COST-VOLUME-PROFIT ANALYSIS AS A TOOL OF PROFIT PLANNING AND CONTROL

(A Case Study of Salt Trading Corporation Limited)

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RECOMMENDATION

This is to certify that the thesis

Submitted by:

Prakash Bahadur Bohara

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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 Faculty of Management. This thesis is forwarded for examination.

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Lecturer Achyut Gyawali	Prof. Dr. Bal Krishna Shrestha	Prof. Dr. Dev Raj Adhikari
Supervisor	Chairperson, Research Committee	Head of the Department

Date: ……..……

VIVA-VOCE SHEET

We have conducted the viva-voce examination of the thesis presented by

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Entitled

COST-VOLUME-PROFIT ANALYSIS AS A TOOL OF PROFIT PLANNING AND CONTROL

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

Master's Degree in Business Studies (M.B.S.)

Viva-Voce Committee

Chairperson, Research Committee ----------

Member (Thesis Supervisor) ----------

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Date: ----------

DECLARATION

I hereby, declare that the work reported in this thesis entitled **"Cost-Volume-Profit Analysis as a Tool of Profit Planning and Control: A Case Study of Salt Trading Corporation Limited"** submitted to Central Department of Management, University Campus, T.U., Kirtipur is my original piece of work done in the form of partial fulfillment of the requirement for the Master's Degree in Business studies under the supervision and guidance of Lecturer Achyut Gyawali, Central Department of Management.

Date: November, 2011

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Prakash Bahadur Bohara

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TABLE OF CONTENTS

LIST OF TABLES

Page No.

LIST OF FIGURES

Page No.

ABBREVIATIONS

AD	Annno Domini
BEP	Break Even Point
BOD	Board of Directors
BS	Bikram Sambat
CDM	Central Department of Management
CM	Contribution Margin
CVP	Cost Volume Profit
FC	Fixed Cost
FY	Fiscal Year
MOS	Margin of Safety
NP	Net Profit
PEs	Public Enterprises
PVR	Profit Volume Ratio
STCL	Salt Trading Corporation Limited
TU	Tribhuvan University
VC	Variable Cost
WTO	World Trade Organization

CHAPTER–ONE

INTRODUCTION

1.1 General Background

Profit planning and control is an important approach mainly in profit oriented enterprises. Profit planning is a magical tool of management. It facilitates the manager to accomplish managerial goals in systematic way when the management is efficient and effective then only it accomplishes its objectives with minimum effort and cost. Therefore a systematic approach which facilitates effective management is profit planning and control. It can be defined as profit or technique of management that enhances the efficiency of managers. In other works profit planning and control (PPC) represents an overall plan of operation, providing guidelines to management and acting as single light for management. A comprehensive profit planning and control is a systematic and formularized approach for starting and communicating the firm's expectation and accomplishing management function in such way to maximize the use of profit plan and to achieve the maximum benefit from the resource available to an organization over a particular span of time. The major objective of profit planning and control is to assist in systematic planning and controlling the operations of the enterprises.

There are some tools which measure the performance of profit planning and control in management. One of the simple and effective tools is cost volume profit analysis. Many decision maker like to combine inform action about variable and fixed cost with revenue information to project profit for different levels of volume, a process is called cost volume profit (CVP) analysis [Atkinson and et al, 2005: 40]. The modern approach of

the study of management concentrates on decision making. Because of the firm's profit or losses are determined by the relationship between the total cost and total sales. The managerial decision of interest to us are those which affect revenue and cost. CVP analysis applies not only for projection of income but relevant to all decision making areas. It is useful in product pricing decision, selection of channels of distribution make, or buy decision, determination of alter native production methods, capital investment etc. CVP analysis represents the basis for establishing the variable budget and thus is available tool for planning and controls [Chowder, 1995: 610-611]. CVP-analysis analyses the relationship among cost, price, profit, sales and production volume. It is highly essential for the managers to know about the interrelationship between cost, volume and profit. CVP analysis is extremely helpful in profit planning and control and management decisions. The use of CVP analysis helps in determining the different level of production to avoid losses to earn the desired profit and so on CVP analysis can be used for the analysis of break even volume, BEP analysis contribution margin which provides the best possible answers of many 'what if" questions. Most management decisions require a careful analysis of cost behavior relationship at different level of production. This is possible only through CVP-analysis CVP analysis deals with how profit and cost change with change with volume.

1.2 Introduction of Salt Trading Corporation Limited [STCL]

The development of any country and her economy are the outcome of industrialization. The economic growth of countries without industrialization is not possible. The economy of Nepal is totally depended on agriculture private sector and foreign investment could not provide sufficient opportunities due to lack of proper infrastructure and

present fluid political condition of Nepal. Public sector is mostly related to import substitute and export promotion. The history of public enterprise begins with the establishment of Biratnagar Jute Mill in 1994 AD. Before the establishment of democracy in 2007 B.S there were limited public enterprises. The government established many industries after the democracy to promote industrialization. Udhyog parisad was established to encourage industrialization (www.nrb.org.np).

Many public enterprises established in Nepal after the democracy to solve the problem of public. To get rapid development of whole country industry council established and together many commercial banks, development bank and even Nepal Rastra Bank was established for the formation of capital. To solve the problem of drinking water khanepani sansthan is established, to solve the problem of electricity Nepal electricity authority is established, to solve the problem of communication Nepal Dursansar sansthan is established. Many other public enterprises are established such as Hetauda cement company, Janakpur cigarette company, Nepal medicine limited, Udayapur cement company, Agriculture tools co. limited, National trading limited, Nepal khadya sansthan, Nepal oil corporation, The timber corporation, National construction company, Nepal airlines corporation and many others.

In this way every public enterprises have special objective for their establishment. We know that our country is landlocked and far from sea. We generally face the problem of salt and there used to be happen many frauds related with salt. So to regulate the flow of salt there was a necessary of an institution. To eliminate the problem of salt and to regulate the flow of iodinated salt "salt trading corporation limited" was established in 2020 B.S. The establishing capital was only Rs 13,02,000 and it was a joint investment of Nepal Government, National trading

limited and general public. Nepal government had invested Rs 2,02,000,national trading' share was Rs 1,00,000 and the share of general public was Rs 10,00,000. Salt trading started the trade of salt from India with the help of government. Salt trading gradually increased the area of business and achieved the success. It expanded its business in various sectors, which are as follows.

1. Food materials
2. Agricultural instruments
3. Fuel, Lubricants and Tayar Tubes
4. Machine and equipments
5. Construction materials
6. Others

Now salt trading corporation is trading Salt, Rice, Flour, Oil, Sugar, Tayar, Tubes, lubricants, LP Gas, Cement, Ghee, Fertilizers, Dal, Tea, Coal and other products all over the country. STCL has the paid up capital of Rs 2,85,37,500 in financial year 065/066 and sales of Rs 3,19,04,32,746 and profit of Rs 4,55,35,190 (www.stcnepal.com).

1.2.1 Organizational Structure of STCL

STCL is government controlled public enterprise. There is majority of shares in control of government. So whatever the decision made by government, they are implemented. There are nine members of board of directors, by which STCL is operated. It is the powerful unit of the salt trading corporation limited. Under the control of board of directors, there is another management committee, which must implement the policies and plans of board of directors. Management committee is made from the employees and board of directors is made from shareholders. It is formed with eleven members, which are responsible for the daily operation and

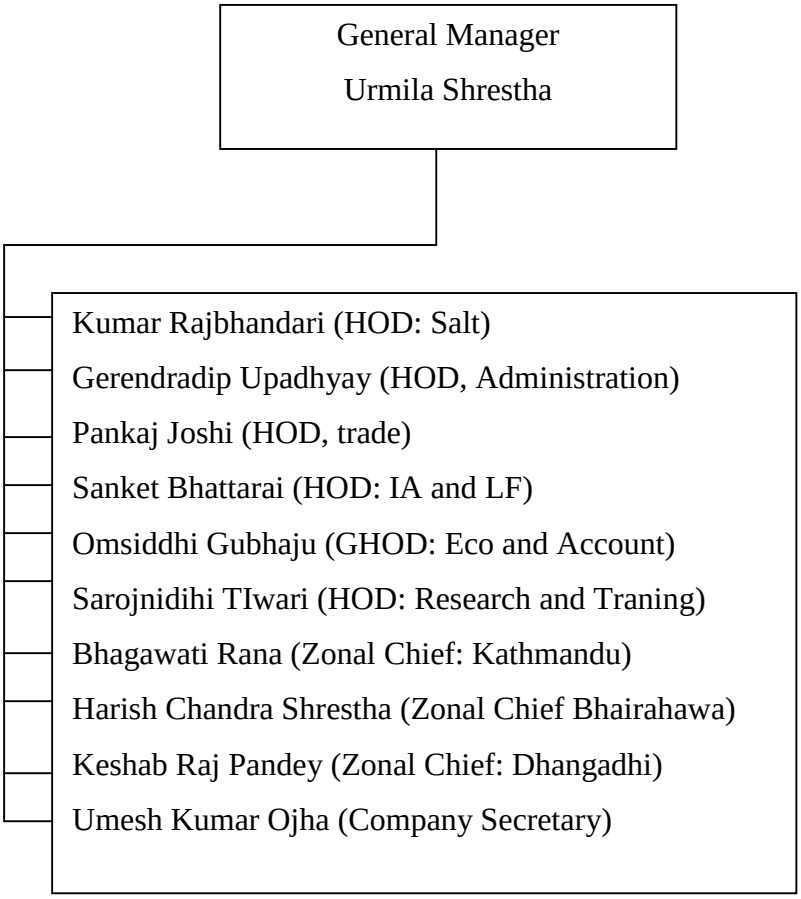
administration. They are autonomous for decision taking under the policy of board of directors. The current board of directors is as follows.

1. Sri Laxmidas Manandhar	President
2. ,, Surya Prashad Silwal	assistant secretary
3. ,, Laxman Agrawal	representative STCL
4. ,,Rajendraman Sherchan	member
5. ,,Kritikumar Joshi	,,
6. ,,Isworlal Shrestha	,,
7. ,,Kalyan Govind Shrestha	,,
8. ,, Autal Malla	,,
9. ,,Gaurishankar Agrawal	,,

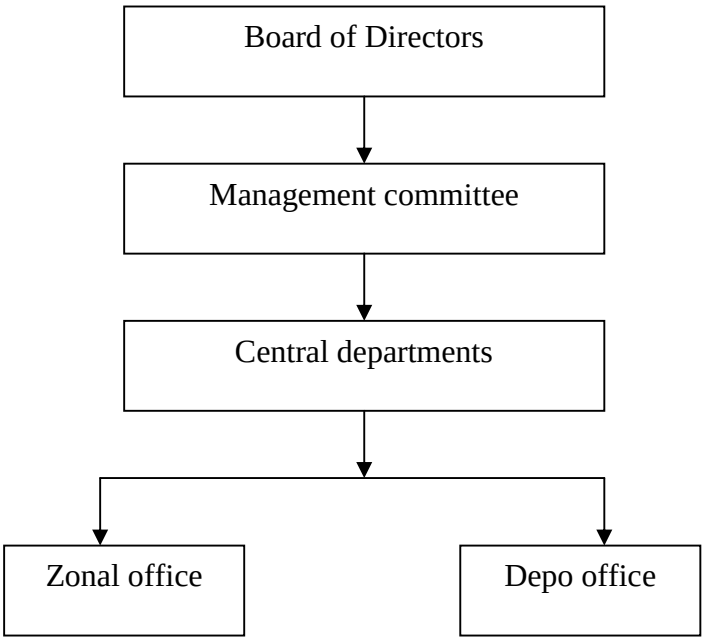
STCL has expanded its branches all over Nepal to make the follow of salt smooth and timely. There are nine zonal offices and nine depo offices all over Nepal. Zonal offices and depo offices are responsible to distribute salt and other products to the respecting districts. The central office is situated in Kalimati of Kathmandu. There are six different departments to make the operation easy and smooth. They are responsible for their assigned responsibility. The six departments are as follows,

1. Salt department
2. Administrative department
3. Trade department
4. Internal auditing and corporate finance department
5. Eco and Account department
6. Research and training department

The current management committee of STCL is as under,



Organizational Structure



Source: Annual report of STCL.

1.3 Statement of the Problem

Nepalese organization are still in infancy position . Despite various alternative and liberal policies of the government of Nepal for public corporation, new public corporation were not profitable. Such conditions of established corporation are not acceptable for their betterment. There may be various and different reasons for the poor performance of public enterprises. Such reasons should be investigated and enforce corrective actions for improvement in their performance. Nepalese organization are of small and middle scale. They have no huge investment. They are all running with indigenous technology and resources. There is no development in the sector of information technology. We have no efficient human resource and modern technology, because of which the pace of industrialization is too slow. Government of Nepal established some public enterprises to solve the problems of industries and dependency. Among these public enterprises STCL is one of them, established under the joint investment of public and government. PE's of Nepal are not progressing as their objectives. So it is necessary to study the problems why PE's are not progressing.

