

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Nepal is a small, least developed and landlocked country situated between two large countries China and India. It has a lot of problems as well as prospects too. Unemployment is said to be the biggest problem of the country. Nepal is an agricultural country. Most of the people of the nation are primarily engaged in agriculture sector and they are depended on agriculture to fulfill their basic needs. A weak economy in one country may be offset by a strong economy in another. To overcome weak economy of Nepal, it is very essential to develop the infrastructure and facilities for establishment of manufacture and processing industries.

Industries have not been developing to the extent of expectation in Nepal. The reason for it is the lack of dashing entrepreneurs. We can trace the industrial development process in Nepal mainly after establishment of Biratnagar jute mill and Udyog Parishad in 1936. People hesitate to invest due to the lack of appropriate knowledge and the lack of sufficient investing capital. Unstable political environment is another reason for it. States should effort to encourage people for investment and create new investment opportunities with the minimum required facilities. For a successful investment, first one should know his/her own financial condition. It is necessary to look into the factors, which influence the development of industries and to assess those factors. After re-instate of democracy in 2046 B.S. some important changes took place in the field of industry. Some industries were established from the private sector thereafter. The role which manufacturing industry has been playing in the national economy is marginal but gradually, it is in increasing trend and market is also being large due to the increment of consumer needs and desires.

Establishing and running of enterprise are a risky task and it needs huge knowledge of management and profit planning. Profit planning plays a vital role in the development of all types of enterprises. Therefore, understanding of profit planning is very essential to conduct a business. Profit planning involves two aspects; profit and planning. Profit is the primary objective of business. It is necessary for survival and growth of any business entity but profit does not just happen or improve. They are managed. Profit is the primary measurement of business success in any economy, if firm is not able to earn profit then it fails to hold the capital for long period. When business firm can't hold capital, it can't secure and retain other sources, such as manpower, materials and machine etc. In other words the more profitable firm/enterprises are more attractive to the holders of the available capital. These firms can attract capital, which they need to buy the other resources. Here key is that capital and other resources are scarce they are allocated to the profit makers in roughly descending order of their profit potential.

There are several different interpretations of the term 'profit'. According to an economist, profit is the reward for entrepreneurship for risk taking. Labor might say that profit is a measure of how efficiently labor has produced and that it provides a base for negotiation a wage increase. An investor will view it as a gauge of the return on his/her money. An internal revenue

agent might regard it as a base for determining income taxes. An accountant will explain it simply as the excess of firm's revenue over expenditure of producing revenue in a given fiscal year. Similarly Planning is the first essence of management and all other functions are performed within the framework of planning, planning means deciding in advance what is to be done in future? Planning starts from forecasting and predetermination of future event. Planning is the whole concept of any business organization. No firm can achieve its predetermined goal and objectives in the absence of proper plan. Hence, it is life blood of any organization which makes efficiently run towards the competitive environment. It is a method of thinking out acts before hand. Planning is the foundation of profit realization and a plan is a projected course of action. Management is the process of planning, organizing, directing, decision-making and controlling. In modern day profit planning is taken as an important technique of decision-making. It is also regarded as a way of management and is given the name profit planning programmers; profit planning is a part of overall planning process of an organization.

Cost volume profit analysis serves as a powerful tool in the hands of management for profit planning. The systematic relationship between cost volume and profit is shown by cost volume and profit analysis. It is analytical tool for analyzing the relationship among cost, profit and sales or production volume. Mainly there are three elements in CVP analysis.

They are;
Cost: fixed cost
Variable cost
Volume: sales in RS
Sales or production units
Profit: sales revenue – total cost

The following equation shows the relationship between cost volume and profit:

Sales volume = total cost + profit

Or

Total cost = Sales volume – profit

Or

Profit = sales revenue – total cost

By analyzing the above equation all these terms are interconnected and dependent each other. For instance, profit per unit of a product depends on its selling price and cost per sales. The selling price to a greater extent will depend upon the cost and cost depends upon the volume of production. It is highly essential for the management to have the complete knowledge about the interrelationship among the cost, volume and profit. A study concerning this interconnection is undertaken through cost-volume –profit analysis. Cost-volume-profit analysis is extremely helpful in profit planning and control, management decision, cost control, budgeting etc.

CVP analysis can be used in profit planning because it provides the information about the behavior and relation of cost, volume and profit. It also provides the information about sensitivity of profit due to variation in projected amount of output or sales. CVP analysis is an important way to look into effects on profit from variations in cost and sales and to take appropriation decisions. CVP analysis is great helpful in managerial decision making, especially in cost control and profit planning. Profit planning is the fundamentals part of the overall

management functions. Therefore CVP is also known as complementary to PPC. Profit planning can be done only when the management has the information about the cost and selling price of the product. Profit planning and control have wide application. It can be applied in both profit making and non profit making organizations, and also in both manufacturing and non manufacturing business. In Nepalese context, manufacturing organizations are facing so many problems. There are need for a large number of good managers and managerial decisions in a developing country like Nepal. Most of organizations are in loss, profit earning is necessary to serve organization. Achieving objectives of the business organization, profit motive being the most dominant. For this application, profit planning tools are necessary. Cost-volume-profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of these relationships CVP analysis simplifies the real-world conditions that a firm will face. C-V-P 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, demands variable costs, fixed cost, 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 corner-stone of profit planning.

CVP plays significant role in profit planning and BNL, a manufacturing enterprise is taken for this study about the application of CVP in Nepalese manufacturing company.

1.2 Company Profile

Bottlers Nepal limited Balaju Kathmandu is one of the manufacturing and processing companies. It is established in 1979 under the company act 1964. It was initially started as a private enterprise and converted into public enterprises in 1985 issuing shares to Public. The Company is located at Balaju, in an area of the 10.648 square meters of land and the building of the co. covers 5.823 square meters.

The principal activity of the company is to manufacture and sell soft drinks under the registered trademarks of the coca- cola company. There were no changes in the nature of these activities. The coca-cola Sabco (Asia) ltd, a company incorporated in Dubai, UAE which holds 98.16% shares of Bottlers Nepal Ltd is the parent company. The company also received support from Coca- Cola Sabco (Asia) Ltd, the parent company on sales, marketing and technical operations. The company continues to maintain its leadership in the soft drink market because of its strong market infrastructure backed up by their effective sales and promotional plans and consumers preferences in their products. The company has already started distributing the products through the Manual Distribution Center (“MDC”) directly through its wholly owned company Troika Traders (p) Ltd since 1st Jan 2006. The result of this distribution through the MDCs is very productive. We were able to increase the market share and numeric distribution by serving the markets more effectively due to the implementation of the MDC distribution model.

The company is committed to deliver the quality product to its consumers at all times. To comply with the Coca-Cola standards of sugar, the company has started using the imported

sugar. The cost benefit of the quality derived from imported sugar is more beneficial than locally available sugar.

1.2.1 Share Capital

The BNL was started with an authorized capital of Rs. 30,250,000.00. In the initial period its paid up capital was Rs. 10,500,000.00 of Rs. 100. Now, the company has authorized capital of Rs. 430,000,000.00, issued capital of Rs. 370,000,000.00 and paid up capital of Rs. 194,889,000.00 The BNL has 37 shareholders and par value of share is Rs. 100.

1.2.2 Subsidiary company

Bottlers Nepal (Terai) limited, a subsidiary co. of BNL, Balaju, Kathmandu was established in 1986 under the company Act, 1964 with the object of producing and bottling soft drinks under the brand of coke, Fanta and Sprite. The company is situated in Chitwan district is under the management of coca cola Syabco Asia ltd. Dubai. BNTL belong to approximately 90.78% of equity shares to holding company BNL, Balaju. The current economic, political and security situation in the country has likewise affected the operations of our subsidiary company, Bottlers Nepal (Terai) limited. The company suffered a major volume set back because of the long term unrest that also affected the regions. During the year 2006/07, the company has encountered almost 70 days of closures. Due to these external factors, the performance of the company has been badly affected. In addition, there has been an impact of Rs 29mm as additional depreciation charges compared with previous year 2005/06. As a result, the company is bearing losses of Rs 26mm against the profit before tax of Rs 19mm from the previous year 2005/06.

1.2.3 Profit Position

BNL is one of the top ten companies listed in the NEPSE in terms of market capitalization. The company produces bottles soft drink named coca cola, Fanta orange, Fanta lemon and sprite.

Due to the several market competition and disturbances in the market, the company of the sales volume has increased by 1.15% compared to previous year. However, the profit after tax of the company has decreased by 28.14% due to change in accounting policy on depreciation. Retained earning of the company is a net of Rs 84million adjusted for the additional depreciation of earlier years and provision of income taxes.

1.2.4 Distribution Policy

The company doesn't have direct distribution to the consumer. The strategic long term plan is used in the company. As mentioned above, the company uses two types of distribution channel, i.e. through the dealer and retailer to the consumers. Since the company doesn't sell from company itself, it uses some kinds of commission system. But there is not any policy of discounts and incentives. Like, 8% commission on sales price is given to distributor whereas nearly 13.30% commission on sales price is provided for retailer.

In order to stay ahead of the competition, the company had launched several programs with financial and technical support from the coca cola company. The objectives of those programs are to increase the per capita consumption of its beverages in the market. This company will continue to promote all its products as before.

1.3 Statement of the Problem

Industrialization is an effective means of achieving economic development. It is the major hope, which can raise the living standards and provide better quality of life in the country. In the absence of industrialization, Nepal's problems like poverty, insecurity and overpopulation cannot be solved (*Pradhan, 1984:14*).

The center problem of economic development of the background countries is industrialization. It is one of the major tools with the aid of which the vicious circle of background and poverty can be broken (*Cuker: 1974:9*).

It's also a major instrument of progress, modernization and social change in developing countries (*UNDP: 1974:1*).

Nepal is in infancy period of industrialization. The manufacturing sector is very small. In recent years the growth rate is relatively more satisfactory. The manufacturing sector has to face numerous problems which have acted as constraints in the growth of manufacturing industries. Mainly such problems are caused by the land locked situation of the country, undeveloped situation of the country, undeveloped situation of physical human, financial and administrative infrastructure and energy at reasonable rates, non availability of trained and skilled manpower, shortage of capital, small size of market unawareness of the industrial potential, higher cost of production, low productivity of inputs, manpower and technology, instabilities in government policy etc. The industrialization process in Nepal is being developed very slowly. In spite of various attractive policies of the government in respect of industrialization, new investment made on industrial sector is not satisfactory. The financial performance of established manufacturing industries is also not good. Most of the industries are operating in losses and such condition of the established industries discourages the new investment both in manufacturing and non-manufacturing sector. There may be various and different reasons for the poor performance of manufacturing industries. Such reasons should be investigated and should be taken corrective measures for the improvement of their performance. The BNL is one of the biggest industries in the country. Being a large-scale industry large amount is invested from various sectors; therefore, the successful operation of the industry is very much important. How the business is being operated largely depends on how the business operation is planned. The key motive of every business enterprise is to make and maximize profit. Profit just doesn't happen by chance, it is to be managed. Cost-volume-profit analysis is a supplementary tool of profit planning. CVP analysis is hugely helpful for developing alternative strategies in sales planning and cost estimation. Nepalese firms are still being run with primitive management. They lack modern management culture there is a lot of difference between the theory and practice in the business form. In Nepal, the practice of using CVP analysis tools for different management decision is rare. CVP analysis provides the technique of profit planning framework. Based on annual published annual report, performance of the Nepalese industry is not satisfactory. Poor performance is the outcomes of poor planning controlling, decision making. The question has risen whether Nepalese managers are enough competent? Do they use CVP analysis tools and technique to carryout planning, decision making and controlling function? The research question posed mainly in this research will be following:

- Whether or not Nepalese manufacturing companies are practicing CVP analysis?

- What are the major difficulties in application of CVP analysis?
- Why are the Nepalese companies suffering from loss?
- Which part i.e. Contribution Margin (CM), Break Even Point (BEP), and Margin of Safety (MOS), Of CVP analysis is mostly practice and which are not practice till now?
- What sales volume is needed to achieve break even?
- What should be the sales volume to earn a desired profit?
- What will be the profit or loss to the specified level of sales?
- What will be the relationship between cost, volume and profit?

1.4 Objective of the Study

The main objective of the study is examining the use of CVP analysis to plan the profit in BNL. The other specific objectives of this study are:

- To analyze different components of cost as per cost behavior.
- To study the present application of Cost Volume Profit (CVP) analysis in Bottlers Nepal Limited (BNL).
- To study the profitability and financial position of BNL.
- To analyze the CVP and its impact in profitability of BNL.
- To provides suggestion and recommendation on the basis of major finding

1.5 Significance of the Study

This study will be significance in the following ways:-

- This study provides necessary recommendation to the related department of the company.
- This study will be useful for potential managers, accountant, policy maker and planners
- It examines the application of CVP analysis in the company.
- It provides information on the application of the tools under profit planning in difference circumstantiate.
- It will also provide the literature to the researcher, who wants to carry on further research in this field. .

1.6 Limitation of the Study

Each and every research has some limitations. Basically, not availability of required data and information would be the major limitations of the study. The study is confined only to CVP analysis as a tool of profit planning and control.

Following factors will limit the study:-

- The study will cover the data of five years only from BNL.
- The study will based in the secondary data mostly, if there is necessary of primary data researcher will collect and included.
- The accuracy of this study will depend upon the true response and the data available from the management.
- The time and the availability of resource is the main limitation of the study.

- This study would only concern with fulfilling the partial requirement in Master in Business studies (MBS).

1.7 Organization of the Study

The entire study has been divided into the following five chapters:-

Chapter 1:- Introduction

The chapter is introduction framework that includes background of the study, profile of the concern company, statement of the problem, objective of the study, significance of the study, limitation of the study and organization of the study.

Chapter 2:- Review of the Literature

This chapter concerned with review of literature. It focuses on the theoretical part of the study including conceptual review and review of previous related studies.

Chapter3:- Research Methodology

These chapters deals with methodology that includes research design, source of data, data collection procurers and data analysis tools.

Chapter 4:- Presentation and Analysis of Data

This is the most important and most extensive chapter as it includes the main theme of the study. This chapter deals with the presentation and analysis of collected data and information. For this purpose various analytical tools will be used.

Chapter 5:- Summary, Conclusion and Recommendation

This chapter is the final chapter of the study which includes summary of the study, major finding, conclusion and recommendation.

The Bibliography, Appendix includes in the last of the thesis.

