

**COST VOLUME PROFIT ANALYSIS  
OF  
PARAMOUNT CARPET INDUSTRY JHAPA  
  
A THESIS**

**Submitted by:**

**Yog Narayan Chaudhary**  
Ramswarup Ramsagar Multiple Campus  
T.U. Reg: 7-2-25-70-2002  
Roll No: 232/065  
Symbol N: 140150/067

**Submitted to:**

Office of The Dean  
**Faculty of Management**  
**Tribhuvan University**

In Partial Fulfillment of the Requirements for the  
Master's Degree of Business Studies (M.B.S.)

**Jankpur dham ,  
2013**

## VIVA-VOCE SHEET

We have conducted the VIVA-VOCE examination of the thesis

**Submitted by:**

**Yog Narayan Chaudhary**

***Entitled***

**COST VOLUME PROFIT ANALYSIS OF PARAMOUNT CARPET INDUSTRY, JHAPA**

*And found the thesis to be the original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment for the Master's of Business Studies (M.B.S)*

### Viva-Voce Committee

Chairman Research Committee .....

Member (thesis Supervisor) .....

Member (External Expert) .....

**Date:** .....

## RECOMMENDATION

This is to certify that the thesis

**Submitted by:**

**Yog Narayan Chaudhary**

***Entitled***

**COST VOLUME PROFIT ANALYSIS OF PARAMOUNT CARPET INDUSTRY JHAPA**

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

**Ram Naresh Thakur**  
Thesis Supervisor

Date .....

Chairman Research Committee

**Prof Dr.Shailendra Lav Karn**

Signature .....

Date .....

**Assistant campus Chief**  
**Jugeshwar sah**

Date:.....

**Campus Chief**

**Vishnudeo yadav**

Date .....

## ACKNOWLEDGEMENTS

Giving me opportunity to this thesis to fulfill the partial requirement of MBS Program held Tribhuvan University, I would like to heartily thank to Tribhuvan University.

I express my profound gratitude to my **Supervisor Mr. Ram Naresh Thakur**, Lecturer and Head of Research Department **Prof Dr. Shalandra Lav Karn** for their patient and continuous guidance with valuable comments and kind support to me all way through this thesis.

I also owe an indebtedness to all reputed authors whose writing have provided me the necessary guidance and invaluable materials for the enrichment of my research paper in all possible ways. I would like to express my guidance appreciation to all the staff for **R.R. M. Campus, Jankpur Central** library staff and security Board Library that provide me all necessary information and data. And also express my gratitude to the staff of various corporate bodies who bigheartedly Made accessible the requisites information.

I have tried to cover all the possible matter I felt, important to sum up the "**COST VALUME PROFIT ANALYSIS OF PARAMOUNT CARPET INDUSTRY, JHAPA**". I am hopeful that this task will be helpful to the student of business studies and to those who want to make further researchers under this topic

.....  
**Yog Narayan Chaudhary**

## **DECLARATIONS**

I hereby declare that this thesis entitled "**COST VOLUME PROFIT ANALYSIS OF PARAMOUNT CARPET INDUSTRY**". Submitted to Research Department, **R.R.M. Campus, Jankpur** Nepal my original work done in the form of partial fulfillment of the Master's Degree in Business Studies (M.B.S.) under the supervision of my thesis guides **Mr. Ram Naresh Thakur** Lecturer of **R.R.M. Campus**.

.....  
**YOG NARAYAN CHAUDHARY**  
**Researcher**  
**R.R.M. Campus**  
**Campus Roll N. – 265/065**  
**TU. Regd N. : 7-2-25-70-2002**

**Date:** .....

# TABLE OF CONTENTS

Page No.

<b>Recommendation</b>	
<b>Viva-Voce Sheet</b>	
<b>Declaration</b>	
<b>Acknowledgements</b>	
<b>Table of Contents</b>	
<b>List of Tables</b>	
<b>List of Figure</b>	
<b>Abbreviations</b>	

## CHAPTER -ONE

<b>INTRODUCTION</b>	<b>1-8</b>
1.1 Background	1
1.2 Historical Background of Carpet Industry	2
1.2.1 Potential of Carpet Industry	4
1.2.2 Profile of Paramount Carpet Industry	4
1.2.3 Introduction to Paramount Carpet Industry	5
1.3 Statement of the Problem	5
1.4 Objective of the Study	6
1.5 Focus of the Study	6
1.6 Significant of the Study	7
1.7 Limitations of the Study	8
1.8 Organization of the Study	8

## CHAPTER – TWO

<b>REVIEW OF LITARETURE</b>	<b>9-48</b>
2.1 Introductions	9
2.2 HistoricalBackground	9
2.3 Meaning and Definition of Profit Planning	13
2.3.1 Use of CVP Analysis in Profit Planning & Control	15
2.4 Application of CVP Analysis in Profit Planning & Control	16
2.4.1 Cost-volume-profit Analysis as a tool of Profit Planning and Control	17
2.5 Concept of Cost Volume Profit Analysis	18
2.6 Cost and Its Classification	19
2.6.1 Concepts of Cost	19
2.6.2 Classification of Costs	19
2.6.2.1 Behavior Wise Classification of Cost	20
2.6.2.2 Segregation of Semi Variable Cost	22
2.7 Approached to Cost Volume Profit Analysis	23
2.7.1 Contribution Margin Approach	23
2.7.2 Contribution Margin Ratio:	23

2.7.3 Uses of Profit Volume Ratio	24
2.7.4 Cost and Revenue Equation Approach	25
2.7.5 Break Even Analysis	25
2.8 Computation of Break Even Point	25
2.9 Major Tools Used In Profit Planning and Control.	27
2.10 Economics Characteristics of Cost Volume Profit Analysis	31
2.11 Application of Break Even Analysis	33
2.12 Assumptions of Break Even Analysis	33
2.13 Limitations of Break Even Analysis	33
2.14 Other Use of Break Even Analysis	34
2.15 Cash Break –Even Point	34
2.16 Break-Even Sales Volume In The Presence Of Step Or Moving Fixed Cost.	35
2.17 Break Even Sales Volume in the presence of step or Moving Fixed Cost	35
2.17.1 Cost-Volume-Profit Analysis for a Multi- Product Company/ Firm)	35
2.18 Margin of Safety	36
2.19 Costs–Volume Profit Analysis and Limiting Factors	37
2.19.1 CVP Analysis with a Single Constraint	37
2.19.2 CVP Analysis with a Multiple Constraints	37
2.20 ASSUMPATION Underlying CVP Analysis	38
2.21 Purpose of CVP Analysis	38
2.22 Sensitivity Analysis	39
2.23 Review of the Journal And Articles	39
2.24 Review of The Related Studies	41
2.25 Research Gap	48

### **CHAPTER – THREE**

<b>RESEARCH METHODOLOGY</b>	<b>49-52</b>
3.1 Introduction	49
3.2 Research Design	49
3.3 Population and Sample	50
3.4 Source and Types of Data	51
3.5 Variable of Studies	52
3.6 Methods of Analysis & presentation	52
3.7.1 Descriptive Technique	52
3.7.2 Quantitative Technique	52

### **CHAPTER – FOUR**

<b>PRESENTATION AND ANALYSIS DATA</b>	<b>54-85</b>
4.1 Introduction:	54

4.2 Analysis of Budgeted and Actual sale	54
4.2.1 Analysis of Sales for Selected Product Lines	58
4.3 Profit (Loss) Pattern of PCI	59
4.4 Cost Analysis	60
4.4.1 Fixed Cost Analysis of PCI	61
4.4.2. Analysis of fixed cost for selected product lines	63
4.4.3 Analysis of Variable Cost	63
4.4.3.1 Analysis of Variable Cost for Selected Product Lines	65
4.4.4 Analysis of Semi-Variable or Semi-Fixed Costs	67
4.5 Analysis of Sales and Cost Relationship of PCI	69
4.6 Cost-Volume-Profit Analysis of PCI	71
4.6.1 Computation of BEP	72
4.6.1.1 Analysis of BEP in Rupees for the Entire Company	73
4.6.1.2 Computation of BEP for selected product lines.	73
4.6.1.3 Computation of BEP as Percentage of Capacity	76
4.6.1.4 Computation of Cash BEP of PCI	78
4.6.2 Break Even Analysis of Multi-Products & Sales Mix.	79
4.6.2.1 Comparison of Individual BEP and Overall BEP of Selected Products	80
4.6.3 Analysis of Contribution Margin	81
4.6.3.1 Analysis of Contribution Margin in Entire form of PCI	81
4.6.3.2 Analysis of Contribution Margin for Selected Product Lines	81
4.6.4 Analysis of Safety Margin of PCI	82
4.6.5 Profit-Volume Analysis	83
4.6.5.1 P/V Analysis in Entire form of the PCI	84
4.6.5.2 P/V Analysis for Selected Product Lines	
4.7 Summary of the Projection	84
4.8 Major Finding	85

## **CHAPTER -FIVE**

<b>SUMMARY, CONCLUSION &amp; RECOMMENDATION</b>	<b>87-90</b>
5.1 Summary	87
5.2 Conclusion	89
5.3 Recommendation	90
Bibliography	
Appendices	

## List of Tables

---

<b>Table</b>	<b>Page No.</b>
3.1 Population and Sample of carpet Industry	50
3.2 Classification of Variables	52
4.1 Total Budgeted and Actual Sales Volume of PCI	54
4.2 Summary of statistical calculation of PCI	56
4.3 Calculation of the Trend of Total Sales of PCI	57
4.4 Sales figure of selected product lines	58
4.5 Profit (Loss) trend of PCI	59
4.6 Fixed Cost Details of PCI	62
4.7 Specific Fixed Cost for Selected Product Line	63
4.8 Statement of Detail Variable Cost of PCI	64
4.9 Statement of Variable Cost for Selected Product Lines	66
4.10 Statement of Semi variable Costs	67
4.11 Classification of Semi-Variable Costs	68
4.12 Cost Structure Analysis of PCI	69
4.13 Cost Structure Analysis of PCI in Percentage	70
4.14 Income Statement of PCI for the year 2063/64 to 2068/69	72
4.15 Computation of BEP for Selected Products Lines	74
4.16 Computation of BEP as percentage of Capacity	76
4.17 Computation of BEP as percentage of capacity for selected product lines	77

4.18	Computation of Cash BEP of PCI	78
4.19	Product wise BEP sales of PCI	80
4.20	Comparison of BEP	80
4.21	Computation of MOS of PCI	82
4.22	Summary of the study of PCI	85

## List of Figures

<u>Figure No:</u>	<u>Page No:</u>
2.1	Structure of PPC.....12
2.2	Variable Cost.....20
2.3	Fixed Cost.....21
2.4	Semi-Variable/mixed Cost.....22
2.5	Graphical Approach of BEP.....26
2.6	Economics Characteristics of CVP Analysis.....32
4.1	Actual Sales & Budgeted sales in Bar Diagram.....55
4.2	Sales & Profit Trend of PCI .....60
4.3	Sales FC & VC Trend.....76

## **ABBREVIATIONS**

%	:	Percentage
$\sigma^2$	:	Variation
BEP	:	Break Even Point
CDM	:	Central Department of Management
CCA	:	Central Carpet Association
CM	:	Contribution Margin
CMPU	:	Contribution Margin per Unit
CV	:	Coefficient of Variation
CVP	:	Cost Volume Profit
DPAT	:	Desire Profit after Tax
FC	:	Fixed Cost
MBS	:	Master of Business Studies
No.	:	Number
PCI	:	Paramount Carpet Industry
P.E.	:	Probable Error
P/V	:	Profit-Volume
PPC	:	Profit Planning and Control
r	:	Correlation Coefficient
S.D. ( )	:	Standard Deviation
SD	:	Standard Deviation
SP	:	Selling Price
SPPU	:	Selling Price per Unit
T.U.	:	Tribhuvan University
TC	:	Total Cost

VC : Variable Cost

VCPU : Variable Cost per Unit

# **CHAPTER – I**

## **INTRODUCTION**

### **1.1 Background**

Nepal is in infancy period of industrialization .The manufacturing sector is very small. In recent years the growth rate is relatively more satisfactory. The manufacturing system has to face numerous problems which have acted as constraints in the growth of manufacturing industry faces such problems are caused by the Land and-luck situation of the country, undeveloped situation of physical human financial & administrative infrastructure & non-availability of energy at reasonable rates, non availability of trained &skilled manpower, shortage of capital, small size of market higher cost of production low productivity of inputs, manpower & technology, instabilities in government policy etc.

Industrialization is an important factor to develop a country. It helps to fulfill the basic needs of people, proper utilization of resources release population pressure on land export and import substitution, employment generation increase income levels. Now a day, industrialization is considered as an essential factor for the economic development & social progress.

Nepal the steepest country in world descends height of the Mount Everest to the tiger prowling jungles ,more than 2500years of culture where Hinduism & Buddhism have met & created undreamed of glories of spiritualism through stone brick & metal for the eye of behold &for the soul to experience. The most beautiful Himalayan kingdom country discover the world of mountain river jungle & culture in the world of Nepal (visit Nepal 1998)

Carpet industries belong to agro-based industry. They are known as Garment Industry. Carpet industries are absorbing local agriculture product as their raw materials for value addition activities. Carpets collection wool from farmers & played then provide finish wool & ready hand knotted carpet to customers.

The primary purpose of planning in business then is to increase the chances of operating planning document committed performance budgets are caused profit plan.

Profit earning is necessary for every industry. Among the objectives of the industries, Profit is the most dominant success & failure of industries, depend on quantity of profit. A Industry would those succeed to obtain funds from the capital market, if it has been earning profit or has but in Nepalese context all manufacturing organization aren't earning profit. Some carpet industry is a example of carpet industry which has been bearing loss every year. It's facing so many problems because of huge losses.

Profit is derived from the business operations profit don't just happen. It should be managed through coordinated & controlled business operations. Profit planning & control (PPC) allow management to plan future activities for the desired amount of profit. Through profit planning management can plan about what level of operating activities will generate desired amount of profit or it also determines or projects its future amount of profit at certain specified volume of activities. Profit planning is building the way through which management can accomplish it's objectives of earning desired amount of profit. Management set profit or operating target for future operation. Profit planning helps management to decide & build the path so that target can be met.

Cost volume profit (CVP) analysis is an important tool for PPC. It is one of the management tools used for establish & analyze the relationship between total cost, total revenue & total profit. For this it establishes a relationship between elements of PPC. There is no debate that profit is the function of several elements like selling price, sales unit, variable cost & fixed cost of the product. These are also affected by other some subjective economic environmental factors. C-V-P analysis helps to study relationship between revenue & cost to determine the level of activity. It is hence, known as a supplementary tool of profit planning. It is immensely helpful in developing different alternatives courses of action for planning & controlling profit.

## **1.2 Historical Background of Carpet Industry**

The development of on export quality carpet was initiated with the influx of Tibetan refugees in the early sixties. Credit goes to the Swiss association for technical association (SATA) for their contribution. In the development of the carpet industry in Nepal through financial & technical support to the Tibetan refugees resettlement

programs. In the beginning it was lunched as a source of livelihood for the Tibetan refugees & marketing was limited to tourist visiting the kingdom efforts to gain access to the international market arena paid off in 1964

when the first commercial shipment left to Europe namely Switzerland with vision & Entrepreneur skill. It transformed into an actionably recognized commercial commodity & remains the most important export product in Nepal.

Nepalese - Tibetan carpets contains a very high degree of hand processing & qualities ranging from 60-150knts per square inches. Regularity safe guard are in place to ensure that only highest quality fleece wool is imported for the use of these carpets. Buddhism basically influences the traditional design & color in markets tastes. A wide rang of sizes from 0.25sqm has replaced the traditional size to 56sqm & in shape such as round, octagon & customer shapes. The desired designs styles & shades are the certain of local designers & engineers with regular feedback from the market.

At present 95% of the production of carpet is concentrated in the Kathmandu valley with the remaining 5% spreading over a number of other districts of the country.(Carpet Bulletin,2009:3)

Carpet industries provides qualitative carpet to foreign customer at world wide level, the demand of hand knotted qualities carpets is increasing day by day carpet industry buys wool at a reasonable price in regular basis then makes qualitative carpet & exports with foreign customer for their carpet to export the reasonable price to shipment of their foreign customer to fulfill these objectives. The carpet industry has been working from its set up.

Carpet industry is playing vital role to improve the economic condition of weavers & whole Nepalese people as well as it business. Carpet industry is providing various product lines in the market which are as follows;

- (i) Pasma shawl
- (ii) 150 knot carpet
- (iii) 100 knot carpet

(iv) 60 knot with different name carpet.

(v) Others woolen goods etc.

Carpet industry has been collecting wool in our country as well as import from Tibet. Carpet industry has been playing vital role to increase export business & up lift the economic condition of Nepal.

### **1.2.1 Potential of Carpet Industry**

Products have become the important part of earning foreign currency. It has important role in our export sector of nations. The uses rate of hand knotted Nepalese carpet is increasing every year in foreign country. It provides qualitative hand knotted Nepalese carpet to the customer of national & international. The demand of carpet products are increasing day by day because of high quality & hygiene. Carpet has helped the all related area to improve their standard of life by purchasing wool at reasonable & suitable price. It has worked to uplift the life standard of poor people.

Nepal is an agricultural country where 80% of the total people are depended on agriculture sector. Their main source of income & employment is agriculture sector. A few people rely on export business. They produce wool in high quality which is the main raw martial of carpet industries. Carpet production is increasing by 2% every year. The Government focuses its attention in increasing carpet production. Three Years interim plan (2064/065-2066/067) makes many policy & strategies in export sector to fulfill its goal & objectives which increase future potentiality of carpet industries.

### **1.2.2 Profile Of Paramount Carpet Industry**

The following aspects are included in the Paramount Carpet Industry;

While the nations was facing the problem of export business at that time some of business man think & study alternative export market & production to increase export business production of hand knotted carpet weaving & export.

That study showed & gave the priority together & promote wool producer to establish carpet industry in the thinking of declared to establish carpet industries in Kathmandu. After the long thinking & discussion was formed to register at Gothatar VDC word

No-4 Kathmandu. He registered carpet industry in the name of Paramount Carpet Industry in 1989 AD.(memorandum of association)

### **1.2.3 Introduction to Paramount Carpet Industry**

There are nearly about dozen famous carpet industry in establish at Kathmandu valley. Among them paramount carpet industry is one of the famous carpet exporter company which is established in 2045B.S. in Gothatar VDC word no 4 by the founder of Mr. Deepak Kumar Bhattra. Its main object to establish this industry to earn maximum profit by providing qualities products as well as to increase export business & also to help the government by earned maximum foreign currency.

At present, industry cover about 20% of the market of carpet export. The sales volume of this industry is increased by 20% for the comparison of last year. (Annual Report of PCI).

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

The industrialization process in Nepal is being developed very slowly in spite of various attractive polices of the government in respect of industrialization. New investment made on industrial sector isn't satisfactory. The financial performance of established manufacturing industry is also not good .most of the industry is operating in losses & such condition of the well established industry discourage new investment both in manufacturing & non-manufacturing sector. There may be various & different reasons for the poor performance of the manufacturing industries such reasons should be investigated & should be taken corrective measures for the improvement of their performance.

Paramount carpet industry is the famous carpet industry of private sector in the country providing different kinds of carpets. A huge amount of money is invested for this industry. But the financial performance of the industry is not satisfactory & it is bearing a heavy loss every year.

How the business is being operated largely depends on how the business operation is planned. Poor performance is the outcome of poor planning, controlling & decision

making .the main key motives of every business is to make & maximize profit. Profit just doesn't happen by chance. It is to be managed cost-volume-profit analysis is a supplementary tool of planning for profit. Cost-volume-profit analysis is immensely helpful for developing alternatives strategies in sales planning & cost estimation.

The study of basically designed to solve the following problems;-

- i , Is the paramount carpet industry practicing cost-volume -profit analysis tools & technique to carrying out planning, decision making & control functions?
- ii, What are the major difficulties in the application of cost-volume-profit analysis in carpet industry?
- iii, In which area of the industry cost-volume-profit analysis can be applied to improve the performance of the carpet industry?
- iv, Which part of cost-volume-profit analysis is mostly practiced till date?

#### **1.4 Objective of the Study**

The planning objective of the study is to identify & evaluate the current proactive of cost-volume-profit analysis & its effectiveness in carpet industry with special reference to carpet industry the specific objectives of the study are;-

- i ,To evaluate the sales volume to break even & to predict desire profit.
- ii, To study the relationship of cost-volume-profit analysis & its applicability as a tool of budgeting.
- iii, To define the cost classification practice of the company.
- iv, To suggest & recommend on the carpet industry based on major finding.

#### **1.5 Focus of the Study**

Although more money chasing isn't business, the main objective of business is to earn reasonable profit. It helps continuity in the business. The survival, expansion & diversification of business depend upon its ability to earn profit. The profit is the measuring rod for business efficiency & effectiveness. Therefore, the business should

earn reasonable profit which will be beneficial of both business & Society.

Like every business organization, Paramount Carpet Industry is also established to earn profit Cost Volume Profit analysis serves as a technique of profit planning. It examines the response of the profit to change in volume. Every business organization must use Cost Volume Profit Technique to plan profit. One of the major causes of poor performance is the outcome of not using Cost Volume Profit technique & tools properly.

This has raised a question whether Nepalese manager are competent enough? Do they practice Cost Volume Profit analysis tools & techniques to carryout planning controlling functions & decision making? Thought Paramount Carpet Industry is currently having a fair estimate of total cost total revenue & profit at various level of volume due to the lack of application, Cost Volume Profit analysis tool & technique. Therefore the study focuses as the Cost Volume Profit analysis.

## **1.6 Signification of the Study**

Cost-volume-profit analysis is one of the powerful management tools to show relationship between the element of profit planning & use for decision making in certain situation .cost-volume-profit analysis is one of the tools of profit planning & controlling so this study will be significant is the following ways;-

- i , It highlights the relationship between cost - volume & profit as an applicable tool of profit planning.
- ii, This study would be very useful to the potential Managers Accountants Policy maker & Researcher because it deals with practice of cost-volume-analysis of carpet industry as an important tool of profit planning & controlling.
- iii, This study is helpful to the related department of carpet industry by providing necessary recommendations.
- iv, It is also useful for interested parties, investor, shareholders & other stake holder.

## **1.7 Limitations of the Study**

These are the main limitations of the studies are as follows:-

I, Analysis is concentrated in cost-volume-profit & it doesn't cover the other area of the industry.