There are some factors which are not letting PE's to progress and to be developed with the application of modern accounting tools and technology. The main problems are indigenous technology and no knowledge of modern technology. In Nepal there is fluid political condition, there is no stability and independent policies with the wrong cultural development. We are in the condition of political transitional period, so there are problems of labours strike, company lockout, and band. The study basically find out the problems faced by STCL with the help of CVP tool to comment on the justification of financial results,

This study has to found out the answers of the following problems of the statement:

- Whether or not STCL is practicing the CVP analysis?
- What are the main difficulties in the application of CVP analysis?
- In which way the cost, profit and loss of STCL are recorded?
- Whether the application of CVP analysis of PPC is significant from STCL?

1.4 Objectives of the Study

There used to be general and specific objectives of any study. The major objective of this study is to examine of "cost, volume, profit analysis" as a tool to measure effectiveness of PPC of Salt Trading Corporation Limited. And the specific objectives of the research have been as follows:

- To analyze the present situation of CVP analysis in STCL.
- To identify the problems of STCL to apply CVP analysis.
- To analyze the impact of CVP in the profitability of STCL.

1.5 Significance of the Study

The present research work is the study of the practice of cost-volume-profit analysis in STCL. This study is significant in following ways:

- It analyzes the nature of cost incurred by STCL.
- It examines the application of CVP analysis in the company.
- It explores the problems and potentialities of the company.
- It is useful to the potential managers, accountants, policy makers and planner etc.
- It provides information on the application of the tools for profit planning in different circumstances.

- This study is also directed toward providing necessary recommendations to the related department of the company.
- It provides literature to the researchers who want to carry further research on the similar issues.

1.6 Limitations of the Study

This study is confined only on cost-volume-profit analysis as a tool of PPC of Salt Trading Corporation Limited. Therefore this is not free from the following limitations:

- Cost-volume-profit analysis covers the period of eight years data ranging from the fiscal year 2058/59 to 2065/66 only.
- The study is mostly depended on secondary data.
- The accuracy of this study is based on the true response and the data available from management of the company.

1.7 Organization of the Study

The preparation of the dissertation will be organized in a certain design and the certain chapters, which are acceptable from university. This thesis is a descriptive and analytical research design which includes the following chapters.

Chapter I: Introduction: This chapter have covered introduction, statement of the problem, objective of the study, significant of the study, limitations of the study and organization of the study.

Chapter II: Review of literature: This chapter deals with the review of various journals, books, published or unpublished reports, articles and previous thesis.

Chapter III: Research methodology: This chapter includes research design, time period covers, source of data, data collection technique and analysis tools.

Chapter IV: Data analysis and interpretation: In this chapter the collected data re tabulated and analyzed by using various statistical tools, graphs and diagrams. Similarly, this chapter includes major findings.

Chapter V: Summary, conclusion and recommendations: This chapter contains summary, conclusion and recommendations of the study:

Bibliography, appendix and other supporting documents have also been incorporated at the end of the study.

CHAPTER –II

REVIEW OF LITERATURE

2.1 Conceptual Framework

2.1.1 Concept of profit planning and control

A profit planning or budget is the formal expression of enterprises' plans and objective stated in financial terms, for a specified future period of time (Pandey, 1994: 556).

Profits do not just happen, profits are managed. When an organization's management plans its profit, it is known as profit planning. It is an overall planning process of an organization.

Profit means excess of company's revenue over the expenses of producing revenue in a given fiscal period. It is a primary measure of success of a company. Grog, jack and Johnston, Kenneth's state that "profit is the primary measure of business success in an economy if a firm cannot make profit, it cannot obtain capital, it cannot secure and retain other resources, such as manpower, materials and machines etc. In other words, the more profitable enterprises are more attractive to the holders of the available capital. Since these enterprises can attract capital they have the money needed to buy other resources. The key point is that capital and other resources are scare, they are allocated to the profit marks in roughly descending order of their profit potential planning means arrangement for doing or using something or considering in advance, it operates as the brain center of an organization it includes establishing objectives, developing premises about the environment selecting, course of action, initiating necessary activities and re- planning.

Planning constitute the main portions of a comprehensive profit planning system. The primary purpose of planning in business that is to in care the chances of making a profit. The budget is the primary operating planning, documents committed performance budgets and called profit plan. Each manager and subordinate is responsible for the operating of profit plan. Since, each manager and subordinate has authority, in varying degrees to make decisions which will affect the profit of the firm, he has commensurate responsibility for making decisions, the result of which will most nearly accomplish or batter his budgeting targets.

Profit planning is a format planning and involves the preparation in advance of quantitative as well as financial statement to indicate the indication of the management is respective if the carious aspect if the business. Profit planning in fact is a managerial technique and it is written plan in which all aspects of business operations with respect to definite future period are decided. It is a formal statement of policy objective and goal established by the management for some future period. Profit planning is a predetermined detail plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. Thus, it can be said that profit is a tool which may be used by the management in planning the future courses of action and controlling the actual performance (Dangol, 2004: 266-267).

2.1.2 Cost Volume Profit Analysis (CVP)

People invest huge amount of money in the business to earn profit. But to make profit is not a joke. Profit planning is the function of the selling price of product and units sold. The entire amount of profit planning is associated with CVP interrelationships. CVP analysis is the technique

that explores the relationship which exist between costs, revenue and output by showing the effects on profit of changes in selling price or services fees, costs, income tax rate and product mix. CVP analysis provides the management which a comprehensive overview of the effect on revenue and costs of short-term financial changes.

CVP analysis is a systematic method of examining the relationship. Between changes in activity and change in total sales revenue, expenses and profit. As a model of this relationship. CVP is powerful and helpful tool for managerial decision making cost control and profit planning in certain situation. Profit planning is the function of selling price of product, demand, variable cost fixed cost, tax. Management plans future operation by using CVP analysis for estimation of selling price per unit, variable cost, fixed cost and sales volume. CV analysis helps manager to see in advance to set different strategies and decision of business activities. The aim of CVP analysis is to have correct estimate of fixed cost, total revenue and profit.

CVP analysis helps manager to understand the interrelationship between cost, volume and profit in organizations by focusing the following four elements.

- Price of a product.
- Volume or level of activity.
- Per unit variable cost.
- Total fixed cost

Generally CVP analysis provides the answer to the questions such as:

- What sales volume needed to avoid losses ?
- What sales volume needed to earn desired profit ?

- What will be the effect of change in price?
- Which product or operation of a plant should be discontinued as soon?

CVP analysis seeks to estimate the profit or loss at different activity level. The aim of CPV analysis is to have correct estimate of :

- Total cost
- Total Revenue
- Profit at Various Volume (Munakarmi, 2003: 394-400).

2.1.3 Importance of CVP Analysis

Planning, controlling and decision making are the essential management functions. CVP analysis helps managers to prepare plan for profit to control cost and make decision. It helps:

- To determine the BEP in terms of units or sales volume.
- To ascertain the margin of safety.
- To estimate the profit or loss at various level of output.
- To assess the likely effect of management decision such as an increase or decrease in selling price adoption of new method of production to reduce direct labour cost and increase output.
- To help the management of find the most profitable combination of cast and volume.
- To determine the optimum selling price.
- To determine the sales volume of which the profit goal of firm will be achieved.
- To determine the maximum sales volume to avoid losses.
- To determine most profitable product (Munakarmi, 2003:401-402).

2.1.4 Purpose of CVP Analysis

Cost volume profit analysis helps management in a number of ways. The following purposes are served by it;

i. Calculation of profit resulting from a budget sales volume.
ii. Calculation of sales volume to break even.
iii. Calculation of sales volume to produce desired profit.
iv. Effect of changes on price, costs and profits.
v. Determination of new break-even point for changes in cost and selling price.
vi. Measurement of effect of changes in profit factors.
vii. Choosing the most profitable alternatives.
viii. Determining the optimum sales mix.
ix. Determination of capacity and equipment selection.
x. Long-term decision on continuance of product.
xi. Make or busy decision on sub-assemble or part.
xii. To contemplate the increase or decrease in profit due to change in method or production etc. (Dangol, 2004:416).

2.1.5 Assumption of CVP Analysis

CVP analysis is a vital technique that provides supplementary information for profit planning. Every business starts with the target of break even and that is aims to earn profit every its life. But the business firm passes through many ups and dawns. CVP analysis helps to plan for even set of goal in short-run. But CVP analysis encompasses the following assumption.

a. classification of all costs as variable and fixed

While developing and applying CVP analysis including BEP analysis, it assumes that sll cost can be classified in fixed and avarable costs. In fact, it is extremely difficult to identify each and ecery cost into fixed and variable. Costs are recorded in traditional types in developing countries thus it makes very hard to segregate cost into fixed and variable. Moreover flexible policy of company also makes to identify the cost as fixed and variable, the application of CVP analysis become almost impossible.

b. Linear behavior of cost within the Relevant Range

CVP analysis assumes that the total fixed costs do not change in short-run within relevant range. Total cartable costs are exactly proportionate to sales volume. But in reality cost behavior may not remain same with the change in the volume of output because of change in production setup with more or less purchase material cost per unit change due to quantity discount. costs change over time due to inflation EBP units and other variable of profit function do not remain constant over time. Therefore, BEP and other variables do not remain at every movement valid changed situation.

It inessential that anyone preparing or interpreting CVP results should be aware of the underlying assumptions. if these assumptions are not recognized, serious error may result and incorrect conclusion may be drawn from the analysis (Bajracharya et al. 2005: 258-260).

2.1.6 Application of CVP analysis in profit planning and control

cost volume profit analysis is an important tool for profit planning. It has been defined as a managerial tool showing the relationship among cost, selling price, profit and volume of activity. CVP analysis can be applied for the following purposes;

a. It helps in fixation of selling price.
b. It is helpful in cost control.
c. It also assists the management in understanding the behaviors of cost and help in budgetary control.
d. It helps in determining the level of output where all the cost cal be met.
e. It assists the management in profit planning.
f. It also assists the management in performance evaluation for the purpose of management control.
g. It helps carry much in making managerial decision such as make or buys a part, drop or continues a department or product; ine, accept or reject a special orders, selection of a profitable product mix (Dangol et al, 2004: 416).

2.1.7 Special problem in CVP Analysis

As per Welsch et al (2000), cost volume profit analysis is applied to individual product and all the product or activities combined. In latter case three problems can be encountered which are as follows:

1. Activity Based

When two or more product or activities are combined for break-even analysis, the activity based is usually net sales dollars. Product units are preferable if the analysis is applied ton one product. For multiple product

the activity base must be in additive units using common dominator of volume or output. Therefore, for the company as a whole, net sales dollar are usually the only satisfactory common denominator because manufacturing, selling and demonstrative activities are expressed in combination.

If flexible expenses budget are used, they can be summed for cost volume profit purposes. This process may cause some complication because the different departmental flexible budget is related to different activity base. For example, selling expenses may be related to sales dollars, factory overhead related to direct lab our or machine hour. To add the flexible expenses budget amounts, it must be assumed that the departmental activity factor correlate reasonably well with the overall activities base selected for break-even purposes. The usually producer in developing break even analysis based on flexible expenses budget is to add the foxed cost components shown in flexible budget amounts and to treat the remaining cost as variable.

2. Inventory change

Usually the budget charge in inventories (that is finished goods and work in process) are immaterial in amount and thus may be disregarded in cost volume profit analysis. On the other hand, when the change in budgeted inventory is significant it should be included in the analysis

Indecent the effects of cost volume profit analysis required subjective judgment about the effect of change.

a. What management might do (about to making inventory change) at different volume level and

b. The conceptual precision that is desired.

We will consider two practical approaches other used:

a. Disregarded the inventory change.
b. Include the inventory change.

3. Non-operating Income and Expenses

Non-operating income (gains) and expenses (losses) and extraordinary gain and losses, if material in amount accuse another problem in cost volume profit analysis. The basic issue is whether they should be included or excluded. Extraordinary gains and losses are Non-operating incomes (and gains) and expenses (and losses) are recurring but they are not related to ongoing operations. Normally they are excluded from CVP analysis. However, if they are included it is preferable to include the net of other incomer and other expenses if the excess is expenses, it should be added to fixed expenses, where as if the excess id income, it should be deducted from the fixed expenses.

4. Margin of Safety

The soundness of business is mediated by margin of safety. The difference between total sales and break even is identified by margin of safety. The high margin of safety is good for business. It indicates that there can be substantial falling of sale and yet profit can still be made on the other hand if the small margin of safety is small. It indicates the week position of business. The small margin of safety shows that even small reduction in sales or production will adversely affect the profit position of business. If margin of safety is satisfactory, the following steps can be taken:

- Increase the selling price.
- Increase the fixed cost.
- Increase the variable cost.

- Increase the sales or product mix ratio.

Margin of safety is ascertained by using following formula:

$$\text{Margin of safety (in units)} = \frac{\text{Profit}}{\text{Contribution Margin per unit}}$$

$$\text{Margin of safety (in RS.)} = \frac{\text{Profit}}{\text{P/v Ratio}}$$

$$\text{Margin of safety (in \%)} = \frac{\text{(Actual sales-BE sales)}}{\text{Actual sales}} \times 100$$

201.8 Approaches to cost volume profit analysis

The CVP relationship can be analyzed through different approaches which are:

a. Contribution margin approach.
b. Formula (equation approach.
c. The graphic (break-even-chart) approach.

a. Contribution margin

Contribution margin is the difference between the sales and variable cost of production. Contribution margin consists the fixed cost and profit i.e. contribution margin is the amount that contributes to recover of all fixed costs and to the generation of profit.