CHAPTER - 2

REVIEW OF LITERATURE

In order to make a research on the subject some other literature should also be reviewed. Review of the literature is supported to revise the eminent literature related to the study. Main purpose of literature review is to find out the works done in the subject on the areas of research. Some possible study and conceptual prospective available in this respect have been reviewed. Various books, articles, journals, bulletins, reports, news statement, research study published by various institutions and some thesis etc. are the bases for preparing it. Some philosophers, writers or researchers have given the contribution for preparing it.

2.1 Introduction to Profit Planning

Profit planning is the key point of management. Without proper planning, profit will not be achieved in the expected extent. Therefore, every enterprise should plan for profit in a systematic way. Various functional budgets are the basic tools for proper planning of profit and control. Usually, profit don't just happened, profit are managed. Profit planning is a part of overall planning process of an organization.

Planning and controlling are the primary function of business. Without planning and controlling any business cannot run smoothly in competitive and global environment. In fact, profit planning is a managerial technique in written form in which all aspect of business operation for a defined period is included. It is a formal statement of policy, plan, objectives and goals established by the top management. Profit planning is deciding in advance at present, what to achieve in the future. A profit plan is the formal expression of the enterprises plan, goals and objectives stated in financial terms for specific future period of time. Mostly profit plan depends upon the objectives of the organization. Plan should achieve the goals of the organization. It determines approach by which the goals or objectives are to be accomplished commonly. The approach is described in the form of strategic, policies, programmers and procedures for achieving the chosen objectives in a given environment. Profit planning programming also provides proper organizational structure to implement the approved plans and policies.

Profit planning function of management rests upon some fundamentals views that are the conviction that a management can plan the long range destiny of a manufacturing enterprise by making continue streamed of well conceived decision. The thrust of the comprehensive profit planning concept goes to the very heart of management that is the decision making process especially for long range success. The streamed of managerial decision must generate plans and actions to provides the essential inflows that are necessary of support the plant outflow of the enterprises So that, realistic profits and return on investment are earned. Continuing generation of profits by managerial manipulation of the inflow and outflow provides the substance of profit planning'. (Welsch, 1992:31)

The aggregate meaning of the preparation of various functional annual budgets is known as profit planning. The determination of next year tends to achieve the sales which are 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, machines and money in the future. A formal profits 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 profits.

2.1.1 Profit

An organization is established to achieve some goals. It has its own objectives. To achieve the goals of organization objectives should clearly mention. In this competitive globalized business age, an organization whether it is public or private profit is essential. Profit isn't change; it is result of successful management. Profit is the primary measure of successful business of a firm or a company. It is the main test of the business enterprises performance. Simply, profit is the excess of income over cost of product or services.

The basic objective of running any business organization is to earn profit. Profit is taken to measure the competency and efficiency of the management. Profit isn't just happened but it is managed. If a firm cannot make profit it cannot generate capital of future. Profit is the primary measurement of successful business in any economy. Profit is a residual income left after the payment to other factor of production. The difference between the outflows of expenses (i.e. cost of production, selling and distribution of that products etc.) and inflow of income (i.e. sales price) is called profit. It is a reward for business activities. Profit is obtained by subtracting the cost from revenue. Profit determines the financial position, liquidity and solvency of the business. Generally profit is controversial terms and many authors define its in different ways.

The basic objectives of running any business organization are to earn profit. Profit serves as a yardstick for judging the competence and efficiency of the management. (Maheshwari, 2000:171)

The word "profit" implies a comparison of the operation of the business between to specific date which is usually separated by an interval of one year. In order to optimize those corporate source of wealth in which national prosperity depends on those corporate financial objectives of the company is to maximize within socially acceptable limits profit from the use of funds employed by them. The maximization of profit within socially acceptable limit implies that a proper regard to public interest has been paid. No company can survive long without profit; profit is the ultimate measure of its effectiveness and in a capitalized society. There is no future for a private enterprise which always increased loses. The survival measure of the effective performance of a business is a profit which really is a measure of how well a business performs economically. Profit is a signal for the allocation of resources and a yardstick for judging managerial efficiency. Profit is a primary objective of a business in view of the heavy investment which is necessary for the success of most enterprise. Profit in the accounting sense tends to become a long term objective which measures not only the success of product but also the development of market of it. (Kulkarni, 1985:245)

According to the *economist perception*, some economist says that profit is a rent of ability. Some says profit as reward for risk bearing of business. It is also said that profit is return

to uncertainty bearing and it is also reward for innovation. Innovations are those new products or process which increases national income more than they increases national cost. (*Reeki, 198:380*)

In the opinion of *Myers john N*, Profit is the dominant goal in business and profit making should be the main objectives in terms of which the general effectiveness of organization is measured. In other words, profit is obtained by subtracting the cost from revenue. Profit is the reward of the entrepreneur rather of the entrepreneurial functions.

Profit differs from the return on other factors in three respects:

- Profit is residual income and not contractual or certain income as in the case of others factors.
- There is much greater fluctuation in profit than the reward of the other factors.
- Profit may be negative but rent, wages and interest must be always being positive. (*Modern economic theory, 1981:299*)

Dean Joel clearly distinguishes the views of accountant and economist about profit as following point. The most important point of different between economist and accountant approaches is:

- The business of cost i.e. what should be subtracted from revenue to get profit.
- The meaning of depreciation.
- The price level basis for valuation of assets.
- The treatment of capital gains and losses and perhaps most important. (*Dean Joel, 2007:256*)

The term profit in views from management as follows:

- An intangible expression of the goals it has set for the firm.
- A measure of the performance towards the achievement of its goals.
- A means of maintaining the health growth and continuity of the company. (*Williams, 1988: 245*)

2.1.2 Planning

Planning is the first essence of management and all other function is performing within the framework of planning. Planning means deciding in advance, what is to be done in future? Planning starts from forecasting and pre-determination of future events. Planning is the whole concept of any business organization. No firm can achieved its pre-determined goals and objectives in the absence of proper plan. Hence, it is life blood of any organization which makes efficiently run towards the competitive environment.

Planning is also aimed at giving shape to the future. It is a basic function of management. It may be defined as the selection from among the alternative of courses for future actions. It is functioned by the managers decided what goes out to be accomplished and how they are to be reached.

The planning process which involves both short and long term is the most crucial components of the whole system. It is both foundation and the bond for the other elements because it is through the planning process that we determine what we are going to do, how we are going to do it and who is going to do it. It operates as the brain centre of an organization.

Profit don't just fall, it should be properly planned. In other words, profit isn't a matter of changes. It comes from effective and realistic plan. Planning is the process of developing enterprises objectives and selecting future course of action to accomplish them. It is the methods thinking about acts and purpose before planning starts comes forecasting and determination of future events. It is the first essence of management and all other functions are performs within the framework of planning. So, planning is the basic foundation of profit plans. Planning assesses the future makes provision for it and assumes the achievements of pre-defined goals. Simply, the planning means the determination of any works in advance of actions. Basically, it is a decision making process that provides a base for economic and effective future course of action.

Planning means a assessing the future making provision for it and assuring that establishing goal can be met with acceptable home frame. Define the planning it simplest term as determination of anything in advance of action. It is essentially a decision making process that provides a basis for economical and effective action in the future. Effective planning sets the stage for integrated action to take place, reduce the number of enforceable crisis, promotes to use of more efficient methods and provides the basis for the managerial function of control.(Filppo, Sixth edition p 49)

Glenn A Welsch defines management planning as the design of a desired future state for an entity and effective ways of bringing in about. He further explains that a fundamental purpose of management is to provide for a feed forward process. The concept of feed forward planning is generally recognized as the most difficult task facing the manager and it is one on which it is very easy to procrastinate. It clearly indicated that panning is a decision making process of the highest order, it requires management time and dedication and a systematic approach. The decisions made in the planning process are; Anticipatory, since they are made something in advance of action and Interrelated, since they comprise broad groups of interdependent choice from alternatives of the government. (Welsch, 1979:11)

Planning is the basic foundation of profit planning and a plan is a projected course of action. Planning is a technique whereby the use pattern of resources is carried out.(Agrawal, 1989:348)

A planning process includes goal setting, resource evaluating, forecasting by different methods and formulating a master plan. Planning depends upon the organized objectives. For the planning purpose, a firm's objective can distinguish mainly three types: prime, instrumental and specific. The prime objective is to complete the action. Instrumental objectives are for accomplishment of divisional and individual goal. Specific objectives are those objectives that have been specified as to time and magnitude, which are known as organizational goals. Therefore, company's objectives provide the ultimate criteria for resolving difficulties of company and company objectives are the base for long range profit planning.Planning is the conscious recognition of the future of present decision. Planning is the feed forward process to reduce uncertainty about future. So planning is an intellectual process, rational way, a systematic way and the goal oriented task. Primary function of management and planning provides all managerial activities and it is directed towards efficiency. (Welsch,. 1992:3)

In operational terms, planning process involves four stages, (*Welsch, Hilton and Gordon, 1992:75*)

- **Objectives**

The first stage in the planning and control system is setting the objectives which are designed as the broad and long range desired state or position in the future. They are motivational or directional in nature and expressed in qualitative terms.

- **Goals**

The second stage in the planning process is specifying the goals. The term goals as an element in planning 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 denote specific methods or course of actions to achieve 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.

- **Budgets/Plans**

The final step is the preparation of budgets/plans. Basically budgeting is the periodic planning to implement the alternative during a particular fiscal period, usually one year. It converts goals and strategies into annual operating plan.

2.1.3 Profit Planning

Profit planning is the primary function of management in any organization. A company always wants to earn maximum profit through the optimum utilization of available resources. Profit planning measures the success of any organization. Various budgets are major elements of profit planning. It is a key which helps to predict the future, minimizes risks, estimates output from the scarce resources and helps for various managerial decision making processes.

A profit plan is estimation and determination of revenues and expenses that evaluates how much income will be generated in order to meet the 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 planning is, therefore a fundamental part of the overall management functions and is a vital part of the total budgeting process. The management determines the profits goals and prepares budgets that will lead them to the realization of these goals. Profit planning can be done only when the management has the information about the cost of the products both fixed and variables and the selling price at which it will be in a position to sell the products of the company. (*Maheshwari 2000:171*)

Profit planning is planning for future operation in such a way as to maximize the profit or to maintain a specified level of profit. A comprehensive profit planning is also known as broad budgeting schedule developed in financial statements. Profit planning deals with the development of objectives, specification of short term goals, development of strategic and

tactical profit plan. In other word, profit plan is a detail expression of the expected result from the planning decisions. Profit planning is an important approach developed to facilitate for effective performance of management process like as planning, organizing, staffing, controlling etc. Therefore, profit planning carry out the responsibility of forward thinking about the future operation of the organization. It is the precise measurement of operation in terms of quantity (i.e. the matters of profit planning are expressed in numerical value).

Profit planning is a comprehensive statement of intentions expressed in financial terms for both short and long term operation of the firm. It is a plan for the accomplishment of organizational expectations. It is a base for measuring the variation between planned and actual performances. The success of each organization will be determined by reaching or exceeding those targeted plans. Profit planning is one of the comprehensive approaches that have been developed to facilities effective performance of the management process. It is a systematic and formalized approach for performing significant phases of management planning and control functions. In includes following activities:

- Development and application of broad and long term objectives of organization.
- Specification of organization goals.
- Development of long run profit plan in broad terms.
- Development of short run profit plan detailed by assigned responsibilities.
- System of periodical performance report detailed by assigned responsibilities.
- Follow up the procedure.

The main aim of profit planning is to forecast about future. So it plays the vital role in the development of organization. It is the most important tool in the field of managerial decision making in the enterprises. Main purposes of profit planning and control are as follows: (*Welsch, 1992:44*)

- To state the firms expectations (goals) in clearly format terms to avoid confusion and facilitate their attainability.
- To communicate expectation to all concerned with management of the firms so that they are understand, supported and implemented.
- To avoid a detailed plan of action for reducing uncertainty and for its proper direction of individual and group efforts to achieve goals.

Profit planning is a part of an overall planning process and is an area in which finance function play a major roles. The success of each enterprise in realizing its optimum profit in each year will be determined by the extent to which it establishes, develops, co-coordinate plans to meet those objectives and exercise control of all facts of its activity so as to have actual results reach or exceed those planned. This entire process constitutes the further stated that profit planning & control has the ultimate objectives of attaining the optimum profits. (*Kellen, Isal Woyne & Ferrera, 1999:388*)

Neil W. Chambrlin describes in his research report that “profit planning & control refer to the organization techniques & procedures whereby long & short range plans are formulated, considered & approved. A profit plan is an advance decision of expected achievement based on the most efficient operating standards in effect or in prospect at the time it is established against which actual accomplishment is regularly compared. In short, it provides a tool for more

effective supervision of individual operations and practical administration of the business as a whole.

Matz and Milton described the profit planning is a well throughout operational plan with its financial implications expressed at both long and short range profit plans and budget in the form of financial statements including balance sheets, income statement and cash flow statement and working capital projection.

Ninemeier, Jack D and Sctimidgall, Rayrall defines the topic profit plan "as an estimation and pre-determination of revenues and expenses that estimates how much income will be generated and how it should be spent in order to meet investment and profit requirements."

