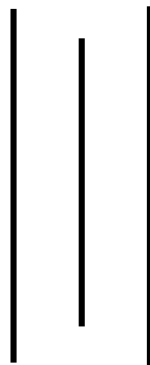


**COST-VOLUME-PROFIT ANALYSIS AS A TOOL  
IN PROFIT PLANNING AND CONTROL  
(A Case Study of Salt Trading Corporation Ltd.)**

**By**  
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**A Thesis Submitted to:**  
**Office of the Dean**  
**Faculty of Management**  
**Tribhuvan University**



*In partial fulfillment of the requirement for the degree of  
Master of Business Studies (MBS)*

**Kathmandu, Nepal**  
**August 2010**

## **RECOMMENDATION**

This is to certify that the thesis

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**Entitled:**

**COST-VOLUME-PROFIT ANALYSIS AS A TOOL  
IN PROFIT PLANNING AND CONTROL  
(A Case Study of Salt Trading Corporation Ltd.)**

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## **DECLARATION**

I hereby declare that the work reported in this thesis entitled “Cost-Volume-Profit Analysis as a Tool in Profit Planning And Control (A Case Study of Salt Trading Corporation Ltd.)” submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the degree of Master of Business Studies (MBS) under the supervision of Joginder Goet of Shanker Dev Campus, T.U.

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## **ABBREVIATIONS**

BE	:	Break Even
BEP	:	Break Even Point
CM	:	Contribution Margin
CMPU	:	Contribution Margin Per Unit
CV	:	Coefficient of Variation
CVP	:	Cost-Volume Profit
DDC	:	Dairy Development Corporation
DOL	:	Degree of Operating Leverage
e.g.	:	Example
GDP	:	Gross Domestic Product
HCIL	:	Hetauda Cement Industry Limited
HPPCL	:	Herbs Production and Processing Company Limited
i.e.	:	That is
Ltd.	:	Limited
No.	:	Number
NRB	:	Nepal Rastra Bank
NTC	:	National Trading Limited
P	:	Price
P/L Account	:	Profit/Loss Account
P/V Ratio	:	Profit Volume Ratio
PE	:	Public Enterprise
PPC	:	Profit Planning and Control
Q	:	Quantity
r	:	Correlation
Rs.	:	Rupees
S.N.	:	Serial Number
SPPU	:	Selling Price Per Unit
STCL	:	Salt Trading Corporation Limited
TFC	:	Total Fix Cost
V/V	:	Variable Cost to Volume

VCPU : Variable Cost Per Unit

# **CHAPTER - I**

## **INTRODUCTION**

### **1.1 Background of the Study**

Science and technology has created such a fundamental change in the 21<sup>st</sup> century that the world can be categorized into developed countries and developing countries. The development of a nation's economy is the outcome of industrialization. The economic growth of countries without industrialization is not possible.

The economy of Nepal is totally depended upon agriculture. Private sector and foreign investments could not provide sufficient opportunities due to lack of proper infrastructure and present situation of the country. Public sector is mostly related to import substitute and export promotion. The history of public enterprises begins after the establishment of Biratnagar Jute Mill in 1994 A.D. Before the democracy of 2007 there were limited public enterprises realizing the need of industrialization. The government of Nepal established many industries after the democracy to promote industries. Udhyog Parisad was established to encourage industrialization. After some years it was converted into cottage and village industry development.

After the restoration of democracy in 2047, the government adopted the policy of liberalization and privatization of public enterprises. It is seen that continuous inefficiency and ineffective of PEs have had a negative impact on the economy particularly on the issues of sustainability and their overwhelming demand on government resources. Besides, lack of clear definition of private and public sector, both the sectors unfairly competing with each other in all the areas covering manufacturing, trading, services etc.

In developing country like Nepal, industrialization is the most essence for rapid economic development. Industrializations increase the value of agricultural products and helps to shift and labour force from agricultural to industries.

Nepal has insufficient physical infrastructure and resources. But the important point is that the reasons behind Nepal's under developed situation are due to lack of proper utilization of available resources. For the productive and effective control system. Profit planning and control is used an important tool for the same purpose which helps to achieve desire goals and objective according to its plan and control standard.

### **1.2 Introduction of Salt Trading Corporation Limited**

The controllable transaction of salt in our country has resulted because of artificial shortage of salt from time to time. Moreover, an unnecessary increase in price of salt, selling inedible salt to the people created need of an institution to eliminate such situation. Salt trading corporation Ltd. (STCL) was incorporated in the year 2020 B.S. to regulate supply of salt with the collaboration of government National Trading Limited (NTL). The investments made by government, NTL and common people were Rs. 2,02,000, Rs. 100,000 and Rs. 10,00,000 respectively. STCL has been progressing rapidly. It has authorized capital of Rs. 100,00,00,000, issues capital Rs. 1,00,00,00,000 and paid up capital of Rs. 2,47,77,700. At present STCL has many branches across the country. Its main office is situated in Kalimati of Kathmandu.

The establishment of STCL regulated to distribution of quantitative salt at proper price to its customers all over the country. Especially salt trading corporation limited is working for edible salt. It provides salt containing iodine, oil, ghee, sugar, flour item, tyre, tube, fertilizer, rice, cement, dal, tea, wheat, coal and other product throughout the country.

### **1.3 Statement of the Problem**

Nepalese corporations are still in infancy position. Despite various attractive and liberal policies of the government of Nepal for public corporation, new public corporations were not satisfactory. The financial performance of established 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 corporations. Such reasons should be investigated and enforce corrective action for improvement in their performance.

STCL was established under the joint public and private ownership as a service oriented trading business. A huge amount of investment was made but the performance of the company was not fully satisfactory. Since it has made a long journey, the profit and loss trend of the company in the immediate previous 7 years are given below:

(NRs. in Lakh)

<b>Fiscal Year</b>	<b>Profit (in Rs.)</b>
2058/59	115
2059/60	328
2060/61	694
2061/62	1005
2062/63	505
2063/64	113
2064/65	158

*Source: Annual Report of STC*

STCL is operating at profit. The profits are in fluctuating trend. Profit is an accounting measure. It may not reflect economic reality of business enterprise because of various problems like, labour strike, political situation of the country. So, the study is basically need to find out the problems faced by STCL with the help of CVP tools to comment on the justification of financial results.

This study has tried to answer the following questions:

- ) In which way the cost and profit and loss of STCL be recorded?
- ) What is the relation among the cost, volume and profit of STCL?

- ) What is the impact of cost-volume profit on performance of STCL?

#### **1.4 Objectives of the Study**

The main objective of this study is to examine "cost-Volume-Profit Analysis" as a tool to measure effectiveness of PPC of "Salt Trading Corporation."

To achieve this objective the following sub-objectives were set:

- ) 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 suggestions for the betterment of selected organization.

#### **1.5 Significance of the Study**

The present research work is the study of the practice of cost-volume-profit analysis in Salt Trading Corporation. This study will be significant in the 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 will be 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 towards 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 issue.

#### **1.6 Limitation of the Study**

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



- ) Cost-volume-profit analysis covers the period of last seven years data ranging from the fiscal year 2058/59 to 2064/65 only.
- ) The study is mostly based 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 descriptive research design is used in the study. Analysis of data is based on the description of various financial and statistical tools.

The whole study is organized into the different chapters.

### **Chapter – I Introduction**

This chapter have covered introduction, statement of the problem, objective of the study, significant of the study and limitations of ht study.

### **Chapter – II Review of Literature**

This chapter deals with 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 techniques and analysis tools.

### **Chapter – IV Data Presentation and Analysis**

In this chapter, the collected data are tabulated and analyzed by using various statistical tools, graphs and diagrams. Similarly, this chapter dealt with major findings of the study.

### **Chapter – V Summary, Conclusions and Recommendations**

This chapter has contained summary, conclusions and recommendations of the study.

Bibliography, appendix of 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, 12989: 556).

Profits do not just happen, profits are managed. When an organization's management plan 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 Johnsoton, Kenneths, 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 world, 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 bay other resources. The key here is that capital and other resources are scare, they are allocated to the profit makers 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-0 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 better his budgeting targets.

Profit planning is a forward planning and involves the preparation in advance of quantitative as well as financial statement to indicate the intention of the management is respective of the various aspect of 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.

