COST-VOLUME-PROFIT ANALYSIS AS A TOOL TO MEASURE THE EFFECTIVENESS OF PROFIT PLANNING AND CONTROL

(A Case Study of Gorakhkali Rubber Industry Limited)

A Thesis
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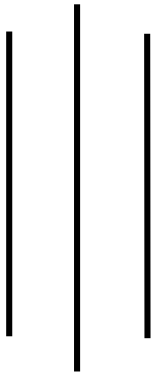

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Abbreviation

ADB	Asian Development Bank
BEP	Breakeven Point
BES	Breakeven Sales
CNCCC	China National Chemical Construction Corporation
CPPC	Comprehensive Profit Planning and Control
CVP	Cost-Volume-Profit
DNPL	Dabar Nepal Pvt. Ltd.
DOL	Degree of Operating Leverage
EBIT	Earning Before Interest and Tax
FC	Fixed Cost
FY	Fiscal Year
GDP	Gross Domestic Product
GP	Gross Profit
GRIL	Gorakhkali Rubber Industry Limited
HDL	Himalayan Distillery Ltd.
MOS	Margin of Safety
NEA	Nepal Electricity Authority
NFC	Nepal Food Corporation
NOP	Net Operating Profit
OP	Operating Profit
PPC	Profit Planning and Control
PV	Profit Volume
SPPU	Selling Price Per Unit
SR	Sales Revenue
USA	United state of America
VC	Variable Cost
VCPU	Variable Cost Per Unit
WTO	World Trade Organization
ZBB	Zero Based Budgeting

CHAPTER I
INTRODUCTION

1.1 Nepal at a Glance

Nepal, the steepest country is the world, descends from the height of Everest to the tiger prowling jungles below. Between the valleys rich in more than 2500 years of culture where Hinduism and Buddhism have met and created undreamed of glories of spiritualism through stone, brick and metal for the eye to behold and for the soul to experience. The most beautiful Himalayan kingdom countries discover the world of mountain, river, jungle and culture in the world of Nepal. (Visit Nepal 1998: p.1)

Nepal is a small developing country situated in South East Asia. It covers the total area of 1,47,181 sq. km, which is 0.03% of the world and 0.3% of the Asia. It is situated in the lap of Himalayan in between the latitude of 26°22’ to 30°27’ North and longitude 80°4’ to 88°12’eat and elevation ranges from 90 to 8848 meters. The average length being 885 km east to west and average breadth is about 193 km north to south. It is a small land locked country, surrounded by two big economic giant China and India. It has a rapid population growth rate 1.4% p.a. compared to the least developed countries. Geographically Nepal is divided into three regions, in which the Himalayan region covers 15% (22077.15 sq. km) where the highest peak of the world, the Mt. Everest, stands. The Hilly region covers 68% (100083.08 sq. km.). It is captured by mountains, high peaks, hills, valleys and lakes. And the Terai region covers 17% (25020.77 sq. km) of total area of the country. It is the gigantic plane of alluvial soil and consists of dense forest area, national wildlife reserves and conversation areas. Nearly 25% of total population still lies below absolute poverty line. It has only $1120 per capita income. Though most of the people are depended on agriculture for their livelihood, foreign remittance and some industries also play significant role in national economy.

1.2 Industrial Growth and Development in Nepal

Industrialization is an important factor for achieving the basic objective of a country's economic and social progress. Industrialization not only provides goods and services but also creates employment opportunities. It facilitates an effective mobilization of resources of capital and skill, which might otherwise remain unutilized. Industrialization plays a

crucial role in achieving high rate of economic growth in developing countries. Economic development of a country is contingent to the industrialization, which is conventionally measured by increment in the share of industry and a rise in per capita income. Industrial development a phenomenon more than what has been traditionally defined is a function of interaction among the set of parameters comprising resources, human capital and natural technology and management dynamism. In the history of industrialization, especially after the Second World War a very few developing countries in Asia witnessed especially newly industrialized economies. Nepal, a developing region in Asia, where development efforts have been thwarted by amazingly increasing population growth rate, acute disguised unemployment and object poverty, unstable politics and other many factors that have halted the aspirations of better future of this region.

The growth and development of industries in Nepal can be traced to some thirteen or fourteen hundred years ago, when, "Lichhavi Kings" ruled in Nepal. At that period, especially cottage and small industries were established and operated. Nepal was rich in the skill of making handicraft goods, wooden carved goods, statue and arts. From the very beginning of the nineteenth century, Nepal used to import some superior varieties of goods and these kinds of imports generally lost the effects of ancient crafts and small industries.

In 1935 a development agency named "Udyog Parishad" (Development Board) was constituted for accelerating the industrial and commercial activities in the country. In 1936, "Gharelu Ilam Parchar Adda" was established. In 1936 Nepal company act was enacted. This act was formulated with the aim of establishment of industries by the domestic and foreign private investors. In the same year, "Biratnagar Jute Mill" was lunched as joint venture of India and Nepal with an authorize capital as Rs. 1.6 million and paid up capital as Rs. 0.8 million and was the first modern industry of Nepal. However, the real attention was given to the industrial development of the country only after the dawn of democracy; particularly after the introduction of first five years plan in gear 1956 A.D. The government then decided to speed up, support and regular industrial development in the country. Then different acts and policies were enacted to encourage the industries to come up and to regulate the industrial system. Due to all these efforts on the part of the government, same progress was observed in the number of activities in them. We now have an emerging industrial sector in the country and the management

challenges are growing. Manufacturing industries like Gorakhkali Rubber Industry Limited can contribute much more for the industrialization.

1.3 Overview of Gorakhkali Rubber Industry Limited

Being a landlocked country surface transportation is vital importance to Nepal. As road network is gradually increasing, demand for spare parts of vehicles as well as demand of tyres and tubes is gradually increasing day by day. That is why, to fulfill the requirement of tyres and tubes of different vehicles, Gorakhkali Rubber Industry was incorporated in Jestha 30, 2041 (June 1984) under the Company Act 2021 with an objectives of manufacturing tyres and tubes of various types of vehicles like trucks, buses, cars, jeeps and others and market them. Company was incorporated as a joint sector company. Nepal Oil Corporation, National Trading Limited, NIDC, Salt Trading Corporation are the main promoters and is managed by Salt Trading Corporation. ADB also holds share of the company as a foreign investor.

The factory is situated at picturesque confluence of Marsyangdi and Daraundi River of Majuwa Khairani of Gorkah district. The industry is the first large scale unit established in Nepal in the interior and rugged mountain region of the country.

The foundation stone of the factory was laid on Poush 25, 2043 B.S. The first factory complex is spread over in an area of 30 hector of flat land. The technical knowhow and design for the factory was provided by the equipment supplier, M/s China National Chemical Construction Corporation, China. CNCCC was also responsible for installation and commissioning of the plant. The machines and equipment were imported from China under differed payment agreement which denominated in US dollars. Subsequent to devaluation, this loan has been converted to Nepali rupees and it is provided by consortium of local banks and financial institution.

The industry commenced trial production from Chaitra 2048 B.S. and commercial production from Shravan 2049 B.S. It was formally inaugurated by Late His Majesty King Birendra Bir Bikram Shahadev on Marg 25, 2049 B.S. The factory's installed capacity is 88000 sets of tyres. But industry is not operating in its total production capacity because of different problems like lack of electricity supply, water supply, strike, not availability of raw material in the home country, and financial burden. It imports

necessary raw material mainly from India and also from Australia, USA, Germany, Malaysia, and Korea. The industry's market is India, Sri Lanka, Bangladesh and own nation Nepal.

The products of the industry are of very high quality and exportable. The industry is fully devoted to expand its present market share within the country and in the south Asia as will. For this, it has already made the agreement with Modi Group of India for management, marketing and technical support. Every organization has its own strengths and weaknesses. In the same way GRIL has its own strengths and weaknesses which are as follows:

Strengths of GRIL:

- National products.
- High potential market.
- Agreement with foreign company.
- Experienced marketing team.
- Highly professional group of management

Weaknesses of GRIL:

- Underutilization of capacity.
- All raw material dependency to outside countries.
- Distribution and managerial problems to run in full capacity.

1.3.1 Objectives of Gorakhkali Rubber Industry Limited

The main objective of the industry is producing automobile's tyres, tubes of high quality. The industry being only one tyre producing industry in the country has focused the goal of import substitution for tyres and tubes.

1.3.2 Organizational Structure

The organizational structure of the industry is shown in Appendix I

1.3.3 Problems facing by Gorakhkali Rubber Industry Limited

GRIL is facing the following problems:

- National disturbance due to political conflict,
- Strikes,

- Increasing competitors,
- Lack of electricity supply,
- Lack of water supply,
- Not availability of raw material in the home country,
- Financial burden,
- Price problems due to underutilization of production capacity.

1.4 Statement of the Problem

The industrialization process in Nepal is being developed very slowly. In spite of various attractive policies of the government in respect of industrialization, new investment made on industrial sector is not satisfactory. The financial performance of established manufacturing industries is also not good. Most of the industries are operating in losses and such condition of the established industries discourages the new investment both in manufacturing and non-manufacturing sector. There may be various and different reasons for the poor performance of manufacturing industries. Such reasons should be investigated and should be taken corrective measures for the improvement of their performance.

Gorakhkali Rubber Industry is only one rubber industry in the country producing rubber tryes and it is enjoying the monopoly power in the country. A huge amount of money is invested for this industry and investors are Nepalese public enterprises, Nepalese private sectors, general public and ADB as a foreign investor.

The GRIL is one of the biggest industries in the country with installed capacity of 88000 sets of tyres. Being a large scale industry large amount is invested from various sectors; therefore, the successful operation of the industry is very much important. The success of industry will not only attract the foreign investment in the country but also increases the private sector within the country. But the financial performance of the industry is not satisfactory and it is bearing a heavy loss every year since the time of its operation and accumulated the loss of NRS 787,286,146 to the date.

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

making. The key motive of the every business enterprises is to make and maximize profit. Profit just doesn't happen by chance, it is to be managed. Cost-Volume-Profit analysis is supplementary tool of planning for profit. CVP analysis is immensely helpful for developing alternative strategies in sales planning and cost estimation.

If the business enterprise suffering from continuous loss then the profit plan of the business should be reviewed. This study is basically designed to solve the following problems by taking into account the budget's role in planning the profit.

- Does the company practice the appropriate budgeting system?
- Is the company practicing CVP analysis for its profit planning?
- Are there any difficulties facing by the industry in the application of CVP analysis?

1.5 Objectives of the Study

The main objective of this study will be to examine "Cost-Volume-Profit analysis as a tool to measure the effectiveness of PPC of Gorakhkali Rubber Industry Limited." To achieve this objective, the following sub objectives have been set;

- To study the relationship of cost, volume and profit as an applicable tool of budgeting.
- To study the trend of sales of GRIL
- To study the cost classification practice of the company.
- To study the profitability analysis and financial performance of GRIL.
- To study the sensitivity analysis of GRIL.
- To study the risk and return relationship of the company with the help of operating leverage technique.
- To provide relevant suggestions, recommendations and practical ideas for improving the condition of GRIL.

1.6 Significance of the Study

The main objective of profit plan is to forecast about the future events to overcome the risk from uncertainties. The research study will be mainly concerned with the CVP analysis as a tool to measure the effectiveness of profit planning and control of GRIL and will try to fill out the gap of the managerial disability towards the CVP analysis or in other words this research work will really research the elements and the factors affecting the cost volume profit those the managerial level has not studied yet. This study will be significant in the sense that it has treated to study the CVP analysis of the manufacturing company which is one of the most important tools of PPC. This study will be further significant because it highlights the relationship of CVP as an applicable toll of budgeting and it also highlights the sensitivity of cost-volume-profit variables. The study would be very useful for entrepreneurs, decision makers, researchers and the managers because it will deal with the practice of CVP analysis of manufacturing industry as a very important tool of PPC.

1.7 Limitations of the study

This study will cover the CVP analysis as a tool to measure the effectiveness of profit planning and control of GRIL. The limitations of thesis study are:

- The study covers the data of five year only i.e. from FY 2063/064 to FY 2067/068 because of not conducting annual general meeting, the company is unable to provide latest data.
- Analysis is concentrated in some managerial, financial and accounting aspects and it doesn't cover the other areas of the enterprise.
- The comprehensibility and the accuracy of the study is based on the data availed from the management of GRIL.
- The study is mainly based on secondary data.
- Being a researcher as a student and due to limited time and resource constraints the study is neither comprehensive nor extensive.

1.8 Research Methodology

The research methodology is the process of arriving to the solution of the problem through the planned and systematic dealing with collection, analysis and figure. To achieve the objectives of the study the following methodology has been employed which includes the research design.

Nature and sources of data based upon primary and secondary resources. Primary data are collected from the employees of GRIL using questionnaire consisting of both closed and open ended questions through direct interview. And secondary sources of data are:

- Financial statement of GRIL
- Previous studies made in the field
- Published and unpublished articles
- Newspapers, magazines, and related websites
- Other relevant data available in the subject area.

Available datas are analyzed and presented with the help of various statistical tools and techniques like bar diagram, pie-chart, trend analysis, correlation, variance, sensitivity analysis, BEP analysis etc.

1.9 Organization of the study

The entire study has been organized into five main chapters:

Chapter-I: Introduction

The first chapter consists of brief view of Nepal, role of industrialization, industrial development in Nepal, a brief review of GRIL, statement of the problem, objective of the study, limitation of the study, significance of the study, and design of the study.

Chapter-II: Review of literature

The second chapter deals with conceptual frame work including the fundamental concept of PPC and the cools of PPC. It will also deals with the various theoretical aspects of the CVP analysis and include the brief review of previous research work.

Chapter-III: Research Methodology

The third chapter deals with the research methodology followed to achieve the purposes of the study have been described. It will consist of the research design, the period covered, used, research variables etc.

Chapter-IV: Data Presentation and Analysis

The fourth chapter deals with the data collected through the various sources have been presented. It is mainly consists the analysis of sales plan, variable cost plan, fixed cost plan and other relevant factors are analyzed from the profit and loss account, balance sheet, and cash flow statement of the company. Apart from this, sensitivity analysis and risk measurement are also analyzed and the findings is summarized.

Chapter -V: Summary, conclusion and Recommendation

This last chapter covers summary, conclusions, and recommendations of the study. This ends the study paper.

The bibliography, appendix, and glossary have been included at the end of the study paper.

CHAPTER – II
CONCEPTUAL FRAMEWORK
AND REVIEW OF LITERATURE

2.1 Introduction of Literature of Review

Review of literature is a compilation of theoretical review and the review of the thesis/dissertation carried out in the similar field. Literature here means the related printing materials about the subject matter of the research work. It may be in various forms like book, booklet, thesis reports etc. Review of literature is vital while doing research work as it gives the finding of the previous study. It can be used as a secondary data, and it gives the valuable information about the subject. This chapter aims to gives a conceptual framework and makes a review of the relevant studies that have already been done in this research topic so that some new contributions could be given to the established body of knowledge

The chapter reviews the available literature relating to Gorakhkali Rubber Industry Ltd. and view expressed by various scholars, writers and researchers on the Cost Volume and Profit Analysis and Profit Planning and Control. So far as analysis of Cost Volume Profit is concerned, some studies have been undertaken by the management experts and students describing the Cost Volume Profit Analysis as a tool to measure the effectiveness of Profit Planning and Control. This chapter has been divided into three main sections. They are as follows:

- Conceptual framework.
- Review of articles/journals/thesis
- Research gap.

2.2 Review of Conceptual Framework:

2.2.1 Profit:

Profit means the excess of total revenue over the total cost of production. Generally profit is known as the part of income of the firms. Profit is the primary measure of business in any economy. We can simply define the word ‘profit’ as the primary measurement of success of management effectiveness in business enterprise. Profit usually occurs according to how it is managed. If profit is managed well it will occur positively but if it isn’t managed properly the profit will occur negatively. So, positive profit is virtually said to be profit and it plays an

important role where as negative profit is said to loss. In any business activities, there is no value of must make plans and programs in order to gain profit in their business enterprises.

Profit is the primary objective of the business. The word profit implies a comparison of the operation of the business between two specific dates, which is usually separate by an interval of one year. No company can survive long time without profit. Profit is ultimate measure of its effectiveness, and in a capitalist society, there is no future of private enterprise which always incurs loosed. Profit is a signal for the collection of resources and yardsticks for judging managerial efficiency. (Kulkarni, 1992:p100)

According to economic perception; some economist says that profit is the rent of ability. Some says profit as reward for risk bearing of firm. It is also said that profit is return to uncertainty bearing and it is also reward for innovation. Innovations are those new products of process which increases national income more than they increase national cost.(Reeki, 1988:p380-381)

“Profit is the reward for unsecured risks and the earning of management.”(Lynch & Williamson: 2000 A.D.)

Simply, profit is the excess of income over cost of production. Profit is obtained by subtracting the cost from revenue.

Profit=Total revenue – Total cost.

There are two types of profit.

a. Gross Profit

b. Net Profit

a. Gross Profit:- Generally, profit is denoted by gross profit. Gross profit is that profit which comes by subtracting all the explicit expenditure from total revenue. Gross includes all the implicit cost, i.e. implicit wages, rent interest on capital and loans, depreciation fund, windfall gain, monopoly gain etc. so, gross profit is calculated as follows.

Gross profit = Total revenue – Explicit cost.

b. Net Profit:- Net profit is the actual profit and it comes after deducting all the implicit cost from gross profit so that net profit is defined mathematically as follows.

Net Profit = Total Revenue – (Total explicit costs + Total Implicit costs).
Or, Net Profit = Gross Profit –Total Implicit Cost.

Profit are not just happen but are managed. If a firm fails to make profit, it can't achieve capital for very long period. So, it is the acid test of a business. "Profit is a signal for the allocation of resources and yard stick for judging managerial efficiency." (ISC and CCC: 1998 A.D.) Profit measure the business enterprises performance. New ideas plans and strategies arouse along with profit. Profit makes profit whereas loss makes ruin. The best examples making loss are Nepali public enterprises which are going to be dissolved one by one from government sector day by day.

Thus, it is quite obvious that the profit is obtained by subtracting the cost from the revenues and it also the reward for taking risks. Profit plays a veal role, not only in managerial decisions but also in the general life standard of human beings. Therefore, management should continuously evaluate efficiency of its company in terms of profit.

2.2.2 Planning:

Planning is the future oriented activity, which is the first essence of management, also all other functions are performed within the framework of planning. It is the sole concept of any business organization. Without the proper and efficient planning, no firm can accomplish its predetermined goals and objectives. Hence, it is the life blood of any organization, which makes them efficiency run towards competent environment.

Planning, forecasting and budgeting are often the most focused things in the mind of an entrepreneur struggling to keep his company going. Planning is the cornerstone of effective management, and a vital part of good planning is budgeting. Planning is the first essence of management and all other functions are performed within the framework of planning. Planning means deciding in advance what is to be done in future. Planning starts with forecasting and predetermination of further events.

Planning is the basic foundation of profit and control. We should be cleared about the concept of planning. According to “Oxford Dictionary”, planning means,

- (To do something) arrangement for doing or using something, considered or workout in advanced.
- Way of arrangement something especially when shown on a drawing scheme.

The planning means thinking and deciding in advance what is to be done in future. It is a method of thinking out acts and purposes before and planning starts with forecasts and complete with determination of future events. It is the first essence of management and all other function performed within framework of planning. Planning is the process of developing enterprise objectives and selecting future course of action to accomplish them. It includes:

a. Establishing enterprise’s objectives.
b. Developing premises about the environment in which they are to be accomplished.
c. Selecting a course of action for accomplishing the objectives.
d. Initiating activities necessary to translate plans into action.
e. Current re-planning to correct deficiencies. (Welsch, Hilton and Gordon: 1999:p3)

Planning begins with the setting of general goals, proceeds to the cost volume profit analysis of various alternatives and ends with the preparation of a detailed quantitative plan of action the budget. (Lynch: 1989) the budget in turn provides a motive and guide to action for all responsible managers in all segments of the firm.

“Planning is the feed forward process to reduce uncertainty about future. The planning process is based on the conviction that management can play its objectives and condition that state of the enterprise that determines its destiny.” (I.M. Pandey: 1987).

Planning is done for a specific period i.e. planning covers a period. As per the period covered by planning it is divided into two types. They are as follows:

a. **Long Range or Strategic Planning**

Strategic planning is a top management function in which organization’s purpose, mission and overall objectives and policies are developed to position the organization advantageously in its operating environment. The strategic plans are also known as “Grand Plans”. They have

a strong external orientation and cover the total organization. A long range planning is closely concerned with the concept of the corporation as long living institution.

Long term planning is used to determine the overall direction of organization. Successful enterprises have always done some long range planning. It is more important for broad and long living enterprises.

Long term planning covers 5-10 years varying with the objectives and types of the organization. It is one of the most difficult time span involved in planning as many problems in short-range planning can be traced to the absence of a clear sense of direction and the practices which a comprehensive long range plan provides. (Chorafas: 1990)

b. **Short-range or Tactical Planning**

Short range or tactical planning covers plan for any activity that will not be more that one year. It may be monthly, quarterly, and semi-annually. It contains less qualitative plans than long term or strategic plan. This planning should be done at all levels and full participation of decision maker as well as implementer should be made. Short range or tactical planning follows the purpose, mission, goals and objectives laid by strategic plan.

Short range plans have shorter time frames and narrower scopes than strategic plans. Short term planning provides the specific ideas for implementing the strategic plan. It is the process of making detailed decisions about what to do, whom to do it, and how to do it. Tactical plans translate broad strategic goals and plans into specific goals and plans. Each strategic plan is generally implemented through several tactical plans. Because of the practical needed for conforming plans to accounting periods and somewhat arbitrary limitation of the long range to three of five years is usually based as has been indicated on the prevailing belief that the degree of uncertainty over long period makes planning of questionable value.

Tactical short range plans cover about a year and are less formal and detailed than long range plans. It usually covers more than three months. It is done at all levels and involves directing the organization activities, overall strategic objectives consisting with the organization's mission and policies. Single plans are developed for unique situation so it provides consistency and efficiency for on going operations.

Thus, planning process both short and long term is the most crucial component of the whole system. It is both the foundation and the bond for the other elements because it is through the planning process that we determine what we are going to do, how are going to do, who is going to do it. It operates as the brain center of an organization and like the brain, it both reasons and communicates.

2.2.3 Control

Once the planning is determined, it must be carried out under control. Controlling shares management activity and for this, managers compare actual performance against the planned performance and find out the deviations taking remedial steps to remove the deviations. Immediate action should be taken to remove the deviations to make an improvement in the performance because promptness is the essence of an effective control. Controlling is the measurement and correction of performance in order to make sure that enterprises objectives and the plans devised to attain them are accomplished.(Koontz & Heinz:1999, p45)

Controlling means evaluating the firm's activities against the plan and deciding what should be done if the plan is being followed.(Lynch & Williamson:1995,p18)

"A control process designed to help monitor the periodic activities of business and of each responsibility center has the following phases:

- Compare actual performance for the period with the planned goals and standards.
- Prepare a performance report that shows actual results, planned results and any differences between the two (i.e. Variation above or below planned results)
- Analyze the variations and the related operations to determine the underlying causes of the variations.
- Develop alternative course of action to correct any deficiencies and learn from the successes.
- Make a choice (corrective action) from the set of alternatives and implements it.
- Follow up to appraise the effectiveness of the correction. Follow with feed forward for re-planning."(Welsch:1999)

Thus, control must necessarily rest upon the concept of feedback, which requires performances measurements and triggers corrective action designed to ensure attainment of the objectives. When plans become operational control must be exercised to measure

progress. In some cases, control also results in the revisions of prior plans and goals or in the formulation of new plans changes in operations and reassignment of people. Control approach must be tailored to the characteristics of the operation and the organization structure.

2.2.4 Profit Planning

Profit planning is a systematic approach for achieving effective management performance. Profit is a primary measure of every business success and any business enterprises therefore need to increase the chances of making profit. Hence the primary purpose of profit planning is to increase the chances of making profit in the enterprises.

Profit planning in fact is a managerial technique and a business budget is such a written plan, in which all aspects of business operation with respect to a definite future period are included. Profit planning of budgeting is forward planning and involves the preparation in advance of the quantitative as well as financial statements to indicate the intention of the management in respect of the various aspects of the business. 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 tool, which may be used by the management in planning the future course of actions and controlling the actual performance. (S.P. Gupta: 1991)

Profit planning is, therefore a fundamental part of the overall management functions and is a vital part of the total budgeting process. The management determines the profit goals and prepares budgets that will lead them to the realization of these goals. Profit planning can be done only when the management has the information about the cost of the products both fixed and variables, and the selling price at which it will be in a position to sell the products of the company.(Maheshwari, 2000:p.171)

2.2.5 Profit Planning and Control

Profit Planning and Control can be defined as process/technique of management that enhances the efficiency of management through planning revenue and expenses. It is also known as comprehensive budgeting, managerial budgeting and simply budgeting as well. It is

also an essential concept of accounting in the literature of business. The Profit Planning and Control system can be described as a historical combination of goal setting machine for increasing an enterprises profit, and goal achieving machine by coordinating, planning and controlling business activities.

Profit planning and control is an important tool of management for assuring profit in the organization. It is more relevant for profit-oriented enterprises. Though, it is essentials to an organization, it is not an end of management or substitute of management. If facilitates the managers to accomplish managerial goals in a systematic way. It is a set of steps that are taken by firms to achieve the desired level of profit.

Profit is the ultimate goal of every business house. They involve in business for making profit. Profit cannot be achieved sassily. It should be managed well with better managerial skills. So profit is the planned and controlled output of management. By element, profit is the difference of revenue and cost. Profit plan, thus refers to the planning of revenue (i.e. increase the revenues), and planning of cost (i.e. increase the efficiency of cost.)

The management is efficient if it is able to accomplish the objective of the enterprise. It is effective, when it accomplishes the objectives with minimum effort and cost. In order to attain long-range efficiency and effectiveness, management must chart out its course of action in advance. It should forecast its sales and allocate resource in various costs heads. A systematic approach that facilitates effective management performance is profit planning and control, or budgeting. Budgeting is therefore an integral part of management. In a way, a budgetary control system has been described as a historical combination of a goal-setting machine for increasing an enterprises profit, and "goal-achieving, machine for facilitating organizational co-ordination and planning while achieving the budgeted targets."(Ojha & Gautam, 2011:p.1)

Profit Planning and Control involves:

a. Development and application of broad and long range objectives for the enterprises,
b. Specification of goals,
c. Development of a strategic long range profit plan in broad terms.
d. Specification of a tactical short range profit plan detailed by assigned responsibilities (division, department, and project),

e. Developing of a system of periodic performance report detailed by assigned responsibilities,
f. Control system, and follow-up procedures. (Ojha & Gautam:2011.p2)

Profit planning and control is a new term in the literature of business. Though it is a new term it is not a new concept in the management. It is also known as comprehensive budgeting. It can be defined as a management planning covering all phase of profit operation for a definite future period. “A profit planning is a formal expression of policy, plan, objectives and goals established by management of the concern as a whole and for each sub-division. (Dongol R.M.: 2056 B.S.)