2.2 Process of Profit Planning

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. Therefore, individual managers engaged in the planning process should help knowledge about the components of profit planning are explained below;

The steps of profit planning are explained below;

a. Identification and Evaluation of Relevant Variables

In order to implement PPC efficiently management should evaluate the relevant variable that present on the function of an enterprise. Identification also involves separate consideration of variables that are non- controllable and those that are controllable. This means, management planning must focus on how to manipulate the controllable variables. Moreover there must be managerial planning of how to work with the non- controllable variables. By relevant variables we obviously imply those that will have a direct and significant impact on the enterprise. However, in most enterprise there is a strong need for a periodic evaluation of the relevant variables, usually on an annual basis. A comprehensive PPC programmed uses such a periodic evaluation in depth. So, analysis and evaluation of the environmental variables must be a continuing concern of management. This activity should involve all executive managers; who in turn should expect various staff groups to provide data and recommendations. A particularly significant phase of this analysis includes an evaluation of the present strength and weakness of the enterprise. (*Welch, 1992:258*)

b. Development of the Broad Objectives of the Enterprise

On the basis of evaluation of the enterprises and practical assessment strength and weakness of the enterprises of the management is in a position to develop the realistic objective of the enterprises. Development of the broad objectives of enterprises is a relevant variable and an assessment of the strength and weakness of the organization executive management can specify this phase of profit planning. The statement of broad objectives should express the mission, vision, and ethical tone of the enterprises. It tends to provide identify continuing of purpose and definition. (*Welsch,, 1979:65*)

c. Development and Establish Specific Goals for the Enterprises

The purpose of the steps is to bring the statement of broad objectives into sharp focus and at the same time to move from the realm of general information to the confines of internal management. This component of comprehensive PPC programs deals specific short range and long range goals for the enterprises. This step provides definite and measurable goals for the whole enterprises and for each of the major sub-division. (*Opcit, 2004:65*)

d. Development and Evaluation of Company Strategies

Company strategies are the basic trust ways and practice that will be used to attained planed objectives and goals. The management should develop the strategy for the strategic or long range profit plan and tactical (short range) plan. The purpose of development of strategies is to find the best alternatives for attaining the plan broad objectives and specific goals. It focuses on how to plan. Here are some examples of basic strategies: (*Welsch, 1992:77*)

- Increase long-term market penetration by using technology to develop new products and improve current product.
- Emphasize product quality and price for top of the market.
- Price of product with low market price to expand sales volume.
- Use both industrial and local advertising programme to build market.
- Improve employee moral and productivity by initiating a behavioral management programme.

e. Preparation of Planning Premises

When the objectives for the periodic plan are developed the executive management should provide with the certain instruction and guidelines to the lower management in order to develop the profit plan of the other respective responsibilities centre. Thus, instruction and format guidelines as communicated by the top management at this point in the planning process have come to be generally identified as the statement of planning premises. It is simply a communication step from executive management to the lower level of management. (*Opcit, 2001:66*)

f. Preparation and Evaluation of Projects Plan

When the planning premises is received from the top management, the executive responsible for the enterprises sub unit most develop the project plan. The project owns prepare and evaluate the periodic plans should be develop with the help of project plans must be coincided with the project plan. Periodic and project plans are different in nature and function, project plan encompass variable time horizons because each project has a unique time dimension. Project plan encompass such items for improvement of present production, new and expanded physical facilities etc. the nature of project is such that they must be planed as separate unit. In planning for a project the time span considered most normally is the anticipated life span of the project. The preparation and evaluation of current and future project plan are essential of formal basis of the planning phase. (*Welsch 1992:79*)

g. Development and Approval of Tactical Profit Plans

When the managers of various responsibility centers in the enterprise receive the executive management planning structure and the project plans they can begin intensive activities to develop their respective strategic and tactical profit plans. The strategic long range

plan and the tactical short range profit plan are usually developed. It is possible that executive management or the chief financial executive will develop the strategic and tactical profit plans. (Welsch 1992:80)

h. Implementation of Profit Plans

Implementation of management plans that have been developed and approved in the planning process involves the management function of leading subordinates in attaining enterprise objectives and goals. Thus, effective management at all levels requires that enterprise objectives, goals, strategic and policies be communicated and understood by subordinates. The plan should have been developed with the managerial convention that they are going to be met or exceeded in all major respect. If these principles are effective in the development process various executive and supervisors will have a clear understanding of their responsibilities and the expected level of performance. (Welsch, 1992:84)

I. Use of Periodic Performance Report

The implementation of plan requires the timely performance reports to be prepared and forwarded by respective organizational sub units. For this Welsch explained, as profit plans are being implemented during the period of time specified in the tactical plan , periodic performance report are needed. These performance reports are prepared by the accounting department on a monthly basis. Also some special performance reports are prepared more often as per need. These performance reports;

- I) Compare actual result and planned performance and
- II) So each difference as favorable or unfavorable performance variation.

A clear distinction must be made between external and internal financial report.

Internal reports can be further classified as; (Welsch 1992:85)

- Statistical reports that give the basic quantitative internal statistics about the operation of the enterprises.
- Special managerial reports about none recurring and special problems.
- Periodic performance reports which are focus on dynamic and continuous control tailored to assigned managerial responsibilities.

j. Follow up Procedure

Follow up action is an important fact of effective control and re-planning. Performance reports are the bases for effective follow up action. This is the part of effective control. It is important to distinguish between causes and effect. The performance variation is effect, the management must determine the underlying causes, and the identification of causes is primarily a responsibility of line of management. Analysis to determine the underline causes of both favorable and unfavorable performance variance should be given immediate priority. In the cases of unfavorable performance variance, after identifying the basis causes, as opposed to the results, an alternative for corrective action must be selected. Then the corrective action must be implemented. In the case of favorable performance, the underlying causes should also be identified. (Welsch 1992:88)

2.3 Elements of Profit Planning

The basic elements are as follows:-

2.3.1 Comprehensive and Co-Ordinate Plan

The profit planning considers all activities and operations of an organization. The budgets prepared by different departments inside an organization are to be complied of coordinated and it is done by profit planning.

2.3.2 Expressed in Financial Terms

All activities covered by budgets are related with funds. Therefore, the budget has to be expressed in money units (i.e. in rupees, dollars, pounds etc.)

2.3.3 Plans for Operational Resources and Expenses

It is a plan for the firms operation and resources. Budget is a mechanization to plan for the firm's all operations or activities. The two aspects of every operation are revenue and expenses. The budgets must plan for any quantity of revenue and expenses related to specific activity only. The plan should be made to carry out the operations. The planning for resources will include planning assets and sources of funds.

2.3.4 Future Plan

It is a plan for specific period. Time dimension must be added to a budget. A budget is meaningful only when it is related to a specific time. The budget estimates will be relevant only for some specific period.

2.4 Components of Profit Planning

Profit planning and control is a systematic and formalized approach for accomplishing the planning, co-ordination and control responsibilities of management. Components of PPC are bones of a business/ an enterprise, which help it operate properly, effectively. The components of PPC are as follows; (*Welsch, 1979:74*)

2.4.1 The Substantive Plan

This plan represents the following:

- Broad objectives, missions and short term goals of the enterprise.
- Specified enterprise goals, structure, responsibility and authority.
- Enterprise policies and strategies.
- Instructions and communication of executive management planning.

2.4.2 The Financial Plan

The financial plan includes:

A) Strategic Long Range Profit Plan:

- Sales, cost and profit projections.
- Major projects and capital additions.
- Cash flow and financing.
- Personnel requirements.

B) Tactical Short Range Profit Plan:

i) Operating Plan:

It includes:

- Planned income statement.
- Sales plan.
- Production (or merchandise purchase) plan.
- Administrative expenses budget.
- Distribution expenses budget.
- Appropriation type budget (e.g. research and development, promotion, advertising).

ii) Financial Position Plan:

It includes planned balance sheet (i.e. assets, liabilities and owner's equity)

iii) Cash Flow Plan:

- Planned cash flow statement.
- Cash flow from operating activities.
- Cash flow from investing activities.
- Cash flow from financing activities.

C) Variables Expenses Budgets (i.e. output expenses formula)

D) Supplementary Data (i.e. CVP analysis, Ratio analysis)

E) Performance Reports (i.e. each month and as per need)

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

2.5 Major Tools Used in Profit Planning and Control

Profit planning and control represents an overall plan of operations, which covers a definite period and formulates of planning decision of management. It consists of three main budgets which are:

2.5.1 Operating Budget

The operating budget covers revenue and expenses. In other words, operating budget relates to the physical activities or operations of a firm such as sales, production, purchases material, labor and other different expenses budget. Operating budget has the following term;

i) Sales Budget

Sales budget is the starting point in the preparation of the comprehensive PPC. It is an estimate of the goods that will be sold. After knowing creating the idea of what its sales be, it can be then decide how much to produce or purchase. All the other plans and budget are dependent upon the sales budget. (*Arthur, 2004: 687*)

A sales budget is a detailed schedule of expected sales for coming period, which is usually expressed in both amounts and units. Once the sales budget has been set a decision can be made on the level of production that will be needed to support sales and the production budget

can be set well. The sales budget is constructed by multiplying the expected sales in units by the sales price. (*Garrison, 1985:306*)

Sales budget is prepared from sales forecast where as a sales forecast encompass potential sales for the entire industry as well as potential sales for the firm preparing the forecast. Sales results from prior years are used as a starting point in preparing a sales forecast. (*Welsch, Hilton and Gordon, 1992:173*)

It should be broken down not only in time periods but also into geographical or responsibility areas by the use of sales quotas.

ii) Production Budget

The second step of PPC is the production budget. The production budget is an estimate of the quantity of goods to be manufactured during the budgeted period.

After the sales budget has been prepared, the production requirements for the forthcoming budget period can be determined and organized in the form of a production budget. Sufficient goods will have to be available to meet sales need and provide for the desired ending inventory. A portion of these goods will already exist in the form of beginning inventory. The remainder will have to be produced. Thus, production budget can be determined by adding budgeted sales units to be desired ending inventory and deducting the beginning inventory from the total. (*Horngreen, Fester and Datar, 1999:182*)

iii) Purchase Budget

In case of non manufacturing concern it would prepare a merchandise purchase budget to plan the amount of goods to be purchased during the period. The merchandise purchase budget is in the same basis format as the production budget. It shows goods to be purchased but it doesn't show the goods to be produced.

iv) Direct Material Budget

After the production needs have been computed, a direct material budget should be prepared to show the materials that will be required on the production process. Sufficient raw materials will have to be available to meet production needs and to provide for the desired ending raw material inventory for the budget period. Part of this raw materials required will already exists in the form of a beginning raw material inventory. The remainder will have to be purchased from supplier.

v) Direct Labor Budget

The direct labor budget is also developed from the production budget. Direct labor requirements must be computed so that the company will know whether sufficient labor time is available to meet production needs. Just knowing the requirement in advance, direct labor requirement can be computed multiplying product to be produced by each period by the number of direct labor hours required to produce a single unit. Many different types of labor may be involved. If so, then computation should be by type of labor needed. The hours of direct labor time resulting from these computations can be multiplied by the direct labor cost per hours to obtain budgeted total direct labor cost.

vi) Manufacturing Overhead Budget

The manufacturing overhead budget provides a schedule of all costs of production other than direct material and direct labor. These costs should be broken down by cost behaviors for budgeting purpose and a predetermined overhead rate developed. This rate will be used to apply manufacturing overhead to units of product throughout the budget period.

vii) Selling and Administrative Overhead Budget

The selling and administrative expenses overhead budget contains a listing of anticipated expenses for the budget period that will be incurred in areas other than manufacturing. The budget will be made up of many smaller individual budgets submitted by various persons having responsibility for cost control in selling and administrative matters. If the number of expenses item is very large separate budget may be needed for the selling and administrative functions.

2.5.2 Financial Budgets

Financial budgets are concerned with expected cash receipts or disbursements, financial position and result of operations. The components of financial budgets are;

I) Budgeted Income Statement

The budgeted income statement is one of the key schedules in the budget process. It is the document that tells how profitable operations are anticipated to be in the forth coming period. After it has been prepared, it stands as a benchmark against which subsequent company performance can be measured. (*Garrison, 1985:313*)

ii) Cash Budget

Cash budget is the detail showing cash receipt cash disbursement and the balance cash. The cash budget is composed of four major sections. The receipts section, the disbursements section, the cash excess or deficiency section, and the financing section. The receipts section consists of the opening balance of cash added to whatever is expected in the way of cash receipts during the budget period. The disbursement section consists of cash payments that are planned for the budget period. The cash excess or deficiency section consists of the difference between the cash receipts section total and the cash disbursement section total. The financing section provides a detailed account of the borrowing and repayments projected to take place during the budget period. It is also includes a detail interest payment that will due on money borrowed.

iii) Budgeted Balance Sheet

Budgeted balance sheet is a statement of assets and liabilities prepared after the preparation of operating budgets and financing budgets. It is based on functional or operating budgets, cash budget, income statement and the previous year's assets and liabilities. In other words, budgeted balance sheet developed by beginning with the current balance sheet and adjusting it for the data contained in the other budgets.

2.5.3 Appropriation Budget

The appropriation budget covers all types of expenditure on advertising and research sectors.

Apart from above budgets, PPC also has relationship with following additional budgets such as flexible budgets, capital expenditure budget, CVP analysis, completion of profit plan and performance reports.

i) Flexible Budgets

Flexible expenses budget relates only to expenses or costs. They are also called dynamic, activity or output adjusted expenses budgets. The concept of flexible expenses budget is that all expenses are incurred because of passage of time, output, activity or combination of time and output or activity. Therefore, it is complementary to tactical profit plan, which helps to provide an expense plan. They should be adjusted to actual output for comparison with actual expenses in periodic performance report. Expenses or costs must be identified into fixed and variable expenses or costs in flexible budget.

ii) Capital Expenditure Budget

Capital expenditure budgeting is a process of planning and controlling of the long term and short term expenditure for expansion, replacement and contraction of fixed assets. Capital budgeting is useful to earn future profit and reduce future costs. The major elements of a capital expenditure budget are cash outflows and cash in flows. Cash outflow includes the cost of the project as cash outlays at different times during the life of a project. The cash outflows are affected by the provision of residual value of old equipment, tax position, addition working capital needed etc. cash inflows are expected cash revenue during the life of a project. The non cash expenses like depreciation and tax position can affect the cash inflows.

iii) 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 programmed involved were being initiated for the first time. No costs are viewed as being ongoing in nature; the manager must start at the ground level each year and present justification for all costs in the proposed budget regardless of the type of cost involved. Zero based budgeting differs from traditional budgeting in which budgets are generally initiated on an incremental basis, the managers start with last years budget and simply adds to it according to anticipated needs. The manager does not have to start at the ground each year and justify ongoing costs for existing programmed.

iv) Activity Based Budgeting

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

v) 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 tools in managerial decision making. Specially, cost control and profit planning with the help of cost volume profit analysis.

vi) Completion of Profit Plan

The principal output of a budgeting is a comprehensive profit plan that ties together all phases of an organizations operations. The completion of profit plan is compromised of many separate budgets or schedules that are interdependent. In other words, completion of profit plan means the process of profit panning ends with the planned income statement and planned balance sheet.

vii) Performance Reports

Performance report is an important part of a comprehensive PPC system. The performance reporting phase of a comprehensive PPC programmed significantly influences the extent to which the organizations planned goals and objectives are attained. Performance reports deal with control aspect of PPC or management control function of management defined as "the action necessary to assure the objectives, plans, policies and standards are being attend" or in other words, the objectives of control is to guarantee the achievement of the planned objectives of the management by introducing periodic systematic correction measure. Performance report is one of the vital tools of management to exercise its control function effectively.