### **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 prize or services fees, costs, income tax rate and product mix. CVP analysis provides the management with a comprehensive overview of the effect on revenue and costs of kind 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 net 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 question such as:

- ) What sales volume needed 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

### **2.1.3 Importance of CVP Analysis**

Planning, controlling and decision making are the essential management functions CPV 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 cost and volume.
- ) To determine the optimum selling price.
- ) To determine the sales volume of which the profit goal of the firm will be achieved.
- ) To determine the maximum sales volume to avoid losses.
- ) To determine most profitable and least profitable product (Munankarmi, 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 buy 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 Assumptions 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 it aims to earn profit ever its life. But the business firm passes through many ups and downs. CVP analysis helps to plan for even set of goal in short-run. But CVP analysis encompasses the following assumption (Bajracharya et al. 2004, 258-260).

#### **a. Classification of all costs as Variable and Fixed**

While developing and applying CVP analysis including BEP analysis, it assumes that all cost can be classified into fixed and variable costs. In fact, it is extremely difficult to identify each and every 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 variable costs are exactly proportionate to sales volume. But in reality cost behaviour 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 is essential 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.

### **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 behaviours of cost and help in budgetary control.
- d. It helps in determining the level of output where all the cost can be met.
- e. It assist the management in profit planning.
- f. It also assists the management in performance evaluation for the purpose of management control.
- g. It helps very much in making managerial decision such as make or buy a part, drop or continue a department or product line, 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**

Cost volume profit analysis is applied to individual product or part of a business and all the products or activities combined. In latter case three problems can be encountered which is as follows (Welsch, et al, 2000: 513-518).

#### **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 over head related to direct labour 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 activity base selected for break even purposes. The usually producer in developing break even analysis based on flexible expenses budget is to add the fixed cost components shown in flexible budget amounts and to treat the remaining cost as variable.

## **2. Inventory Change**

Usually the budget change 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.

Including the effects of cost volume profit analysis required subjective judgement about the effect of change.

- a. What management might do (about to making inventory changes) 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-recurring and unused therefore they should be excluded. 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 income and other expenses if the excess is expenses, it should be added to fixed expenses, where as if the excess is 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 as 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 margin of safety is small. It indicate 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 sales and production volume.
- ) Increase the selling price.
- ) Decrease the fixed cost.
- ) Increase the variable cost.
- ) Increase the sales or product mix ratio.

Margin of safety is ascertained by using the following formula:

$$\text{Margin of Safety (in units)} = \frac{\text{Profit}}{\text{Contribution Margin Per Unit}}$$

$$\text{Margin of Safety (in Rs.)} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

$$\text{Margin of Safety (in \%)} = \frac{(\text{Actual Sales} - \text{ZBE Sales})}{\text{Actual Sales}} \times 100$$

### 2.1.8 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-formal 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 or sales.

It can be expressed as:

$$\text{Contribution Margin} = \text{Sales} - \text{Variable Cost}$$

or

$$\text{Contribution Margin} = \text{Fixed Cost} + \text{Profit}$$

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

$$\text{CM Ratio or PV Ratio} = \frac{\text{Contribution Margin}}{\text{Selling Price}}$$

### **b. Formula Approach**

The most popularly practiced approach to the break-even point and cost volume profit analysis is the formula, also known as the equation. It is particularly because the equation provides the most general and easiest to remember and uses an algebraically equation to calculate the breakeven point. The answers provided by solving the equation may sometimes, need to be rounded to whole numbers of units or lots sizes. The rounding of break-even-points is always done upward because this will provide a small profit rather than the small loss that would be shown from rounding downward (Dangol, et al, 2062: 422).

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

$$\text{BE Sales Value} = \text{FC} + \text{VC} \pm \text{Profit}$$

$$\text{BE Sales Units} \times \text{SPPU} = \text{FC} + (\text{BE Sales Unit} \times \text{VCPU}) \pm 0$$

<b>Contribution margin approach</b>	<b>Symbol or equation</b>
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  $\pm$  Profit

BE sales units x SPPU= FC + (BE sales units x VCPU)  $\pm$  Profit

### **c. The Graphical Approach to CVP Analysis**

A break-even-chart is used to graphically depict the relationships among revenues, variable costs, fixed costs and profit (or losses). The no profit, no loss point (the breakeven point) is located at the point where the total cost and

total revenue lines cross. Below this point, the firm losses, and above this point, the firm earns profit (Bajracharya et al., 2004: 231 - 232).

In the graph given below the fixed costs remain 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.

$$\text{Total cost} = \text{TFC} + Q \times \text{VCPU}$$

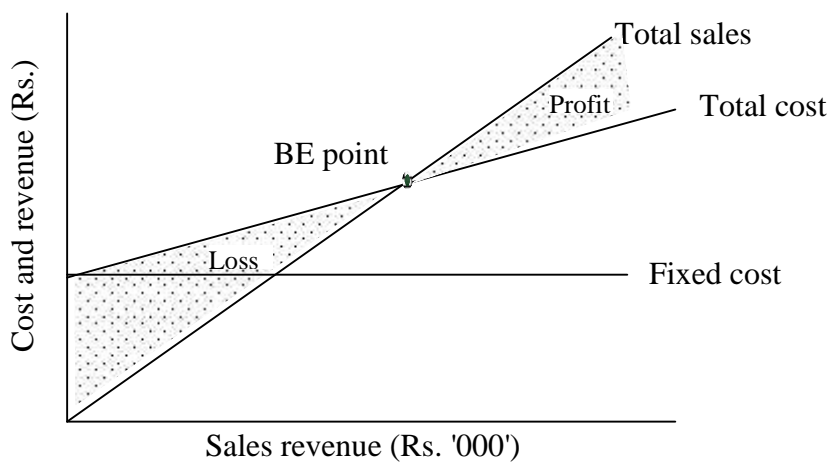
At volume 'Q' + 'N'

$$\text{Total costs} = \text{TFC} + (Q + n) \times \text{VCPU}$$

$$\zeta \text{ Total cost} = O + n \times \text{VCP}$$

$$\zeta \text{ Total cost} = \zeta \text{ Variable costs}$$

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



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

where,

$$\text{Total Sales Revenue} = \text{Total Costs.}$$

### **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 that system of analysis which determined probable profit at any level of activity. It portrays the relationship between cost of production, volume of production and the 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, 2008: 175-181).

#### **a. Applications of Break-Even Analysis**

Break-even concept can be used to formulate different 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 variable cost changes on sales volume.
- ) Selection of most profitable alternative and make or buy decisions and drop and/or add decisions (Maheshwari, 2000: 182).

#### **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 cost vary proportionately with activity.
- ) Selling price per unit remains constant. It is not affected by sales 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 types of commodities.
- ) The fixed cost may not remain constant as well 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 break-even-point.
- ) Consumers may be given certain discount on purchases to promote sales. This revenue may not be perfectly variable with level of sales output (Maheshwari, 2000: 189-184).

### **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 from the loss, does it mean that the company is facing the difficulties in paying its monthly bills for rent salary, suppliers and labours? Not necessary. It is because all fixed cost is kept in numerator while computing BEP. Fixed cost 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.

$$\text{Cash BEP} = \frac{\text{Cash Fixed Cost}}{\text{SPPU ZVCPU}}$$

or

$$\text{Cash Break-Even-Point} = \frac{\text{Cash Fixed Cost}}{\text{Contribution Margin or P/V Ratio}}$$

### **e. Profit Volume Analysis**

The analysis of relationship between profit and volume is known as profit volume analysis. The two factors 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:

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times \frac{\text{SZVC}}{\text{S}} \times 100\%$$

The ratio 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 mean increase in profit only because fixed costs are assumed to be constant at all level of production (Maheshwari, 2000: 185).

$$\text{P/V ratio} = \frac{\text{Changes in Contribution}}{\text{Change in Sales}} \times \frac{\text{Change in Profit}}{\text{Changes in Sales}}$$

This ratio would remain constant at different levels of production since variable costs as a proportion to sales remain constant at various levels. This ratio is



useful for determination of the desired level of output or profit and for the calculation of variable costs for any value sales. The variable cost can be expressed as follows:

$$VC = \text{Sales} (1 - P/V \text{ Ratio})$$

Comparison of different P/V ratios is usually made by the management to 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.