“Comprehensive profit planning and control is a systematic and formalized approach for accomplishing the planning, co-ordination and control responsibilities of management.” (Glenn A. Welsch)
“A profit plan or budget is the formal expression of the enterprise’s plans and objectives stated in financial terms for a specified future period of time.” (I. M. Pandey, 1994:p287)

“A budget is a comprehensive and coordinated plan, expressed in financial terms for the operations and resources of enterprises for some specific period in the future.” (Fregman, 1973:p144)

Hence, profit planning and control represents an overall plan of operation, providing guidelines to management and acting as signal light for the management. It enables the management to correct its policy. Profit planning and control covers a definite period of time and formulates the planning decisions of management.

2.2.6 Origin of Profit Planning and Control

Towards the end of 1921 national budget for the FY 1922/23 was prepared in USA. With the introduction of national budget in USA businessman started realizing the importance of the budgeting. National budget covers or implies on the following:

a. Forecast the probable future expenditure.
b. Analysis of the sources from which income is to be realized to meet the expenses and
c. Maintaining co-ordination between expenditure and source of income.

During that time USA businessman were also suffering from the problem of coordination between expenses for material, rent and labor etc. and receipt from sales, so they started thinking about adaptation of budget. Slowly and gradually they started adopting the budget. This can be considered as origin of profit planning and control.

The first book ever written in business budget was published in UK in 1932. The name of the book was, “Business budget and budgetary control” and the writer was A.W. Willsmore. This book is a collection of six articles written by him, which are published in “The Times” engineering supplement published between 5/12/1931 to 6/12/1932 but this philosophy could not get popularity in UK before 1936.

Interest of British business was aroused by Mr. R. Dankely who presented interesting reviews on several industries of USA which has introduced and adopted budgeting at the sixth international engineers for scientific management held in London in 1935. But actual popularity by PPC was gained after Marshall Plan.

2.2.7 Components of Profit Planning and Control:

Component of PPC are bones of an enterprise which helps it operate properly, efficiently and effectively. The components of PPC are thus: (Welsch,1979:p74)

A. The substantive plan:
   - Broad objectives of the enterprise
   - Specified enterprise goals
   - Enterprise strategies
   - Executive management planning instruction

B. The financial plan:
   1. Strategic long-range profit plan:
      - Sales, cost, and profit projections
      - Major projects and capital additions
      - Cash flow and financing
      - Personnel requirements
   2. Tactical short-range (annual) profit plan:
      a) Operating Plan (Planned income statement)
         - Sales plan

- Production (or merchandise purchases) plan
- Administrative expense budget
- Distribution expenses budget
- Appropriation-type budget (e.g. research and development, promotion, advertising)

b) Financial Position Plan (Planned Balance Sheet)

- Assets
- Liabilities
- Owner's equity

c) Cash flow plan

C. Variable Expenses Budgets: (output expense formula)

D. Supplementary Data: (CVP, Ratio Analysis)

E. Performance Reports: (including any special reports)

F. Follow-up, Corrective Action, and Re-planning Reports.

In the current competitive business environment, profit planning becomes an integral part for operation management and planning in large business organizations. Profit planning is playing an important role in business organizations to make their dreams true.

2.2.8 The basic Elements of Profit Planning and Control:

Management Planning and control program provides the comprehensive framework within which planning and controlling process is carried out. Such system encompasses all aspects of an organization's operations, and thus is seen as a total system. These are the basic elements of profit planning and control :(Welsch, 1979:p73-75)

1. **Comprehensive and coordinated plans:-** Budget is a comprehensive and coordinated plan. The profit planning considers alls activities and operations of an organization. The budget prepared by the different department inside the organization has to be compiled or coordinated and it is guided by profit planning. So, before preparing the profit planning, firstly all the departmental budgets have to be compiled and that budget is known as comprehensive budget for profit planning.
2. **Expressed in financial terms:-** It should be expressed in financial terms. All activities covered by budget are related with funds. So the budget has to be expressed

monetary units i.e. in Rupees, Dollars, Pounds or Euro etc. It stands as basis for comparison of budget and actual.

3. **Plan for operational resources and expenses:-** It is a plan for the firm's operating and resources of budget in mechanization to plan for the firm's all operations or activities. The two aspects of every operation are revenue and expenses. The budget must plan for quantity of revenue and expenses related to specific operation. Planning should not be done for revenue and expenses only. The plan should be made for carry out the other operation. The planning for resource will include planning for assets and sources of funds.
4. **Future plans:-** It is a future plan for specific period. Time dimension must be added to a budget. A budget is meaningful only when it is related to a specific time. The budget estimates will be relevant only for some specific period.

2.2.9 Profit Planning and Control Process

Profit planning and control process necessarily integrates the planning, leading and control functions of management. A PPC program includes more than the traditional idea of a periodic or master budget. Rather, it encompasses the application of a number of related management concepts through a variety of approaches, techniques and sequential steps. The term comprehensive means (1) the application of the broad concept of profit planning and control to all happen of operations in an enterprises and (2) the application of a total systems approach. (I.M. Pandey: 1987)

When the results of actual performance become available, they are tabulated and compared with the budget for purposes of highlighting off standard performance as a basis for instituting corrective action. (I.M. Pandey: 1987)

Hence planning involves the step of setting objectives specifying goals, formulating strategies and expressing budgets as well as appraising the performance. Welch and his friends opine planning process includes the following phases:

a. Identification and evaluation of external variables.

The variable identification phase of the PPC Process focuses on identifying and evaluation the effects of the external variables. As the management planning focuses on the best possible

manipulation of controllable and non controllable variables, these variables are considered separately. This is done to minimize the potential unfavorable impacts.

A particularly significant phase of this analysis includes the evaluation of the present strength and weakness of the enterprise. Planning must start with objectives and realistic understanding of the present status of the products, services, markets, profits and returns on investment, cash flow, availability of capital, productive capabilities, and the competence of both management and non management personnel. This aspect of planning process is usually difficult for most management because deficiencies and inefficiencies are frequently difficult to identify and evaluate objectively by those directly involved. The comprehensive PPC approach is based on the expectation that these significant aspects of operations will be critically analyzed and evaluated periodically in on orderly manner.

b. Development of the broad objectives of the enterprise.

In this phase of the PPC process, the executive management should express the mission, vision, and ethical character of the enterprise. Its purpose is to provide identity, continuity of purpose and definition. However, the statement of broad objectives normally should not specify the quantitative goals. Rather, it should be a narrative expression of the purpose, objectives and philosophical character of the business. It should be signed for wide dissemination and should be believable, which means, in the long run the company's actions must be in harmony with the statement.

c. Development of specific goals for the enterprise.

The phase provides both narrative and quantitative goals that are define and measurable. These are specific goals that relate to the enterprise as a whole and to the major responsibility center. Executive management should exercise leadership in the planning phase so that there will be a realistic and clearly articulated framework within which operations will be conduct toward common goals. This statement of specific goals should defined such operational goals as expansion or contraction of products and service lines, geographical areas, share of the market by major products and service lines, growth trends, production goals, profit goals, profit margins, return on investment, and cash flow. When the goals are specific they could after basis for performance measurement.

d. Development and evaluation of company strategy.

The purpose of developing and dissemination enterprise strategies (long term or short term) is to best alternatives for a attaining the planned broad objectives and specific goal. Strategies focus on "how", therefore they outline a plan of action for the enterprise. Executive management must be creative and directly involved in the development of new strategies and in the adaptation of currently ongoing strategies in harmony with the relevant variables with management must focus on identification of the critical area that influences the long _range success of the enterprise. Critical areas should be pinpointed through evaluation of relevant variable. Although strategy formulation is of continual concern to executive management, periodic reassessment of the strategies is essential in the light of a careful analysis of all relevant variables and their probable future impact on the enterprise.

e. Executive management planning instruction.

This is communication phase between the top management to middle and lower management levels. It explains the broad objectives, enterprise goals, strategies, and any other executive management instruction issued by the top management communicate the planning foundation that the necessary for the participation of all levels of managements in the development of the strategic and tactical profit plans for the upcoming budget year. At this point of planning process, the foundation has been established to articulate the broad and specific objectives of the enterprise and the strategies that facilitate their attainment.

f. Preparation and evaluation of project plans.

A part from tactical planning and strategic planning, the concept of profit planning and control covers a systematic and integrated approach to project planning. Project plans encompass such items as plans for improvement of present products, new and expanded physical facilities, and entrance into new industries, exit from products and industries, new technology and other major activities that can be separately identified for planning purposes.

The nature of project is such that they must be planned as separate units. In planning for a project, the time span considered must normally be the anticipated life span of the project. Project approved must then be timed into the strategic and tactical profit plans. In addition to any ongoing project, management should encourage on a continuing basis project proposal from any source within the enterprise. Consistent with this approach, during the formal

planning cycle, management must evaluate and decide upon the plan status or each project in process and select any new projects to be initiated during time dimensions covered by the upcoming strategic and tactical profit plans.

g. Development and approval of strategic and tactical profit plan.

Strategic or long range plan and the tactical or short range profit plan and usually developed at the same time. It is generally seen that the executive management develops the strategic and tactical profit plans but the backlash of this practice is that denies the full participation by middle manager in the planning process. And this can give rise to unfavorable behavioral effects.

So here we assume a participatory and the managers of each responsibility centers have received instructions of the executive management. Now the manager of each responsibility center will immediately initiate activities within there responsibility centre to develop a strategic long range profit plan and in harmony with the long range plan, a tactical short range profit plan. However a certain format and procedural instructions should be provided by a centralized source to establish the general format, amount of detail and other relevant procedural and format requirement essential for aggregation of the plans of the responsibility centers into the overall profit plans.

After the completion of the two profit plans the approval must be initiated. This process involves approval, disapproval or revision based on action by executive management or presentation and justification by the manager of the responsibility centers to the next higher level of authority.

h. Implementation of profit plan.

Once the plans are developed and approved, they need to be implemented in such a way that leads the subordinates in attaining enterprise objectives and goals. Thus effective management at all levels requires that enterprise objectives, goals, strategies, and policies be communicated and understood by subordinates, there are many facets involved in management leadership. However, a comprehensive profit planning and control program may aid substantially in performing this function. Plans, strategies, and policies developed through significant participation establish the foundation for effective communication.

i. Use of periodic performance reports.

Performance reports are those reports that show actual results, planned results and variations those two, to be analyzed to take necessary corrective measures in the future. These performance reports are prepared by the accounting department on a monthly basis however some special performance reports are prepared whenever needed.

A clear distinction must be made between external and internal financial reports. Internal reports can be further classified as (a) statistical reports that give the basic quantitative internal statistics about the operations of the enterprise, (b) special managerial reports about nonrecurring and special problems, and (c) periodic performance reports. The latter reports focus on dynamic and continuous control tailored to the assigned managerial responsibilities. These reports are primarily repetitive, short term reports developed for each of the responsibility centers, which are essential for effective control.

j. Use of flexible expense budget.

Flexible budget is completely different from the profit plan but it is used as a complimentary to the profit plan. Flexible budget gives realistic information about expenses that make it possible to compute budget amounts for various output volumes or rates of activity in each responsibility center. To do this, the flexible budget provides a formula for each expense in each responsibility center. The formula gives the relationship of each expense to output in the centre. Each formula includes a constant expense factor and a variable expense rat. To apply this concept in a department, each expense must be classified into one of the three categories: (a) Fixed expense, (b) Variable expense, and (c) Semi variable expenses. In the case of a fixed expense the variable rate is zero and in the case of a variable expense, the constant factor is zero, and in the case of semi variable expense, there is a value for both the constant factor and the variable rate.

k. Implementation of follow-up.

To determine whether things are going on as per plans, a continuous follow up action is important. Because performance reports are based on assigned responsibilities, they are the basis for effective follow up actions. It is important of distinguish between the causes and results of that. The performance variations are the results and the management must determine the underlying cause. Analysis to determine the underlying causes of both favorable and unfavorable performance variances should be given immediate priority. In the

case of unfavorable performance variances, after identifying the basic causes, as opposed to the results, an alternative for corrective action must be favorable, the underlying causes should be identified and this is helpful for improving efficiency and for developing positive reinforcement to the less successful operations and employees. This is called “transference of success”.

And finally there should be a special follow up to the prior follow up actions to determine the effectiveness of prior corrective actions to provide a basis for improving future planning can control procedures.

2.2.10 Some Argument For and Against PPC

Profit planning and control suggest a sophisticated approach to decision making, continuous commutation and integration of actual historical data, projections and managerial judgments. It can be prepared at different way such as product wise, time wise, capacity wise, etc. so its flexible application is another important function of the profit planning. It can be applied in large enterprises and small enterprises. But the usefulness of comprehensive PPC have been emphasized in the preceding discussions, however, it should not be assumed that concept is foolproof or that it is free of problems.

The following main arguments are usually given against profit planning and control.

1. It is difficult, but not impossible to estimate revenues and expenses in our company realistically.
2. Our management has no interest in all the estimates and schedules. Our strictly informal system is better and works well.
3. It is not realistic to write out and distribute our goals, policies and guidelines to all the supervisors.
4. Budgeting places too great a demand on management time, especially to revise budget constantly. Too much paper work is required.
5. It takes away management flexibility.
6. It creates all kinds of behavioral problems.
7. It places the management in a strait jacket.
8. It adds a level of complexity that is not needed.
9. It is too costly, aside from management time.
10. The managers, supervisors and other employees hate budgets.

The following are main arguments usually given for profit planning and control.

1. It forces early consideration of basic policies.
2. It requires adequate and sound organization structure, that is, there must be a definite assignment of responsibility for each function of the enterprises.
3. It compels all members of managements, from the top down, to participate in the establishment of goals and plans.
4. It compels departmental managers to make plans in harmony with the plans of other departments and of the entire enterprises.
5. It requires that management put down in figures what is necessary for satisfactory performance.
6. It requires adequate and appropriate historical accounting data.
7. It compels management to plan for the most economical use of labour, material and capital.
8. It instills at all levels of management the habit of timely, careful and adequate consideration of the relevant factors before reaching important decisions.
9. It reduces cost by increasing the span of control because less supervision is needed.
10. It pinpoints efficiency and inefficiency.

2.2.11 Major Tools Used in Profit Planning and Control

Budgeting is the one of major tolls used in PPC. Budgeting means deciding or estimating in advances, the course of action to achieve a particular target or objectives in a given period of time along with the numerical expression of the inputs required and outputs expected.

“Budgeting includes a plan that details revenues and how funds will be spent of labour, raw material, capital and so on, as well as periodic reviews of actual versus budgeted amounts. Budgeting is thus a management tools used both for planning and control. Depending on the nature of the business detailed plans may be formulated for the next few months, the next year, the next five years or even longer.” (Weston J. Fred: 1981)

A budget is effectively used for control purpose. It is a qualitative expression of a plan action prepared in advance for the period to which it relates. In the simple word, budget is a statement showing the planned income and expenditure for a future period prepared in terms of money or quantity or both.

A budget is a plan of management's intensions of attaining specified objectives. The commitment of management is key to the success in preparation and implementation of a budget. The basic elements of a budget are:

1. It is a comprehensive and coordinated plan.
2. It is expressed in financial terms.
3. It is a plan for the firm's operations and resources.
4. It is a future plan for a specified period. (I.M. Pandey: 1983)

2.2.12 Purposes of Budgeting

Simply stated, the process of preparing and using budgets to achieve management objectives is called budgeting. More specifically, a comprehensive profit planning and controlling or budgeting is a systematic and formalized approach for stating and communicating the firm's expectations and accomplishing the planning, coordination, and control responsibilities of management in such a way as to maximize the use of given resources. The major purposes of budgets or budgeting are:

1. To state the firm's expectations (goals) in clear, formal terms to avoid confusion and to facilitate their attainability.
2. To communicate expectations to all concerned with the management of the firm so that they are understood, supported and implemented.
3. To provide a detailed plan of action for reducing uncertainty and for the proper direction of individual and group efforts to achieve goals.
4. To coordinates the activities and efforts in such a way that the use of resources is maximized.
5. To provide a means of measuring and controlling the performance of individuals and units and to supply information on the basis of which the necessary corrective action can be taken.

The purpose of budgeting in the context of an annual budget is to project as accurately as possible the sales, income, expenditure and profit for the ensuring year. This is the principal objective and all other requirement of budgeting stem from it.

2.2.13 Essentials of Budgeting

A successful and sound budgeting system is based upon certain prerequisites. These prerequisites represent management attitude, organization structure and managerial

approaches necessary for the effective and efficient application of the budgeting system. The following are some of the important essentials or fundamentals of a successful budgeting:

a. **Top Management Support:-** A budgeting system will be an utter failure if it is not initiated and supported by top management. Top management must realize that budgeting is not merely an accounting device, but it is an important management tool. A company will be able to implement the budget plans proficiently and effectively if top management has a positive attitude towards budgeting and gives directions for budget implementations. The support of top management for the budgeting system implies that it is confident about its capability to plan the future course of action and run the enterprise successfully. Top management should not only have a positive attitude towards budgeting but should also devote necessary time and resources to the preparation and implementation of budgets.

b. **Clear and Realistic Goals:-** Budgeting is a means to achieve goals and objectives. All planning presupposes that objectives and goals have been clearly and unambiguously established. Budgeting will not successes, if the goals to be achieved are not clear, budget implementation will not be systematic. In the absence of goal clarity, employees will lack a proper direction; the efforts of management will be wasted. The enterprise objectives and budget and budget goals to be accomplished through budgeting should be reasonable and realistic; they should be capable of attainment. Budget goals shouldn't be set at too high or too low level.

c. **Assignment of Authority and Responsibility:-** A sound organizational structure is essential for the success of the budgeting system. Authorities and responsibilities of each manager should be clearly identified and established. A sound organizational structure and a clear cut assignment of authorities and responsibilities provide an effective means to achieve the enterprises objectives and budget goals in a coordinated and efficient manner. Usually, firms have a combination of both formal and informal organizational structures.

d. **Creation of Responsibility Centers:-** A small firm can possibly be managed by an individual or a small group of individuals. But the activities of a large firm can't be supervised by individuals or a few individuals. For effective control of all activities, a large firm is divided into meaningful segments, departments of divisions. Each sub-unit has certain activities to perform and its manager is assigned specific authority and responsibility to carry

out those activities and is held responsible for his decisions affecting those activities. The sub-units of enterprises for the purpose of control are called responsibility centre or decision centers. For planning and control purposes, responsibility centers are usually classified into three classes: cost centers, profit centers and investment centers.

e. **Adaptation of the Accounting System:-** The accounting system catering only to the needs of external users is not adequate for the purpose of profit planning and control and internal management. Budgeting is based on the data generated by the accounting system. Control of performance involves the comparisons of actual performance (results) with the planned performance. Therefore, the accounting system should be suitably adopted to facilitate the planning and control process; it should be structured around the areas of responsibility. In fact, a sound budgetary system needs the creation of a responsibility accounting system.

f. **Full Participation:-** Full participation of managers and their subordinates at all levels should be sought in developing the budgeting system. The participation should be meaningful and real. A meaningful participation creates a positive motivation. “Participation tends to increase commitment; commitment tends to heighten motivation; motivation which is job-oriented tends to make managers work harder and more productively; and harder and more productive work by managers tends to enhance the company’s prosperity; therefore, participation is good.” (Miller: 1966)

g. Effective Communication:- Communication is the process of transmitting ideas or information from one person to another. A sound budgeting system requires effective communication of enterprises objectives and budget goals and means of implementing budgets through the organization so that a unified effort may be directed to accomplish those objective and goals. Effective communication implies transmission of information as well as understanding. Information has been effectively communicated if the receiver has understood its intended implication. Budgeting is a formal way of communicating plans, objectives and budget goals to various responsibility centers.

h. **Budget Education:-** For the success of budgeting, everyone in the enterprise should have confidence in the budgeting system and should be involved and committed to it. The line executives, who actually prepare the budgets, should not only be confident of their ability to plan for the future with reasonable precision, but also should understand the technicalities of

budgeting. There should be a proper system of educating employees about various facets of budgeting to have a better involvement, commitment and participation.

i. **Flexibility:-** The budgeting system should be flexible enough to take advantage of all opportunities that arise from time to time. Inflexibility impairs the initiative and freedom of managers and subordinates in making decisions. In fact, budgeting is a device to facilitate a decentralized decision making. Once the budgets have been developed with full participation of all and have been approved, top management can delegate more authority and responsibility to lower levels of management and can exercise better control over them through budgets.

2.2.14 Types of Budgets

All enterprises make plans some in a systematic and formal way, while others in informal manner. However, they differ in their budgeting practices. Generally, the large and medium firms have a comprehensive system of budgeting, they prepare budgets for all of their important operations; but the small firms and some large and medium firms don't have a comprehensive system of budgeting, they prepare budgets for a few of their operations. We have emphasized previously that a comprehensive budgeting involves the preparation of a master budget with a complete package of the component budgets.

The three important components of the master budget are: (a) operating budgets, (b) financial budgets, and (c) appropriation budget.

1. Operating Budgets

Operating budgets relate to the planning of the activities or operations of the enterprise, such as production, sales and purchases. Operating budget is composed of two parts; a programme or activity budget, and a responsibility budget. These represent two different ways of looking at the operations of the enterprise; but arriving at the same results. Operating budget has following term:

a. Sales budget:- A sales budget is a detailed schedule of expected sales for the coming period. It is usually expressed in both amount and units. Once the sales budget has been set, a decision can be made on the level of production that will be needed to support sales and the production budget can be set well. The sales budget is the starting point in preparing the master budget. The sales budget is constructed by multiplying the expected sales in units by

the sales price. Generally, a sales budget is accompanied by computation of expected cash receipts for the forthcoming budget period. This computation is needed to assist in preparing the cash budget for the year. Expected cash receipts are composed a collections on sales made to customer in prior periods plus collection on sales made in the current budget periods. (Garrison, 2000)

Sales budget is the starting point in the preparation of the comprehensive master budget. All the other plans and budgets are dependent upon the sales budget. The budget is usually presented both in units and dollars of the sales revenue or sales volumes. The preparation of a sales budget is based upon the forecast. It is also known as corner stone for all the other budgets. That's because the production level and the inventory level and manufacturing cost as well as non-manufacturing cost generally depend on the forecasted level of unit sales or revenues. For sales planning, the sales manager should be made directly responsibility even if he is not the actual compiler, though this is advisable that should assume the responsibility when he agrees to the figures.

b. Production budget:- When the sales plan is completed the next step in building the short range profit plan is to develop a production plan. The production plan involves determining the number of units of each product that must be manufactured to meet planned sales and maintain the planned inventory levels of finished goods. Production plan provides the basis foundation for planning direct material, direct labor and manufacturing overhead costs. (Welsch: 1992.)

The production budget shows the quantities to be produced for achieving sales target by keeping sufficient inventories. It can be expressed in quantitative or financial or both. The production budget can be presented in the following formula:

Production = Quantity sold – Beginning Inventory + Ending Inventory.

By the preparation of production budget as a planning tool, the foundation for planning all aspects of factory operations are established such as for requirement of direct material, direct labor needs, supervisory needs, factory overheads, plant capacity, and factory service activities. The coordination between sales plans, inventory policies, and production requirements comes into focus and is resolve in the production plan. It is also an important

factor of coordinating overall functional activity such as cash flow planning, financing, research and development, engineering, capital additions, etc. It is the bases for controlling production, inventories, production cost, and labour in the factory. (Ojha & Gautam; 2011, p.41)

c. Direct Material Budget:- Material budget is prepared just after the preparation of production in manufacturing company. Once production output is planned, material required for the planned output is ascertained and then a quantity of material to be purchase is estimated. The material budget includes planning and controlling of raw material and components/ parts used in the manufacturing of finished products. Planning and controlling purchases and materials usages is the plan to maintain coordination between (1) factory requirements for raw materials, (2) raw materials inventory levels, and (3) purchases of raw materials.

Sufficient raw materials will have to be available to meet production needs and to provide for the desired ending raw materials inventory. However, some quantity of materials requirement will already exist in the form of beginning raw materials inventory. The remainder will have to be purchased from a supplier. (Ojha & Gautam; 2011, p.71)

Planned material consumption = planned production units X standard raw material usage per unit of output.

(Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p280)

Material budget is classified by, each product, each material, each department and each month.

d. Purchase Budget:- Director Materials are essential for production and must be purchased in each period in sufficient quantities to meet production need and to confirm to the company's ending inventory policies. The materials budget specifies the quantities and timing of each raw material needed. The purchase budget specifies the estimated quantities to be purchased, and estimated cost for each raw material and required delivery dates. It is computed as:

Planned Purchase unit = Planned material consumption + Desired ending inventory of raw materials − Beginning inventory of raw materials.

(Ojha & Gautam; 2011, p.72)

e. Direct Labour Budget:- Labour is generally classified as direct and indirect labour. Direct labour comprises all the worker's who were directly involve on specific productive output. Hence, as with direct material costs, direct labour costs are directly traceable to output. The direct labour budget is also developed from the production budget. Firstly, direct labour requirements must be computed so that the company will know whether sufficient labour is available to meet production needs. By knowing in advance, the company can develop a plan to adjust the labour force as the situation may require. Direct labour requirements can be computed by multiplying product to be produced in each period by the number of direct labour-hours required to produce a unit. Many different types of labour may be involved. If so, then the computation should be made of the type of labour needed. The hours of direct labour resulting from these computations can then be multiplied by the direct labour cost per hour to obtain the budgeted total direct labour cost.

f. Manufacturing or factory Overhead Budget:- Manufacturing overheads are the part of the total production cost, which is not directly identifiable with specific products or jobs. Manufacturing overheads include many dissimilar expenses; therefore, they cause problem in the allocation of these costs to products. They are two distinct types of responsibility centers in most manufacturing companies, production and services. The manufacturing overhead budget provides a schedule of all costs of production other than direct material and direct labour. These costs should be broken down by cost behavior as variable and fixed for budgeting purposes and a predetermined overhead rate should be developed. This rate will be used to apply manufacturing overheads to the units of product throughout the budget period. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p283)

g. Selling and Administrative Overhead Budget:- The selling and administrative expenses 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. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p284)

2. Financial Budgets

Financial budgets are concerned with financial implications of the operating budgets – the expected cash inflows and cash outflows, financial position and the operating results. The important components of financial budgets are: cash budget, Performa balance sheet and income statement and statements of changes in financial position. The components of financial budget are as follows:

a) Budget income statement:- The budgeted income statement is one of the key schedules in the budget process. It is the document that tells 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. (Garrison; 1985:p.313)

b) **Cash budget:-** The cash budget is very much like a budgeted statement of cash flows, but with a relatively short time frame. The financial manager must be able to anticipate short term borrowing must be made in advance of the date the cash is needed. When considering a loan proposal, the bank lending officer will need to know how much cash will needed, how soon it will be needed, and when the borrower expects to repay the loan. A potential borrower who cannot answer these questions because a cash budget has not been prepared may be denied an otherwise. Reasonable loan request or may be charged a higher interest rate because of the perceived risk caused by these uncertainties. The financial manager also must know when temporarily excess cash is available for investment and when it will be needed, so that cash can be invested to earn interest income. A number of assumptions about the timing of cash receipts and disbursements must be made when the cash budget is prepared.