2.6 Cost Volume Profit Analysis

The dictionary meaning of cost is the price paid to acquire, produce, accomplish or maintain any things. Volume is a mass or quantity of something or amount. Profit is the ratio of such pecuniary gain to the amount of capital invested and analysis is resolution, separation or breaking into parts. But actually cost volume profit analysis is the process of examining the relationship among revenues, cost and profits for a relevant range of activity and for a particular time frame. Basically, CVP analysis involves finding the most favorable combination of variable costs, fixed cost, selling price, sales volume and mix of products sold. CVP analysis provides the managers with a powerful tool for identifying those curses of action that will and will not improve profitability.

Cost volume profit analysis is important tool of profit planning because it provides the information about the behaviors of cost in relation to volume, volume of production or sales where the business will break even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for a target profit level etc. CVP analysis may therefore be defined as a managerial tool showing the relationship between various ingredients of profit planning, (cost, selling price and volume of activity). CVP analysis is an important media through which the management can have an insight into effects in profit on account of variations in cost and sales and take appropriate decisions. Cost volume profit analysis is great helpful in managerial decision making. Specially, cost control and profit planning is possible with the help of CVP analysis. Profit planning is the fundamental part of the overall management functions. Profit planning can be done only when the management has the information about the cost of production and selling price of the product. CVP analysis is an analytical tool for analyzing the relationships among cost, price, profit, sales and production volume. Mainly, there are three elements in CVP analysis. They are cost, sales or production volume and profit. All these terms are interconnected and dependent on one another. For instant, profit per unit of a product depends on its selling price and cost of sales. The selling price to a greater extent will depend in the cost and cost depends on the volume of production. It is highly

essential for the management to have the complete knowledge about the interrelationship among the cost, volume and profit. A study concerning this inter connection is undertaken through cost volume profit analysis. CVP analysis is extremely helpful in profit planning and control, management decision and cost control etc.

CVP analysis can be regarded as a sophisticated method or analytical tool used in management. The use of this method helps in determining the different levels of product of sales to avoid losses to earn a desired net profit and so on. Cost volume profit analysis is one of the major and popular tools to analyze the financial statement of the firms. It is one of the important parts of profit planning and control or budgeting. CVP analysis is one of the most important and powerful tools that manager have at their command in short term planning. It helps managers understand inter relationship between cost volume of profit in an organization by focusing on interaction between the following five elements.

1. Price of product
2. Volume or level of activity
3. Per unit variables costs
4. Total fixed costs
5. Mix product sold

Generally cost volume profit analysis provides information regarding :(*Munakarmi, 2003:124*)

- Minimum level of sales to avoid losses.
- Sales levels to earn target profit.
- Effects of changes in process, costs and volume on profits.
- Effect of changes in sales mix on profit.
- New break even point for changes.
- Impact of expansion plan on CVP relationship.
- Products those are most profitable and least profitable.
- Whether to continue or discontinue the sales of product or operation of plant.
- Whether to close or not the firm for a short term.
- Effect on operating profit with the increase in fixed cost etc.

Cost volume profit analysis provides information for the management decisions about effective budgeting of a company. It is an organized approach for planning, appraisal or coordination and control. Cost volume profit analysis examines the behavior of total revenues, total cost and operating income as changes occur in the output level, the selling price, the variables cost per unit and or fixed cost of a product. (*Datar and Foster, 2003:136*)

Cost volume profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. CVP analysis is subject to number of underlying assumptions and limitations. Nevertheless it is powerful tool for decision making in certain situations. (*Drury, 2000: 17*)

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. CVP analysis is a management accounting tool to show the relationship between the elements of profit

planning. Profit planning is a function of the selling price of product demand, variable costs, fixed costs, taxes etc. (*Bajracharya, Ojha, Goet and Sharma, 2004:225*)

Cost volume profit analysis is the analysis of three variables i.e. cost, volume and profit. Such an analysis explores the relationship existing among cost, revenue, activity levels and the resulting profit. It aims at measuring variations of cost with volume. In the profit planning of a business, cost volume profit relationships is the most significant factor. The CVP analysis is an extension of marginal costing. It makes use of principles of marginal costing. It is an important tool of planning. It is quite useful in making short run decisions.

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 is supplementary tool of planning for profit. CVP is immensely helpful for developing alternative strategies in sales planning and cost estimation. Cost volume profit analysis is an accounting technique showing the relationship between variables. It is equally applicable for non profit making organization to allocate scarce economic resources most effectively among the competing alternative. Allocation of scarce resource among the various demanding sectors is the most important part of national planning.

2.7 Use of CVP Analysis in Profit Planning

Planning, controlling and decision making are the essential managerial function. Cost volume profit analysis helps the managers to plan for profit to control cost and make decision. As such it helps; (*Dr. Bhattarai, 2060:102*)

- To determine the break even point in rupees and units.
- To determine profit and loss at different level of activity.
- To determine the margin of safety in units and rupees.
- To determine new break even points in rupees and units after change on variable cost or fixed cost or selling price.
- To determine the sales volume in rupees and units at which the profit goal of organization will be achieved.
- To determine the most profitable and least profitable product or project.
- To determine the maximum sales volume in units and rupees to avoid losses.
- To determine the optimum selling price.
- To help management to find the most profitable combination of cost and volume.
- To find out effect on profit after increase in or decrease in selling price, variable cost and fixed cost.

2.8 Applications of Cost Volume Profit Analysis

Cost volume profit analysis is applied specially for break even analysis and profit planning. Business organization is 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.

CVP analysis can be applied in the following respects; (*Dangol, 2004:36*)

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

2.9 Approaches to CVP Analysis

There are three approaches to CVP analysis. They are:

- Contribution margin (CM) approach
- Cost and revenue equation approach
- Graphic approach

2.9.1 Contribution Margin Approach

In general sense, contribution is to leave something for some purpose. One very important concept in cost volume profit and break even analysis is contribution margin. Cm reflects the revenue remaining after covering all variable costs. The profit potential of a business enterprise is indicated by contribution margin approach. It highlights the relationship among cost, sales and profit. Contribution margin is the excess of sales revenue over variable costs, so contribution margin means how much is left from sales revenue after covering variable expenses that are contributed toward profit for the period. Contribution margin is used to first to cover the fixed expenses and then whatever remains, after the fixed expenses are covered goes toward profit. If the contribution margin is not sufficient to cover the fixed expenses then a loss occurs for the period. Basically contribution margin indicates why operating income changes as the volume of sales changes.

The difference between selling price and variable cost (i.e. the marginal cost) is known as 'contribution margin' or 'gross margin'. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. It can be expressed by the following formula;

Contribution margin = sales revenue – variable cost

Or

Contribution margin = fixed cost + profit

And

Contribution margin per unit = selling price per unit – variable cost per unit

We can derive from it that profit cannot result unless contribution exceeds fixed cost. In other words, the point of no profit no loss shall be arrived at where contribution is equal to fixed costs. (*Maheshwari, 2000:176*)

CVP analysis is the amount of contribution margin available from the sales volume of absorbs fixed cost and also contributes towards company's profit goal after deducting all variable cost of sales. When the contribution margin is high, then also profit is high. Companies that separately identify and measure the fixed and variable components of cost often use a contribution margin approach on their periodic income statement prepared for internal management uses. These income statements provide financial data that are uniquely useful for management planning purpose because of the emphasis on fixed and variable costs. Most of the managerial decisions that relate to operations (either directly or indirectly) are based in some way to knowledge of the fixed and variable components of cost. (Glen, Ronald and Paul 1995:499)

The variables usually used in cost volume profit analysis are:

1. Sales Value

Any firm or company may have different products, services etc. the sales value or rupees includes the quantity of total sales multiplied by selling price per unit.

2. Variable Cost

Variable cost is that cost which is directly affected by changes in the activity level. The per unit variable cost always remain constant. If the activity level is decreased, the variable cost also decreases. If the activity level or production level increase, then the variable cost also increase. Change in variable cost affects CM ratio, BEP and net income. When variable cost increase, net income, cm ratio and margin of safety will be decreased and it helps to increase BEP.

3. Fixed Cost

Fixed cost remains constant in total amount despite the changes in the level of activities. That is 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. Increase in the fixed cost, increase the volume of BEP and decrease the net income or vice versa. Fixed cost is also called capacity cost.

4. Mixed Cost

Expenditures that cannot be categorized as purely fixed or variables are termed as mixed cost or semi variable cost. Mixed cost contains both variable and fixed cost elements. Repair and maintenance, supervision, telephone cost, electricity charge are some examples of mixed costs. It should be separated into the variable and fixed cost elements for profit planning, cost control and decision making.

5. Jumping Cost

Some cost remains fixed over a wide range of activity, but some jump to a different amount for activity level within that range. Such costs are called jumping costs or step fixed cost or moving fixed cost or ladder fixed costs.

2.9.1.1 Contribution Margin Ratio (CM Ratio)

Contribution margin ratio is also known as profit volume ratio (P/V Ratio). Cm ratio is equals to contribution margin divide by revenue. The analysis of relationship between profit and

volume is known as profit volume analysis. Profit volume ratio or contribution margin ratio establishes a relationship between the contribution and sales value. Percentage of contribution margin to total sales is referred to as the cm ratio. Cm ratio can be calculated by using either per unit or total revenue minus total variable cost information as follows.

$$\begin{aligned}\text{CM Ratio} &= \frac{\text{sales revenue} - \text{variable costs}}{\text{Sales revenue}} \\ \text{Or} \\ &= \frac{\text{Contribution margin}}{\text{Sales revenue}} \\ \text{Or} \\ &= \frac{\text{SPPU} - \text{VCPU}}{\text{SPPU}}\end{aligned}$$

It is also the remaining percent of the variable cost ratio:

$$\begin{aligned}\text{CM Ratio} &= 1 - \text{variable cost ratio} \\ \text{Or} \\ &= 1 - \frac{\text{Variable cost}}{\text{Sales revenue}}\end{aligned}$$

Fixed costs do not change within the relevant range in the short run so net profit change by the same amount as the contribution margin changes?

$$= \frac{\text{Changes in net profit}}{\text{Changes in sales revenue}}$$

This ratio is helpful for determination of the desired level of output or profit and for the calculation of variable costs for any value of sales. The variable cost can be expressed:

$$\text{VC} = \text{Sales} (1 - \text{CM ratio})$$

Comparison of different CM ratio 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 price.

A business enterprise can improve its profit by improving a profit volume ratio. The management can eliminate the unprofitable lines which are having either a lower profit volume ratio or low volume. A lower ratio means less profitability and vice versa. The profit volume ratio can be increased by:

- Increased sales price per unit.
- Decreasing variable cost.
- Increasing the production of products having high p/v ratio and vice versa.

2.9.1.2 Use of Profit Volume Ratio

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

The p/v ratio is used to determine the following facts:

- For the analysis of break even point.
- For ascertaining of profit at a budgeted sales volume.

- For calculation of sales amount required to earn a target profit.
- For ascertaining sales amount needed to keep up with previous profit while decreasing selling price.
- For ascertaining profit on margin of safety.
- For determination of selling price.

2.9.2 Cost and Revenue Equation Approach

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

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost}$$

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

$$\text{Profit} = \text{Total Revenue} - \text{Total Variable Cost} - \text{Fixed Cost}$$

Or,

$$\text{Profit} = (\text{Unit Selling Price} \times \text{Sales Unit}) - (\text{Unit Variable Cost} \times \text{Sales Units}) - \text{Fixed Cost}$$

Or,

$$P = (S \times Q) - (V \times Q) - FC$$

Or,

$$P = Q(S - V) - FC$$

Where,

P = Profits

Q = Sales Units

S = Unit Selling Price

V = Unit Variable Cost

FC = Fixed Cost

2.9.3 Break Even Analysis

Break even analysis is the term used to study of the relationship between cost, volume and profit at various level of activity. It is the most widely known from of the CVP analysis. Break even analysis is a special case of CVP analysis. Break even analysis is used to determine the level of sales of products required to just recover all cost incurred during the period. (Hammer, 1999:592)

Break even analysis is widely used technique to study cost volume profit relationship. The narrow interpretation of the term break even analysis refers to a system of determination of that level of activity where total cost equals total selling price. The broader interpretation refers to that system of analysis, which determines probable profit at any level of activity. (Maheshwari, 2000:175) Cost volume profit analysis is sometimes referred to simply as a break even analysis. This may be misleading because break even analysis is just one part of the entire

CVP concept. It is always taken as an important part of profit planning as it gives the planner many insights into the data with which he or she is working. Profit planning of each firm begins from break even analysis. A popular technique to study cost volume profit relationships is break even analysis. It concerns with the study of revenue and costs in relation to sales at which the firm's revenue and total cost will be exactly equals or the net income will be zero. It is a 'no profit no loss' situation.

2.9.3.1 Break Even Point

The point, which breaks the total cost and the selling price evenly to show the level of output or sales at which there shall be neither profit nor loss, is regarded as break even point. At this point, the income of the business exactly equals its expenditure.

Break even analysis, more precisely the break even point tells what quantity of output sold at which total revenues equal total costs. Break even point is that quantity of output sold at which the operating income is zero. Break even point is the bridge between the loss area and the profit area. Profit begins from the break even point. It is survival point where all firms must at least remain to sustain or continue the business. (*Bajracharya, 2004:23*)

2.9.3.1.1 Approaches to Cost Volume Profit and Break Even Analysis

The cost volume profit relationships and the break even point can be analysed through different approaches. Mainly the break even point and other required cost volume profit relationships can be explained through contribution margin statement approaches or graphic approach or equation/formula approach. A contribution margin statement is a variable costing income statement where philosophy is all fixed costs are period cost which should be deducted from the contribution margin of the same period. Only the variable costs vary proportionately to the level of output or sales. Most often, we use the equations approach to the solution of cost volume profit analysis and break even analysis instead of the graph or the income statement.

A. Contribution Margin Approach

The contribution margin income statement approach to CVP analysis allows the preparation of Performance statement from the available information. BEP and other required CVP relationships can be explained through a contribution margin statement.