### **2.1.10 Managerial Uses of CVP Analysis**

Planning, controlling and decision making are the essential managerial functions. CVP analysis helps the manager to plan for profit, to control cost and make decisions. It is necessary to describe in greater details about its 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 believes profit is too 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 changes.

#### **b. Management uses the Budgeted Amounts to Control Operations throughout the Certain Period**

Management should not now just sit back and wait until 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 results with planned results.

**d. Management uses CVP analysis to know how much Business Safe**

The higher the safety margin the safer is the 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**

Up to BEP, the company earns 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 CM/PU.

**2.1.11 Cost Volume Profit Analysis for a Multi-Product Firm**

The relative proportion of sales of product is called the sales mix 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 if 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, 2000: 187).

#### **2.1.12 BEP for Sales Mix/Multi-Product**

In multi-product firm, BEP is calculated in aggregate. The sales mix is 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 values as follows:

$$\text{In Units} = \frac{\text{Individual Product's Sales Units}}{\text{Total of All Products Sales Units}}$$

$$\text{In amount} = \frac{\text{Individual Product's Sales Amount}}{\text{Total of All Product's Sales Amount}}$$

Calculate weighted average for all product as follows:

$$= \text{Sales Mix (Units)} \times \text{Units Contribution Margin}$$

or

Sales Mix (Units) × 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 requires the segregation of all cost into 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, 200: 162-165).

#### **a. Level of Output Compared to Levels of Expenses Method**

According to this method the output at two different level in compared with corresponding level of expenses. Since, fixed cost remain 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 o 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:

$$\text{Fixed Cost Portion} = \text{Total Semi-Variable Cost} - \text{Variable Cost}$$

### **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, whereas 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 plotted on the horizontal axis and the cost 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 test 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 procedures 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 an equation with the help of a number of observations. The linear equation can be assumed as:

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

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

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

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

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

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

Where,

a = Fixed cost

b = Unit variable cost

n = No. of observations

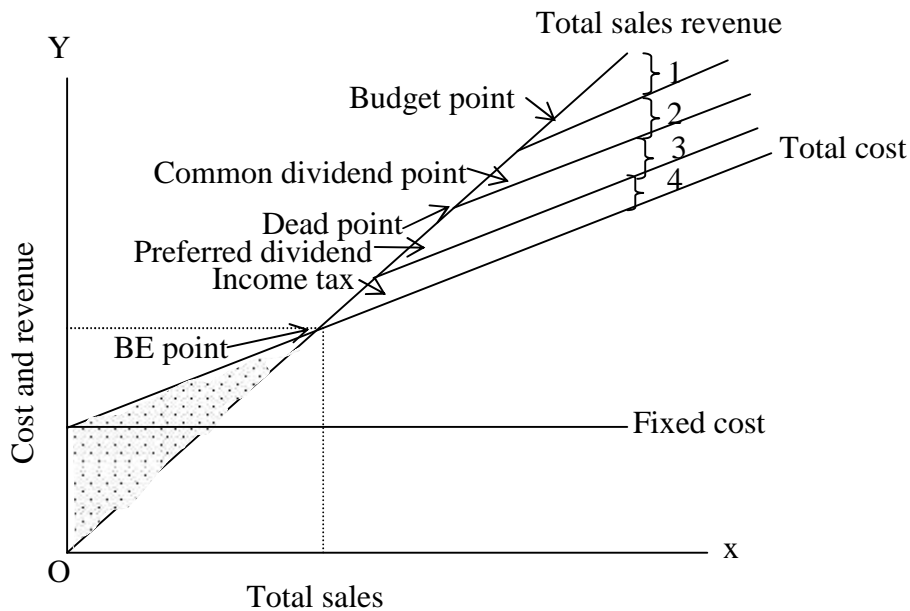
X = Output in units

= 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" (Welsch, Hilton & Gordon, 1979: 467-468).



Key,

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

The above chart indicates a few of the economic characteristics of a business, viz. (Welsch, Hilton & Gordon, 1979: 469).

- ) 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.

- J To preferred dividend or danger point is the point below which preferred dividend are not earned.
- J 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.

### **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 labour. These critical factors in the CVP analysis 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 a 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 (Munankurmi, 2003: 146).

#### **b. CVP Analysis with a Multiple Constraints**

Where more than one scarce resources exists, the optimum production programme 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 optimized 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 (Munankurmi, 2003: 148).

#### **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 product in general but it fails to explain the among of certainty in the product and also between the alternatives. To cover come such a difficulty, risk and uncertainty analysis can also be used 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 happening of the even in consideration is 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 judgement towards likeliness of happening of the condition forecasted). It must be understood here that probability assigned here is a subjective probability based in, personal judgement of the man making such a analysis (Pandey, 2003: 17).

### **2.1.17 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 leverage. The highly labour intensive organization has 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 costs. Such a structure reflects high operating leverage and relatively high break even point. Company with lower fixed costs 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 costs are being used in organization. The relationship of a company's variable and fixed costs is reflected in its operating leverage. Generally, highly labour intensive organization has high variable costs and low fixed costs and this makes low operating leverage and relatively low break even point. Conversely, organization that is highly capital intensive may have a cost structure that includes low variable and high operating leverage with high break even point which reflects high operating leverage with high break even point. It shows that fixed costs and operating leverage have a direct relationship. Higher the amount of fixed costs higher the operating leverage and break even point and vice versa. In other words the firm with relatively high operating leverage has proportionally high fixed expenses, the firm's breakeven point will be relatively

high. The operating leverage, factor 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 is 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 impact of certain percentage or amount of change in volume, price or cost factors 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 Units x VCPO - Fixed Cost - Taxes

But if one of the factors remain 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 various of factors. It is affected by change in volume, cost and prices. Profit may be affected by the changes, (increase or decreases), in the following factors:

### **) Effect of Price Changes**

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

### **) Effect of Volume Changes**

A change in volume, not accompanied with a change in the selling price and/or costs, will not affect P/V ratio. As a result, the 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 in price invariably affects volume. A price reduction 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 increase substantially. Similarly, a price rise may reduce profits if there is a material fall in volume.

### **) Effect of Change in Variable Costs**

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

### **) Effect of Changes in Fixed Costs**

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

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

### ) **Effect of Changes 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 changes in an other factors. Therefore, all such changes should be carefully visualized and their net impact on profit must be seen (Pandey, 1995: 203-208).

## **2.2 Review of the Previous Research Work**

The research topic cost volume profit analysis as a tools to measure effectiveness of PPC/budgeting of a company, in Nepalese context. But must researches have been made in the area of profit planning and control and management accounting in Nepalese context. As profit planning and control and management accounting cover major of the aspects of cost volume profit analysis, researchers made on these area are taken into consideration for the sake of review to examine how profit planning and control and management accounting practices in Nepalese companies. An attempt is made here to review some of the researches, which have been submitted on profit planning and control and management accounting in the context of Nepal.

**Sharma** (2001), had conducted the research on the topic of "*Profit Planning in Commercial Bank: A Case Study of Nepal Bangladesh Bank*". He covered 8 years data fiscal years 2051/058. This study mostly based upon secondary data.

### **His Main objectives:**

- ) The basis objectives of the research are to appraise Nepal Bangladesh Bank, appropriately for the application of comprehensive PPC system.

- ) To highlight the current profit planning premises adopted and its effectiveness in HB Bank.
- ) To observe NB Banks profit planning on the basis of overall managerial budget developed by the bank.
- ) To analyze the variance of budget and actual achievement.
- ) To study the growth of the business of the Bank over the period.

**His major findings:**

- ) Objectives of the bank are expressed in literacy form and not specified clearly, therefore there is a danger of it being misinterpreted in the ways of one's benefits by the concerned.
- ) Major concentration of resources mobilization of NB Bank is at deposit mobilization. In this respect they are increasing higher cost toward deposit mobilization.
- ) This funding shows the actual deposit is more variable than the budget one.
- ) Deposit mobilization by the bank is found to be considerable growing every year.
- ) Interest as well as other expenses found in increasing trend each year corresponding to the increase in deposit. The interest expenses are perfectly and positively correlated with deposit.
- ) The amount of interest income and other income is increasing every year corresponding to increase in loan, deposit and overdraft.
- ) It seems average rate of growth of other income is higher than that of other expenses.
- ) Liquidity position of the bank seems to be satisfactory.
- ) The bank did not practice CVP analysis.