II, Since, the report is prepared in short time based on secondary data and some published source the out come of the study covers the related data of the paramount carpet industry Jhapa form F/Y 263/064 to 2068/069

## **1.8 Organization of the Study**

**CHAPTER-I;** -The first chapter includes background of study an introduction of carpet industry statement of problem objectives importance & limitation of the study.

**CHAPTER-II;** -The second chapters consist in review of literature under which the terms cost-volume-profit have been described.

**CHAPTER-III;** -The third chapters submit, the research methodology follows to achieve the purpose of the study which includes research design, period covered nature & sources of data tools used to analysis the data & research variables etc.

**CHAPTER-IV;** -The fourth chapter takes the data collected through the various sources have been presented. It manly consist the analysis of sales plan, variable cost plan fixed cost plan & other relevant factors are analyzed from profit & loss account balance sheet .A part from this sensitivity analysis & cost-volume-profit analysis with product mix has also been analyzed & finding has been summarized.

**CHAPTER-V;** -The last chapter deals with the summary, conclusion & recommendations. This ends the study paper.

The bibliography appendix & glossary have been submitted at the end of the study paper.

## **CHAPTER –II**

### **REVIEW OF LITERATURE**

#### **2.1 INTRODUCTION**

The Purpose of reviewing the literature is to develop some expertise in ones area to see what new contribution can be made & to receive some ideas for developing are research design. Their relevant finding issues arguments logics & suggestion, which will give a glimpse guide line to go further depth of the study. In other word there has to be continuity in research. This continuity in research is ensured by linking the present study with the post research studies.

#### **2.2 Historical Background**

Review of literature is supposed to revise the eminent literatures relating to the study various books articles journals bulletins reports news statements & thesis etc are the basis for preparing it. Philosophers, writers or researchers have given the contribution on it since many years.

Generally profit is known as the part of income of the firms. Profit is the motivating force in the business. Success of business depends on profit. Profit promises to provide satisfaction to consumer we can simply define the word profit as the primary measurement of success of management effectiveness in business enterprise. In other words profit means the excess of total revenue over total cost of production. Usually profits don't happen they are managed or produce. Thus it is quite obvious that profit is obtained by subtracting the cost from the revenues & it is also the reward for tacking risk. Profit plays a vital role not only in managerial decision but also in the general life standard of human beings. Therefore management should continuously evaluate efficiency of the company in term of profit.

The word planning stats thinking & deciding what ought to be done in advance. It is also a process of developing enterprises. Objective & selecting future courses of action to accomplish them. Planning is the process of developing enterprises objectives & selecting future course of action to accomplish them. It includes (welsch, 1992:3)

- Establishing enterprises objectives
- Developing premises about the environment in which they are to be accomplished.
- Selecting a course of action for accomplishing the objects.
- Initiating activities necessary to translate plans in to action
- Current re-planning to correct deficiencies

Planning is essential to accomplish goals. It reduces uncertainty and provides effective direction to the employed by determining the course of action advance.

Thus, planning establishes the objectives, goals strategies, policies and standards of enterprises. Past is the father of present and to a great extent, present is a guide for future. Therefore, planning for future needs proper guidance to be taken from past event and adequate acquaintance should be made of present action.

Once the planning is determined, it must be carried out under control. Controlling shares management actively and for this managers compare actual performance against the planned performance and find out the deviations taking remedial steps to remove the deviations to make an improvement in the performance because promptness is the essence of an effective control. Controlling means evaluating the firm's activities against the plan and deciding what should be done if the plan is not being followed. (Lynch and Williamson, 1999:18)

Control is the process of ensuring that actual activities confirm to plan activities. Control helps in correlation. Therefore, planning and controlling are the major function of management.

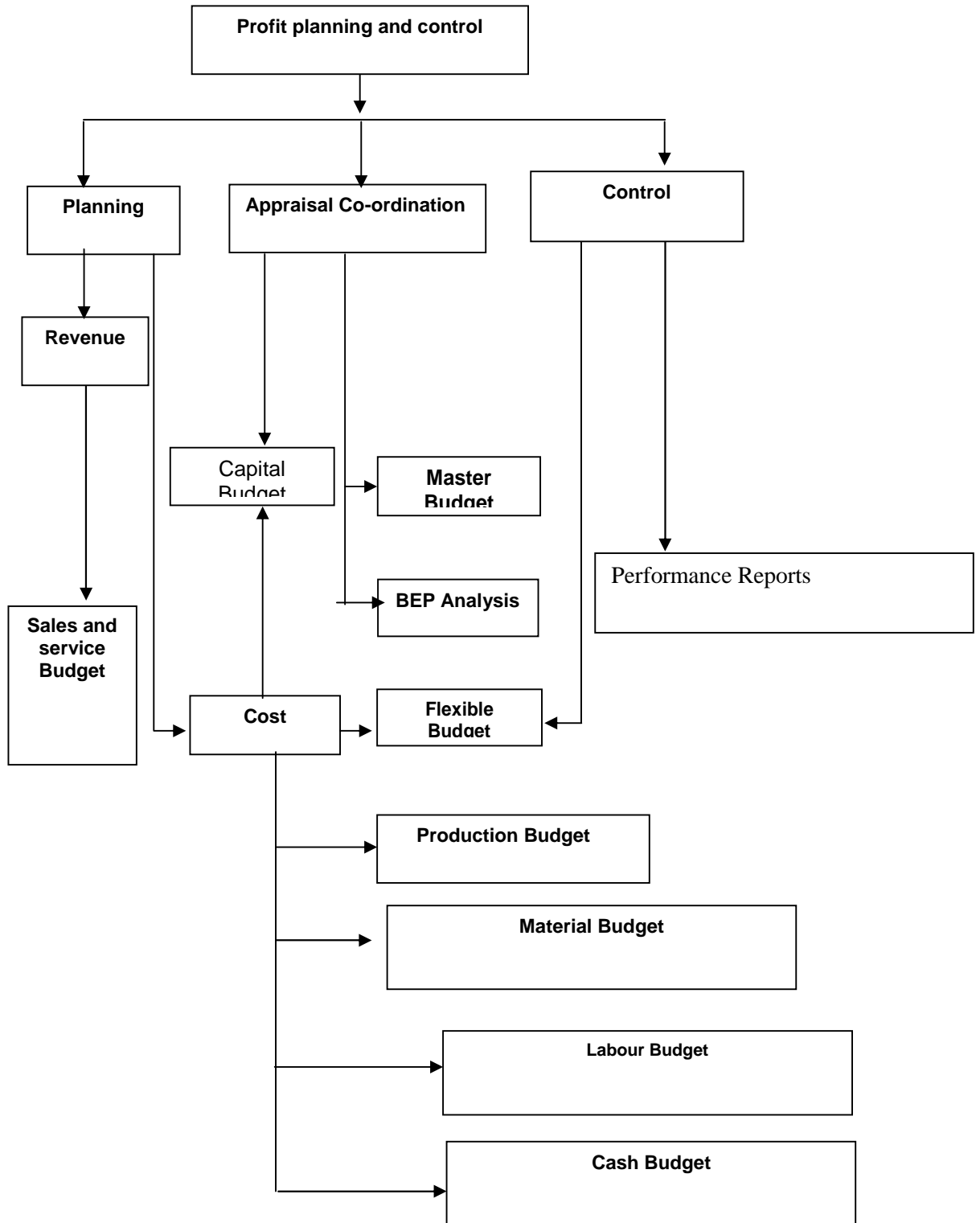
- According to Welsch, controlling involves
- Establishing goals and standards.
- Comparing measured performance against the established goals and standards.
- Reinforcing successes and correcting shortcomings
- Control provides timely information that may prompt the revision of goals.

The purpose of control is achieved with setting standards, comparing predicted and

actual results against these standards and taking corrective actions. Planning and controlling are interdependent and thus closely related with each other because a manager can not control unless he has planned a course of action for effective and smooth managerial behavior into proper profit and progress on behalf of company, firm or enterprises. Under this condition to be applied, both planning and controlling are mutually inseparable.

**Structure of Profit Planning and Control:**

**Figure 2.1**  
**Simple structure of PPC**



*( sources:Adhikari, 2012:21)*

### **2.3 Meaning and Definition of Profit Planning**

Profit planning is one of the most important managerial functions, profit planning is merely a tool of management, which is used to plan and control business operation and inter action.

When a management plans, profit for a specific period of time that is known as profit planning. Every firm has to make a plan of profit if it has to survive and grow in the business line or business world in future.

The phrase "comprehensive profit planning and control" is a new term in the language of business but it is not new concept in the management. Commonly, comprehensive profit planning and control have been identified as 'a way of managing'. The term "comprehensive" means the application of the board concept of profit planning and control all phases of operations on an enterprises and the application of a total system approach.

Profit planning is the process of determining the required amount of profit from each principle unit of business. A profit plan is an advance decision of expected achievement based on the most efficient operating standards of time. It is established against which actual accomplishment is regularly compared.

Profit planning is the estimation and predetermination of revenues and expenses the estimate how much income will be generated and how it should be spend in order to meet investment and profit requirement. In the case of institutional operation, it presents a plan for spending income in a manner that doesn't result in a loss (Ninemeire, 1984:133). Explaining the use of profit plans and budget, they further mention that once it is developed, managers know that when actual expenses exceed budget limitations, there may be problems. The profit plan tells managers how much money remains to be spent in each expenses category, profit plans are also used to developed new budgets.

Profit planning or budgeting is a forward planning and involves the preparation in advance of the quantitative as well as financial statement to include the intention of management in respect of the various aspects of the business. Profit planning, in fact is a managerial technique and it is a written plan in which all aspects of business

operation with respect of definite future period are included. It is a formal statement of policy, plan, objective and goal established by the top management in respect of some future period. Profit planning is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. Thus, we can say that profit planning is a tool, which may be used by the management in planning the future course of action and in controlling actual performance (Gupta, 1997:521).

Profit planning is a systematic and formal means of decision making and attaining organizational objectives and goals at a specific future period of time by the application of diversified managerial tools for utilization of available resources at a reasonable manner.

Provides a disciplined approach to the solution of business problems Develops throughout the organization and atmosphere of profit mindedness, encouraging an attitude of the cost consciousness and maximum asset utilization. Coordinates the operating plans of the diverse segments of the business into a single, comprehensive plan. Encourage a high standard of performance by stimulating competition, providing a sense of urgency and serving as an incentive to perform more effectively

Affords the opportunity to appraise systematically every facet of the business as well as examine and restate periodically its basis policies and guiding principles.

Aids and directing capital and effort into the most profitable channels.

Provides yardsticks or standards to measure performance and gauge the managerial judgment and ability of the individual executive.

According to Welsch, the three most relevant aspect of PPC concept are:

PPC requires major planning decision by management.

PPC entails pervasive management control activities.

PPC recognizes many of the critical behavioral implications throughout the organization.

In the opinion of J. Batty, when dealing the question of profit planning it is usual to consider (Batty, 1982: 322).

- The volume of out put in terms of numbers of product or other units.
- The verity to be produced (the product mix)
- The cost to be incurred.
- The prices to be charged.

The aim of profit planning should be to ensure and adequate return on capital employed and financial stability. Therefore, profit planning includes a complete financial and operational plan for all phases and facts of the business.

A profit plan is a comprehensive statement of intentions, expressed in financial terms, for the operations of the firm or a short period. It is a plan of the firm's expectations and is used as a basis for measuring and controlling the actual performance of managers and their units (Panday, 1999:257).

Thus, profit planning is used for development and acceptance of objectives and goals and moving an organization effectively to achieve those objectives and goals. Profit planning is developed to meet the objective of effective performance of the management process.

Profit planning is an integral part of the management; by the help of it any enterprises should earn realistic profit return on investment. It is financial and narrative expressions of the expected results form the planning decision. By using profit planning technique, one can achieve the desired goals. Profit plan is flexible and depends upon the size and nature of the firms.

### **2.3.1 Use of CVP Analysis in Profit Planning & Control**

Planning, controlling and decision-making are the essential managerial functions. Const-volume-profit analysis helps the managers to plan for profit, to control cost and make decision. As such it helps (Munakurmi, 2002:123)

- To estimate profits or losses at various level of output.
- To help management to fine the most profitable combination of costs and volume (units).
- To determine the break-even point in terms of unit or sales value

To ascertain the margin of safety. To determine the sales volume at 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. To determine new break-even point from change in fixed or variable cost. To assess the likely effect of management decisions such as an increase or a decrease in selling price, adoption of new method of production to reduce direct labor and increase output.

-

## **2.4 Application of CVP Analysis in Profit Planning and Control**

Profit planning is the fundamental part of the overall management function and cost-volume-profit analysis is a major tool of profit planning therefore, cost-volume-profit analysis is used for the following respects (Dangol, 2018):

It helps in determining the level of output where all the costs can be met. It is helpful in cost control. It helps in fixation of selling price. It also assists the management in understanding the behavior of cost and helps in budgetary control. It assists the management in performance evaluation for the purpose of management control. It helps very much in making managerial decisions such as make or buy a part, drop or continue a department or product line, accept or reject a special order, selection of a profitable product mix etc.

### **2.4.1 Cost-volume-profit Analysis as a tool of Profit Planning and Control**

Cost volume profit analysis examines the behavior of total revenues, total costs and operating income as changes occur in the output level, the selling prices, the variable cost per unit and/or fixed costs of a product (Horngreen,1999:350).

Cost volume profit analysis is a systematic method of examining the relationship between change in activity (i.e. output) and changes in total sales revenue, express and net profit. As a model of their relationship CVP analysis simplifies the real world condition that a firm will face. Like most models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations. Nevertheless, it is a powerful too for decision making in certain situations (Drury, 2000:296).

Most of the businesses fail after a few years, sometimes months, of starting because they tend to do anything for volume without thinking how it's going to affect bottom line. Cost-volume-profit analysis is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is the function of the selling price of the product, demand, variable costs, fixed costs, taxes etc. the whole picture of profit planning is associated with cost-volume-profit interrelationship (Bajracharya, 2004:225).

CVP analysis is and important media through which is the management can have an insight into effects on profit on account of variation in cost and sales and take appropriate decisions. Profit planning can be done only when the management has the information about the cost of the product and selling price of the product.

The key motive of business enterprises is to make and maximize profit. Profit doesn't happen by chance. It is to be managed. CVP is a supplementary tool of planning of profit. It is immensely helpful for developing alternative strategies in sales planning and cost estimation. CVP is an accounting technique showing the relationship between the above mentioned variables. This technique is equally important in profit making and non profit making organization.

Cost-volume-profit analysis is a management accounting tool to show the relationship

between the ingredients of profit planning. Profit planning is the function of selling price of the product, the variable costs and volume to be sold. The entire scope of profit planning associated with CVP interrelationship. A widely used technique to study CVP relationship is break even analysis. Break even analysis is concerned with the study of revenues and costs in relation to sales at which the firm's revenue and total costs will be exactly equal (or net income is zero). Thus the BEP may be defined as a point at which the firm's total revenues are exactly equal to total costs, yielding zero income, the 'no profit' 'no loss' is an break even point or a point at which losses and profit begins (Khan and Jain, 1993:235)

Cost-volume-profit analysis can be regarded as a sophisticated method or analytical tool used in management. It is extremely useful profit planning and control, management decision, cost control, building etc.

## **2.5 Concept of Cost Volume Profit Analysis**

CVP analysis is an analytical tool for analyzing the relationship among cost, price, profit, sales and production volume. Mainly, there are three elements in CVP analysis. They are cost, sales of production volume, and profit. All these terms are interconnected and dependent on one another. For instant, profit per unit of a product depends on its selling price and cost of sales. The selling price to a greater extent will depend on the cost and costs depend on the volume production. It is highly essential for the management to have the complete knowledge about the interrelationship among the cost, volume and profit. A study concerning this interconnection is undertaken through cost-volume-profit analysis.

CVP analysis is a supplementary tool of profit planning. It tells many things about the relationship between the business variable. Total variable costs are proportionate to the sales volume; whereas the total fixed costs remain unchanged within the relevant range of the output levels. That is why; net incomes are not in proportion to sales. Knowing the relationships, one can assess the profit at forecasted sales volume; likewise, required sales can be ascertained for the minimum level of profit. If a company sells more than one product, called the product mix, each product may not be equally profitable. So the company's profit will depend up on the ratio of each

products sale on the total sales revenues. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low margin items can cause the total profit to decrease even though total sales increase. On the contrary, a shift in the sales mix from low-items to high margin items can cause the reverse effect; total profit may increase even though total sales decrease. (Adhikari, 2009:23)

Thus, CVP analysis is the techniques of summarizing the effects of changes in a organization volume of activity on its cost, revenue and profit. Cost volume profit analysis applies marginal or variable costing principles while establishing the effect of the future course of activities on the financial results of the firm. Knowledge of how cost behaves in response to change in volume and how profit behaves in response to change cost and volume helps management to make numerous short terms optimal decisions relating cost control and profit maximization.

## **2.6 Cost and Its Classification**

### **2.6.1 Concepts of Cost**

Sacrifice or foregoing of resource made for the attainment of specific purpose is known as cost and are measured in monetary terms. Cost are collected, classified, determined, analyzed and controlled keeping in view the very purpose for which it has been incurred. Cost must be paid for production or purchase of goods and services. Usually costs are incurred with a view to obtained more return or resources in future. Immediate effect of cost is that it causes decrease in assets or increase in liabilities.

### **2.6.2 Classification of Costs**

Cost classification is the process of grouping costs according to their characteristic. In other word, it is the placement of like items together by virtue of their common features. Though costs are identified with cost units, cost centers or cost objectives in general, the same figures can be classified differently depending upon the very purpose or specific requirement of the management. Cost classification not only helps management in determining product costs for stock valuation and profit measurement but also helps in decision-making planning and control.

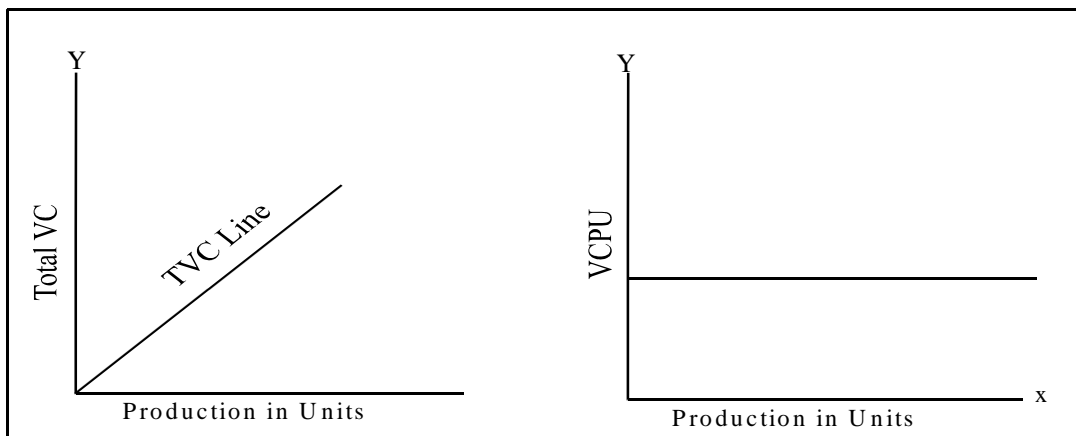
### 2.6.2.1 Behavior Wise Classification of Cost

All costs do not show the same behavior throughout the operation. There exists a relationship between cost and volume of activity. Cost behavior implies the relationship between cost and activity. In most of the organization, cost can be classified as variable, fixed and mixed as these behave in relation to activity volume.

**Variable cost:** These costs tend to vary in direct proportion to the volume of output. In other words, when volume of output increases, total variable cost also increases. But the variable cost per unit remains fixed. It includes direct materials, direct wages, power, royalties, normal spoilage, small tools, and commission of salesman, etc. It is shown in the figure below.

**Figure 2.2**

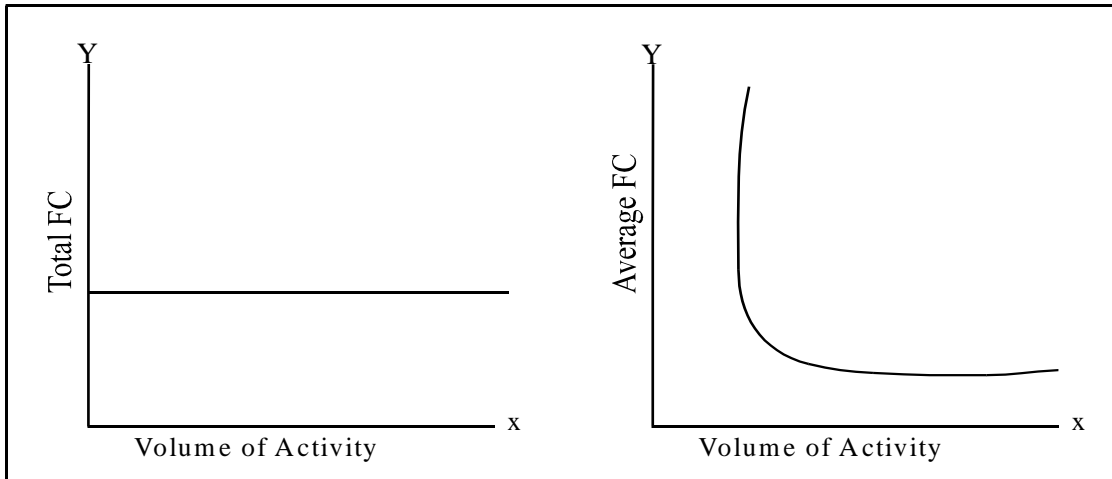
#### Variable Cost



*Source: Munakarmi, 2004:21, 24)*

**Fixed Cost:** These costs remain fixed in "total" amount and do not increase or decrease when the volume of production changes. But the fixed cost per unit increases when volume of production decreases and vice versa. Fixed cost per unit decreases when the volume of production increases. It includes rent and lease, municipal tax, managerial salaries; building insurance, salaries and wages of permanent staffs etc. It can be shown in the figure below.

