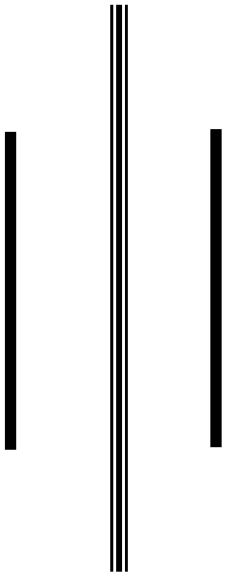
COST VOLUME PROFIT ANALYSIS

AS A TOOL OF PROFIT PLANNIN AND CONTROL IN MANUFACTURING INDUSTRY OF NEPAL

(A CASE STUDY OF SRI BHRIKUTI PLUP AND PAPER NEPAL LTD)



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

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DECLERATION

I, hereby declare that this thesis entitled "**Cost Volume Profit Analysis As a Tool of Profit planning and control, A Case Study on Sri Bhrikuti Plup and Paper Nepal Ltd."** Submited to Balkumari Collage, Faculty of management, Tribhuvan University, is my original work done in the form of partial Fulfillment of the requirement for the master Degree in Business study under the Supervision of Mr. Bhim Narayan Adhikari, Lecturer, Balkumari Collage.

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Lastly, I want to say that this research is my original work. I do not want to declare that this study is perfectly satisfactory and complete as there may be limitations and shortcoming because of limited time and resources. I hereby wanted to take the responsibility of all the errors, mistakes and shortcomings.

Shiva Dutta Chapagai
12, April 2009

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LIST OF ABBREVIATION

AS	=	Actual Sales
BS/AD	=	Bikram Sambat / Annu Domini
GDP	=	Gross Domestic Product
BEP	=	Break- Even -Point Analysis
RoI	=	Return on Assets
BPPNL	=	Sri Bhrikuti Plup and Paper Nepal Ltd
HMG/N	=	His Majesty of Government of Nepal
HMG	=	His majesty's Government
CVP	=	Cost Volume Profit Analysis
PPC	=	Profit Planning and Control
MOS	=	Margin of Safety
DOL	=	Degree of Operating Leverage
FY or F/Y	=	Fiscal Year
FC	=	Fixed Cost
Etc	=	Etcetera
Pvt. Ltd	=	Private Limited.
Pp	=	Page Number
i.e.	=	That is
P/V	=	Profit- Volume Ratio
SPPU	=	Selling Price per Unit
CMPU	=	Contribution Margin per Unit
VDC	=	Village Development Committee
VC	=	Variable Cost
RDL	=	Royal Drugs Limited
NTC	=	Nepal Telecom
NEA	=	Nepal Electricity Authority
S.D.	=	Standard Deviation
EBIT	=	Earning Before Interest and Tax
CV	=	Coefficient of variation
V/V	=	Variable Cost Ratio
CM	=	Contribution Margin
PE	=	Probable Error
r	=	Correlation Coefficient
Rs.	=	Rupees
$\overline{X}$	=	Arithmetic Means
T.U.	=	Tribhuvan University

CHAPTER - ONE
INTORDUCTION

1.1 General Background

Nepal is a land-locked country sandwiched between China on the north and India on other three sides. It covers an area of 1,47,181 Square km and runes all along 885 km from east to west and 145 km to 241 km from north to south. It is categorized as one of the least developed countries of the world where about 50 percent of the population live below absolute poverty line. Topographic variations have generated problems on the settlement patterns of the people and socio-cultural settings.

Geographically the country is divided in three regions, terai, mountain, and hill accommodation 48.4%, 7.3% and 44.3% of Population respectively. Based on area of districts, these regions constitute 23%, 35% and 43% of the total land area. There are five development regions and 75 administrative districts. Districts are further divided into smaller units, called village development committee (VDC) and municipality. Currently there are 3915 VDC and 58 Municipalities in the country.

Nepalese economy basically depends upon agriculture. About 81 percent people depend upon agriculture. It is the major source of employment, national income, food, industrial raw materials, and exportable items, basis of trade and commerce and major investment sector. Ninety one percent of the total populations live in rural areas. The annual per capita income is around US $ 210 and literacy rate is only 39.6 percent. Sixty percent of the people have no access to the physical facilities i.e. road, water, health, education, and other services. Women who constitute other half of the population are outside the main stream of development of the country. Alarming trade deficit and migration of people towards urban area, open boarder, increased population and rising unemployment problem have created numerous challenges which hinder the socio-economic development of the country. Various donors have assisted Nepal is her socio-economic environment, especially of terai Nepalese providing various programmers at lower level.

In the context of Nepal industrialization is in its infancy industrial sectors have contributed in the economy not more than 12% and more than 78% still depending ion agriculture for livelihood.

Cost volume profit analysis is the great helpful in managerial decision-making. Specially, cost control and profit planning is possible, with the help of cost volume profit analysis. Its can be used the profit planning because it provides the information about the behavior and relation of cost with volume and sales where the business will give zero profit due to variation un projected amount of output or sales. It gives the ideas about the amount of profit from the projected sales volume and vice-versa.

'Cost Volume Profit analysis includes both contribution and break-even analysis. Break-even analysis emphasized the level of output or production activity at which sales revenue exactly equals to the total costs that is there is no profit or loss. In other words, the no profit no loss point is break-even point in which losses cease and profit begin."(Khan and Jain, 1993:700)

'Cost Volume Profit analysis may therefore be defined as a management accounting tools to show the relationship between the elements of profit planning. The whole picture of profit planning is associated with cost volume profit inter relationship. A popular technique to study cost volume profit relationship is Break-even analysis. Breaks Even analysis is concerned with the study of revenues and cost in relation to sales of which the firm's revenues and total cost will be exactly equal or the net income will be zero. It is a "No profit no loss" situation. More precisely, it is called the breakeven point. Cost volume profit analysis is sometimes referred to simply as breakeven analysis. This may be misleading, because break-even analysis is just one part of the entire CVP concept. Yet it is always taken as an important part of profit planning as it gives the planner many insights into CVP analysis is immensely helpful for developing alternative strategies in sales planning and the cost estimation. Cost volumes profit analysis, though must after illustrates business cases, is equally, applicable for non-profit making organizations to allocate scarce economic resources must effectively among the competing alternatives. Allocation of scarce resources among the famous demanding sectors is the most important part of national planning.

Profit planning and control have wide application. It can be applied in both profit making and non-profit making org, and also in both manufacturing and non-manufacturing business. Comprehensive budgeting, profit planning and control have been identified as way of management sophistication for the firm, which requires high degree of management sophishcation. CVP analysis is great helpful in managerial

decision-making, specially, in cost control and profit planning. Profit planning is the fundamental part of the overall management functions. Therefore, CVP is also known as complimentary to PPC. Profit planning can be done only when the management has the information about cost and selling price of the product. Nepal Electricity Authority (NEA) are taken for this study about the application of CVP-analysis as a tool of profit planning and control.

1.2 Evolution of Industry in Nepal

In Nepal, the history of development of industry begins after the establishment of "Udhyog Parisad" in 1936 A.D. During the Rana regime, they were not interested in the development of the country. Though, Biratnagar jute mill (1936), Nepal Bank Ltd (1937), Juddha match factory, Morang cotton mill, Mahendra Sugar Mill and Butawal Plywood and Bobiu Factory had been established euring this regime. They are the parents industry in Nepal. After the introduction of Democracy in 2007 B.S, the Government felt the need of the industrialization and started some public enterprises; likewise the government established a separate unit as "Industry Department". After the restoration of democracy, the department has been recognized with its new name "Cottage and Small Industry Department".

It was felt that the private sector could not set up all basic and feasible industries capable of making special contribution to the Industrial development of the country. Within the period of this plan the new industrial policy 1974 was also announced by government of Nepal. In 1981 a new industrial policy was declared and the main features of this policy were that all industries were kept open to private sector except the defiance industry.

The changing political situation has changed its industrial policy. In 1992 a new industrial policy was declared and this policy is very liberal in respects of registration and other official procedures. Private investment is encouraged and foreign investment is welcomed. In this reference, such as Basbari lather and shoes factory, Bhrikuti Paper Mill and Harisiddhi brick factory are the major in first phase. The process will continue. Likewise the ministry of industry, UNDP has jointly conducted a foreign investment forum on the first week of the December 1992, the investors more than hundred countries attended the conference and should their keen interest in the industrialization process of Nepal. They also signed on the proposal of so many industries to be established in Nepal. It is believed that the conference leads the industrial situation of Nepal towards the golden future.

The first year plan period (1956-61), in this period, industrial policy (2014), private firm registration Act (2014), and factory and factory's workers Act (2016) were published, Nepal industrial development corporation was established in 2016.

Second plan (1963-65), in this plan sugar, metals, handicrafts, hotels, match, textile, biscuit and confectionary industries including janakpur cigarette factory. Birgung sugar factory and Bansbari Leather and shoe factory were established in the public sector.

Third plan (1965-70), In this plan, vegetable ghee, flour mill, soap, cold storage, bakery etc. Industries were established in private sector, while Hetauda and Balaju textile Industries were established in the public sector under the assistance of Chinese government. At the same period New industrial policy and industrial enterprises Act (2030) were enacted and Industrial Services Center (2031) was set up.

Fifth plan (1975-80), in this period, only 3 industries were established in the public sector, while a few small industries, such as flour mill, sugar, cotton, textile, soap, polythene pipe, etc, were established in the private sector. Security exchange Center (2033) came into existence.

Sixth plan (1980-85), in this period, biscuit and confectionery, shoes and sandal, rice mills, brick factories were established in the private sector. Hetauda Cement Industry, Bhrikuti paper Factory, Nepal Orient Magnesite and Nepal Metal Industry were under construction phase, However, Industrial policy (2037), Industrial Enterprises Act (2038), Foreign In vestment and Technology Act (2038) were formulated.

Seventh plan (1985-90) in his period, industries established in the private sector were woolen carpets, ready made garments, beer, distillery, cement, cigarette, etc. Lumbini Sugar Factory, Udayapur Cement Factory, Idustrial District Management Ltd and Economic Services Center Ltd were set up in the public sector.

Eight plan (1992-97), in this period, HMG has adopted open and liberal economic policies. As a result, Industrial policy (3049), industrial Enterprises Act (2049), Foreign Investment and Technology Transfer Act (2050) were reviewed. During the plan period, medicines, soap and detergent powder industries were set up under foreign collaboration. HMG had already privatized 16 public enterprises.

Ninth plan (1997-2007) has also been accomplished which continued the liberal economic policy. The plan had targeted to privatize 30 more public enterprises during the plan period but which could not be done as per the target.

Tenth plan (2002-2007), at present the Tenth plan period. 2003-2008 is in operation. The main objective of Tenth plan is to make economic sector of country effective healthy, dynamic and competitive by maximum utilization of available resources. The plan conceives to expand the role of private sector for higher economic growth and effective operation of poverty alleviation programme. The strategic adopted for the promotion of private sector are as follows (Tenth plan, 2002-2007, National Planning Commission, HMG Nepal: 108).

1. Emphasis on investor friendly environment for forward economic improvement by policy wise quarantine.
2. Provision of entry and drawback of private investment in every sector of economy by defining the role of private sector.
3. Increase in competitive capacity by providing facilities and benefits to the investment sector.

1.3 Brief Introduction Sri Bhrikuti Pulp and Paper Nepal Limited

Sri Bhrikuti Pulp and Paper Nepal Ltd (BPPNL) are contributing for social welfare and also national development. The most important social contribution of BPPNL how ever has been in its positive impact on the poorest of the poor. In a 200 KM rang from kapilbastu through Nawalparasi and Chitwan to Bara and Parsa.

On October 1,1978 an 'Agreement between the government of the People's Republic of China and His Majesty of Government of Nepal (HMG\N)on construction of complete project" was entered into; on 27th December 1997 a document entitled 'summary of tasks on the construction of Bhrikuti paper mill was signed. On the basis of these understanding, the Chinese Government provided assistance to His majesty's Government of the Nepal of the construction of Bhrikuti paper mill. Nepalese side had to build the infrastructure including land equitation erection of boundary wall's installation of HI electricity, water supply drainage system residential areas and telephone facility etc. On the other side chine had to install and operate the entire processing as well as servicing plants of equipment. On the initial production capacity of the mill was 10 ton per day now production capacity of the mill was 13 tons writing and printing paper per days.

Being the first mechanized integrated paper mill of Nepal, the objectives of BPPNL is to product white writing and printing paper from agricultural wastes such as wheat-straw, Rice-straw and forest waste product such as sabai grass.

The mill's established with in authorized capital of Rupees 250000000. Under the privatization policy of Nepal this mill was transferred to private sector in 2049 B.S. After privatization its name changes into 'Sri Bhrikuti Plup and Paper Nepal Ltd'. Now it has an authorized capital of Rs 1215100000. Its have two paper mills PM-1 and PM-2. Production capacity of PM-1 is 18 ton and PM-2 is 70 ton. It has 50 ton waste paper recycling plant. It provides employment opportunities more then 1000 peoples and contributing for social welfare and also national development.

The mill was situated on the right side of the Narayani River just opposite of Naraynagarh and adjacent to the main East-West highway. It is in the Village of Gaindakot, Nawalparasi District, Lumbini Zone. Besides being located near the hub of highways linking East-West Nepal with Kathamandu, The mill's vicinity is favored with good condition regarding raw material, Labor, electricity, water supply medical and residential facilities, and transportation facilities.

1.4 Statement of Problem

Profit is the main objective of any business organization or firm. Besides other tasks they have to attain, the maximum profit. Due to the low volume of production the production cost per unit is high which tends to the higher selling price. Which does not match with the satisfaction level of the public those are anxious to search for the technology? The utilization of fixed assets to their optimum level is very rare in this field and it is one of the problem that these types of production houses is suffering and due to the under utilization of the capacity, the cost increases significantly.

Based on published annual reports, performance of BPPNL is not satisfactory. Poor performance in the outcome of poor planning, Controlling and decision-making. The question has been raised whether BPPNL managers use CVP Analysis tools and techniques to carry out planning decision-making and controlling function?

The research questions pashed mainly in this research will be following:

1. What are the major difficulties in the application of CVP analysis?
2. Whether or not BPPNL is practicing CVP analysis?
3. In which area, it should addressed the concept of CVP analysis for the improvement of competitive position?
4. To what extent the concept of CVP analysis has been implemented?

1.5 Objectives of the Study

The main objective of the study will to examine "cost-volume-profit analysis" as a tool to measure the effectiveness of PPC of "Sri Bhrikuti Pulp and Paper Nepal Ltd. (BPPNL)". To achieve the objectives the following sub-objectives were set:

1. To examine the practice and effectiveness of the CVP analysis of BPPNL.
2. To explore the current situation of CVP analysis and provide suggestions if any for improving the condition of BPPNL.
3. To analyze the relationship of cost, volume and profit as an applicable tool of budgeting.

1.6 Significance of the Study

The research study will mainly concerned with the CVP analysis of Bhrikuti pulp and paper Nepal Ltd (BPPNL) and it will try to fill out the gap of the managerial disability towards the CVP analysis or in other words this research work really research the elements and the factors affecting the cost volume and profit those the managerial level has not yet studied. It will explore the problems and potentialities of the company and it will also provide information on the application of the tools for profit planning in different circumstances. It will examine the application of CVP analysis in the company.

1.7 Limitations of the Study

This research study will concerned with CVP analysis in Sri Bhrikuti Pulp and Paper Nepal Ltd. (BPPNL). It will strictly base on the primary as well as secondary data for the analysis. The cost volume and profit are the main elements of study so this research will not consider other factor of Sri Bhrikuti pulp and paper Nepal Ltd. (BPPNL). Time and resources for the study will the major constraints. CVP analysis will cover the period of last five years only.

1.8 Scheme of the Study

This study will be divided into five chapters, which are as follows :

In chapter first we will present introduction of BPPNL, statement of problem, objectives of study, significance and limitation of the study.

Chapter second will present about "Framework and Review of Literature" and will be further divided into two parts. The first part will be concerned with review about

profit planning, its importance, usefulness, framework from various books journals and articles, etc. The second part is review of previous studies and research gap between this study and previous study.

In chapter third we will discuss the "Research Methodology" adopted for the study where we will discuss research design, sources and types of data, data collection method and analytical procedure.

In chapter four we will present the analysis of data and presentation of data. Data will be presented and analyzed using different tools and Techniques.

Chapter five will focus on summary, conclusion and recommendation.

CHAPTER - TWO
REVIEW OF LITERATURE

2.1 Introduction

Review of literature an essential part of all studies. It is a way to discover what other research in the area of our problem has uncovered. A critical review of the literature helps the researcher to develop a through understanding and insight into previous research works that related to the present study. It is also a way to avoid investigating problems that have already been definitely answered. It supports the researcher to explore the relevant and true facts for the reporting, purpose in the field of study. Literature here means the related printing material about the subject matter of the research work. It may be in various forms like book, book lets, thesis report, news papers etc. In the course of research, review of the existing literature would help to check the chances of duplication in the present study.

This chapter emphasis the theoretical parts of this research. It includes review of "profit planning and control" and "cost volume profit analysis and other relevant subject matter of this research work. This chapter consists of the following two parts:

2.2 General Concept of Profit Planning and Control

Profit planning and control is a powerful approach, mainly in profit-oriented enterprises. Profit planning is merely a tool of management. It is not an end of management or substitute of management. It facilitates the managers to accomplish managerial goals in a systematic way. The management is efficient if it is able to accomplish the objectives of the enterprises. It is effective, when it accomplishes the objectives with minimum effort and cost. In order to attain long rang efficiency and effectiveness, management must chart out its course of action in advance. A systematize approach that facilitates effective management performance is profit planning and control.

The fundamental concept of PPC includes the underlying activities or tasks that must generally be carried out to attain maximum usefulness from PPC. These fundamental have never been fully codified. The mechanics of PPC involve such activities as the design of budget schedules, routine and repetitive computations, and clerical activities related to a PPC program. (Welsch et. Al, 1992, 32)

The aggregate meaning of the preparation of various functional annual budgets is known as profit planning. The determination of next year's production tends to achieve the sales, which is directly related with revenue generation. The decision on new capital investment and financial borrowing represents profit planning. In all cases the firm is deciding now how it will use its resources i.e. manpower, material, machine and money in the future. A formal profit planning is the key to corporate survival in a world of rapid social change and intense competition. Profit planning can take the best use of firm's opportunities and resources to meet the targeted profit.

2.2.1 Profit

Theoretically profit is broad aspect; there must be profit in every organization to run the organization. Some organization has to earn profit is their main objectives. So profit is necessary for an organization. But sometimes it seems vague. In actual field and actual practice it is manageable and some extent it is controllable. Profit is a tool for measuring managerial of efficiency and competency. In other words, profit is the primary measurement of successful business in any economy. Profit is a residual income left after the payment to other factors of production. The difference between the outflow of expenses and inflows of income is called profit. It is a reward for business activities. Profit determines the strength of financial position of the company.

According to Henery Grayson "Profit may be considered for making innovation, a reward for accepting risks and uncertainly and the result of imperfection in the market structure."Honsen defined" Profit as the residual payment that is left to the producer's income after all other payment has been met." Similarly Drucker said, "The surplus of current income over past cost is profit."

Simply profit from the excess of income over cost of production, but the term 'profit is very controversial and there is several different interpretation about this. An economist will say that profit is the reward for entrepreneurship for risk taking and bearing uncertainty. A labors leader might say that it is a measure of how efficiently labor has produced and that it provides a base for negotiating a wage increase. An internal revenue agent might regard it is a base for determining income taxes, the accountant will define it simply as the excess of firm's revenue over expenditure of producing revenue in given fiscal period. Dean clearly distinguishes the views of

Accountant Economist about profits in as following ways. The most important point of difference between Economist and accountant approaches centre on: (Dean, 1982, 13).

1. The business of cost, i.e. what should be subtracted from revenue to get profit.
2. The treatment of capital gains and losses, and perhaps more important.
3. The meaning of depreciation.
4. The price level for valuation of assets.

A profit is estimation and determination of revenues and expenses that evaluate how much income will be generated in order to meet financial requirements. It presents a plan for spending income for profit generation. It represents an overall plan of operations for definite period of time and formulates the planning decision of the management.

Profit differs from return on other factors in three respects (Dewett, 1981, 299)

1. Profit is residual income and not contractual or certain income as in the case of other factors.
2. There is must greater fluctuation in profit than the reward of the other factors.
3. Profit may be negative award, as rent, wage and interest must always be positive.

The term profit in views of management as follows (Lynch & Williamson, 1989, 215)

1. An intangible expression of the goals it has set for the firm.
2. A measure of the performance towards the achievement of its goals.
3. A means of maintaining the health growth and continuity of the company.

It is the ultimate objective of management to maximize profit over the long term and consistent with its social responsibility. To plan profit intelligent management needs to know,

1. The economic characteristics of the firm's operation.
2. The nature of the market for its products.
3. The nature and severity of its competition.
4. The cost of these factors of production, the material, the labor, the productive, capacity, the capital etc.