B. Formula Approach

The most popular practiced approach to the break even point and cost volume profit analysis is the formula also known as the equation. The formula approach uses an algebraic equation to calculate the break even point. (*Rainborn, 1993:89*)

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

Table 1
Formula Approach of CVP Analysis

Contribution margin approach	Symbol or equation
Sales volume(units)	Q
Selling price per units	SPPU
Sales revenue (Rs)	Q x SPPU
Less; variable costs	Q x VCPU
Contribution margin	Q x SPPU – Q x VCPU
Less; fixed costs	FC
Net profit	Q x SPPU – Q x VCPU – FC

Equation:

Sales – variables cost – fixed cost = net profit

Or

Sales = variable cost + fixed cost + net profit

Or

$Q \times SPPU = Q \times VCPU + FC + \text{net profit}$

Therefore,

$$Q = \frac{FC + \text{Profit}}{CMPU}$$

Where, $SPPU - VCPU = CMPU$

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

$$\text{BEP in Rs} = \frac{\text{Fixed cost}}{P/V \text{ Ratio}}$$

There is no profit no loss at BEP. In case the volume of output or sales is to be computed for a desired profit, the amount of desired profit should be added to fixed cost in the formula given above.

$$\text{Required sales to earn DP in units} = \frac{\text{Fixed cost} + \text{DP}}{CMPU}$$

$$\text{Required sales to earn DP in Rs} = \frac{\text{Fixed cost} + \text{DP}}{P/V \text{ ratio}}$$

$$\text{Required sales to earn DPAT in units} = \frac{\text{Fixed Cost} + \frac{DPAT}{1-T}}{CMPU}$$

$$\text{Required sales to earn DPAT in Rs} = \frac{\text{fixed cost} + \frac{DPAT}{1-T}}{P/V \text{ Ratio}}$$

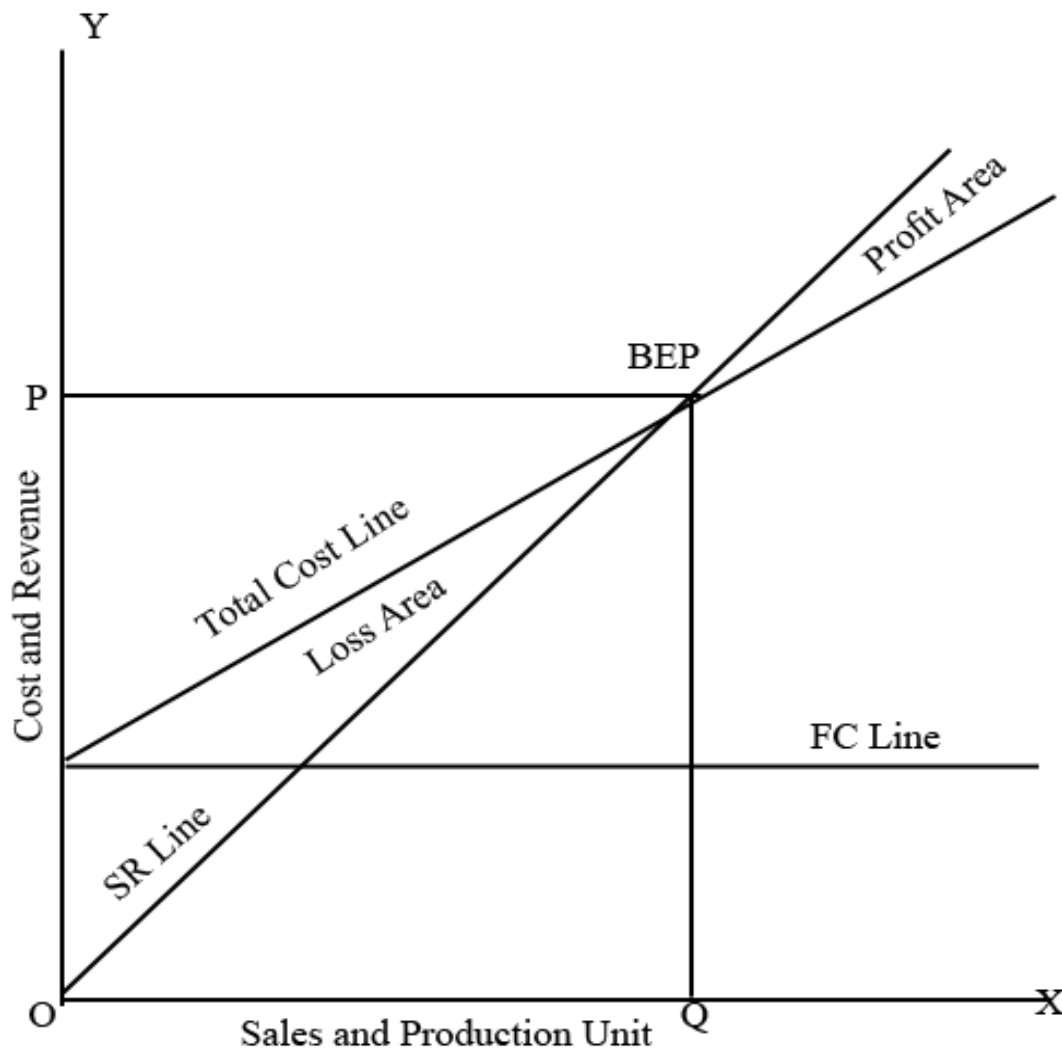
The contribution margin and equation approaches are two equivalents for finding the BEP. Both methods reach the same conclusion, so personal preference dictates which approach should be used.

C. The Graphic Approach

A break even chart is used to graphically depict the relationships among revenues, variable costs, fixed costs and profit or losses. The no profit no loss point (BEP) is located at the point where the total cost and total revenue line cross. Below this point the firm bears losses and above this point, the firm earns profit.

Figure 2.1

Graphic Approach of BEP Analysis



In the above chart, sales and production unit is plotted on horizontal or x-axis and vertical or y- axis represents cost and revenue. In graph the fixed costs remain constant with relevant range; the fixed cost curve is parallel to 'ox' axis. Variable cost slope upward from the origin to right but depends on variable cost ratio. The total costs curve parallels the variable cost curve. BEP is located where the total cost line crosses the sales revenue line. The above graph clearly states that if the company can reach the point BEP, it can generate sufficient revenues to cover all its operating expenses. At this point total revenues equal the total cost. Here, the revenue

curve break up (intersects) the total cost curve, that's why this point is called 'break even point'. At BEP total sales revenues = total cost. (*Bajracharya, Ojha, Goet and Sharma, 2004:230*)

If the actual sales are more than the break even sales, the organization will earn profit and if the actual sales are less than the break even sales, the organization will suffer from loss.

2.9.3.2 Cash Break Even Point

Some of the firms fixed costs are non cash outlays, and for a period, some of its revenue may be in receivable. It may be therefore important to find BEP on a cash basis for accounting and financial decision making. If non cash items are eliminated from revenues and costs, the BEP analysis on cash basis can easily be computed. It is the point where cash break even (i.e. the value of sales where cash realization on account of sales will be just sufficient to meet immediate cash liabilities). While calculating this point cash fixed cost (i.e. excluding depreciation and deferred expenses) and cash contribution (i.e. selling price less the cash variable costs) is considered. The point helps the management in determining the level of activity below which there are chances of insolvency on account of the firms inability to meet cash obligations unless alternative arrangement are made. (*Maheshwari, 2000:178*)

The cash break even point can be computed by the following formula.

$$\text{Cash BEP} = \frac{\text{FC} - \text{non cash outlays}}{\text{CM ratio}}$$

$$\text{Where, CM ratio} = 1 - \frac{\text{variables cost}}{\text{Sales revenue} - \text{non cash items}}$$

2.9.3.3 Composite Break Even Point

In case a concern is dealing in several products, a composite break even point can be computed according to the following formula. (*Maheshwari, 2000:179*)

$$\text{Composite BEP in units} = \frac{\text{Total Fixed Cost}}{\text{Composite CMPU}}$$

$$\text{Composite BEP in Rs} = \frac{\text{Total Fixed Cost}}{\text{Composite P/V ratio}}$$

2.9.3.4 Applications of Break Even Analysis

Break even concept can be used to formulate different policies in a business enterprise, some of this application is: (*Maheshwari, 2000:182*)

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

2.9.3.5 Assumption of Break Even Analysis

The assumptions underlying the construction of break even points are as follows; (*Ibid*, 1999:168)

- All costs can be classified into fixed and variable cost. There is no other cost than fixed cost and variable cost.
- Selling price per unit remains constant. It is not affected by sales volume.
- Fixed cost will remain constant and variable cost varies proportionately with activity.
- Either the firm produces only one product or the product mix is constant at all level of output.
- General Price level will remain essentially stable in the short run.
- Changes in the opening and closing inventories are not significant.
- That the level of production and sales remain unchanged during the period.

2.9.3.6 Limitations of Break Even Analysis

The break even analysis is based on some unrealistic assumptions. Its main limitations are as follows: (*Ibid*, 2001:168)

- According to the assumption of break even point, total cost can be divided into only fixed and variable costs, which is not practicable in real life. There are some costs, which are neither fixed nor variable. Those costs are described as semi fixed or semi variable costs.
- The assumption that fixed cost always remains constant is not true. Sometimes it can be increased, especially in that situation, when production or operation technique is changed.
- The assumption that variable cost per unit always remains constant cannot be entirely true.
- Constant selling price is also not true. In case of increase in sales volume, some modification can be made in selling price by considering the nature of demand for the goods.
- The assumption that either the firm produces only a single product or product mix ratio remains constant is also obviously quite unrealistic. Industries producing several types of goods have to bring about modification in the product mix ratio from time to time.
- The assumption that the production level and sales levels should be equal is another drawback of break even point. Such a condition is hardly found in practice.
- The capital invested in business is also a significant element of profit planning and control. However, it is not given a place in break even point.

2.9.4 Margin of Safety

Margin of safety is the excess of budgeted or actual sales over the break even sales volume. In other words, it is the difference between the budgeted or actual sales revenue and the break even sales revenue. It is a position above the break even point. It serves as a cushion or spring plate that enables a business firm to absorb the shocks of adverse business conditions. It indicates the extent to which sales may fall before suffering any loss i.e. greater the margin, safer the firm. The soundness of business is indicated by margin of safety. The difference between total sales and break even sales is identified by margin of safety. The high margin of safety is good for business. It indicates that there can be substantial falling of sale and yet profit can still be made. On the other hand, if the margin of safety is small, it indicates the weak position of business. The small margin of safety shows that even a small reduction in sale or production will

adversely affect the profit position of business. The margin of safety indicates the extent to which sales may fall before the firm suffers a loss. Larger the margin of safety, safer is the firm. A high margin of safety is particularly significant in times of depression when the demand for the firm's product is falling. A low margin of safety may result for a firm which has a low contribution margin ratio. When the both the margin of safety and the cm ratio low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume, or reducing variable costs by bringing improvement in the manufacturing process. (*Ibid*, 2006:240)

It gives management a feel for how close projected operations are to be organizations break even point. Managers often consider the size of the company's margin of safety when making decisions about various business opportunities. The larger is the safety margin, the greater is the chances for the company to earn profit (i.e. larger the margin of safety, safer the company). (*Munakarmi*, 2003:127)

Margin of safety can be ascertained by using the following formula:

Margin of safety in units = Actual sales in units – Break even sales in units

Margin of safety in Rs = Actual sales in Rs – Break even sales in Rs

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

Margin of safety in Rs = $\frac{\text{profit}}{\text{P/V ratio}}$

The relationship between margin of safety and actual sales is known as margin of safety ratio, which is determined as follows; (*Munakarmi*, 2003, P-127)

Margin of safety ratio = $\frac{\text{Actual sales} - \text{BE sales}}{\text{Actual sales}}$

If margin of safety is unsatisfactory, it can be improved through the following steps:

- By increasing the sales and production volume.
- By increasing the selling price.
- By decreasing the fixed costs.
- By reducing the variable costs.
- By changing the sales or production mix ratio.

2.10 CVP Analysis for a Multi Product Firm

Sales mix can be defined as the relative combination of two or more products represented in total. It is not only the sales revenue that makes profit. The proportion of the sales contributed by different products greatly changes the amount of profit. Managers try to achieve that combination, or mix, that will yield the greatest amount of profit. If a company sells more than

one product, these may not be equally profitable. So the company's profit will depend upon the ratio of each product's sale to total sales revenues. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low margin items can cause the total profit to decrease even though total sales increase. In the contrary, a shift in the sales mix from low margin items to high margin items can cause the reverse effect total profit may increase even though total sales decrease.

The relative proportion of sales of product is called the sales mix or the product mix. In the case of a multi product firm, the contribution for each product can be found out by deducting its variable costs from sales revenue. The break even point for each product can be calculated only if the total fixed costs of the firm are distributed and fixed cost for each product is known. The firm's overall break even point can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi product firm's p/v ratio will be the weighted average of the p/v ratios for all the products, the weights being the relative proportion of each product's sale. The p/v ratio for the multi product firm can also be calculated by dividing the total contribution from all products by total sales. A change in the product mix will not affect the firm's break even point and profit if each product has the same p/v ratio. However, a change in the product mix will change the break even point and profit when products have unequal p/v ratios. (Maheshwari, 2000:187)

In case of single product, the solution of a problem required is much simple. But if the company has more than one product the solution for the problem required may be a little complex. The term product mix and sales mix are used interchangeably. When a firm produces or sells more than one type of commodity, it is described as product or sales mix. In such a situation different selling price, variable cost result in different unit contribution margin and contribution margin ratio. As a result, break even points vary with the relative proportion of the commodities produced or sold. However, the assumption has to be made that sales mix remains constant. It does not change for a specified period.