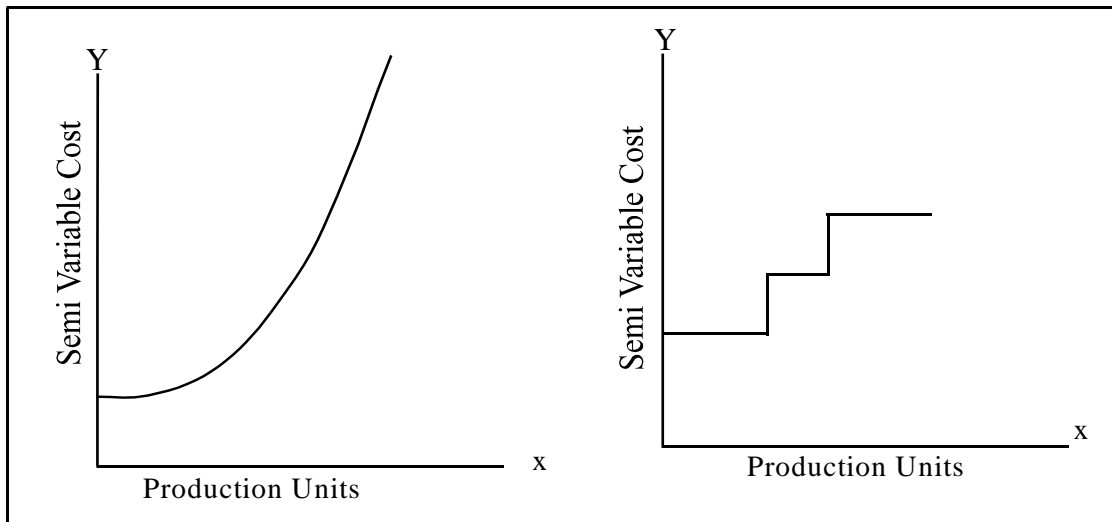
**Figure 2.3:**  
**Fixed costs**



*Source: Munakarmi, 2004:24)*

Mixed Costs: These are partly fixed and partly semi variable costs has often a fixed element below which it will not fall at any level of output. The variable elements in semi variable costs changes either at a constant rate or in lumps. For example, interlocation of an additional shift in the factory will require additional supervisor and certain cost will increase in lumps. In the case of telephone, this is a minimum charge and after a specified number of causes, the charges are made according to the number of calls made. Thus, there is not fixed pattern of behavior of semi variable cost. It includes supervision, light and power, telephone expenses, maintenance and repairs, depreciation, compensation for accidents etc. Semi variable cost can be shown in the figure below.

**Figure 2.4:**  
**Semi Variable/Mixed**



*Source: (Munakarmi, 2004:24)*

### 2.6.2.2 Segregation of Semi Variable Cost

The semi variable cost can be divided into two parts fixed and variable cost. The division of cost to fixed and variable cost is known as segregation of fixed and variable cost is known segregation of cost. There are many method of separating semi variable cost in to fixed and variable cost. The main to methods are as follows;

- a. High-low method
- b. Least square method

a) **High-low method:** This method assumed that the change in semi variable or semi-fixed cost is caused by variation in output or activity.

The following steps should be followed for segregation of semi-variable or mixed cost under high-low method.

- Step 1 to elect highest and lowest level of activity
- Step 2 to take the corresponding cost of highest and lowest level of activity.
- Step 3 to find out the different between highest and lowest points and ascertains the variable cost per unit by using following

b) **Least square method:** Least square method is a statistical method. It is an accurate and trusted method of segregation fixed and variable cost from mixed cost. In this method, first of all, variable cost per unit is calculated. After this, the fixed cost is calculated. The fixed and variable cost can be separated by adopting the stepwise process as shown below.

## **2.7 Approached to Cost Volume Profit Analysis**

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

- I. Contribution margin approach
- II. Cost and revenue equation approach
- III. The graphic (break even chart) approach

### **2.7.1 Contribution Margin Approach**

The profit of a business enterprise is indicated by contribution margin approach. It highlights the relationship among cost, sales and profit. Contribution margin is the excess of sales price of a unit of output over its variable cost. Contribution margin enables to meet fixed costs and add to the profit. The total fixed costs are covered by it and balance amount is an additional to the net profit. Contribution margin can be represented as:

- I.  $\text{Contribution Margin} = \text{Sales} - \text{Variable cost}$
- II.  $\text{Contribution margin} = \text{Fixed cost} + \text{Profit}$
- III.  $\text{Profit} = \text{Contribution Margin} - \text{Fixed Cost}$

### **2.7.2 Contribution Margin Ratio:**

Contribution margin ratio also expresses the relationship of contribution to sales. It is also termed as profit volume ratio, contribution sales or variable profit ratio. If the contribution margin is divided by sales revenue, the result is profit volume ratio. Symbolically, it is:

### 2.7.3 Uses of profit volume ratio

Profit volume ratio can be taken as a significance evaluation tool on earning of business enterprises. The earning capacity of enterprises can be measured by the profit volume ratio. The higher profit volume ratio reflects the firm's ability for increasing profitability.

The profit volume ratio is used to determine the following facts;

**I. Determination of selling price:** selling price can be determined with the help of profit volume ratio. In order to fix the selling price, it is essential to know about the fixed cost, variable cost and budgeted profit. Besides production volume is also required to be fixed. The selling price can be determined by using following formula

**II. Ascertainment of profit a budget sales volume:** The profit can be determined with the help of margin ratio. For this purpose, the following elements should be determined before hand:

1. Sales amount
2. Variable cost
3. Fixed cost

The following formula used to ascertain the profit:

Profit=sales P/V ratio) - Fixed cost

**III. Ascertainment profit on selling price:** Profit volume ratio can be used for finding out the profit on selling price. For this purpose, the following formula is used:

Profit= sales units after break -even  $\times$  unit selling price XP/V ratio

**IV. Determination of profit on cost:** Profit can be determined on the basis of variable cost and sales with the help of profit volume ratio. In order to ascertained the profit, the following formula used:

The formula ascertained the profit per unit for the sales after break even sales.

#### **2.7.4 Cost and Revenue Equation Approach**

The cost and revenue equation approach is based on the income statement concept. It represents the most convenient and accurate approach to cost volume profit analysis. The various formulations in CVP are derived from the revenue and cost function. The relationship between cost, volume and profit can be expressed algebraically as:

$$\text{Profit} = \text{Total revenue} - \text{Total cost}$$

Total revenue and total are affected by sales volume. The addition of quantity in above equation will provide information for knowing the effect of revenue, costs and volume as operating profits. When the quantity is included in the above equation, its algebraic form will be as follows.

#### **2.7.5 Break Even Analysis**

The relation among cost, volume and profit can be found out clearly through break-even analysis. Break-even analysis is regarded as a sophisticated method or tool used in management. It is the most widely known form of cost-volume analysis. So these two terms are used interchangeably.

The break-even point used under break-even analysis. Break-even point is the level of activity where total cost is equal to total sales. It is a specific level of activity or volumes of sales, which breaks the revenues and costs evenly. It is point of activity or volumes of sales, which breaks the revenues and costs evenly. It is point of "no profit, no loss". If the sale or production is higher than breakeven volume, there will be profit. In the same way if the sales is less the break even sales, there will be a less.

### **2.8 Computation of Break Even Point**

Break-even point can be determined by following method

#### **A) Algebraic or Formula Method**

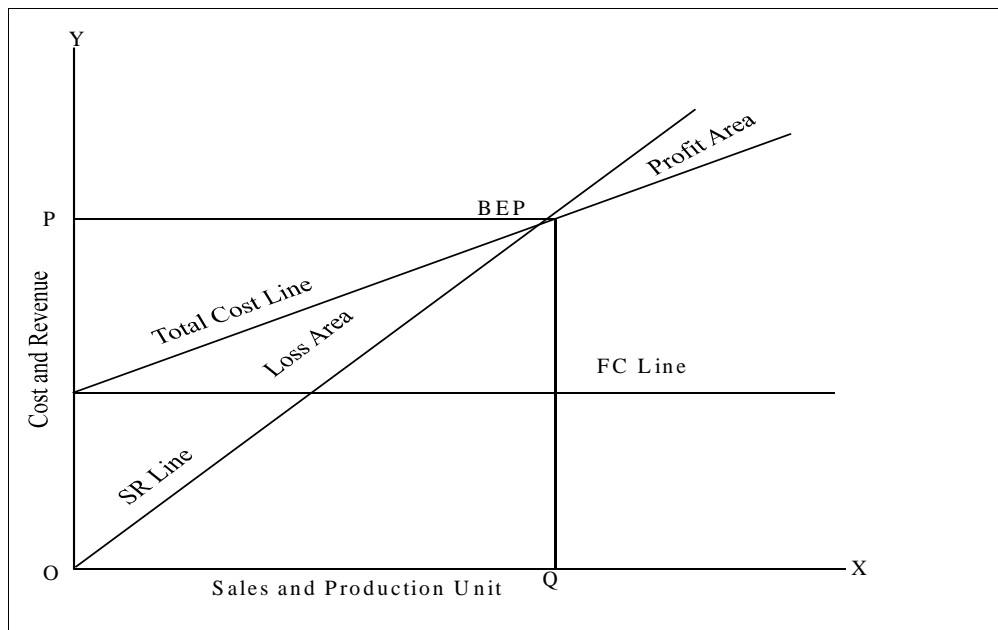
Break even can be determined by the use of formula. It is also termed as algebraic method. According to the definition of breakeven point, it is such a level of sale or activity, where there is neither profit, nor loss. It is that level of sales, where total cost is equal to total sales revenue. It can be presented in equation from in the following

## B) Graphic or Chart method

A break even chart is used to graphically depict the relationship among revenues, variable costs, fixed costs and profit (or losses). The no profit, no loss point (the break even 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, 2004:231 & 232)

In the graph given below the fixed costs remain constant without the relevant range; the fixed cost curve is parallel to 'ox' axis, variable cost slope downward from the origin to right but the slope depends on variable cost ratio. The fixed cost curve parallels the variables cost curve. So the angle 'O' equals the angle 'V' it is because total cost=total fixed cost plus total variable costs at volume 'Q'.

**Figure 2.5:**  
**Graphic approach to BEP**



(Source;-Munakarmi, 2004:145)

The 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, the total revenues equal the total cost. Here, the revenue breaks up (intersects) the total cost curve that's why this point is called break even point. In short, Break Even point is that point where,

## 2.9 Major Tools Used in Profit Planning and Control

Planning and control consists of three main budgets which are:

**a. Operating Budget.**

**b. Financial Budget.**

**c. Appropriation Budget.**

**a. Operating Budget;** - It relates to the physical activities or operations of a firm such as sales, production, purchased, labor and other different expenses budgets. In specific terms an operating budget has the following terms:-

**i. Sales budget:** - Sales budget is prepared from sales forecast where as a sales forecast encompasses potential sales for the entire industry as well as potential sales for the firm preparing the forecast. Sales results from prior year are used as a starting point in preparing a sales forecast (Welsch, 1922:173).

**ii. Production Budget:** - Production budget is the initial step in budgeting of manufacturing operations. The production budget is an estimation of planned quantity of goods to be manufactured during budget period. After the sales budget has been prepared, the production requirements for the coming budget period are determined and organized in the form of a production budget. Sufficient goods will have to be available to meet sales needs and for the desired ending inventory. A portion of these goods will have already existed in the form of beginning inventory. The remainder will have to be produced thus, the expected volume of production is determined by subtracting the estimated inventory at the beginning of the period from the sum of the units expected to be sold and the desired inventory at the end of the period (Adhikari, 2009:36).

The production budget is an estimate of the quantity of goods to be manufactured during the budget period. The production budget is developed in three steps. They are:

Formulate policies relation to inventory levels, and/or production levels. Determine the total quantity of each product that is to be manufactured during the budget period.

Schedule this production by interim periods. The budgeted production having been developed for the budget period, interim production must be planned so as to. Have sufficient goods to meet interim sales requirements. Keep interim inventory levels within reasonable limits. Manufacture the goods as economically as possible.

**i. Purchase Budget:**-Non-manufacturing enterprises are the merchandise goods. Instead of preparing the production budget they prepare a merchandise purchase budget showing the amount of goods to be purchased from suppliers during the periods. The merchandise purchase budget is in the same basic format as the production budget; expect that, it show goods to be purchased rather than good to be produced (Adhikari, 2009: 36).

**ii. Direct Material Budget:** - The material budget specifies the quantities and timing of each raw material needed. Direct materials are essential for production and must be purchased in each period in sufficient quantities to meet6 production needs and to confirm to the company's ending inventory policies. Sufficient raw materials will have to be available to meet production needs and to provide for the desired ending raw material inventory for the budget period. Part of this raw materials requirement will already exist in the form of a beginning raw material inventory. The remainder will have to be purchased from supplier.

**iii. Direct Labor Budget:** - The direct labor budget is also developed from the production budget. Firstly, direct labor requirements must be computed so that the company will know whether sufficient labor is available to meet production needs. By knowing in advance, the company can develop a plan to adjust the labor force as the situation may require. Direct labor requirements can be computed by multiplying product to be each period by the number of direct labor-hours required to produces a unit. Many different types of labor may be involved. If so, then computation labor resulting from these computations can then be multiplied by the direct labor cost per hour to obtain the budgeted total direct labor costs (Adhikari, 2009:).

**i. Manufacturing Overhead Budget:** - Manufacturing overheads are the part of the total production cost, which is not directly identifiable with specific products or jobs. The manufacturing overheads budget provides a schedule of all costs of production other than direct material and direct labor. These costs should be broken down by cost behavior for budgeting purposes and a predetermined overhead rate developed. This rate will be used to apply manufacturing overheads to units of product through the budget period (Adhikari, 2009:37).

**ii. Selling and Administrative Overhead Budget:** - The selling and administrative expenses overhead budget contains a listing of anticipated expenses for the budget period that will be incurred in areas other than manufacturing. The budget will be made up of many smaller, individual budgets submitted by various persons having responsibility for cost control in selling and administrative matters. If the number of expenses item is very large, separate budgets may be needed for the selling and administrative functions (Adhikari, 2009:37).

**b. Financial Budgets:** - Financial budget is important because it is useful in predicting claim on future cash activities financial position and result of operations. The components of financial budget are (Adhikari,2009:38)

**i. Cash Budget:** - A cash budget is developed after all the operational budgets and capital expenditure outlay has been accomplished. A cash budget shows the planned cash inflows, outflows and ending position by interim period for a specific time span. The cash budget is composed of four major sections; the receipts section, the disbursements section, the cash excess or deficiency section and the financing section. The receipt section consists of the opening balance of cash added to what ever is expected in the way of cash receipt during the budget period. The disbursement section consists of cash payments that are planned for the budget period. The cash excess or deficiency section total and the cash disbursement section total. The financial section provides a details account of the borrowing and repayments projected to take place during the budget period (Adhikari, 2009:).

**ii. Budgeted income statement:** - The budgeted income statement is one of the key schedules in the budget process. It is the documents that tell how profitable operations are anticipated to be in the forth coming period. After it has been prepared,

it stands as a benchmark against which subsequent company performance can be measured. The income statement will be completed after addition of the interest expenses, which is computed after the cash budget, has been prepared. It can be developed by time period, sales district and product by assembling appropriate budget amounts from schedules already developed (Adhikari, 2009:).

**iii. Budgeted balance sheet:** - The budgeted balance sheet is developed by beginning with the current balance sheet data and by adjusting it for the data contained in the other budgets. It is based on functional of operating budgets, cash budget, projected income statement and the previous year's assets and liabilities. In other word budgeted balance sheet is a statement of assets and liabilities prepared after the preparation of operating budgets and financial budgets (Adhikari, 2009:).

**iv. Appropriation budget:** - All types of expenditure on advertising and research sectors are covers in appropriation budget. A part from above (operation and financial) budgets, PPC also has relationship with following additional budgets, CVP analysis and completion of profit plan and performance reports (Adhikari, 2009:).

**Capital Expenditure budget :-** Capital budgeting involves the entire process of planning and controlling the expenditures for expansion and contraction of investment in operating (Fixed) assets with returns that are expected to extend beyond one year. Capital expenditures includes such fixed (i.e. operation) assets as property, plant, equipment, major innovations and patents. The major elements of a capital expenditure budget are cash out flow and cash inflow. Cash outflow includes the cost of the project as cash outlays at different times during the life of a project the cash outflows are affected by the provision of residual value of old equipment, tax position, additional working capital needed etc. cash inflows are expected cash revenue during the life of a project. The non-cash expenses like depreciation and tax position can affect the cash inflows (Adhikari, 2009:).

**i. Flexible budgets:** - Flexible budgets directly relate only to expenses of cost. Flexible budgets are also called variable, dynamic, activity and output adjusted expenses budgets, the fundamental concept of flexible budgets for expenses is that all expenses are incurred because of (a) the passage of time (b) output or productive activity (c) a combination of time and output or activity. Flexible expenses budget

concept is complementary to tactical profit plan, its help to provides expenses plans adjusted to actual output for comparisons with actual expenses in periodic performance report (Adhikari,2009:).

**ii. Activity based budgeted budgeting:** - Activity based budgeting recognizes that it is which cause costs and is a more focused method of budgeting. It is activities, which drive costs, and the aim is to control the causes (drives) of costs directly rather than the cost themselves. Activity based budgeting focuses on thesis costs of activities to produce and sell products and services. It separates indirect costs into separate homogeneous activity cost pools. Management uses the causes and effect criterion to identify to cost drivers for each of these indirect cost pools (Adhikari, 2009:).

**iii. Zero based budgeting:** - Zero base budgeting a new approach to the budgeting process. It is a method of budgeting in which managers are required to start zero budget level every year and to justify all costs as if the programs involved were being ongoing in nature: the manager must start at the ground level each year and present justification for all costs in the proposed budget regardless of the type of cost involved. This is done in a series of “decision package” in which manager rank all the activities in the department according to relative importance, going from essential to least importance. Presumably, this allows top management to evaluate each decision package independently and to and to pare back in those areas that appear less critical or that do not appear to be justified in terms of cost involved (Adhikari, 2009:).

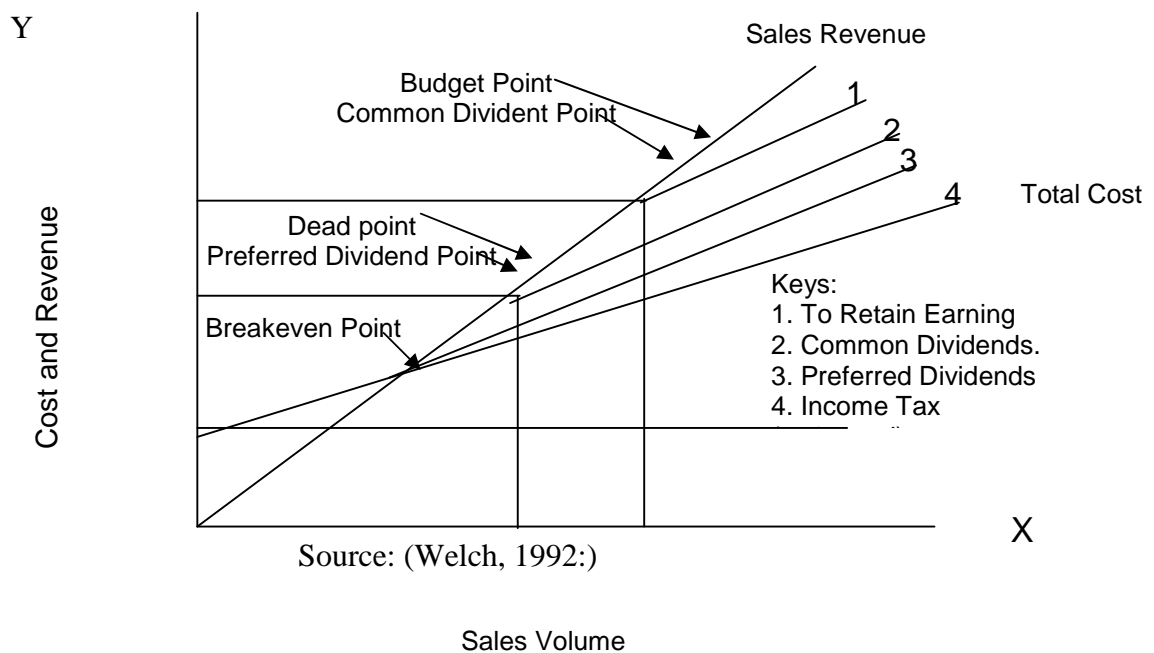
## **2.10 Economics Characteristics of Cost Volume Profit Analysis**

Where cost volume profit analysis is reasonably accurate, the can help management decision making. Essentially, CVP 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 involve average; hence the results should never be interpreted

as precise. Rather than analysis may be characterized appropriately as “Slide rule” approach that may be used to developed and test with a minimum of effort, the approximate effect of cost and profits of several types of management decision.

**Figure 2.6**

**Economic Characteristics of CVP Analysis**



From the break even chart with economic characteristics indicates few of the economics characteristics of a business, which are (Welsch, 1992:468)

Fixed costs, variable costs 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 The break even point

The preferred dividend or danger point the point below that preferred dividends are not earned.

The dead point the point where management earns only the ‘going’ rate on the investment.

The common dividend or unhealthy point the points below which earning are insufficient to pay the preferred dividends and the expected dividend on the common stock.

All these points and as other, can be computed if data are developed for cost volume profit purposes.

### **2.11 Application of Break Even Analysis**

Break even concept can be used to formulate different policies in a business enterprise. Some of these applications are (Mahesh wary, 2000:)

Determination of at different level 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, make or buy decision and drop or add decisions.

### **2.12 Assumptions of Break Even Analysis**

Contribution analysis and break even analysis are based on a specific set of assumptions that should be clearly understood. These underlying assumptions are (Maheshwary, 2003: )

All cost can be classified parts fixed cost and variable cost. There is no cost other than fixed and variable. There is a range of validity (activity) for using the results of the analysis and sales price doesn't change as units of sales change. There is only one product or in case of multiple products, the sales mix among the products remain constant. Basic management policy about operation will not change materially in short run. The general price level (inflation deflation) will remain essentially stable in the short run. Sales and production levels are synchronized. That is inventory remains essentially constant or zero. Efficiency and productivity per person will remains essentially unchanged in the short run. If any of the above assumptions were changed, revised budget would be needed for a new analysis.

### **2.13 Limitations of Break Even Analysis**

Break- even analysis in many business situations can be used for effective decision-making but there is many shortcoming or limitations in its analysis and

interpretations. Some of these can be listed as (Maheshwary, 2000:).

The assumptions of producer's market phenomenon not hold good for all types of commodities.

The fixed costs may not remain constant as well as the variable costs may not vary in fixed proportions at different levels of output.

With variation of the prices of the items or services, which also depend on the factors affecting it, 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 product mix may change the break even point.