**Dahal** (2003), has conducted research on the topic "*Management Accounting Practices in the Listed Companies of Nepal*". His research main objective was

to examine and study the practice of management accounting tools in the listed companies in Nepal.

**His main objectives:**

- ) To study and examine the present practice of management accounting tools in the listed companies in Nepal.
- ) To identify the area where management accounting tools can be applied to strengthen the companies.
- ) To identify the difficulties in applying management accounting tools in Nepalese countries.
- ) To make recommendations to overcome the difficulties. In applying management accounting tools in Nepalese companies.

**His major findings:**

- ) Different types of management accounting tools presented in the collage curriculum are not found to be applied by the listed company of Nepal.
- ) Management accounting is to help manager is overall management activities by providing information and helping in planning controlling and decision making.
- ) Nepalese listed companies are in infant stage in practicing of management accounting tool such as capital budgeting annual budgeting cash flow ration analysis, zero based budgeting, activity based budgeting activity costing target costing and value engineering.
- ) Lack of information and extra cost burden are the main reasons behind not practicing such tools.
- ) As Nepal is proceeding towards globalization and get memberships of WTO companies are recommended to apply management accounting tools to fit with the global environment.

**Namdar** (2005), 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.

**His 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.

**His 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** (2006), had conducted a research entitled "*CVP Analysis as a Tool to Measures Effectiveness of PPC*". (A Case Study of Herbs Production and Processing Co. Ltd.)

**His 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.

**His 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 method 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 trend, which effects on BEP of the company.
- ) Margin of safety of the company is negative trend. So company could not sold properly and suffering form losses.
- ) BEF of the company is analysis higher than Actual sales. So, the 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.

**His 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.

**His 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** (2007), has presented a dissertation on the topic of "*Cost Volume Profit Analysis of Nepal Lube oil Limited*". The mains objective of his study is to examine the use of CVP analysis to plan the profit in Nepal lube oil limited.

**His 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.

**His 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 than 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) pr ration.

**2.3 Research Gap**

All the previous research works were done on PPC of manufacturing company. The research studies have recommended than 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 than using overall tools as a whole of once. This is the main weak point of the previous 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 point 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 person, scholar, students, teachers, stakeholders, civil society, businessman and government for academically as well as policy perspectives.

## **CHAPTER-III**

### **RESEARCH METHODOLOGY**

#### **3.1 Research Design**

This study had adopted the descriptive and analytical type of research design. It describes and analysis all the aspects that have been collected for the purpose of the study. A study design is the arrangement of conditions for collection and analysis of data in the manner that aims to combine relevance to the study with economy in procedure. This study is based on the analysis of past financial performance, based on relevant data.

#### **3.2 Population of Sample**

There are 36 public enterprises operating in Nepal. These are the total population of the study. Out of which STC is selected as a sample using judgmental sampling basis. This study is based on revenue planning and cost-volume-profit analysis of salt trading corporation. Therefore, no specific production on branch was taken for analysis but the whole was considered for analysis through financial data available.

#### **3.3 Nature of Data**

Both the primary and secondary information have been collected from the concerned industry's personal and from available documents. Thus, the primary level of data available from the company and as well the secondary data like publication books, booklets, magazine, newspaper, financial statements etc. have been taken into account while preparing the dissertation.

#### **3.4 Sources of Data**

Both the primary and secondary levels of information have been used to meet specified objectives. Both the sources were used in the study, personal visit in Salt Trading Corporation was made to know the relation. The most important sources of situation of the corporation attempts were made to collect almost all

the information in detail through a structured questionnaire from salt trading corporation. The company's records as well as the observation were made to fill the questionnaire in proper way. Besides this, secondary levels of data were also analyzed using accounting. Statistical and mathematical tool, charts and graphs as for need are demonstrated. Accounting tools like contribution margin and BEP were used, whereas statistical tools like average, on each and standard deviation were utilized.

### **3.5 Survey Methodology**

Necessary intonations and enquires were made with the management personal of the company. They helped by filling the questionnaire provided to them. During the course of field study, different information were collected from the industry.

### **3.6 Data Processing**

Secondary data have been taken mainly from annual reports, auditors reports, balance sheet, profit and jobs account, cost detail sheet, previous thesis and all the relevant publication relating to company's performance were serviced for achieving the desired result.

## **CHAPTER - IV**

### **DATA PRESENTATION AND ANALYSIS**

#### **4.1 General Concept**

Profit planning is the formal expression of the enterprises' plan, goals, objectives stated in financial term for specific future period of time. It is one of the most important management tools that are used to develop effective performance and systematic approach for attaining desire goals. CVP analysis, a tool 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 cost control and profit planning. 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 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 re 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 and other required queries.

This study has tried to cover the activities of the Salt Trading Corporation for the last six year (i.e. from the fiscal year 2058/59 to 2064/65). The information, which has been collected from Salt Trading Corporation, were systematically.

## 4.2 Sales Trend Analysis

### 4.2.1 Overall Sales

STCL in the trading corporation. The sales are given below:

**Table 4.1**  
**Sales Growth**

**(Rs. in Lakhs)**

<b>Years</b>	<b>2058/59</b>	<b>2059/60</b>	<b>2060/61</b>	<b>2061/62</b>	<b>2062/63</b>	<b>2063/64</b>	<b>2064/65</b>
<b>Details</b>							
Total sales	17431	18758	24610	38989	21939	18505	19162
Change in sales	-	7.61%	31.19%	58.43%	-43.73%	-15.65%	3.55%

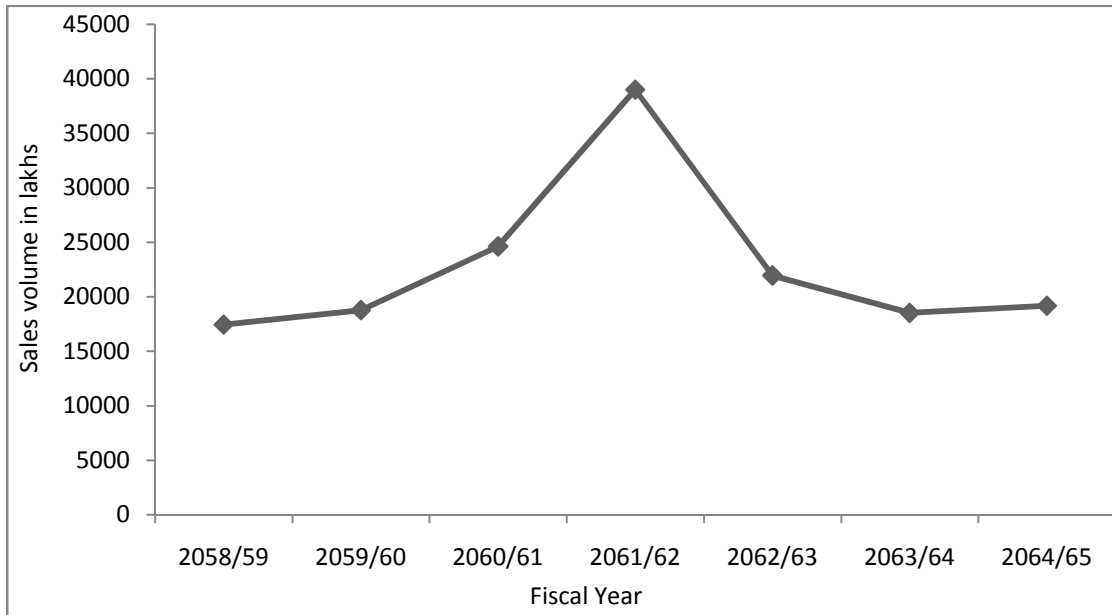
*Source: Annual Report of STCL*

The table 4.1 showed that total sales of the company from the FY 2058/59 to 2063/64 are not stable. The total sales of the company decrease by 15.65 percent and increase by 3.55 percent in the FY 2063/64 and 2064/65 respectively. The cause of decrease is the political situations of Nepal. In that time Nepalese markets are suffering from the criminal activities. These activities can easily distribution the corporation activities. So many times corporation face strike and pressure of peace opposite group. This cause as well as the quality of the product of the corporation is also the plus point to decrease the quantity of sales units. The incremental percentage of total sales show satisfactory in the FY 2058/59 to FY 2061/62 upto 58.43 percent.