The contribution margin income statement approach to cost-volume-profit analysis allows the preparation of pro-formula statement from the available information. BEP and other required CVP relationship can be explained through a contribution margin statement whose philosophy is all fixed costs are period costs that should be deducted from the

contribution margin of the same period only the variable cost vary proportionally to the level of output r sales. 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 ration or profit volume ratios. That is:

$$\text{CM Ration of PV Ration} = \frac{\text{Contribution on margin}}{\text{Selling price}}$$

b. Formula Approach

The most popularly practiced approach to the break-even point and cost volume profit analysis s the formula, also known as the equation. It is particularly because the equation provides the most general and easiest to remember and used an algebraically equation to calculate the breakeven point. The answers provided by solving the equation may sometimes, need to be rounded to while numbers of units or lots sizes. The rounding of break-even-points is always done upward because this will provide a small profit rather then the small loss that would be shown from rounding downward (Dangol, et al, 2004).

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

BE Sales value =FC+VC ± profit

BE sales Units 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 revenues (RS.)	Q x p
Less: Variable cost	Q x VCPU
Contribution margin	Q x P – Q x VCPU
Less: Fixed costs	FC
Net profit	Q x P – Q x VCPU – FC

Therefore, BE sales value = FC + VC ±| profit.

BE sales units x SPPU = FC + (BE sales units x VCPU) ± profit

c. The Graphical Approach to CVP Analysis

A break-even-chart is used to graphically depict the relationships among revenues, variable costs, fixed cists 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 points, the firm earns profit (Bajracharya et al, 2004:231-232).

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

Total cost = TFC +Q x VCPU

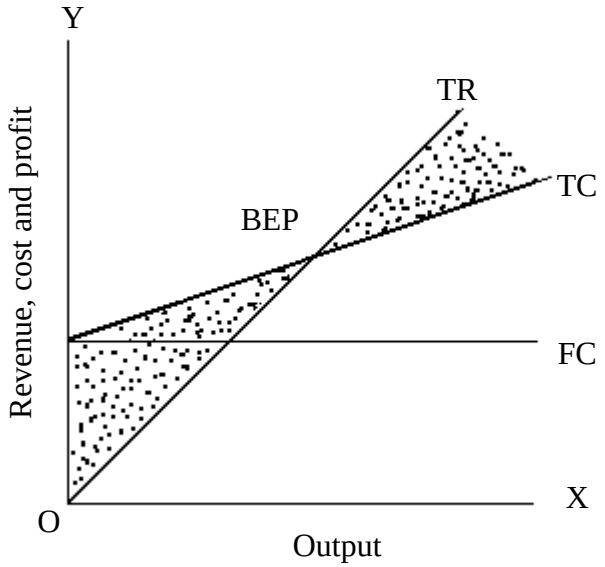
At volume ‘Q’ + ‘N”

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

ζ Total cost = O+ n x VCPP

ζ Total cost = ζ Variable costs

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



The above graphically shows that if the company can reach the point of BEP it can generate sufficient its operation expenses. At this point total revues equal to total cost. Here, the revenue curve breaks up (intersects) the total cost curve, that's why this points called break-even-points is that point,

Where,

Total sales Revenue = Total cost.

2.1.9 Break-Even Analysis

Break-even analysis is widely used technique to study-cost-volume profit relationship. The narrower interpretation of the term break-even analysis refers to a system of determination of that level of activity where total

cost equals total selling price. The broader interpretation refers to activity. It portrays the relationship between cost of production, volume of production and sales value .CVP analysis includes the entire gomsu of profit planning, while break even analysis is one of the techniques used in this process. However is so popular for studying CVP analysis that the two terms are used as synonymous terms (Maheshwari, 1998: 175-181)

a. Application of Break-Even Analysis

Break-even concept can be used to formulate policies in a business enterprise. Some of these applications are:

- Determination of profit of different levels of sales and margin of safety.
- To find the level of output to get the desired profit.
- Effect of price reduction on sales volume and changes in sales mix.
- Effect of fixed cost or arable cost changes on sales volume.
- Selection of most profitable alternation and make or buy decisions and drops and/or adds decisions.

b. Assumptions of Break-Even-point

The assumptions underlying the construction of a break-even chart are as follows:

- All costs can be classified into fixed and variable cost. There is no other cost other than fixed and variable.
- Fixed cost will remain constant and variable costs vary proportionately with activity.
- Selling price per unit remains constant. It is not affected by sakes volume.

- That either the firm produces.

c. Limitations of Break-Even-Analysis

Break-even analysis in many business situations can be used for effective decision making, but there are many shortcomings limitations in its analysis and interpretations. Some of these can be listed as:

- The assumption of producer's market phenomenon may not hold good for all type of commodities.
- The fixed cost may not remain constant as the variable cost may not vary in fixed proportions at levels of output.
- With variation in the prices of the items or services which also depend on the factors affecting its demand and supply will certainly affect the demand of the commodity. This phenomenon is not covered in break-even analysis.
- Identification of fixed and variable costs involved in production process is very complicated. A shift in production mix may change the creak-even-point.
- Consumers may be given certain discount on purchases to promote sales. This revenue my not be perfectly variable with level of sales output.

d. Cash Break-Even-Point

This BEP tells what volume of sales which is necessary to cover all operating expenses. If sales are maintained at the BEP then the company will neither earn profit nor will suffer form losses. What happens if company cannot achieve the BEP? Of courses, the company suffers from losses. It the company suffers form the loss, does it mean that the company is facing the difficulties in paying its monthly bills for rent

salary, suppliers and lab ours? Not necessary. It is because all fixed cost is kept in numerator while computing BEP. Fixed costs include certain non-cash expenses like depreciation and amortization, for which no cash is needed in the short-run. Therefore, company can exclude depreciation and other non-cash expenses in the short-run. Only cash costs are included in fixed costs to calculate cash BEP.

$$\text{Cash BEP} = \frac{\text{Cash fixed cost}}{\text{SPPU -VCPU}}$$

Or

$$\text{Cash Break-Even-point} = \frac{\text{Cash fixed cost}}{\text{Contribution Margin or p/v Ration}}$$

e. Profit Volume Analysis

The analysis of relationship between profit and volume is known as profit volume analysis. The two factor profit and volume are interconnected and dependent with each other profit depends upon sales, selling price to a greater extent will depend upon the volume of production. Thus, the entire amount of profit planning is associated with cost-volume-profit interrelationship.

f. Profit/Volume Ratio

This term is important for studying the profitability of operations of a business. Profit/volume ratio (i.e. p/v ratio) establishes a relationship between the contribution and the sales value. The ratio can be shown in the form of a percentage also. The formula can be expressed by:

$$\text{p/v ratio} = \frac{\text{Contribution}}{\text{Sales}} \left(\frac{\text{S- VC}}{\text{S}}\right) = \left(1 - \frac{\text{V}}{\text{S}}\right)$$

The ration can also be called as contribution margin ratio. This ratio can also be known by comparing the change in contribution to change in sales or change in profit to change in sales. Any increase in contribution would means increase in profit only because fixed costs are assumed to be constant at all level of production.

$$\text{P/V ratio} = \frac{\text{Change in contribution}}{\text{Change in sales}} = \frac{\text{Change in profit}}{\text{Change in sales}}$$

This ratio world remains constant at different levels of production since variable costs proportions to sales remain constant at various levels. This ratio is useful for determination of the desire level of output or profit and for the calculation of variable costs for any value sales. The variable cost can be expressed as follows:

VC = Sales (1 – p/v Ratio)

Comparison of different p/v ratio is usually made by the management of find out which product is more profitable management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling prices (Maheshwari, 1998).

2.1.10 Managerial uses of CVP Analysis

Planning controlling and decision making are the essential managerial function. CVP analysis helps the manager to plan for profit, to control cost and make decision. It is necessary to describe in greater details about it usefulness to management.

a. Management Plan Further Operation with CVP analysis

Profit does not just happen they must be managed and planned. By estimating the SP, VCPU, total FC and sales volume management can estimate profit. The estimated net profit can be examined by estimating SP, VCPU, Total FC and sales volume. If management believe profit are to low or too high, then CVP analysis can be used to determine the likely effects of changes it may wish to make in any of the variables. CVP analysis can be used as a starting point and as a quick and easy way to determine the likely effects of management policy change.

b. Management Uses the Budgeted Amounts to Control Operations throughout the certain period

Management should not now just sit back and wait unit the end of period to see if it was right or wrong. During the period, sales and cost figures actually incurred should compare with those expected to see if additional action should be taken. Management should then use CVP analysis to determine the probable effects of various alternatives which may be considered.

c. Management uses CVP Analysis to Analyze Past Performance

Management should determine the reason for difference or variance between budgeted and actual results. CVP analysis can make an important contribution in planning, organizing and controlling. It provides a framework for planning future operation and means for determining the likely effect of various ways of organizing those operations CVP can be used to control current operation by comparing actual result with planned results.

d. Management Uses CVP Analysis to Know How Much Business Safe

The higher the safety margin the safer is business and lower the safety margin the risk is the business. So margin safety is analysis is possible through CVP analysis.

e. Determination of selling price

Selling price has most sensitive effects in demand, profit and break even. A selling price of product covers all costs plus a required margin. Normally business firm have a goal of charging certain percent of profit margin Of selling price. The profit margin and SP depend on many factors including the nature of item, competition and the required return on investment.

f. Profit pick up in Incremental sales

Us to BEP, the company ears nothing, profit begins only after the BEP. Each unit sold beyond the BEP contributes towards profit. Therefore, each unit sold beyond BEP gives profit equal to CMPU.

2.1.11 Cost Volume profit Analysis for a Multi-product firm

The relative proportion of sales of product is called the sales nix or the product mix. In the case of multi-product firm, the contribution for each product can be found out by deducting its variable costs from sales revenue. The break-even-point for each product can be calculated only if the total fixed costs of the firm are distributed and fixed cost for each product is known. The firm’s overall breakeven point can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi-production firm’s P/V ratio will be the weighted average of the P/V

ratios for all the product sales. The p/v ratio for the multi-product firm can be calculated by dividing the total contribution from all products by total sales.

A change in the product mix will not affect the firm breakeven point and profit it each product has the same P/V ratio. However, a change in the product mix will change the breakeven point and profit when products have unequal p/v ratio (Maheshwari, 1998: 187).

2.1.12 BEP for Sales Mix/Multi-product

In multi-product firm, BEP is calculated in aggregate. The sales mix used to compute a weighted average unit contribution. This is the average of the several products unit contribution margin weighted by the relative sales proportion of each product. The following procedures are followed to calculate BEP for sales mix/ multi- product.

- Calculate CM/PV ratio for each product.
- Calculate proportion of sales mix in units and volutes follows:

$$\text{In Units} = \frac{\text{Individual product's sales Units}}{\text{Total of all products sales Units}}$$

$$\text{In Amount} = \frac{\text{Individual product's sales Amounts}}{\text{Total of all products sales Amount}}$$

Calculate weighted average for all products as follows:

= sales Mix (Units) x units contribution margin

or

Sales mix (units) x PV Ratio

$$\text{Computing BEP in Rs.} = \frac{\text{FC}}{\text{Weighted Average CM/PV Ratio}}$$

2.1.13 Method of Segregating Mixed or semi Variable cost

CVP analysis required the segregation of all cost into fixed and variables. So, the semi-variable cost should also be segregated into fixed and variable accordingly. The segregation of the semi-variable cost is done through one of the following methods (Maheshwari, 1998).

a. Level of Output Compared to Levels of Expenses Method

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

$$\text{Variable Element} = \frac{\text{Change in Amount of Expenses}}{\text{Change in Activity or Quality}}$$

b. Range Method

This method is similar to levels of output compared to level expenses expect that only the highest and lowest point 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.
- Compute the variable ratio “b” using the formula.

$$\text{Variable Rate} = \frac{\text{Difference in cost ‘y’}}{\text{Difference in Activity ‘x’}}$$

Compute the fixed cost as:

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

c. Degree of variability Method (DOV)

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

d. Scatter Group Method

In this method, the given data are plotted on graph paper and line of best fit is drawn, where semi-variable expenses is plotted on the vertical axis (y-axis) and activity measure is plotted on the horizontal axis (x-axis).

Procedure

- The volume of production is potted on the horizontal axis and the costs are plotted on 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 draw 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 paralleled 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.
- The vertical cost of any level can be known by nothing difference between fixed cost and total cost line.
- The scatter-graph method is relatively easy to use and simple to understand. However, it should be used with extreme caution, because it doesn't provide an objective lest for assuring that the

regression line drawn in the most accurate fit the underlying assumptions.

e. Least Square Method

One of the popular methods 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 find a line of best fit. To find the line of best fit, a technique called least square method is used.