Customers may be given certain discount on purchase to promote sales. This revenue may not be perfectly variable with level of sales output.

## **2.14 Other Use of Break Even Analysis**

Break even analysis can be used in a changed situation in different cases and formula are given below.

## **2.15 Cash Break Even Point**

To find out the volume sales that will equalize the cash out flow during a particular period. Cash break even point is used. It is a modification of the traditional accrued basis break even analysis. The fixed costs are divided in to two groups for finding out the cash break even point.

Those are:

Fixed costs requiring cash e.g. salary rent, wage, insurance etc.

Fixed cost not requiring cash e.g. depreciation, deferred expenditure etc.

The following formula is used for finding out cash break even point.

The following formula is used for finding out cash break even- even

## **2.16 Break Even Sales Volume in the Presence of Step or Moving Fixed Cost**

Determination of breakeven sales volume so far was based on the vary assumption that the times of fixed costs will remain stable over a board, relevant range of normal operating volume. But it may not be so. Though some items of fixed cost such as depreciation and rent may remain consent but other items such as supervision, repairs and maintenance may change various items between the capacity volume and relevant range of normal operating volume. Calculation of breakeven volume in the presence of such step or moving fixed cost items requires more homework.

A process of trial and error or resort to specific step helps to overcome such a problem. The points to note here is, we are concerned with the earlier breakeven sales volume as there are numerous break even volumes increasing each time with every increase in step or moving fixed cost (Wagle and Dahal, 2004: ).

## **2.17 Break Even Sales Volume in the Presence of Step or Moving Fixed Cost**

The relative proportion of sales of product is called the sales mix or the product mix. In the case of a multi- product firm, the contribution for each product can be found out by deduction its variable costs firm 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 firms overall break- even can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi-product firms PV ratio will not affect the firm's break even point and profit if each product has the same PV ratio. However a change in the product mix will change the break even point and profit when products have unequal PV ratios.

### **2.17.1 Cost- Volume- Profit Analysis for a Multi Product Firm**

In multi- product firm we have to calculate the BEP in aggregate. The sales mix is used to compute a weighted average unit contribution. This is the average of the several product unit contribution margin weighted by the relative sales proportion of each product.

Following procedures are followed to calculate BEP for sales mix or multi-Product

## **2.18 Margin of Safety**

Margin of safety is the excess of the budgeted or actual sales over the break even sales volume. In other words, it is the difference between the budgeted or actual sales revenue and the break even sales revenue. It is the position above the break even points. It gives management a feel for how close projected operations are to be organizations break even point. Managers often consider the size of the company's margin of safety when making decisions about various business opportunities. The larger is the safety margin, the greater is the chance for the company to earn profit (i.e larger the margin of safety, safer the company). A high margin of safety is particularly significant in times of depression when the demand if the company's or firm's product is falling. A low margin of Safety Company's or firms firm which has a low contribution ratio. When both the margin of safety and the PV ratio re low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume or reducing variables costs by bringing improvement in the manufacturing process, Margin of safety can be ascertained by using the following formula (Munankarmi, 2004: ).

The relationship between safety and actual sales in known as margin of safety ratio which is determined as follows (Munakarmi, 2004:).

The following steps are needed to rectify margin of safety.

With increasing selling price.

With increasing sales volume, if the capacity of fixed cost is not fully utilized.

With reducing fixed cost if possible.

With reducing variable cost (redacting the cost of raw materials, wages and other direct cost)

With substituting product line by more profitable one.

## **2.19 Cost Volume Profit Analysis and Limiting Factors**

CVP analysis is helpful in profit planning and a company will be able to produce any number of output, numbers of output of choice (desires). But in real world it is not possible, because of some critical factors like finishing machine or raw material or labor. These critical factors in the CVP analysis are known as constraint.

### **2.19.1 CVP Analysis with a Single Constraint**

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resource. This can occur if the firm's products are all produced on a single maintained and outer is imagery hours available on this machine. In the same way, single resource constraint arise, if the firms product are all produced with only one material and output is limited by quantity available for that to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scare resource should be allocated to the alternative uses on the basis of contribution per resource (Munakarmi, 2004:).

### **2.19.2 CVP Analysis with a Multiple Constraints**

Where, more than one scarce resource exists, the optimum production program can not easily be establisher the simple process applied in single resource constraint. Under the circumstances simple allocation of recourse constraint 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 may be the ranking of product, because production processes are affected by many constraints factored rather than single constraint. In such situation, linear programming technique may be uses to optimize product mix. The loner programming formulation is required to determine a production plan that maximizes contribution from the product mix. Liner programming is a mathematical technique which shows how to arrive at the

optimum results, allocation of available with the problem of allocating limit resource among competitive activities in an optimal manner. It is a technique to optimize the allocation of scarce resource in product mix problems which provides a valuable extension to cost. - Volume profit analysis (Munankarmi, 2004:).

## **2.20 Assumptions Underlying CVP Analysis**

Break even analysis is the most useful technique of profit planning and control it is a device to explain the relation ship between cost volume and profit. The discussing of the CVP analysis (or break even analysis) so far is based on the following assumptions (Pandey, 2000:).

**a. Cost Segregation** – The total cost can be separate in to fixed an variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit is constant and total variable cost changes in directive proportion to the sales volume.

**b. Constant Selling Price** – The selling per unit remains the constant; that is it done notching with volume or because of other factors.

**c. Constant Sales Mix** - The firms manufacture only one product or if there are multiple precut the sales mix does not change.

**d. Synchronized Production and Sales** - Production and sale saner synchronized that is inventories remain the same.

## **2.21 Purpose of CVP Analysis**

Cost- Volume- Profit Analysis helps management in a number of ways. The following purposes are served by it (Dangol, 2058:).

(i) Calculation of profit resulting from a budgeted sales volume.

(ii) Calculation of sales volume of break-even

(iii) Calculation of sales volume to produce desired profit.

(iv) Effect or changes on price, costs and profits.

- (v) Determinations of new break- even point for changing in cost and selling price.
- (vi) Measurement of effect of changes in profit factors.
- (vii) Choosing the most profitable alternative.
- (viii) Determining the optimum sales mix.
- (ix) Determining the optimum sales mix.
- (x) Determination of capacity and equipment selection
- (xi) Long- term decision on continuances of products.
- (xii) Make or buy decisions on sub- assemble or part.
- (xiii) To contemplate the increase or decrease in profit due to change in method of production etc.

## **2.22 Sensitivity Analysis**

Sensitivity analysis is the measurement of elasticity if the change in cost, volume and profit factors or break even point or give profit. The strategist should focus more on the factor, which is more on the factor, 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 change in volume, price or cost factors one on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determination variable. We know that the goal of business enterprises is to maximize profit. Is the excess of revenues over the total cost.

But one of the factors remain unchanged sometime the manger can internationally change the price and cost factors as a part of strategic decision. But the strategy should focus more one the favor, which is more sensitive or responsive for profit. Therefore, to measures the sensitivity of cost volume profit factors, we can see the impact of certain percentage or a out change in volume price or cost factors on net profit (Bajrachary, 2004:).

## **2.23 Review of the Journal and Article**

*Guidry, Horrigan , craft* (Cost Volume profit analysis (CPV) is one of the most

hallowed, and yet one of the simplest, analytical tools in management accounting. In a general sense, it provides a sweeping financial overview of the planning process (Horngren et al, 1994). That overview allows managers to examine the possible impact of a wide range of strategic decision. That decision can include such crucial areas as pricing policies, product mix, market expansions or contractions, outsourcing contract, idle plant usage, dictionary expenses planning process. Given the broad range of contexts in which CPV can be used the basic simplicity of CPV is quite remarkable. Armed with just three inputs of data sales price, variable cost per unit, and fixed cost—a managerial analyst can evaluate the effects of decision that potentially alter the basic nature of a firm.

However, the simplicity of an analytical tool such as CPV can cut both ways. It can be both its greatest virtue and its major shortcoming. The real world of managerial affairs and a typical analytical model will remove many of those complications in order to preserve a sharp focus. That sharpening is usually achieved in two basic ways: simplifying assumptions are made about the basic nature of the model and restriction is imposed on the scope of the model. Those simplification and restriction limit the reality and relevance of analytical models, so attempts to improve them will involve relaxing some of their underlying assumptions or broadening their scope to include cost of capital and the related impact of asset structure and risk level on strategic decision, while at the same time preserving most of its admirable simplicity. Our variation of the conventional CPV model provides more useful information to management because it focuses on more than operating expenses and sales revenues. Financial managers have long recognized the importance of capital budgeting decision (Brigham, 1995). Our model not only incorporates these admittedly important variables but recognizes the fixed and variable nature of capital costs.

Cost volume profit analysis is a mathematical representation of the economics of

producing a product. The relationship between a product revenue and cost function expressed within the CVP model are used to evaluate the financial implications of a wide range of strategic and operational decisions. CVP analysis is employed to assess

the financial implications of product mix, pricing and product and process improvement decision. CVP analysis facilitates measuring the sensitivity of a product's profitability to variations in one or more of its underlying parameters. Finally, CV analysis may be used to determine the trade-offs in profitability and risk alternative product design and production possibilities. In effect, CVP is a quantitative model for developing such of the financial information relevant for evaluating resource allocation decisions.

Despite its widespread application, CVP analysis is frequently criticized for its use of simplifying assumption, such as deterministic and linear cost and revenue functions. Additionally CVP is disparaged for its focus on a single product and its single period analysis. However as noted by Guidry et al; Nonlinear and stochastic CVP models evolving multistage, multiproduct, multivariate, or multi period frameworks are all possible, although a single period model embracing all of the extensions would seem a radical departure from the whole point of CVP analysis, its basic simplicity" (1998:75), Horngren et al. (2000) note that the firms across a variety of industries have found the simple CVP model to be helpful in both strategic and long run planning decisions. A survey of management accounting practices indicates that CVP analysis is one of the most widely used techniques (Gar et al. 2003). However Horngren et al. (2000) warn that in situations where revenue and cost are not adequately represented by the simplifying assumptions of CVP analysis, managers should more sophisticated approaches to financial analysis.

## **2.24 Review of the Related Studies**

There is little research paper- concerning cost volume profit analysis has been conducted. Most of the researcher is in n the profit planning and control. Very few dissertations have been submitted related to cost volume profit analysis. Out of the previous research studies only few research are conducted to analyze the cost volume profit of private enterprise and the study is limited by various constraints. Therefore this study is attempted to review the previous research work on profit planning and control as well as management accounting. As CVP is one of the tools of PPC, the

previous studies related to PPC, are reviewed.

**Nabaraj,(2010)**,The thesis entitled "Profit Planning in manufacturing company (a case study of Nepal Lever Limited)" This thesis was submitted to Nepal commerce campus, T.U. Kathmandu.

The primary objective of this research was to highlight the system of profit planning applied and its effectiveness in Nepal. Lever Ltd in coordination to these main objectives that was focused to meet the following objectives.

- ) To examine the practice and effectiveness of profit in Planning in Nepal Lever Ltd.
- ) To evaluate the practice and effectiveness of profit planning applied in Nepal Lever Ltd with conceptual prescriptions.
- ) To point out feasible suggestion and recommendation to make betterment of Nepalese manufacturing enterprise with special reference on Nepal Lever Ltd.
- ) To analyze the various functional budgets adopted in this enterprise  
On the basis of different analysis, observation and informal discussion, the following major findings have been drawn.
- ) The company has no proper practice of cost segregation.
- ) Yearly budget for income and expenditure prepared by general manager with mutual cooperation of other top level managers and which the board of directors finally approves. The middle and lower level manager and other workers are not participated in preparing the budget.
- ) Nepal Lever Ltd target is more variable than actual because there is no any proper plan and policy during the operating period of the company.

- ) In Nepal Lever Ltd there is detail plan of manpower and systematic approach to labor planning. The company plans for direct labor hour and direct labor cost needed to produce the planned quantities of goods.
- ) The company has no depth analysis of the company's strength and weakness or opportunity and threats.
- ) The company has no practice of sales forecasting Sales and Production are made on ad-hoc basis.
- ) The company has not a problem in production labour force and material but suffers from unavailability of market.

Some suggestions have been recommended on the basis of major finding of the study of profit planning in Nepal Lever Ltd.

Trained and qualified manpower of profit planning should be hired and present manpower should be trained to develop and implement the profit plans effectively.

The company should improve productivity of its product by providing sufficient technical staff and technical equipment.

There is lack of periodical performance reports about the activities of the industry. There system of periodical performance reports should be strictly followed to be considered followed to be considered towards poor performance and to take correct action timely.

The company makes every effort to run the existing plans and utilize the idle equipment and facilities.

For better performance, company should prepare strategic and tactical profit

Nepal Lever Ltd should appoint reliable agents and dealers to improve its sales performance.

Different cost in the company should be diagnosed as controllable and non-controllable within a specific framework of responsibility and time and effective programs should be launched to reduce the controllable expenses.

Modern strategic management system should be introduced instantly.

Finally, the company should adopt a systematic approach to profit planning,

**Rijal(2008)** The thesis entitled " cost volume profit analysis to measure the effectiveness of profit planning and control ( a case study of Nebico Pvt. Ltd)' The study was based on both primary data as well as secondary data and analysis was based on only five years data. The main objective of that research analysis is as follow.

To study relationship of cost volume and profit as an applicable tools of budgeting. To evaluate the stability, financial position and sensitivity of Nebico's activities. To analysis the cost volume and profit of the company and its impact in profit planning and To provide suggestions and recommendations for improving Nebico's condition etc. had pointed out some major findings in this research although most of these findings were out of objectives of the study. Some major findings are as follows: The company's sales have fluctuation but not satisfactory trend of increasing. The company's variable cost is in high proportion than fixed cost in comparison with total cost. This contributes for lower contribution margin. - NEBBICO had no any plan to reduce cost. - The profit trend of the company was not satisfactory. There were not effective sales forecasting techniques. Net profit margin profitability ration and other things were not satisfactory. The company has not utilized its full capacity. The following suggestions have been recommended on the basis of this research; NEBICO should consider BEP analysis while preparing sales plan production and setting the price of its products. Classification of expenses as variable and fixed or controllable or uncontrollable must be made within a specific framework of responsibility and time. - Cost control department separately established which is divided the cost by production and control the cost.

A systematic approach should be made towards comprehensive profit planning. This can considerable contribute to the increase in profitability of NEBICO Ltd.

CVP analysis and PPC manuals should be communicated from top to lower levels. As company as unable to generate, profit as per investment make in fixed cost, company should put address on effective utilization of fixed cost.

All personal should participated on decision making and planning process.

**Sharma,(2009)**,The thesis entitled "Profit Planning in manufacturing company (a case study of Nepal Lever Limited)" is prepared by Mr. Gopal Sharma. This thesis was submitted to Nepal commerce campus, T.U. Kathmandu.

The primary objective of this research was to highlight the system of profit planning applied and its effectiveness in Nepal. Lever Ltd in coordination to these main objectives that was focused to meet the following objectives.

To evaluate the variances between target and actual of Nepal Lever Ltd. To analyze the various functional plans formulated and implemented in Nepal Lever Ltd To examine the practice and effectiveness of profit in Planning in Nepal Lever Ltd.To evaluate the practice and effectiveness of profit planning applied in Nepal Lever Ltd with conceptual prescriptions. To point out feasible suggestion and recommendation to make betterment of Nepalese manufacturing enterprise with special reference on Nepal Lever Ltd. To analyze the various functional budgets adopted in this enterprise

On the basis of different analysis, observation and informal discussion, the following major findings have been drawn. The company has no panning division, It has no skilled and expert and planners as well. The company has no proper practice of cost segregation. Yearly budget for income and expenditure prepared by general manager with mutual cooperation of other top level managers and which the board of directors finally approves. The middle and lower level manager and other workers are not participated in preparing the budget. Some suggestions have been recommended on the basis of major finding of the study of profit planning in Nepal Lever Ltd. Trained and qualified manpower of profit planning should be hired and present manpower should be trained to develop and implement the profit plans effectively. The company should improve productivity of its product by providing sufficient technical staff and technical equipment. There is lack of periodical performance reports about the activities of the industry. The system of periodical performance reports should be

**Poudel (2010)**- The thesis entitled "A comparative study on cost volume profit analysis of Unilever Nepal Ltd and Dabur Nepal Private Limited" His research was in partial fulfillment of MBS submitted to the Nepal commerce campus, T.U. His Objectives of the study was;

To calculate of profit resulting from a budgeted sales volume, To calculate breakeven point CM analysis margin of safety analysis and profit volume analysis. To calculate sales volume to produce desire profit Mr. Poudel, has pointed out various findings and recommendations based on the analysis of data and information. Some of the major recommendations are as follows Classification of expenses items as variable and fixed or controllable and non controllable must be made within specific framework of responsibility and time. Separate cost control department should be established for the effective management of cost.UNL and DNPL should be considered BEP analysis while preparing sales plan production plan and selling price of its products. Some portion of profit should be allocated to research and development program so that new technology could be found which provide more competitiveness on the market.UNL and DNPL should have proper manpower planning. System of periodical performance reports should be strictly followed to be consists about poor performance and take corrective action immediately and timely. New market areas should be identifying for the coverage of increased activities of companies. A systematic approach should be made towards comprehensive profit. This can considerably contributed to the increased in profitability to UNL and DNPL. Since separate one of cost in to their fixed and variable elements each and the heart of CVP analysis, all decision makers sought to be fully aware of and understand the coat structure of their operation otherwise CVP analysis will provide meaningless information.

Mean and standard deviation of sales achievement is lower than budgeted sales There is a positive correlation between sales target and sales achievement. However sales achievement in respect to sales and yet to be achieved Correlation analysis shows the positive relationship between budgeted sales and actual sales C.V is found to be marginally higher in comparison with budgeted sales which indicate that the functionally in budgeted sales and actual sales are almost same DNPL does not prepare production budget as separate. They assume budgeted sales itself is the

budgeted production Inventory turnover of the company are not satisfactory. Inventory turnover are found to be fluctuating over the past 6 years The gross profit margin shows the decreasing trend which signifies the increasing trend of cost of goods sold

The Following are Findings DNPL should define the clear long range and short range profit plan formalized approach for accomplishing the planning , coordination and control responsibilities of management systematic approach should be made on implementation of profit plan The company should develop the systematic periodic performance reports Variance analysis should be effectively done The company should prepare separate production budget and direct labour plane separate costing section should be established Pricing policy should be revised. Cost plus pricing method should be adopted to fix price.

**Mainali, G.P (2010)** The thesis entitled ‘CVP Analysis as a tool of a profit planning and control’, a case study of salt trading co-operation ltd. The following are the objectives of the study:

To analyze the impact of c cost volume profit and performance of STLC.

The following are the major findings. The company sold different products among them agricultural material and machine equipment on total sales found nominal. But other products made highest contribution total sales. Expense s on salt Trading Corporation Limited are fluctuated variable cost as well as fixed cost increased or decreased during the period. It has no details of systematic expanses plan. From the correlation a analysis, it is found that there is a high degree of positive correlation between sales and net profit change s in sales made changes in profit but change is not in 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 the BE P ratio.

## **2.25 Research Gap**

There is the gap between the present research and the previous researches. Previous researches were mainly conducted on profit planning and control and budgeting practices in the manufacturing companies especially in public enterprise

The previous researcher did not disclose which of the profit planning and control tools are in practices. But few of the researches were conducted on simple cost volume profit analysis of public and private limited companies. But to fill gap, it examines the multi product cost volume profit analysis as a tool of profit planning and control, in the Paramount Carpet Industry Limited.

## **CHAPTER –III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research is the process of a systematic and in-depth study or search of any particular topic, subject or area of investigation backed by the collection, compilation, presentation and interpretation of the relevant details or data. It is a careful search or inquiry into any subject matter, which is an endeavourer to discover or find out valuable facts, which will be use full for future application or utilization. The research that involves the discovery of new techniques, a modification of old concepts or a knocking off an existing theory, concept or technique. It may develop a hypothesis and test it by established relationship between different variables and identify the means for problem solving.

Research methodology is the process of arriving at the solution of the problems through a planned and systematic dealing with the collection analysis and interpretation of the facts and figures. The objectives of this study will be to analyze the CVP relationship in Paramount Carpet Industry and there by forward some measures to improve the situation.

Research methodology is the way to solve systematically about the research problem. It consists of the research design, research population and sample, sources and types of data, variables and method of analysis and presentation.

#### **3.2 Research Design**

The research design is an organization approach and not a collection of loose unrelated parts. It is an integrated system that guides the researcher in formatting, implementing and controlling the study. Useful research design can product the answer to the proposed research questions. The research design is thus an integrated frame that guides the researcher in planning and executing the research works.

Data and information are the lifeblood or major portion of any study. This study attempted to show the relationship among cost, volume, profit and various

functional budgets for their achievement and effective application within the conceptual framework of profit

Planning for solving the problems that had accrued in Paramount Carpet. A study design is the arrangement of the conditions for collection and analysis of data in that aims to combine relevancy to the study purpose with the economy in producer. These studies will be intensive based on analysis of the past financial performance.

To fulfill the objective of the study primary as well as secondary data be used and study design will be descriptive as well as analytical.

### **3.3. Population & Sample**

The large group about which the generalization is made is called the population under study, or the universe and small portion on which the study is made is called the sample of the study. Total top 10 carpet industries are taken as population due to largest top 10 carpets industries which exports more than 19000 SQM. It couldn't be possible to attempt all the number of research population in this research. Paramount Carpet Industry is the largest exporter Industry in Nepal 2009. So researcher has taken Paramount Carpet Industry as a sample among 10 Industry The Research had been defined nature and size of population and sample which are presented in appendix X.

Table No-3.1  
Population and Sample of Carpet Industry

Population	Sample
10	1
Total Top Carpet Industry	Paramount

### 3.4 Source and Types of Data

Data may be obtained from several sources; it is not easy to list them in detail. Each research project had its own data needs and data sources. However, the general classification of data sources has the following dimensions.

**Secondary Source of Data;** Data which already used are the secondary source of data. Following are the main secondary source of data of the industry used in this study;-

Library, books & journal\magazines, annual reports of the company.

### 3.5 Variable of Studies

Variables are characteristics of person, things groups, object etc. a variable is thus a symbol to which numerals or values are assigned. In other words, a variable can take on many values. The research had used two types of variables, independent variable and dependent variables, which are presented as below;

**3.5.1 Independent Variables:** A variable is called independent variable if it is not influenced by any other variable under study. The independent variables are those, which are the basis of production.