Once the assumptions about the timing of cash receipts and disbursements have been made, the preparation of the cash budget is a straightforward mechanical process. Budgeted cash receipts are added to the beginning cash balance, budgeted disbursements are subtracted and a preliminary ending balance is determined. The organization will have an established minimum cash balance to be maintained. This inventory of cash serves the same purpose as an inventory of product it is a cushion that can absorb forecast errors. If the cash forecast indicates a preliminary balance that is less than the desired minimum, temporary investments must be liquidated or a loan must be planned to bring the forecast balance up to the desired level. If the preliminary balance is greater than the minimum desired working balance, the

excess is available for repayment of loans or for investment. The cash budget will be prepared for monthly periods at least, many organizations forecast cash flows on a daily basis for a week or two, and then weekly for a month or two, so optimum cash management results can be achieves. Two primary approaches are used to develop the cash budget.

a. Cash receipts and disbursement approach
b. Financial accounting approach

"The cash receipts and disbursement approach basically involves the use of detailed data from the budgeted cash account. The financial statement approaches starts with net income (accrual basis), which is adjusted to cash basis to compute cash flow from continuing operations. The cash receipts and disbursement approach is usually used for the tactical short-term plan because it provides more details. The financial statement method is usually used for board analysis of the cash position and for strategic long range planning." (Welsh: 1989).

c) Budgeted balance sheet:- Budgeted balance sheet is a statement of assets and liabilities prepared after the preparation of operating budgets and financial budgets. It is based on functional or operating budgets, cash budgets, projected income statement and the precious year's assets and liabilities. In other words, budgeted balance sheet develops by beginning with the current balance sheet and adjusting it for the data contained in the other budgets.

3. Appropriation budget

Capital budget involves the planning to acquire worthwhile projects, together with the timings of the estimated cost and cash flows of each project. Such projects require large sum of funds and have long term implications for the firm. Capital budgets are difficult to prepare because estimates of the cash flows over a long period have to be made which involve a great degree of uncertainty.

a) Flexible budget:- Flexible expenses budget is one of the budgeting techniques used for expenses budget. It is also known as variable, dynamic, activity, and output adjusted expenses budgets. Sometimes it happens that actual level of activity substantially differs with planned level of activities. I that situation, control over expenses will be difficult and evaluation of actual performance also becomes hard for management. A flexible budget is one that can be adjusted easily to show budgeted revenue, costs, and cash flow at different

level of activity. Flexible budgeting gives mathematical formulations to expenses from which expenses plans can be computed for planning and control.

b) Capital expenditure budget:- Capital expenditure budgeting is a process of planning and controlling of the long-term and short-term expenditure for expansions, replacement, and contraction of fixed assets. Capital budgeting is useful to earn future profit and reduce future costs. The major elements of capital expenditure budget are cash out-flow and cash in-flows. Cash outflow includes the cost of the project as cash out lays at different times during the life of a project. The cash out-flows 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.

c) Zero based budgeting:- Zero based budgeting is also known as priority based budgeting. It is emerged in the late 1960s as an attempt of overcome the limitations of incremental budgets. This approach requires that all activities are justified and prioritized before decisions are taken relating to the amount of resources allocated to each activity. Besides adopting a 'Zero based' approach Zero based budgeting also focuses on programmes or activities instead of functional department based on line item that is a feature of traditional budgeting. Under Zero based budgeting, the budget for virtually every activity in the organization is initially set to zero. To receive funding the budgeting, each activity must be justified in terms of its continued usefulness. The Zero based budgeting approach forces management to rethink each phase of an organization's operations before allocating resources.

d) Activity based budgeting (ABB):- Activity based budgeting is based on ABC system. In an activity based costing (or ABC) system, the two stage cost allocation process is retained. However, instead of assigning overhead coast only to departments in stage one; Overhead costs are assigned to a large number of cost pools that represent the most significant activities comprising the production process. After assigning the cost to the activities cost pools in stage one, cost drivers are identified that are appropriate for each coat pool then the stage to the overhead cost are allocated from each activities cost pool to each production job in proportion to the amount of activities consumed by the job. The aim of

ABB is to authorize the supply only those resource that are use to perform activities required to meet the budget level of production and sales.

e) Cost volume profit analysis:- Cost volume profit analysis is the study of relationship between cost, Volume, and profit. Cost-volume-profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of these relationships CVP analysis simplifies the real-world conditions that a firm will face. (Drury, Colin; 2000, Management and Cost Accounting*)* Hence, Cost volume profit analysis is a great helpful in managerial decision making, especially cost control, cost reduction and profit planning.

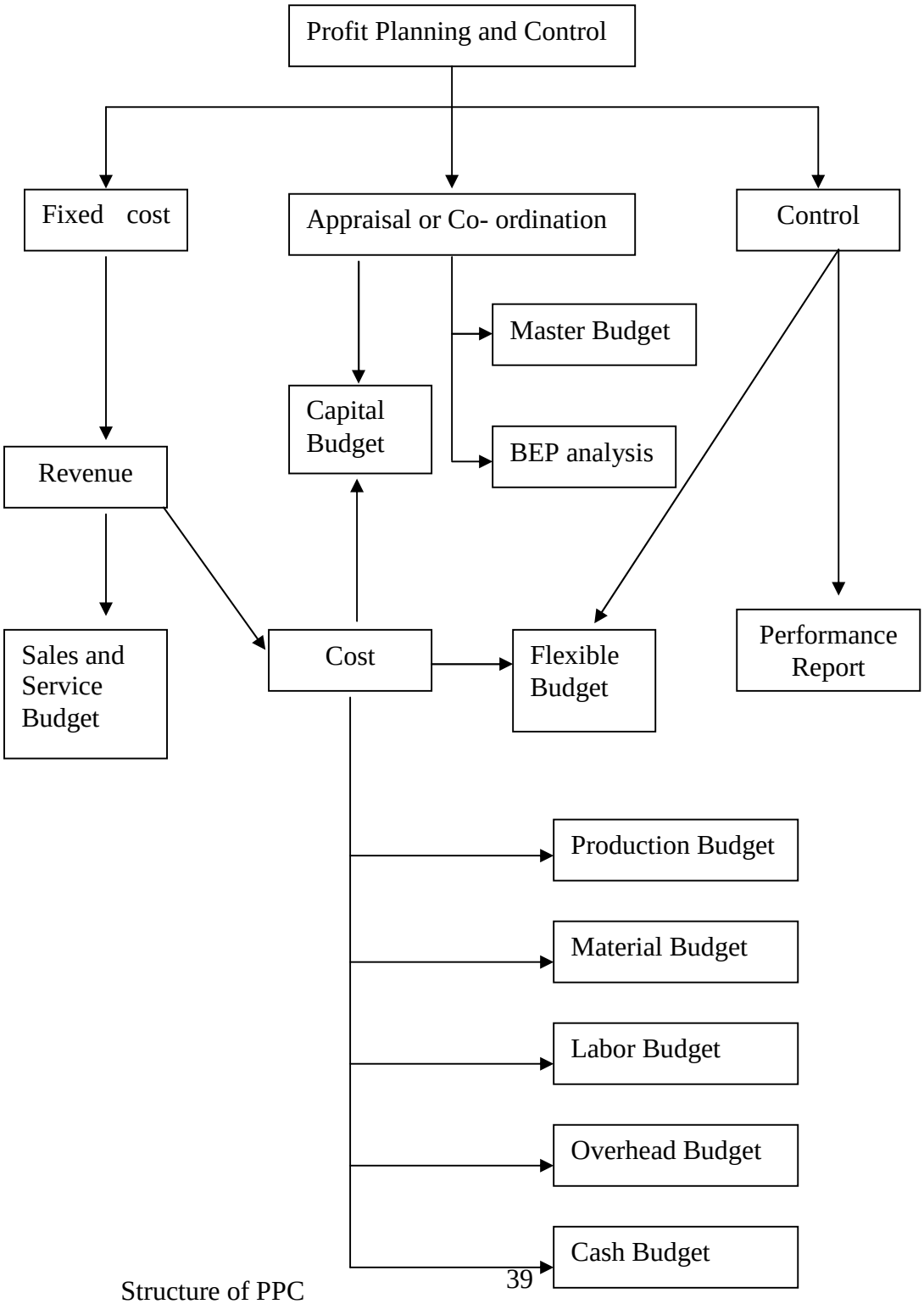
f) Completion of profit plan:- The planning process involves a long-range profit plan and short-range profit plan. In developing, these plans, many budget schedules are prepared to detail plans for each phase of a company's operations. The final step in the planning process is to complete the profit plan by combining the component schedules and preparing planned financial statements. Planned statements of financial position, income and cash flows are prepared in order to determine the implications of the company's plans for its future financial condition. The completion of annual profit plan requires the preparation of following budgets:

- Planned cost of good manufactured.
- Planned cost of good sold.
- Planned income statement.
- Planned balance sheet.
- Planned statement of cash flows. (Ojha & Gautam; 2011, p.193)

g) Performance report:- performance reporting is an important part of comprehensive PPC system. The performance reporting phases of a comprehensive PPC program significantly influences the extent to which the organization's planned goals and objectives are attained. Performance reports deal with control aspect of PPC or management control function of management defined as "the action necessary to assure he objectives, plans, policies and standards are being attend" or in other word the objectives of control is to guarantee the achievement of the planned objectives of the management by introducing periodic systematic correction measure. The main objective of performance report is the

communication of performance measurements, actual results, and the related variances. Properties offer management essential insights into all the facets of operational efficiencies. Besides, performance reports pinpoints and reports critical behavioral problems which provide management a basis for certain follow-up action to find out causes of variations and take necessary corrective action of needed.

2.2.15 Simple structure of Profit Planning and Control



Structure of PPC

2.2.16 Cost Volume Profit analysis as a tool of Profit Planning and Budgeting

Cost-Volume-Profit analysis is an important tool of profit planning because it provides the information about the behaviors of cost in relation to volume, volume of production or sales where the business will break-even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for a target profit level etc. CVP analysis may therefore by defined as a managerial tools showing the relationship between various ingredients of profit planning, (i.e. cost, selling price and volume of activity). CVP analysis is an important media through which the management can gave an insight into effects on profit on account of variations in cost and sales and take appropriate decisions. CVP analysis is great helpful in managerial decision-making. Specially, cost control and profit planning is possible with the help of CVP analysis. Profit planning can be done only when the management has the information about the cost of the product and selling price of the product.

Hence, Cost volume profit analysis is the most popular tools in PPC. It is great helpful in managerial decision making, especially cost control, cost reduction and profit planning. PPC remains incomplete without CVP. It helps managers, business owners and entrepreneurs to determine the profit potential of a new firm or the impact on profit due to changes in selling price, cost or level of activities on current business.

2.2.17 Concept of Cost Volume and Profit Analysis

Individually, 'cost' means price paid to acquire / produce / accomplish / maintain anything. It is the expenditure on goods or services required to carry out the operation of an organization; so we can say that cost is a function of volume. 'Volume' means a mass or quantity of something or amount. Volume is literally, the no of product or services those have been sold out to generate the revenue which an organization expects to exceed the cost incurred. 'Profit' means excess of a firm's revenue over the expenses of the producing revenue in a given fiscal period. Profit is the ratio of such pecuniary gain to the amount of capital invested and analysis in resolution, separation or breaking into parts. In total, Cost volume profit analysis is the study of relationship between cost, Volume, and profit. These three factors are interrelationship and dependent on each other; profit depends upon sales, selling price to a greater extent will depend upon the costs and costs depend upon the volume of production. So, the cost volume profit analysis is the effect on profit of changes in selling prices, services fees, cost, income tax rates and the organization's mix of products and services.

Cost volume profit analysis examines the behavior of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit, and or fixed cost of a product. (Horngren, Datar and Foster; 2003:p136)

"Cost-volume-profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of these relationships CVP analysis simplifies the real-world conditions that a firm will face. Like must models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations. Nevertheless, it is a powerful tool for decision making in certain situations."(Drury; 2000)

Most of the business 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 the 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 product, demand, variable costs, fixed costs, taxes, etc. The whole picture of profit planning is associated with the cost-volume-profit inter-relationships. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p166)

The objectivity of CVP analysis is to establish what will happen to the financial result if a specified level of activity or volume fluctuates. It helps to determine the minimum sales to avoid losses and sales volume at which the profit goal of the firm will be achieved, and it also helps to management to find out the most profitable combination of cost and volume. The management of organization therefore uses cost volume profit analysis to product and calculates the implications of its short run decisions about fixed cost, variable cost, volume and selling price for its profit plan on a continuous basis. Generally, the CVP analysis provides the answer to the following questions: (Koirala, Gyawali, Fago, Subedi, and Niraula; 2010:p.95)

- What level of sales is needed to avoid the losses?
- What sales volume is needed to earn a target profit?
- What would be the effect on profits if we reduce our selling price and sell more units?
- What sales volume is required to meet the additional fixed charges arising from an advertising campaign?
- What will be the effect on the profit, where sales mix is changed?

- What will be the new BEP when there is change in price, costs, volume, and sales mix?
- Which product or product mix is most profitable?
- Which product or product mix should be discontinued or not?
- Which products or services to emphasize?

2.2.18 Cost and its classification

2.2.18.1 Concept of cost

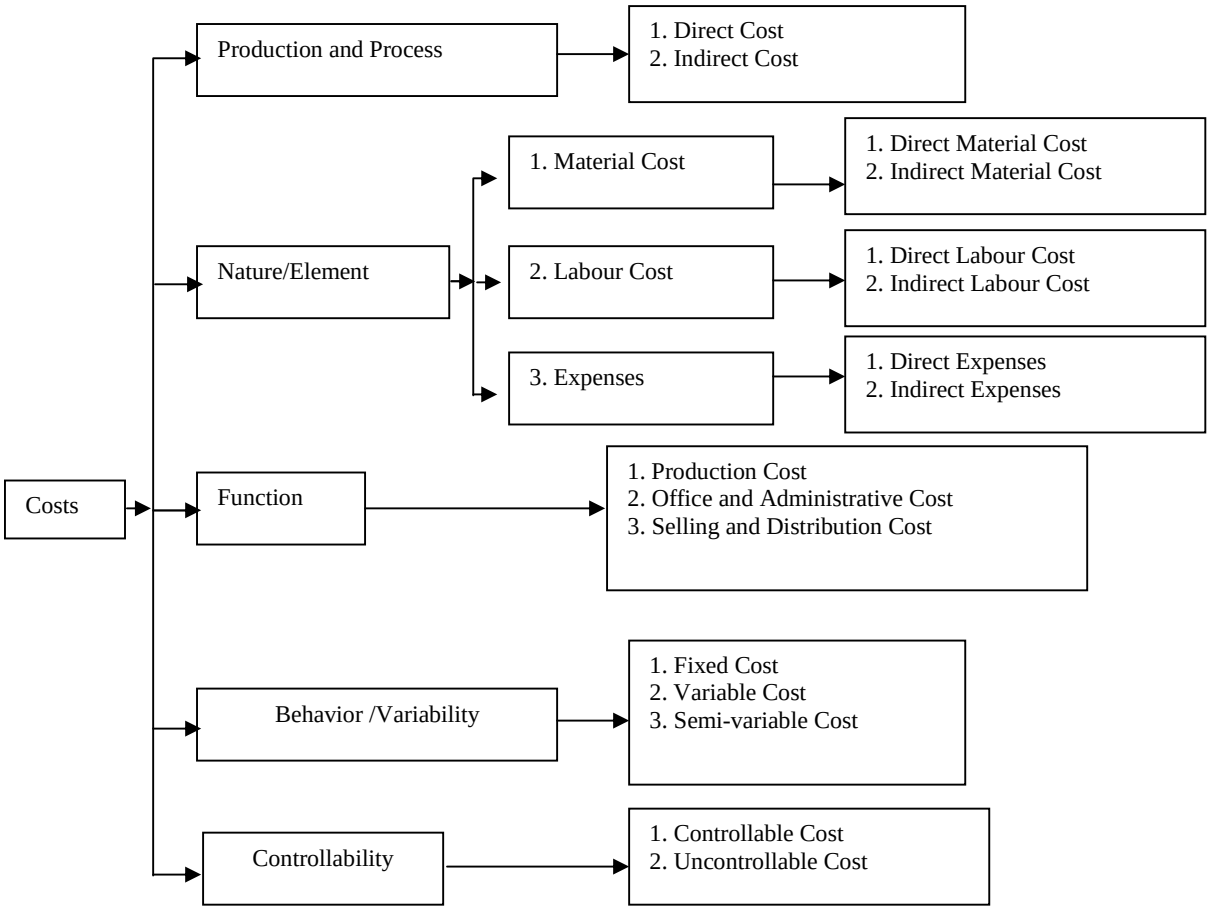
In simple words, cost means the total of all expenses. According to the Oxford Dictionary, cost means the price paid for something. But in cost accounting terminology, cost refers to the amount of expenditure (actual or notional) involved in the production of a product. In this sense, cost does not mean price. Price simply is a selling price which includes cost plus margin (i.e. profit). No product can be produced without incurring costs. Different costs are involved in the production of a product or creation of services. The cost of a product or service is very much important factor on the basis of which the selling price is determined. Though many factors are to be taken into consideration in determining the price of a product or service, cost is the major factor. The cost of a product plus the margin of profit is simply the price (i.e. selling price) of a product. Thus, every manufacturer should be well familiar with the concept, nature and types of cost and their involvement in the goods or services.(Chhetri et. al. 2067: p.372)

According to W.H. Harper- "A cost is the value of economic resources used as a result of producing or doing the things costed."

According to C.I.M.A. London-"cost is the amount of expenditure (actual or notional) incurred on or attributable to a given things."

2.2.18.2 Classification of costs

Classification costs denote the grouping of costs on the basis of similar features of cost. It may be classified into different categories depending upon the purpose of classification. Some of the important bases in which costs are classified are as follows:

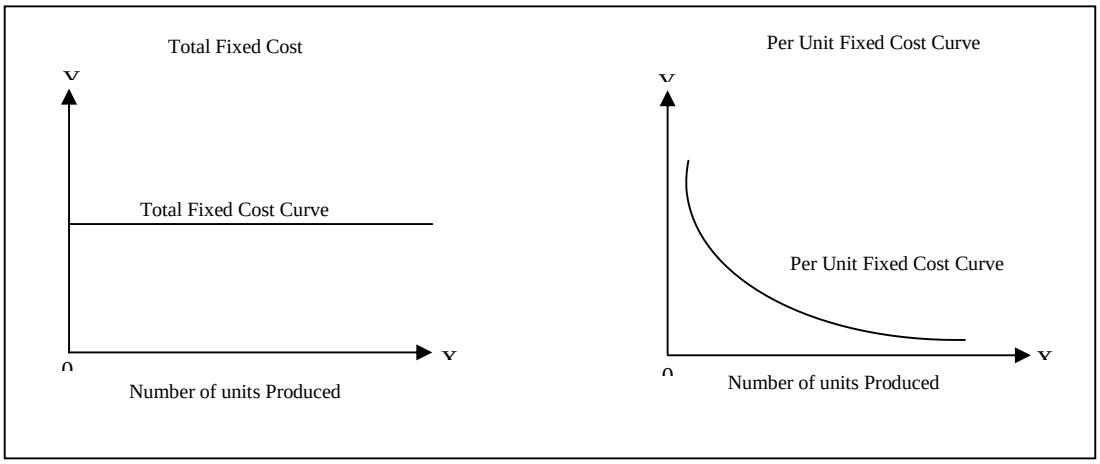


2.2.18.2.1 Classification of cost on the basis of Behavior or Variability

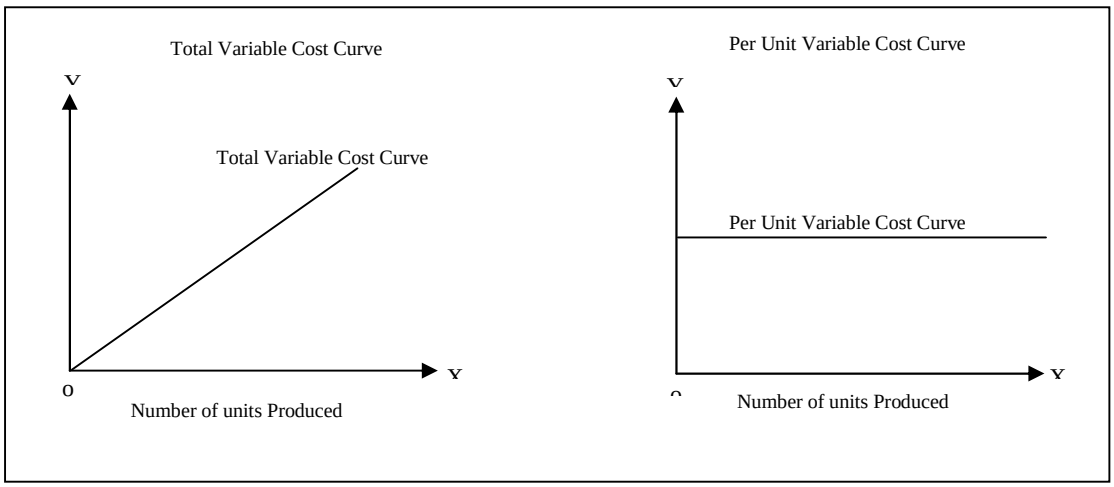
The behavior of costs varies from one another as production increase, some cost remains constant or varies in direct proportion to the volume of production, or others may vary partially. Thus on the basis of variability, costs can be classified into the following three categories:

i. Fixed cost:- Fixed cost is a cost that remains constant, in total, regardless of changes in the level of activity (production/sales) within relevant range. Fixed costs are not affected by changes in activity. As the production increases and decreases, the total fixed costs remain constant. And some fixed cost has to bear by the company even though the production is zero. But the fixed cost per unit in not fixed, as the production increases fixed cost per unit decreases and vice versa. These costs are also known as period cost because these are dependent on time rather than production. These costs are sometimes referred to as capacity cost since they result from outlays made for building, equipment, skilled professional employees, and other items needed to provide the basic capacity for sustained operations.

Examples of fixed cost include depreciation, insurance, rent and rates, managerial salaries, property tax, etc. Following diagram also help to clear the concept of fixed cost:



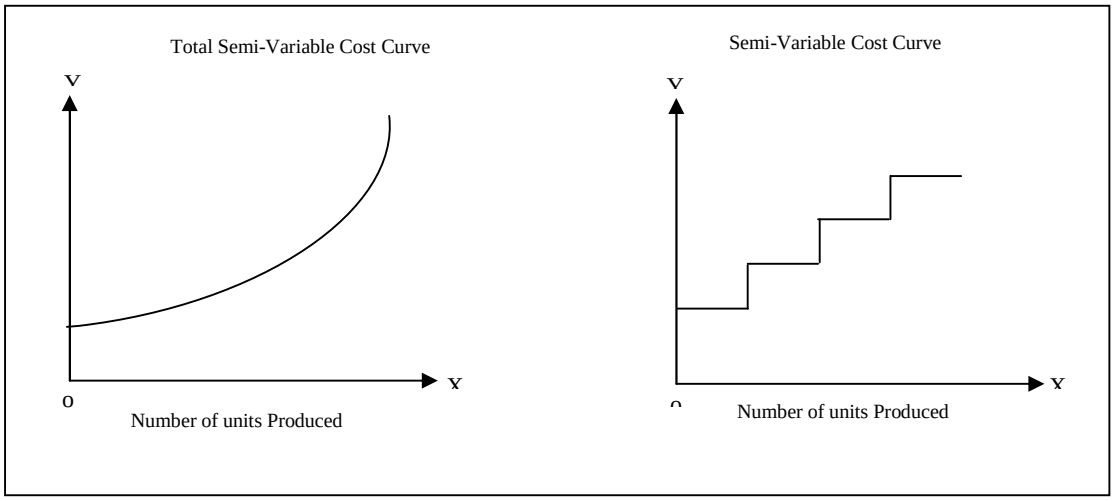
ii. Variable Cost:- Variable cost are those cost which, in total, Vary/change in direct proportion to the activity level (production/sales) within relevant range. Variable costs are affected by the change in activity. As the production increases, total variable cost also increases by the same proportion and vice versa. If production increases by 50%, total variable cost will also increase by same percentage i.e. 50%. If the production is zero, total variable cost will be also zero. But the variable cost per unit is always fixed either production increases or decreases. Examples of variable cost include direct material, direct labour (wages), direct expenses, etc. Following diagram also help to clear the concept of variable cost:



iii. Semi-variable cost or Semi-fixed cost or Mixed cost:

These costs are partly fixed and variable. Semi variable cost is an expense which contains both a fixed cost component and a variable cost component so it is also called as mixed cost. Cost that remains fixed up to certain volume after which it becomes variable, total of which responds less than proportionately to change in volume of activity is considered as semi-

variable cost. Telephone bell show the similarities of semi-variable cost. It includes partly fixed charge up to a certain level/calls then varies according to the calls. Examples of semi-variable cost include electricity charges, telephone charges, salary of supervisor, repairs and maintenance etc. Following diagram also help to clear the concept of semi-variable cost:



2.2.18.3 Segregation of Semi-Variable Cost

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

a. High-Low Method or Two Points Method

b. Least Square Method

a. High-Low Method or Two Points Method:- This method considers two levels of activity to split the cost. It considers the output at different levels i.e. high or low pint is compared with the amount of expenses incurred at these different periods. In the high-low pint method, the semi-variable cost is segregated into the fixed and the variable components using exactly two data points. The two points consist of selecting the periods of the highest and the lowest activity levels comprising the changes in costs that result from the two levels.