The relationship of the price it can get for its goods to the expenses of producing and selling them." (Lynch And Williamson, 1989, 99-100) It is quite clear that there is not exact definition of profit. Whatever the definition may be, profits are residual income

left after the payment of the cost of factor of production. The success of business depends largely upon the profit earned or surplus increase by the business. The efficiency of management is reflected upon the volume of profit/surplus of business. "The survival measure of how well a business performs economically. Profit is a signal for the allocation of resources and a yardstick for judging managerial efficiency" (Kubkarni, 1985, 245).

2.2.2 Planning

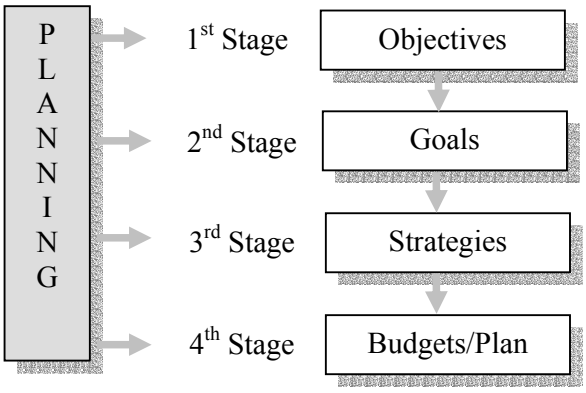
"Planning is the function that determines in advance what should be done. It consists of selection the enterprise objective, policies, programmes, procedures and other means of achieving these objectives. Planning is intellectual in nature, it is mental work. It is looking ahead and preparing for the future."

- Theo Haimann

"Planning is the thinking process, the organized foresight, the vision based on facts and experience that is required for intelligent action."

- Alford and Beatty

Profit is not a matter of chance but it comes from effective and realistic plan, Planning is deciding in advance that to be done in future. Planning is the process of developing the objective of enterprise and selecting future course of action to accomplish them. It is the method to thinking about action and purpose, planning starts from forecasting and determination of future events. It is the first essence of management and all other functions are preformed within the framework of planning. Planning is the basic foundation of profit plans. Planning includes the establishing objectives of enterprises, developing promise about the environment in which they are to be accomplished selecting a course of action for accomplishing the objectives, initiating activities necessary to translate plans into actions and current re-planning to correct deficiency. The operational terms, planning process involves four stages (Welsch, et. Al 1992, 75).



Objectives : The first stage in the planning and controlling system is setting the objectives, which is defined as the broad and long-range desired state or position in the future. They are motivational or directional in nature and are expressed in quantitative terms.

Goals : The second stage in planning process is specifying the goals. The term goals as an element in panning represent targets, specified in quantitative terms to be achieved in a specific period of time.

Strategies : The next step involves laying down the strategies. Strategies devote specific methods or course of actions to active the goals, strategies are the basic thrusts ways and tactics that will be used to attain planned objectives and goals. A particular strategy may be short-term and long-term strategies focus.

Budget/Plans : The final step is the preparation of budget/plan. Basically budgeting is the periodic planning to implement the alternative during a particular fiscal period. Usually one year. It converts goals and strategies duding into annual operating plan.

"An effective planning involves the some basic element, which may be summarized as follows:

1. A clear definition of the objectives.
2. An analysis of the steps required for attaining the objectives.
3. Examination of the steps required and an asset of the allowances to cover uncertainties.
4. Calculation of the total time and cost involved.
5. Consideration of the alternative method of reaching the objectives.
6. Decision on the method to the implemented.
7. Establishment of time schedule for individual part of the agreed plan, i.e. relative to calendar time scale." (Woodgate, 1977, 1)

Planning decisions are interdependent and must be partitioned in conformity with the operational or organizational subdivisions of the entity. Therefore, planning follows the lines of authority and responsibility in the enterprise. This subdivision means that there is a subset of planning decisions (and a consequent plan) for each manger in the entity (i.e. for each area of responsibility) from the highest to the lowest management levels. It makes possible effective and integrated application of the feed forward concept (Welsch et.al 1992, 33).

Planning is an imagination, foresight, and sound judgment etc that is mental and intellectual process. The top level, medium level and lower level manager or all level managers participate in planning task, but planning differs as per the level. Planning is deciding in advance what is to be done in future. Planning is not only to make plan, rather it should be implemented by better utilization of resources for targeted and per-determined goal achievement.

2.2.3 Profit Planning

A PPC techniques must continually be adapted, not only for each particular enterprise but for changing conditions within the enterprise. Various techniques must be tried, improved, or discarded and replaced with others. In other words, a PPC program must be dynamic in every sense of the word. It will usually take more than one year to attain a realistic program, and management must not expect too much during this period. So, profit planning will be effective only if all responsible executives' expert continuous and aggressive efforts towards their accomplishment. Responsibility centre managers must accept responsibility for attaining or exceeding department goals specified in the profit plans.

The profit planning cannot substitute for enlightened management. It is a system that can aid in performing the management process. The budget manual of one prominent company states: The profit plan should be regarded not as a master, but as a servant. It is one of the best tools yet devised for advancing the affairs of a company and the individuals in their various spheres of managerial activity. It is not assumed that any profit plan is perfect. The most important consideration is to make sure, by intelligent use of the profit plans, that all possible attainable benefits are derived from the plans as rendered and to re-plan when there are compelling business reasons (Welsch et.al 1992, 62).

The PPC model involves

1. Development and application of broad and long-rang objectives of the enterprises.
2. Specification of enterprise goals.
3. Specification of a tactical short-range profit plan detailed by assigned responsibilities. (Division, department, project)
4. Development of strategies long-range profit plans in broad forms.

5. Establishment of a system of periodic performance report detailed by assigned responsibilities.
6. Development of follow-up procedures" (Lynch & Williamson 1989, 30).

"Profit planning is a part of an overall process and is an area in which finance function plays major role, profit planning is now an important responsibilities of financial manager. While activities of these short require an accounting background, they also require the knowledge of business principles economic statistics and mathematics. Hence, profit planning represents an overall plan of preparation, covers a definite period of time and formulates the planning decision of management." (Myres, 1989, 250)

"Profit planning is fact is a managerial techniques and a profit plan is such a written plan, in which all aspects of business operation with respect to definite future period are included. It is a formal statement of policy; plan objectives, 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 basic for a subsequent of performances." (Gupta, 1995, 21)

The profit planning and control is used for the development and acceptance of objectives and goals and moving an organization efficiently systematically and timely to achieve the predetermined objectives and targeted goals. It is not a separate techniques that can be though of and operated independently of the total management process. Rather the broad concept of profit planning entails integration of numerous management approaches and techniques. Profit planning and control can be reviewed as one of the major valuable approaches that have been developed to facilitate effective performance of the overall management process. Profit planning and control is not an accounting technique. It is related with accounting system in the following respect.

1. Historical data, which are particularly relevant for analytical purpose in the development of enterprises, plans.
2. The financial components of a profit plan.
3. Actual data for comparison between the budgeted and actual performance.

2.3 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:

1. Forecast the probable future expenditure.
2. Analysis of the sources form which income is to be realized to meet the expenses.
3. Maintaining co-ordination between expenditure and sources of income.

During that time USA businessman were also suffering from the problem of co-ordination between expenses for material, rent and labour 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. The 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.

2.4 Fundamental Concept of Profit Planning and Control

The concept of budgeting was originally established with the function of an accountant. At its origin, the function of budgeting was assigned to the accountant. But in modern day budgeting is given much more importance and is regarded as a way of management and in more important sense is regarded as basic technique of decision-making and is given the name "Profit Planning and Control Program."

a) Management Involvement and Commitment

Management involvement entails managerial support, confidence, participation and performance orientation. In order to engage competently in comprehensive profit planning and control, all levels of management, especially top management, must (i) Understand the nature and characteristics of PPC, (ii) Be convinced that this particular approach to managing is to devote the effort required to managing is to devote the effort required to make it operative (iii) Support the program in all its planning process as performance commitments. For a comprehensive profit planning and control program each member of management, starting from the president, the impetus and direction must come from the very top.

b) Organizational Adaptation

A profit planning and control program must rest up on sound organizational structure for the enterprise and a clear-cut designation of lines of authorities and responsibilities. The purpose of organizational structure and the assignment of authority are to establish a framework with in which enterprise objectives may be attended in a co-ordinate and effective way on a continuing basis. The scope and interrelationship of the responsibilities of each individual manager are specified. To increase management and operational efficiency, particularly all enterprises, except perhaps the very smallest ones, should be structurally disaggregated into organizational sub-units. The manager of each submits would be assigned specific authority and responsibility for the operational activities of that submit. These subunits are often referred to as decision centers or responsibility centers. Responsibility centers are further classified in respect to the extent of responsibility as follows:

- Cost center
- Profit center
- Investment center

c) Responsibility Accounting

In order to set-up profit planning and control on a sound basis, there must be a responsibility accounting system, that is, one tailored first and foremost to the organizational responsibilities. With in this primary accounting structure, secondary classification of costs, revenues, and other financial data that are relevant may be utilized in accordance with the needs of the enterprise. A responsibility accounting system can be designed and implemented on a relevant basis regardless of the other features of the accounting systems, standard cost systems, direct costing systems, and so on. When the accounting system is established on a responsibility basis, the historical data generated become especially pertinent for planning and control purpose.

d) Full Communication

Communication can be defined as an interchange of thought or information to bring about a mutual understanding between two or more parties.

Communication can be of dialogue, message or understanding from working together. Although, the management gives least importance to communication, it is most important thins for any organizational observation and control. Most of the organization faces lot of problems due to bad communication system.

Communication is needed for both the feed forward and feed backward process, which is mot important for operation of any organization. Role of communication can be justified in all aspect of management. It is needed either for decision making or for supervision or for evaluation. Flows of information must be adequate in all side (Downward, upward and laterally)

For profit planning and control, effective communication means development of well defined objective, specification of goals, development of profit plans and reporting and follows up activities related to performance evaluation for each responsibility center. Communication for effective planning and control requires same understanding of responsibilities and goods in both the executive and subordinates.

e) Realistic Expectation

Profit planning and control must be based on realistic approach or estimation. Management must use realistic assumption and must not take either irrational optimism or unnecessary conservation.

Perfection on setting goal or objectives of the further sales, production levels, costs, capital expenditures, and cash flows and so on determines the success of profit planning and control programmed. So, for profit planning and control purpose, a realistic approach reared with time dimension and external and internal environment that will prevail during the time span should be considered. This is called realistic expectation.

Before preparing comprehensive profit planning and control programme, management has to take a good care that the goal or objective which is going to be determined neither should be too low nor should be too high but should be attainable with high level of efficiency. This is because goals set very low will destroy motivation as it does not require efforts and goal set high will discourage the implementer as it would not be attained with existing capacity of the units, but the goal which will be of challenging nature, will be of real value and will keep the organization alert which is the main objective of the realistic expectation.

f) Flexible Application

Profit planning and control programmed or any other management techniques should not dominate management slowly. Any of such techniques of management must not be flexile or rigid. These are the techniques or means, which is not only the end of the management itself because the main end or aim of the management is to use the resources in the most effective way and earn high return on investment and for this purpose profit planning and control or other techniques are used as means only.

g) Timeless

Whether an individual or an entity remains idle or busy, time passes at the same rate. The problem of the manager in one hand is to accomplish the planned activities in a given time and on the other hand is to prepare the plan itself. Phasing of the planning is of two types: One is (a) Timing of planning horizons and (b) Timing of planning activities. Planning horizons is the time for which the planning is done or we can call it like span of the plan. For any enterprise, there used to be many planning horizons to maintain the continuity of planning activities. The decision made by the manager for future activities reflects the managerial planning. In other words, managerial decision, which reflects planning activities, always effects on future activities only. It does not have any effect on present or past. Major decision should be made on the basis of adequate supporting study, analysis, evaluation and consolation.

For effective implementation of planning, management of an enterprise must establish a definite time dimension for each activity. In other word, for each activity related with planning would be given definite time for implementation, followed by other activities. This is called planning activities.

From the viewpoint of time dimension, a manager should maintain clear-cut distinction between historical and future consideration. Because the result derived from historical activities should be considered as platform for deciding plan.

h) Individual and Group Recognition

Behavioural aspects of human being are of the field of study of the psychologist, educators and businessman, and finding was that there could be so many unknown misconception and speculations, which has to be considered for an efficient management. A good and dynamic leadership can resolve this problem by integrating all the group efforts for betterment of the organization. This fact also has been well considered under profit planning and control approach and focuses have been given to resolve the behavioural problems.

i) Follow up

The importance of follow up action on profit planning and control approach is more. Follow up action after a careful study is needed to:

- Correct the action of substandard performance in a constructive manner.
- To recognize and transfer the knowledge of outstanding performance to other and based on the study and evaluation to provide a sound basis for future profit planning and control programme.

2.5 Profit Planning and Control Process

The profit planning process should involve periodic consistent and in-depth re-planning so that all aspects of operation are carefully re-examined and re-evaluated.

The steps of PPC process can present on the graph as follows:

(Welsch, et..al 1992, 73-88)

Profit Planning and Control Process

Management Function	Sequential Phase of the PPC process	Primary Responsibilities
↑ Planning ↓	**1. External relevant variables** Identify and evaluate	↕ Executive Management
	2. Broad objective of the business Develop or revise	
	3. Specific enterprise goals develop Consistent with item 2 above	
	4. Enterprise strategies Specify major throusts to attain Objectives and goals	
	5. Executive management planning instructions Specify planning premise (guide lines) For managers (based on item 1-4 above)	↕ Middle
	6. Project plans Develop and evaluate for each project	
	7. Strategic profit plan (Long range) Develop for 3-5 or 10 years	
	8. Tactical profit plan (short range) Develop for up coming year.	↕ All Level Management
Leading ↓	**9. Implementation of profit plans** Implementation throughout the budget year	
↓ Controlling ↓	**10. Performance reports** Prepare monthly reports by responsibility	
	11. Follow up Provide feedback, take corrective action and plan	↕

The above formal PPC process should be repeated on yearly basis. Therefore all the basis steps in the planning phase should be reviewed and evaluated annually. The sequential phases of the above PPC process are the following steps.

(i) Identification and Evaluation of External Variables

The variable identification phase of PPC process focuses on evaluating the effects of the external variables. Identification also involves separate consideration of variable that are non-controllable and those that are controllable. This means that management planning must focus on how to manipulate the controllable variables. This aspect of the planning process is usually different for must management because deficiencies and inefficiencies are frequently difficult to identify and evaluate objectives by those directly involved.

(ii) Development of the Broad Objectives of the Enterprise

The statement of broad objectives should express the mission, vision and ethical character of the enterprises. Its purpose is to provide enterprise identity, continuity of purpose and definition. The basic purposes are :

- To define the purpose of the company.
- To clarity the philosophical character of the company.
- To create a particular 'Climate' with in the business.
- To set done a guide for manager to make decisions.

The statement of broad objectives should not specify quantitative goals. It should be a narrative expression of the purpose, objective and philosophical character of the business.

(iii) Development of Specific Goals for Enterprises

It provides both narrative and quantitative goals that are definite and measurable. These specific goals are related to both enterprise and major responsibility center. Executive management as the second component of the substantive plan for the upcoming budget year should develop these goals. These broad but specific goals, must be developed for the both strategic long-range plan and the tactical short-range plans. These statements of specific goals should define such operational goals which are expansion or contraction of product and service lines, geographical area, share of market, growth trends, production goals, profit margins, return on investment and cash flow.

(iv) Development and Evaluation of Company Strategy

Company strategies are the basic thrusts, ways and the tactics that will be used to attain planned objectives and goals. A particular strategy may be short-term or long-term. Its purposes are to find the best alternatives for attaining the planned broad objectives and specific goals. Strategy focuses 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 adoption of currently ongoing strategies in harmony with the relevant variable with which management must cope. In the development of basic strategies for the enterprises, executive management must focus on identification of the critical area that influences the long-range success of the enterprise.

(v) Executive Management Planning Instruction

The executive planning instruction, issued by the top management communicates the planning foundation that is necessary for the participation of all level management in the development of the strategic and tactical profit plans. It is also called as the statement of planning guidelines. It explains the broad objectives, enterprises goals, enterprises strategies and any other executive management instruction needed to develop the strategic and tactical profit pans.

(vi) Preparation and Evaluation of Project Plans

Project plan encompass variable time horizon because each project has unique time dimension. It encompassed such items as plans for improvement of present products, new and expanded physical facilities, and entrance into new industries, exit from product and industries, new technology, and other major activities that can be separately identified for planning purpose. The nature of projects is such that they must be planned as separate units. Preparation and evaluation of current and future project plans are essential on a formal basis as one of the planning phases.

(vii) Development & Approval of Strategic and Tactical Profit Plans

The managers begin with intensive activities to develop their strategic and tactical profit plan after receiving planning instruction and project plans. Thus

both plans are developed concurrently. Certain format and procedural instruction should be provided by the centralized source, normally the financial function, to establish the general format, amount of details and other relevant procedural and format requirements essential for aggregation of plans of the responsibility centers into the overall profit plans.

(viii) Implementation of Profit Plan

Implementations of profit plans that have been developed and approved in the planning process involve the management function of leading subordinate in attaining enterprise objectives and goals. Thus effective management at all levels requires that enterprises, objectives, goals strategies and policies be communicated and understood by sub-ordinates. Plan strategy and policy developed through significant participation established the foundation for effective communication. The plans should have been developed with the managerial conviction that they are going to be meeting or exceeded in all major respects.

(ix) Use of Periodic Performance Report

Periodic performance reports are needed as implementation of profit plans are being implemented during the period of time specified in the tactical plan. The accounting department on monthly basis prepares these reports. These performance reports compare (a) actual performance with planned performance and (b) show each difference as a favourable or unfavourable performance variation. In an organization internal and external reports are made. These reports focus on dynamic and continuous control tailoured to the assigned managerial responsibilities.

(x) Use of Flexible Expenses Budgets

The flexible expense budget is also referred as the variable budgets, expenses control budge, formula budget etc. The flexible budget concept applies only to expenses. It is completely separate from the profit plan but it is used to complement it. It gives realistic information about expenses that make it possible to compute budget amount for various output volumes or rates of activity in each responsibilities center. The formula given the relationship of each expense to output in the center and each formula includes a constant expense factors and a variable expenses rate.

BA = FC + (UVC × Q)

Where,

BA = Budget allowance

FC = Fixed Costs

UVC = Unit Variable Cost

Q = Quantity

(xi) Implementation of Follow Up

Follow up is an important part of effective control because performance reports are the basis for effective follow up action. It is important to distinguish between cause and effect. The performance variations are effects, the management must determined the underlying cause. The identification of cause of primary responsibilities of the line management. In the case of unfavourable performance variance, after identifying the basic causes, as opposed to the results, an alternative for corrective action must be selected. Then the corrective action must be implemented.

In the cost of fixed expenses, the variable rate is zero, in the case of variable expenses, the content factor is zero and in the case of semi-variable expense, there is a value for both the constant factor and the variable rate. To apply the concept in a department then each expense must be classified into three categories.

1. Fixed expenses: that remains essentially constant in the short run regardless of changes in output or volume of activity.
2. Variable expenses: that very directly proportional with changes in output.
3. Semi-variable expenses: Those are neither fixed nor variable but have both a fixed and a variable component.

2.6 Purpose of Profit Planning and Control

A comprehensive profit planning and control is a systematic and formularized approach for starting and communication the firm's expectation and accomplishing management in such a way to maximize the use of the profit plan and to active the maximum benefit from the resources available to an organization over a particular span of time. It serves as a tool for management control. The maximum objective of profit planning and control is to assist in systematic planning and in controlling the

operations of the enterprises. In fact, it is the best source of communication and an important tool in the hand of management. The purpose of budgeting or profit planning and control may be summarized as follows:

1. To state the firms expectation (goals) in formal terms clearly to avoid confusion and facilitates their attainability.
2. To communicate expectation to all concerned with the management to the firms so that they are understood, supported and importance.
3. To provide a detailed plan of action for reducing uncertainty and for its proper direction of individual and group effects to achieve goals.
4. To co-ordinate the activities and efforts in such a way that the use of sources is maximized.
5. To provide a means of measuring and controlling the performance of individuals and units and to supply information based on which the corrective action can be taken.

2.7 Limitation of Profit Planning and Control

Profit planning and control is an important tool of management. However, each tool suffers some limitation and its use is fruitful within these limits. Profit planning and control is also not a limitless tool, so it is essential that the user of profit planning and control must be having a full knowledge of its limitations. The limitations of budgeting are as under.

1. Based on Estimates

Profit planning is not an exact science. Its sources depend upon precision of estimates. The success of profit planning and control depends to a large degree on the accuracy with which the basic estimate will be made. Therefore, estimates should be made on the basis if of all the facts available. Using correct and modified statistical techniques and management can make the accurate estimates.

2. Danger of Rigidity

Profit planning and control is an estimation and quantitative expression of all relevant data. So, there can be the tendency to attach some sort of rigidity or finality to them. However, rigid ness makes profit planning and control useless. For usefulness, the profit planning and control must be flexible. Various techniques must be tried, improved or discarded and replaced with others. In other words a profit planning and control programmed must be dynamic in every sense of the word.