**3.5.2. Dependent Variable:** A variable is called dependent variable if its values depend upon the other variables. The investigators purpose is to study analyze and predict the variability in the dependent variable. The dependent variable is the variable that is being predicted.

There are three factors (ie. cost, volume and profit) of C-V-P analysis, which are interconnected and dependent on one another.

So these factors are depending variables. But, testing relationship between theses variable following criteria are assumed

Table No 3.2  
Classification of Variables

S.N.	Independent Variable	S.N	Dependent Variable
1	Sales Unit	1	Sales Rs.
		2	Cost (Variable & Fixed)
		3	Profit

### **3.6 Methods of Analysis & Presentation**

Secondary data were used in the study the secondary data were collection from the company's annual reports and other related document, company's website and books published reports etc. 3.3Profiles of Respondent.

### **3.7 Methods of Data Collection**

Analysis and presentation of the data is used the core of each and every research work. In order to get the concrete results from this research, data are analyzed by using different types of tools. Basically, following two techniques are used to explain the collected data.

#### **3.7.1 Descriptive Technique**

Descriptive technique is a fact-findings operation searching for adequate information. It is a type of a study, which is generally conducted to assess the opinions, behaviors or characteristics of given population and to describe the situation and events occurring at present. Descriptive technique is a process of an accumulating fact. It dose not necessary seek to explain relationships, test hypothesis, make predictions, or get at meanings and implications of study.

#### **3.7.2 Quantitative Technique**

Descriptive techniques would not be enough prepare excellent research report. To

fulfill in gap, or make the research report attractive and for better understanding the 2.

2. **Statistical Tools;-** The relation between two or more variables can be measured by using statistical tools. In the study the following tools are used.

i. **Bar Diagram:-** Bar diagram are one of the easiest and the most commonly used methods of presenting the numerical data. They present the data by means of bars, or rectangles of equal width. The length of bars represents the given figures and the width may be of any size.

ii. **Mean:-** The sum of all observation divided by the number of observation is called mean. In such cases all the items are equally deviated by  $\bar{X}$ . It is defined by the following formula:

iii. **Standard Deviation (S.D.):-** The standard deviation is defined as the positive root of the mean of the squared deviations from their mean of a set of values. It is also known as Root Mean Square Deviation. It is usually denoted by the Greek letter  $\sigma$  (Small sigma).

The SD is calculated by the following formula:

iv. **Coefficient of Variation (C V):-** The relative measure of dispersion based on SD is called coefficient of SD. Thus

100 times coefficient of SD is called coefficient of variation. It is denoted by C.V. Thus,

v. **Correlation Analysis;-** The degree of relations between two variables at a time is called correlation. In other words, two variables are correlated in such way if one variable changes then other variable also changes subsequently.

The correlation coefficient measures the degree of correlation between Y on X. It should be +1 and -1. If not there is no correlation between two variables.

vi. **Co-efficient of Determination ( $r^2$ ):-** A meaningful analysis is available from the square of correlation coefficient ( $r^2$ ), which is called the coefficient of determination and calculated using the following formula:

## CHAPTER-IV

### PRESENTATION AND ANALYSIS OF DATA

#### 4.1 Introduction

Profit planning is used for development and acceptance of proper objective and goals for an organization. It is also used to move the organization efficiently to achieve to preset objectives and goals. In profit planning, cost-volume-profit analysis can be the most important devices to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in managerial decision making specially cost control and profit planning. The CVP analysis is a specially way of presenting and studying the inter-relationship between cost, volume and profit. The basic objective of this study is to examine the presentation practice of CVP analysis and identify the area where CVP analysis could be applied to strengthen the Paramount Carpet Industry. This chapter presents the analysis and interpretation of data.

#### 4.2 Analysis of Budgeted and Actual sale

PCI is the multi-product manufacturing company producing and selling different types of products. The attempt begins to present and analysis the previous budgeted sales and actual sales performance. The following table presents the budgeted and actual sales achievement from fiscal year 2062/63 to 2067/68.

**Table No 4.1**

Total Budgeted and Actual Sales Volume of PCI (in 00000)

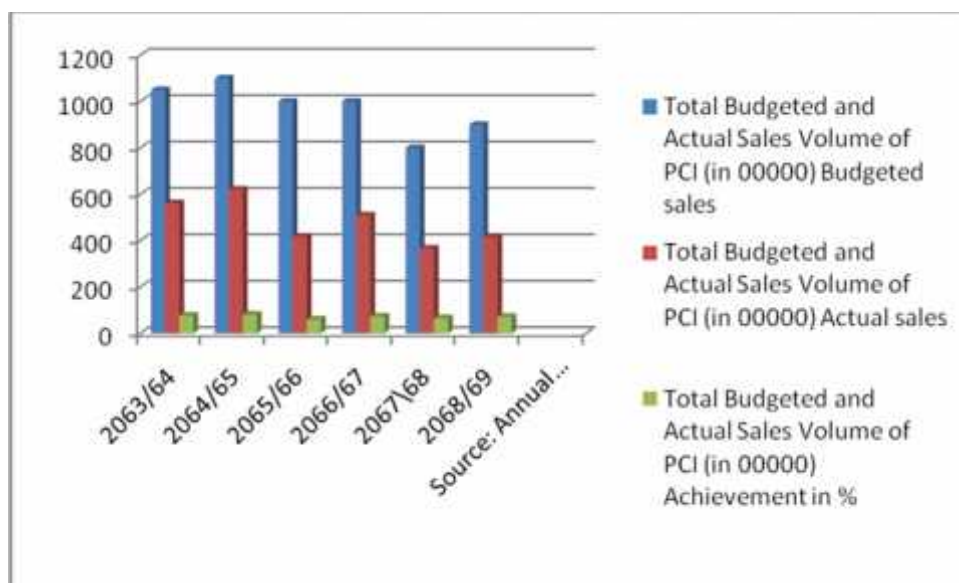
Year	Budgeted sales	Actual sales	Achievement in %
2063/64	1050	561.281	76.36
2064/65	1100	620.592	80.60
2065/66	1000	417.690	59.68
2066/67	1000	508.739	72.68
2067/68	800	366.576	65.46
2068/69	900	415.756	71.46

*Source: Annual Reports of PCI 2063\64 to 2068\69*

From the table, it becomes clear that the total sales unit of PCI is fluctuating. There are various reasons, which cause the variation. The actual sales shown on the table above are according to invoice issued. . The sales revenue, taxation and charges were shown in the balance sheet of the company as current liabilities

The table shows that there is high gap between actual sales and budgeted sales. The sales trends have unfavorable because actual sales of all fiscal years are very less than budgeted sales. But the percentages of achievement are fluctuating. So, it can be expected that the gap between actual sales and budgeted sales won't be fulfilled in future also. We can present the sales target and achievement more effective by bar diagram and trend line as below.

**Figure No 4.1**  
**Actual Sales and Budgeted Sales in Bar Diagram**



In order to find out the nature of variability of target sales and sales achievement of different years, we have to calculate arithmetic mean, standard deviation and coefficient of variation of target and achievement figure of PCI for six years. These statically tools are calculated by using spreadsheet method and summarized here under. Here,

Actual sales = X

Budgeted sales =Y

**Table no 4.2**  
**Summary of statistical calculation of PCI**

<b>Statistical Tools</b>	<b>Actual Sales(X)</b>	<b>Budgeted Sales(Y)</b>
Mean(X)	481.77	975
Standard Deviation ( )	98.95	89.49
Coefficient of Variation (C.V)	20.53	9.178
Correlation Coefficient (r)	0.89	
Coefficient of determination ( $r^2$ )	0.792	
Probable Error	0.572	

*Source: Calculation from appendix-II*

The calculation value of different statistical tools presented above in table no. 42 shows that budgeted sales mean is greater than actual sales mean. But standard deviation of actual sales is greater than the budgeted sales. The coefficient of variation of actual sales is more than coefficient of variation of budgeted sales. This shows that the budgeted sales fluctuation less than actual sales for the company. Having smaller C.V budgeted sales are more homogenous or homogenous or less variable or uniform or more consistent than actual sale.

Similarly, the correlation co-efficient between two variable (i.e. Budgeted sales and Actual sales) is 0.879. It shows that there is positive correlation between two variables of the PCI.

The significance of correlation is tested with probable error. The value of correlation coefficient is greater than 6 PE (i.e.  $0.51 > 6 \times 0.035$ ) the calculation value of r is significant for PCI.

### Trend Analysis

To analysis the trend of actual sales least square method can be used to estimate the possible future sales for given time or year. A straight-line trend will show the relationship between time period and actual sales of the relevant year. In this method, it is assumed that the sales consistently changes (increase or decrease) with the change in time and such can be expressed by the component of time factor. In this method time factor is considered as independent factor and sales is considered as dependent factor upon time. The straight line trend of actual sales (Y) depends upon the times (X), which is expressed as:

$$Y = a + bX$$

For the calculation the value of a (constant) and b (variable) can be obtained by solving the following two equations:

$$Y = na + b \sum X \dots\dots\dots (1)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (2)$$

**Table No 4.3**  
**Calculation of the Trend of Total Sales of PCI (Amount in Rs 0000)**

Year(X)	Total Sales(Y)	X= (x-2065/66)	XY	X <sup>2</sup>
2063-64	561.281	-3	-1683.843	9
2064/65	620.592	-2	-1241.184	4
2065/66	417.690	-1	-417.690	1
2066/67	508.739	0	0	0
2067\68	366.576	1	366.576	1
2068/69	415.756	2	831.512	4
Total	Y=2890.634	X=-3	XY=(-2144.629)	X <sup>2</sup> =19

Therefore, a = 461.79 and b = (39.96)

Thus,  $y = 461.79 + (39.96) X$ , is the trend line of sales figure which shows the positive sales revenue in the future.

By using this trend equation we can estimate actual sales, for the F/Y 2067/68

$$Y = 461.79 + (39.96) \times 3 = \text{Rs. } 341,910,000$$

Therefore, if the trend doesn't change, the possible sales for year will be Rs 341,910,000. The sales will be Rs 301,950,000 in 68/69 and the sales will be Rs 261,990,000 in 69/70.

#### 4.2.1 Analysis of Sales for Selected Product Lines

Three product lines 150 kont, 100 kont and 60 kont are selected for further analysis and interpretation. The following table shows the sales figure of selected product lines.

**Table No 4.4**  
**Sales figure of selected product lines (Rs in 000)**

Fiscal Year	150kont			100kont			60kont		
	Rs	SQM	USP(R S)	Rs	SQM	USP(RS)	Rs	SQM	USP(R S)
Ref	1	2	1÷2=3	4	5	4÷5=6	7	8	7÷8=9
2063\64	12133	12133	10000	20120.	22355.5	9000	50431	6003.69	8400
2064\65	13000	12322.27	10550	20800	21666.7	9600	55125	6409.88	8600
2065\66	7125	6477.27	11000	12120	11824.3	10250	41232	4717.62	8740
2066\67	9132	8081.41	11300	14120	13447.6	10500	50313	5602.78	8980
2067\68	6452	5467.79	11800	10232	9452.19	10825	37123	4124.7	9000
2068\69	8321	6710.48	12400	11230	9721.65	11500	32326	3298.57	9800

Source: Annual Reports of PCI 2063/64 to 2068/69

The table shows that the sales figure is in increasing trend. Higher sales volume recovers higher portion of fixed cost, and it assists to maximize profit. The unit selling price (USP) is calculated by dividing total sq. m. sold (unit) to total sales revenue. Total sales and total sq. m. are not speared as different sizes like 70/140, 140/200 etc. The company had not proper sales records of different size of product lines. The unit-selling price of the 150 kont,100 kont & 60 kont was in fluctuation condition. The number of unit sold of selected product lines was growing trend. By using time series regression equation the forecasted sales of 150kont, 100kont and 60kont for FY 2067/68 is Rs 56908200, Rs.73549500 and Rs 3088000 respectively. (Appendix III).

### 4.3 Profit (Loss) Pattern of PCI

Profit is the major element of each and every Business endeavors for survival, further development and fulfilling social expectation. In modern business, effectiveness and efficiency of any business organization or management are measure form profit. But PCI is suffering loss from the beginning of its operation year. The profit pattern of PCI is presented below. The profit (loss) pattern is analysis on the basis of actual sales achievement.

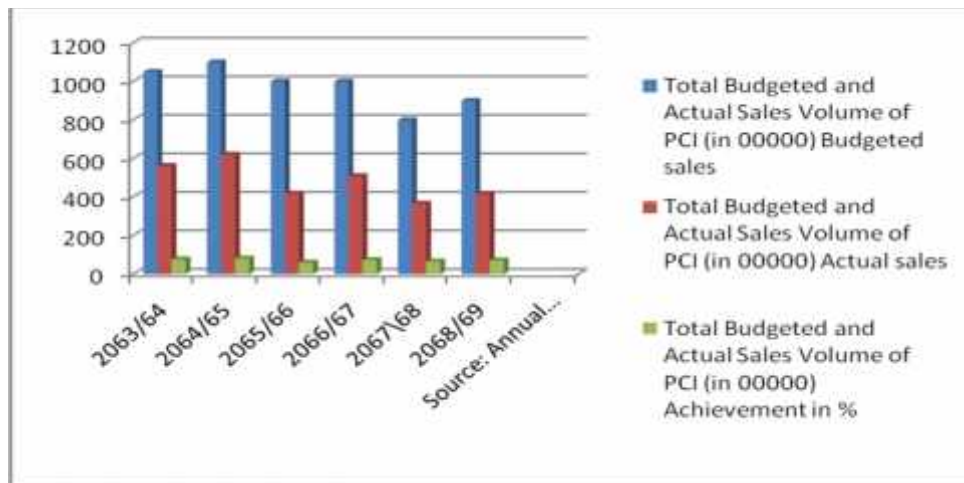
**Table no 4.5**  
**Profit (Loss) trend of PCI (Rs ‘000’)**

Year	Sales		Profit	
	Rs.	% Change	Rs.	% Change
2063/64	561281000	114.13	10331237	33.28
2064/65	620592000	10.56	12755260	23.46
2065/66	417690000	(32.56)	(12629308)	(199)
2066/67	508739000	21.79	12466047	198.7
2067\68	366576000	(27.94)	(976873)	(107.83)
2068/69	415756000	(11.82)	14408797	147.49

Source Annual report of PCI (2063/64 to 2068/69)

The table shows that the profit (loss) trend fluctuating annually. The fluctuating rate of loss in abnormal condition. The decreasing rates of losses are 33.28%, 23.46%, (199%),198.7%, (107.83%) and 147.49% in fiscal year 2063/64, 2064/65, 2065/66, 2066/67, 20667/68 and 2068/69 respectively. It can be expressed in bar diagrams computing the sales trend with profit (loss) trend.

**Figure no 4.2**  
**Sales and Profit Pattern**



#### 4.4 Cost Analysis

Cost planning and control id not reduction in cost but it means better utilization of limited resources. Expenses planning and controlling should focus on the relationship between expenditure and benefits derived from those expenditure. Cost analysis is necessary to attain enterprise goals. There are different types of cost incurred in the company.

Generally costs are classified into four categories, which are

- i. cost of production
- ii. administrative expenses
- iii. selling and distribution expenses
- iv. financial expenses

**Cost of Production:** the costs which are related with production and included raw materials, packaging materials, direct expenses, water and electricity, repair and maintenance, blending charge, other expenses etc.

**Administrative expenses:** administrative expenses are a part of management cost. it includes salary and allowance, P/F contribution, printing and stationary, water and electricity, communication expenses, bank charges, repair and maintenance, meeting fesses, traveling expenses, conveyance and fuel expenses, computer software expenses, AGM expenses, rent, taxes and fees, guest entertainment, notices publication expenses security expenses, members fees and subscription, legal and professional fees, insurance premium, training and recruitment expenses, miscellaneous expenses etc.

**Selling and Administrative expenses:** it is the cost incurred for selling and distribution of the product and included: transportation cost and insurance expenses, advertisement, hoarding board rental, distributions meeting exp traveling, expenses of sales man, complementary expenses, sales promotion expenses, leakage and breakage etc. **Financial expenses:** it includes interest on overdraft, interest on term loan etc.

#### **4.4.1 Fixed Cost Analysis of PCI**

Such costs are those in which the total fixed costs remain constant over a relevant range of volume/out put, while the unit fixed costs vary with out put. As the production units increase fixed cost per unit decrease, it is because same cost will be dispersed in more production unit. Fixed cost in total are variable for different fiscal year affected by internal and external environment factor of the company. The fixed cost of PCI is presented in the table below.

**Table no 4.6**  
**Fixed Cost Details of PCI**

Details\Years	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
Repair & Maintenance	50000	51322	50325	54085	56089	58076
Electricity	145728	152579	180933	191334	190267	190070
Telephone	42660	43290	39680	51857	65955	68725
Water	10350	9750	10020	10882	10568	14332
Salary	14520000	16000000	1800000	2000000	2200000	2012000
Deprecation	0	1000000	0	0	0	0
Audit Fees	1000000	100000	1000000	1000000	1000000	1000000
Rent	100000	880000	120000	120000	120000	120000
Bank Charge	800000	1100000	970000	1080000	1200000	1500000
Export Expenses	900000	3600000	900000	1100000	850000	90000
Interest On Loan	30000000	24535000	4200000	4800000	5000000	490000
Insurance Charges	25493000	2079000	2166700	2078800	2078800	4078000
	2161000		0	3290000	3790000	5200453
			2401000			
<b>Total Fixed Cost</b>	<b>49434238</b>	<b>49550941</b>	<b>4938958</b>	<b>3377695</b>	<b>3186167</b>	<b>3292965</b>
				8	9	6

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The items included in the field cost production expenses all are semi-variable cost. The amount shown in the table above regarding Telephone, water, electricity and repair and maintenance were segregated into fixed cost. Similarly, the items included in the fixed selling and distribution expenses and administrative expense, all are fixed cost nature.

Salary and wages of production department increasing trend all year. The rent expenses are in increasing trend up to all year. The deprecation expenses are Fixed pattern all year.

The bank charge and insurance charge are fluctuating nature. The audit fee is

increasing nature. The export expenses are increasing trend. AT last the interest on loan is decreasing trend.

#### **4.4.2. Analysis of fixed Cost for Selected product lines**

The specific fixed cost for selected product lines are shown in the below.

**Table no 4.7**  
**Specific Fixed Cost for Selected Product Lines**

Fiscal year	60kont(RS)	100kont(RS)	B1150kont (Rs)
2063/64	26373900	11691256	6345232
2064/65	32380790	10945351	6224800
2065/66	35692381	8946031	4900547
2066/67	24400680	5856564	3519356
2067\68	23398067	5361915	3101697
2068/69	24069407	5956149	2904100

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The specific cost of the selected product lines are segregated on the basis of Production Proportion. The specific fixed costs of selected product lines are increasing annually. By using time series regression equation the forecast fixed cost of 150kont, 100 kont and 60 kont for F/Y 2067/68 are Rs 1703672.66, Rs. 2208013.33 and Rs. 19267202 respectively and total fixed cost is 21504500.74 (Appendix IV).

#### **4.4.3 Analysis of Variable Cost**

Variable costs are those in which the total cost are assumed to change in direct proportion to changes in volume/out put within the relevant range, while the unit cost remains constant, variable cost appear on a graph as a straight line with a positive slope, the lines rises as the production volume increases.

To produce finished goods and transfer these goods to the market, the company bears different types of variable cost. The company's variable cost per unit is varying in different years according to PCI's cost detail sheet; the variable costs are presented in the table below.

**Table no 4.8**  
**Statement of Detail Variable Cost of PCI**

Details\Years	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
Materials used	4410065	4876080	3281850	3997235	2880240	3182023
Repair	\$ 00	00	00	00	00	00
Maintenance	200000	205288	201301	216340	224356	246354
Electricity	1068672	1118911	1326841	1403116	139588	1513927
Telephone	383940	389610	357120	466718	593595	596270
Water	58650	55250	56780	61668	59882	57268
Wages	639320	101210	1000000	2400000	2400000	2340000
Transportation	4473749	8588130	8081230	8381250	7172520	0
Traveling	1650000	2350000	2125000	2450000	1720000	8283143
Sampling	1200000	1400000	1600000	1700000	0	2230000
Administrative	2650000	2450000	2200000	2000000	2100000	1500000
Other	Mis 74894	99610	44488	87203	1800000	2100000
Expenses					37453	96250
Total Variable Cost	4534057	5050921	3448535	4188897	3042703	3582255
	25	99	0	95	94	12

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The costs of material consumed are included raw materials, weaving charge and packaging material. The costs of material consumed are included direct expenses of purchase. Telephone charge, water charge, electricity charge, and repair and maintenance are semi-variable cost nurture. It is separated as fixed and variable cost and cost variable cost portion is shown in the table above. Out of these items are variable cost natures.

Similarly, all items under Variable cost expenses are variable cost nature. Material consumed transportation Telephone, water, and electricity expenses are fluctuating nature. Only sampling expense is increasing annually. Water charge is 2065\66 is decreased on the comparison of other year and electricity also same condition. But other year is increased both. Repair and maintenance is increased all year. Other expenses of cost of goods sold and miscellaneous expenses are fluctuating, and administrative expense is decreasing.

The total variable cost is highly increased in the F/Y 2063/64 to Rs. 505092199 from Rs 453405725, which is 11.39% of the F/Y 2062/63. In the year 2064/65, the total variable cost is decreased by 31.72% from Rs 505092199 and reached to Rs. 344856350. In the F/Y 2065/66, the variable cost reached to Rs. 418889795 by increasing 21.46% as compared to F/Y 2063\64. In the final year of the study i.e. 2067/68 the variable cost is decreasing by 27.36% and reached to Rs 304270394 from Rs 418889795 of the previous year 2065\66. In the final year of the study i.e. 066107 the variable cost is increasing 15.06% and reached to Rs. 358225512 from Rs. 304270394. Therefore, the total variable cost of the PCI is fluctuating annually. By using time series regression equation the expected variable cost for F/Y 2068/69 is Rs. 322935620.70 (Appendix VI).

#### **4.4.3.1 Analysis of Variable Cost for Selected Product Lines**

The variable costs for different product lines are not same. Different product line had different combination of material, labor and other expenses. Since, not availability of detail variable cost item of each selected product lines are presented lines, the total variable cost and unit variable cost of selected product lines are presented at total form in the table below.