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



**Figure 4.1**  
**Sales Growth**



The amount of total sales volume can be clearly present with the help of simple bar-diagram. Simple bar-diagrams is the simplest of the bar diagram and is use frequently is practice for the comparative study of values of a single variable. The figure No. 4.1 shows that the different years sales volume with different bar diagram. Among them, the highest bar is in the fiscal year 2061/62. In that year the sales is more than the other years. And other years has similar position. It can clear that the sales trend is not constant. It is fluctuating in different year with different causes above mention.

#### **4.2.2 Product -Wise Sales**

STC has six different products ranging (1) Consumable (2) agricultural material (3) Fuel, lubricant and tyre tubes (4) machines and equipment (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**

(NRs. in lakhs)

Years		2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
Products								
1. Consumable material	Amount (Rs.)	10241	12970	14756	16125.3	11762.8	12037.6	11818
	Change (%)	-	26.65	13.77	9.28	-27.05	2.34	-1.82
2. Agricultural material	Amount (Rs.)	2657.9	904.1	1382.2	2586	99.83	12212	173.4
	Change (%)	-	-65.98	52.88	87.09	-98.14	-98.77	141
3. Fuel, lubricant and tyre tubes	Amount (Rs.)	4035.9	3932.9	7709.2	17359.7	6651.8	4409.4	4310.2
	Change (%)	-	-2.56	96.03	125.18	-61.68	-33.71	-2.25
4. Machine and equipment	Amount (Rs.)	-	57.25	137.6	2231.4	815.28	33.28	26.9
	Change (%)	-	-	140.35	1521.65	-63.46	-95.91	-19.17
5. Construction materials	Amount (Rs.)	247.6	308.61	514	110.14	69.3	560.56	1547.06
	Change (%)	-	24.63	39.96	-78.57	-37.08	708.88	175.98
6. Other materials	Amount (Rs.)	248.4	585.9	110.85	576.7	2540.1	1463.32	1286.55
	Change (%)	-	135.86	-81.08	420.25	345.85	-43.95	-12.08

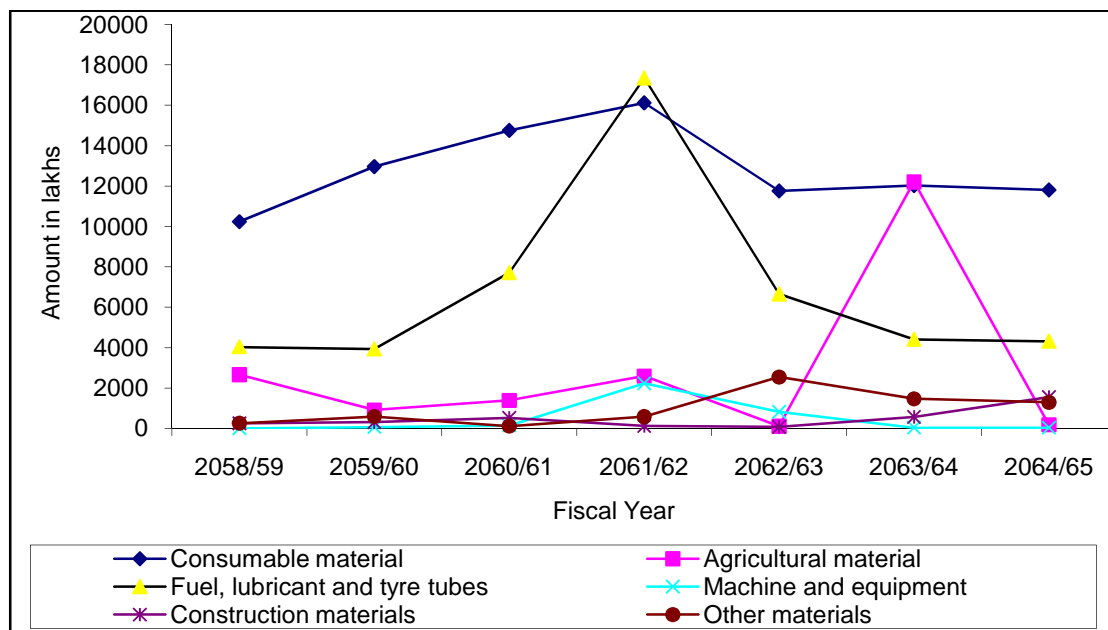
*Source: Annual Report of STCL*

The table 4.2 show that total sales of products are in increasing trend during the fiscal year 2058/59 to 2061/62. After that these product sales trend slightly decrease. The consumable material increase by 26.65 percent, 13.77 percent and 9.28 percent in the fiscal year 2059/60, 2060/61 and 2061/62 and decrease in the next two years by 27.05 percent and 1.82 percent in the fiscal year 2062/63 and 2064/65 but it has increased by 2.34 percent in the fiscal year 2063/64. The sales of agricultural material in the FY 2059/60 decrease by

65.98 after that increase in next two years. Again it goes downward. But it has highly increased by 141 percent in the fiscal year 2064/65. Similarly fuel, lubricant and tires tubes sales showed similar fluctuations. The sales condition of machine and equipment increase by 140.235 percent in the FY 2060/61 and more than that percentage in next year. But the sales product in the FY 2062/63, 2063/64 and 2064/65 decrease. The last two products sales value fluctuates. FY 2059/60 it increase and after that it decrease. But the sales of construction material has increased by 708.88 percent and 175.98 in the FY 2063/64 and 2064/65 respectively. The sales of the machine and equipments in the FY 2059/60 is nil.

The sales of trend of each product of the company can be seen from the following graphical presentation.

**Figure 4.2**  
**Contribution of Each Product on Total Sales**



The sales of different products 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

type 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 of FY 2061/62 and 2062/63 is nominal.

### 4.3 Variable Cost Analysis

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

**Table 4.3**  
**Variable Cost Details**

(NRs. in lakhs)

Years	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
<b>Products</b>							
Sales value	17431	18785	24610	38989	21939	18505	19162
Cost of sales							
Opening inventory	2899.81	1999.68	3707.16	6881.34	4706.69	7898.88	8765.78
Add: Purchase	13316.21	15408.9	21380.60	29825.30	17984.00	12797.14	10082.7
Add: Misc. expenses	1632.96	3135.72	3816.58	4032.63	4580.53	3990.36	4741.32
Total	17848.98	20544.3	28904.34	40739.27	27271.22	24686.38	23589.81
Less: Closing inventory	1999.68	3707.19	6681.34	4706.77	7898.82	8765.78	7144.40
Total cost of sales	15849.3	16837.11	22223.00	36032.5	19372.4	15920.6	16445.4
Change (%)	-	6.23	30.0	63.62	-46.24	-17.82	3.30

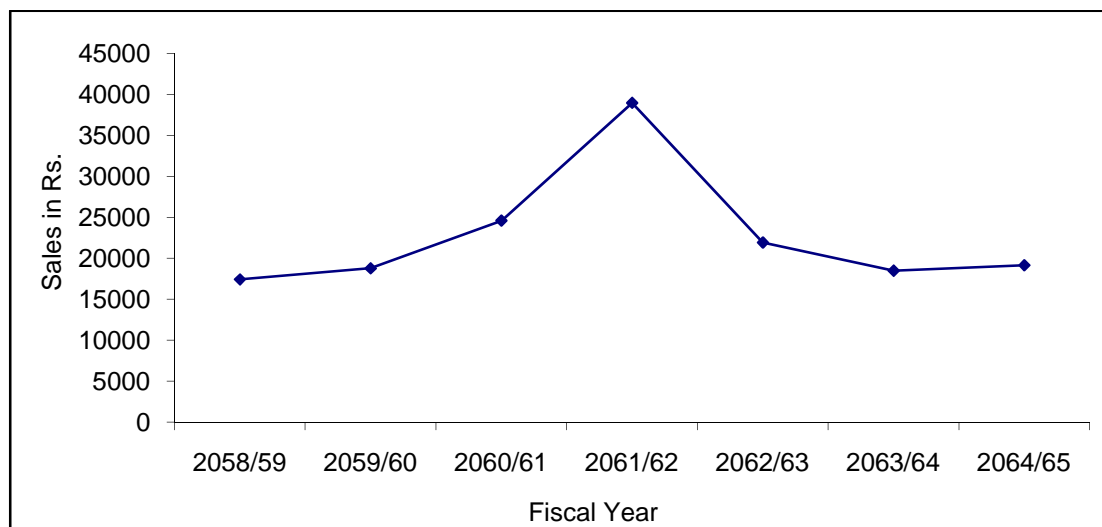
*Source: Annual Report of STCL*

The table 4.3 shows the fluctuating trend in the variable cost sheet. Variation in variable cost of sales, opening inventory, purchases and miscellaneous expenses for different year is because of different external and internal factors.