3. **Application for Long Period**

   The installation of a complete profit planning and control is not possible in a short period. It should be continuously used in the business, and should be revised and modified with the changes situation in the business.

4. **Execution is not Automatic**

   A skillfully prepared profit planning and control will not itself improve the management of enterprises, unless it is properly implemented. For the success of profit planning and control it is essential that all the related persons inside the enterprises should understand it. It is mostly required that each executive must feel the responsibility and should make efforts to attain the budgeted goals. Departmental leaders should seriously think that it is their individual responsibilities to fulfill the target set up in their department budget. The success of a budgeting system totally depends upon the efficient management and administration.

5. **Not a Substitute for Management**

   Profit planning and control is a management tool. It is not a substitute for the management. It is totally wrong to think that the introduction of profit planning and contact is alone sufficient to ensure success and to guarantee future profits. It is only for achieving the end.

6. **Costly Affairs**

   The installation of a profit planning and control system is an elaborated process involving to much time and costs. Normally it is so costly that small column cannot afford to it. Even for a large concern, it is suggested that there should be some correlation between the costs of operating a budgeting system and when benefit derived from it. The system should be adopted only when benefit exceeds the cost.

7. **Proper Evaluation**

   For finding out the inefficiencies, proper evaluation should be made. In the absence of proper evaluation, budgeting will hide inefficiencies. So there should be continuous evaluation of the actual performance, standards also should be re-examined regularly.

8. Lower Morale and Productivity

Unrealistic targets should not be set and used as a pressure tactic. By doing it profit planning and control will lower moral and productivity. To some extent, profit planning and control may be used as pressure device but its extent must be carefully determined.

2.8 Application of Profit Planning and Control

Some people say that comprehensive profit planning and control is applicable only to large and complex organizations. Usually it is commented that "comprehensive budgeting is a fine idea for most business, but ours is different." Or “It is impossible to project our revenue and expenses” and so on. Sometimes specific industries are viewed as not amenable to profit planning and control. These views are common regarding non-manufacturing enterprises, services companies, financial institutions, hospitals, certain retail business, construction companies and real estate enterprises. To the contrary, profit planning and control can be adapted to any organization (profit or non-profit, service or manufacturing, regardless of size, special circumstances or conditions.) The fact that a company has peculiar circumstances or critical problem is frequently a good reason for the adoption of certain profit planning and control procedures. In respect to size, when operations are extensive enough to require more than one or two supervisory personnel, there may be a need for profit planning and control applications. The smaller company certainly has different needs in this respect than a larger one. As with accounting, a single profit planning and control system that is appropriate for all enterprises cannot be designed. A profit planning and control system must be tailored to fit the particular enterprises and its environmental changes.

2.9 Major Tools used in PPC.

2.9.1 Flexible Budgets

Flexible expense budget relates only to expenses or costs. They are also called dynamic, activity or output adjusted expenses budgets. The concept of flexible expense budget is that all expenses are incurred balance of passage of time, output, activity or combination of time and output or activity. They should be adjusted to actual output for comparison with actual expenses in periodic performance report.

2.9.2 Zero Based Budgeting

Zero based budgeting is the method of budgeting in which managers are required to start at zero budget levels every year and to justify all cost as if the programmes involved were being initialed for the first time. No costs are viewed as being on going in nature; the manager must start at the ground level each year and present justification for all costs in the proposed budget regard less of the types of cost involved.

2.9.3 Activity Based Budgeting

Activity based costing can be lead to improved decision making which principles extend budgeting. Activity based budgeting focuses on the lost of activities to produce and sell products and services. It separates indirect costs into separate homogeneous activity cost pools. Management uses the cause and effect criteria to identify to cost drivers for each of these indirect cost pools.

2.9.4 Cost-Volume-Profit Analysis

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

2.10 Concept of Cost-Volume Profit Analysis

The analysis of relationship between costs, volume and profit is known as cost-volume profit analysis. It is an analytical tool for studying the relationship between volume, cost, price and profit. It is also an importance tool, use for profit planning in a business. There are three factors of cost-volume profit analysis, which are inter connected and dependent with each other. For example, profit depends upon sales; selling price to a greater extent will depend upon the volume of production.

Cost-volume profit analysis is great helpful in managerial decision making. Specially, cost control and profit planning is possible with the help of cost volume profit analysis.

CVP analysis is a examines the behaviour of total revenue, total cost and operating income as changes as changes occur in the output level, the selling rice, the variable cost per unit and/00 the fixed costs of a product (Horngren, datar and foster, 2003).

CVP 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 this relationship CVP analysis simplifies the real world conditions that a firm will face. Like most models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations, which will be discussed later in this chapter, nevertheless, it is a powerful tool for decision making in certain situation (Durry, 2000).

CVP analysis is provides the management with a comprehensive overview of the effects on revenue and cost of all kinds of short-run financial changes. It is a related to profit, sales volume and cost.

Generally cost volume, profit provides information regarding;

1. What minimum level of sales need be achieved to avoid losses?
2. What should be the sales level to earn a target profit?
3. What will be the effect of changes in the prices, costs and volume on profits?
4. How will profits be affected when sales mix is changed?
5. What will be new break-even point on the (3) and (4) above?
6. What will be impact of plant expansion on cost volume profit relationships?
7. What product is the most profitable and which one is the least profitable?
8. Should sale of a product or operation of the plant be discontinued?
9. Should the firm be shut down temporarily?

   (Pandey, 1998, 231)

The CVP analysis is of immense utility to management as it provides an insight into the effects and inter-relationship of factors which influence profits of the firm. It is with the help of the CVP analysis that the finance executive is enabled to present facts and figures in accurate reports and intelligible charts to management for action.

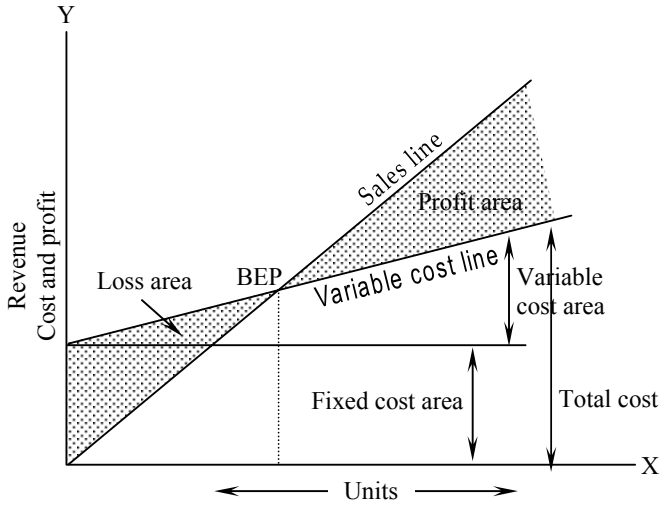
2.11 Use of Cost-Volume Profit Analysis in Profit Planning

The assumptions over emphasis the market sovereignty of product is (i.e. seller) rather than that of consumer. Therefore to assume that seller has choice to sell as many as of his product in the market, at the given price fixed by him is neither true nor possible.

Competitive market with a wide range of substitute products in the market has minimized the role of the seller and has over focused on the sovereignty of the customers. Though, it has been criticized by the authors, CVP analysis is powerful tool in the hands of management for profit planning. The contribution margin analysis provides the best possible answers of many 'what if' question of the management. Most management decision requires a careful analysis of cost behaviour in relationship to output volume. This is possible only through CVP analysis. Besides, CVP analysis deals with how profit and cost change with change in volume (Goet et. al, 2003, 121).

Most of the business fails 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 cost-volume profit interrelationships. A popular technique to study cost-volume-profit relationship is break-even analysis. Break-even analysis is concerned with the study of revenues and costs in relation to sales at which the firm's revenues and total costs will be exactly equal or the net income will be zero. It is a "No profit no loss" situation. This point is a cornerstone of profit planning. This can be explained, through cost-volume-profit graph as follows:

Cost-Volume-Profit Graph



The key motive of business enterprises is to make and maximize profit. Profit does not happen by chance. It is to be managed. Cost-volume-profit analysis (CVP) is a supplementary tool of strategies in sales planning and the cost estimation. A certain relationship exists between the variables like selling price, sales volume, expenses, and taxes. Cost-volume-profit analysis is an accounting technique showing the relationship between these variables. This technique is applicable in all economic sectors (manufacturing, wholesaling, relating, and service industries), because the same types of managerial functions are performed in each type of organization. (Rainborn, Barfield and Kinney, 1993) cost-volume-profit analysis, though most often illustrates business cases, is equally applicable for non-profit making organizations to allocate scare economic resources most effectively among the competing alternatives. Allocation of scare resources among the various demanding sectors is the most important part of national planning.

2.12 Utility of CVP or B/E Analysis

Break-even analysis is the most useful technique of profit planning and control. It is a device to explain the relationship between cost, volume and profit. The utility of the break-even analysis lies in the following advantages (A.I.C.P.A., Cost Analysis for Pricing and Distribution Policies, 1965, pp, 5-8).

1. It is a simple device to understand accounting data.
2. It is a useful diagnostic tool.
3. It provides basic information for further profit improvement studies.
4. It is useful method for considering the risk implications of alternative actions.

2.13 Application of CVP Analysis

CVP analysis is as essential tool for profit planning and control. It is used in management accounting to show relationship between cost, selling price, and profit and production volume. It can be used the following reasons:

1. It helps to fix the selling price.
2. It assets the management to understand the behaviour of cost.
3. It is used to control cost.
4. It provides essential information about cost volume to the management.
5. It helps to take a correct decision from the various types of alternatives.
6. It helps to determine the profitable range and breakeven point.

Cost volume profit analysis is applied specially for break-even analysis and profit planning. Business organizations are run to earn profit. Profit planning is the fundamental part of the overall management function. Profit planning can be done only when the management has the information about the cost of the product both fixed and variable cost and the selling price of the product. The cost-volume-profit relationship will be established by break-even analysis. Therefore, cost-volume-profit analysis uses for:

- Contribution margin analysis
- Break-even analysis
- Profit-volume analysis (Maheshowri, 2000, 174)

2.13.1 Contribution Analysis

In general sense, contribution is to leave something for some purpose. One very important concept is CVP and BEP analysis is contribution margin. Contribution margin reflects the revenue remaining after coveting all variable costs. In management accounting language, contribution margin is the excess of sales revenue over variables cost.

So, Contribution analysis involves a series of analytical techniques used to determine and evaluate the effects on profit of changes in sales volume (i.e. units sold) sales price, fixed cost and variable costs. It focuses of contribution margin. The term 'profit' used in CVP analysis is the amount of contribution margin available from the sales revenue to absorb fixed cost and also to contribute towards company profit goal after deduction all variable cost of sales. Therefore CVP analysis requires distribution of cost into variable cost and fixed cost. All semi variable costs need to be clearly segregated into variable and fixed component. Contribution margin is the excess sale over the variable cost. (Goet, et. al, 2005, 121)

Symbolically,

Contribution margin = Sales - Variable cost or fixed cost + profit

$$\text{CMPU} = \quad \text{SPPU - VCPU or } \frac{\text{Contribution margin}}{\text{Sales units}}$$

Contribution margin is usually expressed as a percentage of sale or contribution margin ratios i.e.,

$$\text{CM ratio} = \frac{\text{CM}}{\text{Sales revenue}} \text{ or } \frac{\text{CMPU}}{\text{SPPU}} \text{ or } 1-\frac{\text{VC}}{\text{Sales revenue}} \text{ or } 1-\frac{\text{VCPU}}{\text{SPPU}} \text{ or 1 - cost volume ratio}$$

$$\text{or} \quad \frac{\text{Difference in profit (i.e. contribution margin)}}{\text{Difference in sales revenue}}$$

2.13.2 Break-even Analysis

Break even analysis is the term used to study of the interrelationship between cost volume and profit at various level of activity. It is the most widely known form of the cost volume profit analysis. Therefore, the cost volume profit analysis is also called as break even analysis.

The break-even point is used under Break-even analysis. Break even point is the level of activity at which total cost equals to total revenue. In other words, break even point is a point of "No profit no loss". If the sales or production is higher than the break even point volume, there will be a profit and if the sales (production) are less than BEP sales there will be a loss.

Break even point can be determined by the following methods:

(i) Algebraic or formula method

(ii) Graphic or chart method

(i) Algebraic or formula method: Break even point occurs when profit will be nil. In other words, when total cost equals to total revenue, profit will be nil. At break even point.

Total revenue = Total cost

Finding total revenue (TR)

Total revenue = Selling price per unit x series in units

Symbolically,

$$TR = S \times Q$$

Where,

TR = Total revenue

S = Selling price per unit

Q = Sales quantity

Finding total cost (TC)

Total cost = Fixed cot + variable cost ± profit/loss

= Fixed cost + variable cost per unit × Sales in units (for BEP sales)

Symbolically,

$$TC = FC + (V \times Q)$$

Hence, TR = TC (for BEP sales)

or, $S \times Q = FC + (V \times Q)$

or, $(S \times Q) - (V \times Q) = FC$

or, $Q(S-V) = FC$

or, $Q = \frac{FC}{S-V} = \frac{FC}{CM}$ or, $S - V = CM$

Where,

Q = Break even quantity

FC = Fixed cost

S = Selling price per unit

V = Variable cost per unit

CM = Contribution margin per unit

Some Important Formula

Formulas:

1. Variable cost ratio (VC ratio) $= \frac{\text{Variable cost}}{\text{Sales}}$

$= \frac{\text{Difference in cost}}{\text{Difference in sales amount}}$

$=$ 1 - PV ratio

2. Variable cost = VC ratio × Sales

= Sales (1 - PV ratio)

= Total cost - Fixed cost

3. Variable cost per unit $= \frac{\text{Difference in cost}}{\text{Difference in output}}$

$=$ Selling price × VC ratio

4. Contribution margin ratio (PV/CM ratio) $= 1 - \frac{\text{Variable cost}}{\text{Sales}}$

$= \frac{\text{Diff. in profit}}{\text{Diff. in sales}}$

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

$=$ 1 - VC ratio

5. Contribution margin (CM) = PV ratio × sales = Sales $\left(1 - \frac{V}{P}\right)$

6. sBEP in Rs. $= \frac{\text{Fixed cost}}{\text{PV ratio}}$

BEP in units $= \dfrac{\text{Fixed cost}}{\text{CMPU}}$

7. Profit on given sales = Sales - Variable cost - Fixed cost
   = (Actual sales - BEP sales) × PV ratio
   = (Actual sales unit-BEP sales unit)×CMPU

8. Required sales to earn desired profit = $\dfrac{\text{Fixed cost} + \text{profit}}{\text{PV ratio}}$

9. Required sales to earn X% profit on sales = $\dfrac{\text{Fixed cost}}{\text{PV ratio} - \text{Expected profit rate}}$

10. Required sales to suffer X% loss on sales = $\dfrac{FC}{PV + X\%}$

11. Sales to earn x profit after tax $= \dfrac{FC + \dfrac{\text{Profit after tax}}{1 - \dfrac{\text{tax rate}}{100}}}{\text{PV ratio}}$

12. Sales required to earn equal profit of alternatives = $\left|\dfrac{\text{Diff. fixed cost}}{\text{Diff. PV ratio}}\right|$

13. Alternative project for different level of sales = $\dfrac{FC - FCI}{VCI - VC}$

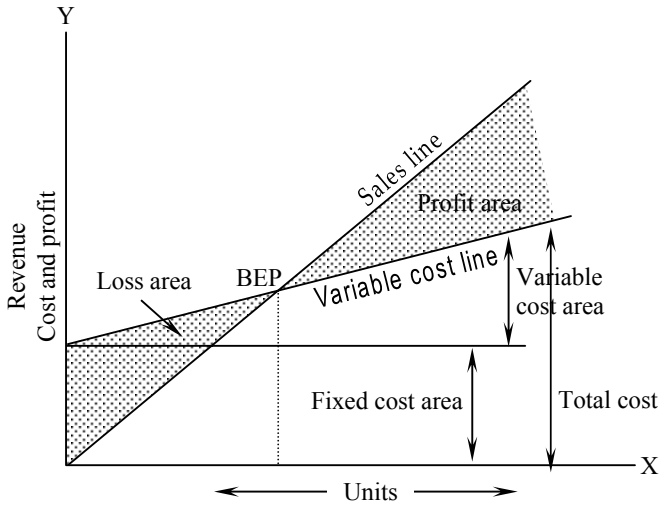
14. Margin of safety = Actual sales - BEP sales
    $= \dfrac{\text{Profit}}{\text{PV ratio}}$

15. Margin of safety ratio = $\dfrac{\text{Margin of safety}}{\text{Actual sales}}$

16. Margin of safety ratio = $\dfrac{\text{Actual Sales - BEP sales}}{\text{Actual sales}}$

(ii) Graphic or Chart Method: The break even point can be also determined with the help of a graph. A simple illustration of break even chart is given below.

Cost-volume-profit graph



Sales Volume: Sales volume is shown in x-axis and cost is shown in y-axis. Fixed cost is always equal within a certain level of activity, so fixed cost curve is parallel to x-axis. Total cost increases with increase in sales volume. As a result total cost curve is slopping upwards to right side. The total cost curve starts from point C. OC is the fixed cost. OC is also total cost when the sales volume is zero. The sales revenue curve originates from the origin because sales revenue is zero when is also volume is zero. The sales revenue curve is also slopping upwards to right.

An equilibrium point between total cost curve and total revenue curve is known, as break even point where both the cost and revenue is equal at OP and the break even quantity is OQ. If the actual sales volume is more then break even sales, the firm will earn profit and if the actual sales is less then the break even sales, the firm will suffer from loss.

2.14 Assumptions of Break Even Analysis

The break even analysis is based on some important assumptions, which are as follows:

1. All cost can be classified into two parts, fixed cost and variable cost. There is no cost other than fixed and variable.
2. There is a relevant range of validity (activity) for using the results of the analysis.
3. Sale price dies not change as units of sale changes.
4. There is only one product or in case of multiple products, the sales mix among the products remains constant.

5. Basic management policy about operations will not change materially in the short run.
6. The general price level (inflation/deflation) will remain essentially stable in the short run.
7. Sales and production levels are synchronized, that is inventory remains essentially constant or zero.
8. Efficiency and production were changed revised budget would be needed for a new analysis.

2.15 Special Problems in Cost Volume Profit Analysis

There are three special problems in cost volume profit analysis that are as follows:

1. The activity base
2. The change in inventory
3. The non operating expenses and Incomes

1. The Activity Base

When two or more products or activities are combined for break even analysis, the activity base is usually in amount. Product unit is used for single product. The activity base must be in additive units using a common denominator of volume or output in multiple products. For the company as a whole, net sale amount are usually the only satisfactory common denominator because manufacturing, selling and administrative activities are expressed in combination.

2. The Change in Inventory

Usually, the budgeted change in inventories (that is finished goods and work-in-process) is 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.

Management policy in inventory changes is:

- Disregard the inventory changes
- Include the inventory changes

3. The Non operating Income and Expenses

Non operating incomes and expenses (extra ordinary gains and losses) cause another problem in cost volume, profit analysis. The main problem is that whether they should be included or excluded in the analysis.

Management policy may be to:

- Include the non operating income and expenses.
- Exclude the non operating income and expenses.

2.16 Limitations of CVP or B/E Analysis

The break-even, or cost-volume-profit, analysis is a simple and useful concept. But it is based on certain assumptions, which have been discussed earlier. These assumptions limit the utility and general applicability of the break-even analysis. Therefore, the analysis should recognize these limitations and adjust data, wherever possible, to get meaningful results. The cost-volume profit analysis suffers from the following limitations (Irwin, 1973).

1. It is difficult to separate costs into fixed and variable components.
2. It is correct to assume that total fixed cost would remain unchanged over the entire range of volume.
3. The assumption of constant selling price and unit variable cost is not valid.
4. It is difficult to use the break-even analysis for a multi-product firm.
5. The break-even analysis is a short run concept and has a limited use in long range planning.
6. The break-even analysis is a static tool.

2.17 Profit Volume Analysis

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

Profit/Volume Ratio This term is important for studying the profitability of operations of a business. Profit/volume ratio (i.e. p/v ratio) established a relationship

between the contribution and the sales value. The ratio can be shown in the form of a percentage also. The formula can be expressed by (Maheshowri, 2000,184).

$$\text{PV ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{S - VC}{S} = 1 - VC/S$$

The ratio can also be called as contribution margin ratio. This ratio can also be known by comparing the change in contribution to change in sales or change in profit to change in sales. Any increase in contribution would mean increase in profit only because fixed costs are assumed to be constant at all level of production. Thus, (Maheshowri, 2000, 185).

$$\text{PV Ratio} = \frac{\text{Changes in Contribution}}{\text{Change in Sales}} = \frac{\text{Changes in Profit}}{\text{Changes in Sales}}$$

This ratio would remain constant of different level of production since variable costs as a production to sales remain constant of various levels. This ratio is useful for determination of the desired level of output or profit and for the calculation of variable costs for any value sales. The variable cost can be expressed as under.