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. The term least square means that the sum of the squares of the deviations from the plotted points to the regression line is smaller that would be obtained from any other line fitted to the data. So that in trend line analysis drawn from the relationship between the independent and dependent variables. The least square straight-line trend gives more reliable estimate than any other methods. In

cost estimation in relation to activity levels, activity volumes are defined as independent variable (X) and the mixed costs relating to that activity as dependant variable (Y). Then the amount of dependent variable or cost (Y) for any level of independent variable or production (X) can be explained through following least square straight line:

Least square straight line Y on X

Y= a + bx

Where,

a = Fixed cost per period

b = Variable cost per unit

n = Number of observations

X = Activity measures (units or hours)

Y = Total mixed cost observed

Since (b) stands for variable cost per unit and (a) stands for fixed cost per period, the value of (a) and (b) should be computed to segregate the mixed cost into variable and fixed components.

Value of (a) and (b) can be directly estimated using simple mathematical formula:

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

$$a = \frac{\sum Y - b\sum X}{N}$$ (Singh, Ojah & Acharya; 2004: p.27)

2.2.17 Use or Application of CVP Analysis in Profit Planning

Planning, controlling and decision making are the essential managerial functions. Cost-volume-profit analysis helps the managers to plan for profit, to control cost and make decision. As such it helps: (Munamkarmi; 2003: p.123-124)

- To determine the break-even point in terms of unit or sales value.
- To ascertain the margin of safety.
- To estimate profits or losses at various level of output.
- To help management to find the most profitable combination of costs and volume (units).
- 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 pint for changes in fixed or variable cost.

- To assess the likely effect of management decisions such as an increase or a decrease in selling price adoptions of new method of production to reduce direct labour and increase output.

2.2.20 Purpose of Cost Volume Profit analysis

CVP analysis helps management in a number of ways. The following purposes are severed by it: (Dangol et al., 2061: 160)

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

2.2.21 Approaches to Cost Volume Profit analysis

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

i. Contribution Margin Approach
ii. The graphic or break even Approach

2.2.21.1 Contribution Margin Approach

Contribution margin is the difference between the sales revenue and variable cost of production. Contribution margin consists the fixed cost and profit i.e. contribution margin is the amount that contribute the coverage of all fixed costs and to the generation of profit. It is the total sales revenue less total variable costs. The term is called contribution margin because whatever is left, after covering the variable costs, contributes pay the fixed costs and

to earn profit. If contribution is not sufficient to cover the fixed costs the firm suffers from losses.

The contribution margin income statement approach to cost volume profit analysis allows the preparation of pro-forma statement from the available information. BEP and other required CVP relationship can be explained through a contribution margin statement whose philosophy is all fixed costs are period costs that should be deducted from the contribution margin of the same period only the variable costs vary proportionally to the level of output or sales. It can be express as:

Contribution margin = sales − variable cost

Or, Contribution margin = Fixed cost + Profit

With the help of table we can express contribution margin as follows:

Sales revenue (net)	XXXX
Less: Variable cost	XXXX
Contribution margin	XXXX
Less: Fixed cost	XXXX
Net profit	XXXX

2.2.21.2 The graphic or break even Approach

Cost volume profit analysis includes both contribution analysis and break even analysis. Break even analysis uses the same concept as contribution analysis; however, it emphasizes the level of output or productive activity at which sales revenue exactly totals cost; that is, there is no profit or loss. BE analysis rests upon the foundation of cost variability. It is usually applied on a total company basis.

At break-even sales, the company just break-even i.e. recovers all of its costs. On other words, break even sales volume is that level of sales volume which a company neither makes a profit nor suffers losses. It will just be able to recover its cost. To put breakeven point in other words, this is a point at which a company breaks the loss (minus) zone and enters into profit zone. Break even analysis helps the management to know which sales volume will only recover its cost and after which it starts giving profit. Therefore, it can provide management some insights into profit planning. (Ojha & Gautam; 2011:p.244). Methods of calculating break-even point are as follows:

i. Formula or algebraic equation method

The most popular practiced approach to the break-even point and cost volume profit analysis is the formula, also known as the equation. It is particularly because the equation provides the most general and the easiest to remember-approach uses an algebraic equation to calculate the break even pint. The answers provided by solving the equation may sometimes, need to be rounded to whole numbers of units or lot sizes. The rounding of break even pints is always done upward because this will provide a small profit rather than the small loss that be shown from rounding downward. (Raiborn, Barfield and Kinney: 1993)

- Algebraic equation method:

  BEP sales in Rs. ─ Variable cost ─ Fixed cost = 0

- Formula method:

- Contribution margin per unit (CMPU) = Selling price per unit ─ Variable cost per unit

  = Selling price per unit × PV ratio

$$= \frac{\text{Difference in profit}}{\text{Differene in sales unit}}$$

$$= \frac{\text{Profit}}{\text{Margin of safety units}}$$

- Profit Volume Ratio $= 1 - \frac{\text{Variable cost}}{\text{Sales}}$ or, $1 - \frac{\text{Variable Rate}}{\text{Selling Price}}$

  Or, $\frac{\text{Sales} - \text{Variable cost}}{\text{Sales}}$ or, $\frac{\text{Contribution Margin}}{\text{Sases}}$

  Or, $\frac{\text{Difference in profit}}{\text{Difference in sales}}$ or, $\frac{\text{Profit}}{\text{Margin of Safety (Rs.)}}$

- Break Even Point (in units) $= \frac{\text{Fixed cost}}{\text{CMPU}}$

  (in Rs.) $= \frac{\text{Fixed cost}}{\text{P/V Ratio}}$

- Required sales to earn Desired Profit (in units) = $\frac{\text{Fixed cost + Desired Profit}}{\text{CMPU}}$

  (in Rs.) = $\frac{\text{Fixed cost+Desired Profit}}{\text{P/V Ratio}}$

- Required Sales for Desired Profit after tax (in units) = $\frac{\text{Fixed cost} + \frac{\text{DPAT}}{1-\text{Tax rate}}}{\text{CMPU}}$

  (in Rs.) = $\frac{\text{Fixed cost} + \frac{\text{DPAT}}{1-\text{Tax rate}}}{\text{P/V Ratio}}$

- Profit = Sales ─ Variable Cost ─ Fixed Cost

  Profit = (Sales Rs. × P/V Ratio) ─ Fixed cost

  Profit = (Sales Units × CMPU) ─ Fixed Cost

  Profit = (Actual Sales Units ─ BE Sales Units) i.e. Margin of Safety × CMPU

  Profit = (Actual Sales in Rs. ─ BE Sales in Rs.) × P/V Ratio

- Margin of safety (in units or Rs.) = Actual sales ─ Break Even Sales

  Or, Margin of safety = $\frac{\text{Profit}}{\text{PV Ratio}}$

  Or, Margin of Safety = $\frac{\text{Actual Sales} - \text{BE Sales}}{\text{Actual Sales}}$

- Fixed Cost = Sales ─ Variable Cost ─ Profit

  = Sales unit × CMPU ─ Profit

  = Sales Rs. × PV ratio ─ Profit

- Required Sales for Fixed Percentage of Profit on sales = $\frac{\text{Fixed cost}}{\text{SPPU} - \text{VCPU} - \text{Profit per unit}}$

- Required sales in Rs. At which point both plants/machines produce equal amount of profit (i.e. Indifference Point) = $\frac{\text{Change in Fixed Cost}}{\text{Change in P/V Ratio}}$

(Koirala, Gyawali, Fago, Subedi, & Niraula; 2010: p.99-100)

ii. Income statement method

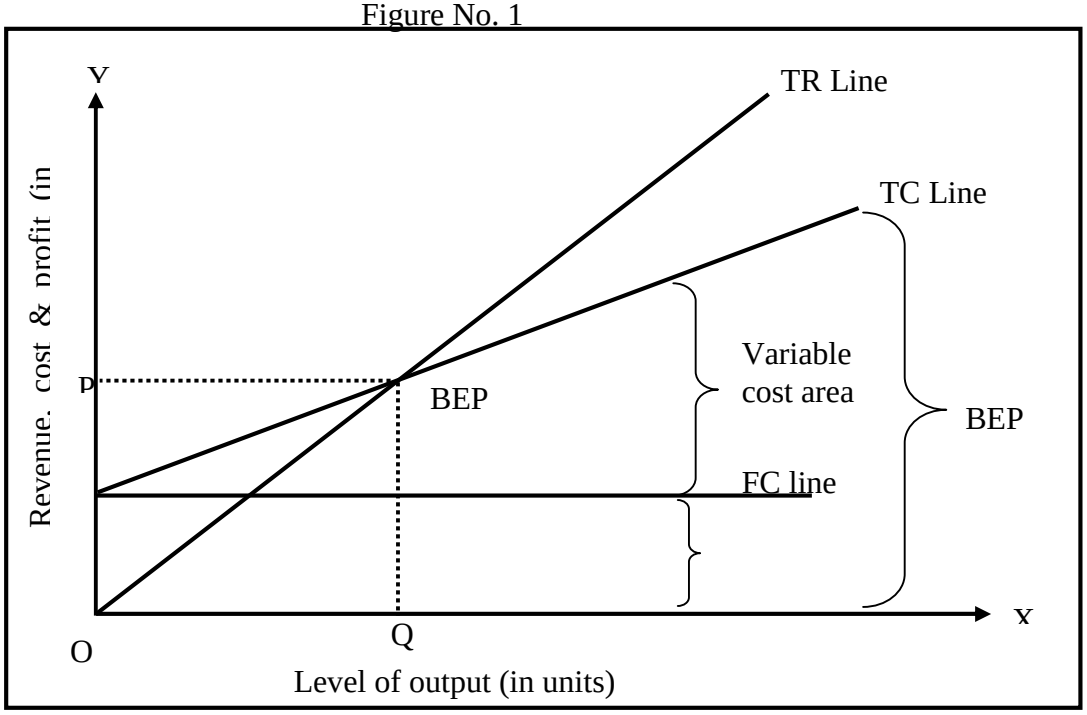
Sales revenue	xxx	→	BE sales (Rs.)
Less: Variable cost	xxx		
Contribution margin	xxx		
Less: Fixed cost	xxx		
Profit	Nil		

iii. Graphical method

The 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 pint (the break-even point) is

located at the pint where the total cost and total revenue line cross. Below this point, the firm incurs losses, and above this point, the firm earns profit.

Figure No. 1



Justification

Since fixed costs remain constant within the relevant range, the fixed cost curve is parallel to 'OX' axis. Variable costs slope upward from the origin to right but the slop depends on variable cost ratio. The total costs curve parallels the variable cost curve. So the angle 'O' equals the angle 'V'. It is because

Total costs = total fixed costs plus total variable costs

At volume 'Q'

Total cost = TFC + Q × VCPU

At volume 'Q+n'

Total costs = TFC + (Q+n) × VCPU

ΔTotal costs = O + n × VCPU

Or, ΔTotal costs = ΔVariable costs

That's why the slope of the total cost curve equals the slope of variable cost curve. The above graph clearly states that if the company can reach the point of BEP it can generate sufficient revenues to cover all of its operating expenses. At this pint, the total revenues equal the total cost. Here, the revenue curve breaks up (intersects) the total cost curve, that's why this pint is

called ‘break-even point’. To sum up, break-even point is that pint where, total sales revenues = total costs. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p173-174)

2.2.21.2.1 Application of break even analysis:

Break-even concept can be used to formulate different policies in a business enterprise. Some of these applications are: (Maheshwari; 2000: p.182)

- Determination of profit at different levels of sales and margin of safety.
- To find the level of output to get the desired profit.
- Effect of price reduction on sales volume and changes in sales mix.
- Effect of fixed cost or variable cost changes on sales volume.
- Selection of most profitable alternative, make or buy decisions and drop and/or add decisions.

2.2.21.2.2 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: (Maheshwari; 2000: p.182-183)

- All cost can be classified into two parts, fixed cost and variable cost. There is not cost other than fixed and variable.
- There is a relevant range of validity (activity) for using the results of the analysis and sales price does not 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.
- 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 assumption were changed, revised budget would be needed for a new analysis.

2.2.21.2.3 Limitation of break even analysis

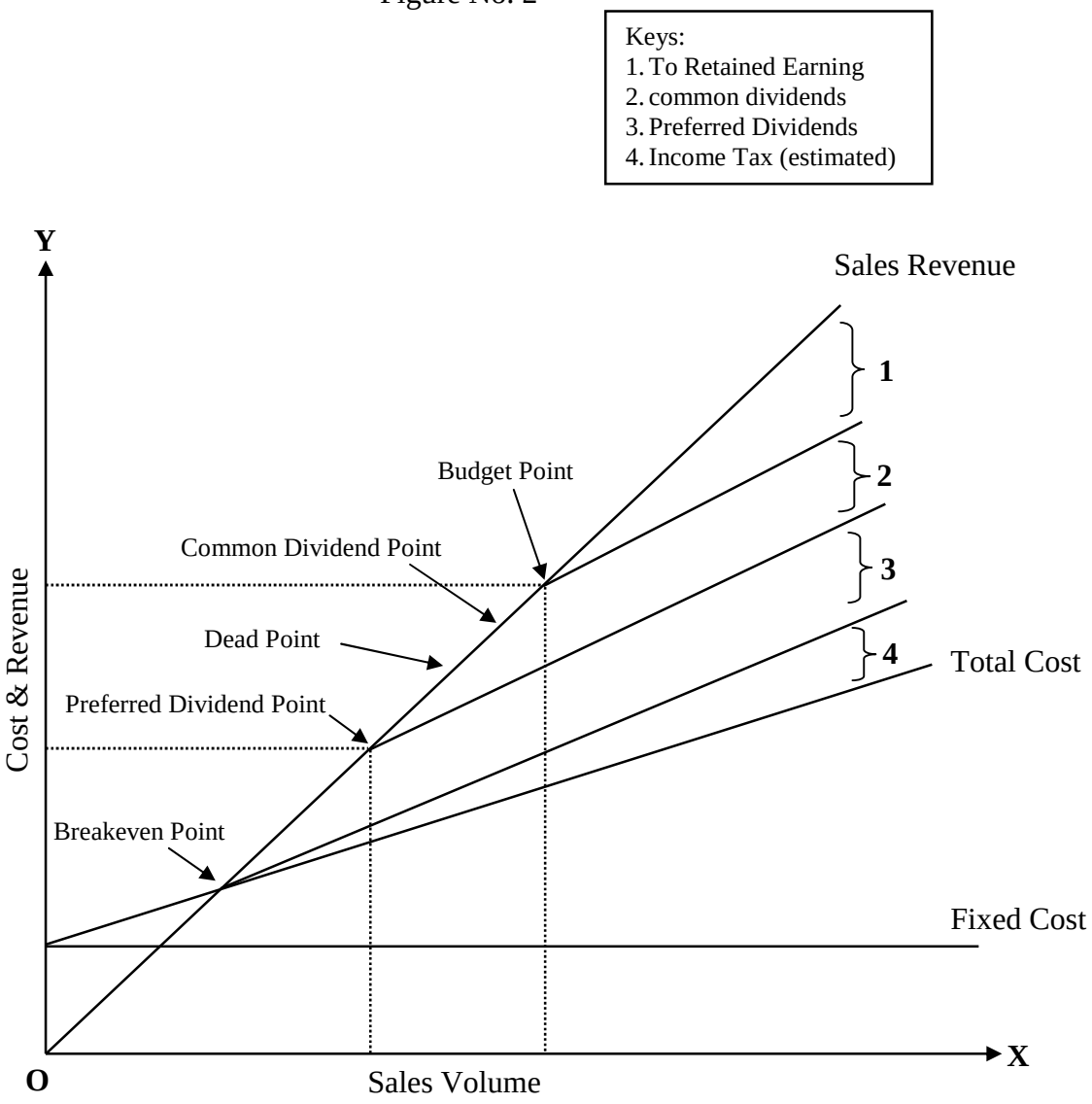
Break-even analysis in many business situations can be used for effective decision making, but there are many short coming limitations in its analysis and interpretation. Some of these can be listed as: (Maheshwari; 2000: p.183-184)

- The assumption of producer's market phenomenon may 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 in the prices of the items or services which also depend on the factors affecting its demand and supply will certainly affect the demand of the commodity. This phenomenon is not covered in break-even analysis.
- Identification of fixed and variable costs involved in production process is very complicated. A shift in product mix may change the break-even point.

2.2.22 Economic Characteristics of Cost Volume Profit Analysis

Where cost-volume-profit analysis are reasonable accurate, they 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 averages; hence the results should never be interpreted as precise. Rather, the analysis may be characterized appropriately as a 'slide-rule' approach that may be used to develop and test, with a minimum of effort, the approximate effect on costs and profit of several types of management decisions. (Welsch,; 1979: p.467-468)

Figure No. 2



Above break-even chart with economic characteristics indicates few of the economic characteristics of a business, which are: (Welsch,; 1979: p.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 pint-the pint below which 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 point below which earnings are insufficient to pay the preferred dividends and the expected dividends on the common stock.

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

2.2.23 Margin of Safety

Margin of safety is defined as the excess of budgeted (or actual) sales over the break even volume of sales. It is expressed in monetary term (values) or as number of units (volume). It is the difference between total sales revenue and break even sales revenue. The margin of safety indicates that the amount by which sales could drop before profit reaches the break even points.

The margin of safety is computed using actual or estimated sales values depending on the purpose. To evaluate future risk when planning, use estimated sales. To evaluate actual risk when monitoring operations use actual sales. Once the break even sales amount is determined, the margin of safety can be calculated in units or rupees as follows:

Margin of safety (MOS) = Total sales ─ Break even sales.

The size of margin of safety is an important indication of the business vitality. If it is large, there can be substantial falling of sales and yet a profit can be made. A larger margin of safety also gives manager greater confidence in making plans such as incurring addition fixed costs. On the other hand, if the margin of safety is small, then any decrease in sales volume may cause a loss to the company. Similarly, if the margin of safety is small manager may have to put more emphasis on reducing costs and increasing sales to avoid potential losses.

If the margin of safety is unsatisfactory, possible steps to rectify the causes of mismanagement of commercial activities as listed below can be undertaken: (Globusz publication: 2009)

a) Increasing the selling price.
b) Reducing fixed & variable cost.
c) Substitution f existing products by more profitable lines of product.
d) Increase in the volume or output.

e) Modernization of production facilities and the introduction of the most cost effective technology.

The margin of safety can be expressed in percentage form which is also known as margin of safety ratio. The margin of safety percentage is the margin of safety divided by actual or estimated sales, in either units or revenues.

$$\text{Margin of safety ratio} = \frac{\text{Margin of Safety}}{\text{Total sales}}$$

The margin of safety can also be found by using following formulas:

$$\text{Margin of safety (in units)} = \frac{\text{NPBT}}{\text{CMPU}}$$

$$\text{Margin of safety (in Rupees)} = \frac{\text{NPBT}}{\text{CM ratio}}$$

$$\text{Margin of safety ratio} = 1 - \frac{\text{BEP sales}}{\text{Total sales}}$$

$$= 1 - \text{BEP ratio}$$

2.2.24 Cost Volume Profit Analysis for a Multi-Product or Sales Mix

Sales mix can be defined as the relative combination of two or more products represented in total. It is not only the sales revenue the makes profit. The proportion of the sales contributed by different products greatly changes the amount of profit. Managers try to achieve that combination, or mix, that will yield the greatest amount of profit. If a company sells more than one product, these may not be equally profitable. So the company's profit will depend upon the ration or each products sale to 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' profit. A shift to low-margin items can cause the total profit to decrease even through total sales increase. In the contrary, a shift in the sales mix from low-margin items to high margin items can cause the reverse effect-total profit may increase even through total sales decrease. (Bajracharya, Ojah, Goet, Sharma, & Gautam; 2009: p.195)

2.2.25 Break-even point for 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.

$$\text{Overall BEP (in units)} = \frac{\text{Total Fixed Cost}}{\text{Weighted Average CMPU}}$$

Where,

Product	Sales units	Sales mix	CMPU	Contribution(CMPU × Sales Mix)
X	Xxx	Xxx	Xxx	Xxx
Y	Xx	Xxx	Xxx	Xxx
Weighted Average CMPU				Xxx

$$\text{Overall BEP (in rupees)} = \frac{\text{Total Fixed Cost}}{\text{Weighted Average PV ratio}}$$

Where,

Product	Sales in amount	Sales mix	PV Ratio	Contribution(PV ratio × Sales Mix)
X	Xxx	Xxx	Xxx	Xxx
Y	Xxx	Xxx	Xxx	Xxx
Weighted Average PV ratio				Xxx

(Koirala, Gyawali, Fago, Subedi, & Niraula; 2010: p.100)

2.2.26 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 if its choice (desires). But in real word it is not possible, because of some critical factors like finishing machine or raw material or labour. These critical factors in the CVP analysis are known as constraint.

2.2.27 Cost Volume Profit Analysis Under Resource Constrains

We assume that there are several different products, all with positive contributions per unit that the businessman would be prepared to produce in the coming year. However, one is

aware that she/he will be unable to meet demand for the entire product range because she/he does not expect there to be available sufficient quantities of one or more of the resources (e.g. machines, labour, material, storage space) require of provide inputs for several products. The problem is how to ration out, or allocate, the resources in producing the various products in such a way as to maximize the total expected profit. (Bajracharya, Ojah, Goet, Sharma, & Gautam; 2009: p.209)

2.2.27.1 Cost Volume Profit Analysis with a no resource constraint

If there were no constraints, the firm would produce and sell as much of both the products as if could, as each produces a positive contribution, so no choice between the two alternatives would be needed. The maximum demand of the products would determine the optimal mix in case of no resource constraints.

2.2.27.2 Cost Volume Profit 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 machine and output is limited by hours available on this machine. In the same way, single resource constraint arise, if the firm's products are all produced with only one material and output is limited by quantity available for that materials. When there is a constraint for a scarce resource to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scarce resource should be allocated to the alternative uses on the basis for contribution per scarce resource. (Munankarmi; 2003: p.146)

2.2.27.3 Cost Volume Profit Analysis with a multiple constraints

In general, more than one resource will constrain the amount that can be produced. In this situation, we can no longer obtain a ranking of product profitability simply by using the ratio of contribution margin per unit of scarce resource. The ranking of products across the different constraining resources will generally differ. When multiple constraining resources exist, simple profitability rankings among products are not possible. While simple profitability rankings are not possible if multiple constraining resources exist, the linear programming solution maximizes the total contribution margin subject to the described constraints.

Multiple products with multiple constraints on production require a linear programming formulation to determine a production plan that maximizes the contribution margin from the product mix. The linear programming approach highlights the important point that the most profitable products are those that have the maximum contribution margin per unit of scarce resource consumed.

The optimal solution is not as easy to find of both resources are in limited supply, because the rankings of contribution per unit of scarce resource differ. Suppose there are two products; A and B, with two or more resources constraints. The solution may be;

- Produce A only,
- Produce B only,
- Produce some combination of A and B
- Produce neither of the products, if neither product under consideration has a positive contribution per unit.

In actual business operations, decision-making have to deal with a large number of variables with several constraints in their attempt to arrive at an optimum solution to the problem of resource allocation- machinery, men, material, finances, time and space. For example, suppose an automobile manufacturing company has a limited supply of steel and a limited capacity to manufacturing trucks, tankers, tractors, cars and jeeps, each having a different demand schedule. The company would be interested in knowing as to what should be the optimum product-mix of allocation pattern of the limited resources so that the output (or profit) is maximum. The problem is solved by applying a sophisticated mathematical technique, known as linear programming. (Dwivedi; 1998)

2.2.28 Cost Volume Profit Analysis under condition of uncertainty:

The fundamental variables used in the cost-volume-profit analysis are (1) the selling price per unit, (2) the variable cost per unit, (3) the total fixed costs, and (4) the expected sales volume of each product. In any given decision problem, all four of these factors can be uncertain. To simplify the problem, however, we can first start with the uncertainties I sales volume assuming other factors equivalent to certainty. Moreover, relative to the expected sales quantity, the costs and selling prices are quite certain; that is, for analytical purpose, the decision maker may be justified in treating several factors as certainty equivalents.

Normally, in cost-volume-profit analysis, sales volume is treated as a random variable. A random variable can be thought of as an unknown quantity. Therefore, the outcome and the decision under cost-volume-profit are based on the random sales volume of each product. The simplest and widely adopted approach to business decision making under uncertainty is to estimate the likelihood that the random variable will take on various possible values. Such an estimate is called a subjective probability distribution. The decision in then made by choosing that alternative which has the highest expected monetary value. (Bajracharya, Ojah, Goet, Sharma, & Gautam; 2009: p.197)

2.2.29 Assumption underlying Cost Volume Profit Analysis

Cost-volume-profit analysis is a vital technique that provides supplementary information for profit planning. Every business starts with the target of break-even and then it aims to earn profit over its life. But the business firm passes through many ups and downs. Cost-volume-profit analysis helps to plan for every set of goals in the short-run. But the cost-volume-profit analysis encompasses the following assumptions: (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p167-169)

a. Classification of all costs as variable and fixed: While developing and applying cost-volume-profit analysis including the break-even analysis, we have assumed that all costs can be classified into fixed and variable components. In fact, it is extremely difficult to identify each and every cost element as fixed and variable ones. Traditional types of recording cost in developing countries like Nepal has made it very hard to segregate costs as fixed and variable. Moreover the flexible policy of the company also makes it more difficult to exactly identify the cost as fixed and variable ones. It one fails to identify the costs as fixed and variable, the application of cost-volume-profit analysis becomes almost impossible.

b. Linear behavior of costs within the Relevant Range: Cost-volume-profit analysis assumes that the total fixed costs do not change in the short-run within the relevant range. Total variable costs are exactly proportionate to sales volume. But in reality cost behavior may not remain constant. With the change in the volume of output we change the production setup. With more or less purchase, material costs per unit change due to quantity discounts. Costs change over time owing to inflation. Discretionary fixed costs are not certain in terms of what amount will be spent. Therefore, out BEP units or any other variable of profit

functions do not remain constant over time. And it's useless to compute the BEP and other variables at every moment for the changed situation.

c. Treatment of step fixed costs: The relevant range for many costs is very short. In that case it becomes very difficult to compute the required volume. Because we cannot say which is the relevant range for our needed volume.

d. Constant selling price for any volume in the short run: Indeed, most often we offer a quantity discount for different lots of production. This makes it difficult to determine the CMPU and C/M ratio.

e. No effect of the size of inventory on net income: The application of cost-volume-profit analysis is possible only under the situations of either following variable costing for inventoriable product cost or all production volume be sold within the same period. Cost-volume-profit analysis does not work under the full costing method where inventory change occurs.

f. **Single product or constant sales mix:** Cost-volume-profit analysis assumes that either a single product is sold or, if more products are sold, the ration of each product on total sales will be in accordance with a predetermined sales mix.

g. Short-term time horizon: Cost-volume-profit analysis is a short-term planning tool, because nothing remains stable in the long run. In the condition of changing variables all equations of Cost-volume-profit analysis becomes impossible.