**Table no 4.9**  
**Statement of Variable Cost for Selected Product Lines**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
150 kont						
A. Total Variable cost	90997500	97500000	53437500	68490000	48390000	61736416
B. Production in SQM	12133	12322.27	647727	8081.41	5467.79	6710.48
C. Unit variable cost (A÷B)	7500	7912.50	8250	8475	8850	9200
j 100 kont						
A. Total Variable cost	120720000	124800000	72720000	84720000	61392000	65961395
B. Production in SQM	22355.5	21666.67	11824.39	13447.6	9452.19	9721.65
C. Unit variable cost (A÷B)	5400	5760	6150	6300	6495	6785
60 kont						
A. Total Variable cost	22693950	24806250	18554400	22640850	16705350	13569404
B. Production in SQM	6003.690	6409.88	4717.62	5602.783	4124.7	3285.57
C. Unit variable cost (A÷B)	3780	3870	3933	4041	4050	4130

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The total variables costs of selected products lines are increasing causes of increase in production units. The variable cost of 150kont is increasing all year. Similarly, unit variable cost of 100kont and 60kont are increase. Internal and external environment, managerial decisions, productions process and technology factor affect to change in variable cost. Increasing unit selling price and also increasing unit variable cost is

negative signal of higher CM per unit it helps to maximize operation profit. By using time series regression equation the expected variable costs of 150kont, 100kont and 60kont for F/Y 2067/68 are Rs , Rs. 42233601, Rs 5609843 and 1324446 respectively. (Appendix-V)

#### 4.4.4 Analysis of Semi-Variable or Semi-Fixed Costs

The semi variable costs are the one which remain same for certain relevant range and then change as per the activity level. Semi variable expenses have some of the characteristics of both fixed and variable costs. Semi variable expenses are changed by combined effect of passage of time, activity/ output and management discretion decision. The company PCI had also incurred some costs like semi variable or semi fixed costs nature, which is shown in the table below.

**Table No 4.10**  
**Statement of Semi variable Costs**

Particulars	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
Repair&	250000	256610	251626	270425	280445	262045
Maintenance	121440	1271490	1507774	1594450	1585555	1483222
Electricity	0	432900	396800	518575	659550	690500
Telephone	426600	65000	66800	72550	70450	75550
Water	69000					

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The company has not particular method to segregate the semi-variable costs into fixed and variable cost. According to the high financial officer and other managerial personal, semi-variable costs are classified into variable and fixed by relevancy, their nature and the judgment of the related officers. The total semi-variable costs are increasing causes of increasing in production units from F/Y 2003/04 to 2007/08. By using time series regression equation the expected semi-variable cost for F/Y 2067/68 is Rs 3218830 (Appendix VI)

To simplify the problem discussion were done with company's senior officers or PCI.

At last, the above mentioned semi variable costs were classified into variable and fixed as per the suggestion and details given by the senior staffs of the company. The semi variable costs variable costs are classified in the following way, which is shown in the table below.

**Table No 4.11**  
**Classification of Semi-Variable Cost** ( In Rs)

Particulars	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
<b><u>Production Expenses</u></b>						
Repair & maintenance	250000	256610	251626	270425	280445	262045
Electricity	1214400	1271490	1507774	1594450	1585555	1483222
Telephone	426600	432900	396800	518575	659550	690500
Water	69000	65000	66800	72550	70450	75550
<b>Total SVC</b>	<b>1960000</b>	<b>2026000</b>	<b>2223000</b>	<b>2456000</b>	<b>2596010</b>	<b>2511317</b>
<b><u>Variable Cost</u></b>						
Repair&	200000	205288	201301	216340	224356	209636
maintenance80%	1068672	1118911	1326841	1403116	139588	1305235
Electricity88%	383940	389610	357120	466718	593595	621450
Telephone90%	58650	55250	56780	61668	59882	64217
Water 85%						
<b>Total VC</b>	<b>1711262</b>	<b>1769059</b>	<b>1942042</b>	<b>2147842</b>	<b>1017421</b>	<b>2200538</b>
<b><u>Fixed Cost</u></b>						
Repair &	50000	51322	50325	54085	56089	52409
maintenance20%	145728	152579	180933	191334	190267	177986
Electricity12%	42660	43290	39680	51857	65955	69050
Telephone10%	10350	9750	10020	10882	10568	11332
Water 15%						
<b>Total FC</b>	<b>248738</b>	<b>256941</b>	<b>280958</b>	<b>308158</b>	<b>1578589</b>	<b>310777</b>

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

#### 4.5 Analysis of Sales and Cost Relationship of PCI

Cost structure refers to the relative proportion of fixed and variable cost in an organization. There is no categorical answer possible of which cost structure is best. A firm might have many fixed costs but few variable cost or mixed cost and vice versa. A firm's cost structure can have a significant impact on decision; in the matter of risk etc. company with high fixed cost will incur losses much more quickly than the company with lower fixed cost if the reversionary condition strikes the industry. In sum, company with high fixed cost will experiences wider movement in net income as changes take place in sales, with greater profit in good year and greater loss on year. Company with low fixed cost will enjoy some what greater stability in net incomes, but if will do so at the risk of losing substantial profit if sales trend upwards in the long run.

The cost analysis of PCI is briefly analyzed in the below table no 4.12 for the fiscal year from 2063/64 to 2068/69.

**Table No 4.12**  
**Cost Structure Analysis of PCI ( In Rs.000)**

Fiscal year	Sales revenue	Total VC	Total FC	Total Cost
2063/64	561281000	501515525	49434238	550949763
2064/65	620592000	55828579	49550941	607836740
2065/66	417690000	380780350	49538958	430319308
2066/67	508739000	462495995	33776958	496272953
2067\68	366576000	335691194	31861679	67552873
2068/69	415756000	375231200	32929656	408160856

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

**Table No 4.13**  
**Cost Structure Analysis of PCI in Percentage**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
% of variable cost to total cost	91.02	91.84	88.48	93.19	91.33	93.49
% of variable cost to sales revenue	89.35	89.96	91.16	90.91	91.57	90.25
% of variable cost increase	14.78	10.16	(31.79)	21.46	(27.41)	9.05
% of fixed cost to total cost	8.98	8.16	11.52	6.81	8.67	8.07
% of fixed cost to sales	8.8	7.98	11.86	6.64	8.69	7.92
% of sales increase	14.13	10.56	(32.69)	21.79	(27.94)	13.34

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

Table No.4.13 presented above shows that the proportion of variable cost and fixed cost of PCI for fiscal year 2062/63 to 2067/68 are 91.02 %, & 8.98%, 91.84% & 8.16%, 91.84% & 8.16%, 88.48% & 11.52%, 93.19% & 6.81%, 91.33% & 8.67% and 93.49% & 8.07% respectively. Overall the proportion of variable cost is higher than the fixed cost of the company. Similarly the proportion of variable cost and fixed cost to total sales of PCI for the F/Y 2062/63 to 2067/68 are 89.35% & 8.8%, 89.96% & 7.98%, 91.16% & 11.86%, 90.91% & 6.64%, 91.57% & 8.69 and 90.25% & 7.92% respectively. Here, the proportion of variable cost to sales revenue is almost higher but the proportion of fixed cost to sales revenue is changing. Again, the percentage of sales also changing and the percentage of variable cost of PCI for the F/Y 2062/63 to 2067/68 is 10.16% & 10.56%, (31.79)% & (32.69)%, 21.46% & 21.79%, (27.41)% & (27.94)% and 9.85% & 13.34% respectively. It shows that when sales fluctuating then the variable cost also fluctuating. The relationship between sales revenue, fixed cost and variable cost of PCI can be shown in the bar diagram which is presented below

## **4.6 Cost-Volume-Profit Analysis of PCI**

Cost volume profit is management accounting tool to show the relationship between the ingredients of profit planning. Profit planning is the function of selling price of the product and unit sold. The entire gamut of profit planning is associate with CVP interrelationship. CVP analysis is the technique that explores the relationship, which exists among costs, revenue, output level and resulting profit. Cost-Volume-Profit analysis can be extended to cover the effects of changes in selling prices or services fees, cost, income tax rate and product mix. The aim of CVP analysis is to have a fair estimate of total costs, total revenue and profit at various sales volumes. CVP analysis provides the management with the comprehensive overview of the effects on revenue and costs of all kinds of short run financial changes. It is related to profit, sales volume and costs. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the company will be achieved. And this analysis is possible only when the management has information about variable and fixed costs and selling price of the product or sales revenue. On the calculation of BEP in PCI, following assumptions should be considered:-Activity base is selected in term of sales revenue

The concept of cost variability is valued so cost can be classified as fixed and variables.

Other type of income (non operating income) is not included in the revenue

There is no opening and closing stock

Sales mix ratio among the product remain costing

**Table 4.14**  
**Income Statement of PCI for the F.Y. 2063/64 - 2068/69**

<b>Items / Year</b>	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
A. Sales Revenue(Rs)	561281000	620592000	417690000	508739000	366576000	415756000
B. Variable Cost: Total Variable Cost	501515525	558285799	380780350	462495995	335691194	375231200
C. Contribution Margin (A-B)	59765475	62306201	36909650	462430005	30884806	40524800
D. Fixed Cost: Total Fixed Cost	49434238	49550941	49538958	33776958	31861679	32929656
E. Profit (Loss) (C-D)	10331237	12755260	(12629308)	12466047	(976873)	7595144
F. P/V ratio = (CM/Sales)	0.1065	0.1004	0.0808	0.0909	0.0843	0.0974
G. BEP = (FC/P/V ratio)	464171249	493535269	562942704	371583696	366367806	338086817
(A-G)	97109751	127056731	(145252704)	137155304	208194	77669183

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69) base on table no 4.1

4.6 and 4.8

#### **4.6.1 Computation of BEP**

To fulfill the objectives of the study, BEP and other related computation are necessary to complete. These are BEP in Rs. For the entire form of the company, BEP in units and Rs. Of selected product lines, BEP percentage of capacity and cash BEP etc.

#### 4.6.1.1 Analysis of BEP in Rupees for the Entire Company

The table no 4.14 shows that the BEP in Rs. Of each fiscal year 2063\64 is very high than actual sale. In other words, the actual sale of each fiscal year 2063\64 is not reached at BEP. But other fiscal year is good. It indicates that the company has fluctuated at that point because of the political instability and economic inflection. The actual sales of F/Y 2062/63, 2063/64, 2064/65, 2065/66, 2066/67 and 2067/68 are Different in BEP by Rs. Rs. 97109751, Rs. 1127056731, Rs. (145252704), Rs. 137155304, Rs. 208194 and Rs. 77669183 respectively.

Causes of higher BEP

**Low actual sales and high variable cost:** Since actual sales of each fiscal year were low, this results the lower contribution margin course of higher variable cost.

**Low CM Ratio:** Since low sales and low contribution margin, the CM ratio was less than 20%. The low CM ratio recovers low portion of fixed costs, this results there were need of high sales revenue to reach at BEP.

**Higher the Fixed Costs:** The fixed cost of PCI is increasing every year. Not recovery of higher portion of fixed cost results higher BEP.

Comparatively low difference between actual sales and BEP sales were the results of increasing CM ratio and decreasing fixed costs to variable cost ratio. By using time series regression equation the expected BEP for F/Y 2067/68 is Rs. 265815989.8 (Appendix-VII)

#### 4.6.1.2 Computation of BEP for selected product lines.

To find out either sales revenue of selected product lines were met the BEP, for selected product lines assists to analysis, which product is profitable and which one is poor, or which needs to push, or continue or drop. The following tabular computation shows the BEP of selected product lines.

**Table No 4.15****Computation of BEP for Selected Products Lines**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
150 kont						
A. Specific Fixed Costs (Rs)	6345232	6224800	4900547	3519356	3101697	2904100
B. Unit Selling Price (Rs)	10000	10550	11000	11300	11800	12400
C. Unit Variable Costs(Rs)	7500	7912.50	8250	8475	8850	9200
D. CM per unit (Rs)(B-C)	2500	2637.5	2750	2825	2950	3200
E. CM Ratio (D÷B)	0.25	0.25	0.25	0.25	0.25	0.25
F. BEP in units (A/D)	2538	2360.11	1782	1245.79	1051.42	907.53
G. BEP in Rs.	25380000	24899160	19602000	14077427	12406756	11253372
H. Actual Sales in units	12133	12322.27	6477.27	8081.41	5467.79	6710.48
(H-F)	9595	9962.16	4695.27	6835.62	4416.37	5802.95
100 kont:-						
A. Specific Fixed Costs (Rs)	11691256	10945351	8946031	5856564	5361915	4356149
B. Unit Selling Price (Rs)	9000	9600	10250	10500	10825	11500
C. Unit Variable Costs(Rs)	5400	5760	6150	6300	6495	6785
D. CM per unit (Rs)(B-C)	3600	3840	4100	4200	4330	4715
E. CM Ratio (D÷B)	0.4	0.4	0.4	0.4	0.4	0.41
F. BEP in units (A/D)	3247.57	2850.38	2181.96	1394.42	1238.31	923.891
G. BEP in Rs.	29228130	27363360	22365090	14641410	13404706	10624754
H. Actual Sales in units	22355.5	21666.67	11824.39	13447.6	9452.19	9721.65
(H-F)	19107.98	18816.32	9642.43	12053.18	8213.88	8797.76
60 kont:-						
A. Specific Fixed Costs (Rs)	26373900	32380790	35692381	24400680	23398067	18855754
B. Unit Selling Price (Rs)	8400	8600	8740	8980	9000	9800
C. Unit Variable Costs(Rs)	3780	3870	3933	4041	4050	4130
D. CM per unit (Rs)(B-C)	4620	4730	4807	4939	4950	5670
E. CM Ratio (D÷B)	0.55	0.55	0.55	0.55	0.55	0.55
F. BEP in units (A/D)	5575.877	6845.83	7425.08	4940.41	4726.88	3325.53
G. BEP in Rs.	46837367	58874138	64895199	443648818	42541200	32590192
H. Actual Sales in units	6003.69	6409.88	4716.72	5602.783	4124.7	3298.57
(H-F)	427.813	435.95	(2708.36)	662.373	(602.18)	(26.96)

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The BEP in SQM of 60 kont is Lower than actual sales of all fiscal year. In other word, the actual sales of 60kont crossed the BEP expect 2064/65 2066/67 & 066/67. The actual sale is excess than BEP by 435.95 SQM, 662.373 SQM, than other are below the BEP, they are (2708.36)SQM, (602.18) & (26.96) of F/Y, 2064/65, 65/66, & 2067/68 respectively. The BEP in rupee is also calculated in the above. The contribution margin per SQM is in constant condition, because the contribution margin is higher, but actual sales is crossed the BEP. The main cause of that is lower the fixed cost. Another way, the product had produced has produced at huge quantity, where high portion of fixed cost is utilized that directly increases than operating profit.

100 and 150 kont were started to produce and distribute from F/Y 2062/63. The contribution margins of 100kont and 150kont are in also constant condition. But the CM ratio of 150kont is 0.25 all year and CM ratio of 100kont is 0.44. Constant the CM ratio indicates utilization of same portion of variable cost and vice versa. In this way actual sales of 150kont and 100kont are also crossed the BEP. The actual sale of 150kont is higher than BEP by 9595SQM, 9962.16SQM, 4695.27SQM, 6835.62SQM, 4416.37SQM and 5802.95 SQM of F/Y 2062/63 to 2067/68 respectively. The actual sale of 100kont is also higher than BEP by 19107.93SQM, 18816.32SQM, 9642.43SQM, 12053.18SQM, 8213.88SQM and 8797.76SQM of F/Y 2062/63 to 2067/68 respectively. So, these two products lines are also in profitability.

The two-product lines 150kont and 100kont are producing and distributing under the customer demand. The products were well established may years ago. As a result, extra product launch cost, advertisement and other fixed costs are saved. Causes of lower fixed costs, mass production and customer demand, the 150kont crossed the BEP. In addition, the 100kont is crossed the BEP. By using time series regression equation the expected BEP of 60kont, 150kont and 100kont for F/Y 2067/68 are Rs. 342739100, Rs.668095000 and 267626000. Respectively (Appendix – VII)

#### 4.6.1.3 Computation of BEP as Percentage of Capacity

In the case of entire from of the company, the computation of BEP as percentage of estimated sales may be suitable rather than capacity. It is known that PCI is the manufacturer of multiple products. The BEP of PCI had calculated in Rupees for entire from. The following table shows the computation of BEP as percentage of estimated sales of PCI

**Table No. 4.16**  
**Computation of BEP as percentage of Capacity**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
A. BEP in Rs	464171249	493535269	562942704	37158369 6	366367806	2681314 47
B. Estimated sales( In Thousand )	105000000	110000000	100000000	10000000	800000000	9000000
C. BEP as percentage of estimate sales (A/B×100)	44.20%	44.86%	56.29%	37.16%	45.79%	29.79%

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

From the table, BEP in Rs. F/Y 2062/63 to 2067/68 are 44.20%, 44.86%, 56.29%, 37.16%, 45.79% and 29.79% of corresponding estimated sales. Of the company would be met the estimated sales, there would be profit.

Similarly, computation of BEP as percentage of capacity had possible to compute regarding selected product lines. The production capacity of PCI is to produce 400 SQM daily where six categories of products. 150kont, 100kont, 60kont, Palpa, Banana shaggy and 80kont are produced in the combined form regularly. To total production of six products might be not more than 400SQM daily. Following the computation shows the annual production capacity.

Annual production capacity = Daily production capacity × Working days in year  
= 400 × 300 days (assumed)  
= 120000 SQM.

Following table shows the computation of BEP as percentage of capacity for selected product lines.

**Table No 4.17**  
**Computation of BEP as percentage of capacity for selected product lines**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
A. Annual production capacity (SQM)	120000	120000	120000	120000	120000	120000
150 kont B.BEP In Units (SQM)	2538	2360.11	1782	1245.79	1051.42	907.53
C.BEP/production capacity [B/A × 100]	2.15%	1.97%	1.485%	1.039%	0.88%	0.76%
100 kont D.BEP In Units (SQM)	3247.57	2850.35	2181.96	1394.42	1238.31	923.89
E.BEP/production capacity [D/A × 100]	2.7%	2.3%	1.8%	1.1%	1.00%	0.77%
60kont F.BEP In Units (SQM)	5575.877	6845.83	7425.08	4940.41	4726.88	3325.53
G.BEP/production capacity [F/A × 100]	4.6%	5.7%	6.1%	4.1%	3.9%	2.77%
H. Total BEP in SQM (B+D+F)	11361.447	12056.29	11389.04	7580.62	7016.610	5157.25
I. Total BEP/Production capacity [H/A × 100]	9.4%	10%	9.4%	6.3%	5.8%	4.30%

Source: Annual Report of PCI (F/Y 2062/63 to 2067/68) base on table no 4.15 and the

memorandum of the company From the table, BEP in cases of 150kont is recovered only 2.15%, 1.97%, 1.485%, 1.039% and 0.88%, and 0.76 in the F/Y 2062/63 to 2067/68 respectively. The 100kont's BEP as percentage of capacity is 2.7%, 2.3%, 1.8%, 1.1%, 1.00% and 0.77 in F/Y 2062/63 to 2067/68 respectively. Similarly, BEP as percentage of capacity of 60kont is 4.6%, 5.7%, 6.1%, 4.1% , 3.9% and 2.77% in

F/Y 2062/63 to 2067/68 respectively. Its percentage is also increased expect in F/Y 2065/66 and 2065\66. The total BEP in SQM of selected product lines are 11361.447SQM, 12056.29SQM, 11389.04SQM, 7580.62SQM, 7016.61SQM 5157.25SQM in F/Y 2062/63 to 2067/68 respectively. Selected three product lines are utilized the total production capacity by 9.4% 10%, 9.4%, 6.3%, 5.8% and 4.30% in F/Y 2062/63 to 2067/68 respectively.

#### 4.6.1.4 Computation of Cash BEP of PCI

**Table No. 4.18**

Particular	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
A. Total Fixed costs (Rs.)	49434238	49550941	49538958	33776958	31861679	32929656
B. Deprecation (R	1000000	1000000	1000000	1000000	1000000	1000000
C. Net Fixed Costs in Rs. (A-B)	48434238	48550941	47538958	32776958	30861679	31929656
D. D. Total Sales	561281000	620592000	417690000	508739000	366576000	415765000
E. Debtors (Rs.)	949413	1360867	18143958	21182367	12852160	18418390
F. Cash sales Rs. (D-E)	560331587	619231133	399546042	487556633	353723840	397346610
G. Variable Cost in Rs.	501515525	558285799	380780350	462495995	335691194	375231200
. Contribution Margin (F-G)	58816062	60945334	18765692	25060638	18032646	22115410
I. CM Ratio (H÷F)	0.104	0.098	0.046	0.051	0.05	0.056
J. Cash BEP in Rs.(C/I)	465713827	495417765	1033455608	642685450	61723580	570172429
(F-J)	94617760	123813368	-633909566	--155128817	29200260	-172825819

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

The cash BEP in Rupees in computed at entire from of the company. The following table shows the computation of cash BEP in Rs. of PCI for F/Y 2062/63 to F/Y 2067/68.

The cash sales of F/Y 2062/63 to 2063/64 are reached at cash BEP and 2065/66 to 2067/68 are not reached at cash BEP. So, out of debtors and depreciation, the company had at profitability condition in F/Y 2062/63, 2063/64 and 2064/65. The expected cash BEP in F/Y 2067/68 is Rs. 346790556 (Appendix-VIII)

#### **4.6.2 Break Even Analysis of Multi-Products & Sales Mix.**

Sales mix can be defined as the relative combination of product represented in the total sales. Most companies have several products, and PCI has also more than 6 products, which are not equally profitable. Profit depends to some extent on the sales mix that company is able to achieve. Profit will be greater if high margin items make up a relatively large proportion of total sale consist mostly low margin items.

The break even analysis of multi product company like as PCI is complex because different products will have different selling prices, different costs and different contribution margins. Break even point depends on the mix which the various products are sold.

$$\text{Over BE sales} = \frac{\text{Total fixed cost}}{\text{Average Weighted CM Ratio}}$$

For PCI,

$$\text{Overall BE sales} = 32929656 / 0.3655 = 90094817$$

The details calculation is presented in appendix –XII. The sales mix and CM ratio of each product are classified on the basis of sales. In the calculation, the break even point of PCI is Rs. 265815989.8 in sales for the F/Y 2067/68. This is computed by dividing the fixed costs by the company's average CM ratio. But Rs. 90082470.03 represents BEP for the company. If the sales mix changes, than the BEP will be change. The details sales of each product of PCI at BEP for the F/Y 2067/68 are presented below in table no 4.19.