VC = Sales (1-P/V ratio)

Comparison at different P/V ratios is usually made by the management to find out which product is more profitable. Management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling prices.

2.18 Margin of Safety and Margin of Safety Ratio

The Margin of Safety is the excess of budgeted sales over the BEP volume of sales. Margin of safety is a cushion available to a business firm to protect it against the future business happenings. The higher is the margin of safety, the safer is the business. In other words, it is the differences between actual or budgeted sales and break even sales (Goet et al 2005, 12).

Symbolically,

Margin of safety (MOS) = Actual sales volume - BE sales

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

CVP analysis is applied to (I) individual product level and (II) company level. In applying CVP analysis for overall company the problems of sales mix arises. Sales mix can be defined as the relative combination of products represented in total sales. If only one product or similar products are involved, the complication of sales mix is avoided. In case of multiple products, the managers try to achieve that combination or mix that will yield the greatest amount of profits. Most companies have several products and these products are after not equally profitable. Profit of the company will also depend on the sales mix. Profit will be greater if high items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in the sales mix can cause interesting variations in a company, shifts in the sales mix from low margin items can cause reverse effect. Hence, in order to maximize profit, the firm needs to sell the most profitable mix of products. One important point to note here is when all individual products of a company are in break even, the company will also be in break even. However, when the company is in break even, its products are not necessary be in break even. Similarly, the changes in sales mix will also bring changes in BE sales.

The overall or company BE sales is computed by using the following formula:

$$\text{Company BE sales (Units)} = \frac{\text{Total fixed costs}}{\text{Weighted CMPU}}$$

$$\text{Where, Weighted CMPU} = (\text{Weight} \times \text{CMPU}) \text{ or } \frac{\text{Total CM}}{\text{Total Sales Unit}}$$

$$\text{Company BE sales (Rs.)} = \frac{\text{Total Fixed Costs}}{\text{Weighted P/V Ratio}}$$

$$\text{Where, Weighted CMPU} = (\text{Weighted} \times \text{CM Ratio}) \text{ or } \frac{\text{Total CM}}{\text{Total Sales Revenue}}$$

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

2.20.1 CVP Analysis with Single Constraint

Scare resources should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only on constraining resource. This can occur if the firm products are all produced on a single machine and output is limited by hours available on this machine. In the same way, single resource constraint arises, if the firm's products are all produced with only one material and output is limited by quantity available for these 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 basic of contribution per scarce resource (Munakarmi, 2003: 146).

2.20.2 CVP analysis with a Multiple Constraints

Where more than one scarce resource exists the optimum production program can not easily be established by the simple process applied in single resource constraint. Under the circumstance simple allocation of resource or the basis of contribution margin per unit is neither feasible not desirable contribution margin per units scarce resources may be different for different scarce resources may be the ranking of product : because production processes are affected by many constraints factors rather than single constraint. In such situation linear programming technique may be used to optimize product mix. The linear programming formulation is required to determine a production plan that maximized contribution from the product mix. Linear programming is a mathematical technique, which shows how to arrive at the optimum results, allocation available resource in a meaningful manner. It is basically concerned with the problem of allocating limit resources among competitive activities in an optimal manner. It is technique to optimize the allocation of scarce resources in product mix problems which provides a valuable extension to cost volume profit analysis (Munakarmi, 2003. 148).

2.21 CVP Analysis under Condition of Uncertainty

CVP analysis has been used for various purposes such as choosing between machine and products, planning of profit and most significantly fixing up of selling price. Management has used this as a conveniently tools of profit planning without giving consideration of risk and uncertainly involved in it. Although margin of safety ratio explains the degree of sensitivity of the project and product and it also explains between the alternatives. To overcome such as difficulty, risk and uncertainty analysis like in any other management decision-making can also be used in CVP analysis.

Probability distribution approach is a simple statistical tool, which may be used to measure the risk and uncertainty involved in CVP analysis. A probability distribution theory normally suggest for postulation of various possibility of happening of the event in consideration. This may be done either taking into consideration of the experience in the past or may be done by considering the personal intuition of the persons doing so. In business reference of past experience are hardly available not a person is likely to behave in the same manner in the similar situation in different time. Therefore, personal judgment plays significant role in the management decision-making. The condition thus, postulated are assigned probability (i.e. ones judgment towards likeness of happening of the condition forecasted). It must be understood have that probability assigned here is a subjective probability based in, personal judgment of the man making such an analysis (Pandey, 2003: 17).

2.22 Step (Jumping) Fixed Cost and Multiple BEP

Break-even point is determined by dividing the fixed costs by the contribution margin per unit. It the fixed cost jumps once (i.e. step fixed) then it is required to consider a different amount of fixed cost corresponding to each step. As such, BEP is computed for each level of fixed costs. Some of these computed BEP might not be feasible because they may violate the limits imposed by the relevant range corresponding to the level of fixed costs considered in their computation. As a result real or actual BEP is determined through trail and error approach (Munakarmi, 2003, 136).

2.23 Sensitivity Analysis

Assess the impacts of the changer in cost-volume-profit variable sensitivity analysis is the measurement of elasticity of the change in cost-volume-profit factor on break-even point or given profit. The strategies should focus more on the factor, which is more sensitive or responsible for profit. To measure the sensitivity of cost-volume-profit factor one can see the impact of certain percentage or amount changes in volume, price or cost factor on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinant variable. We know that the goal of a business enterprise is to maximize profit. Profit is the excess of revenues over the total costs.

Net profit = Total sales revenue - Total costs

= Sales units × SPPU - Sales units × VCPU - FC -Taxes

So that, profit = (Sales volume, selling price, VC, FC, Taxes, etc)

It means, profit is 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 strategies decision. 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 changes in volume, Price, or cost factors on net profit.

2.24 General Assumptions in Cost Volume Profit Analysis

Cost-volume-profit analysis is 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 up and downs. Cost-volume-profit analysis helps to plan for every set of goals in the short-run. But cost-volume profit analysis encompasses the following assumptions.

1. **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 in to fixed and variable component. In fact, it is extremely difficult to identify each and every cost element as fixed and variable ones. Traditional types of cost recording in developing countries like Nepal have 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.

   If one fails to identify the costs as fixed and variable the application of CVP analysis becomes almost impossible.

   For example, BEP units = $\frac{\text{Fixed cost}}{\text{SPPU} - \text{VCPU}}$

   If one fails to identify the cost as fixed and variable how can it be possible to compute the required variable?

2. **Linear behaviour of Costs Within the Relevant Ranger**

   Cost-volume-profit analysis assumes that the total fixed cost do not change in the short-run with in the relevant range. Total variable costs are exactly proportionate to sales volume. But in really cost behaviour 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 units 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, our BEP units or any other variable of profit function do not remain constant over time. And it's useless to compute the BEP and other variables at every moment for the changed situation.

3. **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 out needed volume?

4. **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.

5. **No Effect of the Size of Inventory on net Income**

   The application of cost-volume-profit analysis is possible only under the situation of either following variable costing for inventoriable product cost or all production volume be sold with in the same period. Cost-volume-profit analysis does not work under the full costing method inventory change occurs.

6. **Single Product or Constant Sales Mix**

   Cost volume profit analysis assume that either a single product is sold or, if more products are sold, the ratio of each product on total sales will be in accordance with a predetermined sales mix.

7. **Short-term time Horizon**

   Cost volume profit analysis is a short-term planning tool, because nothing remains table in the long run. In the condition of changing variables all equations of cost volume profit analysis become impossible.

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

The key limitations underlying cost-volume-profit analysis are ; all costs cannot be classified as fixed and variable ones, the behaviour of costs is not necessarily liner with in the relevant range, step-fixed costs are difficult to treat, selling price does remain constant for all volume of sales even in the short-run, cost volume profit analysis works only in variable costing system, sales mix does not remain constant over time, and cost volume profit analysis applies only to a short term horizon.

2.25 Cost Structure

Cost structure refers to the relative proportion of fixed and variable cost in on organization. The relationship of a company variable and fixed cost is reflected in is operating leverage. The high labour incentive organization have high variable cost and low fixed cost and thus have low operating leverage and a relatively low break point conversely, organization that are highly capital intensive have a cost structure that include low variable and high fixed costs. Such a structure reflects high operating leverage and relatively high break-even point company with lower fixed costs and higher variable costs will enjoy greater stability in net income and will be more protected from losses during bad years but at the cost of lower net income in good years (Munakarmi, 2003 , 145).

There are three types of costs by their nature of variability: They are,

a. **Variable Cost** Variable cost it that cost which is directly affected by changes in the activity level. Per units variable cost is always constant if the activity level is decreased the variable cost also decreases. If the activity level or production level increase, variable cost also increase. Changes of variable cost effects to p/v rate, BEP and net income. When variable cost increase, net income, p/v ratio and margin of safety will be decreased but it helps to increase BEP.

b. **Fixed Cost** Fixed cost remains constant in total amount despite the change in the level of activity. It means the fixed cost, remains unchanged in total as the activity levels vary. When other factors remain unchanged, the change in fixed cost effects to BEP and net income. When the fixed cost is increased, the volume of BEP increase but the net income decrease or vice-versa. Fixed cost is also called capacity cost.

c. **Semi-Variable Cost** Expenditure that cannot be categorized as purely fixed or variable are termed as mixed cost or semi-variable cost. Mixed cost contains both variables and fixed cost elements. Repair and maintenance, supervision,

telephone, electricity charges are some example of mixed cost. It should be separated into the variables and fixed elements for profit planning, cost control and decision making.

2.26 Financial Statement Analysis

Financial statement at least refers to the two statements, which are prepared by a business concern at the end of the year. These are:

a. **Income Statement:** It is prepared by an enterprise in order to know the profit earned and loss sustained during a specified period.

b. **Position Statement or Balance Sheet:** It is prepared by a business concern on a particular date in order to know its financial position.

The above-mentioned statements are collectively called financial statements of a company. (Jain, el.al 1991 vi 1).

Analysis is the process of critically examining in detail accounting information given in the financial statement. For the purpose of analysis, individual items are studied. Their interrelationship with other related figures established the data are sometimes rearranged to have better under standing of the information with the help of different techniques or tools for the purpose. Financial analysis is helpful in assigning the financial position and profitability of a concern. This is done through the comparison of rations over the period (Jain, et. al 1991 vi/4).

Absolute figures are valuable but they standing alone convey no meaning unless compared with another. Accounting ratios show inter-relationship which exist among various accounting data. When relationship among various accounting data supplied by financial statement is worked out, they are known as accounting ratios.

Ratio may be classified in a number of ways keeping in view the particular purpose. Ratios indicating profitability are calculated on the basis of the profit and loss account are called profitability ratios and those ratios indicating financial position are calculated on the basis of the balance sheet are called financial ratios.

2.26.1 Profitability Ratios

Profitability ratios are of utmost importance for a concern. These ratios are calculated to enlighten the end results of business activities, which is the sole criterion of the

overall efficiency of a business concern. The following are the important ratios. (Jain, et al 1991: VI/28).

a) **Gross profit ratio:** This ratio tells gross margin and is calculated as under:

$$\text{Gross profit ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

b) **Operating profit ratio:** This ratio establishes the relationship between operating profit and sales and is calculated as follows:

$$\text{Operating profit ratio} = \frac{\text{Operating profit}}{\text{Net sales}} \times 100$$

c) **Net profit ratio:** This ratio is very useful to the proprietors and prospective investors because it reveals the overall probability of the concern. This is the ratio of net profit after taxes to net sales and is calculated as follows:

$$\text{Net profit ratio} = \frac{\text{Net profit after tax}}{\text{Net sales}} \times 100$$

d) **Return on shareholders' investment ratio:** The ratio, also called return on proprietor's funds is a measure of the percentage of net profit to shareholders funds. The ratio is expressed as follows:

Return on shareholders investment ratio

$$= \frac{\text{Net profit after tax, interest and preference dividend}}{\text{Equity shareholders' funds}}$$

Equity shareholders funds = Equity share capital + Capital reserves + Revenue reserve + Balance of profit and loss account - fictitious assets.

e) **Return on total assets:** This ratio is calculated to measure the profit after tax against the amount invested in total assets to creation whether assets are being utilized properly or not.

$$\text{Return on total assets} = \frac{\text{Net profit after tax}}{\text{Total assets}} \times 100$$

2.26.2 Financial Ratios

These ratios are calculated to judge the financial position of the concern form long-term as wells short-term solvency point of view. The following are the ratios, which are calculated in this respect (Jain S.P. et al 1991: VI/39).

a) **Current ratio:** This is the most widely used ratio. It is ratio of current assets to current liabilities. It is expressed as follows:

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current assets = Cash, Bank balance, Short term, Investment, Bills receivables, trade debtors, Inventories and Pre-paid expenses etc.

Current liabilities = Bank overdraft, Bill payable, Trade creditors, provision for taxation, proposed dividend, accrued interest on loans and debentures, outstanding expenses etc.

Generally 2:1 is considered ideal for concern i.e. current assets should be twice of the current liabilities.

b) **Quick ratio :** This is the ratio of liquid assets to liquid liabilities 1:1 ratio is considered ideal ratio for a concern because it is wise to keep the liquid assets are those assets which are readily converted into cash and will include cash balance, bills receivable, sundry debtors and short-term investment. Inventories and prepaid expenses are not included in liquid assets. Quick ratio is calculated as follows:

$$\text{Quick ratio} = \frac{\text{QuickAssets}}{\text{CurrentLiabilities}}$$

c) **Fixed assets ratio :** This ratio is calculated as under :

$$\text{Fixed assets ratio} = \frac{\text{Fixed Ratio}}{\text{Capital Employed}}$$

Capital employed = Equity share capital + Preference share capital + Undistributed profit + Reserve and surplus + Long term liabilities - Fictitious assets

This ratio gives an idea as to what part of the capital employed has been used in purchasing the fixed assets for the concern. If the ratio is less than one it is good for the concern.

d) **Ratio of current assets to fixed assts:** This ratio is worked out as ratio of current assets to fixed assts = $\frac{\text{Current assets}}{\text{Fixed assets}}$. This ratio differs from industry to industry and therefore no standard can be laid down. Decease in the ratio may mean that trading is stock or more mechanization has bee put through. An increase in the ratio may reveal that inventories and debtors have unduly increased or fixed assets have been intensively used.

e) **Debt to equity ratio**: This ratio is calculated to measure the relative proportions of outsiders' funds and shareholders' funds invested in the company. This ratio is also known as external internal equity ratio and is calculated as follows:

$$\text{Debt to equity ratio} = \frac{\text{Long - term debts}}{\text{Shareholders' fund}}$$

f) **Proprietary ratio:** A variant of debt to equity ratio is the proprietary ratio, which shows the relationship between shareholders' fund and total assets. The ratio is worked out as follows:

$$\text{Proprietary ratio} = \frac{\text{Shareholders' fund}}{\text{Total assets}}$$

2.27 Risk Measurement: The Operating Leverage & Break-even Point

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 cost does not change. Say, if sales decline, variable cost also decline in the same ratio so that contribution margin also decline proportionately. But fixed cost does not decline. So the net operating income declines more rapidly, the same thing applies in the case of increases as well. Sales revenues change, but some part of costs known as fixed costs, remains 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 or EBIT associated with a given percentage change in sales.

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

Alternatively,

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

$$\text{DOL} = \frac{Q(\text{SPPU} - \text{VCPU})}{Q(\text{SPPU} - \text{VCPU}) - \text{FC}}$$

$$\text{Where, } Q = \text{Total demand in units}$$

SPPU = Selling price per unit

VCPU = Variable cost pert unit

FC = Fixed Cost

As we know, $BEP_{units} = \frac{FC}{SPPU - VCPU}$

Leverage decision is meant to substitute variable costs by the fixed cost. To create a degree of operating leverage means the employment of higher amount of fixed costs, which eventually increase the break-even point also. No DOL is to be said when the DOL occurs '1' and in this situation BEP comes to '0'. High fixed cost increase the DOL and they also increase the BEP. So, there is a close relationship between the DOL and BEP. A high DOL and a high BEP both are the indicators of high risk (Bajracharya et al 2005: 249).

Is high DOL or less DOL better? As you know a high DOL firm goes into loss sooner as sales decline and earns more as sales increase. A smaller DOL firm goes into loss only after a large decline in sales and earns less than a high DOL firm as sales increase. A no DOL firm never goes to operating loss and earns less than a high DOL firm in case of increasing sales.

Therefore a decision to select a DOL depends upon the future likelihood. If the future is likely to be positive for the firm it is better to choose high fixed cost alternative (high DOL). If it is pessimistic, it is safe to operate with a small or no amount of fixed costs (less DOL)

Secondly, the selection of a DOL is sometimes subjective. A risk taker may prefer a high DOL but a risk averter prefers a small DOL. A high DOL makes good times better and bad times worse.

2.28 Review of Related Study

This part is a descriptive presentation of the literature work done by the various authors and previous researcher in the related field. It encompasses a combined effort of the entire researcher. The major objective of this part is to the analyzed the previous research study.

As profit planning and control and management accounting cover major aspects of cost-volume profit analysis, research made on these sectors is taken onto consideration for review.

Dangol (2001), had conducted a research entitled "Profit Planning in Manufacturing Public Enterprises; a Case Study in Hetauda Cement Industry Ltd.". Dangol has focused her study in the application of profit planning concepts in PEs.

Necessary data and other information were collected from both the secondary and primary sources of data. Dangol had painted out various findings.

Some remarkable findings were as follows:

1. No proper application of any effective sales forecasting technique.
2. Planning of budgeting policy of the company is very poor and there is no system of taking corrective action for pre-planning.
3. Decision making power is centralized.
4. There is no clear but duties and responsibilities of the employee.

Poudel (2004), has prepared the thesis entitled "Profit planning and control in Nepal Telecom Ltd". The general objective of the study is the assessing NTC's present situation and future prospects. The following findings have been drawn on the basis of analysis.

The major findings are as follows;

1. NTC has not adequately considered controllable and uncontrollable variables affecting the cooperation.
2. The sales plan and achievement is satisfactory to some extent.
3. CPV relationship has been considered while developing the sales plans and fixed assets purchase plans.
4. Financial performance of NTC is not so good.
5. NTC has totally neglected the concept of variance analysis.
6. NTC does not follow the periodic performance reports.
7. NTC does not consider the use flexible budgeting.

Kharel (2005), working capital management a case of BPPNL.

The major finding is as follows;

1. The major component of current assets of BPPNL is fluctuating during the study period.
2. It doesn't have any clear vision about the investment of working capital.
3. The current ratio is very poor and sales volume is not satisfactory level.
4. BPPNL has not seriously examined the working capital management.
5. The theory of high risk of high return is not applied here.
6. Liquidity position is weak.
7. The BPNL has higher proportion of inventory on current assets by which large funds of the company tied up in it.
8. Net Profit is in negative figure during the study period.

Kadel, (2006) has conducted a research work on the topic of "Inventory Management of BPPNL" this study covered six year period from FY2054/2055 to 2059\2060.

Major findings are as follows;

1. For the purchase or collection of raw materials BPNL use three methods I.e. direct collection, collection through agent by global tender and through letter of credit (L.C.) for foreign purchase. Mainly BPNL purchases its raw material from local places but sometimes from Indian and China in the case of chemicals.
2. There is no proper target for material purchase in the company and the price and quality of collection materials are fluctuating from year to year.
3. Goods receiving process is a document on the basis of which purchases are verified and payment is made to the suppliers. It is also helpful in filling any claim for short supplies. It provides complete record for all material received.
4. Store control device practice n BPNL the store control device adopted is Bin Card and store ledger. The company has not applied ABC analysis techniques to control various types of inventory in the store.
    a. Bin cards: In context of BPNL with its help the store keeper can sent material requisition for the purchase of material in time.
    b. Store Ledger: The Store ledger is systematically maintained by computer method. This ledger provides the information for the pricing of material issued and the money value at any time for each item maintained in stove.

c. Issuing materials: material once received by the store is issued by the concerned department as per the quantity demanded in the requisition form previously provided to the store department.

5. In average there is more or less balance between the annual requirement and purchase. By C.V., the annual purpose is inconstant. This is the symbol of poor estimation.
6. There is no classification system so there is difficult to determine the ordering and carrying cost.
7. The company is not following economic order quantity model in purchasing division.
8. The higher value of S.D. for actual sales includes its inconsistent nature compared to closing stock. However value of C.V. indicates that closing stock it fluctuates more than actual sales. The value of correlation coefficient is +0.77 means the positive relationship between these two variables i.e. increase in closing stock result into increase in actual sales and vice versa.
9. Higher value of S.D. for actual purchase compared to closing stock indicates that actual purchase fluctuates more than the closing stock. However, value of C.V. indicates that actual purchase is relatively stable compared to closing stocks. The value of correlation coefficient (+0.80) means the positive relationship between these two variables. This means the movement of both variables is most in the some direction.
10. In an average actual purchase is slightly greater than the actual sales. Value of both S.D. and C.V. signifies the consistent nature of actual sales compared to actual purchase.
11. The consumption pattern of the company is also fluctuating year to year. This shows that the company is unable to utilize its existing capacity in the production of paper and Pulps.
12. Consumption and production trend is increasing.
13. The trend of material cost is increasing. The production cost is decreasing year to year.
14. The investment in inventory stock of BPNL is in large amount. The value of inventory stock is in fluctuating trend.