Certain underlying assumptions place definite limitations on the use of Cost-volume-profit analysis. Therefore it is essential that anyone preparing Cost-volume-profit information is aware of the underlying assumption of which the information has been prepared. If these assumptions are not recognized, serious errors may result and incorrect conclusions may be drawn from the analysis.

2.2.30 Limitation of Cost Volume Profit Analysis

Assumptions limit the utility and general applicability of the CVP analysis. Therefore, the analysis should recognize these limitations and adjust data, wherever possible, to get

meaningful results. The CVP analysis suffers from the following limitations: (Pandey; 1999:p214)

- It is difficult to separate costs into fixed and variable components.
- It is not correct to assume that total fixed cost would remain unchanged over the entire range of volume.
- The assumptions of constant selling price and unit variable cost are not valid.
- It is difficult to use the break-even analysis for a multi product firm.
- The break-even analysis is a short run concept and has a limited use in ling range planning.
- The break-even analysis is a statistic tools.
- It is also ignores the non-operating income & non-operating expenses.

2.2.31 Special Problems in Cost Volume Profit Analysis

Cost-volume-profit analyses are applied to individual products or parts of a business and all the products or activities combined. In the latter case, there are three special problems may be encountered: (Welsch, Hilton and Gordon; 2001: p.513-518)

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

- **The Change in Inventory:** Usually the budgeted changes in inventories (i.e. finished goods and work-in-process) are immaterial in amount and thus may be disregarded in cost-volume-profit analysis. On the other hand, when the change in budgeted inventory is significant, it should be included in the analysis. Including the effect of inventory changes in cost-volume-profit analysis requires subjective judgments about what management might do (about making inventory changes) at different volume levels and the conceptual precision that is desired. Management considers two practical approaches or policies in inventory changes often used: (a) Disregard the inventory changes (b) Include the inventory changes.

- **The Non-Operating Incomes and Expenses:** Non-operating incomes (gains) and expenses (losses) and extra-ordinary gains and losses, if material in amount, cause another problem in CVP analysis. The basic issue is whether they should be included or excluded. Extra-ordinary gains and losses are non-recurring and unusual; therefore, they should be excluded. Non-operating incomes and expenses are recurring but they are not related to ongoing operations. Management considers the policy may be to: (a) Include the non-operating incomes and expenses, (b) Exclude the non-operating incomes and expenses.

2.2.32 Sensitivity Analysis

Sensitivity analysis is the measurement of elasticity of the change in cost,-volume-profit factors on break-even-point or given profit. The strategist should focus 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 on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinant variables. We know that the goal of a business enterprise is to maximize profit. Profit is the excess of revenue over the total costs.

Net profit =Total sales revenue ─ Total costs

=Sales units × SPPU ─ Sales units × VCPU ─ Fixed cost ─ Taxes

So that, Profit = f (Sales volume, Selling price, VC, FC, Taxes, etc.)

Means, profit are the function of volume, Price, VC, FC, Taxes and so on.

But none of the factors remain unchanged. Sometimes the manager can intentionally change the price and cost factors as a part of strategic decisions. But the strategy should focus more on the factor, which is more sensitive or responsive for profit. Therefore, to measure the sensitivity of cost-volume-profit factors we can see the impact of certain percentage or amount change in volume, price, or cost factors on net profit. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p183)

- **Impact of Price Changes:-** As increase in the selling price will the increase the P/V ratio and as a result will lower the break-even pint. On the contrary a decrease in selling price will reduce the P/V ratio and therefore, result in a higher break-even point.

- **Impact of Volume Changes:-** a change in volume, not accompanied with changes in the selling price and/or costs, will not affect P/V ratio. As a result, the break-even pint remains unchanged. Profit will increase with increase in volume and will be reduced with a decrease in volume.

- **Increase of Changes in Fixed Cost:-** a change in fixed cost does not influence P/V ratio. Other factors remaining unchanged, a fall in the fixed costs will, however, lower the BEP and raise profits. An increase in fixed cost either caused due to some external factors or due to some changes in the management policy, will raise BEP. Increase in factory rent or insurance and taxes are examples of external factors, while increased depreciation or salaries of managers may be the result of management decisions.
- **Impact of Change on Variable Cost:-** The impact of the changes in variable cost on profit is straight forward if it does not cause any change in selling price and volume. An increase in variable cost will lower P/V ratio, push up the BEP and reduce profits. On the other hand, if the variable cost declines, P/V ratio will increases, BEP will be lowered and profit would rise.

- **Impact of Changes in a combination of Factors:-** The management accountant, evaluating profit plans or budgets, must realize that a change in one factors leads to a changes in another factors. Therefore, all such changes should be carefully visualized and their net impact on profit must be seen. (Pandey; 1999: p.203-208)

2.2.33 Risk Measurement; the operating leverage

Operating leverage tells us how profit change with the change in sales. It is evident that profit changes more rapidly than sales. Why do profit change more rapidly than the sales? It is because some costs do not change. Say, if sales decline, variable costs also decline in the same ratio so that contribution margin also declines proportionately. But fixed costs do not decline. So the net operating income declines more rapidly. The same thing applies in the case of increase as well. Sales revenues changes, but some part of costs, known as fixed costs, remain unchanged. That is why net operating income changes more rapidly. This change is called the operating leverage.

Operating leverage can be measured in terms of the “Degree of Operating Leverage” (DOL). A DOL shows the times of percentage change in net operating income of the given percentage change in sales. Degree of operating leverage (DOL) may be defined as the percentage change in net operating income (NOI) or EBIT associated with a given percentage change in sales. (Pandey, et. all, 2004)

The use of operating fixed cost creates an operating leverage. Operating fixed cost includes salary, rent, maintenance cost, deprecation etc. Higher the fixed operating cost higher will be the operating leverage and vise versa. DOL also indicates the business risk and all other things being equal, the higher a firm’s DOL, the greater is its business risk. (Bajracharya & Bhattarai ; 2009:p.104) The operating leverage factor is determined as under:

$$\text{DOL} = \frac{\text{Percentage change in net operating income or EBIT}}{\text{Percentage change in sales}}$$

Alternatively;

$$\text{DOL} = \frac{\text{Contribution margin}}{\text{Net operating income}}$$

$$\text{DOL} = \frac{Q(SP-VCPU)}{Q(SP-VCPU)-\text{Fixed cost}}$$

Leverage decision is meant to substitute variable costs by fixed costs. To create a degree of operating leverage means the employment of higher amount of fixed costs, which eventually increases the break-even-point also. No DOL is to be said when the DOL occurs '1' and in this situation BEP comes to '0'. (Bajracharya, Ojha, Goet, Sharma, & Gautam; 2009:p187)

2.2.34 Financial Statement Analysis:

Financial Statements are basically a summary of financial data of corporation. They contain information that is useful for analyzing and understanding the financial performance of a business. The objectives of financial statement is to provide information about financial position, performance and changes in financial position of a corporation that is useful to a wide range of users in making financial decision. Reported assets, liabilities and equity are directly related to a corporation’s financial position. Reported income and expenses are directly related to a corporation’s financial performance. An integrated use of the balance

sheet, income statement and statement of cash flows provide in-depth view about firm's efforts on maintaining a trade-off between profitability and risk. (Paudel, Baral, Gautam, & Rana: 2011,p34 & 35)

2.2.35 Profitability Ratios

The efficiency of a business is measured by the profitability. Profitability is an important measure of a company's operating success. The long-term survival of a business enterprise depends on satisfactory income earned by it. An evaluation of company's past profits may give to the investors, creditors and others a better understanding for decision-making. Profitability ratios measure the degree of operating success of a company in an accounting period. Profitability Ratios try to establish relationship among profit, turnover, and capital employed, etc. (Bahracgarya, Puskar & et. al. : 2013,p7.19)

2.3 Previous Thesis:

This part is a descriptive presentation of the previous thesis done by the MBS students. The main objective of this part is to get some ideas and knowledge. Numerous studies have been made in the areas of Cost-Volume-Profit analysis for the partial fulfillment of the requirement for the Degree of Master in Business Studies. Here, an attempt is made to review some of the thesis submitted on the CVP in the context of Nepal.

- **Khatiwada, Gayatri.** (2013) has conducted a research on the topic "A study on Cost-Volume-Profit analysis of Unilever Nepal Limited". She has focused her research in the CVP analysis. She has covered the data of five years i.e. from FY 2062/63 to 2066/2067 with secondary data.

  She has listed the following major objectives:

  - To study the relationship of cost, volume and profit analysis of sample organization.
  - To evaluate profitability, financial position and sensitivity fo UNL activities.
  - To analyze the cost-volume-profit of the company and its impact on performance.
  - To provide suggestion and recommendation for improving UNL condition for further improvements.

On the basis of the different analysis, observation and information discussion, the following major findings have been drawn by Miss. Duwadi:

- Total sales of the company are fluctuating. The domestic is equal with total sales.
- The company produces different products among them product toilet soaps have made highest contribution on total sales. But the share of product tea on total sales in found nominal.
- Expenses of UNL are fluctuating variable cost as well as fixed cost increased or decreased haphazardly. But the trend of semi-variable cost decreased every year.
- The company has no details of systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for the profit planning and control.
- The proportions of variable cost are higher than fixed cost in total cost amount which made for lower contribution margin.
- Profit of the UNL increased year by year. Though sales decreased in the same year profit increased due to the reduction of fixed cost.
- The profitability position of the company was satisfactory but not an expected.
- As the company has high margin of safety, the company might be at lower risk.

❖ **Duwadi, Durga.** (2011) has conducted a research on the topic "A study on Cost-Volume-Profit analysis of Unilever Nepal Limited". She has focused her research in the CVP analysis. She has covered the data of five years i.e. from FY 2062/63 to 2066/2067 with secondary data.

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- The profitability position of the company was satisfactory but not an expected.
- As the company has high margin of safety, the company might be at lower risk.

❖ **Shrestha, Rajendra. (2011)** has submitted the thesis on the topic "A study on Profit Planning and Control of Radio Nepal". Mr. Shrestha has covered the data of seven years. In his research paper he has used secondary data and partly on primary data. The major specific goals of the study can be listed as below:

- It aims to know the solution of the profit planning and control in radio broadcasting companies.
- It desires to find out variance between the budgeted and actual revenue of the company.
- It makes comparative study of income and expenditure of the company.
- It aims to know the reasons for earning less income during the study period.
- It desires to make suggestions and recommendation based on major findings of the study.

After the study of Radio Nepal, Mr. Shrestha listed the following conclusion as the major findings of the study:

- Radio Nepal suffered from huge loss during the fiscal years from FY 2060/60 to FY 2066/67 BS.
- High expenditure on employees and operating expenses and lack of full utilization of capital resources has caused loss.

- The loss of Radio Nepal has decreasing trend in the beginning fiscal years from the FY 2060/61 BS to FY 2062/63 BS and shows increasing trend from the FY 2063/64 BS to FY 2066/67 BS.
- The major sources of income for Radio Nepal are programmes and advertisement revenue and it spends a major share of its income of the employees and operation of radio broadcasting system.
- The unscientific division and lack of co-ordination among the departments of Radio Nepal creates problems like delay and inefficiency in the performance.
- It has no any planning for the sales revenue or the programmes and advertisement income for future.
- It has partially depended on the government for the operation activities.
- Unnecessary expenses and very low income from the few sources are making Radio Nepal poor in economic condition.
- The budgets like expenditure budgets are prepared only once in a year.
- Radio Nepal has not prepared clear annual goal or target briefly. Like expansion of market, development of product, profit margin, etc.
- The employees are divided into different politically sheltered unions.
- It does not have separate planning committee or planning experts.

❖ **Bartaula, Kedar.** (2010) had conducted a research entitled "Cost-Volume-Profit analysis as a tool to measure effectiveness of Profit Planning and Control: A case study on Nepal Electricity Authority". His research was in partial fulfillment of MBS, submitted to Shankar Dev Campus, Kathmandu. The study has covered a five year period from FY 2061/62 to 2065/66.

The main objective of this research is to examine & study cost-volume-profit analysis of NEA to determine the relationship between cost, volume, and profit and financial position of the NEA, the specific objectives were:

- To study and examine the relationship between cost, volume and profit as a tool of management.
- To evaluate the profitability, financial position and sensitivity of Nepal Electricity Authority's activities.

- To analysis the cost-volume-profit of the company and it's impact in profit planning.
- To make necessary suggestions and recommendations to the company on the basis of study.

Mr. Bartaula has pointed out various findings and recommendations based on the analysis of data and information. Some of the major findings are as follows:

- NEA's sales revenue is increasing in fluctuating trend. Sales revenue of NEA is not sufficient to cover the cost. Forecasted sales of NEA is in increasing level. NEA's actual revenue is lower than budgeted revenue.
- NEA has not segregated cost into fixed and variable. There was non-practice of identifying semi-variable cost and their segregation into fixed and variable cost. CVP analysis is not practicing by NEA.
- Variable cost of NEA is more than its fixed cost in total cost structure.
- NEA fixed cost like interest and depreciation high. Long term loan of NEA are the main cause to increase interest.
- NEA has no effective plan and technique to reduce costs. Goals and objectives of NEA are not clearly communicated to all levels of management.
- NEA has less PV ratio and more BEP sales; as a result NEA is suffering from less.
- Margin of safety in NEA is negative because break even sales is higher than actual sales. There is no safety margin in NEA.
- NEA's contribution margin is not able to meet its fixed cost, so. NEA is no entertaining any profit.

❖ **Yadav, Mahabir Prasad.** (2010) had conducted a research entitled "A Study on Cost-Volume-Profit analysis as a tools of Profit Planning and Control: A case study of NEBICO Pvt. Ltd.". His research was in partial fulfillment of MBS, submitted to Shankar Dev Campus, Kathmandu. The study has covered a five year period from FY 2060/61 to 2064/65. His major objectives were as follows:

- To explore relationship of Cost-Volume and Profit as tool of budgeting.
- To analysis the Cost-Volume-Profit of the company and it's impact in Profit Planning.
- To evaluate the sensitivity of profitability.

- To provide suggestion and recommendation for improving Nebico's condition.

The major findings upon analysis of Nebico Pvt. Ltd.'s activities are as follows:

- There is great lack of skilled employees to prepare budgeting and analyze their financial position.
- Nebico has relatively high fixed cost (i.e. interest, depreciation, repair, salary and wages, provident fund subsidies etc)
- The company has no detailed lists of fixed, variable expensed. No specific list is available for mixed expenses planning which is significant in profit planning and control.
- Sales trend of the company is fluctuating and lacks efforts to improve them.
- Variable cost of Nebico is proportionately higher than fixed or total costs, hampering the overall company's profit.
- Like other manufacturing company of Nepal, Nebico has no effective plan and technique to reduce costs.
- Goals and objectives of Nebico are not clearly communicated to all levels of management.
- The company lacks effective inventory policy. Raw material handling, stocking and controlling system are not systematic and efficient.
- Lacks new and systematic techniques of forecasting sales and purchase.
- Nebico has tried to adopt new technology for improving quality products.

❖ **Guragai, Durga Devi.** (2010) has conducted a research on the topic "A study on Cost-Volume-Profit analysis: a case study of Kantipur Publication Pvt. Ltd.". She has focused her research in the CVP analysis. She has covered the data of five years i.e. from FY 2061/62 to 2065/2066 with secondary data.

She has listed the following major objectives:

- To study relationship of cost volume and profit as an applicable tool of budgeting.
- To analyze the trend of sales volume of the publication.
- To analyze the profitability position of Kantipur Publication Pvt. Ltd.
- To analyze the sensitivity of Kantipur publication Pvt. Ltd.
- To make suggestions and recommendations with the help of major findings.

Every research work is done to find something new based on the objectives of the study on the basis of different analysis, observation and formal as well as informal discussion the following major findings have been drawn by Miss Guragai:

- Sales of the Kantipur Publication are increasing every year in fluctuating rate.
- The company produces Saptahik, Kantipur daily, Kathmandu post, Nepal saptahik and Nari etc. Nepal Saptahik was dropped after the fiscal year 2062/63.
- Total variable cost ratio was not constant. High portion of variable cost includes cost of materials. Variable cost covers nearly 80% on an average of sales.
- Fixed cost did not remain constant in the different fiscal year.
- Semi-variable cost also fluctuated each year.
- There is not proper coordination among production, administration, distribution, store and sales department of Kantikpur Publication.
- Profit of the company is fluctuated every year. Though sales decreased in the same year profit increased due to decrease in fixed cost.
- Contribution margins and P/V ration were in increasing trend. It is very low die to the huge amount of variable cost.
- BEP decreased during the period due to the decrease in fixed cost and increase in P/V ratio.
- Margin of safety is in increasing trend. High MOS ratio indicates that the company is in strong profitability position and the company might be at lower risk.
- The company's operating leverage decreased which indicates decreased in operating risk of the company.

❖ **Thapa, Srijana. (2010)** has submitted the thesis on the topic "A comparative study of Cost Volume and Profit analysis as a tools of Profit Planning: a case study of Dabar Nepal Pvt. Ltd. & Himalayan Distillery Ltd.". This is the comparative study in manufacturing sector. Miss Thapa has covered the data of five years. The study was based on primary as well as secondary data. The general objective of this study is to evaluate the CVP analysis of multi products of manufacturing company. The specific objectives of this study are as follows:

- To study and analyze different components of cost as per cost behavior.
- To evaluate the impact of profit of HDL and DNPL.

- To assess break-even point of overall firm as well as individual product.
- To show the relationship of cost, volume and profit between multi products.
- To provide necessary suggestions and recommendations on the basis of major findings of the study.

Major findings

Major findings from secondary data are as follows:

- Sales trend of both companies are increasing yearly. It shows that the net loss can be decrease in future for HDL and profit should increase in DNPL.
- Expenses trend of both is increasing year by year.
- The costs of both companies are classified into fixed and variable. There is no practice of identifying semi variable and their segregation into variable and fixed by using scientific techniques.
- From hypothesis test it is found that there is significant relationship between cost volume and profit of HDL, where as there is no significant difference between averages cost, volume and profit of DNPL.

Major findings from Primary Data are as follows:

- Practices of CVP analysis tools are not mostly used to forecast and evaluate cost, volume and profit in the manufacturing companies.
- Management of the companies are not in favor of segregation of cost in variable and fixed, mostly they used as a variable and fixed cost whatever the nature of cost.
- Management of the both companies not taking interest for BEP analysis.
- Both of the companies are focusing their objectives on increase in profit.
- For decision making process, participating all staff would be great though of the both companies.

- **Gurung, Mohan. (2008)** has done a research programme on the topic "Profit Planning and Control of Nepal Food Corporation". The study was focused on the application of PPC in NFC. The research was based on PPC in public enterprises. The study has covered a five year period. Basically the study was based on secondary data but for the primary data general discussions with the management were also done.

The major objectives of the study are as follows:

- To examine the application and practices of PPC in NEC.
- To analyze various functional budgets adopted by the NFC.
- To assess the financial performances of NFC by using different financial ratios.
- To analyze the budget variance.
- To know about Break even sales and,
- To provide suitable suggestions and recommendations based on the analysis for improving the NFC conditions.

Major findings are as follows:

- The use of profit planning and control was not practiced by NFC management.
- The objectives set by the management were very ambiguous which resulted in the fluctuation in the actual and targeted result.
- There were fluctuations not only in the actual and targeted sales but also in the targeted sales also. The target was very high and sometime the target was very low. There was no linearity in the target figure.
- The management used to sales plan for different food grains item but rice and goats were major sales.
- Rice only, constituted the 95% if total transaction.

Following are some of the recommendations:

- Firstly, NFC has to make short-term and long-term planning to fulfill the goals of the corporation.
- There should separate department for planning.
- The participatory approach in planning and decision making should be made. Employees of every level should be given participation in planning.
- A thorough analysis of historical data has to be done before planning.
- NFC should allow deal on other food grains items also for profit generation.

❖ **Dhakal, Dipendra Raj.** (2005) has submitted a research on the topic "Cost-Volume-Profit analysis as a tool to measure the effectiveness of Profit Planning and Control: a case study of Gorakhkali Rubber Industry Limited". Mr. Dhakal study is based on

primary as well as the secondary data. The study has covered a five year period from FY 2056/57 to 2060/61.

Major findings of the study are as follows:

- Sales plan of GRIL is not properly maintained. The industry sues the various methods for sales planning like market survey, distribution networks etc. but upto date record are not maintained. So they have poor budgeting system.
- Sales trend of GRIL shows the negative directions which can further increase the net loss for future. The sales trend is very fluctuating.
- GRIL dies not practice the scientific and appropriate cost classification technique. Costs are classified into fixed and variable as per the decision of the management.
- Out of the total cost of GRIL, variable cost is almost 60% in every year which causes the low contribution margin.
- Out of the two main products: truck tyres and non-truck tyres, truck tyres are more profitable than non-truck tyres. As shown by the product contribution margin.

On the basis of the findings of the research study, Mr. Dhakal has pointed the following recommendations:

- Gorakhkali Rubber Industry Limited should clearly define its goals and objectives. And management should make sure that each & every employee is aware of the organizational objectives, which are the basis foundations of planning because conflicting goals always create confusions in their application phase.
- The industry does not have any practice of budgeting. Therefore, it is recommended that the company should develop the budgeting practice, which is one of the tools of profit planning. To improve the financial condition of the industry, it should develop annual (tactical) and long term profit plan.
- GRIL does not have separate costing department. Costing is done by traditional methods combining with judgment basis and no precise distinction has been made regarding the nature of the cost as fixed or variable, controllable and non-controllable, direct or indirect etc. So the industry should establish a separate costing department, if possible and cost classification must be made within a specific framework of responsibility and time.

- To improve profit planning system in GRIL, trained and qualified professionals should be hired.

2.4 Research Gap:

Research gap is also called the difference between the previous research and the current research. Most of the past research studies are either about profit planning and control or Cost-Volume-Profit. But in partial fulfillment of the requirement of the degree of Masters of Business studies, very low research have been done in CVP analysis as a tool to measure the effectiveness of PPC. Mostly, all the researches applied some statistical and financial tool and objectives, findings and recommendations of all these previous studies are more over the same. This research studies is a little much different from them.

This research will examine the current practice of CVP analysis in the manufacturing industry, namely Gorakhkali Rubber Industry Limited. The company has been suffering heavy losses, the major causes of such losses should find out and in-depth analysis should be done. PPC techniques would not be effective to dig out the real causes. So CVP analysis as a tool to measure the effectiveness of PPC is helpful to fill up these gaps and it will be helpful to find out the major causes of continuous losses. So the current research is conducted.

CHAPTER – III

RESEARCH METHODOLOGY

3.1 Introduction

Research is a systematic and organized effort to investigate a specific problem that needs a solution. However, research is undertaken not only to solve a problem existing in the work setting, but also to add or contribute to the general body of knowledge. Research is thus a knowledge building process. With the opening up of new frontiers of knowledge through research, new concepts and theories are developed to explain, verify, and analyze the social phenomena. (Prem R. Pant; 2010:p.29)

Research methodology is the way to solve systematically about the research problem (Kothari; 1990:p.39). It helps to analyze, examine and interpret various aspects of research works such as sales, costs and other aspects of cost-volume-profit analysis, related to an effective tool of profit planning. In this research work, various statistical techniques are applied in the research methodology.

As the basic objectives of the present research is to highlight the current practice of cost-volume-profit analysis in Nepalese industry. In according with the basic objectives other sub-objectives are also formulated and research methodology is followed to achieve the objectives of the research study.

3.2 Research Design

In order to make any type of research planned and systematic research design is necessary which fulfill the objectives of the study. Generally research design means defining procedures and techniques which guide to study and propound ways for research validity. A research design is the plan of attack: what approach to the problem will be taken? What methods will be used? What strategies will be most effective?

According to Young (1966)-"Research design is the logical and systematic planning and directing a piece of research".

According to Kerlinger (1994)-"Research design is the plan, structure, and strategy of investigation conceived so as to obtain answers to research question. The plan is the overall

scheme or program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data".

A research design is the arrangement of conditions for collection and analysis of data in such a manner that it aims to combine relevance to the study purpose with economy in procedure. This study attempts to show the relationship among cost, volume and profit and various functional budgets for their achievement and effective application within the conceptual framework of profit planning for solving the problems that have accused in GRIL. Therefore, this study is closely related to various accounting statements as well as the actual results of the budget. These information and data are presented by analytical method. But the qualities aspect of the research such as effectiveness of CVP in the industry, Views of various managers and personnel, and the theoretical prescriptions are explained in words wherever necessary. Therefore, analytical as well as descriptive research will be applied as the research design for the study.

3.3 Time Dimension (Period) of the Research Study:

The period covers by the study are five years for trend analysis and one year for the analysis of cost-volume-profit variables and related aspects. The period covered is from the fiscal year 2063/2064 to 2067/2068.

3.4 Nature and Sources of Data:

Data are the blood and weapons for successful and critical analysis of the organization and anything else. Data may be information, statistics, figures, charts, tables' etc. collection of data is necessary for successful analysis and to draw meaningful conclusions of the research.

There are two types of data i.e. primary and secondary. Primary data are obtained through direct interview, questionnaire, dialogues and discussion to the related persons. If it is based on primary data, the analysis will be more critical and imperative but the accuracy of the primary data will determined by the authenticity and reliability of data provided by the related sectors.

The secondary data collected through the different publications. The research analysis will be based specially on secondary data, which will be as follows.

1. Annual Reports, balance sheets, auditor's report, P/L account, official records and financial statements of the GRIL.
2. Journals, booklets relating to the related organizations.
3. Bulletins and reports periodically published by various governmental bodies.
4. Other published materials like newspaper, journals, magazines, and textbook etc. and unpublished official's records.
5. Dissertations relation to CVP analysis at the library of Shankar Dev Campus.
6. Dissertations relation to CVP analysis at central Library of Tribhuvan University.
7. Books related to PPC and CVP analysis.
8. Websites of related topic.

3.5 Statistical Tools Used

Crude data are managed and analyzed in proper tables and formulas. Interpretation and explanation are made wherever necessary.

To analyze the collected data, financial and statistical tools are used which are:

- Mean,
- Regression,
- Graph,
- BEP chart,
- Pie-chart,
- Bar diagram,
- Percentage ratio etc.

Similarly the accounting tools used as per necessary are:

- Contribution margin,
- Break-even point,
- Sensitivity analysis etc.

3.6 Research Variables

Variables are characteristics of persons, things, groups, objectives 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 researcher had used two types of variables, independent and dependent variables, which are presented as below:

i. Independent variable:- 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 prediction.

ii. 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 (i.e. cost, volume and Profit) of CVP analysis, which are interconnected and dependent on one another. So these factors are depending variables.

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

The research variables of the present study are sales, costs, profit and loss, time period and items included in balance sheet and other related statement of Gorakhkali Rubber Industry Limited.