**Table No. 4.19**

**Product wise BEP sales of PCI**

S.N	Products	Sales('000)	Sales mix	Product wise BEP (overall BEP × Sales mix)
1.	150kont	83209952	0.37	30787682
2.	100kont	111798975	0.49	54781497
3.	60kont	32325986	0.14	4525638
Total		227246713		90094817

Source: Base on Appendix IX

**4.6.2.1 Comparison of Individual BEP and Overall BEP of Selected Products**

The following table shows the individual and overall BEP of selected products:-

**Table No 4.20**

**Comparison of BEP**

S.N.	Products	Individual BEP	Products Wise BEP
1.	150kont	83209952	30787682
2.	100kont	111798975	54781497
3.	60kont	32217786	4525638
	Overall BEP		90094817

Source: Base on table no.4.15 and 4.19

In the above table, individual BEP of each product is less than the product wise BEP. This is due to the fixed cost. In the individual BEP, we use the separate fixed costs of the respective product. But in the overall BEP we use the total fixed cost of the company as a whole to calculate the BEP. The main cause of difference between individual BEP and product wise BEP is fixed cost plays the vital role in cost-volume and profit analysis.

### **4.6.3 Analysis of Contribution Margin**

Contribution Margin is the different between sales amount and variable cost. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. Contribution margin can be as follows:-

$$\text{Contribution margin (CM)} = \text{Sales value} - \text{Variable cost}$$

Or

$$\text{Contribution margin (CM)} = \text{Profit} + \text{Fixed Cost}$$

The analysis of contribution margin is divided into two parts, which are: Analysis of contribution margin is entire from of PCI, and Analysis of contribution margin for selected product lines.

#### **4.6.3.1 Analysis of Contribution Margin in Entire form of PCI**

The contribution margin is fluctuating trend form F/Y 2062/63 to F/Y 2067/68 according to previous table no 4.14. The contribution margin ratio is also fluctuating trend. Fluctuating the CM ration is indicated that uncertainty of fixed costs. But this ratio is less than 20%. Since higher fixed cost at increasing trend; and lower CM ratio, the company actual sales are crossed at BEP. Except 2064/65. For higher CM ratio, sales must be increasing and variable must be decreased. Other way fixed cost should be constant or controlled or sales and production should be done in mass.

#### **4.6.3.2 Analysis of Contribution Margin for Selected Product Lines**

According to table no 4.15, the contribution margin of 150kont is in increasing condition. The CM ratio are less than 30%, But the CM ratio are 25% all year. In sprit of lower CM ratio, the actual sales 150kont are crossed the BEP. Causes is that lower fixed costs and comparative maximum production and sales.

Similarly, the contribution of 100kont is in also increasing condition but CM ratio is

also in constant condition. The CM ratios are higher than 30% ie40% all year, lower fixed costs and market monopoly sales, the product had also crossed the BEP.

Another product, 60kont the Contribution margin is in increasing condition too. The CM ratio is in constant trend too. The CM ratios are more than 30% ie 55% all year. Since, lower fixed costs and mass production and selling, 60knt had crossed the BEP.

In this way, the CM ratios of selected product lines are nearly and higher 30%. To increase the CM ratio of selected product and variable cost should be minimized as far as possible by using proper decision making

#### 4.6.4 Analysis of Safety Margin of PCI

The margin of safety (MOS) can be defined as the excess of sales over the break even volume of sales. It states the amount by which sales can drop before to be incurred in an organization. The formula for its calculation is:-Margin of safety (MOS) = Total sales – Break even sales

Although the PCI is not reached at BEP and its CM ratio is also low. In addition to find out either high or low margin of safety of PCI, it is needed to compute margin of safety. It is known that high margin of safety is particular significant in times of depression. Following the table shows margin of safety in entire form of the company.

**Table no 4.21**  
**Computation of MOS of PCI**

Particulars	2063\64	2064\65	2065\66	2066\67	2067\68	2068/69
A. Budgeted sales (Rs)	1050000000	1100000000	1000000000	1000000000	800000000	900000000
B. BEP in Rs	464171249	493535269	562942704	371583696	366367806	268131447
C. Margin of safety (A-B)	585828751	606464731	437057296	628416304	433632194	631868553
D.MOS ratio (C/A × 100)	55.80%	55.14%	43.69%	62.8%	54.2%	70.20%

Source Annual report of PCI (Fiscal Year 2063/64 to 2068/69)

According to table no 4.21, MOS ratio is high all year. The high MOS ratio is the result of low CM ratio. Since, low actual sales comparative than BEP, there are not Raised condition of suffering fluctuation regarding sales fall, because actual sales are fluctuating annually.

When actual sales be crossed BEP and there be arise low CM ratio and MOS ratio then the management should be think of the possibilities of increasing the price of sales or reducing variable cost by adopting in the manufacturing process.

Similarly, according to previous table no. 4.15 show, difference amount of actual sales and BEP are highly positive selected products lines. It is indicated that there is high MOS ratio. As a result, it could be ensure that selected products lines, 150kont, 100kont, and 60kont would be profitable at depression period where demand of the products be lower or falling conditions.

#### **4.6.5 Profit-Volume Analysis**

Profit volume ratio established a relationship between the contribution and sales volume. The two factors profit and volume are interconnected and dependent with each other. Profit depends upon sales; selling price to a great extent will depend upon the volume of production. It can be presented by:-

$$\text{Profit Volume (P/V) Ratio} = \frac{\text{Contribution Margin}}{\text{Sales}}$$

Since, total BEP in Rs. of PCI is higher than actual sales of all presented fiscal years. For the short term profit planning the management should adjust the price, volume and costs. The actual sales must be nearly BEP and then profit volume analysis may have proper meaning. By the way, target profit, required sales and adjustable costs can be forecasted by using P/V analysis for future operation planning.

P/V analysis is also divided into two parts which are:

P/V analysis in entire form of the company.

P/V analysis for selected product lines.

#### **4.6.5.1 P/V Analysis in Entire form of the PCI**

The table no 4.14 shows the profit volume ratio of PCI for the year 2061/62 to 2066/67. Profit volume ratio is also known as contribution margin ratio. As the contribution margin fluctuates generally, but CM ratio also fluctuation and the case is same here. The P/V ratio is minimum 0.0843 in F/Y 2066/67 and maximum 0.1115 in the fiscal cost is assumed to be constant at certain level of activity. Higher contribution margin ratio is better and management always put effort to increase this ratio. Management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling price.

#### **4.6.5.2 P/V Analysis for Selected Product Lines**

The above table no 4.15 shows the P/V ratios of 150kont 100kont and 60kont. The P/V Ratio 150kont in F/Y 2062/63 to 2067/68 are constant 0.25 all year. The P/V Ratio of all is constant condition.. Similarly, the P/V ratio of 100kont is also in increasing condition. The P/V ratios are 0.44, in F/Y 2062/63, to 2066/67 respectively. But the P/V ratio of 60kont is increasing annually but The P/V ratios are constant 0.55 in the F/Y 2061/62, 2062/63, 2063/64, 2064/65, 2065/66 and 2067/68 respectively. Since, higher the P/V ratio increases the profit. So, management always put effort to increase the P/V ratios.

#### **4.7 Summary of the projection**

The study we are forecasted the various factors of PCI like sales, variable cost, fixed cost etc for the coming fiscal year 2067/68 by using time series regression equation which can be presented in the following table;

**Table no. 4.22**  
**Summary of the study of PCI**

Particular	past yr.	past yr.	Past yr.	past yr.	past yr.	past yr.	Budgeted yr.
Year	2063/64	2064\65	2064\65	2065\66	2066\67	2067\68	2068/69
Sales	561281000	620592000	417690000	508739000	366576000	415756000	341910000
Variable Cost	501515525	558285799	380780350	462495995	335691194	375231200	322935620
Fixed Cost	49434238	49550941	49538958	33776958	31861679	32929656	20596041
Profit & loss	10331237	12755260	(12629308)	12466047	(976873)	7795144	(1621661)
BEP	464171249	493535269	562942704	371583696	366367806	268131447	265815989
Cash BEP	465713827	495417765	1033455608	642685450	61723580	448500054	598087719

Source; Annual Report of PCI (F/Y 2063/64 to 2068/69)

#### **4.8 Major Finding**

From the analysis of various data collected by secondary sources and on the basis of observation and discussion, the following major findings have been draw Sales plan of PCI is not properly maintained. There is a deviation between budgeted sales and actual sales. Sales trend of PCI is fluctuating yearly. It shows that the net loss be decrease in future Expenses trend of PCI is increasing year by year. The company has no details and systematic expenses plan. The Fixed cost variable cost and mixed cost expenses plan is necessary elements for the profit planning and control.

The cost of PCI is classified into fixed and variable. There is no practice of identifying semi variable and their segregation into variable and fixed by using scientific techniques.

The total fixed cost of the company is increasing annually. Due to the raw materials cost increasing yearly; the unit variable cost of carpet also is increasing annually.

The Unit selling price also increasing annually. Due to the political & economical environment the sales of company decreasing condition. For profit achievement, the company should be adjusted fixed cost, variable cost, sales and profit by ratio analysis.

The actual sales of the F/Y 2065/66 to 2067/68 are not reached at BEP. The huge amount had invested into fixed costs. The contribution margin is very low cause of higher unit variable cost. Depreciation and interest on long-term loan is increasing annually. Other controllable cost is also increasing. Since lower sales than BEP or estimated sales, the MOS ratio is satisfactory.

The actual loss of other products and departments are recovered by selected product lines profit. Since limited Nepalese liquor market and selling and distribution activities, production and sales are comparatively low than production capacity.

Expenses planning and controlling should focus on the relationship between expenditure and benefits derived from those expenditure.

Separate cost control dependent should be established for the effective management and reduction.

The PCI should consider about the product line to improve its profit. Market studies on demand, supply and pricing of product should be carried out and loss oriented costs should be identified and control.

The PCI should consider BEP analysis which preparing sale plan, production plan and selling price of its products.

## CHAPTER-V

# SUMMARY, CONCLUSION AND ECOMMENDATIONS

### 5.1 Summary

The C-V-P analysis occupies an important place in profit planning and control. This study mainly aims to analyze the relationship between cost, volume and profit of PCI. In Nepal, the manufacturing sector is very weak in every aspect of performance. Numbers of manufacturing industries are very few in Nepal. Among them only 32 manufacturing industries are listed in NEPSE. Here Paramount Carpet Industry is taken as sample for the purpose of the study. In the study, researcher has analyzed the sales, fixed costs, variable cost and profit (loss) of the PCI and selected product as well.

As per the need of the study, the researcher has analyzed secondary data. The needed secondary data were collected from the period of fiscal year 2065/66 to 2067/68. The financial statement i.e. balance sheet, income statement and other related data were found from annual report of the PCI, Which was provided by the company.

The main objectives of the research is to analyze different components of cost as per cost behavior to analyze the impact of fixed cost on profit and to analyze break-even-point of overall firm as well as individual product. For the purpose completion of the study, the related books, articles, journals and published thesis were studied by the researcher, which is presented in the second chapter the review of literature.

To accomplish the objectives of the research, the accounting and statistical tools and techniques have been used, which are presented in the chapter four data analysis.

Management effectively achieves organizational objectives through the efficient use of scarce resource in a changing environment. Future is uncertain which creates risk and reduce risk; the only reliable weapon is good management. C-V-P analysis is an

analytical technique for studying the relationship between volume, cost and profit which helps to manage future cost and profit. Profit planning is a management technique and it is a written plan in all aspect of business operation for specific future period. C-V-P analysis is a device used to determine the usefulness of profit planning process of the firm. In fact, the entire field of profit planning has become associated with C-V-P inter-relationship.

Cost-volume-profit analysis, a most important tool of planning means of predicting the effect of changes in cost and sales levels on the Income of business. In its simplest form, it involves the determination of sales levels at which a company neither earns a profit nor incurs a loss, or in others word the point at which it breaks even. Often break-even analysis is known as C-V-P analysis. But break-even analysis is a special case of C-V-P analysis. however C-V-P analysis techniques is included to find out sales volume to earn a zero profit or desired profit, to affect income by changes in selling price, to check income if new machine will be installed, to examine operating profit if fixed cost as well as unit variable cost will be changes etc. solving such alternative C-V-P analysis is more appropriate then break-even analysis.

In this way company may use C-V-P analysis as planning tool when sales volume, unit selling price and variable and fixed cost are known, then to find out profit, as target profit at certain sales volume. By using C-V-P analysis tools the management of the company can control the costs also.

The C-V-P analysis tool is applied in the Paramount Carpet Ltd. to find out whether the tool is practicing or not. Paramount Carpet ltd. , one of the leading weaving manufacture which is the largest player in international market and for decades has been synonymous with quality product, had not practicing C-V-P analysis tools, costs are not segregated as fixed costs and variable costs where there are not proper mechanism to segregate semi-variable or semi-fixed costs into fixed and variable cost. To solve the problems regarding C-V-P analysis and not application, some objectives are formulated: cost segregation as fixed and variable cost, unit variable by adopting suitable mechanism and computation of

C-V-P analysis by its extension tools. To fulfill the objectives of the study, historical as well as managerial research design is adopted.

Hence, descriptive and quantitative technique are used to analyze and interpretation

the data. After it, some finding: major and others are also achieved.

## **5.2 Conclusion**

Different types of profit planning tools, which are used in the academic field, are not found applied by PCI. It shows the gap between the theory and practice. C-V-P analysis is not applied by PCI as no segregation of cost into fixed and variable, which is the hardcore of CVP analysis. Company has no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So PCI has not been able to use C-V-P analysis and make the realistic and smart budget.

Since, not adopting C-V-P analysis tool for profit planning, before and after operation of venture, the company had incurring profit and loss annually changing condition. The actual sales of the F/Y 2065/66 to 2067/68 are not reached at BEP. The huge amount had invested into fixed costs. The contribution margin is very low cause of higher unit variable cost. Depreciation and interest on long-term loan is increasing annually. Other controllable cost is also increasing. Since lower sales than BEP or estimated sales, the MOS ratio is satisfactory.

The actual loss of other products and departments are recovered by selected product lines profit. Since limited Nepalese liquor market and selling and distribution activities, production and sales are comparatively low than production capacity.

Hence, avoiding C-V-P analysis tool and not utilizing full capacity, the company is bearing loss. Promoter and director, and staff of the company are enjoying by achieving allowance and salary respectively. Other part, general shareholders are not achieving dividend and government couldn't claim for income tax since loss and loss recovery situation.

### **5.3 Recommendations**

On the basis of the study of C-V-P analysis as a tool to measure effectiveness of profit planning and control (PPC) of PCI, it seems necessary to develop, implement and improve the process of C-V-P analysis from beginning to end with PPC. Nepal is proceeding towards globalization with membership of WTO. Nepalese companies should fit with the global environment with best-fit managerial strategies development. As the completions are very high in the context of liberalization, company should provide attention towards cost minimization rather than profit maximization. For this, C-V-P analysis tools can be of great help. Thus the following recommendations based in the finding of research study are made.

- I, Classification of expenses item as variable and fixed or controllable and non controllable must be made within specific framework of responsibility and time.
- ii, Expenses planning and controlling should focus on the relationship between expenditure and benefits derived from those expenditure.
- iii, Separate cost control dependent should be established for the effective management and reduction.
- iv, PCI should consider about the product line to improve its profit. Market studies on demand, supply and pricing of product should be carried out and loss oriented costs should be identified and control.

PCI should consider BEP analysis which preparing sale plan, production plan and selling price of its products.

PCI is multi Product Company; more emphasis should be provided the product having high contribution so as have more profit.

Some portion of fund should be allocated to research and development program so that new technology could be found which provide more competitiveness in the market. System of periodical performance reports should strictly followed to be conscious about poor performance and take corrective action immediately and timely. New market should be identified for the coverage of increased activities of companies.

For overall profitability of the company, the company should analyzed other profit planning tools i.e. decision making where department wise, product wise, make or buy, drop or continue, decision are provided. The company PCI is also multiple products producer and its products some materials like ENA, denature sprit and GNA for self consumption. There may be high cost rather then consider supplier. So decision- making tool also can adopt for profit planning purpose.

A systematic approach should be toward comprehensive profit planning. This can considerably contribute to the increase in profitability to PCI. Since separate of costs into their fixed and variable elements is at the heart of C-V-P analysis, all decision makers sought to be fully aware of, and understand, the cost structure of their operation; otherwise C-V-P analysis will provide meaningless information.

Above recommendation are concerned with short-term profit planning (c-v-p analysis) which might be helpful to plan the profit and future operation for PCI. Hence, the recommendation would be improve C-V-P relationship of PCI.

## BIBLIOGRAPHY

ADB. (2001), *Nepal & ADB sign partnership agreement to fight povert*  
Kathmandu.

Adhikari , M. (2009). ”*Cost –volume figure no-4.6 profit analysis of himalayan distallary pvt ltd*”, Unpublished Master’s thesis, TU kathmandu.

Agrawal, G. R. (2004). *Dynamic of business environment in Nepal*, Kathmandu: M.K Publishers and Distributors.

Anthony, R.N.and .A. Welsch. (1997). *Fundamentals of Management Accounting*, Illinois: Rechard D. Irwin Homewood.

Annual Reports of Paramount Carpet Industry F/Y 2061/62 to 2066/67, Kathmandu.

Carpet magazine from the land of Himalayan, No-12,march 2010.

Batty, J. (1982). *Management accounting, Plymouth*: The English Language Book Society and Macdonald and Evans Limited.

Bajracharya, B. C.(2004). *Business statistic and mathematics*, M. K. Publisher and Disitbutors, Kathmandu, Nepal.

Bradely, J. F. (1964). *Administrative financial management*, USA: Holt, Richard and Wiston Inc.

Central Bureau of Statistics (2007). *Statistics pocket book 2007*. Kathmandu: Central Bureau of Statistics.

Chalise, I.R. (2001). *Profit planning in manufacturing company : a case study of nepal lever limited*, Unpblished Master’s Thesis, Nepal Commerce Campus, T.U. Kathmandu.

Chaudhari, A. K. & P./K. Sharma ,(2003). *Statistical methods*, Kathmandu: Khanal Books & Stationery.

CIA, (2064). *Bulletin central carpet association*.

Dahal, U.K. (2006). " *Cost volume profit analysis as a tool measure the effectiveness of profit planning with special reference to dabur nepal pvt. ltd,*" Unpublished Master’s Thesis, Shankar Dev Campus, T.U. Kathmandu.

Dahal, R. K. & K. N. Wagle. (2004). *Management accounting*, Kathmandu: Khanal Books & Stationery.

Dangol , R. M. (2058) . *Management accounting*, Kathmandu: Taleju Prakashan.

Drury, C. (2000). *Management and Cost accounting*, Business Press: Thomson Learning.

- Fisher, Paul M and Frank, Werner G.(1985). *Cost accounting*, South Westren Publishing Co-Cincinnati.
- Fago, G. (2003). *Profit Planning and Control*, Kathmandu: Buddha Academic Enterprise Private Limited.
- Gautam, Y. P. (2006). "*An analytical and comparative study on cyp analysis of unilever nepal limited and dabur depal pvt. ltd*", Unpublished Master's Thesis, Nepal Commerce Campus, T.U
- Goyal, S.N and Mohan, M. (1997). *Management accounting*. New Dhili: Schand and Company
- Gupta, S. C. (1997). *Advanced accounts*, New Delhi: S. Chand and Company.
- Gupta, S. P. (1995). *Management accounting*. Agra: Shahitya Bhawan Publication.
- Horngreen, C. T., George, P. and S. M. Dater. (1999). *Cost accounting a managerial approach*, New Delhi: Printice Hall of India Private Limited.
- Khan, M. Y. and P. K. Jain. (1993). *Management accounting*, New Delhi: Tata McGraw Hill Publishing Company Ltd.
- Kothari, C. R. (1990). *Research methodology, methods and techniques*, New Delhi: Willey Eastern Limited.
- Lynch, R. M. and R. W. Williamson, (1999). *Accounting for management*, New Dehli: Willey Eastern Limited.
- Maheshwary, S. N. (2000). *Management accounting and financial control*, New Delhi: Sultan Chand and Sons Educational Publishers.
- Manandhar R. (2007)."*Cost-volume profit analysis of kathmandu dairy ltd*", Unpublished Master's Thesis, Nepal Commerce Campus, T.U.
- Ministry of Finance, *Budget speeches*. (2005/06). Kathmandu: Ministry of Finance, Nepal, Government
- Munakarmi, S. P. (2002). *Management accounting*, Kathmandu: Buddha Academic Enterprises Pvt. Ltd.
- Nepal Tourism Board,Kathmandu: (1998), and (2011). *Nepal tourism board, for visit Nepal 1998 and 2011*.
- Ninemeire, J. D. and R. Schmidgall. (1984). *Basic accounting standard*, Air Publishing Company.
- Pandey, I. M. (1999). *Management accounting*, New Delhi: Vikas Publishing House Pvt. Ltd.
- Pant, P. R. (2004). *Business environment-in nepal*, Kathmandu: Buddha Academic Publisher & Distibuter Pvt. Ltd.

Rijal, M. (2005). "*Cost volume profit analysis to measure the effectiveness of profit planning and control: a case study of nebico pvt. ltd*", Unpublished Master's Thesis, Nepal Commerce Campus, T.U.

Pokharel P. (2006). "*Cost-volume profit analysis of himalayan distillery ltd*" Unpublished Master's Thesis, Nepal Commerce Campus, T.U.

Shrestha, B. P. (1981). *An introduction to Nepalese economy*, Kathmandu: Ratna Pustak Bhandar.

Timilsina, D.R. (2007) . "*Cost volume profit analysis of Himalayan distillery limited.*" An Unpublished Master's Degree Thesis, Nepal Commerce Campus, Minbhaban.

Timilsina, N. (2008), "*Budgetary performance and its impact on profitability (A case study of Dabur Nepal pvt. ltd.*" ) . An unpublished Master's degree Thesis, Nepal Commerce Campus, Minbhaban

Wagle, K. N. and Dahal, R. K.(2004). *Management accounting*, Khanal Books Prakashan, Minbhawan, Kathmandu.

Welsch, G. A., R. W. Hilton and P.N. Gordon. (1992). *Budgeting profit planning and controlling*, New Delhi: Prentice Hall of India Pvt. Ltd.

Weston, J. F. and J. F. Copeland. (1992). *Managerial finance*, Chicago: The DrydenPress.