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

$Y = a + bx$ and the various sub-equation shall be,

$\phi y = na + b\phi x^2$

$\phi xy = a\phi x + b\phi x^2$

Similarly, the equation can be fitted for any number of order or degree depending upon the number of observations available and the accuracy desired. Unit variable cost and fixed cost can be computed by using the following formula:

$$b = \frac{n\phi xy - \phi x\phi y}{n\phi x^2 - (\phi x)^2}$$

$$a = \frac{\phi y - b\,\phi x}{n}$$

Where,

a = Fixed cost

b = Unit variable cost

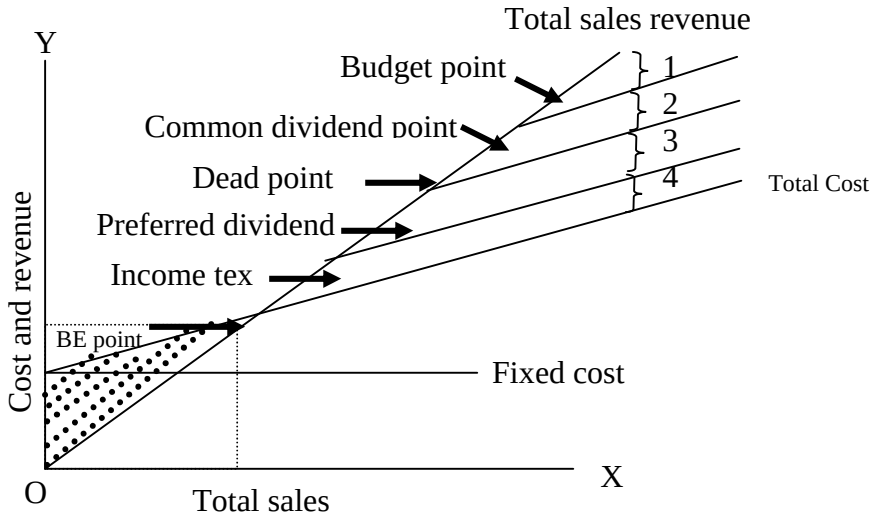
n = No. of observations

x = Output in units

ϕ = Sum of variables

2.1.14 Economic Characteristics of CVP Analysis

"Where cost volume profit analysis is reasonably accurate, they can help management decision making. Essentially, cost-volume profit analysis offers greater insight into the economic characteristics of a company and may be used to determine the approximate effect of various alternatives. CVP analysis is based on estimates, however, and the arithmetical manipulations generally involved average. Hence the result should never be interpreted as précis. Rather, analysis may be characterized appropriately as a "slide-rule" approach that may be used to develop and test with a minimum of effort, the approximate effect on costs and profits of servable types of management" (Welch, Hilton & Gordon, 2000).



Key,

1. Retained earning
2. Common dividends
3. Preferred dividend
4. Income tax (estimated)

The above chart indicates a few of the economic characteristics of a business, via.

- Fixed costs, variable cost and total costs at varying volumes.
- The profit and loss potential, before and after income taxes, at varying volumes.
- The margin of safety the relationship of budget volume to break-even volume.
- To break-even-point.
- To preferred dividend or danger point is the point below which preferred dividend are not earned.
- The dead point the point where management earns only the “going” rate on the investment.

The common dividend or unhealthy point the below which earnings are insufficient to pay the preferred dividends and the expected dividends on the common stock (Welsch, Hilton and Gordon, 2000).

2.1.15 Cost-Volume-profit Analysis with Limiting Factor

CVP analysis is helpful in profit planning and expected that a company will be able to produce any number of outputs of its choices (desire). But in real world it is not possible, because of some critical. Factors like

finishing machine or raw material or labor. These critical factors in the CVP analysis are known are known as constraints.

a. CVP analysis with a Single Constraint

Scarce resources should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resources. This can occur if the firm products are all produced on a single machine and output is limited by hours available on this machine. In the same way single resources constraint arises, if the firm's products are all produced with only one material and output is limited by quantity available for the materials. When there is a constraint for scarce resources to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scarce resources should be allocated to the alternative uses on the basis of contribution per scarce resources.

b. CVP Analysis with a Multiple Constraints

Where more then one scarce resource exists, the optimum production programmer can not easily be established by the simple process applied in single resources or the basis of contribution margin per unit is neither feasible nor desirable. Contribution margin per unit of scarce resources may be different for different scarce resources. In such situation, linear programming technique may be used to optimize product mix. The linear programming formulation is required to determine a production plant that maximizes contribution from the product mix. Linear programming is a mathematical technique which shows how to arrive at the optimum results, by allocating available resources in a meaningful manner. It is basically concerned with the problem of allocating limit resources among competitive activities in an optimal manner. It is a technique to optimize

the allocation of scarce resources in product mix problem which provides a valuable extension of cost-volume-profit analysis (Munakarmi, 2003:148).l

2.1.16 CVP Analysis under Condition of Uncertainty

CVP analysis can be used for various proposes. Such as choosing between machine and products, planning of profit and most significantly fixing up of selling price. Management has used this as a convenient tool of profit planning without giving consideration of risk and uncertainty involved in it. Although, margin of safety ratio explains the degree of sensitivity of the product and also between the alternatives. To cover come such a difficulty, risk and uncertainty analysis can also be sued in CVP analysis.

Probability distribution approach is a simple statistical tool which may be used to measure the risk and uncertainty involved in CVP analysis. A probability distribution of happing of the even in consideration id used. This may do neither taking into consideration of the experience in the past or may be done by consideration the personal intuition of the persons doing so. In business, references of past experience are hardly available therefore a person is likely to behave in the same manager in the similar situation in different time. Personal judgment plays significant role in the management decision making. The condition thus, postulated are assigned probability (i.e. ones judgment towards likeliness of happening of the condition forecasted). It must be understood here that probability assigned here is a subjective probability based in, personal judgment of the man making such a analysis (Pandey, 2003).

1.1.17 Cost Structure and operating leverage

a. Cost Structure

Cost structure refers to the relative proportion of fixed and variable cost in an organization. The relationship of variable and fixed cost is reflected in its operating. The highly labour intensive organization ahs high, variable cost and low fixed cost and thus make low operating leverage and relatively low break even point. Conversely, organization that is highly capital intensive has a cost structure that include low variable and fixed cists. Such a structure reflects high operating leverage and relatively high break even point. Company with lower fixed cists and higher variable costs will enjoy greater stability in the income and will be more protected from losses during bad years but at the cost of lower net income in good years.

b. Operating Leverage

Operating leverage is a measure of the extent to which fixed cists are being used in organization. The relationship of a company is variable and a fixed cost is reflected in its operating leverage. Generally, highly labour intensive organization high variable costs and low fixed costs and this makes low operating leverage and relatively low breath even point. Conversely, organization that I hly capital intensive may have cost structure that includes low variable and high operating leverage with high breath which reflects high operating leverage high breath even point. It shows that foxed costs and operating leverage have direct relationship. Higher the amount of fixed costs higher the operating leverage and breath even point and vice versa. In other world the form with relatively high operating leverage has proportionally high fixed expenses, the firms

breakeven point will be relatively high. The operating leverage, factory is determined as under (Munakarmi, 2003:145).

$$\text{Degree of operating leverage} = \frac{\text{Contribution Margin}}{\text{EBIT}}$$

2.1.18 Sensitivity Analysis

Sensitivity analysis in the measurement of elasticity of the change in cost volume and profit factors or breakeven point or given profit. The strategist should focus more on the factors, which is more sensitive or responsive for profit. To measure the sensitivity of cost volume profit factors one can see the I pact of certain percentage or amount of change in volume, price or cost factor on the net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinate variables. The goal of business enterprise is to minimize profit which occurs on account of excess of revenues over the total costs.

Net profit = Total sales revenue – Total cost = sales Units SPPU – sales Unit x VCPO- fixed cost- Taxes

But oil one of the factors remains unchanged; sometimes the manager can intentionally change the price and cost factors as a part of strategic decisions. But the strategy should focus more on the factors, which is more sensitive or responsive for profit. Therefore, to measure the sensitivity of cost volume profit factors, we can see the impact of certain percentage or amount change in volume, price or cost factors on net profit (Bajracharya, et al; 2004:245).

Profit is the function of a several of factors. It is affected by change in volume, cost and price. Profit may be affected by the change (increase or decrease), in the following factors:

⁾ Effect of price changes

An increase in the selling price will the increase P/V ration and as a result will lower the breakeven point. On the contrary, a decrease in selling price will reduce the P/V ration and therefore, result in a higher breakeven point.

⁾Effect of Volume change

A change in volume, not accompanied with a change in the selling pr8ice and / or costs, will not affect p/v ration. As a result, the breakeven point remains unchanged. Profit will increase with an increase in volume and will reduce with a decrease in volume.

⁾ Effect of price and volume changes

A change is price invariably affects volume. A price reduces increases 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, price rice may reduce profits if there is material fall in volume.

⁾ Effect of change in Variable Costs

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

- **Effect changes in fixed costs**

A change in fixed cost does not influence P/V ration. Other factors remaining unchanges, a fall in fixed cost does not influence P/V ration. Other factors remaining unchanges, a fall in the fixed cost will lower the BEP and rise profit. An increase in fixed costs caused either due to some external factors or due to some changes in the am management policy, will rice the BEP. Increase in factory rent or insurance and faxes are examples of external factors, while increased depreciation or salaries of managers may be the result of management decisions.

- **Effect of change in combination of Factors**

The financial manager of the management, evaluating profit plans or budgets must realize that change in one factor leads to a change in an other factors. Therefore, all such change should be carefully visualized and their net impact on profit must be seen (Pandey, 1595:203-208).

2.2 Review of Unpublished Master Degree Dissertation

Among other master degree thesis written by previous researchers. Some are founded to be relevant for studies which are presented below:

Namder (2006). Has submitted the thesis on the topic *"CVP analysis of Dairy Development Corporation". The main objective of this thesis is to determine the relationship between cost, volume and profit and profitability of the DDC.*

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 of sales.
- To analyze the productivity of the labour by using different productivity ratios.
- To analyze the CVP of the corporation and its impact or its profit planning.
- To provide necessary suggestions and recommendations, whatever necessary, base on findings.

His research covered the time period of five years from 2055/61. Research methodology was through primary as well as secondary sources..

Major findings:

- DDC has been planning only on should term basis.
- The practice of CVP analysis has not been used yet.
- There is no practice of segregating cost into fixed and variable.
- 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 high low contribution margin, resulting in high BEP sales.
- The profitability of the DDC is also very poor.
- All the levels of management are not involved in profit planning and decision making of the corporation.

Aryal (2007), had conducted a research entitled *"CVP Analysis as a Total to Measures Effectiveness of PPC"*. (A Case Study of Herbs Production and Processing Co. Ltd.)

Main objectives:

- To analyze the variance between target and actual sales of HPPCL.
- To evaluate the profitability financial position HPPCL.
- To provide suitable suggestions and recommendations based on the analysis for improving of HPPCL'S condition etc.

Major findings:

- Budgets were prepared on traditional method.
- HPPCL has burden of management and administration expenses and interest on loan which is directly influencing the profitability.
- HPPCL adopted traditional pricing meth9od to determine price, which may not appropriate in today's competitive market.
- There was a not practice to separating cost in to fixed and variable. The costs are roughly classified and that classification is not scientific and appropriate. Thus it is difficult to use financial tools, like as flexible budget, CVP, cost of goods sold and degree of operating leverage and profit margin ratio.
- HPPCL is suffering from huge cusses, so in every year has negative net profit margin ratio.
- Profit volume ration of the company is in fluctuated friend, which effects on BEP of the company.
- Margin of safety of the company is negative trend. So company could cot sold properly and suffering form losses.
- BEF of the company is analysis higher then Actual sales. So, company should not maintain its expenses.

Bhusal (2006), has conducted a research entitled *"Use Of Cost Volume Profit Analysis To Plan The Profit In Nepalese Manufacturing Companies (A Case Study Of Bottlers Nepal Ltd.)"*. The main objective

of his study is to examining the use of CVP analysis to plan the profit in bottlers Nepal limited.

Main objectives:

- To study the present application of CVP analysis in Bottlers Nepal Limited.
- To study the profitability and financial position of Bottler Nepal Limited.
- To analyze the CVP and its impact in profitability of Bottler Nepal Limited.

Major findings:

- The company has not maintained the broad and long range objectives and periodic report and objectives are limited to the high ranking official only.
- Sales and production target are not achieving because there is not an effective forecasting system.
- The profit of the company is not satisfactory.
- The company has no details and systematic expenses plans. The fixed, variable and mixed expenses plan is the necessary elements for profit planning and control.
- BNL has not proper practice of segregating the costs into fixed and variable or controllable and non-controllable.

Adhikari (2009), has presented a dissertation on the topic of "Cost Volume profit Analysis of Nepal Lube oil Limited". This mains objective of his study is to examine the use of CVP analysis to plan the profit on Nepal lube oil limited.

Main objectives

- To produce and refine oil and chemicals in the country itself, substitute import of refined goods and purchase necessary new materials from other countries.
- To make necessary contract and agreement with different national and international, governments departments, office and bodies to increase production, capabilities and improve quality.
- To study the relationship between cost volume and profit as a tool of budgeting.
- To manage the non-technical and technical manpower form outside or inside the company and give necessary training inside on outside the company.
- To sell the product in direct part of the country.
- To provide necessary suggestion and recommendation wherever necessary base on finding.