Sharma (2007), has conducted a research on the topic '**Profit Planning in Manufacturing Industry of Nepal: A case study of BPPNL"**

The major finding is as follows;

1. Even the target sales of BPPNL are good but it has not success to achieve its target.
2. Actual sales will go some direction to that of budgeted sales.
3. Actual production is bellows than target production. Targets are set at high expectation but actual productions are only an average of 80 percent of target production.
4. Positive correlation between budgeted and actual production.
5. Finished goods and stock in process have been valued at the weighted average cost taking into account the cost of raw- materials, handling of materials and manufacturing cost excluding depreciation and interest of selling price whichever is lower.
6. Actual material is always lower then the expected but labor cost always lower than budgeted.
7. The administrative expenses of BPPNL are in fluctuating trend. It is due to that the management is unable to control the administrative work and for a result the management officer is change in every two or three year. So the expenses are also fluctuating due to the different plants of different management officer.
8. Every year the production expenses are in increasing trend. It is so because every year the cost of raw material and its transportation cost are increasing. And also the cost of employee and repair and maintenance of plant is increasing because the plant is became older and order every year. These are the major factors that help to increase the production cost every year.
9. Units produce very lower than the standard.
10. Every year the selling expenses are fluctuating. On of the main cause is the sales promotion activities were done that year to increase the sales.
11. The company current sales revenue is below than the BEP level which means that the company operates in a huge loss due to very high FC and VC .Its P/V ratio is 48.75 %, which is very high. If the idle capacity of BPPNL is utilized efficiently it helps to reduce some loss.

12. Balance sheet of BPPNL shows weak financial condition as well as very poor performance of management.
13. Liquidity position, current ratio, net profit margin, turnover ratio, and employed turnover radio are not good. Debtor turnover ratio is also low. It is indicates that the company's management is less efficient of debtor.

2.29 Research Gap

There is the gap between the present research and the previous researchers. Previous researchers conducted in the area of PPC in manufacturing enterprises but most research has failed to explain the use of CVP as a tool of PPC. The previous researcher did not disclose which of the profit planning and controls tools are in practice which is not and why. Thus, to fill up costs-volume-profit analysis gap, the current research is conducted. Mainly the research is accounting and financial data analysis types of research. It examines the current practice of CVP analysis, tools of PPC test analysis in the BPPNL. Probably this might be the first research study carried of one private separate company on this topic in Nepal.

CHAPTER - THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research Methodology refers the various steps that are generally adopted by researcher in studying his/her research problem along with the logic behind it. Thus, research methodology is a systematic and organized effort to investigate a specific problem that needs a solution (Wolf and Pant, 1999:203). Every research should be out lined in the systematic manner and for that reason research methodology is one of the most important parts.

This section deals with a set of methods that were applied while conducting the research study in order to achieve the research objective. It helps to analysis, examine and interpret various aspects of research work such sales, cost and other aspects of CVP analysis, related to effective tool of PPC.

"Research is systematic and organized effort to investigate a specific problem that needs a solution (Sekaran 1992). This process of investigation involves a series of well thought out activities of gathering, recording, analyzing and interpreting the data with the purpose of finding answers to the problem. Thus, the entire process by which we attempt to solve problems or search the answers to questions is called research". (Wolff & Pant, 2005, 4)

3.2 Research Design

Research design we mean an overall framework or plan for the activities to be undertaken during the course of a research study. The research design serves as a framework for the study, guiding the collection and analysis of the data, the research instruments to be utilized, and the sampling plan to be followed.

Research design is like a philosophy of life; no one is without one, but some people are more aware of theirs and thus able to make more informed and consistent decision. Similarly, every type of empirical research has an implicit, if no explicit, research design. Because a design always exists, it is important to make it explicit, to get it out in the open where its strengths, limitations, and implications can be clearly understood (Maxwell, 1996, 3-4)

The study is closely related with quantitative plans and accounts of BPPNL. So, analytical approach has been considerably, adopted to present the data. But the qualitative aspects of the research, such as; effectiveness of cost volume profit analysis or Budgeting on profitability problem of formulating and implementing profit plants are explained when ever necessary. Therefore, the present study has followed both analytical as well as descriptive approaches of research design.

3.2 Period Covered

The present study is under taken for a period of last 5 years. This study tries to explain about these 5 years activities and also state the strength and weakness of profit planning and control of BPPNL

3.3 Source of Data

Data is a most for all kind of study. This study mainly based on secondary data, primary data also included taken from personnel of BPPNL. Primary data are collected through the questionnaire and interview with personnel. Secondary data have been taken from the published data have been taken from the published document of BPPNL.

3.5 Data Analysis Tools

The total aspect of the cost volume and profit will be reviewed and research for the element those have been hiding since the establishment. Collected data from primary and secondary source will be analyzed using accounting and statistical tools.

3.5.1 Accounting Tools

1. Cost Volume Profit Analysis

Or,

Break Even Analysis

Cost volume profit analysis of breakeven analysis is a technique used to examine the relationship between volume, total costs, total revenue and profit.

The break even point is used under breakeven analysis. BEP is the level of activity at which total cost equals to total revenue. In other words, BEP is a point of "No Profit no Loss". If the sales and production is higher than the break even point volume, there will be a profit and if the sales (Production) are less than BEP sales there will be a loss.

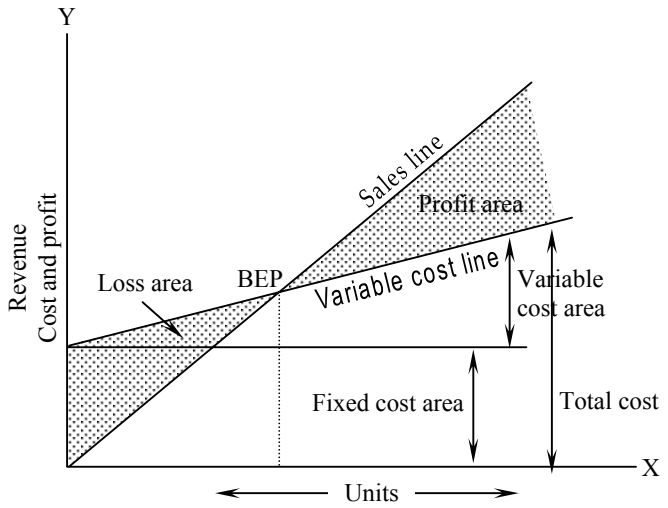
BEP can be determined by the following method:

(i) Algebraic or formula method

(ii) Graphic or chart method.

(iii) BEP in Rs. $= \frac{\text{Fixed cost}}{\text{PV ratio}}$

BEP in units $= \frac{\text{Fixed cost}}{\text{CMPU}}$



2. Sensitivity Analysis

Sensitivity analysis is the study of the responsiveness of a model's dependent variable(s) to change in one or more of the model's independent variables. It is often applied to an organization's cost-volume profit model to determine how profit or some other variable will respond to some proposes change.

3. Ratio

Ratio is the expression of one figure in terms of another. It is the expression of the relationship between the mutually independent figures. It is a simple mathematical expression of the relationship of one item to another. Absolute figures alone convey no meaning unless they are compared each other. Accounting ratios show the interrelationship existed among various accounting data.

Accounting to **Wixon, Kell and Bedfor,** "A ratio is an expression of the quantitative relationship between two numbers."

According to **Kohler,** "A ratio is the relationship of one amount to another expressed as the ratio of or as a simple fraction, integer, decimal fraction or percentage." (Munankarmi, 2003: 299).

The calculate the financial position BPPNL, the following ratios are used:

Current ratio = $\frac{\text{Current ratio}}{\text{Current liability}}$

Quick ratio = $\frac{\text{Quick assets}}{\text{Current liability}}$

Net profit ratio = $\frac{\text{Net profit}}{\text{Sales}} \times 100 = ...\%$

Total assets turnover ratio = $\frac{\text{Net sales}}{\text{Total assets}} = ...\text{times}$

Debt to total assets ratio = $\frac{\text{Long term Debt}}{\text{Total assets}} \times 100 = ...\text{times}$

Gross profit margin = $\frac{\text{Gross profit}}{\text{Sales}} \times 100 = ...\%$

Net profit margin = $\frac{\text{Net profit}}{\text{Sales}} \times 100 = ...\%$

Operating ratio = $\frac{\text{Operating cost}}{\text{Net Sales}} \times 100 = ...\%$

3.5.2 Statistical Tools

The standard deviation is the absolute measure of dispersion in which the drawbacks present in other measure of dispersion are removed. It is said to be the best measure of dispersion as it satisfies mot of the requisites of a good measure of dispersion.

1. Standard Deviation

Standard deviation (S.D.) is defined as the positive square root of the mean of the square of the deviations taken from the arithmetic mean. It is denoted by □ (Bajracharya, 2065: 177).

S.D. (σ) = $\sqrt{\frac{1}{n}\sum(x-\bar{X})^2}$

2. Coefficient of Variation

Standard deviation is the absolute measure of dispersion. The relative measure of dispersion based on the standard deviation is known as the coefficient of standard deviation.

$$\text{Coefficient of S.D.} = \frac{\text{S.d.}}{\text{Mean}} = \frac{\sigma}{x}$$

The coefficient of dispersion based on standard deviation multiplied by100 is known as the coefficient of variation (C.V.). If $\overline{X}$ be the arithmetic mean and σ, the standard deviation of the distribution, the C.V. is defined by:

$$\text{C.V.} = \frac{\sigma}{\overline{X}} \times 100$$

It is independent of unit. So, two distributions can better by compared with the help of C.V. for their variability. Less the C.V., more will be the uniformity; consistency etc. and more the C.V. less will be the uniformity, consistency etc (Bajracharya, 2065: 180).

3. Correlation and Regression Analysis

There are various ways of measuring the relationship existing between variables of an economic and social phenomenon. The simplest is correlation and regression analysis. We will start from correlation analysis as it gives a simple relationship between the variables and provides an essential tool for regression analysis to measure the improvement brought by regression.

Correlation may be defined as the degree of linear relationship between two or more variables. Two variables are said to be correlated when the change in the value of one variable is accompanied by the change of another variable. For example, changes in the value of advertisement are associated with the change in sales; similarly, changes in price are accompanied by changes in quantity demanded. The correlation like regression shows the degree and direction of relationship between the variables but, unlike regression, it does not show cause and effect relationship (Sthapit, 2007 Reprint: 363).

Correlation coefficient denoted by r measures the intensity or magnitude or degree of relationship between the two variables and is given by the formula (Sthapit, 2007 Reprint: 366).

$$r = \frac{\text{Covariance}(X, Y)}{\sigma_x \sigma_y}$$

4. Probable Error (P.E.) of Correlation Coefficient

Probable error of the correlation coefficient denoted by P.E. is the measure of testing the reliability of the coupled value of the correlation coefficient, 'r'. The probable error (P.E.) is defined by:

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

Where,

r = Correlation Coefficient

n = number of pairs of observation

If r < P.E, the value of 'r' is not significant no matter how height r value. is there is no evidence of correlation between the variables. If r > 6 P.E, the value of r is significant i.e. correlation is significant.

5 Regression Analysis

The theory of regression analysis was first developed by Sir.F Galton. Regression Analysis is used as a tool of determining the strength of relationship between two variables. Thus it is a statistical device, with the help of which, we can estimate or predict the value of one variable when the value of other variable is knows. The unknown variable which we have to predict is called dependent variable and the variable whose value is knows is called independent variable and the variable whose value is known is called independent variable. The analysis used to describe the average relationship between two variables is known as simple linear regression analysis. (Bajracharya, B.C. 2065: 273).

Line of Regression of x and y:

The line of regression of x and y is the line, which gives the best estimate of x for any give amount of y. The regression equation is expressed as:

$$Y = a + bx$$

We shall get the normal equations for the estimating 'a' and 'b' as:

$$\Sigma y = na + b\,\Sigma x \quad \text{.....} \quad \text{(i)}$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad \text{.....} \quad \text{(ii)}$$

Where,

x = Value of independent variable

a = Y intercept

Y = Value of dependent variable

b = Slope of trend line/coefficient of regression.

6. Normal Probability Distribution

Normal probability distribution is an important statistical technique in the hands of decision makes for evaluating the risk ness of a project. the use of the normal probability distribution will enable the decision maker to have an idea of the probability of different expected values of NPV that is, the probability of NPV having the value of zero of less; greater the zero and within the range of two values. if the probability of having a NPV of zero or less is considerably low, say, .5, it implies that the risk in the project in the small.

Formula; $Z = \frac{X - \mu}{\sigma}$

3.6 Research Variables

The collected data, which are obtained from different sources, are not appropriate form to analyze. So first, all collected data separated as relevant and irrelevant then all irrelevant data compiled and processed in appropriate forms. All collected data is not analyzed, only useful data is used according to their requirement. The data will be described by presenting in the light of theoretical bases with using different tools and technique of PPC. Similarly the collected data are presented and arranged in tabulation data are presented and arranged in tabulation forms ratio; graph, etc are also presented. The research variables of the present study are SPPU, VCPU, Fixed Cost, Profit, sales volume, BEP, Profit Ratio, and Profit Margin of these enterprises. These variables are measured in terms in terms of various components of PPC.

CHAPTER - FOUR

PRESENTATION AND ANALYSIS OF DATA

This chapter presents the analysis and interpretation of the data. The main purpose of this chapter is to examine Cost-volume profit analysis, a tool of PPC, can be the most important device to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in managerial decision making especially cost control and profit planning. The cost volume-profit analysis is a specific way of presenting and standing the inter-relationship between costs, volumes and profit.

The basic objectives of the research work examine CVP analysis as a tools to measure effectiveness of PPC, present practice of CVP analysis and identify the area where CVP. Major finding of the research depends on data presentation and analysis. Here, the researcher has tried to present and interprets the collected data in systematic manner and meaningful ways. To meet the said objectives, the secondary data is used for sales trend analysis, budgeted and actual sales analysis, statically analysis, profitability ratio analysis, operating leverage analysis and cost-volume profit analysis etc. The secondary data are collected from profit and loss account, cost details sheet balance sheet etc. This is provided by account section of the company (i.e. Annual Report)

Use of CVP in profit planning is the basic objectives of this study. It will examine the present practice of CVP analysis and identify the area where CVP analysis can be applied in manufacturing company; BPPNL Is presented. For that purpose sales revenue, profit, income statement contribution margin and sensitivity test are done.

This study has tried to cover the activities of the BPPNL. For last Five Years (i.e. from fiscal Year 2060/061 to fiscal Year 2064/065). The information, which have been collected from BPPNL

4.1 Sales Plan of Sri Bhrikuti Pulp and Paper Nepal Ltd.

Sales planning are the necessary components of profit planning and control. We can't imagine the business activities with out sales because of the crucial role of sales in business an organization should consider on planning and controlling of sales activities. All the plans and program of product, purchases wages, overhead etc, are directed for sales. The sales budget is a overall form of all the subsidiary budget.

BPPNL has been planning crucial role in the sector of utilities. BPPNL is not able to fulfill the demand of customer. The BPPNL is running in loss since last five years. The following table presents the sales budget and actual sales achievement from fiscal Year 2060/061 to fiscal Year 2064/065)

Table No. 4.1

Sri Bhrikuti Pulp and Paper Nepal Ltd

Sales budget and achievement

(In metric ton)

Fiscal Year	Actual sales	Total target sales	Achievement in percentage
2060/061	12762	15835	80.59
2061/062	13265	16421	80.78
2062/063	11782.188	14865	79.23
2063/064	12996.019	16195	80.25
2064/065	11812	14673	80.05

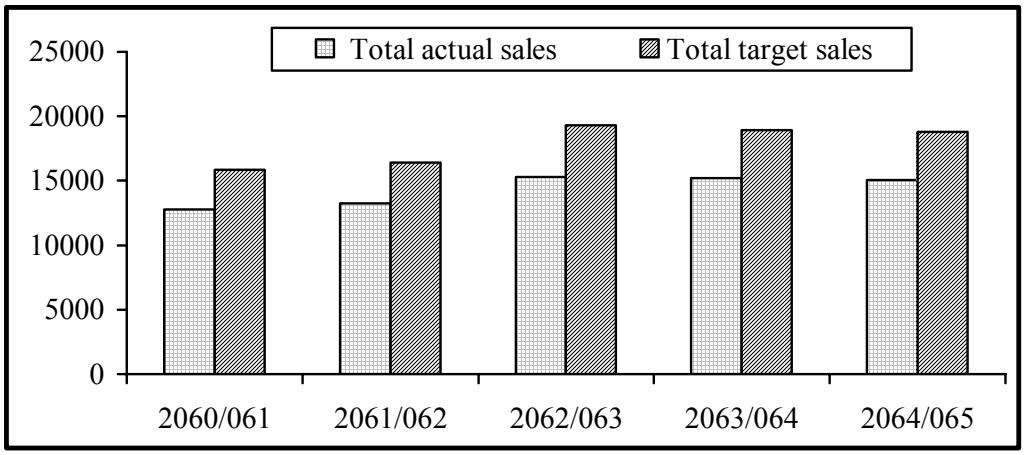
Source: Auditors report

The above table shows that the actual sales achievement is below than target sales each year. The achievement was highest in the FY 2061/062. The target is set at high expectation but actual sales achievements are only in average 80.18% of target figure. Even the target sales of BPPNL are good but it has not get success to cover its target. There is not any progress in sales achievement that's why BPPNL is facing Loss in every year. The achievement is always below that target sales. It is due to weak sales forecast using traditional forecast method, lack of raw materials, poor marketing and lack of ability to use right main power in right place, inefficient management, most personnel are influenced by political parties and political and economic condition of country.

The following bar diagram presents the actual sales and target sales of BPPNL more efficiently.

Figure No. 4.1

Sales Target and Sales Achievement of BPPNL



The bar diagram shows the clear picture of budgeted sales and actual sales. Budgeted sales are higher than the actual sales in every year. Which means that is not so satisfactory result of planning department of BPPNL. So BPPNL should try to meet the targeted sales for the coming year.

One of the most important objectives of statistical analysis is to get one single value that described the characteristics of the entire mass of hug and unwieldy data. Such a value is called the control value or and average. Here on attempt is made to present arithmetic mean and standard derivation with coefficient of budgeted and actual sales of BPPNL. This analysis cover a period of five year i.e. F.Y. 2060/061 to 2064/065 and calculated in appendix I and summarized below.

Table No. 4.2

Nature of Variability of Actual and Budgeted Sales of BPPNL.

Details	Budgeted Sales	Actual Sales
Mean(X)	813600584.8	661040119.6
Standard Deviation (S.D.)	4987842128	49593670.21
Coefficient of Variation (C.V.)	6.13%	7.5%
Correlation Coefficient (r)	.99	
Probable Error (P.E)	0.006	
Coefficient of Determination	.98	
Regression equation of Best fit	.0948X-139826140.2	

Sources: Appendix- I

The above result shows that actual sales are more consistent and more uniformity then budgeted sales. Hence, the coefficient of variation of budgeted sales is higher then the actual sales, so the actual sales are more consistent and more uniform then budgeted sales.

Another statistical tools, Coefficient of correlation is be used to analyze the relationship between budgeted and actual sales. As per the calculation done in Appendix (I) the value of r is 0.99 this shows that there is high degree of positive correlation between budgeted sales and actual sales revenue. The significance of correlation (r) is tested with probable error (P.E), calculation is shown in Appendix-(II). The value if PE= 0.006 here r>6 PE that means (r) is definitely significant.

We can fit the regression line to show the degree of relationship between budgeted sales and actual sales and to predict approximately actual sales with the given budgeted figure.

So the regression line of achievement Y on budgeted X is as follows:
Y= 0.984X – 139826140.2

The detail calculation of above equation is presented in Appendix- (I). This computation shows that the expected actual sales would be 0.948 times of budgeted sales subtract 139826140.2. The estimated actual sales Y calculated in Appendix (I) is presented in table below:

Table No. 4.3

Estimated Actual Sales of BPPNL

Year	Budgeted Sales (X)	Actual Sales (Y)	Estimated Actual Sales Y=0.984X -139826140.2
2060/061	761727416	613903712	609713637.1
2061/062	765858806	618666163	613778924.9
2062/063	799280797	633270597	646666164
2063/064	890234716	737454134	736164820.3
2064/065	850901189	701905992	697460629.8

Source: Appendix-I

From the above if we have the budgeted sales of 2064/065 we can calculate the expected actual sales of that period. The value of the coefficient of determination $(r)^2$ 0.98 explain the actual sales achievement up to 98% due to budgeted sales and remaining 2% due to other reason. Therefore factors except budgeted sales that can affect the actual sales should be considered.