CHAPTER IV

PRESENTATION AND DATA ANALYSIS

4.1 Introduction

Data presentation and analysis is the important part of the research work. It is known as the heart of research. Major findings and recommendations are depends on the data presentation and analysis.

The main objective of this study is to examine Cost-Volume-Profit analysis as a tool to measure the effectiveness of PPC of Gorakhkali Rubber Industry Limited. To fulfill this objective some presentation and data analysis will be done. This chapter is mostly concentrated on analysis and presentation of available data of five years (i.e. form FY2063/64 to FY2067/68).

4.2 Sales plan of Gorakhkali Rubber Industry Limited

Sales planning process is a part of PPC because a) it provides for the basic management decisions about marketing and b) based on those decisions, it is an organized approach for developing sales plan. If sales plan is not realistic, most other parts of overall profit planning are not realistic. Therefore, a sales plan should be realistic. Gorakhkali Rubber Industry does not have long range and short range sales plan. It hasn't properly maintained the annual sales budget. Since the industry doesn't plan sales therefore actual sales value has been analyzed. Actual sales values means the total monetary value of units sold of tyres and tubes within the period of one fiscal year by GRIL. The following table shows the actual sales revenues collected by GRIL for five years from FY2063/64 to FY2067/68.

Table No. 1

Gorakhkali Rubber Industry Limited

Sales Revenue

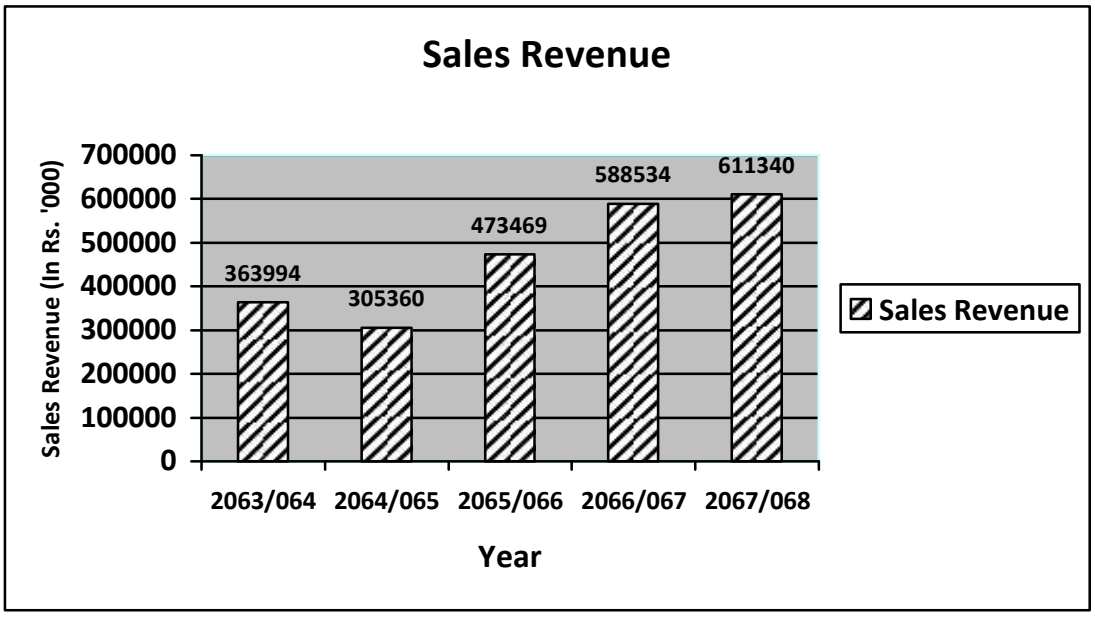
Year	Actual Sales Revenue (Rs.)	% Change
2063/64	363,993,566	—
2064/65	305,360,182	(16.11)
2065/66	473,468,981	55.05
2066/67	588,534,277	24.30
2067/68	611,340,481	3.88

From the above table, it becomes clear that the total sales revenue of Gorakhkali Rubber Industry is fluctuating. There are many reasons which cause the variation on sales revenue. Demand of products, cost of products, quality of products, service providing system of the company, political situation of Nepal, government policies, highly competition, life of product, warranty and guaranty of products etc are the main cause of fluctuating the sales revenues of the GRIL.

In the fiscal year 2063/64, the total revenue collected by the industry is only Rs. 363,993,566. In the fiscal year 2064/66, the company's sales revenue is Rs. 305,360,182 which is 16.11 percent less than the sales revenue of previous year 2063/64. But in the fiscal year 2065/66 Sales revenue is increased by 55.05% as compared to the previous year's sales. Similarly, in FY 2066/67 the sales revenue is increased upto Rs. 588,534,277 which is 24.30% more than precious year's sales revenue. In the FY 2067/68 sales revenue is increased by only 3.88% and reached to Rs. 611,340,481 from Rs. 588,534,277. Therefore, the above analysis clearly shows that the sales revenue trend is the industry is fluctuating. That means at the beginning of the analysis the percentage change analysis trend is in decreasing order and after that it is in increasing order for one year but after that sales amount is in increasing order but the percentage change in sales is in decreasing order. The presentation of the above total sales figure will be more effective by following graph:

Figure No. 3

Graphical representation of total sales of GRIL



To analyze the trend of actual sales least square method can be used to estimate the possible future sales for given time or year. This method shows the relationship between time and sales. To fit the straight line trend, time factor is assumed as independent variable (X) and sales is assumed as dependent variable (Y). In the table, FY 2065/66 is assuming as midyear and other values are estimated by using least square method. Then straight lime trend of actual sales (Y) depends upon the time (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:

$\sum y = n\,a + b \sum x$ …….. (i)

$\sum xy = a \sum x + b \sum x^2$ …….. (ii)

Table no. 2

Gorakhkali Rubber Industry Limited

Time series analysis

Fitting straight line trend by least square method

(Amount in Rs.'000)

Years(X)	Actual sales (y)	x=X─2065/66	Xy	x^2
2063/64	363,994	─2	─727,988	4
2064/65	305,360	─1	─305,360	1
2065/66	473,469	0	0	0
2066/67	588,534	1	588,534	1
2067/68	611,340	2	1,222,680	4
Total	$\sum y$ = 2,342,697	$\sum x$ = 0	$\sum xy$ =777,866	$\sum x^2$=10

Calculation of variable cost per unit (b):

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

$$= \frac{5 \times 777866 - 0 \times 2342697}{5 \times 10 - (0)^2}$$

=Rs. 77,786.6

Now, calculation of fixed cost (a):

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

$$= \frac{2342697 - 77786.6 \times 0}{5}$$

=Rs. 4,68,539.4

Therefore, a = 4,68,539.4 and b = 77,786.6

Thus, y = 4,68,539.4 + 77,786.6X, is the trend line of sales figure.

By using this trend equation, we can estimate the actual sales for the FY 2068/69. For the estimation of the sales of the year 2068/69, FY 2065/66 is using as base year.

Y = 4,68,539.4 + 77,786.6 X 3

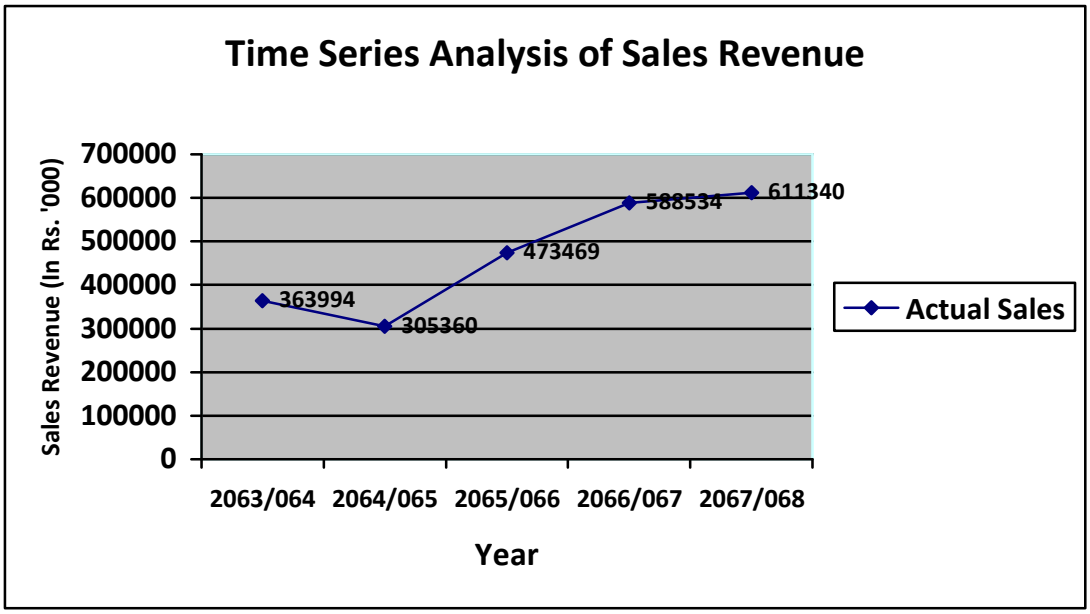
= 4,68,539.4 + 2,33,359.8

= Rs. 7,01,899.2 thousand.

Therefore, if the trend does not change, the possible sales for the year 2068/69 will be Rs. 7,01,899.2 thousand.

The presentation of the above sales figure with the trend will be more effective by the following graph:

Figure no. 4



From the above figure, it becomes clear that the trend line of Gorakhkali Rubber Industry is fluctuating. First it is in decreasing order and there after FY 2064/065 it is in increasing order.

4.3 Cost plan of Gorakhkali Rubber Industry Limited

In simple words, cost means the total of all expenses. According to the Oxford Dictionary, cost means the price paid for something. But in cost accounting terminology, cost refers to the amount of expenditure (actual or notional) involved in the production of a product.

GRIL has classified the cost into three categories which are as follows:

i. Cost of Sales
ii. Selling and Distribution costs
iii. Administrative costs

i. Cost of Sales: The costs which are related with production includes: raw materials, packaging materials, electricity and energy, repair and maintenance of plant and machinery including building and construction infrastructure.

ii. Selling and Distribution costs: These cost are related to management and include: TADA, printing and stationary, communication expenses, entertainment expenses, donation, legal and other professional expensed, meeting allowances, audit fee, training expenses, other expensed, bank commission, office expenses, repair and improvement, rubber processing cost, doubtful debts, employee expensed, tax and fees, advertisement expenses, insurance, preliminary expenses, technical expenses etc.

iii. Selling and Administrative costs: It is the cost incurred for selling and distribution of the product and include: cash discount, transportation, export expenses, loading and unloading expenses, reimbursement of tyre, discount in sales, sales promotion, sales bonus, interest on deposit received from dealers etc.

Each of the cost has both fixed costs and variable cost included in it. As per the nature and information provided by Mr. Dinish Karki, Account Department and Mr. Upendra Manandhar, Administrative Department, they are classified into the two categories; Variable and Fixed costs. The industry does not have any particular method or technique to classify the costs into variable and fixed. Therefore, the costs that are classified for our purpose are purely based on judgment approach.

4.3.1 Variable Cost Analysis of Gorakhkali Rubber Industry Limited

Variable costs are those cost which, in total, Vary/change in direct proportion to the activity level (production/sales) within relevant range. Variable costs are affected by the change in activity. As the production increases, total variable cost also increases by the same proportion and vice versa. If production increases by 50%, total variable cost will also increase by same percentage i.e. 50%. If the production is zero, total variable cost will be also zero. But the variable cost per unit is always fixed either production increases or decreases. Examples of variable cost include direct material, direct labour (wages), direct expenses, etc. The variable costs of GRIL are presented in the table as follows:

Table No. 3

Variable cost Analysis of GRIL

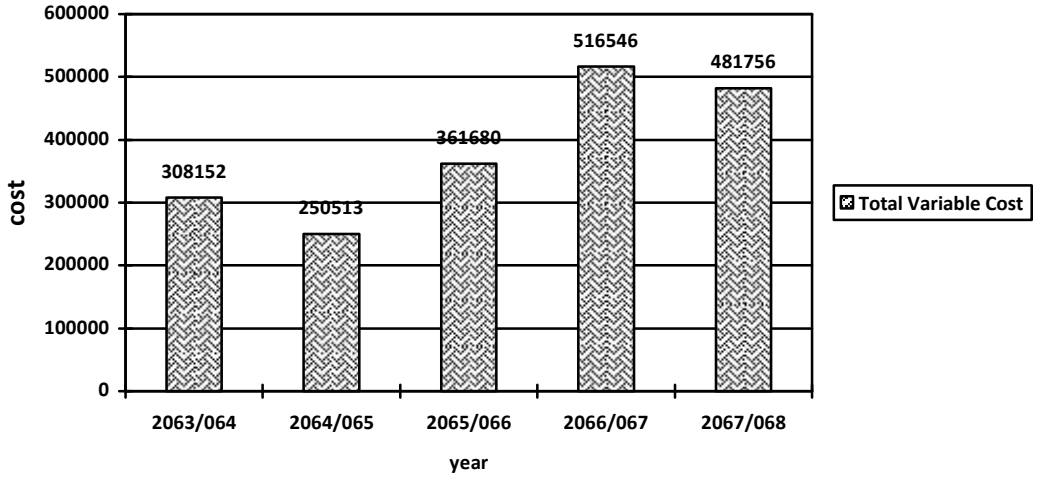
Amount (Rs.'000)

Particulars	Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
1. Cost of Sales:					
Raw Material	2,18,386	171,401	251,661	357,416	353,953
Packaging materials	5,552	5,000	7,395	12,077	-
Electricity & Energy	42,371	34,327	53,270	78,708	63,532
Total	2,66,309	2,10,728	3,12,326	4,48,201	4,19,485
2.Administrative cost:					
Traveling & daily expenses	2,117	1,539	1,766	1,901	2,161
Printing & stationary	347	232	595	696	566
Communication expenses	1,299	980	893	1,260	1,135
Books and newspaper	44	47	56	46	62
Entertainment expenses	424	257	343	681	874
Donation	117	166	264	350	342
Office supplies	541	436	494	930	599
Technical & professional exp.	2,061	927	392	293	420
Management meeting allowance and expenses	224	232	253	334	310
Other meeting allowance and expenses	-	-	255	468	495
Training expenses	82	-	111	67	127
Water & Electricity	417	136	137	103	121
Fuel & vehicle	2,020	1,403	1,684	1,967	2,178
Other expense	2,793	1,224	791	811	466
Bank commission	460	324	349	296	139
Other expenses	2,893	9,400	1,097	1,477	584
Total	13,045	16,078	8,689	10,869	10,110
3.Selling & Distribution:					
Cash discount	10,688	9,087	13,625	18,592	21,229
Carriage & transportation exp.	2,462	2,040	3,702	4,940	4,060
Loading & unloading	22	71	128	149	106
Reimbursement of tyres	3,709	2,953	3,717	3,267	4,581
Export expenses	6	-	-	-	-
Discount on sales	11,911	9,556	19,493	30,527	22,185
Total	28,798	23,707	40,665	57,476	52,161
Total Variable cost(1+2+3)	**3,08,152**	**2,50,513**	**3,61,680**	**5,16,546**	**4,81,756**
Change	-	(18.70%)	44.38%	42.82%	(6.74%)

Above table shows that there is variation in variable cost of sales, administrative cost and selling and distribution cost for different years. This table shows that Total Variable Cost is decreased in FY 2064/65 by 18.70% and in FY 2067/68 by 6.74% but increased in FY 2065/66 by 44.38% and in FY 2066/2067 by 42.82%. This table shows, the company is spending High amount for purchasing raw materials. Electricity charges, traveling and daily expenses, cost of reimbursement of tyre, cash discount, carriage & transportation expenses, and discount on sales etc. are also responsible for fluctuating of variable cost. The real situation of variable cost of the company can be seen from the following graph:

Figure no. 5

Total variable cost of GRIL



From this figure we can clearly see that total variable cost of GRIL is fluctuating. Total variable cost is lowest in FY 2064/065 and highest in FY 2066/067.

4.3.2 Fixed Cost Analysis of Gorakhkali Rubber Industry Limited

Fixed cost is a cost that remains constant, in total, regardless of changes in the level of activity (production/sales) within relevant range. Fixed costs are not affected by changes in activity. As the production increases and decreases, the total fixed costs remain constant. And some fixed cost has to bear by the company even though the production is zero. But the fixed cost per unit in not fixed, as the production increases fixed cost per unit decreases and vice versa. The Fixed costs of GRIL are presented in the table as follows:

Table No. 4

Fixed cost Analysis of GRIL

Amount (Rs.'000)

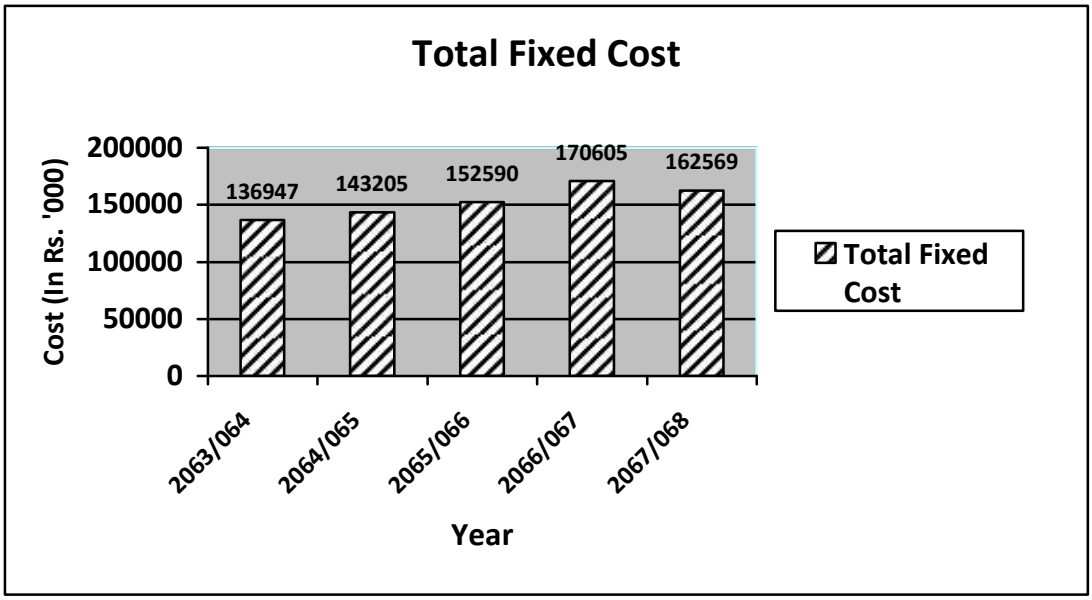
Particulars	Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
1. Cost of Sales:					
Repair & Maintenance:					
) Plant and Machinery	2,140	2,174	4,433	6,096	7,510
) Building & Construction infrastructure	81	30	71	105	133
Total	2,221	2,204	4,504	6,201	7,634
2. Administrative cost:					
Employee expenses	43,934	54,818	65,054	92,883	87,668
Tax and fees	662	301	243	591	292
Advertisement & promotion	87	36	17	295	240
Scholarship	-	-	-	-	60
Repair & Maintenance:					
Vehicle	425	400	466	690	690
General repair	128	2	112	360	154
Annual general meeting	12	170	-	644	297
Insurance	1,743	2,095	2,037	2,919	2,596
Audit fee	81	81	89	94	94
Rent	137	138	264	462	508
Total	47,209	58,041	68,282	98,938	92,599
3.Selling & Distribution:					
Sales Promotion	3,023	540	455	5,103	4,179
Sales Bonus (interest on deposit received from dealers)	1,650	1,436	1,465	2,059	2,209
Total	4,673	1,976	1,920	7,162	6,388
4. Other Fixed Costs:					
Depreciation	26,912	23,383	21,806	21,508	19,874
Interest	55,932	57,601	56,078	36,796	36,074
Total	82,884	80,984	77,884	58,304	55,948
Total Fixed cost(1+2+3+4)	**1,36,947**	**1,43,205**	**1,52,590**	**1,70,605**	**1,62,569**
Change	-	4.57%	6.55%	11.81%	(4.71%)

Above table shows that there is variation in fixed cost of sales, administrative cost and selling and distribution cost for different years. This table shows that Total Fixed Cost is decreased in FY 2067/68 by 4.71% and but increased in FY 2064/65 by 4.57%, in FY 2065/66 by 6.55% and in FY 2066/2067 by 11.81%. This table shows, the company is spending High amount for charging depreciation and paying interest. Employee expenses, insurance

expenses and sales promotion etc. are responsible for fluctuating of fixed cost. The real situation of fixed cost of the company can be seen from the following graph:

Figure no. 6

Graphical representation of Total Fixed Cost of GRIL

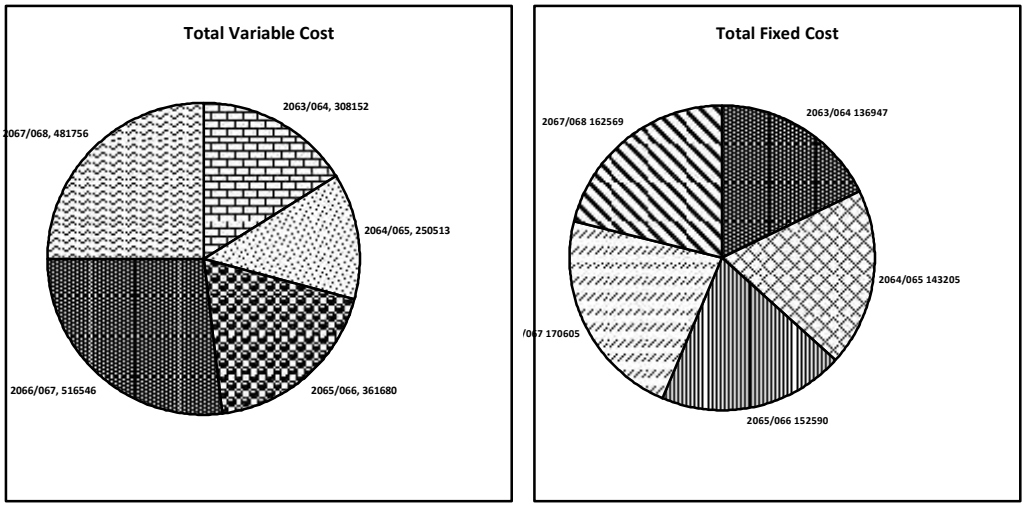


From the above chart we can clearly see that total fixed cost of 2066/67 is highest and 2063/64 is lowest.

The total variable cost and total fixed cost can be seen from the following pie-chart:

Figure no. 7

Pie-chart showing Total VC and total FC



From the above pie chart we can see total fixed cost and total variable cost of Gorakhkali Rubber Industry Limited.

4.3.3 Semi-Variable Cost Analysis of Gorakhkali Rubber Industry Limited

The semi-variable costs are the one which remain same for certain relevant range and then change as per the activity level. The industry has not particular method to segregate the semi-variable costs. According to Mr. Dinish Karki, Account Department and Mr. Upendra Manandhar, Administrative Department, semi-variable costs are classified into variable and fixed cost by the relevancy, their mature and the judgment of the related officers. On going through the interview with company's senior officers, they have the practice of separating semi-variable costs into fixed and variable but no particular method has been sued except the judgmental basis. Therefore, the above costs were classified into variable and fixed as per the suggestion and detail given by the senior staffs of the industry.

4.4 Profitability Analysis of Gorakhkali Rubber Industry Limited

Since the industry is suffering loss from the beginning of its operation year, therefore it is not relevant to analyze only the net profit (loss) of the industry. For this reason gross profit and operating profit are also analyzed apart from net operating profit with the help of trading and profit & loss account. Gross profit can be found out after deducting cost of sales from the total sales revenue. The operating profit of the industry has been derived after adding other income and subtracting selling and distribution expenses and office and administrative expenses from grass profit. And the net operating profit can be calculated after deducting interest expenses and depreciation from operating profit.

The gross profit, operating profit and net operating profit can be shown as follows:

Table No. 5

Profitability Analysis of Gorakhkali Rubber Industry Limited

Amount (Rs'000)

Years	Particulars		
	Gross Profit	Operating Profit	Net Operating Profit
2063/64	98,672	8,027	(74,817)
2064/65	74,178	(10,635)	(91,619)
2065/66	1,55,491	66,987	(10,897)
2066/67	2,11,054	71,337	13,033
2067/68	1,28,356	(15,046)	(70,994)

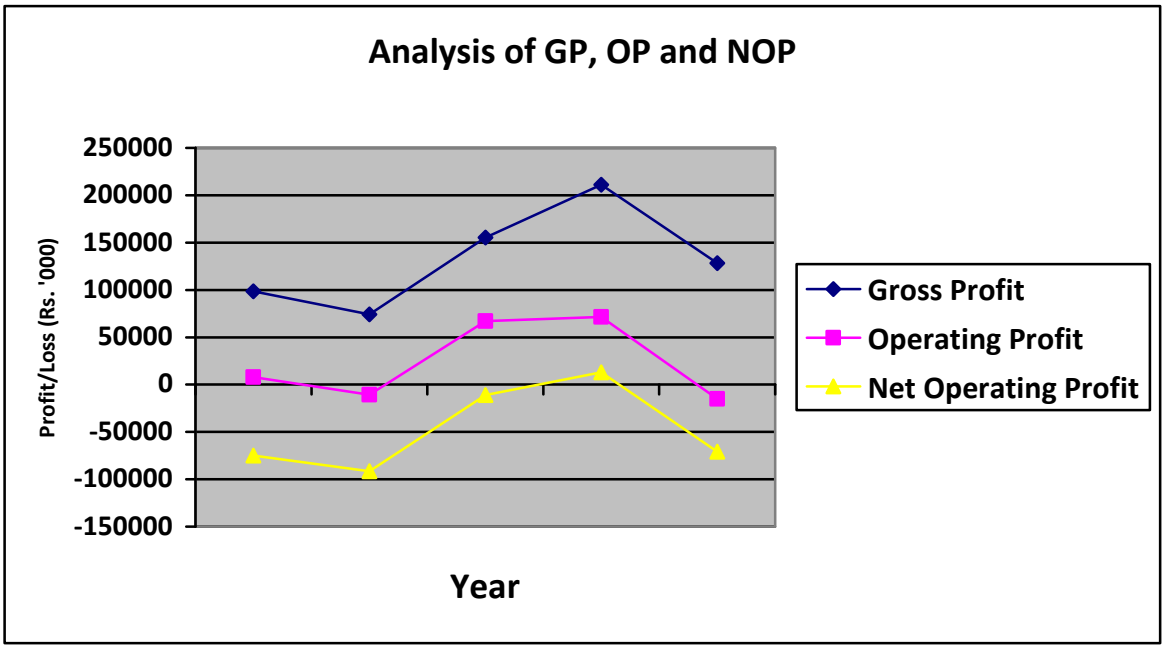
Details of gross profit, operating profit and net operating profit for the five years are shown in the Appendix III.