Purchases and miscellaneous expenses have greater contribution towards increase in amount at cost of sales every year. In the FY 2062/63 variable cost decrease by 46.24 percent. Small increase in FY 2059/60 and a little bit increase in year 2060/61. But variable cost largely increase by 63.62 percent in FY 2061/62 and in the FY 2063/64 these cost decrease by 17.82 percent. Similarly, in the fiscal year 2064/65 variable cost increase by 3.30 percent. In this corporation all of the variable cost are cost of sales. Because these types of corporation are not manufactures, only one trading company. Those they have not specific manufacturing cost. From the annual reports of Salt Trading Corporation, we can get only above mentionable cost i.e. cost of sales as a variable cost. The position of variable of the company can be clearly seen from the following graphic presentation.

**Figure 4.3**

**Trend of Variable Cost**



The amount of variable cost can be clearly present with the help of histograms. Here, in Histograms, independent variable and cost as dependent variable. The figure 4.3 shows that the variable cost move upward and downward haphazardly.

#### **4.4 Fixed Cost Analysis**

Fixed cost remains constant in total amount despite the changes in the level of activity with in a fiscal year. That is fixed cost remains unchange in total as the

output level varies within a year, but fixed cost per unit basis decrease as the level of activity 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 is annual report, fixed cost is classified into the following patterns.

**Table 4.4**  
**Fixed Cost Details**

(NRs. in lakhs)

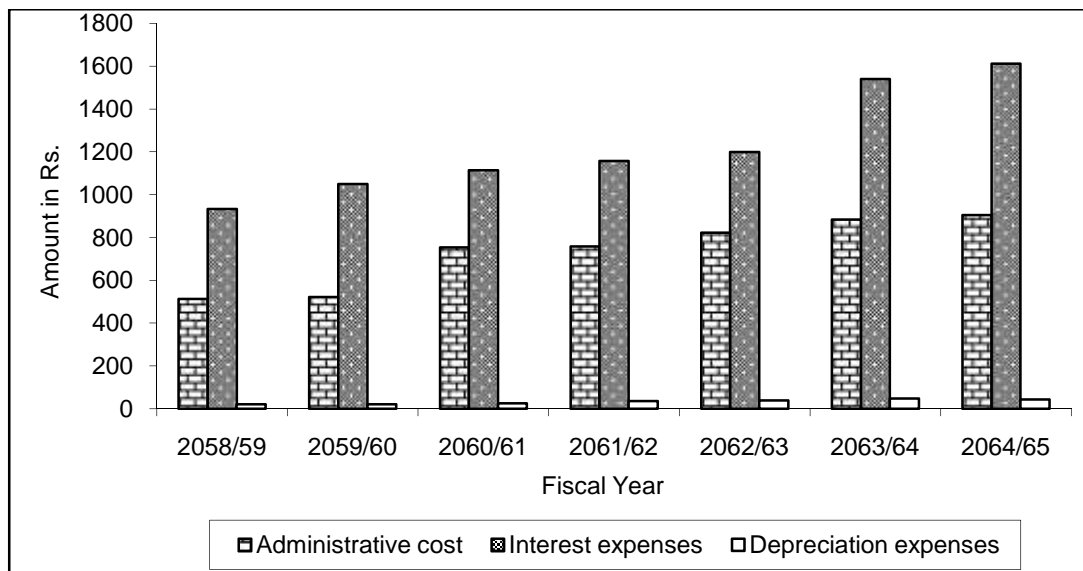
Fiscal Year	Administrative Cost		Interest Expenses		Depreciation Expenses		Total cost	
	Cost	Change %	Cost	Change %	Cost	Change %	Cost	Change %
2058/59	512.4	-	933.5	-	21.1	-	1467	-
2059/60	522.5	1.97	1050.3	12.51	20.8	-1.42	1593.6	8.62
2060/61	753.6	44.22	1114.3	6.09	25.4	22.12	1893.3	18.81
2061/62	758.3	0.624	1156.8	3.81	36.4	42.91	1951.6	3.08
2062/63	822.9	8.52	1199.9	3.73	38.7	6.61	2061.5	5.63
2063/64	883.6	7.37	1540.1	28.35	47.3	22.22	2471.0	19.82
2064/65	904.7	2.39	1611.8	4.65	42.7	-9.73	2558.4	3.54

*Source: Annual Report of STCL*

The table 4.4 shows that administrative expenses, interest and depreciation expenses for different FY. In the FY 2058/59 to 2064/65 the costs are increasing trend. The nature of fixed cost is remained constant in total amount despite the change in the level of activity with in a fiscal year. But in this corporation the trend of fixed cost no remain constant. In every year, every cost of change ratio is increasing trend. In administrative is increased by 1.97 percent and thereafter, the cost is increased by 44.22 percent, 0.624 percent, 8.52 percent, 7.37 percent and 2.39 percent in the year 2060/61, 2061/62, 2062/63 and 2063/64 respectively. Maximum increased year is 2060/61. In that year the management spent huge amount of money on the topic of administrative expenses (i.e. salary and wages, welcome to guest, insurance, donation etc.). These costs can be seen on the table of details information about

the administrative cost. In this way, the interest expenses are in fluctuating trend form 3.73 percent to 28.35 percent in the different fiscal year. Corporation has to pay more interest to the investors one after another fiscal year. Ultimately, these increases has portion of increase amount of total fixed cost. Except of 2059/60 the cost of depreciation expenses also increasing trend in every year. Corporation has buy new machine, new vehicle and other fixed nature goods. Therefore, the amount of charging depreciation is also increases. And finally all these increase are the bases to increase total fixed cost. In the FY 2059/60 the cost increase by 8.62 percent, in the FY 2060/61 it increase by 18.81 percent, in the FY 2061/62 by 3.08 percent, in the FY 2062/63 by 5.63 percent, in FY 2063/64 by 19.82 and FY 2064/65 by 3.54 percent. The higher increase point is in the fiscal year 2060/61 and lowest point is in the fiscal year 2059/60 in total. The position of the fixed cost of the corporation can be clearly seen form the following graphic presentation.

**Figure 4.4**  
**Position of Fixed Assets**



The amount of the fixed cost can be clearly present with the help of simple bar-diagram. Simple bar diagrams is the simplest of the bar diagram and is used frequently in practice for the comparative study of value of single variable. The figure 4.4 shows that the fixed cost is increase different fiscal year gradually.

#### 4.5 Income Statement Analysis

Income is computed by deducting all expenditure from turnover. It is surplus of sales over expenditure. Income measure the real performance of the company. High income indicates good performance whereas low income threatens the company. Value of income is received by deducting fixed and variable cost form sales. Contribution margin is obtained by deducting variable cost from sales out of which fixed cost is deducted to get net profit. Much information can be presented with the help of the following income statement.