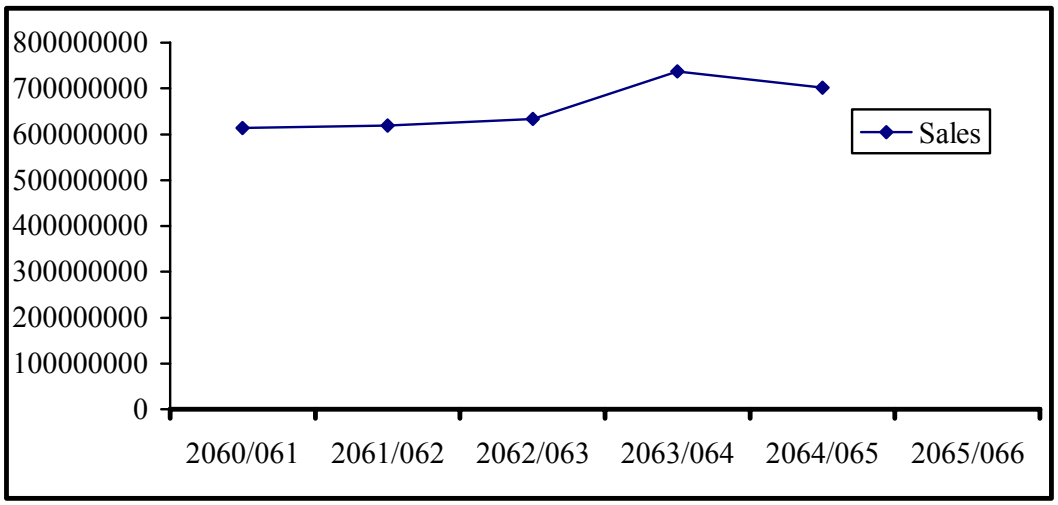
Least square method can also be used to analysis the trend of actual sales and estimate the possible future sales for a given time or year. To fit the straight-line the time factor is considered as independent factor and sales revenuer is considered a dependent upon time. This calculated in Appendix III shows that the sales will increase by Rs. 29479253.1 per year. If sales trend of past years will continue for future, the sales revenue for FY 2065/066 assuming 2062/063 as base year would be.

$Y_c = 661040119.6+29479253.1\times3 = 749477878.9$

Expected actual sales for FY 2065/066 is Rs. 749477878.9

Figure No. 4.2

Trend line of sales for BPPNL



Source: Appendix-III

4.2 Expenses Planning & Control of Sri Bhrikuti Pulp & Paper Nepal Ltd.

Planning and control of expenses is an important in profit planning and control. It may cause either increase or decrease in expenditure. It is not reduction of cost but it means better utilization of limited resources. Expenses planning and controlling

should focus on the relationship between expenditure and benefits derived from those expenditure. The expenses for each department should be carefully assessed for developing tactical profit plan. Expenses planning and controlling is essential to obtain enterprise's goals. There are different kinds of expanses in the BPPNL. Expenses planning support the objective and planned program to be ruled.

Expenses must be established for each responsibility center in the enterprises after estimating the amount of cost of sales, employees cost interest, administration expenses, Distribution, Depreciation, operation and maintaining cost etc.

The table below shows the different expenses and percentage change over F.Y. 2060/061 to 2064/065.

Table No. 4.4

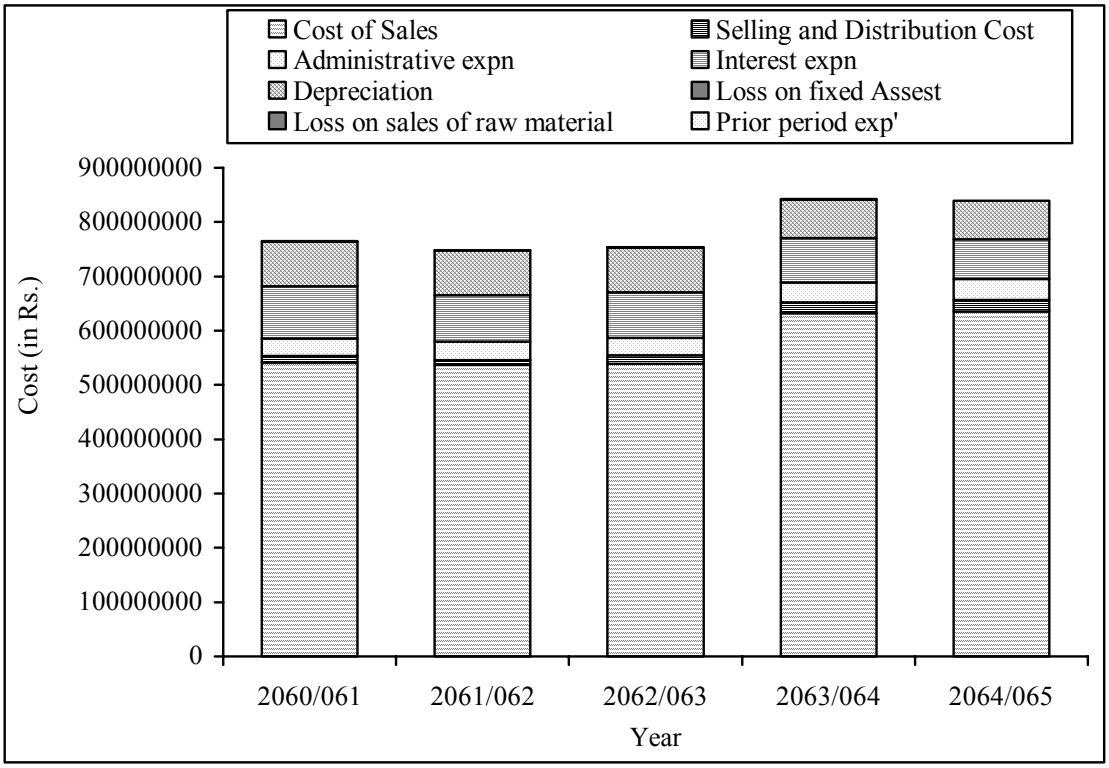
Expenses Trend of BPPNL

Fiscal Year / Cost type	2060/061	2061/062	2062/063	2063/064	2064/065
Cost of Sales	541734227	537153685	539112703	632647654	635820972
Selling and Distribution Cost	11371704	8819097	15174283	18961242	21053162
Administrative exp^{n}	32076221	33937129	32448288	37431192	38574993
Interest exp^{n}	96478749	85166474	84326483	81338719	72855521
Depreciation	82270169	82467237	81385140	71410552	70937002
Loss on fixed Assets	46011		1407487		
Loss on sales of raw material	183649				
Prior period exp'	238931	856785	482775	376372	345799
Total	764399661	748400407	754337819	842165731	839587449
% Change then previous Year	-	-2.09	0.79	11.64	-0.30

Sources: Annual report BPPNL.

Figure No. 4.3

Expenses Trend of BPPNL



Sources: Table No. 4.4

Above table and figure shows the total cost of BPPNL for different fiscal Years. Where cost of sales is fluctuated different fiscal Year. Other cost, also be fluctuated increasing and decreasing trend from FY 2060/061 to 2064/065. A interest expenses is in decreasing trend. Loss of sales of raw material is nil expect F.Y.2060/061.

Manly the total expenditure is covering by cost of sales, selling & distribution, administration, interest and depreciation. In overall F.Y. BPPNL's profit is negative pattern. BPPNL should emphasis to control on these types of cost and should consider the expenses planning and controlling.

The trend line of expenses for BPPNL calculated in Appendix –III. We can calculate the expected actual expenses for F.Y. 2065/066 assuming 2064/065 as base year is,

Y_c = 789778213+24414090X

= 789778213+24414090×3

Y_c = 863020483.4

So, if the expenses trend does not change the possible expenses for F.Y. 2065/066 will be 863020483.4

4.3 Sales Profit Relation of BPPNL.

The basic objective of running any business organization is to earn profit. Profit is the primary measure of business success in any economy. It do no just happen. It is managed. If a firm can not make profit, it can not achieve capital for very long. Profit is taken as measurement of the competency and efficiency of the management. Profit is a residual income left after the payment to other factors of production. The difference between the outflow of expenses and inflow of incomes is called profit. It is a reward of business activity. Profit determines the strength of financial position of the company.

The Uniformity or variability of net profit of BPPNL is analyzed and relation between actual sales revenue and net profit is also studied under this topic. The actual sales and net profit of the company during the F. Y. five Year period had presented in the table below:

Table No. 4.5

Actual Sales and Actual Profit of BPPNL

Year	Actual Sales (X)	Increase/ Decrease	Profit	Increase/ Decrease
2060/061	6139037123	-	-127190692	-
2061/062	618666163	0.775	-123371988	3.09
2062/063	633270597	2.36	-118947916	3.58
2063/064	737454134	16.45	-90095684	24.25
2064/065	701905992	-.048	-132248719	-64.20

Source: Annual Report, BPPNL

The table shows that the actual sales are increasing trend expect F.Y. 2064-065 with increasing rate expect F.Y. 2064/065. The BPPNL is suffering from losses in overall F.Y. and net loss in decreasing trend expects F.Y. 2064/065. The highest increasing rate is sales revenue is 16.45% in the F.Y. 2063/064 and net loss is 64.20% in the F.Y. 2064/065.

The nature of variability of actual sales and profit of different years, the arithmetic means, standard deviation and coefficient of variance calculated in Appendix-II has been presented in table below:

Table No. 4.6

Summary of Statistical Calculation of Sales and Profit of BPPNL

Particulars	Sales (X)	Profit (Y)
Mean	813600584.8	118370999.8
Standard Variation (S.D)	4987842128	14800096
Coefficient of Variation (C.V)	6.13%	12.50%

Sources: Appendix- I & II

The above table 4.6 shows that the actual sales revenue are more fluctuated then net profit (losses) being the high C.V. of sales revenue then that of net profit.

Expected profit

Expected profit (P) = Expected sales Revenue (S.R) - Expected cost (C)

Expected sales Revenue from section 4.1 page

Expected cost from section 4.2 page

E (P) = E (S.R.) - E (Cost)

E (P) = 749477878.9 -863020483.4

Expected profit (P) = (113542604.5)

Normal probability distribution

The Probability of Net losses of BPPNL, being less then (113542604.5), is the shaded area under the Normal probability Distribution

$$Z = \frac{X - \mu}{\sigma}$$

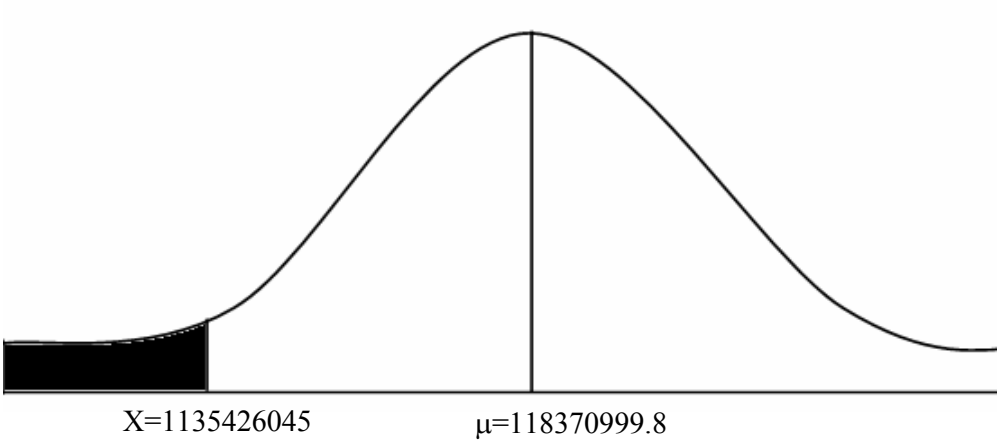
$$Z = \frac{113542604.5 - 118370999.8}{14800096}$$

$$Z = -32$$

According to Z table the value Z on 0.32 is 0.1255 or 12.55 %

Figure No. 4.4

Normal Probability Distribution of Sales and Net Profit for the Year 065/066 of BPPNL



4.4 Financial Analysis of BPPNL

Ratio analysis is the process of determining interpreting numerical relationship between figures of financial statements. Since an absolute accounting figure often does not provide much meaning by itself, it has to be analyzed in relation of other figures so that significant in formation about the company's financial performance can be derived.

It is a tool of scanning the financial statement of the firm. Though this, one comes to know in which areas of the operation the organization is strong and in which areas it is weak.

It is calculated here in summary of key financial position of BPPNL. From the balance sheet and income statement of difference fiscal year. The financial statement analysis provides information to plan evaluate and control operations with in the company management itself can use these parameters to improve the organization's performance in future, because a true know how of the strength and weakness is requires. For exploring maximum benefits and to correct the weakness to meet the challenges.

Since an absolute numerical figure on its own does not speak much, ratio which is a relative expression between at least two numerical figures has to be calculated to obtain meaningful information therefore the following example will clarify the ratio of BPPNL in last five year.

Regarding the financial analysis, profitability is an important is an important measure of company's operating success. There are two areas for judging profitability. The first measure in the profit margin and the second one is the return on investment. This analysis helps the investors to decide about a company as an investment opportunity at a point of time.

Table No. 4.7

Summary of Financial Analysis of BPPNL

Ratios	**2060/061**	**2061/062**	**2062/063**	**2063/064**	**2064/065**
Profitability Ratios:					
Net profit margin ratio (negative)	20.718%	19.95%	18.78%	12.21%	18.60%
Cross profit ratio	11.75%	13.17%	14.86%	14.21	9.41%
Operating ratio(negative)	108.722%	107.065%	105.50%	103.118 %	109.18%
Return on assets	2.327%	2.43%	2.23%	0.73%	3067%
Return on capital employed	4.33%	3.62%	3.98%	0.79%	0.55%
Financial Ratios:					
Current Ratio (2:1)	0.44	0.54	.48	.55	.47
Current asset to fixed asset	0.30	.38	.46	.47	.50

Sources: Appendix- IV

From the table 4.7 clearly indicates that the company is running in extremely bed condition because the last five year the company is running in heavy loss and condition is worst. If this trend is continued some year more then the company may be closed. In overall F.Y. BPPNL net profit is negative pattern.

Operating ratio is the relationship between cost structure and sales. The above table shows that the operating ratio not less then 103.188% of sales in overall F.Y. so in BPPNL, cost of sales and operating expenses id very high which indicate that the management are not able to control the overall cost in company.

Return on assets (ROI) is calculated to measure the profit against the amount invested in total assets to ascertain whether assets are being utilized properly or not. The table shows that the ROI is in fluctuating trend in overall F.Y., which indicates the bad position of BPPNL. On the other Return on capital employed is also decreasing train therefore, it can be said that the solvency of the company is being not improved.

Regarding the financial ratio, current ratio equal to 2:1 considered to be satisfactory one. Higher ratio indicates that the forms is in liquid and has ability to pay its current obligation in time as and when they became due. And the other hand, lower current ratio represents that the liquidity position of the firm not good and the firm will face difficulty in payment of current ratio may not be favorable because of slow moving stock, unsatisfactory debt collection and Idle cash balance. Current ratio of BPPNL is below the standard i.e. 2:1. It means that the company liquidation position is not good and the firm will face the difficulties in payment of current obligation in time.

The ratio of current assets to fixed assets ratio is in increasing trend in overall F Y, which shows that the business is being expended. Overalls financial analysis of BPPNL shows that the financial condition and solvency of the company is not satisfactory.

4.5 Identification of Cost Variability

Identification of the variability of cost is necessary in planning and control of the cost. Thus the knowledge of cost behaves in the ways with relations to the volume output. First it does not changes with the change in output and second it changes proportion apply with the changing all cost behaviors answer what happen in each expenditure when the output increases or decreases.

According to the behaviors of the Cost can be classified in two types. Fixed cost remain content in total for ascertain range of output for a certain time with an activity level. It does not changes either there is increases or decreases in output.

Another cost which in called variables is of fluctuating nature. Variables cost increase and decrease as the output increase or decrease as the output increase decrease. There is the direct relationship of variables cost with output, and those expenses which are neither variables nor fixed nature: are called semi-variable cost. Classification of cost

into fixed and variables is very important to plan and control of the cost. It helps to determine the volume of operation desired to maintain the company profitable. But BPPNL has not maintained any clear-cut boundaries about costs classification of fixed and variable component.

Cost classification plays most important role in CVP analysis. It helps for the strategy formulation by the management in response to production and return. In care of BPPNL have different types of cost or expenses. But the BPPNL have not practice of CVP analysis. So they don't have any applicable basis of cost classification in to variable and fixed as per suggestion and detail by the senior account officer and finance officer of the company which is presented in table above.

Table No. 4.8

Cost Heads and their Variability

Cost Heads	Cost Variability
1. Cost of sales • Materials consumed • Manufacturing expenses • Increases (Decreases) in work-in process • Increases (Decreases) in finished goods • Claim Received	Variable
2. Administrative Expenses 3. Selling and distribution Expenses 4. Interest Expenses 5. Depreciation 6. Loss on Fixed Assists 7. Profit/ loss Exchange	Fixed

Sources: Interview Question

4.6 Cost Volume Profit Analysis of BPPNL

The cost of volume profit analysis is the process of studying the relationship between cost, volume and profit. It is an analytical technique for studying the relationship between volume, cost price and profit. It is used to determine the profit planning

process of the firm. It is a simple but the powerful tool for planning of profit, and therefore of operation. For a co-ordinate approach toward achieving production and profit goals, It has grow n into basic technique. It is generally used to determine break even point or to gain certain amount of profit. It is method to cover fixed, variable cost and have an estimation of profit. CVP analysis provides attention directing motive in the overall performance of the business enterprises. It indicates at which volume cost and revenues are in equilibrium. BEP is defined as this level of production where revenues and cost of firm are equal and there is neither profit not loss. The cost volume profit analysis of BPPNL is based on following cost.

4.6.1 Variable Cost of Sri Bhrikuti Pulp and Paper Nepal Ltd.

Variables cost are the cost that tend to vary in direct proportion and same direction to changes in production activity, sales activity or some other measures of volume or cost driver. The cost of these inputs increases/ decreases in proportion to increase/decrease in volume or cost driver.

Table No. 4.9

Variable Cost of BPPNL

(In rupees)

Cost Head	2060/061	2061/062	2062/063	2063/064	2064/065
Materials consumed	252914070	314537032	320991990	365969692	355405031
Manufacturing expenses	275734088	209734088	252239147	266750304	237193269
Increases/Decreases	-70328	-63832	-330745	-2362991	-2804260
Decreases) in Finished Goods	3881548	3681548	-38060847	2290650	51222932
Less: Duty Refund	9274849	9264849	4273158		-5196000
Total	541734227	537153685	539112703	632647655	635820972
Percentage Change		-0.845533	0.364703446	17.3497956	0.501593102

Sources: Annual Report of BPPNL

From the above table the variable cost of BPPNL is cost of sales i.e., material consumed, Manufacturing expenses, Increase/(Decrease) in working process, Increase/(Decrease) in finished goods and Less : Duty Drawback & Duty Refund. The variable costs are fluctuation trend and the variable cost in the fiscal year 2061/062 is 537153685, which is decreased by -0.84 percent in fiscal year 2060/061. Fiscal year 2062/063 is 539112703, which is increased by 0.36 percent in fiscal year 2061/062.

Fiscal year 2063/064 total variable cost is 539112703 which is increased by 17.35 percent in fiscal year 2062/063 And fiscal year 2064/065 is 635820972, which is increased by 0.50 in fiscal year 2063/064. Comparatively the variable cost is more fluctuated in fiscal year 2063/064. So that variable cost is controllable cost so: management should try to reduce this cost.

4.6.2 Fixed Cost of Sri Bhrikuti Pulp and Paper Nepal Ltd.

Fixed cost are the costs associated with those inputs, which do not vary with changes in the volume of output or activity within a specified range of activity or output (relevant range). Fixed costs thus remain constant whether the activity increases or decreases within a relevant range. Like other costs, fixed costs are subject to change over a period of time. As fixed costs are unaffected by volume changes, any increase in volume implies that the costs will be allocated to greater number of units.

Table No. 4.10

Fixed Cost of BPPNL

(In Rupees.)

Cost Head	2060/061	2061/062	2062/063	2063/064	2064/065
Administrative Expenses	33076221	33937129	32448288	37431192	38574993
Selling and distribution expenses	11371704	8819097	15174283	18961242	21053162
Interest Expenses	96478719	85166474	84326843	81338719	72855521
Depreciation	82270169	82467237	81385140	71410552	70937002
Loss on Sales of Fixed Assets	46011		1407487		
Exchange gain or loss	-1158930	-4358487	4613377		
Total	222083894	206031450	219355418	209141705	203420678
Percentage		-7.228099	6.4669583	-4.656239	-2.735479

Sources: Annual Report of BPPNL

From the above table there are fluctuations in fixed cost of BPPNL. In year 2060/061 total fixed cost is Rs. 222083894, and fiscal year 2061/062 total cost is 206031450, which in decreased by -7.23 percent. Fiscal year 2062/063 total cost is 219355418, which is increased by 6.47 percent. Fiscal year 2063/064 total cost is 209141705 which is decreased by -4.66 percent and fiscal year 2064/065 total cost is 203420678,

which is decreased by -2.73 percent. Total fixed cost of BPPNL is very high because of high amount of interest on long term loan and depreciation. High fixed cost increase the break-even level. So, BPNNL fixed cost should control if possible.