Major findings:

- Company has usually very low margin at safety and also negative in some fiscal year.
- Sales amount of the company are fluctuating and increasing trend.
- They budgeted sales are more then actual sales in equality.
- Correlation coefficient between budgeted sales quantity and actual sales quantity is negative; this shows that there is moderate degree at negative correction coefficient.
- In flexible budget that company suffers form losses below 100% capacity utilization. Here 100% capacity indicates current utilization capacity is average.
- BEP is in increasing trend due to decrease in (an) ration.

Mainali (2010) has submitted thesis on the topic “Cost-Volume Profit Analysis as a tool of Profit Planning and control: A Case Study of Salt Trading Corporation Limited." His major objective was to analyze the impact of cost-volume profit on performance of STCL.

Objectives:

- To analyze the cost and profit and loss of STCL.
- To study the relationship of cost, volume and profit.
- To analyze the impact of cost-volume, profit on performance of the STCL.
- To provide the suggestions for the betterment of selected organization.

Major findings:

- Company sold different products among them agricultural material and machine equipment on total sales are found nominal. But other products made highest contribution on total sales.
- Expenses of Salt Trading Corporation Limited is fluctuated. Variable as well as fixed cost increase and decrease in the period. it has no details of systematic expenses plan.
- From correlation analysis, it is found that there is high degree of positive correlation between sales and net profit. Change in sales made changes in profit but change is not in same ratio.
- This correlation has no lower BEP ratio. Lower BEP indicates strength position of corporation. Therefore the condition of corporation is not so good taking reference of BEP ratio.
- The highest percentage of MOS ratio indicates that the company is in strong profitability ratio.
- Contribution margin of the corporation is not stable and satisfactory.

- Profit trend of the company is not satisfactory. As compare to profit, proportion is very low with fluctuating trend.
- Financial position of the company is not so good. Net profit margin, profitability ratios and other things are not satisfactory.

2.3 Research Gap

All the previous research work were done on PPC of manufacturing company. The research studies have recommended them effective implementation of PPC. Some research was done on CVP analysis as an important tool of PPC.

One research conducted on practice of management accounting is listed companies of Nepal focusing on the overall aspect of management accounting but could not deal on specific tools like CVP. This is the age of specialization not generalization. It is realized that specific tool becomes more effective rather then using overall tools as a whole of once. This is the main weak point of the precious researches. One research on CVP analysis was made but failed deal on utilization of CVP. Thus to fill up these gap the current research was conducted. Mainly this research focused on operating position of the organization. Therefore, profit and loss account was the focal point of the study of this research profit and loss account fully provides the information of revenue and cost. Clear picture of CVP and its impact on productivity were made in this research. Probably this might be the first research study in the sense of providing Multi product analysis carried on this topic in Nepal. So this study will be fruitful to those interested persons, scholars, students, teachers, stakeholders, civil society, businessmen and government for academically as well as policy perspectives.

CHAPTER – III

RESEARCH METHODOLOGY

3.1 Research Design

The study has adopted the descriptive and analytical type of research design. To give the introduction of the study, literature review and the recommendation and summary are descriptive type of research design. The descriptive research design gives the foundation for the analytical research design. The analysis and presentation is the part of analytical design of research this analysis gives the fact and real findings to the study. To be a success researcher descriptive and analytical research designs should be included in the research .

3.2 Population and sample

There are thirty-six public enterprises in Nepal so we can say that this is the population for the researcher who prepares the research on any one public enterprise. In this sense we can say that salt trading corporation is one of the public enterprise, so population is 36 and sample is one. There should be some similarity among the public enterprises. There is general rule of sampling that we study about a single sample and predict the situation of other on the basis of a sample. But in Nepal, situation is little bit different. There is one the highest tax paying public enterprise and also there is enterprises which have not earned the profit after the establishment. So it means there is great variance in PES. We can not estimate the condition of other companies studying of one. In this sense I like to say that the population is single and sample is single that is salt trading corporation limited (STCL).

3.3 Sources of Data

For any research and analysis data are the most important part. Without data no reliable result can be given. So it is necessary to collect data. To collect data. It necessary to know about the sources of data. Sources are those things or places where required information are found. There are two types of data.

Secondary data are those data, which are collected from library, company's publications, books and journals, negative, books and internet. The main secondary data are library where the previous thesis are studied and necessary data has been collected. The main sources of data collection were the yearly report of salt trading corporation limited. From internet "www.stcnepal.com" is also used to get information. Kantipur nations daily also helped to get some information. To collect the data the 36^{th} to 43^{rd} annual report of STCL were used as main secondary sources.

3.4 Tools of Data Analysis

The collected data are analyzed with the help of various descriptive tools and quantitative techniques with the help of descriptive tools, they are put in a certain format to give the meaningful and systematic result. And the data, which are numeric, are put into certain table, graphs and formulae so these types of data are analyzed using quantitative technique. Such quantitative techniques are BEP, Contribution margin, margin of safety, correlation coefficient, operating leverage, regression etc. which are described briefly as follows:

3.4.1 Break Even Point

BEP is the level of activity where total costs are equal to total sales. It is the point of “no profit, no loss”. The formulae to calculate BEP are as follows:

BEP in units = $\frac{FC}{SPPU \; ZVCPU}$

BEP in Rs. = $\frac{FC}{P/V \; ratio}$

3.4.2 Contribution Margin

Contribution margin highlights the relationship among cost, sales and profit. It is the excess of sales price of a unit of output over its variable cost. It can be represne4ted as:

CM = Sales revenue – Variable cost (S-VC)

3.4.3 Profit Volume Ratio (P/V ratio)

PV ratio expresses the relationship of contribution to sales. If the contribution margin is divided by sales revenue, the result is PV ratio. Symbolically, it is

PV ratio = $\frac{CM}{Sales}$

Or PV ratio = $\frac{FC \; \Gamma \; Profit}{Sales} or \frac{FC \; \Gamma \; P}{S}$

Or PV ratio = 1 - $\frac{V}{S}$ or 1-VC ratio

3.4.4 Correlation Coefficient

Correlation may be defined as the degree of linear relationship existing between two or more variables in the value of one variable is accompanied by change of another variable.

$$r = \frac{n \quad xy\,Z \quad x. \quad y}{\sqrt{n \quad x^2\,Z(\quad x)^2}\sqrt{n \quad y^2\,Z(\quad y)^2}}$$

3.4.5 Least Square

Least square method is based on the mathematical technique of fitting and equation with the help of a number of observations. The linear equation an be assumed as:

$Y = a + bx$ and the various sub-equation shall be,

$\phi y = na + b\phi x^2$

$\phi xy = a\phi x + b\phi x^2$

Where,

$$b = \frac{n\phi xy - \phi x\phi y}{n\phi x^2 - (\phi x)^2}$$

$$a = \frac{\phi y - b\,\phi x}{n}$$

Where,

a = Fixed cost

b = Unit variable cost

n = No. of observations

x = Output in units

ϕ = Sum of variables

CHAPTER-IV

DATA PRESENTATION AND ANALYSIS

4.1 General Concept

Profit planning is a formal expression of the enterprises plan, goals and objectives stated in financial terms for specific future period of time. It is one of the most important management tool that is used to develop effective performance and systematic approach for attaining desired goals. CVP-analysis a tools of 'PPC' can be most important device to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in managerial decision making especially in profit planning and control. The CVP analysis is a specific way of presenting and studying the interrelationship between cost volume and profit.

The main purpose of this research is to examine CVP-analysis as a tool to measure the effectiveness of profit planning and evaluate the present practice of CVP-analysis and identify the area where CVP analysis could be applied to strengthen the manufacturing industries. For this reason salt trading corporation has been randomly selected for the study and analysis purpose. To meet the said objectives the secondary data we used for sales trend analysis, cost analysis, profitability analysis and cost volume profit analysis etc. The secondary data were collected from annual report of the company similarly the primary data were used for segregation of cost into variable and fixed cost and other required queries. This study has tried to cover the activities of the salt trading corporation for the last seven year (i.e. From the fiscal year 2058/059 to 2065/066). The information which has been collected from salt trading corporation, were systematically presented.

4.2 Sales Trend Analysis

4.2.1 Overall Sales

STCL is a trading corporation. The sales are as follows,

Table 4.1

Sales Growth

Rs in Lakhs

Year / Details	2058/059	2059/060	2060/061	2061/062	2062/063	2063/064	2064/065	2065/066
Total sales	18834	24654	39075	22215	18505	19162	21389	31904
Change in sales %	7.8%	30.9%	58.49%	-43.15%	-16.70%	3.55%	11.62%	49.16%

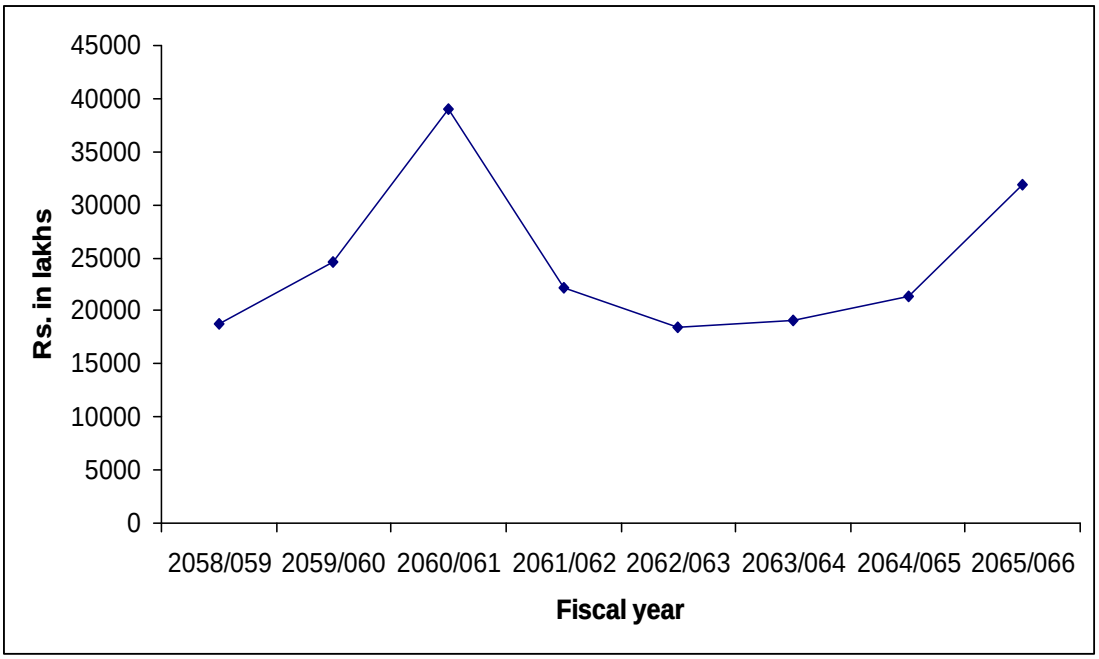
Source: Annual report of STCL

The table 4.1 showed that total sales of the company from the FY 2058/59 to 2065/66 is fluctuating. From fiscal year 2058/59 to 2060/61 sales is increasing but in FY 2061/62 and 2062/63 it is decreased suddenly to negative point. The cause of decrease is political situation of Nepal. After the peace process in 2062/63 the sales is increasing gradually every year. The sales in year 2059/60, 2060/61 and 2065/66 is satisfactory which has been increased, 30.9%, 58.49 and 49.16% respectively.

The overall sales of the company can be seen from the following graphical presentation.

Figure 4.1

Sales Trend of STCL



The amount of total sales volume can be clearly presented with the help of simple bar diagram. Simple bar diagram is the simplest way of comparative study of values of a single variable. The figure 4.1 shows that the different years sales fluctuation clearly. The highest sales is in year 2060/61 and slopped straight down in 2061/62 in year 2063/64 the sales is minimum. Since that year the sales is increasing gradually every year. Which concludes that the sales is in increasing trend which is good for STCL.

4.2.2 Product-wise sales

STCL has six different products ranging

1) Food material
2) Agricultural material
3) Fuel lubricant and type tubes
4) Machines and equipments
5) Construction materials

6) Other materials

The sales values of each product are presented in the following table.