Wolff, H. K., & P. R. Pant (2007). *Social science research & thesis writing*, Kathmandu: Buddha Academic Enterprises Pvt. Ltd.

Guidry, Horrign Craft, *Journal of managerial issue vol. 10*.

Robert Kee Joe Lane Prof. of Accounting *Journal of managerial issue*

**APPENDIX - II**

**Let Actual and Budgeted Sales be denoted by x & y respectively**

6 Year	X(0000000)	Y(0000000)	x=X-A	y=Y-B	x <sup>2</sup>	y <sup>2</sup>	xy
2064/65	561.281	1050	52.572	50	2760.66	2500	262710
2065/65	620.592	1100	111.853	100	12511.09	10000	11185.3
2065/66	417.690	1000	-91.049		8289.92		-
2066/67	508.739	1000	-	-	-		-
2067/68	366.576	800	-142.163	(200)	20210.31	40000	28492.6
2068/69	415.756	900	-92.983	-100	8645.83	10000	9298.3
N=6	X=2890.634	Y=5850	X=-161.8	Y=(150)	X <sup>2</sup> =52417.83	Y <sup>2</sup> =62500	XY=51603.3

For actual sales:

$$\text{Mean } (\bar{X}) = \frac{X}{N} = \frac{2890.634}{6} = 481.77$$

For Budgeted Sales:

$$\text{Mean } (\bar{Y}) = \frac{Y}{N} = \frac{5850}{6} = 975$$

Let,

A=Assumed Mean for X = 481.77

B=Assumed Mean for Y = 975

Computation of Standard deviation (†)

For Actual Sales:

$$\dagger_x = \sqrt{\frac{x^2}{N} - \left(\frac{x}{N}\right)^2} = \sqrt{\frac{52417.83}{6} - \left(\frac{-161.8}{6}\right)^2} = 89.49$$

For,

Budgeted Sales:

$$\dagger_y = \sqrt{\frac{y^2}{N} - \left(\frac{y}{N}\right)^2} = \sqrt{\frac{62500}{6} - \left(\frac{-150}{6}\right)^2} = 98.95$$

Computation of C.V

For Actual Sales:

$$C.V_x = \frac{x}{X} \times 100 = \frac{89.49}{481.77} \times 100 = 18.575\%$$

For Budgeted Sales:

$$C.V_y = \frac{y}{Y} \times 100 = \frac{98.95}{975} \times 100 = 10.148\%$$

Computation of Correlation Co-efficient (r)

$$r = \frac{N \cdot \sum xy}{\sqrt{N \cdot \sum x^2} \sqrt{N \cdot \sum y^2}}$$

$$= \frac{6 \times 51603.3}{\sqrt{6 \times 52417.83} \sqrt{6 \times 62500}} = \frac{309619.8}{\sqrt{314506.98} \sqrt{375000}} = \frac{309619.8}{107473.8}{19364.91} = 0.89$$

$$= 0.89$$

$$P.E = 0.6745 \times \frac{1 - r^2}{\sqrt{N}}$$

$$= 0.6745 \times \frac{1 - 0.89^2}{\sqrt{6}} = 0.6745 \times \frac{0.2079}{2.4494} = 0.572$$

### **APPENDIX-III**

#### **Calculation of the trend lines of sales of 150k. (Rs. In '0000')**

Years	Total (Y)Sales{0000}	X-2064/65	XY	X <sup>2</sup>
2064/65	12133	(3)	(36399)	9
2065/65	13000	(2)	(26000)	4
2065/66	7125	(1)	(7125)	1
2066/67	9132	0	0	0
2067/68	6452	1	6452	1
2068/69	8321	2	16442	4
Total	Y = 56163	X = -3	XY = (46430)	X <sup>2</sup> = 19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total sales.

a = total assets

b = rate of changes of total sales

x = Year

For the calculation of a sales of 150 knot it can be obtained by solving the following two equations.

$$Y = a + bx \quad \text{..... (i)}$$

$$Y - a = bx \quad \text{..... (ii)}$$

$$56163 = 6a - 3b$$

$$-46430 = -3a + 19b$$

By solving the above equation.

We get,

$$a = 13710.99$$

$$b = -2118.68$$

$$Y = a + bx$$

$$Y = 13710.99 + (-2118.68)x$$

$$Y = 7354.95$$

### Calculation of the trend lines of sales of 100k. (Rs. In '0000')

Years	Total (Y)Sales{000}	X-2064/65	XY	X <sup>2</sup>
2064/65	20120	(3)	(60360)	9
2065/65	20800	(2)	(41600)	4
2065/66	12120	(1)	(12120)	1
2066/67	14120	0	0	0
2067/68	10232	1	10232	1
2068/69	11230	2	22460	4
Total	Y = 88622	X = (3)	XY = (81388)	X <sup>2</sup> = 19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total sales.

a = total assets

b = rate of changes of total sales

x = Year

For the calculation of sales of 150 knot in can be obtained by solving the following two equations.

$$Y = a + bx \quad \text{..... (i)}$$

$$\frac{\Delta Y}{\Delta X} = b \quad \text{..... (ii)}$$

$$88622 = 6a - 3b$$

$$-81388 = -3a + 19b$$

By solving the above equation.

We get,

$$a = 8836.25$$

$$b = -1048.48$$

$$Y = a + bx$$

$$Y = 8836.25 + (-1048.48)x$$

$$Y = 5690.82$$

### Calculation of the trend lines of sales of 60k. (Rs. In '000')

Years	Total (Y)Sales{000}	X-2064/65	XY	X <sup>2</sup>
2064/65	50431	(3)	(151293)	9
2065/65	55133	(2)	(110250)	4
2065/66	41232	(1)	(41232)	1
2066/67	50313	0	0	0
2067/68	37123	1	37123	1
2068/69	32326	2	64652	2
Total	Y = 266550	X = (3)	XY = (201000)	X <sup>2</sup> = 19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= vales of total sales.

a = total sales.

b = rate of change of total sales.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$\sum Y = na + b \sum X \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$266550 = 6a + b (-3) \dots\dots\dots (i)$$

$$\underline{-201000 = a (-3) + b 19 \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 42490 \qquad \qquad \qquad b = -3870$$

We know,

$$Y = a + bx$$

$$Y = 42490 + (-3870) \times 3 = 30880$$

**APPENDIX-IV**

**Calculation of the trend of total Fixed cost of PCI (in Rs)**

Years	Total Fixed cost (Y)(0000)	X-2064/65	XY	X <sup>2</sup>
2064/65	4943.4238	(3)	(14830.2714)	9
2065/65	4955.0941	(2)	(9910.1882)	4
2065/66	4953.8958	(1)	(4953.8958)	1
2066/67	3377.6958	0	0	0
2067/68	3186.1679	1	3186.1679	1
2068/69	3292.9656	2	6585.9312	4
Total	Y =24709.243	X=(3)	XY=(22647.6375)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y = value of total Fixed Cost

a = total Fixed Cost.

b = rate of change of total Fixed Cost.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$\sum Y = n a + b \sum X \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$247092430 = 6a + b (-3) \dots\dots\dots (i)$$

$$\underline{-226476375 = a (-3) + b 19 \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 38241210 \quad b = -5881713$$

We know,

$$Y = a + bx$$

$$Y = 3824210 + (-5881723) \times 3$$

$$= 205960410$$

**Calculation of the trend of 150kont Fixed cost of PCI (in Rs)**

Years	Total Fixed cost(Y)}	X-2064/65	XY	X <sup>2</sup>
2064/65	6345232	(3)	(19035696)	9
2065/65	6224800	(2)	(12449600)	4
2065/66	4900547	(1)	(4900547)	1
2066/67	3519356	0	0	0
2067/68	3101697	1	3101697	1
2068/69	2904100	2	5808200	4

Total	Y =26995732	X=(3)	XY=(27475946)	X <sup>2</sup> =19
-------	-------------	-------	---------------	--------------------

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Value of total Fixed Cost.

a = total Fixed Cost

b = rate of changes of total Fixed Cost

x = Year

For the calculation of a 150 knot fixed cost can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\phi XY = Xa + b\phi X^2 \dots\dots\dots (ii)$$

$$26995732 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-27475946 = a(-3) + b(9) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 4099914.95 \quad b = -798747.43$$

We know,

$$Y = a + bx$$

$$Y = 4099914.95 + (-798747.43) \times 3$$

$$= 1703672.66$$

**Calculation of the trend of 100knt Fixed cost of PCI (in Rs)**

Years	Total Fixed cost(Y)}	X-2064/65	XY	X <sup>2</sup>
2064/65	11691256	(3)	(35073768)	9
2065/65	10945351	(2)	(21890702)	4
2065/66	8946031	(1)	(8946031)	1
2066/67	5856564	0	0	0

2067/68	5361915	1	5361915	1
2068/69	4356149	2	8712298	4
Total	Y =47157266	X=(3)	XY=(51836288)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total Fixed Cost.

a = total Fixed Cost

b = rate of changes of total Fixed Cost

x = Year

For the calculation of a 100 knot fixed cost can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$47157266 = 6a + b(-3) \dots\dots\dots (ii)$$

$$47157266 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-51836288 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 7052182.76 \quad b = -1614723.14$$

We know,

$$Y = a + bx$$

$$Y = 7052182.76 + (-1614723.14) \times 3$$

$$= 2208013.33$$

**Calculation of the trend of 60kont Fixed cost of PCI (in Rs)**

Years	Total Fixed cost (Y)	X-2064/65	XY	X <sup>2</sup>
2064/65	26373900	(3)	(79121700)	9
2065/65	32380790	(2)	(64761580)	4

2065/66	35692381	(1)	(35692381)	1
2066/67	24400680	0	0	0
2067/68	23398067	1	23398067	1
2068/69	18855754	2	37711505	4
Total	Y =161101572	X=(3)	XY=(118466086)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= vales of total Fixed Cost

a = total Fixed Cost

b = rate of change of total Fixed Cost

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$161101572 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-118466086 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 25766967.71 \quad b = (2166588.57)$$

We know,

$$Y = a + bx$$

$$Y = 25766967.71 + (2166588.57) \times 3$$

$$= 19267202$$

**APPENDIX - V**

**Calculation of the trend of total Variable cost of PCI (in Rs)**

Years	Total Variable	X-2064/65	XY	X <sup>2</sup>
-------	----------------	-----------	----	----------------

	cost (Y)			
2064/65	501515525	(3)	(1504546575)	9
2065/65	558285799	(2)	(111657158)	4
2065/66	380780350	(1)	(380780350)	1
2066/67	462495995	0	0	0
2067/68	335691194	1	335691194	1
2068/69	375231200	2	750462400	4
Total	Y =2111542843	X=(3)	XY=(910830489)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= value of total Variable Cost.

a = total Variable Cost.

b = rate of change of total Variable Cost.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\sum Y = \sum a + b \sum X \dots\dots\dots (ii)$$

$$2111542843 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-910830489 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 347782637.70 \quad b = (8282339)$$

We know,

$$Y = a + bx$$

$$Y = 347782637.70 + (8282339) \times 3$$

$$= 322935620.70$$

**Calculation of the trend of 150kont Variable cost of PCI (in Rs)**

Years	Total Variable cost(Y)(Rs. 00}	X-2063\64	XY	X2
2064/65	909975	(3)	(2729925)	9
2065/65	975000	(2)	(1950000)	4
2065/66	534375	(1)	(534375)	1
2066/67	684900	0	0	0
2067/68	483900	1	483900	1
2068/69	617364	2	1234728	4
Total	Y =1205514	X=(3)	XY=(3495672)	X2=19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total Variable Cost

a = total Variable Cost

b = rate of changes of total Variable cost

x = Year

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$4205514 = 6a + b(-3) \dots\dots\dots (i)$$

$$4205514 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-3495672 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 661121.43 \quad b = (79595.14)$$

We know,

$$Y = a + bx$$

$$Y = 661121.43 + (79595.14) \times 3$$

$$= 422336.01$$

**Calculation of the trend of 100kont Variable cost of PCI (in Rs)**

Years	Total Variable cost(Y)(Rs.000}	X-2064/65	XY	X <sup>2</sup>
2064/65	120720	(3)	(362160)	9
2065/65	124800	(2)	(249600)	4
2065/66	72720	(1)	(72720)	1
2066/67	84720	0	0	0
2067/68	61392	1	61392	1
2068/69	65961	2	131922	4
Total	Y =530313	X=(3)	XY=(491166)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total Variable Cost

a = total Variable Cost

b = rate of changes of total Variable cost

x = Year

For the calculation of a 100 knot variable cost can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$530313 = a + b(-3) \dots\dots\dots (ii)$$

$$530313 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-491166 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 94842.91 \quad b = (12914.83)$$

We know,

$$Y = a + bx$$

$$Y = 94842.91 - 12914.83 \times 3$$

= 56098.43

**Calculation of the trend of 60kont Variable cost of PCI (in Rs)**

Years	Total Variable cost (Y)	X-2064/65	XY	X <sup>2</sup>
2064/65	2269395	(3)	(6808185)	9
2065/65	2480625	(2)	(4961250)	4
2065/66	1855440	(1)	(1855440)	1
2066/67	2264085	0	0	0
2067/68	1670535	1	1670535	1
2068/69	1356940	2	2713880	4
Total	Y =11897020	X=(3)	XY=(9240460)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= value of total Variable Cost.

a = total Variable Cost.

b = rate of change of total Variable Cost.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$11897020 = 6a + b(-3) \dots\dots\dots (i)$$

$$-9240460 = a(-3) + b(19) \dots\dots\dots (ii)$$

By solving the above equation

We get,

$$a = 1888780.95 \quad b = (188111.43)$$

We know,

$$Y = a + bx$$

$$Y = 1888780.95 + (188111.43) \times 3$$

$$= 1324446.67$$

**APPENDIX -VI**

**Calculation of the trend of total Semi-Variable cost of PCI (in Rs)**

Years	Total Variable cost (Y)(Rs 000)	X-2064/65	XY	X <sup>2</sup>
2064/65	1960	(3)	(5880)	9
2065/65	2026	(2)	(4052)	4
2065/66	2223	(1)	(2223)	1
2066/67	2456	0	0	0
2067/68	2596	1	2596	1
2068/69	2511	2	5022	4
Total	Y =13772	X=(3)	XY=(4537)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= values of total Sami-Variable Cost.

a = total Sami-Variable Cost.

b = rate of change of total Sami-Variable Cost.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$13772 = 6a + b (-3) \dots\dots\dots (i)$$

$$\underline{-4537 = a (-3) + b 19 \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 2427.26 \quad b = 263.857$$

We know,

$$Y = a + bx$$

$$Y = 2427.26 + 263.857 \times 3$$

= 3218.83(000)

**APPENDIX -VII**

**Calculation of the trend of total BEP of PCI (in Rs)**

Years	Total BEP (Y)(Rs)	X-2064/65	XY	X <sup>2</sup>
2064/65	464171249	(3)	(1392513747)	9
2065/65	493535269	(2)	(987070538)	4
2065/66	562942704	(1)	(562942704)	1
2066/67	371583696	0	0	0
2067/68	366367806	1	366367806	1
2068/69	268131447	2	536262894	4
Total	Y =2526732171	X=(3)	XY=(2039896278)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$Y = a + bx$  ..... (i)

Where,

Y= values of total Break Even Point

a = total Break Even Point

b = rate of change of total Break Even Point.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$\sum Y = na + b\sum X$  ..... (i)

$\sum XY = a\sum X + b\sum X^2$  ..... (ii)

$25266732171 = 6a + b(-3)$  ..... (i)

$-2039896279 = a(-3) + b(19)$  ..... (ii)

By solving the above equation

We get,

$a = 398935451.50$      $b = (44373153.91)$

We know,

$$Y = a + bx$$

$$Y = 398935451.50 + (44373153.91) \times 3$$

$$= 265815989.8$$

**Calculation of the trend of 150knt BEP of PCI(in Rs)**

Years	Total BEP (Y)(Rs.000}	X-2064/65	XY	X <sup>2</sup>
2064/65	25380	(3)	(76140)	4
2065/65	24899.16	(2)	(99798.32)	1
2065/66	19602	(1)	(19062)	0
2066/67	14077.427	0	0	1
2067/68	12406.756	1	12406.756	4
2068/69	11253.372	2	22506.744	
Total	Y =107618.715	X=(3)	XY=(110086.82)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Value of total Break Even Point

a = total Break Even Point

b = rate of changes of total Break Even Point

x = Year

For the calculation of 150 knot BEP of PCI can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\phi XY = Xa + bX^2 \dots\dots\dots (ii)$$

$$107618.715 = 6a + b(-3) \dots\dots\dots (i)$$

$$-110086.82 = a(-3) + b(19) \dots\dots\dots (ii)$$

By solving the above equation

We get,

$$a = 16328.53 \quad b = (3215.86)$$

We know,

$$Y = a + bx$$

$$Y = 16328.53 + (3215.86) \times 3$$

$$= 6680.95(000)$$

**Calculation of the trend of 100kont BEP of PCI (in Rs)**

Years	Total BEP (Y)(Rs.000}	X-2064/65	XY	X2
2064/65	29228.13	(3)	(87684.39)	9
2065/65	27363.36	(2)	(54726.72)	4
2065/66	22365.09	(1)	(22365.09)	1
2066/67	4641.410	0	0	0
2067/68	13404.706	1	13404.706	1
2068/69	10624.754	2	21249.508	4
Total	Y =107627.45	X=(3)	XY=(130121.986)	X2=19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx$$

Where,

Y = Values of total Break Even Point

a = total Break Even Point

b = rate of changes of total Break Even Point

x = Year

For the calculation of 100 knot BEP can be obtained by solving the following two equations.

$$Y = a + bx \dots\dots\dots (i)$$

$$107627.45 = a + b(-3) \dots\dots\dots (ii)$$

$$107627.45 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-130121.986 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 15757.67 \qquad b = (4360.47)$$

We know,

$$Y = a + bx$$

$$Y = 15757.67 + (4360.47) \times 3$$

$$= 2676.26$$

**Calculation of the trend of 60kont BEP of PCI (in Rs)**

Years	Total BEP (Y)(Rs)	X-2064\65	XY	X <sup>2</sup>
2064/65	46837366	(3)	(140512.10)	9
2065/65	58874138	(2)	(117748.76)	4
2065/66	64895199	(1)	(64895.199)	1
2066/67	4436488	0	0	0
2067/68	42541200	1	42541.200	1
2068/69	32590.192	2	65180.38	4
Total	Y =290102.977	X=(3)	XY=(215434.479)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= values of total Break Even Point

a = total Break Even Point

b = rate of change of total Break Even Point.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bX \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$290102.977 = 6a + b (-3) \dots\dots\dots (i)$$

$$\underline{-215434.479 = a (-3) + b 19 \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 46339.55 \quad b = (4021.88)$$

We know,

$$Y = a + bx$$

$$Y = 46339.55 + (4021.88) \times 3$$

$$= 34273.91$$

### **APPENDIX -VIII**

#### **Calculation of the trend of Cash BEP of PCI (in Rs)**

Years	Total BEP (Y)(Rs)	X-2064/65	XY	X <sup>2</sup>
2064/65	465713827	(3)	(1397141481)	4
2065/65	495417765	(2)	(990835530)	1
2065/66	1033455608	(1)	(1033455608)	0
2066/67	642685450	0	0	1
2067/68	61723580	1	61723580	4
2068/69	448500054	2	897000108	
Total	Y =314796284	X=(-3)	XY=(2462708931)	X <sup>2</sup> =19

Calculation of value of a and b

We know,

The straight line trend is give by the following formula.

$$Y = a + bx \dots\dots\dots (i)$$

Where,

Y= value of total Break Even Point

a = total Break Even Point

b = rate of change of total Break Even Point.

x = year.

For the calculation of a (constant) and b (variable) can be obtained by solving the following two equations.

$$Y = a + bx \dots\dots\dots (i)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots (ii)$$

$$314796284 = 6a + b(-3) \dots\dots\dots (i)$$

$$\underline{-2462708931 = a(-3) + b(19) \dots\dots\dots (ii)}$$

By solving the above equation

We get,

$$a = 499183834 \quad b = (50797759)$$

We know,

$$Y = a + bx$$

$$Y = 499183834 + (50797759) \times 3$$

$$= 346790556$$

### **APPENDEIX-IX**

#### **Calculation of overall BEP sales of PCI**

For the fiscal year 2066/67

S. N	Products	Sales	Sales Mix	VC of each product	CM of each product	CM ratio	Weighted CM ratio (CM ratio x sales Max)
1	150kont	83209952	0.37	61736416	21473536	0.25	0.0925
2	100kont	111798975	0.49	65961395	45837580	0.40	0.196
3	60kont	32237786	0.14	13623094	18614692	0.55	0.077
	Total	227246713	-				0.3655

### **APPENDEIX-X**

### Name of Respondents

Serial Number	Company Name	Name of Respondent	Designation of Respondent
1	PCI	Mr Deepak K. Bhattra	Managing Director
2	PCI	Mr S B Shaha	Sr. Manager(export)
3	PCI	Mr Deep SHahi	Sr. Manager(Import)
4	PCI	Mr. Meen K. Lxitel	Dyeing Officer
5	PCI	Mr Madhav Nexpane	Data Entry Officer
6	PCI	Mr Rajx Chalise	MR. Officer
7	PCI	Mr Rameshwor Sxbedi	Production Officer
8	PCI	Mr Karna Bdr. Poxdel	Account Officer
9	PCI	Miss Anjx Shrestha	Ass. Data Entry
10	PCI	Mr. Pradeep Nepal	Ass. Export
11	PCI	Mr.Ishwor Rimal	Store In charge
12	PCI	Mr Bal Kirshna Poxdel	Ass. Production
13	PCI	Mr. Xpendra Mandal	Supervisor Washing
14	PCI	Mr Mxnna Singh	Supervisor Stretching & Bending
15	PCI	Mr. Mohamad Mxslim	Supervisor Cutting

### APPENDEX-XI

### Name of Top 10 Carpet Industries in Nepal

Serial Number	Name of Carpet Industry	Export 2009(sqm)
1	Paramount Carpet Industry	48045
2	Sherpa Carpet Industry	42025
3	Simon Carpet Industry	37388
4	Himalayan Art Industry	25227
5	TT Carpet Industry	26328
6	Pioneer Carpet Industry	24324
7	Exotic oriental Crafts Industry	24234
8	Gama Rug Industry	22340
9	Pair Carpet Industry	19249
10	Himeji Rug Hose	19327

Source; Carpet Magazine from the land of Himalayan No-12 January 2010