4.6.3 Analysis of Contribution Margin (Profit/Volume) Ratio, BEP, Margin of Safety

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

In cost-volume profit analysis we have to compute various ratios, which are important part of CVP analysis. CVP analysis's aim will fulfill when we are able to analyze these all parts of CVP's tools.

The table 4.11 below shows the variable cost ratio (V/C Ratio) CM (P/V) Ratio, Bread even sales, margin of safety, and its percentage to sales and BEP and margin of safety considering other income of BPPNL are calculated.

a) Variable Cost Volume Ratio

The ratio shows the proportion of variable cost to each rupees of sales revenue the formula to calculate P/V ratio is;

$$\text{P/V ratio} = \frac{\text{Variable Cost}}{\text{Sales Revenue}}$$

From the above it is clear that variable cost. Incurred is high and which is in increasing trend. V/V ratio is an average of 87.31 percent, which shows that the BPPNL should control over variable cost to earn better profit.

Table No. 4.11

Computation of Various Ratios of BPPNL and Analysis

S.N.	Particulars	2060/061	2061/062	2062/063	2063/064	2064/065
1	Sales Revenue	613903712	618666163	633270597	737454134	701905992
2	Variable Cost	541734227	537153685	539112703	632647655	635820972
3	V/V Ratio	0.882441687	0.86824481	0.851314913	0.857880681	0.905849187
4	Contribution Margin (S-V)	72169485	81512478	94157894	104806479	66085020
5	P/V Ratio (CM/Sales)	0.117558313	0.13175519	0.148685087	0.142119319	0.094150813
6	Fixed Cost	222083894	206031450	219355418	209141705	203420678
7	BEP in Amount	1889138143	1563744469	1475302076	1471592371	2160583333
8	BEP % on Sales	307.7254798	252.7606264	232.96551	199.5503589	307.8166247
9	Margin of Safety (SR- BE)	-1275234431	-945078306	-842031479.2	-734138237.2	-1458677341
10	MOS as Percentage of Sales (Ratio)	-207.7254798	-152.7606264	-132.96551	-99.5503589	-207.8166247
11	Non Operation income (Other income)	3959718	1548587	6732383	146151914	2038464
12	FC after deducting other income (6-11)	218124176	204482863	212623035	62989791	201382214
13	BEP (12/PV ratio)	1855455132	1551990951	1430022599	443217654.3	2138932283
14	Margin of Safety (SR-BEP)	-1241551420	-933324788	-796752002.2	294236479.7	-1437026291
15	MOS% (MOS/Sales revenue)	-202.2387869	-150.8608105	-125.8154107	39.89895319	-204.7320164
Cash BEP = (Fixed Cost- Non Cash Expenses (Dep^n))/ PV Ratio						
16	Non-Cash Expenses (Depreciation)	82270169	82467237	81385140	71410552	70937002
17	FC after deduction of depreciation (6-16)	139813725	123564213	137970278	137731153	132483676
18	Cash BEP (17/PV Ratio)	1189313804	937831843.9	927936220.8	969123370.3	1407143193

Sources: Annual Report BPPNL

BEP Considering other income and other expenses

$$BEP = \frac{\text{Fixed Cost} - \text{Other income} + \text{Othere Expenses}}{\text{P/V Ratio}}$$

b) **P/V (C/M) Ratio or Contribution Margin Ratio**

Contribution margin ratio is equal to contribution margin divided by revenue. Percentage contribution margin to total sales is referred to as the C/M ratio. Contribution margin expressed as a percentage on sales revenue is called contribution margin (C/M) ratio. The P/V ratio of BPNNL is in fluctuation trend. It is average 12.68 percent which denote that BPNNL is not able to cover the fixed cost and earn reasonable return.

c) Break-Even-Point

Break even analysis is the term used to study of the interrelationship between cost volume and profit at various level of activity. It is the most widely known form of the cost volume profit analysis. Therefore, the cost volume profit analysis is also called as break even analysis.

The point, which breaks the total costs and belling price evenly to show the level of output or sales at which there shall be neither profit of loss, is regarded as break-even point. Cost volume profit analysis is sometimes referred to simply as break-even analysis. Yet it is always taken as an important part of profit planning as it gives the planner may insights into the data which he/she working. Profit planning of each firm's begins from break-even analysis.

With the help of P/V ratio BEP has been calculated, $BEP = \frac{FC}{\text{PV ratio}}$

The BPPNL, BEP is higher than sales in all fiscal year. So, BPPNL is suffering from the loss. In the above table 4.11 BEP sales of BPPNL are as follows Rs, 1889138143, 1563744469, 1475302076, 1471592371, and 2160583333, For the fiscal year 2060/061 to 2064/065 respectively. The trend of BEP sales considering of her income and other expenses also shows that it is in an increasing or decreasing trend so the BPPNL has great risk. The management should try to minimize the BEP sales. The company has high fixed cost so the company should try to reduce fixed cost or increase sales

revenue to earn reasonable profit. And revenue is equal at Rs. 2160583333. If the actual sales amount is more than break-even sales amount the company will earn profit and if the actual sales is less than the break even sales the firm will suffer from loss. Above chart of BPPNL F.Y. 264/065 clearly shows that the actual sales amount Rs. 701905992 is less than total cost amount Rs. 839241650.

d) Margin of Safety

Margin of safety is the excess budgeted/actual sales over break-even point. The margin of safety ratio indicates how safe the future of the firm is the higher the M/S ratio the safer is the firm.

From the above table shows that marginal safety of BPPNL is very low. BPPNL is suffering from loss so its finance position is not good. Marginal safety of BPPNL are -1275234431, -945078306, -842031479.2, -734138237.2, -1458677341 for fiscal year 2060/061 to 2064/065 respectively and marginal safety ratio is also negative and less by -207.7254798, -152.7606264 , -132.96551, -99.5503589, -207.8166247 percent respectively for fiscal year 2060/061 to 2064/065.

When BEP sales are higher than actual sense and marginal of safety has incurred very huge loss. So, safer is the not satisfactory.

4.7 Sensitivity Analysis

Assess the impacts of the changer in cost-volume-profit variable sensitivity analysis is the measurement of elasticity of the change in cost-volume-profit factor on break-even point or given profit. The strategies should focus more on the factor, which is more sensitive or responsible for profit. To measure the sensitivity of cost-volume-profit factor one can see the impact of certain percentage or amount changes in volume, price or cost factor on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinant variable. We know that the goal of a business enterprise is to maximize profit. Profit is the excess of revenues over the total costs.

4.7.1 Risk Measurement: Degree of Operating Leverage and Break Even point for Sri Bhrikuti Pulp and Paper Nepal Ltd.

Operating Leverage tells as 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 change, but some part of costs, known as fixed costs, remains unchanged. That is why net operating income change, but some part of costs, known as fixed costs, remains unchanged. That is why net operating income changes more rapidly. The change is called the operating leverage. A high degree of operating leverage (DOL) makes good times better and bad time worse.

Table No. 4.12

Degree of Operating Leverage and BEP

$$\textbf{DOL} = \frac{\text{Contribution Margin}}{\text{Net OperatingIncome}}$$

Fiscal Year / Particulars	2060/061	2061/062	2062/063	2063/064	2064/065
Contribution Margin	72169485	81512478	94157894	104806479	66085020
NetOperating Income	32681277	40304838	53267706	63029960	8495929
DOL=	2.20	2.02	1.76	1.66	7.77
BEP	1889138143	1563744469	1475302076	1471592371	2160583333

Sources: Annual Report BPPNL

The table show that the degree of operating leverage is high, which means the BPPNL have high fixed cost. High DOL makes good time better but the company running bad time so, high DOL of BPPNL has worse. The company should be focused to increase sales revenue to earn profit and decreasing the DOL.

4.7.2 Assessing the Impact When Sales Revenue or Operating Income is Change

Changing sales revenue is most volatile in relation to net incomes. A small change in sales revenue may cause a big change in net incomes. The decrease in sales revenue is the most volatile in relation to the BEP. One interesting point to note is that the increase in selling is not as much volatile as the decrease in selling price by the same percent.

If increase and decreased of sales revenue by 10 percent with other factors assumed to remain the same, it gets following results:

Table No. 4.13

Sensitivity Analysis of BPPNL

Income Statement by 10% Change in Sales Revenue

Years		Sales	VC	CM	FC	Profit	P/V Ratio	BEP	% Change in BEP
2060/061	Original	613903712	541734227	72169485	222083894	-149914409	0.117558313	1889138143	
	10% Increase	675294083.2	541734227	133559856.2	222083894	-88524037.8	0.197780285	1122881859	-40.5611568
	10% Decrease	552513340.8	541734227	10779113.8	222083894	-211304780.2	0.019509237	11383525259	502.5777045
2061/062	Original	618666163	537153685	81512478	206031450	-124518972	0.13175519	1563744469	
	10% Increase	6805327793	537153685	6268174108	206031450	6062142658	0.921068654	223687397.4	-85.69539961
	10% Decrease	556799546.7	537153685	19645861.7	206031450	-186385588.3	0.035283545	5839307011	273.418236
2062/063	Original	633270597	539112703	94157894	219355418	-125197524	0.148685087	1475302076	
	10% Increase	696597656.7	539112703	157484953.7	219355418	-61870464.3	0.226077352	970267105.4	-34.23264828
	10% Decrease	569943537.3	539112703	30830834.3	219355418	-188524583.7	0.054094541	4055037942	174.8615356
2063/064	Original	737454134	632647655	104806479	209141705	-104335226	0.142119319	1471592371	
	10% Increase	811199547.4	632647655	178551892.4	209141705	-30589812.6	0.220108471	950175627.7	-35.43214505
	10% Decrease	663708720.6	632647655	31061065.6	209141705	-178080639.4	0.046799243	4468912150	203.6786706
2064/065	Original	701905992	635820972	66085020	203420678	-137335658	0.094150813	2160583333	
	10% Increase	772096591.2	635820972	136275619.2	203420678	-67145058.8	0.176500739	1152520260	-46.65698646
	10% Decrease	631715392.8	635820972	-4105579.2	203420678	-207526257.2	-0.006499096	-31299840351	-1548.675451

Sources: Annual Report of BPPNL

The above table shows the break-even amount has decreased with the inverse in sales revenue by 10% that indicates the price or value of sales and break-even point have inverse relation. Similarly the decreased sales value by 10% increases the break-even sales. There is the increment of BEP by502.57%, 273.41%, 174.86%,203.67 and -1548.67% with the 10% decrease. In sales revenue in the FY 2060/061 to 2064/065 respectively. Similarly there is the reduction of BEP by -40.56%, -85.69%, -46.65%, -35.43% and -34.23% with the 10% increased in sales revenue in the FY 2060/061 to 2064/065 respectively.

From the observation the rate of increment is higher then the rate of reduction in BEP with the constant change of sales revenue in the respective year. Therefore, it can be said that the decreases in sales affect the company more then the increase in sales by same percent. So BPPNL should careful in the fluctuation sales especially in those controllable factors that may reduce the sales volume.

4.7.3 Assessing the Impact when Variable Cost Changed

Changing in variable costs on profit is straight forward if it does not cause any changes in selling price or volume. An increase in variable cost will lower the PV ratio and decrease in variable cost will increase the PV ratio. Increase and decrease of variable by 10% with other factors assumed to remain the same it gets following results.

Table No. 4.14

Sensitivity Analysis of BPPNL

Income Statement by 10% Change in variable cost

Years		Sales	VC	CM	FC	Profit	P/V Ratio	BEP	% Change in BEP
2060/061	Original	613903712	541734227	72169485	222083894	-149914409	0.11755831	1889138143	
	10% Increase	613903712	675294083.2	-61390371.2	222083894	-283474265	-0.10000000	-2220838940	-21755.83%
	10% Decrease	613903712	552513340.8	61390371.2	222083894	-160693523	0.10000000	2220838940	17.55831344
2061/062	Original	618666163	537153685	81512478	206031450	-124518972	0.13175519	1563744469	
	10% Increase	618666163	680532779.3	-61866616.3	206031450	-267898066	-.10000000	-2060314500	-23175.52%
	10% Decrease	618666163	556799546.7	61866616.3	206031450	-144164834	0.10000000	2060314500	3175.52%
2062/063	Original	633270597	539112703	94157894	219355418	-125197524	0.14868509	1475302076	
	10% Increase	633270597	696597656.7	-63327059.7	219355418	-282682478	-0.10000000	-2193554180	-24868.51%
	10% Decrease	633270597	569943537.3	63327059.7	219355418	-156028358	0.10000000	2193554180	4868.51%
2063/064	Original	737454134	632647655	104806479	209141705	-104335226	0.14211932	1471592371	
	10% Increase	737454134	811199547.4	-73745413.4	209141705	-282887118	-0.10000000	-2091417050	-24211.93%
	10% Decrease	737454134	663708720.6	73745413.4	209141705	-135396292	0.10000000	2091417050	4211.93%
2064/065	Original	701905992	635820972	66085020	203420678	-137335658	0.09415081	2160583333	
	10% Increase	701905992	772096591.2	-70190599.2	203420678	-273611277	-0.10000000	-2034206780	-19415.08%
	10% Decrease	701905992	631715392.8	70190599.2	203420678	-133230079	0.10000000	2034206780	-584.92%

Source : Annual Report of BPPNL

Above table shows that by 10% increase in variable cost increases the break-even point and 10% decrease in variable costs decreases the break-even point, which indicates that variable cost and break-even point have positive relationship. There is the increment of BEP by -21755.83%, - 23175.52%, -24868.51%, -24211.93%, and -19415.08% with the 10% increase in variable cost in the FY 2060/061 to 2064/065 respectively. Similarly the reduction of BEP by 17.55%, 3175.52%, 4868.51%, 4211.93% and -584.92% with the 10% decrease in variable cost in FY 2060/061 to 2064/065 respectively.

From the observation, it is seen that the rate of increment is higher then the rate of reduction in BEP with the constant change in variable cost in the respective years. Therefore, it can be said that the increase in variable cost affects the company more then the decrease in variable cost by same percentage.

4.7.4 Impact of Changes of Fixed Costs in BEP

Fixed cost is constant cost, which don't change for certain level. In CVP analysis when fixed cost is changed it does not bring any change in contribution margin and PV ratio. But only when fixed cost is changed net income and BEP amount also change. Here the 10% change on fixed cost of BPPNL are measured are as follows.

Table No. 4.15

Sensitivity Analysis of BPPNL

Income Statement by 10% Change in Fixed Cost

For the Fiscal Year 2064/065

Years		Sales	VC	CM	FC	Profit	P/V Ratio	BEP	% Change in BEP
2060/061	Original	613903712	541734227	72169485	222083894	-149914409	0.11755831	1889138143	
	10% Increase	613903712	541734227	72169485	244292283	-172122798	0.11755831	2078051958	1000.00%
	10% Decrease	613903712	541734227	72169485	199875505	-127706020	0.11755831	1700224329	-1000.00%
2061/062	Original	618666163	537153685	81512478	206031450	-124518972	0.13175519	1563744469	
	10% Increase	618666163	537153685	81512478	226634595	-145122117	0.13175519	1720118916	1000.00%
	10% Decrease	618666163	537153685	81512478	185428305	-103915827	0.13175519	1407370022	-1000.00%
2062/063	Original	633270597	539112703	94157894	219355418	-125197524	0.14868509	1475302076	
	10% Increase	633270597	539112703	94157894	241290960	-147133066	0.14868509	1622832284	1000.00%
	10% Decrease	633270597	539112703	94157894	197419876	-103261982	0.14868509	1327771869	-1000.00%
2063/064	Original	737454134	632647655	104806479	209141705	-104335226	0.14211932	1471592371	
	10% Increase	737454134	632647655	104806479	230055876	-125249397	0.14211932	1618751608	1000.00%
	10% Decrease	737454134	632647655	104806479	188227535	-83421055.5	0.14211932	1324433134	-1000.00%
2064/065	Original	701905992	635820972	66085020	203420678	-137335658	0.09415081	2160583333	
	10% Increase	701905992	635820972	66085020	223762746	-157677726	0.09415081	2376641666	1000.00%
	10% Decrease	701905992	635820972	66085020	183078610	-116993590	0.09415081	1944525000	-1000.00%

Source : Annual Report of BPPNL

The table shows that the 10% increment in fixed cost increase the BEP amount with same percentage and 10% decrement in fixed cost decrease the BEP amount by 10%. Therefore, it can be concluded that break-even point and fixed cost have positive relationship. So the company should analyze the nature and variability of cost and find the real and actual fixed cost. Since, the current system of cost analysis and regression is not scientific and practical.

4.8 Major Finding

The above analysis of various data, the following findings had been made:

1. The above table No. 4.1 Sows that the actual sales & target sales both are in fluctuating tends. Sales achievement is below then target sales. The average achievement is 80.18% of target sales. Even the target sale of BPPNL are good but has not success to cover its target.
2. Hence the coefficient of variation of budget sales is lower then actual sales achievement.
3. In the above calculation the value of r is .99 which shows that there is positive correlation between budgeted & actual sales but the degree of relation is higher.
4. The value PE 0.006 where r>6 PE: It means that it is significant. So, it can be said that actual sales will go some direction to that of budgeted sales.
5. The value of correlation coefficient of determination (r^2) .98 explains the actual sales achievement in to 98 % due to targeted sales remaining 2% is due to other reason.
6. The trend line shows that the positive sales figure which Rs.**29479253.1** will be increase every year. The expected actual sales for 2066/067 will be Rs.749477878.9.

Expanses Planning & Control of BPPNL

1. An expense of BPPNL is in fluctuating trend every year mainly the expenses cover by cost of sales, Administrative, selling & distribution, interest & depreciation.
2. The statistical tool calculation said that expenses will be increased if the trend of past years continues for future. The expected total expenses of BPPNL will be Rs863020483.4for FY 2065/066.

Sales profit relation of BPPNL

1. An actual sale is increasing trend except FY 2064/065. It is running in heavy losses in overall FY and net loss is in decreasing trend expect FY2064/065. The highest increasing rate ins sales revenue is 16.45% and net losses is 64.20% in FY 2063/064 and 2064/065.
2. Sales revenue are lower fluctuated then net Profit / losses being the lover CV of sales revenue 6.13% then net losses 12.50%.

   The probability of Net losses of BPPNL in FY 2065/066 being loss then Rs113542604.5
3. It is 12.55 % under normal probability distribution.

Cost variability

1. BPPNL have different types of cost but the company has not practice CVP analysis, so that the company does not have any applicable base of cost classification into the variable and fixed. Cost classification only base on senior staff of the company.
2. Fixed and variable costs both are fluctuate.

Financial position of BPPNL

1. From the above table No 4.7, it is clear that BPPLN net profit in in negative patron and Gross profit of the company is not cover for operating cost.
2. The net profit margin ration is 18.064% on average, it clearly indicates that the company is running in extremely bad condition because the last five year the BPPNL is running in heavy loss and condition is worst.
3. Gross profit margin ration is 12.68% on average and operating profit margin ratio 106.71% on the average in overall FY, which indicated that the BPPNL management are not able to control the over all cost.
4. Current ration is below the standard it means the BPPNL liquidation position is not good and average current ratio is .49 time. So the BPPNL position of liquidity is not satisfactory.
5. ROI and Return on capital employed is also in decreasing trends so the management performance is not optimistic.

Cost volume profit of BPPNL:

1. From the Table No 4.11 shows that the v/c ration of BPPNL is very high, it is clear that variable cost incurred is high. The average v/v ratio is 87% which indicates that the BNNPN should control overall variable cost to earn better profit.
2. Contribution margin is not sufficient to cover the fixed cost, and then a loss occurred for the period. The p/v ration is in average 13 %.
3. The calculation shows that BEP of BPPNL is higher then sales in all FY and it is justified that the BPPNL is unusual general business condition and economic depression.
4. Cash-BEP of BPPNL is also higher then sales in all FY. BPPNL has really faced the difficulty in paying the bill.
5. The margin of safety is in negative which indicated that BPPNL is suffering from loss its financial position is worse. Future of the company is not safe.

Sensitivity analysis

1. High DOL makes good times better and bed time's worse, the BPPNL running heavy losses show that the firm bed times worse.
2. The break-even amount has decreased with the increase in sales revenue and increase when the decreased sales value by 10% that indicates the price or value of sales and break-even point have inverse relation. The fluctuation sales especially in those controllable factors that may reduce sales value.
3. The impact of change in variable cost on profit. That 10% inverse in variable cost increase the BEP and 10% decrease in variable cost decrease the BEP which indicates that variable cost and break-even point have positive relationship. To careful in the fluctuation of variable cost, especially in those controllable factors that may increase the variable cost.
4. The break-even point and fixed cost have proportionate relationship. The total fixed cost of BPPNL is very high. Increasing the fixed cost decreasing the profit and decreasing the fixed cost increasing the profit. It indicates that company should reduction the fixed cost.