**Table 4.5**  
**Income Statement Details**

(Rs. in lakhs)

SN	Details	Years						
		2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
1	Sales	17431	18758	24610	38989	21989	18505	19162
2	Variable cost	15849.3	16836.6	22023	36032.5	19372.4	15920.6	16445
3	Contribution margin (1-2)	1581.7	1921.4	2587	2956.5	2566.6	2584.4	2717
4	Fixed cost	1467	1593.6	1893.3	1951.6	2061.5	2471	2559
5	Net income (3-4)	114.7	327.8	693.7	1004.9	505.1	113.4	158
6	Net profit margin (5/1)	6.58	1.75	2.82	2.58	2.30	0.61	0.82
7	V/V ratio (2/1)	90.90	89.76	89.48	92.42	88.30	86.03	85.82
8	% of FC on sales (4/1)	8.42	8.49	7.69	5.00	9.39	13.35	13.36
9	% of VC on total cost [2] / (2+4)]	91.53	91.35	92.08	94.82	90.38	86.56	86.53
10	% of FC on total cost [2] / (2+4)]	8.47	8.65	7.92	5.14	9.62	13.43	13.47
11	Operating leverage (3]5)	13.79	5.86	3.73	2.94	5.08	22.79	17.20

*Source: Annual Report of STC*

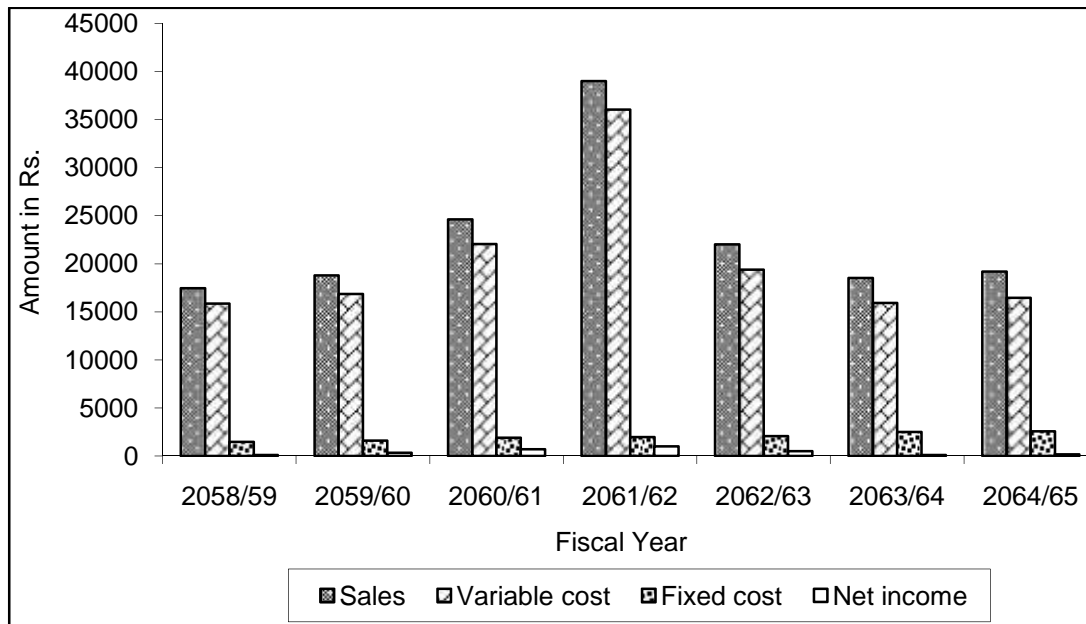
Here, net income represents operating income only. Non-operating income and non-operating expenses are not incorporated in this analysis. Net profit margin of the company are 0.65 percent, 1.75 percent, 2.82 percent, 2.58 percent, 2.30 percent, 0.61 percent and 0.82 percent in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. It indicates that net profits of the company are in increasing trend. But the net profit margin of the FY 2063/64 decrease.



The variable cost ratio of the company are 90.90 percent, 89.76 percent, 89.48 percent, 92.42 percent, 88.30 percent, 86.03 percent and 85.82 percent in the fiscal year 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. The percentage of fixed cost on sales are 8.42 percent, 8.49 percent, 7.69 percent, 5.00 percent, 9.39 percent, 13.35 percent and 13.35 percent and 13.35 in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. Nearly 85 percentage of total sales cover by variable cost but the coverage of fixed cost on sales in below than 10 percentages. The variable costs occupy higher portion in the total costs and the proportion of fixed cost on total cost is very low. This indicates that the company is non-leverage organization. Variable cost changes with the change in activity level but the fixed cost remains constant up to the certain level of capacity. If the level of sales increases, variable cost also increases but the fixed cost remains same. That is why fixed cost is defined as leverage 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 leverage of the company are 13.79, 5.86, 3.73, 2.94, 5.08, 22.79 and 17.20 in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. Except in the three FY 2058/59, 2063/64 and 2064/65 the degrees of operating leverage are not satisfactory. Operating leverage measures the operating risk of company. Lower value of operating leverage indicates lower amount of operating risk. The company uses low amount of fixed cost so it has lower value of operating leverage. Similarly, the company has lower amount of operating risk. Sales, variable costs, fixed cost and operating profit of the company can be clearly seen in the following graphical presentation.

**Figure 4.5**  
**Sales, Variable Cost, Fixed Cost and Profit**



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 relationship between the variables. 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**

(NRs. in lakhs)

<b>FY</b>	<b>Sales (x)</b>	<b>Profit (y)</b>	<b>xy</b>	<b>x<sup>2</sup></b>	<b>y<sup>2</sup></b>
2058/59	17431	115	2004565	303839761	13225
2059/60	18758	328	6152624	351862564	107584
2060/61	24610	694	17679340	605652100	481636
2061/62	38989	1005	39183945	1520142121	1010025
2062/63	21939	505	11079195	481319721	155025
2063/64	18505	113	2091065	342435025	12769
2064/65	19162	158	3027596	367182244	24964
	x = 159394	y = 2918	xy = 81218330	x <sup>2</sup> = 3972433536	y <sup>2</sup> = 1905228

Correlation coefficient (r)

$$\begin{aligned}
 &= \frac{N \sum xy - \sum x \cdot \sum y}{\sqrt{N \sum x^2 - (\sum x)^2} \sqrt{N \sum y^2 - (\sum y)^2}} \\
 &= \frac{7 \mid 81216330 \mid 159394 \mid 2918}{\sqrt{7 \mid 3972433536 \mid (159394)^2} \sqrt{7 \mid 1905228 \mid (2918)^2}} \\
 &= \frac{568528310 \mid 465111692}{\sqrt{27807034750 \mid 25406447240} \sqrt{13336596 \mid 8514724}} \\
 &= \frac{103416618}{\sqrt{2400587510} \sqrt{4821872}} \\
 &= \frac{103416618}{48995.79 \mid 2195.88} \\
 &= 0.96
 \end{aligned}$$

Probable Error (PE)

$$\begin{aligned}
 PE &= 0.6745 \times \frac{(1 - r^2)}{\sqrt{7}} \\
 &= 0.6745 \times \frac{(1 - 0.9216)}{\sqrt{7}} \\
 &= 0.01999
 \end{aligned}$$

The value of correlation coefficient is 0.98. This 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 manner.

Since coefficient of correlation (r) is greater than 6 times greater than PE of r ( $0.6 > 6 \times 0.01999$ ). So it suggests there is significant relationship between the net profit and sales and it shows better future of STCL.

#### 4.7 Contribution Margin

Contribution margin is the excess of sales revenue over variable cost. 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 (CMPU) is selling price per unit less variable cost per unit. Contribution margin expressed 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 Details**

(NRs. in lakhs)

Years	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
<b>Details</b>							
Contribution margin	1581.7	1921.4	2587	2956.5	2566.6	2584.4	2717
P/V or C/M ratio (%)	9.07	10.24	10.51	7.58	11.69	13.96	14.18

The contribution margin of P/V ratio is in fluctuating trend. The P/V ratio of the company are 9.07 percent, 10.24 percent, 10.51 percent, 7.58 percent, 11.69 percent, 13.96 percent and 14.18 percent in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively.

The P/V ratio of the company is not satisfactory. It is very low due to the huge amount of variable cost. The following table shows the analysis of product wise contribution of STCL.