Table 4.2

Product-wise sales growth

(Rs in Lakhs)

Year / Products		2058/059	2059/060	2060/061	2061/062	2062/063	2063/064	2064/065	2065/066
1.Food material	Sales amount (Rs)	12970	14756	16125	11762	12037	11818	14222	21672
	Change%	26.65	13.77	9.28	27.06	2.34	1.82	20.34	52.38
2.Agricultaral material	Amount (Rs)	904.1	1382.2	2586	55	122	173.43	773.9	1973
	Change%	65.98	52.88	87.09	96.17	23.23	42.16	346	154.9
3. Fuel	Amount (Rs)	3932.9	7709.2	17359	6651	4409	4310	3364	6243
	Change%	2.56	96.05	125.18	61.69	33.71	2.25	21.95	85.58
4. Machine & equipment	Amount (Rs)	57.25	137.6	2231	815	33.28	26.9	19.7	-
	Change%	-	140.35	1521.65	63.47	95.92	19.17	26.77	
5.Constructions materials	Amount (Rs)	308.61	514	110	69	560	1547	1625.8	546
	Change%	24.63	39.96	78.57	37.27	711.59	176.25	5.09	66.42
6.Other materials	Amount (Rs)	585.9	110.85	576	2540	1463	1286	1383	1469
	Change%	135.86	81.08	420.25	340.97	42.40	12.10	7.54	6.22

Source:- Annual report of STCL

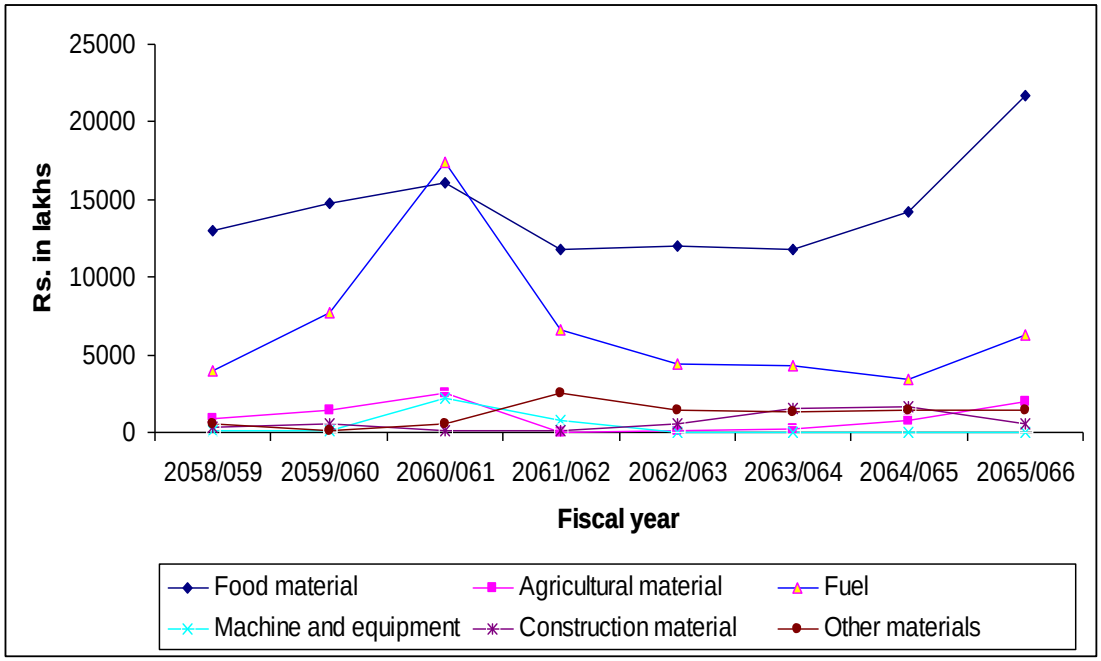
The table 4.2 shows that total sales of the product are in increasing trend during the fiscal year 2058/59 to 2060/61. After that the sales trend slightly decreased. The consumable materials increase b 26.65%, 13.77%, 9.28% in the fiscal year 2058/59, 2059/60, 2060/61 respectively. But in 2061/62 and 2063/64 it is decreased by 27.06% & 1.82% . But in 2064/65 and 2065/66 it has increased highly by 20.34 & 52.38% . The

sales of agricultural material is greatly fluctuating. In 2058/59 it is negative by 65.98% and also in 2061/62 it has decreased by 96.17%. But in fiscal year 2059/60, 2060/61, 2062/63, 2063/64, 2064/65 and 2065/66 it has increased highly by 52.88, 87.09, 23.23, 42.16, 346 and 154.9% respectively. The sales of fule, type and tube is more negative in fiscal year but it has increased by 96.03, 125.18 and 85.58% in 2059/60, 2060/61 and 2065/66 . The sale of machine & equipment has increased heavely by 140.35% and 1521.65% in year 2059/60 and 2060/61 but decreased to negative after that each year up to 2065/66 . And the same fluctuation in the sales trend of construction material and others materials. In this way we can say that in 2061/62 to 2063/64 the sales trend is decreasing and in 2064/65 and 2065/66 the sales is increasing. Because the political change has taken place in the country in year 2062/63.

The change we said above can be seen in the following graphical presentation.

Figure 4.2

Contribution of Each Product on Total Sales



The sales of different product can be clearly present with the help of sub-divided bar-diagram. Sub divided bar diagrams are useful for presenting several items of variables graphically. It also helps to study the relationship between each component. The figure 4.2 shows share of fuel, lubricant and tyre tube and agricultural material in total sales in each fiscal year. The share of other material and construction material in total sales also found significant. But the share of machine and equipment except FY 2060/61 and 2061/62 is nominal.

4.3 Variable Cost-Analysis

Variable cost varies in direct proportion to change in output or activity level, but per unit is constant within one financial years. Variable cost per unit may vary for different financial years on account of internal or external environment of the company. According to the company's annual reports variable cost is cost covering cost of sales which is as follows,

Table 4.3

Variable cost-details

Year / Details	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66
Cost of sales	18758	24610	38989	21939	18505	19162	21389	31904
Opening inventory	1999	3707	6681	4706	7898	8765	7144	6116
Add purchase	15408	21380	29825	17984	12797	10082	13172	25467
Add misc expenses	3135	3816	4032	4580	3990	4741	4190	6623
Total	20552	28903	40538	27270	24685	23588	24506	38206
Less closing stock	3707	6681	4706	7898	8765	7144	6116	10057
Cost of sales	16845	22222	35832	19372	15920	16444	18390	28149
Change%	6.28	31.92	61.25	45.94	17.82	3.29	11.83	53.07

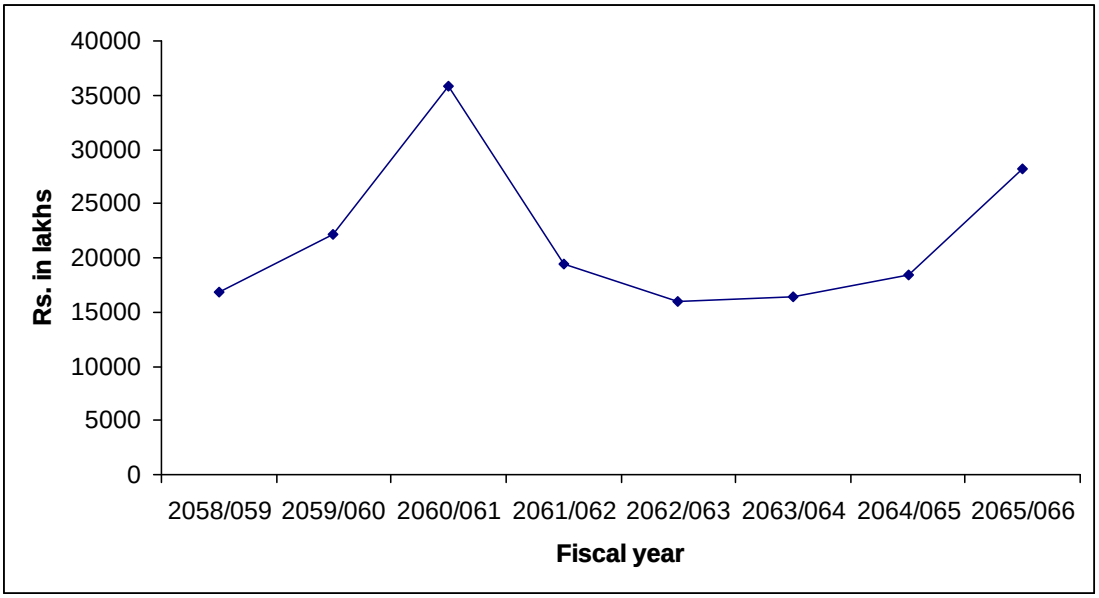
The table 4.3 shows that the fluctuating trend in the variable cost sheet variation in variable cost of sales, opening inventory, purchase and miscellaneous expenses for different years is because of different internal and external factors. Purchase and miscellaneous expenses have greater contribution towards increase in amount at cost of sales every year. In fiscal year 2061/62 and 2062/63 variable cost decreases by 45.94 and 17.82% respectively. In FY 2063/64 and 2064/65 variable cost increases by normal rate of 3.29, 11.83%. But in FY 2059/60, 2060/61 and 2065/66 it has increased by 31.92, 61.25 and 53.07% respectively, which are higher than normal rate of increase.

In STCL all of the variable costs are cost of sales.

Because this is not manufacturing company but only the trading company. Therefore it has not specific manufacturing cost. From the annual report of STCL, we can get only above mentioned cost i.e. cost of sales as a variable cost. The position of variable cost of the company can be clearly seen from the following graphic representation.

Figure 4.3

Trend of variable cost



The amount of variable cost can be clearly seen from the above graph. The trend of variance cost is fluctuating. In 2058/059, 2059/060 and 2060/061 it is up warding means increasing rapidly. But in 2061/062 it decreased significantly. After 2062/063, it has increased slightly in 2063/064, 2064/065 and 2065/66.

4.4 Fixed Cost Analysis

Fixed cost remains constant in total amount despite the change in the level of activity. That is fixed cost remains unchanged in total as the output level varies within a year but fixed cost per unit decreases as the level of activity in increase and vice-versa. Fixed cost in total varies from different fiscal year may not remain stable because of internal and external factors of the company. According to the company's annual report fixed cost is classified into the following patterns.

Table 4.4

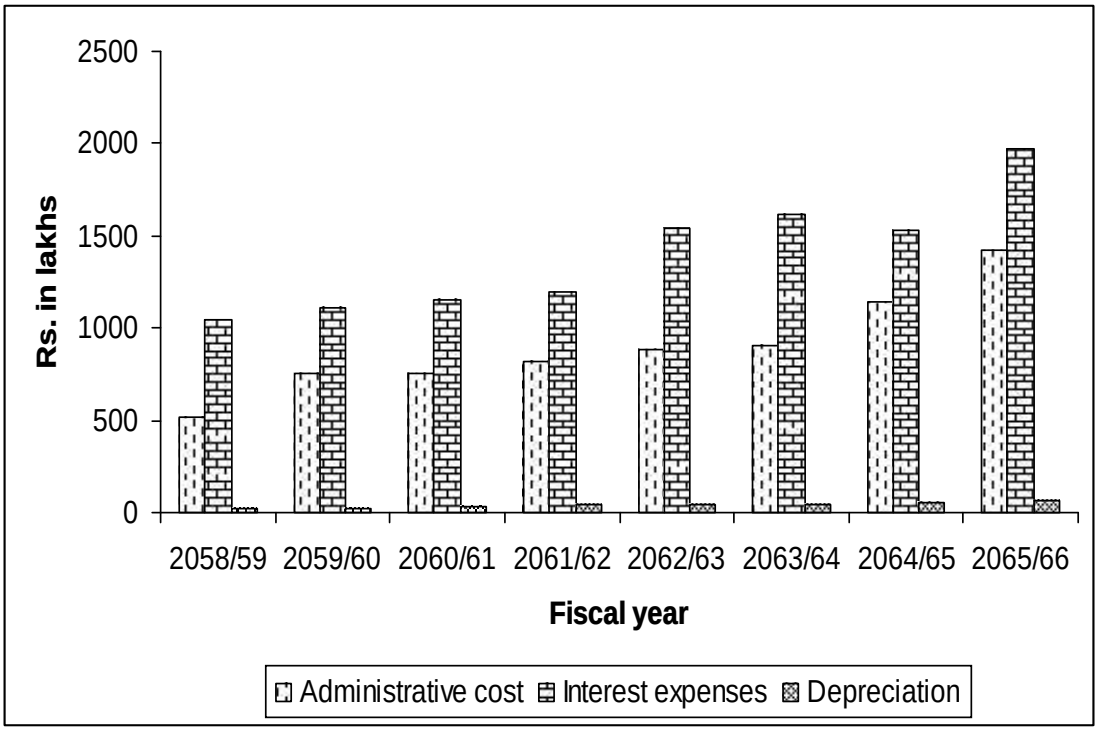
Fixed Cost Details

Fiscal Years	**Administrative Cost**		**Interest exp.**		**Depreciation Expenses**		**Total Cost**	
	Cost	Change	Cost	Change	Cost	Change	Cost	Change
2058/59	522	1.95	1050	12.54	20.8	1.42	1593	8.62
2059/60	753	44.25	1114	12.51	25.4	22.12	1893	18.81
2060/61	758	0.66	1156	6.09	36	42.91	1950	3.08
2061/62	822	8.44	1199	3.72	38	5.56	2059	5.59
2062/63	883	7.42	1540	28.44	47	23.68	2470	19.96
2063/64	904	2.27	1611	4.61	42	11.99	2557	3.52
2064/65	1143	26.44	1529	5.1	51	21.43	2723	6.49
2065/66	1424	24.58	1971	28.91	70	37.25	3465	27.25
Total	7209		11170		330.2		18710	

The table 4.4 shows that administrative expenses interest and depreciation expenses for different FY. In the fiscal year 2058/59 to 2065/66 the expenses are in increasing trend except the depreciation in 2063/64 and the interest in 2064/65. The nature of the fixed cost is remained constant in total amount despite the change in the level of activity. But in this corporation the trend of fixed cost does not remain constant. In every year, every costs are in increasing trend. Administrative cost is increased by 1.95, 44.25, 0.66, 8.44, 7.42, 2.27, 26.44 and 24.58 from the fiscal year 2058/59 to 2065/66 respectively. Maximum increase year is 2059/60. In that year the management spent huge amount of money on the topic of salary and wages, welcome to guest, insurance, donation etc. These costs can be seen on the table of details information about the administrative cost. The interest expenses is also fluctuating from 3.72 to 28.91%. It is negative only in FY 2064/65. Interest covers the largest portion of total fixed cost. Each year corporation has to pay more interest to the investor. Except the year 2063/64 and 2058/59 the depreciation expenses is also in increasing trend. Corporation has bought new machine, vehicle and other fixed nature goods, therefore the amount of depreciation is also increasing. In total the fixed cost is in increasing trend. The rate of increase is lowest in 2060/61 i.e. 27.25%.The position of the fixed cost of the corporation can be shown in graphic representation as follows:

Figure 4.4

Position of Fixed Cost



The amount of the fixed cost can be clearly presented with the help of above simple bar diagram. Simple bar diagram is the simplest way of showing various items, which is frequently in practice for the comparative study of value of single variable. The figure 4.4 shows that the fixed cost is increasing gradually. Where interest expenses has the largest position. which conclude that the company is enlarging the investment and purchasing the fixed assets.