CHAPTER - FIVE

SUMMARY, RECOMMENDATION AND CONCLUSION

5.1 Summary

Profit Planning and control (PPC) means the development of objective and goals effectively and efficiently. It is one of the most importance management tools for planning and controlling business operation. The effective operation of a business concern resulting in to the excess of income over expenditure fully depends upon as to what extent the management follows proper planning effective co-ordination and dynamic control. Every business organization should make a plan with help of various types of tool and techniques. CVP analysis can be used in PPC because it provinces the information about the relationship among revenues, costs and profit where the business will earn zero profit or loss. It also provided the information about sensitivity of profit due to variation in projected amount of output activity.

The BPPNL was established in 2038 B.S. in the public sector was an under taking of HMG of Nepal. In 2049 B.S., company was privatized.

In the content of Nepal and in most of the manufacturing industries, CVP analysis has not been applied in practice. Most of the industries are suffering from loss and poor performance. This study is intended to focus on cost volume profit analysis as a tool of profit planning and control in manufacturing industry of Nepal (a case study of sri bhrikuti plup and paper Nepal ltd). It is examine the use of CVP analysis to plan of profit.

The study use various secondary as well as primary data were collected for last five years from FY 2060/061 to 2064/065. Secondary data were drawn from the annual report of BPPNL and primary data were collected by direct interview and concerned manager. The collected data were analyzed with descriptive and analytical approach with help of various statistical and financial tools.

5.2 Conclusion

1. The actual sales achievement is below then target sales each year. Even the target sales of BPPNL are good but it has not success to cover it's target which means that is not satisfactory result of planning department of BPPNL It shoe gap between theory and practice.
2. In BPPNL the planning of expenses is not good enough. The planning of expenses is depends on the individual person. They consider historical data and do not consider the future business environment while developing the budget.
3. BPPNL have not applied CVP analysis and Separate between fixed and variable cost and have not scientific boundaries on segregated into fixed and variable cost.
4. Analysis financial key of BPPNL, financial condition and solvency of the company is very critical. the company liquidation position is not good and the form will face the difficulties in paying of current obligation in time.
5. The net profit margin ratio is the overall measurement of the firm's management efficiency. Net profit margin ratio is negative pattern on overall FY 2060/061 to 2064/065, which indicates that the not satisfactory performance of management.
6. Analysis shows that the company current sales revenue is below than the break even level and the V/V ratio is high, margin of safety incurred high loss and contribution margin is not sufficient to cover the total fixed cost the PV ratio is in decreasing trend. Cash BEP is also less than current sales revenues. So BPPNL really faces the difficulty in paying the short-term expenses. As a result liquidity position of BPPNL is worse and the future of the company is not safer.

5.3 Recommendations

1. On the basis of entire research study and analysis the following points are recommended which may help for the improvement of cost volume profit analysis as a tool of profit planning and control in manufacturing industry of Nepal:
2. The management of BPPNL should try to minimize the gap between planned sales and actual sales. Because sales achievement is always less than target sales.
3. The management of BPPNL should emphasis control the expenses. Because net profit trend negative in overall FY.
4. BEP is higher then actual sales, so the management should careful in the fluctuation of variable cost and should try to control the cost of get stability in variable cost.
5. The management of BPPNL should try to segregated systematically into fixed and variable and practice BEP level.
6. A systematic and complete profit planning program should be followed general profit, for which the organization should use the PPC like analysis.
7. In the Nepal content, most of the manufacturing enterprises have not practiced CUP analysis in systematic manner so, it is suggested that every manufacturing enterprises should practice CUP analysis.
8. While making the decision the management should take popular management theory like management by objective, participative management etc. This theory can be more effective for better performance of the company.
9. Responsibility, authority and accountability should be defined to all departments.
10. Proper motivational program and reward and punishment system be conducted for effective execution of profit planning.
11. Facilitating quality product in reasonable price BPPNL should control the costs and improve the quality product.

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APPENDIX – I

Statistical Calculation

Target budgeted sales and actual achievement is X and Y respectively.

Year	Budgeted Sales (X)	Actual Sales (Y)	$(X-\overline{X})$	$(Y-\overline{Y})$	$(X-\overline{X})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
2060/061	761727416	613903712	-51873168.8	-47136407.6	2690825641353290	2221840921433340	2445114828060400
2061/062	765858806	618666163	-47741778.8	-42373956.6	2279277442988120	1795552197938690	2023008062878000
2062/063	799280797	633270597	-14319787.8	-27769522.6	205056322637027	771146385431912	397653670939303
2063/064	890234716	737454134	76634131.2	76414014.4	5872790064778820	5839101596723400	5855921605048290
2064/065	850901189	701905992	37300604.2	40865872.4	1391335073685060	1670019527013080	1524321731680110
	ΣX=4068002924	ΣY=3305200598	0	0s	$\Sigma(X-\overline{X})^2$ =12439284545442300	$\Sigma(Y-\overline{Y})^2$ =12297660628540400	$\Sigma(X-\overline{X})(Y-\overline{Y})$ =12246019898606100

Mean budgeted sales $(\overline{X})$ $= \frac{\Sigma X}{n} = \frac{4068002924}{5} = 813600584.8$

Mean Actual Sales $(\overline{Y})$ $= \frac{\Sigma Y}{n} = \frac{3305200598}{5} = 661040119.6$

Standard deviation budgeted sales (σ_x) $= \sqrt{\frac{\sum(X-\hat{X})^2}{n}}$

$= \sqrt{\frac{12439284545442300}{5}}$

$= 4987842128$

Standard deviation of actual sales (σ_Y) $= \sqrt{\frac{\sum\left(Y-\hat{Y}\right)^2}{n}}$

$= \sqrt{\frac{12297660628540400}{5}}$

$= 49593670.21$

Coefficient of variation of budgeted sales (CVX) $= \frac{\sigma_x}{\bar{x}} = \frac{4987842128}{813600584.8} = 6.13\%$

Coefficient of variation of actual sales (CVY) $= \frac{\sigma_Y}{\bar{Y}} = \frac{49593670.21}{661040119.6} = 7.5\%$

Correlation coefficient (r) $= \frac{\left(X-\hat{X}\right)\left(Y-\hat{Y}\right)}{\sqrt{(X-X)^2\left(Y-\hat{Y}\right)^2}}$

$= \frac{12246019898606100}{\sqrt{(12439284545442300)(12297660628540400)}}$

$= 0.99$

Probable error (P.E) $= 0.6745\ \frac{1-r^2}{\sqrt{n}} = 0.6745 \times \frac{1-(0.99)^2}{\sqrt{5}} = 0.006$

Coefficient of determinations = r2 = (0.99)2 = 0.98 regression equation of actual sales (Y) on budgeted.

Sales (X) is given by,

$$Y - \overline{Y} = r\frac{\sigma Y}{\sigma X}\left(X - \overline{X}\right)$$

Or, $$Y - 661040119.6 = 0.99\frac{4959367021}{4987842128}\left(X - 813600584.8\right)$$

Or, $$Y - 661040119.6 = 0.984X - 139826140.2$$

$$Y = 0.984X - 139826140.2$$

Calculation of Estimated Sales

Year	Estimated sales
2060/061	$\hat{Y}$ = 0.984X-139826140.2 = 0.9131X761727416-139826140.2 =609713637.1
2061/062	$\hat{Y}$ = 0.984X-139826140.2 = 0.9131X765858806-139826140.2 = 613778924.9
2062/063	$\hat{Y}$ = 0.984X-139826140.2 = 0.9131X799280797-139826140.2 = 646666164
2063/064	$\hat{Y}$ = 0.984X-139826140.2 = 0.9131X890234716-139826140.2 = 736164820.3
2064/065	$\hat{Y}$ = 0.984X-139826140.2 = 0.9131X850901189-139826140.2 = 697460629.8

APPENDIX – II

Calculation of Statistical Measurement of Net Profit of NTC

Year	Net profit (X)	$(X - \overline{X})$	$(X - \overline{X})^2$
2060/061	-127190692	-8819692.2	77786970502741
2061/062	-123371988	-123371988	25009882976539
2062/063	-118947916	-118947916	332832301822
2063/064	-90095684	-90095684	799493483589729
2064/065	-132248719	-132248719	192591090194049
	ΣX=-591854999	-473483999.2	$\Sigma(X- \overline{X})^2$ = 1095214259564880

Mean Net Profit $(\hat{X}) = \sum \frac{x}{n} = \frac{591854999}{5} = 118370999.8$

Standard Deviation of Net profit (σx) $= \sqrt{\frac{\sum (x - \hat{x})^2}{n}}$

$= \sqrt{\frac{1095214259564880}{5}}$

$= 14800096$

Coefficient of Variation of Net Profit (CVX) $= \frac{\sigma x}{X} = \frac{14800096}{118370999.8} = 12.50$

APPENDIX- III

Time series Analysis of sales for BPPNL Fitting Straight line Trend by Least Square Method

(In Rupees)

Year	Actual sale (Y)	X	X^2	XY
2060/061	613903712	-2	4	-1227807424
2061/062	618666163	-1	1	-618666163
2062/063	633270597	0	0	0
2063/064	737454134	1	1	737454134
2064/065	701905992	2	4	1403811984
	ΣY= 3305200598	**ΣX= 0**	**ΣX^2 = 10**	**ΣXY = 294792531**

Where, assumed 2062/063 as base Year.

The straight line trend Yc = a + bx

Where,

$$a = \frac{\sum Y}{N} = \frac{3305200598}{5} = 661040119.6$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{294792531}{10} = 29479253.1$$

So, 661040119.6 + x29479253.1x

The straight line trend shows that the production will increase by Rs. 29479253.1 per year. If sales trend of past years will continue for future, the sales revenue for FY 2065/066 assuming 2062/063 as base year would be.

$Yc = 661040119.6+29479253.1\times3 = 749477878.9$

$\therefore$ Expected actual sales for FY 2065/066 is Rs. 749477878.9

Time series Analysis of Expenses for BPPNL Fitting Straight line trend by least square method

(In Rupees)

Year	Actual sale (Y)	X	X^2	XY
2060/061	764399661	-2	1	-1528799322
2061/062	748400407	-1	4	-748400407
2062/063	754337819	0	0	0
2063/064	842165731	1	1	842165731
2064/065	839587449	2	4	1679174898
	$\Sigma Y = 3948891067$		$\Sigma X^2 = 10$	$\Sigma XY = 244140900$

Where, assumed 2062/063 as base Year.

The straight line trend

$Yc = a + bx$

Where,

$$a = \frac{\sum Y}{N} = \frac{3305200598}{5} = 789778213$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{294792531}{10} = 24414090$$

So, $= 789778213 + 24414090 \times 3$

$= 863020483.4$

The trend line of expenses for BPPNL calculate in Appendix-III shows the positive figure therefore the expenses will be increased of the trend of pass year continue for future. We can calculate the expenses for fiscal year 2065/066 assuming 2062/063 as base year would be.

$Yc = 789778213+24414090\times3 = 863020483.4$

$\therefore$ Expected expenses for FY 2065/066 is Rs. 863020483.4

APPENDIX- IV

Sri Bhrikuti Pulp & Paper Nepal Ltd.

Profit & Loss Account

From FY 2060/2061 to 2064/065

(In Rupees)

Description	**2060/061**	**2061/062**	**2062/063**	**2063/064**	**2064/065**
Sales	613,903,712	618,666,163	632,270,597	737,454,134	701,905,992
Cost of goods sold	541,734,227	537,153,685	539,112,703	632,647,654	635,820,972
Gross Profit	**72,169,485**	**81,512,478**	**94,157,894**	**104,806,408**	**66,085,020**
Add: Other Business income	3,959,718	1,548,587	6,732,383	2975,606	2,038,464
	76,129,202	**83,061,064**	**100,890,277**	**107,782,086**	**68,123,484**
Less: Administrative Expenses.	32,076,221	33,937,129	32,448,288	37,431,192	38,574,993
Selling & Distribution exp.	11,371,704	8,819,097	15,174,238	18,961,242	21,053,162,
Operating Profit/Loss	32,681,277	40,34,838	53,267,706	51,389,652	8,095,329
Less:					
Write back of FC loan interest	(17,986,612)	-	-		
Interest expenses	96,478,719	85,166,474	84,326,843	81,338,719	72,858,521
Depreciation	82,270,169	82,467,237	81,385,140	71,410,552	70,937,002
Preliminary exp. Write off	-	-	-		

Income from investment	(380,833)	(455,183)	-		
Loss on sale of assets	46,011	-	1,407,487		
Exchange gain loss	(1,158,930)	(4,358,487)	4,613,377	11,640,308	
Prior Period expenses	238,931	856,785	482,775	376,372	345,799
Loss on sale of Raw materials	183,649	-	-		
Net profit/(loss) before income Tax	(127,009,729)	(123,371,988)	(118,947,916)	(101,735,991)	(132,248,719)
Less: income Tax	(180,963)	-	-		
Net profit/ (loss) after income Tax	(127,190,692)	(123,371,988)	(118,947,916)	90,095,684	(132,248,719)
P&L carried forward from	(773,044,347)	(900,235,039)	(1,023,607,025)	(1,146,646,034)	(1236,741,718)
last year					
Capitalized in pm2					
P&L appropriation					
Net Profit Transfer to B/S	(900,235,039)	(1,023,607,025)	(1,142,554,941)	(1,236,741,718s)	(1,388,368,692)

APPENDIX- V

Sri Bhrikuti Pulp & Paper Nepal Ltd.

Administrative Expenses

From FY 2060/2061 to 2064/065

(In Rupees)

Description	**2060/061**	**2061/062**	**2062/063**	**2063/064**	**2064/065**
Cost of employees	16,703,786	17,433,246	16,173,545	20,416,765	17,482,960
Guest house rent	769,215	960,939	968,236	555,699	229,906
Repair & Maintenance	**727,985**	**409,205**	**793,411**	**541,769**	**180,690**
Factory/office cleaning exp.	878,789	684,747	707,798	847,685	724,603
Electricity fuel & water	**1,235,980**	**1,242,373**	**1,386,431**	**1,426,992**	**1,866,151**
Traveling	1,654,052	1,689,663	1,416,368	1,078,108	1,114,816
Conveyance	214,973	219,245	212,732	174,999	168,308
Office operating expenses & consumable	343,024	379,227	347,067	1,046,738	1,163,731
Audit fee and audit expenses	191,930	158,056	179,069	2,33,796	2,37,653
Legal fee and legal expenses	143,066	80,540	209,436	1,52,640	1,93,544
Board meeting fee	8,000	12,000	25,412	14,970	25,000
Rates and taxes	214,458	235,406	244,759	256,297	643,974
Bank charge	741,143	1,049,792	1,469,141	1,584,444	903,069
Vehicle running expenses	3,112,993	2,972,159	3,556,076	3,412,091	2,791,207
Vehicle repair/maintenance	1,534,648	1,999,739	1,120,136	2,166,583	1,129,648

Annual general meeting exp	294,565	-	57,871		
Insurance premium	710,215	662,601	642,457	625,346	5,42,621
Communication	1,463,519	1,572,686	1,553,995	1,596,696	1,383,757
Printing and stationery	340,616	335,098	306,441	325,292	4,34,887
Advertisement	70,855	98,035	-		
Membership fee	157,002	174,860	80,500	130,500	1,66,500
Donation and charity	177,702	142,164	226,369	177,966	334,641
Book and periodical	27,192	28,986	23,329	20,329	25,659
Guest entertainment	288,929	561,344	417,612	484,504	456,002
Training and seminar	2,300	-	-		
Research and development		806,500	-	43,056	9,725
Miscellaneous expenses	69,285	28,469	310,097	117,926	228,672
Loss on sale of Assets					1,625,980
Exchange Loss					4,521,289
Total	32,076,221	33,937,080	32,448,288	37,431,192	38,574,993

APPENDIX- VI

Sri Bhrikuti Pulp & Paper Nepal Ltd.

Balance Sheet

From FY 2060/2061 to 2064/065

(In Rupees)

Particulars	**Fiscal Year**				
	2060/061	**2061/062**	**2062/063**	**2063/064**	**2064/065**
Capital & Liabilities					
Share capital & reserve					
- share capital	434,545,250	434,545,250	434,545,250	434,545,250	434,545,250
- share money received pending allotment		80,000,000	80,000,000	80,000,000	80,000,000
-capital reserve	14,863,075	3,567,663	3,567,663	3,567,663	3,567,663
Mid & long Term Loan					
- secured	888,036,625	940,948,625	892,400,625	1,015,781,892	1014613892
- unsecured	74,750,000	70,940,000	7,469,000	65,440,000	69,100,000
Grand total	**1,412,194,950**	**1,530,001,538**	**1,485,203,538**	**1,599,334,805**	**1,617,810,786**
Assets					
- fixed assets	795,948,523	722,965,788	642,401,053	572,238,738	516,526,829
- capital work in progress	7,705,885	4,989,729	5,982,097	7,475,562	1,161,111
Total fixed assets	**803,654,408**	**727,955,517**	**648,383,150**	**579,714,300**	**517,687,940**
Investment (at cost)	**9,036,337**	**9,300,861**	**9,300,861**	**2,621,856**	
Current assets, Advance & Deposit					

Inventory	149,312,556	159,806,005	203,811,868	177,158,819	135,015,058
Sundry debtor	64,873,263	56,504,360	56,300,580	65,780,464	82,896,641
Cash & Bank balance	4408434	30,090,319	4,249,921	7,301,266	2,204,103
Advance & deposit	27,879,097	32,090,219	33,985,803	26,889,844	38,285,854
Total current assets	**246,473,350**	**278,490,903**	298,348,172	277,130,393	258,401,565
Less : Current liabilities & provision					
Short term loan	363,582,871	294,174,815	331,086,784	241,573,830	241,331,331
Sundry creditor	185,110,695	203,458,700	268,252,561	233,336,917	277,810,723
Provision	11,128,086	15,810,346	18,135,334	21,962,715	27,505,448
Total CL & provision	**559,821,652**	**513,443,861**	617,474,679	496,873,462	546,647,502
Net Current assets	(313,348,320)	(234,952,958)	(319,126,507)	(219,743,069)	(288,245,846)
Profit & loss account	912,952,507	1,027,698,118	1,146,646,034	1,236,741,718	1,388,368,692
Preliminary expenses					
Grand Total	**1,442,194,950**	**1,530,001,538**	**1,485,203,538**	**1,599,334,803**	**1,617,810,786**

APPENDIX - VII

I. Probability ratio						
	Fiscal Year→ Formula↓	2060/061	2061/062	2062/063	2063/064	2064/065
1. Profit margin on sales						
A. Net profit margin	$\frac{\text{Net income}}{\text{Net sales}} \times 100$	$\frac{-127190629}{613903712} \times 100$ = -20.71%	$\frac{-123371988}{618666163} \times 100$ = - 19.95%	$\frac{-118947916}{633270597} \times 100$ = -18.78%	$\frac{-90095684}{737454134} \times 100$ = -12.21%	$\frac{-132248719}{701905992} \times 100$ = -18.60%
B. Gross profit margin	$\frac{\text{Gross profit}}{\text{Net sales}} \times 100$	$\frac{72169485}{613903712} \times 100$ = 11.75%	$\frac{81512478}{618666163} \times 100$ = 13.17%	$\frac{94157894}{633270597} \times 100$ =14.68%	$\frac{104806480}{737454134} \times 100$ =14.21%	$\frac{66085020}{701905992} \times 100$ = 9.41%
C. Operating margin ratio	$\frac{\text{Operating cost}}{\text{Sales}}$	$\frac{607452321}{613903712} \times 100$ = - 108.72%	$\frac{662377148}{618666163} \times 100$ = -107.065%	$\frac{668120414}{633270595} \times 100$ = -105.50%	$\frac{760450640}{737454134} \times 100$ = -103.118%	$\frac{766386129}{710905992} \times 100$ = -109.18%
2. Return on Investment						
A. Return on assets or ROI	$\frac{\text{Net income + Interest expenses}}{\text{Total assets}}$	$\frac{-30711910}{1321160498} \times 100$ =2.32%	$\frac{-38205524}{1586769111} \times 100$ =2.43%	$\frac{-34620773}{1485203538} \times 100$ =2.23%	$\frac{-8756965}{1599334805} \times 100$ =.073%	$\frac{-59393198}{1617810789} \times 100$ =3.67%
3. Assets management ratio						
A. Return on capital employed	$\frac{\text{Net sales + Interest}}{\text{Capital employed}}$ ıpital employed=Total assets-current Liabilities	$\frac{-30711910}{761338846} \times 100$ =4.033%	$\frac{-38205524}{1055325250} \times 100$ =3.62%	$\frac{-34620773}{867728859} \times 100$ =3.98%	$\frac{-8756965}{1102461345} \times 100$ =0.79%	$\frac{-59393198}{10710063284} \times 100$ =0.55%

II	**Liquidity ratio**					
A. Current assets ratio	Current assets / Current liability	246473350 / 559821652 = 0.44	278490903 / 513443861 = 0.54	298348172 / 617474679 = .48	277130393 / 496873460 = .55	25841656 / 546647502 = .47
B. Current assets to fixed assets ratio	Current assets / Fixed assets	246473350 / 795948523 = 0.30	278490903 / 722965788 = .38	298348172 / 642401053 = .46	277130393 / 579714298 = .47	25841656 / 516526829 = .50