From the above table we can see that the company is earning gross profit in each year and operating profit for three years only, but except FY 2066/67 the company has been suffering from net loss. The industry is able to make operating profit but due to the huge amount of interest and depreciation it is bearing net operating loss. In FY 2066/67 the industry earned net operating profit because that year there was a big amount of closing stock of WIP and finished goods which help to decrease the amount of cost of sales and low interest which helps to decrease the fixed cost. Political condition, high competition, low utilization of capacity, strikes and Nepal Banda, old technology, high interest rate of loan are may be the causes of continuous losses of the industry.

Gross profit, operating profit and net operating profit of GRIL can be seen from the following graph also:

Figure no. 8

Graphical Representation of GP, OP and NOP of GRIL



From this above graph of GRIL we can see that the net operating profit has a negative curve.

For the detail information of Gross Profit, Operating Profit and Net Operating Profit, the income statement of GRIL will be required, so which is presented as follows:

Table no. 6

Income statement of Gorakhkali Rubber Industry Ltd.

For the fiscal year 2067/68

(From Appendix III)

(Amount in Rs.'000)

Particulars	Amount	Amount
Sales		6,11,340
Less: Cost of Sales		4,82,984
Gross Profit		1,28,356
Add: Other income		17,858
Total gross profit including other income		1,46,214
Less: Operating expenses:		
⁾ Office and administrative expenses	1,02,710	
⁾ Selling and distribution expenses	58,550	1,61,260
Operating profit		(15,046)
Less: Other fixed cost:		
⁾ Interest expenses	36,074	
⁾ Depreciation	19,874	55,948
Net operating loss or net loss		**(70,994)**

From the above income statement, we can see that there is Rs. 1,28,356 Gross profit, Rs. 18,046 Operating loss and Rs. 70,994 net operating loss in fiscal year 2067/68.

4.4.1 Profitability Ratios of Gorakhkali Rubber Industry Ltd.

Profit is essential for the growth and survival of the business. Without which, no business can run for long time. Profitability ratios are calculated to measure the overall efficiency of the business.

a.Gross profit margin ratio:

Gross profit margin or ratio measures the relationship between gross profit and sales revenue. This ratio is calculated by dividing gross profit by sales and express as % of net sales. A highly gross profit margin ratio signifies a good management due to low

cost of production. It also shows higher selling price without a corresponding increase in cost of goods sold. A low gross profit margin is dangerous and requires a careful analysis of the factor of production.

$$\text{Gross Profit ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$\text{Gross Profit margin ratio (FY 2067/68)} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$= \frac{12,83,56,937}{61,13,40,481} \times 100$$

$$= 20.99\% \text{ or } 21\%$$

This ratio represents the comparatively low gross profit. This ratio signifies there is no good management and high cost of production. Gross profit margin for the FY 2063/64 was 27.11%, for FY2064/65 was 24.29%, for FY 2065/66 was 32.84% and for FY 2066/67 was 35.86. Detail calculation of gross profit margin ratio is shown in Appendix III.

b. Net profit margin ratio:

This ratio measures the overall profitability of the industry by establishing relationship between net profit and sales. The main objective of computing this ratio is to determine the overall profitability effectiveness of the operation. This ratio indicates an average net margin earned on sales of Rs. 100, hence the higher ratio is preferred. A higher ratio ensures adequate return to the owner and enables a firm to face adverse conditions arising from decling selling price, rising cost of production and decreasing demand. A lower ratio is indication of poor financial planning and low efficiency. This ratio can be calculated by dividing net profit by sales and expressed as % of net sales as follows:

$$\text{Net Profit ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

$$\text{Net Profit margin ratio (FY 2067/68)} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

$$= \frac{(7,09,94,000)}{61,13,40,481} \times 100$$

$$= (11.61\%)$$

This result shows that the industry has suffered the huge amount of net losses and industry has poor financial planning and low efficiency. Net profit ratio for FY 2063/64 was (20.55%), for FY 2064/65 was (30%), for FY 2065/66 was (2.30%) and for FY 2066/67 was 2.21% (From Appendix III).

c. Operating profit Ratio:

Operating ratio expresses the relationship between the operating profit and the sales amount.

$$\text{Operating Profit ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$\text{Operating Profit ratio (FY 2067/68)} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$= \frac{(1,50,46,000)}{61,13,40,481} \times 100$$

$$= (2.46\%)$$

Operating profit ratio for FY 2063/64 was 2.21%, for FY 2064/65 was (3.48%), for FY 2065/66 was 14.15% and for FY 2066/67 was 12.12% (From Appendix III).

4.5 Cost-Volume-Profit analysis of Gorakhkali Rubber Industry Limited:

Cost volume profit analysis examines the behavior of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit, and / or fixed cost of a product. Cost-Volume-Profit analysis is an important tool of profit planning because it provides the information about the behaviors of cost in relation to volume, volume of production or sales where the business will break-even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for a target profit level etc.

4.5.1 Income statement analysis of Gorakhkali Rubber Industry Limited:

Income is computed by deducting all expenses from the sales. It is surplus of sales over expenses. Income measures the real performance of the industry. High income indicates good performance whereas low income indicates threat to the company. Value of income is received by deducting fixed and variable cost from sales. When variable cost is deducted by sales the result is called contribution margin and net profit can be find our after deducting fixed cost from the contribution margin. Detail information of income statement is as follows:

Table no. 7

Income statement of Gorakhkali Rubber Industry Limited

For the fiscal year 2063/64 to 2067/68

(Amount in Rs'000)

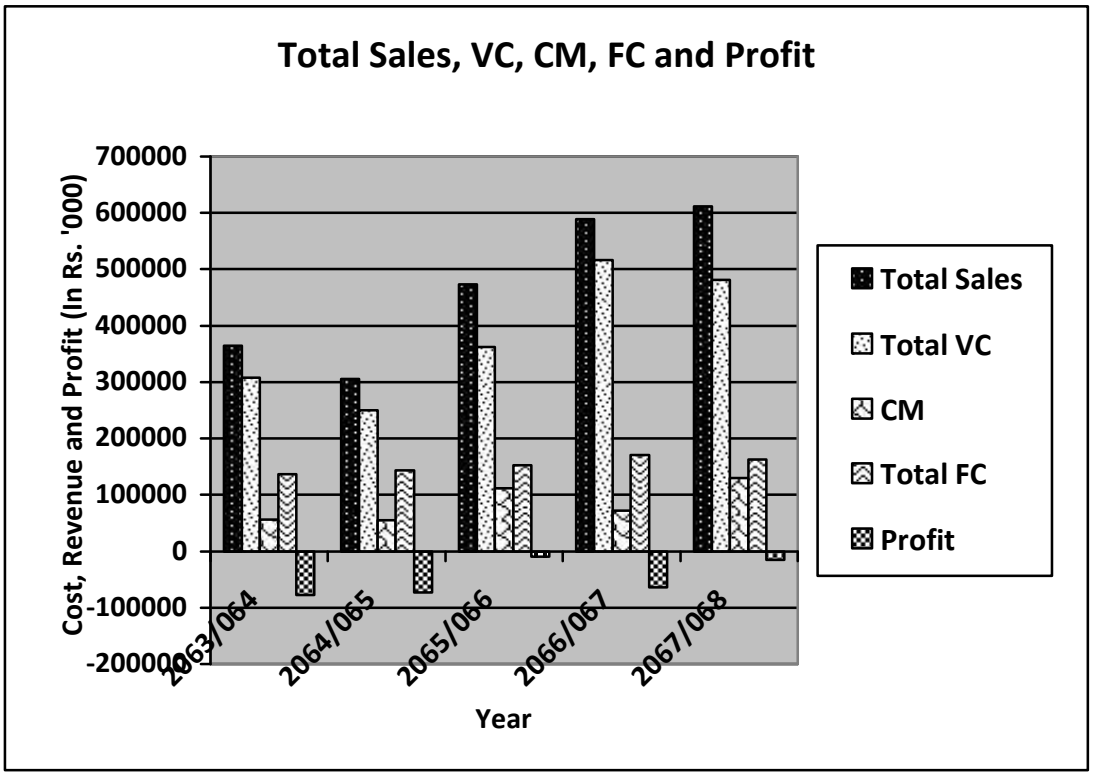
Particulars	**Years**				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales revenue	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Less: Variable cost:					
⌡ Cost of sales	2,66,309	2,10,728	3,12,326	4,48,201	4,19,485
⌡ Administrative cost	13,045	16,078	8,689	10,869	10,110
⌡ Selling & distribution cost	28,798	23,707	40,665	57,476	52,161
Total Variable cost	3,08,152	2,50,513	3,61,680	5,16,546	4,81,756
Contribution margin(S-VC)	55,842	54,847	1,11,789	71,988	1,29,584
Less: Fixed Cost:					
⌡ Cost of sales	2,221	2,204	4,504	6,201	7,634
⌡ Administrative cost	47,209	58,041	68,282	98,938	92,599
⌡ Selling & distribution cost	4,673	1,976	1,920	7,162	6,388
⌡ Depreciation	26,912	23,383	21,806	21,508	19,874
⌡ Interest	55,932	57,601	56,078	36,796	36,074
Total Fixed Cost	1,36,947	1,43,205	1,52,590	1,70,605	1,62,569
Profit or Loss excluding other income (CM-FC)	(81,105)	(88,358)	(40,801)	(98,617)	(32,985)

Add: Other incomes	3,083	14,994	31,053	34,730	17,858
Profit or Loss including other income	(78,022)	(73,364)	(9,748)	(63,887)	(15,127)

This income statement shows Variable cost of the industry is in fluctuating trend. It was highest in FY 2066/67 and lowest in FY 2064/65. Contribution margin is also fluctuating. It was highest in FY 2067/68 and lowest in FY 2064/65. Due to the highly administrative cost and interest charge, the total fixed cost is very high and it is the main causes of losses. The industry has been bearing heavy losses. Income statement shows there is a highest loss in FY 2063/64 and a lowest loss in FY 2065/66. But in this income statement Stocks are not included, so there is difference of the profit between profit and loss account and income statement. Total sales, Total Variable cost, contribution margin, total fixed cost and profit of the company also can be shown from the following bar graph:

Figure no 9

Graphical Representation of Total sales, VC, CM, FC and Profit of GRIL



Above table shows that profit is in downward slope in negative figure so it shows that every year there is losses in GRIL. Total cost is very high in every year in the comparison of total sales.

4.5.2 Analysis of Contribution Margin Ratio, BEP and Margin of Safety:

- Contribution margin and Contribution margin ratio:

Contribution margin:

Contribution margin is the difference between sales revenue and the amount of variable cost. It is the total sales less total variable costs. It is also an amount which is equal to fixed cost plus the profit. It can be express as:

Contribution margin = Sales − Variable cost

Or, Contribution margin = Fixed cost + Profit

Contribution margin for FY 2067/68 = 61,13,40,000 ─ 48,17,56,000

=Rs. 12,95,84,000

Contribution margin ratio:

Contribution margin expressed as percentage on sales revenue is called contribution margin ratio or C/M ratio or profit Volume ratio or P/V ratio. The detail is as follows:

Table No. 8

Contribution Margin Ratio of GRIL

For the FY 2063/64 to 2067/68

(Amount in Rs.'000)

Details	Fiscal Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Contribution margin	55,842	54,847	1,11,789	71,988	1,29,584
Contribution margin ratio(CM/Sales)	0.15 or, 15%	0.18 or, 18%	0.24 or, 24%	0.12 or, 12%	0.21 or, 21%

This table shows that the CM ratio is in fluctuated trend. The C/M Ratio of the industry are 0.15, 0.18, 0.24, 0.12, and 0.21 in the FY 2063/64, 2064/65, 2065/66, 2066/67, and 2067/68 respectively. The C/M ratio of FY 2066/67 is minimum and maximum is in FY 2065/66. Higher the C/M ratio is better. And the C/M ratio of the industry is not satisfactory.

Break Even analysis: BEP is that level of sales volume which a company neither makes a profit nor suffers losses. It will just be able to recover its cost. In other words, this is a point at which a company breaks the loss (minus) zone and enters into profit zone. Break even

analysis helps the management to know which sales volume will only recover its cost and after which it starts giving profit. Therefore, it can provide management some insights into profit planning. The detail is as follows:

Table No. 9

BEP analysis of GRIL

For the FY 2063/64 to 2067/68

(Amount in Rs.'000)

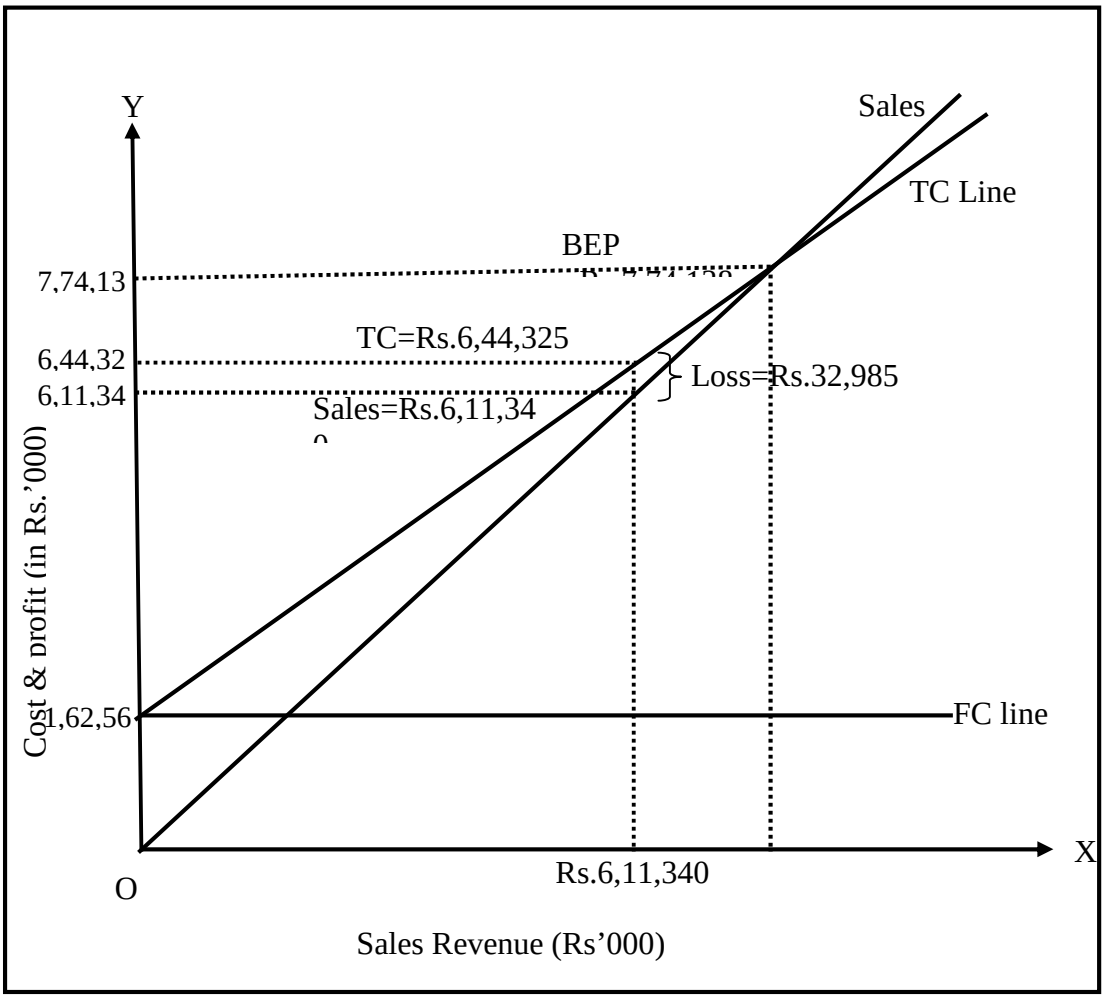
Details	Fiscal Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
Fixed cost	1,36,947	1,43,205	1,52,590	1,70,605	1,62,569
C/M ratio	0.15	0.18	0.24	0.12	0.21
BEP in Rupees (FC/CM Ratio)	9,12,980	7,95,583	6,35,792	14,21,708	7,74,138

This table shows that the BEP is in fluctuated trend. BEP of GRIL is very higher than actual sales. Because of high fixed cost and low CM Ratio it is very high. It is highest in FY 2066/67 and lowest in FY 2065/66.

The BEP can also be computed graphically. The 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 pint (the break-even point) is located at the pint where the total cost and total revenue line cross. Below this point, the industry incurs losses, and above this point, the industry earns profit. This can be presented as follows:

Graphical Representation of BEP in Rupees for FY 2067/68

Figure no. 10



Above figure is presented to point out the BEP sales. In this X-axis is treated as sales revenue and Y-axis is graphed as cost in amount. Since, fixed cost is constant, so it is parallel to X-axis. The total cost increase with the increase in sales revenue. So, total cost curve slope upward to right side. Total cost curve starts from fixed cost of Rs. 16,25,69,000. This cost Rs. 16,25,69,000 is also total cost when sales revenue is zero. This chart also shows that sales revenue is also sloping upward to the right. The point, at which the sales revenue and total cost lines intersect, is known as BEP sales point. In this figure BEP is Rs. 77,41,38,000. If actual sales is more than BEP, then profit will occur, otherwise sales is less then BEP, loss will incur. Here actual sales Rs. 61,13,40,000 is less than total cost of Rs. 64,43,25,000, which leads to the loss of Rs. 3,29,85,000.

- Margin of Safety (MOS) Analysis:

The Margin of Safety (MOS) is the excess of sales over the break even volume of sales. It is the difference between total sales revenue and break even sales revenue. The margin of safety indicates that the amount by which sales could drop before profit reaches the break even points. This can be calculated as follows:

Margin of safety (MOS) = Total sales ─ Break even sales.

Margin of safety (MOS) of FY 2067/68 = 6,11,340 ─ 7,74,138

=Rs. (1,62,798)

This can be presented in table as follows:

Table No. 10

MOS analysis of GRIL

For the FY 2063/64 to 2067/68 (Amount in Rs.'000)

Details	Fiscal Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
BEP in Rs.	9,12,980	7,95,583	6,35,792	14,21,708	7,74,138
MOS (Sales ─ BEP)	(5,48,986)	(4,90,223)	(1,62,323)	(8,33,174)	(1,62,798)

This table shows that the margin of safety of the industry is fluctuating trend. All MOS amount are in negative figure so it indicated that the industry in not strong profitability position.

Table no. 11

Gorakhkali Rubber Industry Limited

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

(Amount in Rs.'000)

Particulars	Fiscal Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Contribution margin	55,842	54,847	1,11,789	71,988	1,29,584
C/M ratio (CM/Sales)	0.15	0.18	0.24	0.12	0.21
Fixed cost	1,36,947	1,43,205	1,52,590	1,70,605	1,62,569
BEP(FC/CM Ratio)	9,12,980	7,95,583	6,35,792	14,21,708	7,74,138
BEP as % of sales (BEP/Sales)	250.8	260.54	134.28	241.57	126.63
MOS (S ─ BEP)	(5,48,986)	(4,90,223)	(1,62,323)	(8,33,174)	(1,62,798)
MOS as % of sales (MOS/Sales)	(150.82)	(160.54)	(34.28)	(141.57)	(26.63)

Above table shows detail analysis of Contribution Margin Ratio, BEP and Margin of Safety. All MOS are in negative figure as the result MOS in percentage is also negative.

4.6 Sensitivity Analysis: Assessing the impacts of the changes in cost-volume-profit variables.

Sensitivity analysis is the measurement of elasticity of the change in cost,-volume-profit factors on break-even-point or given profit. The strategist should focus 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 on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinant variables. Here we systematically deal with the following sensitivity analysis.

4.6.1 Assessing the impact when selling price is changed:

Any changes in selling price will also be changed in CM ratio, BEP, and Profit. To see the effect of change in sales value, we increase and decrease sales revenue of FY 2067/68 by 10% making other thing constant. Result is as follows:

Table no. 12

Income statement when 10% change in selling price of GRIL

For the FY 2067/68 (Amount in Rs.'000)

Details	**Original sales value**	**Changes in sales value**	
		10% increased	**10% decreased**
Sales	6,11,340	6,72,474	5,50,206
Less: Variable cost	4,81,756	4,81,756	4,81,756
Contribution Margin	1,29,584	1,90,718	68,450
Less: Fixed cost	1,62,569	1,62,569	1,62,569
Net Profit or Loss	(32,985)	28,149	(94,119)
Changes in Net Profit/loss	-	61,134	(61,134)
C/M ratio (CM/Sales)	0.21	0.28	0.12
BEP in Rs. (FC/CM ratio)	7,74,138	5,80,604	13,54,742
% changes in BEP	-	(25%)	75%

The above table shows that when sales value is increased by 10%, net loss is decreased by Rs. 6,11,34,000 i.e. the industry earned profit. Similarly C/M ratio is increased up to 0.28 from 0.21. The BEP is decreased to Rs. 58,06,04,000 from Rs. 77,41,38,000 by 25%.

When the sales value is decreased by 10%, net loss is increased by Rs. 6,11,34,000. Similarly C/M ratio is decreased to 0.12 from 0.21. The BEP is increased to Rs. 1,35,47,42,000 from Rs. 77,41,38,000 by 75%. So, we can say that there is inverse relationship between sales and BEP.

4.6.2 Assessing the impact when variable cost is changed:

Any changes in variable cost will also be changed in CM ratio, BEP, and Profit. To see the effect of change in variable cost, we increase and decrease variable cost of FY 2067/68 by 10% making other thing constant. Result is as follows:

Table no. 13

Income statement when 10% change in variable cost of GRIL

For the FY 2067/68

(Amount in Rs.'000)

Details	**Original variable cost**	**Changes in variable cost**	
		10% increased	**10% decreased**
Sales	6,11,340	6,11,340	6,11,340
Less: Variable cost	4,81,756	5,29,932	4,33,580
Contribution Margin	1,29,584	81,408	1,77,760
Less: Fixed cost	1,62,569	1,62,569	1,62,569
Net Profit or Loss	(32,985)	(81,161)	15,191
Changes in Net Profit/loss	-	(48,176)	48,176
C/M ratio (CM/Sales)	0.21	0.13	0.29
BEP in Rs. (FC/CM ratio)	7,74,138	12,50,530	5,60,583
% changes in BEP	-	61.54%	(27.59)%

The above table shows that when variable cost is increased by 10%, net loss is increased by Rs. 4,81,76,000. Similarly C/M ratio is deceased to 0.13 from 0.21. The BEP is increased to Rs. 1,25,05,30,000 from Rs. 77,41,38,000 by 61.54%.

When the variable cost is decreased by 10%, net loss is decreased by Rs. 4,81,76,000 i.e. the industry earned profit. Similarly C/M ratio is increased to 0.29 from 0.21. The BEP is decreased to Rs. 56,05,83,000 from Rs. 77,41,38,000 by 27.59%.

4.6.3 Assessing the impact when fixed cost is changed:

Any changes in fixed cost will also be changed in BEP and Profit but there is no effect of changes of fixed cost in C/M ratio. To see the effect of change in fixed cost, we increase and decrease fixed cost of FY 2067/68 by 10% making other thing constant. Result is as follows:

Table no. 14

Income statement when 10% change in variable cost of GRIL

For the FY 2067/68

(Amount in Rs.'000)

Details	**Original variable cost**	**Changes in variable cost**	
		10% increased	**10% decreased**
Sales	6,11,340	6,11,340	6,11,340
Less: Variable cost	4,81,756	4,81,756	4,81,756
Contribution Margin	1,29,584	1,29,584	1,29,584
Less: Fixed cost	1,62,569	1,78,826	1,46,312
Net Profit or Loss	(32,985)	(49,242)	(16,728)
Changes in Net Profit/loss	-	(16,257)	16,257
C/M ratio (CM/Sales)	0.21	0.21	0.21
BEP in Rs. (FC/CM ratio)	7,74,138	8,51,552	6,96,724
% changes in BEP	-	10%	(10)%

The above table shows that when fixed cost is increased by 10%, net loss is increased by Rs. 1,62,57,000. But there is no change in C/M ratio. The BEP is increased to Rs. 85,15,52,000 from Rs. 77,41,38,000 by 10%.

When the fixed cost is decreased by 10%, net loss is decreased by Rs. 1,62,57,000 i.e. the industry earned profit. The BEP is decreased to Rs. 69,67,24,000 from Rs. 77,41,38,000 by 10%.

4.7 Measuring Risk: Degree of operating leverage (DOL)

The relationship between contribution margin and EBIT is called Degree of Operating Leverage (DOL). It may be defined as the rate of changes in EBIT due to the changes in the rate of sales. The firm operating with high fixed operating cost has higher degree of operating leverage. Higher levels of risk are attached to higher degree of leverage. High operating leverage is good when sales are increasing and bad when they are falling. DOL can be measured as follows:

$$\text{DOL} = \frac{\text{Contribution Margin}}{\text{Earning Before Interest and Tax}}$$

$$\text{Or, DOL} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales} - \text{Variable Cost} - \text{Fixed Cost}}$$

This can be presented in table as follows: –

Table no. 15

Gorakhkali Rubber Industry Limited

Analysis of Degree of Operating Leverage

(Amount in Rs.'000)

Particulars	Fiscal Years				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Less: Variable cost	3,08,152	2,50,513	3,61,680	5,16,546	4,81,756
Contribution margin	55,842	54,847	1,11,789	71,988	1,29,584
Less: Fixed cost	1,36,947	1,43,205	1,52,590	1,70,605	1,62,569
EBT	(81,105)	(88,358)	(40,801)	(98,617)	(32,985)
Add: Interest	55,932	57,601	56,078	36,796	36,074
EBIT	(25,173)	(30,757)	15,277	(61821)	3,089
DOL (CM/EBIT)	(2.22)	(1.78)	7.32	(1.16)	41.95

The above table shows that DOL of GRIL is fluctuating due to fluctuation in contribution margin and profit. The greater the DOL, greater is the business risk. DOL of FY 2063/64, 2064/65 and 2066/67 are in negative figure and DOL of 2067/68 is highest. The DOL of FY 2065/66 is 7.32 times. This implies that the 1 percent change in sales can bring about 7.32 percent changes in profit. It shows that GRIL need to absorb more fixed cost to aim for more profit.