4.5 Income Statement-Analysis

Income is computed by deducting all expenditures from turnover. It is surplus of sales over expenditure. Income measures the real performance of company. High income indicates the good performance whereas and income threatens the company. It is the necessary element to run any company. Value of income is received by deducting variable costs from

sales, contribution margin is obtained. It fixed cost is deducted from contribution margin then we get profit. Much information can be presented with the help of following income statement.

Table 4.5

Income Statement

S.N.	Details Year	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66
1	Sales	18758	24610	38989	21939	18505	19162	21389	31904
2	Variable costs	16845	22222	35832	19372	15920	16444	18390	28149
3	Contribution margin (1-2)	1913	2388	3157	2567	2585	2718	2999	3755
4	Fixed cost	1593	1893	1950	2059	2470	2557	2723	3465
5	Net income (3-4)	320	495	1207	508	115	161	276	290
6	Net profit margin (5-1)	1.71	2.01	3.1	2.32	0.62	0.84	1.29	0.91
7	VC ratio (2/1)	89.8	90.3	91.9	88.3	86.03	85.82	85.98	88.23
8	% of FC on sales (4/1)	8.49	7.69	5	9.39	13.35	13.34	12.73	10.86
9	% of VC on total cost (2/2+4)	91.36	92.15	94.84	90.39	86.57	86.54	87.10	89.04
10	% of FC on total cost (4/2+4)	8.64	7.85	5.16	9.61	13.43	13.47	12.90	10.96
11	Operating coverage(3-5)	5.98	4.82	2.62	5.05	22.47	16.88	10.86	12.95

Source :- Annual report of STCL

Here net income represents operating income only. Non-operating and non operating expenses are not incorporated in this analysis. Net profit margin of the company are 1.71, 2.01, 3.1, 2.32, 0.62, 0.84, 1.29 and 0.91

from FY 2058/59 to 2065/66 respectively. It indicates that net profit of the company are not satisfactory. It is fluctuating up to FY 2060/61 it is

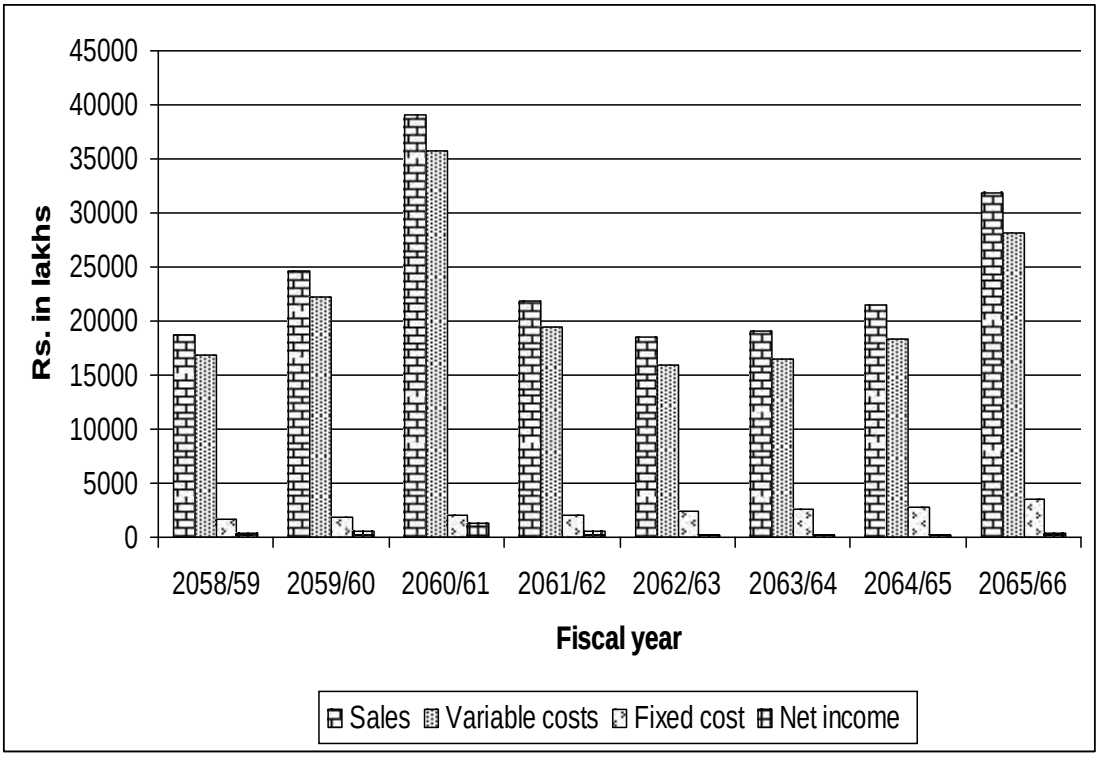
Increasing but from 2061/62 it is decreasing up to 2065/66.

The variable cost ratio of the company are 89.8, 90.3, 91.9, 88.3, 86.03, 85.82, 85.98, 88.23 in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. Which is comparatively high lower VC ratio indicates the ability to earn profit. The percentage of fixed cost on sales are 8.49, 7.61,5, 9.39, 13.35, 13.34, 12.73, 10.86% for the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. Nearly 85% or above of total sales is covered by variable cost but the coverage of fixed cost is below than 10%. The variable cost occupy higher portion of total costs and the proportion of fixed cost on total cost is very low. This indicates that the company is not leverage organization variable cost changes with the change in activity level but the fixed cost remains constant up to the certain level of activity. If the level of sales increases variable cost also increases but the fixed cost remains same. That is why fixed cost is defined as coverage cost. Therefore the company must maintain higher proportion of fixed cost on its cost structure to increase more profit than increase in sales. The operating coverage of the company are 5.98, 4.82, 2.62, 5.05, 22.47, 16.88, 10.86 and 12.95 for the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. Operating coverage measures the operating risk of the company. Lower value of operating coverage indicates lower amount of operating risk. The company uses low amount of fixed cost so it has lower value of operating coverage. Similarly the company has lower

amount profit sales, variable cost, fixed cost and operating profit of the company can be clearly seen in the following graphical presentation.

Figure 4.5

Sales, VC, FC and NP



The figure 4.5 shows that sales, variable cost and fixed cost. Although the sales decrease during the period the profit increase due to the reduction in fixed costs.

4.6 Analysis of correlation between sales and net profit

Two variables said to be correlated if change in the value of one variable appears to be related or linked with change in other variable correlation is an analysis of the covariance between two or more variables. Correlation analysis deals with the degree of relationship between variables. The correlation analysis refers to the closeness of the degree of correlation is measured by correlation coefficient. Various methods can be used to

determine correlation coefficient. Here Karl Pearson's coefficient of correlation, a most popular method is used to determine the coefficient of correlation between sales and net profit.

Table 4.6

Analysis of correlation between sales and net profit

Years	Sales(X)	Profit(Y)	XY	X^2	Y^2
2058/59	18758	320	6002560	351862564	102400
2059/60	24610	495	12181950	605652100	245025
2060/61	38989	1207	47059723	1520142121	1456849
2061/62	21939	508	11145012	481319721	258064
2062/63	18505	115	2128075	3402435025	13225
2063/64	19162	161	3085082	367182244	25921
2064/65	21389	276	5903364	454489321	76176
2065/66	31904	290	92521160	1017865216	84100
Total	195256	3372	180026926	8200948312	2261760

Correlation Coefficient (r) = $\frac{N \quad xy \, Z \quad x. \quad y}{\sqrt{N \quad x^2 \, Z(\quad x)^2}\sqrt{N \quad y^2 \, Z(\quad y)^2}}$

$= \frac{8 \mid 96757926 \, Z195256 \mid 3372}{\sqrt{8 \mid 5143948312 \, Z(195256)^2}\sqrt{8 \mid 2261760 \, Z(3372)^2}}$

$= \frac{115660176}{142654621}$

$= 0.8108$

Probable Error (PE) = $0.6745x \ \frac{1 Z r^2}{\sqrt{8}}$

$0.6745 \text{ x } \frac{1 Z (0.8108)^2}{\sqrt{8}}$

= 0.087

The value of correlation is 0.81, which indicates that there is high degree of positive correlation between sales and net profit. The value of correlation coefficient suggests that if sales increases, net profit also increases, but not in same ratio, the 0.81 correlation coefficient means if sales increase by 100% then there is possibility of profit increase is 81%.

Since correlation coefficient (r) is greater then 6 times of PE of 'r' i.e.(0.81>6x0.087), it suggests that there is significant relationship between the net profit and sales, which is good indicator for future.

4.7 Contribution Margin

Contribution margin is the excess of sales revenue over variable costs. Contribution margin is the balance available to recover fixed expenses after which it contributes towards profit. If the contribution margin available out of sales is not sufficient to recover the fixed costs, then the firm suffers from losses. Contribution margin per unit is selling price per unit less variable cost per unit contribution margin express as percentage on sales revenue is called contribution margin (CM) ratio or profit volume P/V ratio. Total contribution margin and contribution margin ratio are presented in the following table.

Table 4.7

Contribution Margin

Year / Details	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66
Sales	18758	24610	38989	21939	18505	19162	21389	31904
CM	1913	2388	3157	2567	2585	2718	2999	3755
PV or CM ratio	10.29	9.7	8.1	11.7	13.97	14.18	14.02	11.77

The contribution margin and PV ratio are in increasing trend except in year 2060/61. The PV ratios are 10.29%, 9.7%, 8.1%, 11.7%, 13.97%, 14.18%, 14.02% and 11.77% in the FY 2058/59, 2059/60, 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. The PV ratio of the company is not satisfactory, it is too low, due to huge amount of variable costs. The low contribution margin shows the poor profitability of the company. Management tries to increase the value of CM ratio by reducing the variable cost or by increasing selling price. The PV ratio is found using the formula:

$$\text{PV ratio} = \frac{Contribution\ margin}{Sales}$$

4.7.1 Break-Even Analysis

The point which breaks the total cost and the selling price evenly to show the level of output or sales at which there shall be neither profit nor loss is regarded as break-even point. Through contribution margin approach break-even point can be expressed by:

$$\text{Break even point (in amount)} = \frac{Fixed\ cost}{P/V\ ratio} or\ \frac{FC}{CMPU}$$

The following table shows the analysis of BEP:

Table 4.8

Break-Even-Point

Year / Details	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66
BEP in (Rs.)	15481	19515	24074	17598	17681	18032	19422	29439
Change %	-	26.06	23.36	(26.9)	0.47	1.99	7.47	51.58
BEP ratio	8253	0.793	0.6175	0.8021	0.9555	0.941	0.908	0.9227

$$\text{BEP ratio} = \frac{BEP\ sales\ (Rs.)}{Actual\ sales}$$

The table 4.8 shows that the BEP are in fluctuating trend. The main reason of fluctuating trend of BEP are change in fixed cost and change in variable costs. The change in contribution margin of Profit volume ratio is also the root cause of reduction and deduction of BEP. BEP of the company are Rs. 15481, 19515, 24074, 17598, 17681, 18032, 19422 and 29439 for the FY 2058 to 2065/66 respectively. Which are high in comparison to the corresponding sales. The high amount of BEP is not good for the profitability of the company, higher BEP reduces the amount of profit. The ratio of BEP sales on actual soles is called BEP ratio. It provides information about how many percentages of total sales is utilized only to meet the total cost. The break even ratio of the company are 82.53%, 79.3%, 61.75%, 80.21%, 95.55%, 94.1%, 90.80% and 92.27% for the FY 2058/59 to 2065/66 respectively. Lower break-even ratio indicates the strength of the company, but the STCL has not lower BEP ratio, it is too high, so in the basis of BEP ratio, we can say that the company's condition is not good.

4.8 Margin of Safety Analysis

Margin of safety is the excess of actual sales over the break-even sales volume. Thus it provides a certain amount of cashing to the company to avoid loss. The formula for its calculation is, margin of safety (MOS) = total sales– break sales. The larger the margin of safety that indicates the better profitability of the company.