2.11 Break Even Point for Multi Product Firm

The different products may have their own different production facilities and fixed cost separately. In that case cost volume profit analysis can be done for each product separately. But if common facilities and common fixed costs are being used by different products, CVP analysis is performed by averaging data using sales mix as weight. In that case, break even point is calculated as follows:-

Table 2
For determination of break even point in terms of unit

Step – 1	To find out sales mix ratio in units
Step – 2	To find out unit contribution margin for each product
Step – 3	To multiply the sales mix ratio and unit contribution margin of each product separately
Step – 4	To find out weighted average contribution margin by adding product of step-3
Step – 5	To find out overall break even units by using following formula: Overall BEP in unit = $\frac{\text{total fixed cost}}{\text{Weighted CMPU}}$

Table 3
For determination of break even point in terms of Rs

Step – 1	To find out sales mix ratio in sales amount
Step – 2	To find out p/v ratio for each product
Step – 3	To multiply the sales mix ratio and p/v ratio of each product separately
Step – 4	To find out overall p/v ratio by adding product of step-3
Step – 5	To find out overall BEP by using following formula: Overall BEP in Rs = $\frac{\text{Total fixed cost}}{\text{Weighted P/V ratio}}$

Some Important Formula;

$$\text{Overall BEP in unit} = \frac{\text{Total fixed cost}}{\text{Weighted CMPU}}$$

$$\text{Overall BEP in Rs} = \frac{\text{Total fixed cost}}{\text{Weighted P/V ratio}}$$

$$\text{Product wise BEP in unit} = \text{overall BEP in unit} \times \text{Respective proportion (from sales unit)}$$

$$\text{Product wise BEP in Rs} = \text{Overall BEP in Rs} \times \text{Respective proportion (from sales Rs)}$$

$$\text{Required sales for DP in unit} = \frac{\text{Total Fixed cost} + \text{DP}}{\text{Weighted CMPU}}$$

$$\text{Required sales for DP in unit} = \frac{\text{Total fixed cost} + \text{DP}}{\text{Weighted P/V ratio}}$$

$$\text{Required sales for DPAT in unit} = \frac{\text{Total fixed cost} + \frac{\text{DPAT}}{1 - T}}{\text{Weighted CMPU}}$$

$$\text{Required sales for DPAT in Rs} = \frac{\text{Total fixed cost} + \frac{\text{DPAT}}{1 - T}}{\text{Weighted P/V ratio}}$$

2.12 Cost Volume Profit Analysis and Limiting Factors

CVP analysis is more helpful in profit planning if a company is able to produce any number of outputs of its choice (desires). But in real world, it is not possible because of some critical factors like shortage of finishing machine time or raw material or labor. These critical factors in the CVP analysis are known as constraints.

2.13 CVP Analysis with a Single Constraint

Single production constraint exists when the production is constrained by only one resource or bottleneck resource. For example, if all the firms' products require the same basic raw materials, then the firms output will be limited by the available quantity of raw materials. Likewise if the firm's products require the same labor, then the firms output will be limited by the available labor hours.

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resource. This can occur if the firm products are all produced on a single machine and output is limited by hours available on this machine. In same way, single resource constraint arises, if the firm's products are all produced with only one material and output is limited by availability for that material. When there is a constraint for a scarce resource to have alternative uses, the contribution per unit should be calculated for each of these uses. Then the available capacity for such scarce resource should be allocated to the alternative uses on the basis of contribution per scarce resource. (*Munakarmi, 2003:46*)

2.14 CVP Analysis with Multiple Constraints

Where more than one scarce resource exist the optimum production programmed cannot easily be established by the simple process applied in single resource constraint. Under the circumstances simple allocation of resource or the basis of contribution margin per unit is neither feasible nor desirable. Contribution margin per unit of scarce resource may be different for different ranking of product, because production processes are affected by many constrains factors rather than single constraint. In such situation, linear programming technique may used to optimize product mix. The linear programming formulation is required to determine a production plan which maximizes contribution from the product mix. Linear programming is a mathematical technique which shows how to arrive the optimum results, allocation available resources in a meaningful manner. It is basically concerned with the problem of allocating limit resources among competitive activities in an optimum manner. It is a 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*)

Multiple production constraints exists when more than one resources limits the quantity that can be produced any time in an aggregate manner. In situation of multiple production constraints, contribution margin per unit of scarce resource approach used in single production

constraints does not work, as ranking of products across different constraining resources will generally differ. Instead, linear programming helps us to make an optimal allocation or to determine an optimal product mix. Linear programming is a mathematical technique for finding the best uses of firm's limited resources. The basic requirements of a linear programming problem that fits to multiple production constraints problem also can be enumerated as:

- There must be an objective the firm wants to achieve i.e. criterion in which alternatives are assessed e. g. profit maximization (which is our concern at present) or cost minimization. As profits are not linearly related to sales volume, contribution is the appropriate term to be used instead of profit.
- There must be alternative courses of action; one of which will assist in achieving the objective.
- Resources or facilities must be in limited supply
- The variables in the problem must be interrelated
- Objectives and constraints must be able to be expressed as mathematical equations or inequalities and these must be linear equations or inequalities.

2.15 CVP Analysis under Condition of Uncertainty

CVP analysis can be used for various purposes such as choosing between machine and products, planning of profit and most significant fixing up of selling price. Management uses this as a convenient tool of profit planning with giving consideration of risk and uncertainty involved in it.

Our discussion of cost volume profit so far was based on the very assumptions that all costs and revenues were known with certainty. This assumption of single value estimate, which is far from reality naturally, limits the usefulness of CVP analysis for profit planning and other decision purposes. To prove it-self a better tool in the hands of manager, CVP analysis should incorporate risk and uncertainty in its parameters.

The fundamental variables used in the CVP analysis are (1) the selling price per unit, (2) the variable cost per unit, (3) the total fixed cost and (4) the expected sales volume of each product. In any given decision problem, all four of these factors can be uncertain. To simplify the problem, however, we can first start with the uncertainties in sales volume assuming other factors are equivalent to certainty. Moreover, relative to the expected sales quantity, the costs and selling prices are quite certain; that is, for analytical purpose, the decision maker may be justified in treating several factors as certainty equivalents. A possible approach to incorporate risk and uncertainty in CVP analysis is to apply normal distribution theory. A normal distribution theory normally estimates the likelihood than the random variable will take in various possible values. Such an estimate is more or less based on personal judgment and is called subjective probability distribution.

The normal probability distribution approach can be used to further analysis the element of risk in cost volume profit analysis. The use of the normal probability distribution will enable the decision maker to have an idea of the probability of different expected values of sales or cost or profit, that is the probability of sales or cost or profit having the value of zero or less, greater than zero and within the range of two values and so on. Thus, the normal provability distribution

is an important statistical technique in the hand of decision maker for evaluating the riskiness of a firm. The parameters of the normal probability distribution are mean and standard deviation. A particular normal probability distribution can be completely determined, if it's mean and standard deviations are known. The standard deviation is a measure of dispersion of the distribution about its mean. The larger the standard deviation, the more spread out is the distribution.

2.15.1 The Use of Normal Distribution in CVP Analysis

Now the issue is how the information provided by the normal probability distribution can be used in managerial planning and decision making. The manager, in choosing between this product and other products or projects, can probably improve his decision by considering the risk involved.

Though all the variables of the CVP analysis may be uncertain and random, still the sales volume is the most uncertain variables. In most of the cases in businesses the demand is uncertain. Assuming that sales quantity is random variables, we can apply the concepts of the normal distribution in CVP analysis problems.

Managers know their firms expected sales, the break even sales and expected profit. Surely, they would benefit from knowing that:

- The probability of at least reaching the break even sales.
- The probability of making at least the required amount of profit.
- The probability of incurring losses, i.e. not achieving the break even sales volume .etc.

2.16 Steps (Jumping) Fixed Cost and Multiple BEP

Break even point is determined by dividing the fixed cost by the contribution margin per unit. If the fixed cost is jumping one (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 cost. Some of these compute BEP may not be feasible because they may violate the limit imposed by the relevant range corresponding to the level of fixed cost considered in their computation. As a result real or actual BEP is determined through trial and error approach. (Munakarmi, 200:136)

2.17 Assumptions Underlying CVP 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 discussion of the CVP analysis (or break even analysis) so far is based on the following assumptions. (Pandey, 1994:241)

A. Cost Segregation

The total costs can be separated into fixed and variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit is constant and total variable cost changes in direct proportion to the sales volume.

B. Constant Selling Price

The selling price per unit remains the constant; that, it does not change with volume or because of other factors.

C. Constant Sales Mix

The firm manufactures only one product or if there are multiple products the sales mix does not change.

D. Coordinated Production and Sales

Production and sales are coordinated, that is inventories remain the same.

2.18 Limitations of CVP Analysis

Assumptions limit the utility and general applicability of the CVP analysis. Therefore, the analysis should recognize these limitations and adjust data, wherever possible, to get meaningful results. The CVP analysis suffers from the following limitations. (*Pandey, 1999: 214*)

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

2.19 Special Problems in CVP Analysis

There are three special problems in CVP analysis that are as follows :(*Fago, 2003: 236*)

A. The Activity Base

When two or more production 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 denominators because manufacturing. Selling and administrative activities are expressed in combination.

B. The Change in Inventory

Usually, the budgeted change in inventories (i.e. finished goods and work in process) is immaterial in amount and thus may be disregarded in CVP analysis. On the other hand, when the change in budgeted inventory is significant, it should be included in the analysis.

Management policy in inventory change is;

- Disregard the inventory changes.
- Included the inventory changes.

C. The Non Operating Incomes and Expenses

The non operating income and expenses (extra ordinary gains and losses) cause another problem in CVP 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.

2.20 Sensitivity Analysis

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

$$\text{Profit} = \text{total sales} - \text{total cost}$$

Or

$$\text{Profit} = \text{sales units} \times \text{SPPU} - \text{sales units} \times \text{VCPU} - \text{fixed cost} - \text{taxes}$$

So that,

$$\text{Profit} = F (\text{sales volume, variable costs, fixed costs, taxes etc.})$$

But none of the factors remain unchanged; sometimes the manager can be intentionally change the price and cost factors as a part of strategic decision. But the strategy should focus more on the factor, which is more sensitive or responsive for profit. So to measure the sensitivity of CVP factors, we can see the impact of certain percentage or amount change in volume, price, or cost factors on net profit. (*Bajrachaaya, Ojha, Goet and Sharma, 2004:245*)

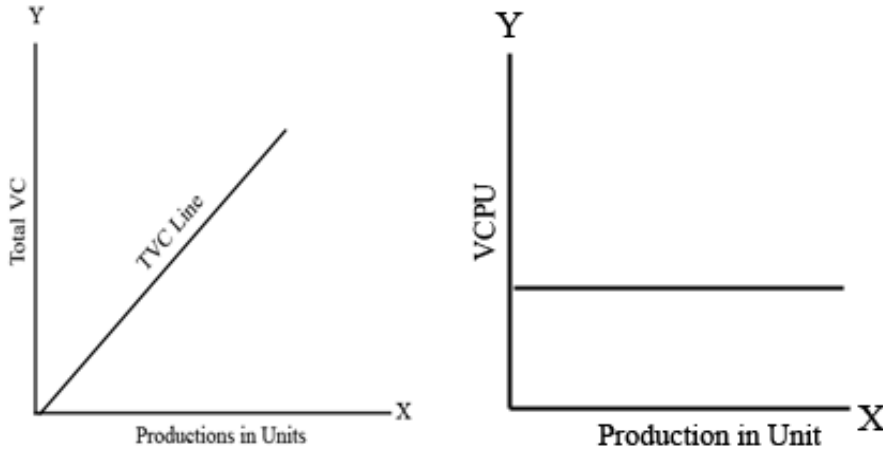
2.21 Cost Structure

There are three types of costs from their nature of variability. They are:

1. Variable Costs

Variable cost varies in direct proportion to change in activity level. If the level of activity increases by 50% the amount of the variable cost also increases by 50% as well. Variable cost in total increases or decreases if the activity level increase or decrease but remain constant if expressed on a per unit basis. Change of variable cost effects to p/v ratio, 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. It will more be more understood clearly with the help of the diagram presented below:

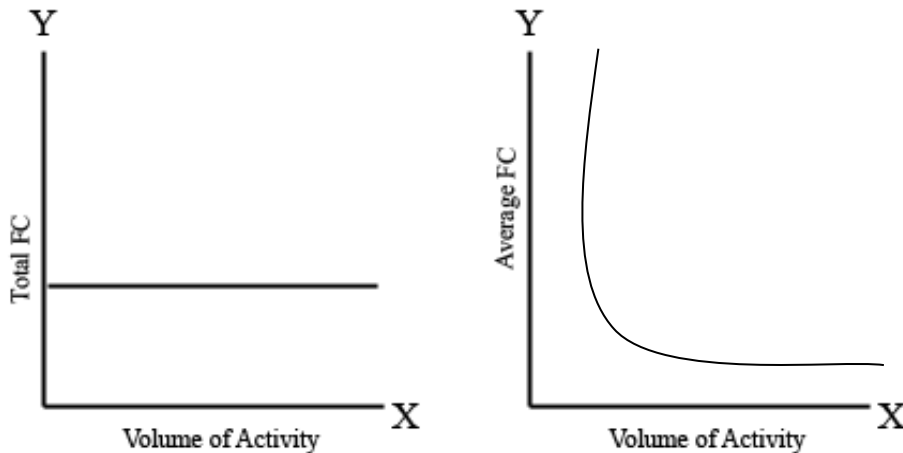
Figure 2.2
Variable Costs



2. Fixed Cost

Fixed costs remain constant in total amount despite the changes in the level of activity. That is, the fixed cost remains unchanged in total as the activity varies. But the fixed cost per unit does change as activity varies. Fixed cost per unit basis decreases as the level of activity increases and vice versa. 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 increases but the net income decreases or vice versa. Fixed cost is also called capacity cost. The concept of fixed cost may be more understood with the help of the following diagram.

Figure 2.3
Fixed Costs

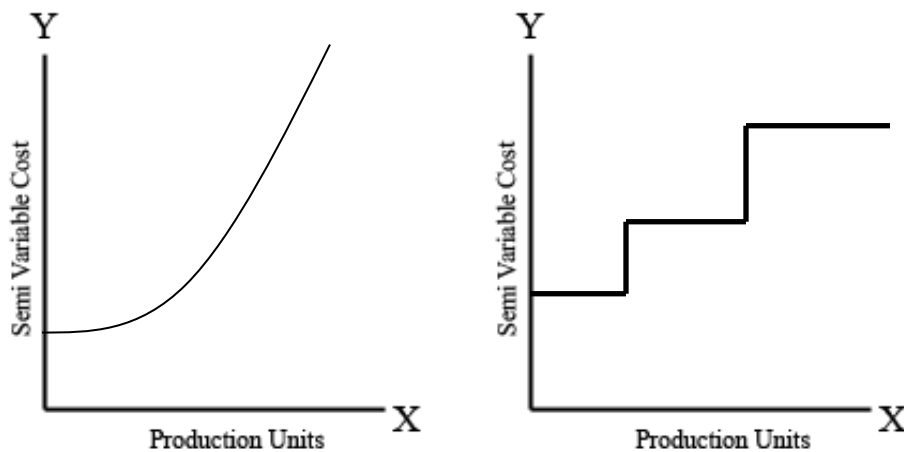


3. Semi Variable Cost

Expenditure that cannot be categorized as purely fixed or variables are termed as mixed cost or semi variable cost. Mixed cost contains both variables and fixed cost elements. Repair

and maintenance, supervision, telephone, electricity charge are some examples of mixed cost. It should be separated into the variable and fixed elements for profit planning, cost control and decision making. In mixed cost, variable cost element is added to the fixed cost element as such mixed cost line slopes upward in the graphs.