4.8 Major findings:

After the analysis of various data, the major findings of the study are as follows:

- GRIL does not have long range and short range sales plan. It hasn't properly maintained the annual sales budget. So they have poor budgeting system.
- Sales trend of GRIL is very fluctuating. Highest sales is Rs. 611,340,481, is in FY 2067/68 and lowest is in 2064/65 as Rs. 305,360,182 , and sales revenue of GRIL is not sufficient to cover the cost.
- From the time series analysis, the possible sales for the year 2068/69 will be Rs. 701,899,200, which is Rs. 90,559,000 more than FY 2067/68.
- Cost are classified into only two categories; variable and fixed cost. The industry does not have any particular and scientific method to classify the costs into variable and fixed. Costs are classified as per management judgment basis.
- Variable cost of GRIL is more than its fixed cost in total cost structure, which made for lower contribution margin.
- The industry does not have any detailed and systematic practice of planning of cost which is one of the essential of profit planning and control.
- GRIL has less C/M ratio and more BEP sales; as a result GRIL is suffering from loss.
- Margin of safety of GRIL is negative because break even sales is higher than actual sales. There is no safety margin in GRIL.
- The industry is able to make gross profit each year and operating profit for some years but the industry has been suffering from net loss each year, so profitability of the industry is very poor.
- Gross profit margin ratio is 21% and Net profit margin ratio is (11.61%), which are not satisfactory. It indicates there is no good management, and low efficiency and poor financial planning.
- DOL of GRIL is fluctuating due to fluctuation in contribution margin and profit. DOL of FY 2063/64, 2064/65 and 2066/67 are in negative figure and DOL of 2067/68 is highest.
- Sensitivity analysis shows that any changes in selling price, variable cost and fixed cost will also be changed in CM ratio, BEP, and Profit. If sales is increased by 10% then the industry can earned profit.
- Due to the heavy losses from many years industry is not able to provide dividend and income tax.

- Industry is receiving discount of custom duty and discount from Nepal Government for interest of investment. But after receiving such discount, industry is not able to increase the volume of sales and production and amount of profit.
- Due to the low working capital, electricity cut off problem and increased in price of raw material, the GRIL is utilizing only 28% capacity, which is one of the reasons of high price of its product.
- GRIL is producing only Bios tyres but in market there is high demand of Redial tyres and industry also planning to product Redial tyres which may greatly help to reduce the loss of the industry.
- Products of GRIL are supplied all over the Nepal therefore it partially successful to substitute the import of tyres.
- The total loss of the GRIL upto FY 2067/68 is RS. 789,286,146 and net worth is in negative figure so there is doubt in industry's future i.e. doubt in industry's 'Going Concern'.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Industrialization is an important factor for achieving the basic objective of a country's economic and social progress. Industrialization not only provides goods and services but also creates employment opportunities. It facilitates an effective mobilization of resources of capital and skill, which might otherwise remain unutilized. Industrialization plays a crucial role in achieving high rate of economic growth in developing countries. By the realization of this fact, many public and private enterprises were established.

Gorakhkali Rubber Industry Limited is one of the biggest industries of the country and the main objective of the industry is producing automobile's tyres, tubes of high quality.

The main objective of this study was to examine "cost-volume-profit analysis as a tool to measure the effectiveness of PPC of GRIL". So the study was fully devoted to examine the CVP analysis of the industry.

From the available data and information, sales trend analysis, costs analysis, profitability analysis, BEP analysis, and sensitivity analysis were done with the help of statistical and financial tools. From the various analysis of CVP variables, the industry shows different results.

Sales trend is continuously increasing except FY 2064/2065 but the industry is utilizing only 28% of its capacity. They have poor planning and budgeting system. Profitability of the industry is very poor due to heavy expenses in fixed cost. Gross profit margin ratio and net profit margin ratio are not satisfactory. The industry has low contribution margin ratio. Fixed cost and interest rate of loan is very high. Degree of operating leverage shows the industry has very risky position. In a short word, GRIL has not practiced CVP analysis techniques as a tool to measure the effectiveness of PPC.

5.2 Conclusion

The analysis shows there is a vast difference between theory and practice in the context of Nepalese industries. Different types of profit planning tools are available but their application

is hardly found in Gorakhkali Rubber Industry Limited. Budgeting is a tool of profit planning and control but Gorakhkali Rubber Industry Limited has not prepared proper sales plan. Due to the lack of budgeting system, the actual data could not be compared with the planned. The industry has neither practiced the scientific cost allocation technique nor the cost plan for the period. The industry has not practiced CVP analysis as a tool to measure the effectiveness of profit planning and control.

Form CVP analysis it is found that the industry has low contribution margin and high fixed cost. Due to the high fixed cost associated with the interest and depreciation, a BEP sale is very high for the industry. The industry has always been run below the BEP and loss of the business is being accumulated every year. DOL of the industry shows that the industry is in risky position. GIRL is not utilizing the full capacity.

If the management does not start utilizing full capacity and initiate the effective cost control program, Gorakhkali Rubber Industry Limited may bear further loss in future.

5.3 Recommendations

On the basis of the findings of the research study the following recommendations are given to improve the present condition of the GRIL:

i. GRIL does not have any practice of budgeting so, it is recommended that the industry should develop the budgeting practice.
ii. The industry does not have any particular and scientific method to classify the costs into fixed and variable therefore the industry should use a scientific and particular method to classify the costs.
iii. The industry does not have any detailed and systematic practice of cost plan, which is one of the essential elements of profit planning and control. So, it is recommended to initiate the cost plan.
iv. The industry is utilizing only 28% capacity so it is recommended to utilize full capacity.
v. The industry is purchasing raw material from foreign country so it is recommended to purchase raw material from the Nepalese market. It helps to stop the outflow of Nepalese currency in foreign market.
vi. The industry should apply alternative solution of electricity problem.
vii. Sometimes the industry faces strikes problem form employee therefore industry should initiate dialogs with concern unions.

viii. Competition is increasing day by day and it is very difficult for earning profit in low price of product so industry should be planned for long term profit.

ix. GRIL is producing only Bios tyres but in the market there is highly demand of Redial tyres so the industry should produce Redial tyres.

x. Because of unnecessary investment in fixed assets, the industry has been bearing heavy loss so the industry should not purchase extra fixed assets like vehicles and furniture etc.

xi. The industry is paying a huge amount as interest on long term loan, which is not good for the industry. So it should emphasis internal financing to minimize such burden. Therefore, GRIL must restructure its capital structure so that the interest burden will decrease.

xii. Because of low working capital the industry is unable to utilize full capacity so it is recommended that the industry should manage working capital.

xiii. Increase in price of product is not only the best idea to generate profit so it is recommended that the industry must make effective pricing policy.

xiv. Participative management should be introduced in formation of plan and policies of the organization. Profit planning manuals should also be communicated to lower level of management.

xv. For the better performance the industry should conduct employee training programme.

xvi. It is recommended that the Research related to CVP analysis should be implemented as for as possible for better quality.

xvii. In the market, the demand of truck tyres is higher than that of non-truck tyres. So that the management has to give more attention for the increase in the production of truck tyres.

xviii. CVP analysis is a very important tool of PPC but GRIL has not practiced CVP analysis so it is recommended to practice CVP analysis.

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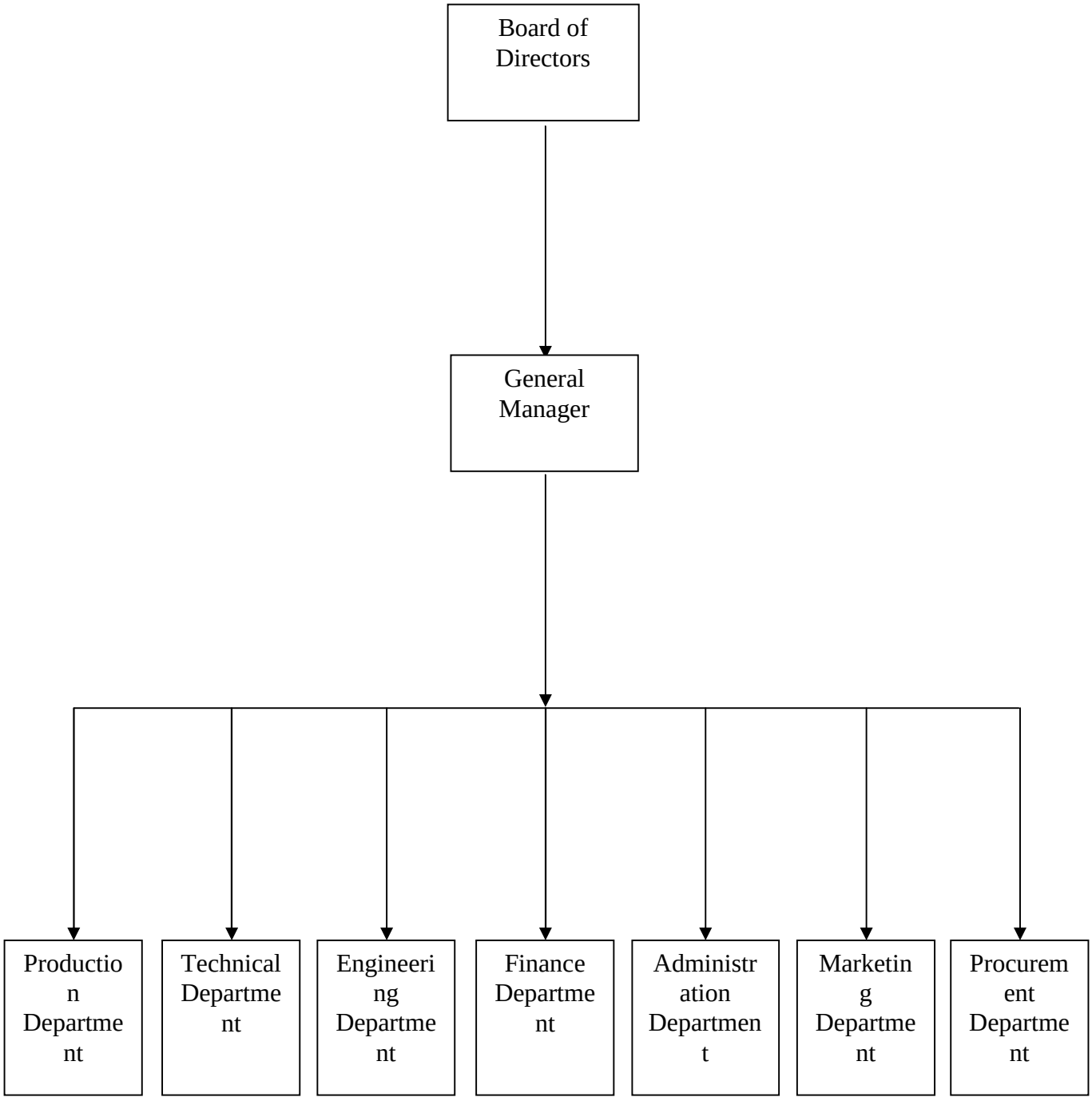
Appendix - I
Gorakhkali Rubber Industry Limited
Organizational Structure



Appendix − II
Gorakhkali Rubber Industry Limited
Profit and Loss Account

Amount Rs. ('000)

Particulars/Years	2063/64	2064/65	2065/66	2066/67	2067/68
Sales Revenue	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Less: Cost of Sales	2,65,322	2,31,182	3,17,978	3,77,480	4,82,984
Gross Profit	98,672	74,178	1,55,491	2,11,054	1,28,356
Add: Other Incomes	3,083	14,994	31,053	34,730	17,858
Total Profit (including other income)	1,01,755	89,172	1,86,544	2,45,784	1,46,214
Less: Office & Administrative exp.	60,257	74,123	76,971	1,09,808	1,02,710
Selling & Distribution exp.	33,471	25,684	42,586	64,639	58,550
Operating Profit	8,027	(10,635)	66,987	71,337	(15,046)
Less: Interest exp.	55,932	57,601	56,078	36,796	36,074
Depreciation	26,912	23,383	21,806	21,508	19,874
Net Operating Profit or Loss	(74,817)	(91,619)	(10,897)	13,033	(70,994)
Last year's loss	(7,85,705)	(8,60,520)	(9,52,180)	(9,63,076)	(7,16,293)
Available for apportionment	(8,60,520)	(9,52,180)	(9,63,076)	(7,16,292)	(7,87,286)
Apportionment:					
i. Adjustment with share capital	-	-	-	2,33,750	-
ii. Remaining loss transferred to balance sheet	8,60,520	(9,52,180)	(9,63,076)	(7,16,293)	(7,87,286)
Gross Profit Margin Ratio (%)	27.11	24.29	32.84	35.86	21
Operating Profit Margin Ratio (%)	2.21	(3.48)	14.15	12.12	(2.46)
Net Operating Profit Margin Ratio (%)	(20.55)	(30)	(2.30)	2.21	(11.61)

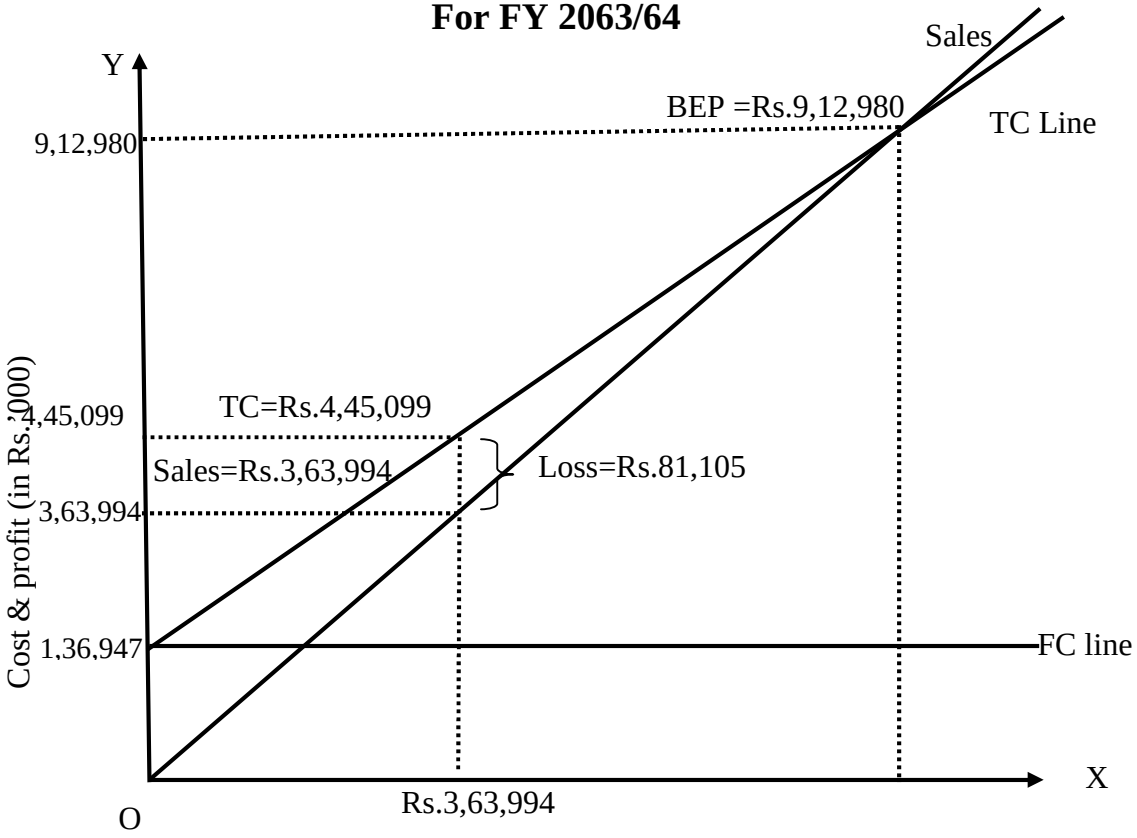
Appendix − III
Gorakhkali Rubber Industry Limited
Income statement

Amount Rs. ('000)

Particulars	**Years**				
	2063/64	2064/65	2065/66	2066/67	2067/68
Sales revenue	3,63,994	3,05,360	4,73,469	5,88,534	6,11,340
Less: Variable cost:					
⎩Cost of sales	2,66,309	2,10,728	3,12,326	4,48,201	4,19,485
⎩Administrative cost	13,045	16,078	8,689	10,869	10,110
⎩Selling & distribution cost	28,798	23,707	40,665	57,476	52,161
Total Variable cost	3,08,152	2,50,513	3,61,680	5,16,546	4,81,756
Contribution margin(S-VC)	55,842	54,847	1,11,789	71,988	1,29,584
Less: Fixed Cost:					
⎩ Cost of sales	2,221	2,204	4,504	6,201	7,634

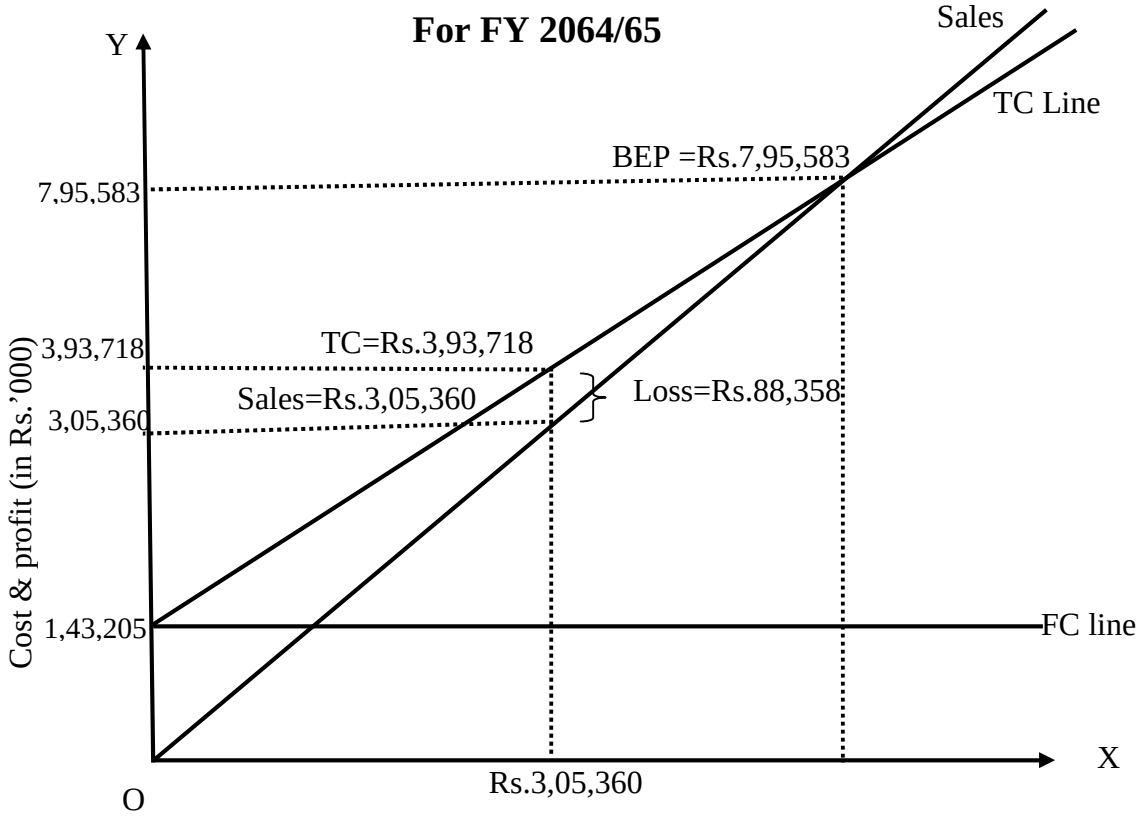
⎫ Administrative cost	47,209	58,041	68,282	98,938	92,599
⎪ Selling & distribution cost	4,673	1,976	1,920	7,162	6,388
⎪ Depreciation	26,912	23,383	21,806	21,508	19,874
⎭ Interest	55,932	57,601	56,078	36,796	36,074
Total Fixed Cost	1,36,947	1,43,205	1,52,590	1,70,605	1,62,569
Profit or Loss excluding other income (CM-FC)	(81,105)	(88,358)	(40,801)	(98,617)	(32,985)
Add: Other incomes	3,083	14,994	31,053	34,730	17,858
Profit or Loss including other income	(78,022)	(73,364)	(9,748)	(63,887)	(15,127)
DOL	(2.22)	(1.78)	7.32	(1.16)	41.95

Appendix IV
Graphical Representation of BEP in Rupees
For FY 2063/64



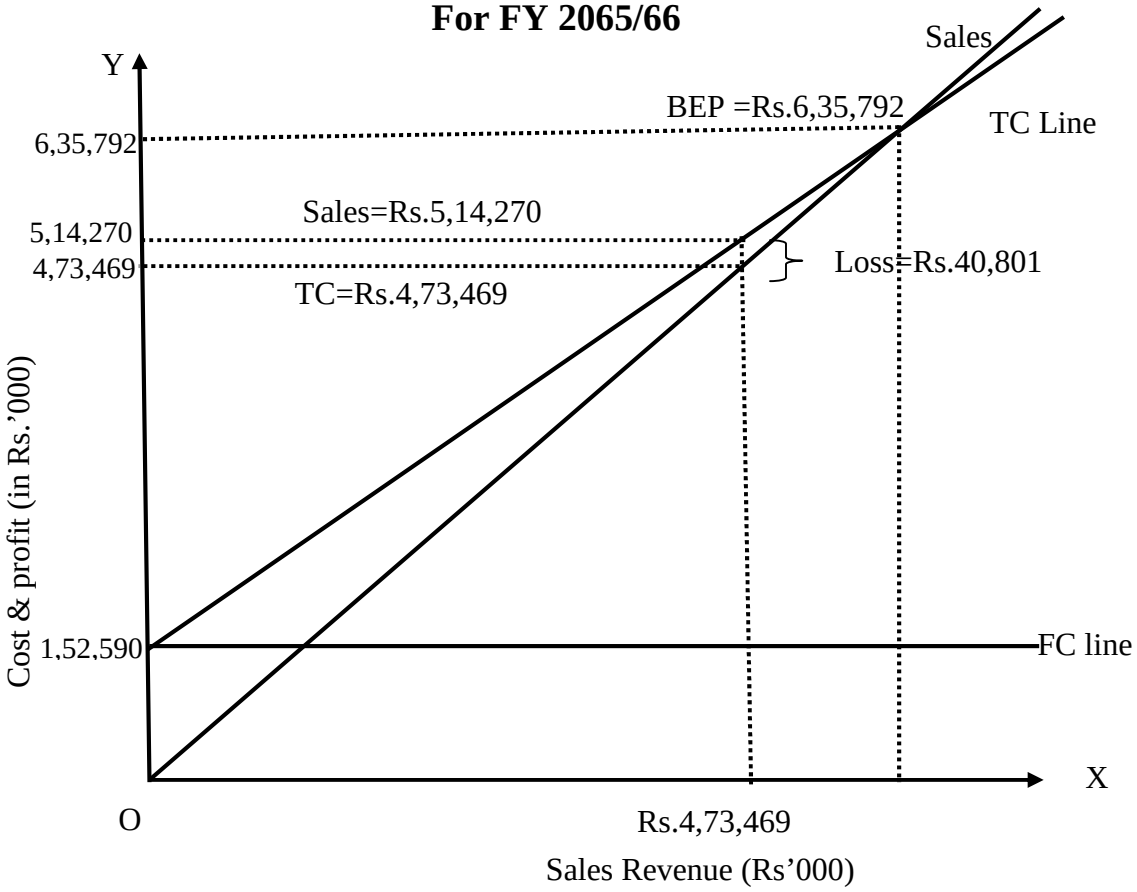
Sales Revenue (Rs'000)

For FY 2064/65

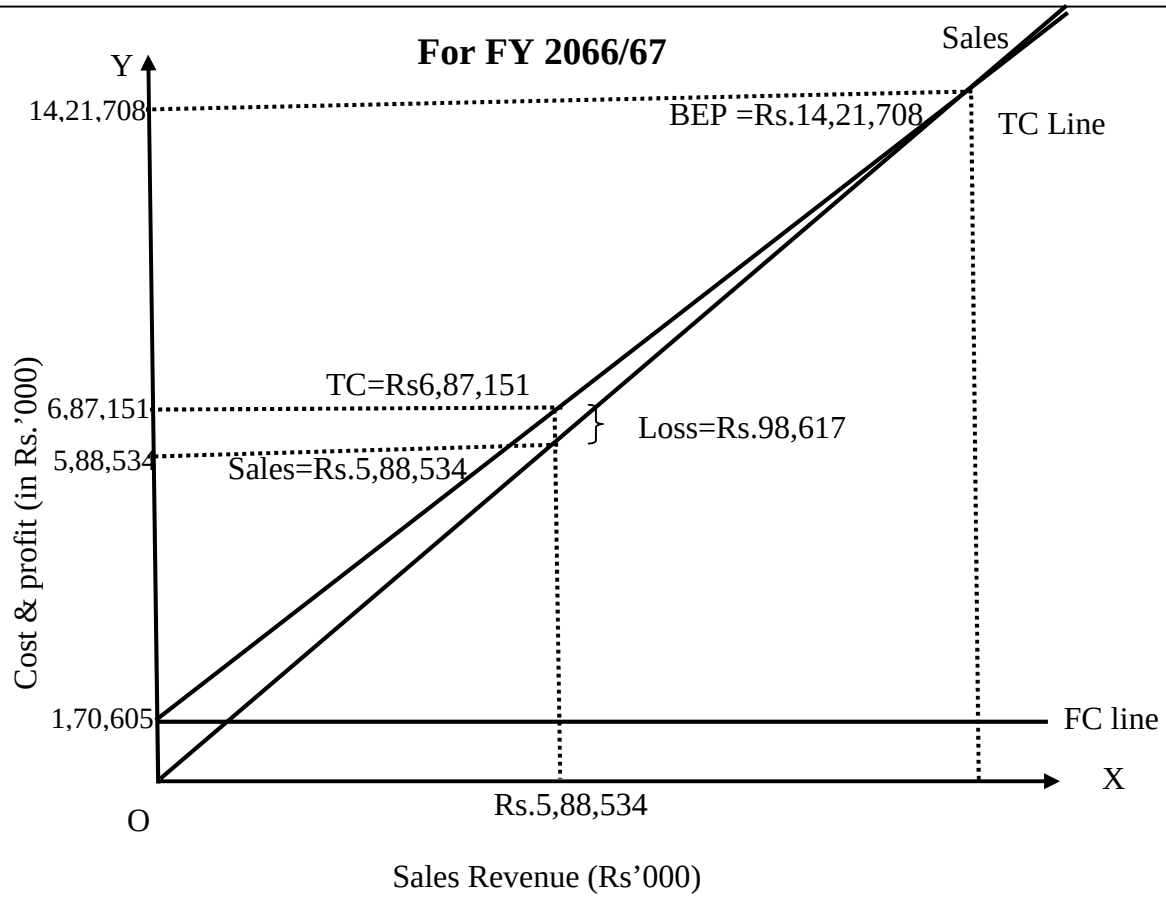


Sales Revenue (Rs'000)

Graphical Representation of BEP in Rupees
For FY 2065/66



For FY 2066/67



For FY 2067/68