A low margin of safety is the result of high operating cost. The margin of safety can be expressed as a percentage by dividing the margin of safety

by actual sales. Margin of safety and safety margin ratio of the company are presented in the following table.

Table 4.9

Margin of Safety Analysis

Year / Details	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66
Margin of safety	3277	5095	14915	4341	864	1130	1967	2465
MOS ratio %	17.47	20.7	38.25	19.79	4.45	5.90	9.20	7.73

In the above table, it can be clearly seen the actual position of the margin of safety of the company. The margin of safety of the company is in fluctuating trend. IN the FY 2058/.59 the MOS is 3277 lakhs. Similarly, MOS are 5059, 14915, 4341, 864, 1130, 1967 and 2465 for the fiscal year 2059/60 to 2065/66 respectively. The margin of safety ratio are 17.47%, 20.7%, 38.25%, 19.79%, 4.45%, 5.90%, 9.20% and 7.73%. The MOS ratio are not satisfactory except in the year 2060/61 of 38.25%. Here the higher percentage of MOS is better for the company.

4.9 Sensitivity of CVP Analysis

The analysis of cost behaviour facilitates the use of CVP technique to know the degree of impact on financial result which is known as "sensitivity analysis." CVP analysis helps to measure the extent of the impact of changes in key factors such as price, volume, variable cost and combination of factors which shows proportionate relationship. 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 prices, volume, variable cost, fixed cost and combination of factors, which shows

proportionate relationship, positive relationship, inverse relation and no relationship. The following table provides the insights in sensitivity analysis.

Table 4.10

Different Factors Affecting CVP Analysis

Factors	Effect in PV ratio	Effect in BEP	Effect in profit
Sales revenue			
Increase	No effect	No effect	Increase
Decrease	No effect	No effect	Decrease
Variable cost			
Increase	Decrease	Decrease	Decrease
Decrease	Increase	Increase	Increase
Fixed cost			
Increase	No effect	Increase	Decrease
Decrease	No effect	Decrease	Increase

4.9.1 Effect of Change in Sales Value

Any change, increase or decrease in the sales value will have effect in profit. There will be changes in profitability as the changes occur in operating leverage. An analysis of increase and decrease of sales value by 10% for the fiscal year 2063/645 with other factors assume remain constant are presented below:

Table 4.11

Income Statement with Change of Sales Value

for the FY 2063/64

NRs. in lakhs

Details	Original	Change on sales value	
		10% increase	10% decrease
Sales revenue	19162	21078	17246
Less: Variable cost	16445	18090	14801
Contribution margin	2717	2988	2445
Less: Fixed cost	2559	2559	2559
Profit	158	429	(114)
CM ratio (CM/Sales)	6.1418	0.1418	0.1418
BEP = $\frac{NFC}{CM\ ratio}$	18046	18046	18046

The above table 4.11 shows that with the increase in sales by 10%, the profit of the company increases by 171.52%. Similarly, when the sales decreases by 10%, the profit also decreases by 171.52%. The profit/loss is changed by the same percentage when sales is changed by 10%. But the CM ratio and BEP are same. They are unchanged with change in sales.

4.9.2 Effects of Change in Variable Cost

The impact of change in variable cost on profit is straight forward if it does not cause any change in sales revenue and fixed cost. An increase in variable cost will lower PV ratio, push up the BEP and reduce profit. On the other hand if the variable cost decline, PV ratio increases, BEP will be lowered and profit will rise. If the increase and decrease of variable cost remain same, it gets following result for the fiscal year 2063/64.

Table 4.12

Income Statement with Change in Variable Cost for the Fiscal year 2063/64

Details	Original	Change on sales value	
		10% increase	10% decrease
Sales revenue	19162	21078	17246
Less: Variable cost	16445	18090	14801
Contribution margin	2717	2988	2445
Less: Fixed cost	2559	2559	2559
Profit	159	(1487)	18025
CM ratio (CM/Sales)	0.1418	(0.5594)	0.2275
BEP	18046	45742	11244

Above table no. 4.12 shows that with 10% increase in variable cost, break even point increases by 153.47% which indicates that variable cost and BEP have positive and proportionate relationship. Similarly, with the decrease in variable cost by 10%, the BEP also has decreased by 37.69%.

4.9.3 Effect of Change in Fixed Cost

A change in fixed cost does not influence PV ratio. Other factors remaining unchanged, a fall in fixed cost will lower the BEP and raise profit. An increase in fixed cost will push up BEP but reduce profit. If increase and decrease of fixed cost by 10% with other factors assume to remain same, it gets following result for the fiscal year 2063/64.

Table 4.13

Income Statement with Change in FC by 10% for FY 2064/065

NRs. in lakh

Details	Original	Change on sales value	
		10% increase	10% decrease
Sales revenue	19162	21078	17246
Less: Variable cost	16445	18090	14801
Contribution margin	2717	2988	2445
Less: Fixed cost	2559	2559	2559
Profit	158	(98)	414
CM ratio (CM/Sales)	0.1418	0.1418	0.1418
BEP	18046	19852	16241

Above table 4.13 shows that when 10% increase in fixed cost, BEP increased by same percentage i.e. 10% and with 10% decrease in fixed cost BEP amount also decreased by the same 10%. Form this situation, it can be concluded that BEP and fixed cost has get direct and proportionate relationship.

4.10 Major Findings of the Study

On the basis of analysis, observation and information the following major findings have been presented:

- The sales of the STCL is in fluctuating trend and increasing since the fiscal year 2063/64.
- STCL sales different products, among them the contribution of other products is the highest.
- The expenses of STCL are in fluctuating trend, variable cost is in high proportion, which contributes for lower profit.

- The company has high fixed cost (i.e. high interest, administrative expenses and depreciation) among them interest expenses is in highest proportion.
- From correlation analysis, it is found that there is high degree of positive correlation between sales and net profit. Change in sales makes change in profit but change is not in the same ratio.
- STCL has higher BEP ratio. Higher BEP ratio indicates weak position of the corporation is not so good taking the reference of BEP ratio.
- The MOS ratio of the company is fluctuating and too low which indicates that the corporation is not in strong profitability ratio.
- Contribution margin ratio of the company is not satisfactory due to high variable cost, which indicates lower profitability.
- The profit trend of the company is not satisfactory. It is fluctuating and low.
- There is no any plan to reduce the cost because of lack of effective cost control programme and technique.
- The company has no detailed and systematic expenses plan. The fixed and variable expenses plan are the necessary elements for profit planning and control.
- In the corporation there is no effective inventory policy. The inventory management and controlling systems are not effective and efficient.
- The corporation does not apply any appropriate and effective sales forecasting technique.
- There is no any special system of taking corrective action for the replanning.
- The board of directors is the main authority which interfere in pricing the materials.

- STCL distributes its products all over Nepal, specially iodionized salt.
- STCL has not proper practice of segregating the costs into fixed and variable or controllable and uncontrollable.
- Financial position of the company is not so good. Net profit margin, profitability ratios and other things are not satisfactory.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Nepal is a developing country in the world. The main sources of income are agriculture. Industrialization is essential for the socio-economic development of the nation. Science and technological advancement play vital role in industrialization of the nation. Management of all these sectors is very essential. Without good management organization cannot achieve its goal and objectives. The government of Nepal has established so many public enterprises to facilitate the services towards the people. Most of the public enterprises are suffering from loss. Available resources and capacity are not utilized properly. Many tools and techniques for measurement of financial performances.

Efficient management is the prime necessity of today's world as resources are limited and scarce. Proper uses of scarce resources in effective and efficient way are essential. As future is uncertain so risk is present in the business world. To avoid or reduce such risk, proper management is very necessary. Management effectively helps achieve organizational objectives through the efficient use of the scarce resources in a changing environment. Cost volume and profit analysis is an analytical technique which helps to study the relationship between cost, volume and profit. Cost volume and profit analysis helps to manage profit without suffering from loss in future. So profit planning refers to a written plan. Without cost, volume and profit planning tools estimation of profit are possible.

The objectives behind the research study is to examine the effectiveness

of profit planning and control with the help of cost, volume and profit tool in Salt Trading Corporation Limited. Focus of this study is to evaluate cost, volume and profit relationship of STCL. Salt Trading in Corporation has been able to meet the expectation of general public. The secondary and primary data with descriptive and analytical approach are used for cost analysis, sales analysis, contribution margin analysis, P/V ratio analysis and break-even analysis. Table analysis and questionnaire distribution are made for gathering information and tabulating them.

Salt Trading Corporation has low contribution margin, low P/V ratio, high break-even-point and low margin of safety. The sensitivity test of CVP analysis proves that if variable and fixed cost increases, the break even piton will also increases and if they are decreased then, the break-even point also decreases. But at the time of increases in sales price the break-even point will decrease. It indicates that cost and break-even point has positive correlation where as sales price and break-even point has negatively correlated. The company's condition is very poor and requires effective improvement in situation.

5.2 Conclusion

Salt Trading Corporation Limited could not achieve the goal. Various popular profit planning tool like, JIT, Zero-based budgeting, CVP analysis are not practiced in Salt Trading Corporation Limited. Cost segregation into fixed and variable where not done. The operating and maintenance cost are in rising trend. No specific technique was used till now to control cost or reduce them. Classification of cost was not done on scientific and systematic basis rather they are done on hunches and prediction made by employees. Salt Trading Corporation Limited still remained behind for the realistic budgeted and was not been able to

practice CVP analysis as a tool to profit planning and control. The study of CVP Salt Trading Corporation Limited shows that the corporation has low and fluctuating contribution margin affecting the profit. Even though corporation's contribution margin has increased by because of increase in sales revenue but the increase in fixed cost has increased BEP to higher level. The sensitivity of CVP analysis in response to change in fixed cost is proportionate whereas it is very high in response to change in sales revenue and variable cost. The increase in sales revenue of the company has also increased profit and safety margin. CVP relationship was not used in STCL while developing sales plan, production plan and pricing strategy. The company is at risky situation since the company has minimum profit in the year 2058/59 and 2063/64.

Salt Trading Corporation Limited control fixed cost and to maximize variable cost profit. The company's management need to take corrective action as soon as possible by controlling cost their behaviors through effective technique, if not Salt Trading Corporation Limited to have suffer from further losses in coming years.

5.3 Recommendations

Nepal is moving towards globalization with membership of WTO. Therefore, Nepalese companies now have to prepare themselves to compete with international market through effective use of limited resources. Profit planning and control is a means for every organization to achieve goals in a cut throat competition without much difficulty. Nepalese organization lacks effective tools for its improvement. Thus, the following recommendations are made taking the reference of major findings.

- In Nepal, more public and private enterprise have not practiced CVP analysis in systematic manner. So, it is suggested that every public and private enterprises should apply CVP analysis.

- CVP analysis shows the relationship cost, revenue, profit. So, this tool is very much useful to every organization in formulation profit plan for future.
- In this corporation, there are many expert and skilled manpower but CVP analysis is not used. Semi-variable costs are not segregated systematically into fixed or variable.
- The objectives are the basic guideline of Salt Trading Corporation. Therefore, duties and responsibilities to be clearly assigned to its staffs. So that overall objectives of the corporation can be achieved.
- BEP ratio of the corporation was not satisfactory level, In the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65, the BEP ratio are 92.18 percent, 82.98 percent, 73.18 percent, 66.08 percent, 80.40 percent, 95.65 percent and 94.18 percent respectively. To make a good condition of the organization, they should have maintained minimum level of BEP ratio. Lower the BEP ratio, lower risk and vice-versa.
- Like other trading company in Nepal, Salt Trading lacks profit planning and control tools for import substitution and increase in profit. Better planning tools are needed to be utilized like CVP analysis and budgeting.
- Salt Trading Corporation Limited should follow CVP analysis to reach break-even point which helps in preparation of sales plan, purchase plan and setting price of its products.
- Salt Trading Corporation should increase the proportion of fixed cost and should reduce the proportion of variable cost on its cost structure to be a leverage organization
- As STCL is multi-product company more emphasis should be provided for the product of consumable materials heaving higher contribution margin to generate more profit.
- As STCL spend huge amount on the topic of salaries and wages, it

should like proper manpower planning to reduce the cost.

- Some portions of profit should be allocated to reduce and development program so that new technology could be found which provide more competitiveness in the market.
- New market areas should be identified for the coverage increase of company.
- System of periodicals performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately.
- Sales revenue of the corporation is fluctuating trend it is not sufficient to cover the cost and earn desire profit. Sales plan of the enterprises should clear maintain and improve.
- There are many new and popular management theories like, management by objective, participative management etc. This principle can be more effective to every organization. STCL should apply this theory for better performance of the enterprises.
- Margin of safety ratio of the corporation was satisfactory level but not sufficient. Higher the percentage of MOS ratio indicates, higher the possibility of good position of the corporation. Therefore the management should ready to keep this position and ready to make more it.
- Different products of different years, contribution margin was also different. Some product of the different year, the contribution margins was not same ratio. Very low contribution margin, the product of machine and equipment, in the FY 2063/64 and 2064/65 was Rs. 4 and Rs. 9 and Rs. 7 in the FY 2061/62 and 2062/63, on the product of construction material. Therefore, the management should ready to replace those products and given to the more emphasis to the remaining products.

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