Figure 2.4
Semi Variable Cost



2.22 Risk Measurement: The Operating Leverage and Break Even Point

Operating leverage is a measures of the extent to which fixed costs are being used in organization. The relationship of a company's variable and fixed costs is reflected in its operating leverage. Generally highly labor intensive organizations have high variable costs and low fixed costs and this have low operating leverage and a relatively low break even point. Conversely, organizations that are highly capital intensive have a cost structures that includes low variable and high fixed costs which reflects high operating leverage with high break even point. It shows that fixed costs and operating leverage has direct relationship. Higher the amount of fixed costs higher the operating leverage and break even point and vice versa. In other words, the firm with relatively high operating leverage has proportionally high fixed expenses; the firms break even point will be relatively high. (Munakarmi, 2003:145)

Operating leverage tells us how profit change in sales. It is evident that profit change 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 decline proportionately. But fixed costs do not decline so, the net operating income decline more rapidly. The some tiling applies in the case of increase well. Sales revenues changes but some parts of costs, known as fixed costs, remain unchanged. This usually net 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). DOL shows the times of percentage change in net operating income of the given percentage change in sales. DOL may be defined as the percentage change in net operating income or EBIT associated with a given percentage change in sales. (Pandey, 2004:245)

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

Alternatively,

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

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

Where, Q = Total Demand in Units

SPPU = Selling Price per Unit

VCPU = Variable Cost per Unit

As we know,

$$\text{BEP in Units} = \frac{\text{Fixed cost}}{\text{SPPU} - \text{VCPU}}$$

Leverage decision is meant to substitute variable cost by the fixed costs. To create a degree of operating leverage means the employment of higher amount of fixed cost which eventually increases the break even point also. No DOL is to be said when the DOL occur '1' and in this situation BEP comes to '0'. Higher fixed cost increases the DOL and they also increase the break even point, so there is close relationship between the degree of operating leverage and the break even point. A high DOL and high BEP both are indicators of higher risk. (*Bajracharya, Ojha, Goet and Sharma, 2004:249*)

2.23 Segregation of Semi-Variable (Mixed) Costs

Cost volume profit analysis requires segregation of all costs between two parts; fixed and variable. This means that the semi variable cost will have to be segregated into fixed and variable elements. This may be done by any one of the following methods; (*Maheshwori, 2000:162*)

A. Levels of Output Compared to Levels of Expenses Method

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

$$\text{Variable element} = \frac{\text{Change in Amount of Expenses}}{\text{Change in Activity}}$$

B. Range Method

This method is similar to levels of output compared to levels of expenses method except that only the highest and lowest point of output is considered out of various levels. This method also designated as "High and Low" method. The high low method is explained step by step as follows;

Step I – The highest pair and the lowest pair are selected.

Step II – the variable rate 'b' computed by using the following formula

$$\text{Variable rate} = \frac{\text{Difference in cost}}{\text{Difference in activity}}$$

Step III – The Fixed Cost Portion is computed as:

$$\text{Fixed cost portion} = \text{Total Cost} - \text{Variable cost}$$

C. Degree of Variability Method

In this method, degree of variability is noted for each item of semi variable expenses. Some semi variable items may have 30 % variability while others may have 70% variability. The method is easy to apply but difficulty is faced in determining the degree of variability.

D. Scatter – Graph Method

In this method, the given data are plotted on a graph paper and line of best fit is drawn, whereas semi variable expenses is plotted on the vertical axis (Y – axis) and activity measure is plotted on the horizontal axis (X axis). The method is explained below.

- The volume of production is plotted on the horizontal axis and the costs are plotted on the vertical axis.
- Corresponding to each volume of production and costs are then plotted on the paper, thus, several points are shown on it.
- A straight line of best fit is then drawn through the points plotted. This is the total cost line. The point, where this line intersects the vertical axis is taken to be amount of fixed element.
- A line parallel to the horizontal axis is drawn from the point where the line of best fit intersects the vertical axis. This is the fixed cost line.
- The variable cost at any level can be known by nothing difference between fixed cost and total cost line

The scatter – graph method is relatively easy to use and simple to understand. However, it should be used with extreme caution because it does not provide any objective test for assuring that the regression line drawn is the most accurate fit for the underlying observations.

E Least Square Method

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

Steps 1 Assume the activity level or production units as ‘x’ and find out the summation of x i.e $\sum X$.

Step 2 Assume the Mixed cost as ‘Y’ and find out $\sum Y$

Step 3 Multiply X and Y, and sum the product i.e. find out $\sum XY$

Step 4 Convert X in to X^2 and find out the sum of X^2 i.e. $\sum X^2$

Step 5 Using the following given below, find out unit variable cost (b):

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

Step 6 Using the formula given below find out fixed cost percent (a):

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

Notes;

N = Number of Observations

2.24 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;

- **Income statement or trading and profit and loss account;** it is prepared by a business concern in order to know the profit earned and loss sustained during a specified period.
- **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 collectively called financial statements of a company. (Jain, 1991:233).

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 interrelationships with other related figures established, the data are sometimes rearranged to have better understanding of the information with the help of different techniques or tools for the purpose. Financial analysis is helpful in assessing the financial position and profitability of a concern. This is done through the comparison of ratios over the period. (Jain. 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 relationships among various accounting data supplied by financial statements are 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.

2.24.1 Profitability Ratios

Profitability ratios are of utmost importance for a concern. These ratios are calculated to enlighten the end results of business activities which are the sole criterion of the overall efficiency of a business concern. The following are the important ratios. (Jain. 1991, VI/28)

a. Gross Profit Ratio:-

This ratio tells gross margin on trading and is calculated as under;

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

b. Operating Profit Ratio:-

This ratio establishes the relationship between operating profit and sales and is calculated as follows;

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

c. Net Profit Ratio:-

This ratio is very useful to the proprietors and prospective investors because it reveals the overall profitability of the concern. This is the ratio of net profit after taxes to net sales and is calculated as follows;

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

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;

$$\text{Return on shareholders investment ratio} = \frac{\text{Net profit after tax}}{\text{Equity shareholders funds}} \times 100$$

$$\text{Equity shareholders funds} = \text{Equity share capital} + \text{Capital reserves} + \text{Revenue reserves} + \text{Balance of profit and loss account} - \text{Fictitious assets}$$

e. Return on Total Assets:-

This ratio is calculated to measure the profit after tax against the amount invested in total assets to ascertain whether assets are being utilized properly or not. It is calculated as under;

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

2.24.2 Financial Ratios

These ratios are calculated to judge the financial position of the concern from long term as well as short term solvency point of view. The following are the ratios which are calculated in this respect. (*Jain. 1991:39*)

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 prepaid expenses etc.

Current liabilities = bank overdraft, bills 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 ie 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 at least equal to the liquid liabilities at all times. Liquid assets are those assets which are readily converted into cash and will include cash balances, bills receivable, sundry debtors and short term investments. Inventories and prepaid expenses are not included in liquid assets. Quick ratio is calculated as follows;

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

c. Fixed assets to Capital Employed Ratio:-

This ratio is calculated as under;

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

Capital employed = equity share capital + preference share capital + undistributed profit + reserve and surplus + long term liabilities – fictitious assets

This ratio gives an ideas 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 Assets; this ratio is worked out as;

$$\text{Current assets to fixed assets ratio} = \frac{\text{Current assets}}{\text{Fixed assets}}$$

This ratio will differ from industry to industry and therefore no standard can be laid down. A decrease in the ratio may mean that trading is slack or more mechanization has been 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 outsider's 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;

$$\text{Proprietary ratio} = \frac{\text{Shareholders Fund}}{\text{Total Assets}}$$

2.25 A Brief Review of Books

“The study of the interrelationship of sales costs and net income is usually called cost-volume profit analysis. CVP analysis examines the response of profit to changes in volume. It relies on linear cost analysis and on linear revenue assumptions. To gain understanding of CVP analysis, the common example of a firm which produces only single product will be used. The analysis will be expanded to cover firms with several products by multiple divisions”. *[Fisher and Frank, Op cit. 109]* “C-V-P analysis consists essentially in examining the relationship between changes in volume (output) and changes in profit. The scope of C-V-P analysis ranges from the determination of the optimal output level of a single- product department to the determination of the optimal mix of large multi-product firm. All these decision rely on the simple relationship between changes in revenues and costs and changes in output levels (mixes). Output should be expanded or the output mix altered if the incremental revenue resulting from the change exceeds the incremental costs of making the change. Thus, all cost, volume and profit analysis is characterized by their emphasis on cost and revenue behavior over various ranges of output levels and mixes”. *[Nicholas, 1974:107]*

“Cost, Volume and Profit analysis includes the related concepts of (a) Contribution analysis and (b) Break even analysis. These concepts entered the mainstream of management accounting starting in the 1930’s, with major emphasis in the 1950’s. Both concepts rest upon the concept of cost variability (i.e. flexible or variable expenses budgets), Contribution analysis involves a series of analytical techniques to determine and evaluate the effects on profits of changes in sales volume, sales prices, fixed expenses and variable expenses. Basically, it applies the concept of a contribution margin income statement: Revenues minus variable expenses equals contribution margin, and contribution margin minus fixed expenses equals profit. Break-even analysis focuses on the breakeven point: Fixed expenses divided by the contribution margin equals break even sales volume (the point at which profit is zero because revenue equals total cost). The result of breakeven analysis is usually graphed to show the relationships between revenue (i.e. sales), fixed expenses, and variable expenses, within a relevant range of sales volume”. *[Hilton 1996: 531]*

“C-V-P analysis is concerned with examining the relationship between changes in volume and changes in total revenue and costs in the short term. Drury has compared the economist’s and accountant’s models of CVP behavior. The major differences are that the total cost and total revenue functions are curvilinear in the economist’s model, whereas the accountant’s model assumes linear relationships. However, we have noted that the accountant’s model was intended to predict CVP behavior only within the relevant range, where a firm is likely to be operating on constant returns to sale. A comparison of the two models suggested that, within the relevant production range, the total costs and revenue functions are fairly similar.” *[Drury, 2005:337]*

2.26 A Brief Review of Previous Research Work

Researches in the area of ‘cost- volume –profit’ analysis as a tool to measure effectiveness of PPC/ budgeting of a company in Nepalese context are not made sufficiently. As profit planning and control and management accounting cover major aspects of cost-volume-profit

analysis, researches made on these sectors are taken into consideration for review. Many researches have been made on manufacturing concerns except only a few of them are profound. Here, an attempt is made to review some of the researches submitted on profit planning and control and management accounting in the context of Nepal.

Miss Pramita Dangol (2001)

Miss Pramita Dangol had conducted a research entitled “profit planning in manufacturing public enterprise; a case study in Hetauda cement industry ltd”. Miss Dangol had focused her study in the application of profit planning concepts in PEs. The time period covered by the research is five years from FY 2051/52 to 2055/56.

The required data and information were collected from both primary and secondary source. Miss Dangol had reached at the conclusion from the analysis making several remarkable findings. Some of the findings were as follows:

- No proper application of any effective sales forecasting technique.
- Planning of budgeting policy of the company is very poor and there is no system of taking corrective action for pre planning.
- Decision making powers are centralized.
- There are no clear cut duties and responsibilities of the employees.

Miss Indira Ghimire (2004)

Miss Indira Ghimire had conducted a research entitled “profit planning in manufacturing company in Nepal; a case study of bottlers Nepal ltd”. Miss Ghimire had concerned her study to examine the practice of profit planning and control in the manufacturing companies in Nepal.

Her major findings are as follows:-

- The company has not maintained the broad and long range objectives and periodic report and objectives are limited to the high ranking official only.
- Relevant internal and external market variables are not fully explored.
- Cost classification is not systematic. There is no practice of segregating semi variable cost.
- Management information system is not performance based.
- Sales and production targets are not achieving due to defective forecasting.
- Enterprises has no financial plan, they have only sales and production forecast.
- There are no any proper criteria for performance evaluation for financial tools.

Mr. Rijal, Madav (2005)

Mr. Madav Rijal had studied on the topic “*cost volume profit analysis to measure the effectiveness of profit planning and control (a case study of Nebico Pvt. Ltd.)*”. The study was based on both primary data as well as secondary data and analysis was based on only five years data. It was submitted to Shankar Dev Campus, Tribhuvan University, and Kathmandu.

The main objectives of that research analysis are as follows.

- To study relationship of cost volume and profit as an applicable tools of budgeting.
- To evaluate the stability, financial position and sensitivity of Nebico’s activities.
- To analysis the cost volume and profit of the company and its impact in profit planning and
- To provide suggestions and recommendations for improving Nebico’s condition etc.

Mr. Rijal had pointed out some major findings in his research although most of his findings were out of objectives of the study. Some major findings are as follows;

- The company's sales trend has fluctuation but not satisfactory trend of increasing.
- The company's variable cost is in high proportion than fixed cost in comparison with total cost which contributes for lower contribution margin.
- NEBICO had no any plan to reduce cost.
- The profit trend of the company was not satisfactory.
- The company had no effective inventory policy.
- There were not effective sales forecasting techniques.
- NEBICO Pvt. Ltd. had not practice of segregating the cost into fixed variable and controllable or non-controllable.
- Net profit margin profitability ration and other things were not satisfactory.
- The company has not utilized its full capacity.
- CVP relation is not considered while developing sales plan production plan and pricing strategy.

The following suggestions have been recommended on the basis of this research;

- NEBICO should consider BEP analysis while preparing sales plan production plan and setting the price of its products.
- Classification of expenses as variable and fixed or controllable or uncontrollable must be made within a specific framework of responsibility and time.
- Cost control department separately established which is divided the cost by production and control the cost.
- A systematic approach should be made towards comprehensive profit planning. This cans considerably contribute to the increase in profitability of NEBICO Ltd.
- CVP analysis and PPC manuals should be communicated from top to lower levels.
- As company as unable to generate more profit as per investment made in fixed cost, company should put address on effective utilization of fixed cost.
- All personnel should be participated on decision making and planning process.

Mr. Dahal, Uday Kumar (2006)

Mr. Uday Kumar Dahal has studies on the topics of *"Cost volume profit analysis as a tool to measure the effectiveness of profit planning with special reference to Dabur Nepal Ltd."* This was submitted to Nepal commerce Campus, TU in Partial fulfillment of Master's Degree in the year 2006.