**Table 4.8**  
**Break-Even Point Details**

(NRs. in lakhs)

Years	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
<b>Details</b>							
BEP (Rs.)	16174	15566	18011	25752	17639	17700	18046
Change (%)	-	-3.79	15.71	42.98	-31.50	0.345	1.95
BEP (Ratio)	92.78	82.98	73.18	66.65	80.40	95.65	94.18

Where,

$$a. \text{ BEP (Rs.)} = \frac{\text{Fixed Cost}}{\text{Weighted Average}}$$

$$b. \text{ Weighted Average} = (\text{P/V ratio of each product} \times \text{sales mix of each product})$$

$$c. \text{ BEP (Ratio)} = \frac{\text{BEP Sales (Rs.)}}{\text{Actual Sales (Rs.)}}$$

The table 4.9 shows that the BEP (Rs.) are in fluctuating trend. The main reasons of fluctuating BEP are the change in fixed cost and change in variable cost. The change in contribution margin of profit volume ratio is also the root of cause of reduction and deduction in BEP. Break-even-point (Rs.) of the company are Rs. 16174, Rs. 15566, Rs. 23752, Rs. 17639, Rs. 17700 and Rs. 18046 lakhs in the FY 2058/59, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. In the FY 2064/65 the company is able to cover all of its cost through sales of Rs. 18046 lakhs. But in the FY 2059/60 and 2062/63, BEP (Rs.) level decrease than other FY. The company earns profit beyond the break-even sales. The ratio of BEP sales on actual sales 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 92.78 percent, 82.98 percent, 73.18 percent, 66.05 percent, 80.40 percent, 95.65 percent and 94.18 percent in the FY year 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. Lower break-even ratio indicates the strength of the company. But this company has no lower BEP ratio. Therefore, the condition of the company is not so good taking the reference of BEP ratio. The company meets its cost through lower volume of sales and major parts of the sales and utilized to generate profit.

#### 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 = Total sales - Break-even sales. The larger the margin of safety that indicates the better profitability. A low margin of safety is the result of the 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 Details**

Years	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65
<b>Details</b>							
Margin of safety (Rs.)	1857	3192	6599	13237	4300	805	1116
MOS ratio (%)	7.21	17.02	26.81	33.95	19.60	4.35	5.82

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 company is in fluctuating trend. In the FY 2058/59 the margin of safety of the company is Rs. 1257 lakhs. Similarly, it are Rs. 3192, Rs. 6599, Rs. 13237, Rs. 4300, Rs. 805 and Rs. 1116 lakhs in the FY 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. The margin of safety ratio of the company are 7.21 percent, 17.62

percent, 26.81 percent, 33.95 percent, 19.60 percent, 4.35 percent and 5.82 percent in the FY 2058/59, 2059/60, 2060/61, 2061/62, 2062/63, 2063/64 and 2064/65 respectively. Here the higher percentage of MOS ratio indicates that company is in strong profitability position.

#### 4.9 Sales Mix and Break-Even Analysis

Most firms have more than one product. The relative proportion of each type of product sold is called the sales mix. All products are not equally profitable in multi-products business. This is because such changes in the sales mix from low margin items to high margin items can cause total profit to increase even through the total sales may decrease and vice-versa. Break-even analysis is somewhat more complex if a company sells more than one product. If the sales mix changes the break-even-point will also change. Thus, to enhance the profit of the firm may introduce require changes in the ratio with the help of break-even analysis. Here, Salt Trading Corporation Limited has six different products. So the company is defined as multi-product organization. Through it is very difficult to calculate product wise BEP for the company due to different sales price and cost price of the product the following procedure is used to calculate product wise BEP.

$$a. \text{ Sales mix (Rs.)} = \frac{\text{Individual Sales (Rs.)}}{\text{Total Sales (Rs.)}}$$

$$b. \text{ Weighted P/V ratio} = \text{Sales mix (Rs.)} \times \text{P/V ratio of each product.}$$

or

Weighted contribution margin = Sales mix (unit) x Contribution margin of each product

$$c. \text{ Overall BEP (Rs.)} = \frac{\text{Total Fixed Cost}}{\text{Weighted P/V Ratio}}$$

$$d. \text{ Product wise BEP (Rs.)} = \text{Overall BEP (Rs.)} \times \text{Sales mix (Rs.) of each product}$$

The product wise BEP in Rs. of the company are presented in the following table.

#### 4.10 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 (sensitivity) of changes in key factors (such as price, volume, variable cost and combination of factors which shows proportionate relationship. The management teams may not only be able to obtain a numerical expression of their business orientation but in addition may be able to assess a range of issues in relation to product and service profitability profit improvement and effectiveness. The following table provides the insights in the "sensitivity analysis."

**Table 4.10**  
**Different Factors Affecting CVP Analysis**

<b>Factors</b>	<b>Effect in P/V ratio</b>	<b>Effects in BEP</b>	<b>Effective in profit</b>
Sales revenue			
Increase	No effects	No effects	Increase
Decrease	No effects	No effects	Decrease
Variable cost			
Increase	Decrease	Decrease	Decrease
Decrease	Increase	Increase	Increase
Fixed cost			
Increase	No effects	Increase	Decrease
Decrease	No effects	Decrease	Increase

##### 4.10.1 Effect of Changes in Sales Value

Any 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 percent for the fiscal year 2063/64 with other factors assume remain constant are presented below:



**Table 4.11****Income Statement with Change of Sales Value for the FY 2064/65**

(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)	0.1418	0.1418	0.1418
BEP = $\frac{\text{Net Fixed Cost}}{\text{CM Ratio}}$	18046	18046	18046

The above table 4.11 shows that with the increase in sales value by 10 percent, the profit of the company will be increased by 171.52 percent. Similarly, with the decrease in sales value by 10 percent the profit of the company will decrease by 17.152 percent. The sales value is changed by the same percentage when changes are made in sales by 10 percent. But the BEP are equal in each case.

**4.10.2 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 P/V ratio, push up the BEP and reduce profit. On the other hand, if the variable cost decline, P/V ratio will increase. BEP will be lowered and profit will rise. If the increase and decrease of variable to 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 2064/65**

(NRs. in lakhs)

Details	Original	Change on Sales Value	
		10% increase	10% decrease
Sales revenue	19162	19162	19162
Less: Variable cost	16445	18090	148014
Contribution margin	2717	1072	4361
Less: Fixed cost	2559	2559	2559
Profit	159	(1487)	1802
CM ratio (CM/sales)	0.1418	0.55944	0.227586
BEP	18046	45742	11244

Above table No. 4.13 shows that, with 10 percent increase in variable cost, break-even point increases by 153.47 percent which indicates that variable cost and break-even point have positive and proportionate relationship. Similarly, with the decrease in variable cost by 10 percent, the break-even-point has been also decrease by 37.69 percent.

#### **4.10.3 Effect of Change in Fixed Cost**

A change in fixed cost does not influence P/V ratio other factors remaining unchanged, a fall in fixed cost will, however, lower the BEP and raise profit. An increase in fixed cost will push up BEP but reduce profit. It increases and decreases of fixed cost by 10 percent with other factors assume to remain same, it gets following results for the fiscal year 2064/65.

**Table 4.13****Income Statement with Change of Fixed Cost for the Fiscal Year 2064/65**

(NRs. in lakhs)

Details	Original	Change on sales value	
		10% increase	10% decrease
Sales revenue	19162	19162	19162
Less: Variable cost	16445	16445	16445
Contribution margin	2717	2717	2717
Less: Fixed cost	2559	2815	2303
Profit	158	(98)	414
CM ratio (CM/sales)	0.1418	0.1418	0.1418
BEP	18046	19852	16241

*Source: Annual Report of STC*

Above table 4.14 shows that 10 percent of fixed cost increase break-even amount is increased by same percentage i.e. 10 percent and with 10 percent decrease in fixed cost, BEP amount is decreased by same 10 percent. From this situation, it can be concluded the break-even point and fixed cost has get direct proportionate relationship.

**4.11 Major Findings**

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

- )] The 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 in Corporation Limited are fluctuated. Variable cost as well as fixed cost increase or decrease during 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 change in profit but change is not in the same ratio.

- ) This corporation has no lower BEP ratio. Lower BEP indicates strength position of the corporation. Therefore, the condition of the corporation is not so good taking the reference of BEP ratio.
- ) The higher percentage of MOS ratio indicates that the company is in strong profitability position
- ) Contribution margin of the corporation are not stable and satisfactory.
- ) The 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.

## **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 correlation. The company's condition is very poor and requires effective improvement in situation.

## **5.2 Conclusion**

Salt Trading in 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.

- J 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.
- J 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.
- J 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.
- J 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.
- J 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.
- J As STCL spend huge amount on the topic of salaries and wages, it should like proper manpower planning to reduce the cost.
- J 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
- J New market areas should be identified for the coverage increase of company.
- J System of periodicals performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately.
- J 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.



- J 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.
- J 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.
- J 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.