased when fixed cost is increased. It is observed from the above table that, fixed cost is increased by 10% BEP amount is also increase by 10%. On the other hand, fixed cost is decrease by 10% amount of profit is increased. This is because less amount of fixed cost is to be covered by same amount of contribution margin. It is seen form the table that 10% decrease in fixed cost causes the same percentage decrease in BEP amount.

4.8 Major Findings

From the presentation and analysis of various data collected from primary and secondary sources, the major findings of the study are as follows:

- The sales value of salt trading corporation has increasing trends but we can see sales percentage has been fluctuating over the five fiscal year.
- There is increasing trends of variable cost of sales and different administrative cost of salt trading corporation and the percentage changes in variable cost are in fluctuating trends but are in positive.
- The fixed cost of salt trading corporation is in increasing trends. This is because of the variation of cost of sales, administrative cost, selling and distribution cost and other fixed costs namely depreciation and interest.
- The net operating income is in increasing trends except in final fiscal year and sales revenue also is in increasing trends. The net operating income to sales revenue ratio of salt trading corporation is in fluctuating trends.

- The gross profit margin ratio of salt trading corporation is in fluctuating trends. The ratio is ranged from 11.80% in fiscal year 2068/069 to 16.78% in fiscal year 2067/068. The average gross profit margin of salt trading corporation is 13.98% with the variation of 14.09%.
- The net profit margin of salt trading corporation is in fluctuating trends and ranged from 0.36% in fiscal year 2065/066 to 1.55% in fiscal year 2067/068. The average net profit ratio of salt trading corporation is 0.98% with 44.28% coefficient of variation.
- The average operating ratio of salt trading corporation is 6.01% and the coefficient of variation of such ratio is 20.18. Lower the operating ratio indicates the higher operating profit.
- The contribution margin of salt trading corporation is in increasing trends except in final fiscal year. The contribution margin ratio of salt trading corporation is Rs. 794218839 in the fiscal year 2064/065 to Rs. 1517573720 in the fiscal year 2068/069.
- The break even sales of salt trading corporation are in increasing trends during the study period. The break even sales revenue are ranged from Rs. 2031771946 in fiscal year 2064/065 to Rs. 5064282695 in fiscal year 2068/069.
- In average, the DOL is 3.74 times, indicating that 1% increase in sales leads to 3.74 times increase in operating income of salt trading corporation. However, the coefficient of variation, 149.45%, shows greater inconsistency in the impact rate.
- When sales value increases by 10%, profit also increases to 319009016 from -142976324. Similarly, profit volume ratio is increased to 0.38 from 0.32. The break even amount is decreased to 3017347953 from Rs. 3480075938. Likewise, when sales values decreased by 10% corporation becomes in loss and breakeven point amount is increased.
- When variable cost is increased by 10% the corporation insures loss more because contribution margin is not enough to cover the fixed cost. But in the other hand when variable cost is decreased by 10%, contribution margin is increased and there is profit.

CHAPTER-V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The government of Nepal has established many public enterprises to provide the services toward the people. Most of the public enterprises are suffering from loss. Available resources and capacity are not utilized properly. Many tools are not practiced in public enterprises for measurement of financial performances. Business organization establishes profit objectives and builds budget plans so that the objective may be realized. In profit planning, management must know the selling price of the unit of product, the variable cost to make and sell it, and the difference between the selling price and the unit variable cost. In short management must know what the contribution margin is for each unit of each product line that is handled. Several factors will affect for profits. They are selling price, the number of units sold the unit variable cost, total fixed cost and the mix in which the various product lines are sold. All these factors must be considered in profit planning. These processes will be based on the historical cost and their trend. Nature of the cost and their ratio will be seen by using various statistical tools.

Cost-volume-profit analysis examines the behavior of total revenues, total costs and operating income as changes occur in the output level, the selling price, and the variable cost per unit and/or the fixed costs of a product. The study entitled cost volume profit analysis as tools to measure effectiveness of profit planning and control. The main objective of this study is, to analysis sale trend of corporation, to evaluate cost volume profit trend, to evaluate sensitivity of the corporation and to provide suggestion and recommendation to the corporation.

To make research fruitful, review of related studies has been concerned in second chapter. To obtain major findings and to reach close to conclusion explanation of the tools and technique has been concerned in chapter third and then implemented.

5.2 Conclusions

Corporation has not been able to achieve the goal. Various popular profit planning tools like just in time production, zero based budgeting, CVP analysis are not practicing by Salt Trading Corporation. The sales value of salt trading corporation has increasing trends but we can see sales percentage has been fluctuating over the five fiscal year. There is increasing trends of variable cost of sales and different administrative cost of salt trading corporation and the percentage changes in variable cost are in fluctuating trends but are in positive. The main problem faced by the corporation is increment in variable operating costs because it has adopted neither the cost control system nor systematic and scientific plan for classification of costs. The corporation earns profit as increasing trend as compared to previous year expect in final fiscal year. Even though the corporation contribution margin has increased by increase in sales revenue but the increase in fixed cost has increased BEP to higher level.

The net operating income is in increasing trends except in final fiscal year and sales revenue also is in increasing trends. The net operating income to sales revenue ratio of salt trading corporation is in fluctuating trends. The gross profit margin and net profit margin ratio of salt trading corporation is in fluctuating trends. The average operating ratio of salt trading corporation is less than ten and Lower the operating ratio indicates the higher operating profit. The contribution margin of salt trading corporation is in increasing trends except in final fiscal year. The break even sales of salt trading corporation are in increasing trends during the study period. The degree of operating leverage of salt trading corporation is positive in all fiscal year except in one fiscal year indicating positive impact of sales on operating income.

5.3 Recommendations

The following recommendation is given to improve the present condition of the corporation on the basis of research work;

- The corporation should segregate costs into fixed and semi-fixed costs which help to control/reduce the cost and easy to find out unit variable cost.
- BEP analysis should be done while planning and segregating the cost.

- STCL should also consider the variable costs. It should reduce as much as it can so as to increase contribution margin ratio.
- In the last fiscal year STCL is in loss with its regular sales revenue so it is recommended that STCL should increase its sales revenue and should control its cost.

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