The main objective of the research was;

- To examine the variance between target and actual sales and production.
- To show the capacity utilization of Dabur Nepal Ltd.
- To forecast future production and sales.
- To analyze financial performance.
- To analyze the CVP of company and its impact of profit planning.
- To analyze the trend of profit over the time covered by the study.
- To provide recommendations and suggestions for improving the profit planning systems of Dabur Nepal Pvt. Ltd.

To conclusion of the research regarding the present practice of profit planning of Dabur Nepal Pvt Ltd. has given below.

- Dabur Nepal Pvt. Ltd constitutes lack of adequate inventory policy.
- No control over external factor i.e. it has poor SWOT analysis.
- Dabur Nepal Pvt. Ltd does not prepare strategic and policies for long term.
- Dabur Nepal Pvt Ltd is not able to coordinate among various departments.
- Dabur Nepal Pvt Ltd not prepares raw material requirement budget and raw material purchase budget systematical.

The researcher also provides the following recommendations;

- CVP analysis should be considered while formulating profit plan.
- Profit planning manuals should be communicated from top level to lower level.
- The company management should look carefully into the basis of setting target for sales and achieving those targets meaningfully.
- Dabur Nepal Pvt. Ltd should focus on the relationship between expenditure and benefit, expenses planning and controlling is necessary to obtains companies goals.
- To get the idea of future cash requirement and application of the form, it should make cash budget systematically.
- The company should prepare raw material budget and production budget scientifically.

Mr. Timsina, Dharma Raj (2007)

Mr. Dharma Raj Timsina had studied on the topic “*cost volume profit analysis of Himalayan distillery limited (HDL).*”). This was submitted to Nepal commerce Campus, TU in Partial fulfillment of Master’s Degree in the year 2007.

The general objective of this study is to evaluate the C-V-P analysis of multi products manufacturing company. The specific objectives of this study are as follows:

- To analyze different components of cost as per cost behavior.
- To analyze the impact of fixed cost on profit.
- To analyze break even point of overall firm as well as individual product.
- To show the relationship of cost, volume and profit between multi products.
- To provide suggestions and recommendations on the basis of major findings.

Mr. Timsina had pointed out some major findings in his research. Some major findings are as follows;

- Different types of profit planning tools, which are used in the academic field, are not found applied by HDL.
- C-V-P analysis is not applied by HDL as no segregation of cost in to fixed and variable, which is the hardcore of CVP analysis.
- Company has no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So, HDL has not been able to use C-V-P analysis and make the realistic and smart budget.
- Production and sales are comparatively low than production capacity.
- Avoiding C-V-P analysis tool and not utilizing full capacity, the company is bearing loss. Promoter and director, and staff of the company are enjoying by achieving allowance and salary respectively. Other part, general shareholders are not achieving dividend and government couldn’t claim for income tax since loss and loss recovery situation.

The researcher also provides the following recommendations;

- Classification of expenses item as variable and fixed or controllable and non-controllable must be made within specific framework of responsibility and time.

- Separate cost control department should be established for the effective management and reduction of cost.
- HDL should consider about the product line to improve its profit. Market studies on demand, supply and pricing of product should be carried out and loss oriented costs should be identified and control.
- HDL should consider BEP analysis which preparing sales plan, production plan and selling price of its products.
- HDL is multi Product Company; more emphasis should be provided the product having high contribution so as have more profit.
- Some portion of fund should be allocated to research and development program so that new technology could be found which provide more competitiveness in the market.
- HDL should have proper manpower planning.
- System of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective action immediately and timely.
- New market areas should be identified for the coverage of increased activities of companies.

2.27 Research Gap

There is the gap between the present research and the previous researches. Previous researches were mainly conducted on profit planning and control and budgeting practices in the manufacturing companies especially in public enterprise. The previous researcher did not disclose which of the profit planning and control tools are in practices, which are not and why. But few of the researches were conducted on simple cost volume profit analysis of public and private limited companies. But to fill gap, it examines the Cost – Volume –Profit Analysis as a tool of profit planning in Bottler's Nepal Limited.

CHAPTER – 3

RESEARCH METHODOLOGY

3.1 Introduction

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

Research methodology is a systematic way to solve the research problem. In other words research methodology describes the methods and process applied in the entire aspect of the study. It may be understand as a science of studying how research is dines scientifically. It help to analyze, examine and interpret various aspects of research works such as sales, cost and other aspects of CVP analysis, related to effective tools of profit planning. The objective of this study will be to analyze the CVP analysis of BNL and thereby forward some measures to improve the situation. The major contents of research methodology followed in course of this study are;

3.2 Research Design

Research design means defining procedures and techniques which guide to study and propound ways for research work. It is an analytical as well as descriptive approach to achieve the objectives. It is the arrangement of condition for collection and analysis of data relevance to the study purpose with economy in procedure. In order to make type of research, this fulfills the objectives of the study. The research design is an organized approach and not a collection of loose unrelated parts. It is an integrated system that guides the researcher in formatting, implementing and controlling the study. Useful research design can product the answers to the proposed research questions. The research design is thus an integrated frame that guides the researcher in planning and executing the research works.

Data and information are the lifeblood or major portion of any study. This study would be attempted to show the relationship among cost, volume, profit and various functional budgets for solving the problems that has accrued in BNL. Cost- volume and profit analysis of BNL are presented and analyzed by descriptive research design and analytical method. A study design is the arrangement of the conditions for collection and analyze of data in manner that aims to combine relevance to the study purpose with the economy in producer. These studies will an intensive based on analysis of the past financial performance.

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

3.3 Research Population and Sample

The large group about which the generalization is made is called the population under study, or the universe and small portion on which the study is made is called the sample of the study.

Research population would be all manufacturing company of Nepal. Due to various circumstances it would not be possible to attempt all the number of research population regarding in this dissertation. To convenient the research, only one BNL will be taken for the research purpose.

3.4 Source and Type of Data

Data and information are the foundation of any study. Data may be obtained from several sources; it is not easy to list them in detail. Each research project has its own data needs and data sources. Secondary data have been taken mainly from annual reports, auditor's reports, balance sheet, P/L account, cost detail sheet, previous thesis and other relevant published and unpublished documents related to BNL. For further information informal interviews were conducted with the concern authority.

3.5 Variables of Studies

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

a) Independent Variables:

A variable is called independent variable if it is not influenced by any other variable under study. The independent variables are those, which are the basis of prediction.

b) Dependent Variable:

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

There are three factors (i.e. cost, volume and profit) of C-V-P analysis, which are interconnected and dependent on one another. So these factors are depending variables. But, testing relationship between these variable following criteria is assumed:

Table 4
Classification of Variables

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

3.6 Method of Analysis & Presentation

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

3.6.1 Descriptive Techniques

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

3.6.2 Quantitative Techniques

Descriptive techniques would not be enough to prepare excellent research report. To fulfill the gap, or make the research report attractive and for better understanding the following profit planning and statistical tools were used:

3.6.2.1 CVP Analysis Tools

C-V-P Analysis was included the following techniques:

Contribution Margin (CM) = Sales – Variable Cost

Contribution Margin Ratio = $1 - \frac{\text{Variable Cost}}{\text{Sales}}$

Break Even Point (BEP) in units = $\frac{\text{Total Fixed Cost}}{\text{SPPU} - \text{VCPU}}$

Where, SPPU - Selling Price per Unit
VCPU- Variable Cost per Unit

Break Even Point (BEP) in Rs. = $\frac{\text{Total Fixed Cost}}{\text{CM Ratio}}$

Where, CM - Contribution Margin

Cash BEP (in Rs) = $\frac{\text{Fixed Cost} - \text{NonCash Outlay}}{1 - \frac{\text{Variable Cost}}{\text{Sales} - \text{NonCash Outlay}}}$

Required sales for desired profit (in units) = $\frac{\text{FC} + \text{Desired Profit}}{\text{CMPU}}$

Required sales for desired profit (in Rs) = $\frac{\text{FC} + \text{Desired Profit}}{\text{CM Ratio}}$

$$\text{Required sales in units for DPAT} = \frac{FC + \frac{DPAT}{(1-T)}}{CMPU}$$

$$\text{Required sales in Rs for DPAT} = \frac{FC + \frac{DPAT}{(1-T)}}{CMRatio}$$

Safety margin (in Units) = Actual sales units – BEP in unit

Safety margin (in Rs) = Actual sales Rs. – BEP in Rs

$$\text{Margin of safety Ratio} = \frac{\text{Actual / Budgeted Sales} - \text{BESales}}{\text{Actual / Budgeted Sales}}$$

3.6.2.2 Statistical Tools

The relationship between two or more variables can be measured by using statistical tools. In this study the following statistical tools are used.

- **Bar Diagram:**

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

- **Mean:**

The sum of all the observations divided by the number of observations is called Mean. In such cases all the items are equally important. It is usually devoted by $\bar{X}$. It is defined by the following formula:

$$\text{Mean (X)} = \frac{\sum X}{N}$$

Where,

$$\sum X = \text{the sum of observations}$$

N = no. of observation

- **Standard Deviation (S.D.):**

The standard deviation is defined as the positive root of the mean of the squared deviations from their mean of a set of values. It is also known as Root Mean Square Deviation. It is usually devoted by the Greek letter δ (Small Sigma)

The SD is calculated by the following formula:

$$SD = \sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}}$$

- **Coefficient of Variation (CV):**

The relative measure of dispersion based on SD is called coefficient of SD. Thus,

$$\text{Coefficient of SD.} = \frac{\delta}{\bar{X}}$$

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

$$\text{CV} = \frac{\delta}{\bar{X}} \times 100$$

- **Correlation Analysis:**

The degree of relationship between two variables at a time is called correlation. In other words, two variables are correlated in such way that if one variable changes then other variables also changes subsequently.

It can be calculated by using following formula:

$$\text{Co-efficient of correlation (r)} = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}}$$

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

- **Coefficient of determination (r²):**

A meaningful analysis is available from the square of correlation coefficient (r²), which is called the coefficient of determination and calculated using the following formula:

$$\text{Co-efficient of determination (r}^2\text{)} = r \times r$$

$$\text{Probable Error (P.E.)} = 0.6745 \times \frac{1-r^2}{\sqrt{N}}$$

CHAPTER - 4

DATA PRESENTATION AND ANALYSIS

Planning sets the proper objectives and goals for an organization and profit planning develops the specific action plans to achieve the pre determined goals and objectives. CVP analysis can be used to plan the profit and it also measures the effectiveness of profit planning and control. CVP analysis analyses the relation among the cost, revenue and profits. It helps the management in cost control and profit planning.

Use of CVP in profit planning is the basic objective of this study. It will examine the present practice of CVP analysis and identify the area where CVP analysis can be applied in BNL. For this purpose historical data of BNL are used in this study taken from the internal and final audit reports.

4.1 Sales Plan of BNL

It is the fundamental plan of overall profit planning. It provides basic management decision about marketing. It is an organized approach for developing comprehensive sales plan. Different important decisions such as production, purchase, expenses etc. are made on the basis of sales budget. The following table shows the sales target and achievement of BNL (in Rs) of five years from 2002/03 to 2006/07.

Table 5
Budgeted Sales and Actual Sales in Rs ‘000’

Year	Budgeted Sales (X)	Increase/ (Decrease) %	Actual Sales(Y)	Increase/ (Decrease) %	Achievement %
2002/03	567000	-	535494	-	94.44%
2003/04	670000	18.17%	609654	13.85%	90.99%
2004/05	740000	10.45%	632114	3.68%	85.42%
2005/06	745000	0.66%	614739	(2.75)%	82.52%
2006/07	775000	4.03 %	621827	1.15%	80.24%

Source: Audit Reports; BNL

The above table shows that the budgeted sale is in increasing trend upto fiscal year 2006/07. But actual sale is in increasing trend up to fiscal year 2004/05 and it is decrease in the fiscal year 2005/06. The highest increasing rates in budgeted and actual sales are 18.17% and 13.85% in fiscal year 2003/04. The table 5 shows the sales target and sales achievement at the period of fiscal year 2002/03 to 2006/07. The table's shows that the sales achievement is always less than the sales target but it is more than 80% achievement in almost years. In the fiscal year 2002/03 actual sales are 94.44% of budgeted sales that are the best result among the five years period and in the FY 2006/07 only 80.42% of budgeted sales achieved which was poorest result among the five years period. In order to examine the nature of variability of actual sales and budgeted sales of different years, the arithmetic means, standard deviation, coefficient of

variation, correlation coefficient, probable error, regression equation of best fit and coefficient of determination calculated in appendix one, have presented in table 6. From the result, sales achievements are less fluctuated than budgeted sales being the lower CV of actual sales than budgeted sales. Similarly, mean sales and standard deviation of actual sales are less than that of budgeted sales.

Table 6
Summary of Statistical Calculation of Sales Data

Particulars	Budgeted Sales (X)	Actual Sales (Y)
Mean	$\bar{X} = 699400$	$\bar{Y} = 602765.6$
Standard deviation (S.D.)	$\sigma x = 83422.419$	$\sigma y = 38538.766$
Coefficient of variation (C.V.)	11.92%	6.39%
Correlation coefficient (r)	0.9240	
Probable error (P.E.)	0.0441	
Regression equation of best fit	$Y = 304219 + 0.4269X$	
Coefficient of determination (r^2)	0.8538	

Source: Audit Reports; BNL

The above data shows that there is not a systematic and realistic sales plan. Budget is based on historical data only and seems that planning section of BNL ignores all other factors that affect the budget. Therefore, the planning section of BNL should search and try to consider those factors that can affect the budgetary process.

Here, value of correlation coefficient is 0.9240 which shows that there is high positive relationship between actual sales and budgeted sales. The value of probable error shows that the calculated value of correlation coefficient is highly significant, since Correlation Coefficient $0.9240 > 0.2646$ ($6 \times \text{P.E.}$).

The value of coefficient of determination is 0.8538 which shows that 85.38 % variation in Actual sales is explained by the variation in Budgeted sales.

The regression equation ' $Y = 304219 + 0.4269X$ ' shows the relationship between actual sales (Dependent variable) and Budgeted sales (Independent variable) by the use of which we can estimate the value of Actual sales from the value of Budgeted sales. The estimated actual sales ($\hat{Y}$) calculated in appendix one is presented in table 7 below.

Table 7
Estimated Sales in RS '000'

Year	Budgeted Sales(X)	Actual Sales(Y)	Estimated Actual Sales $\hat{Y} = 304219 + 0.4269X$
2002/03	567000	535494	546271
2003/04	670000	609654	590242
2004/05	740000	632114	620125
2005/06	745000	614739	622260
2006/07	775000	621827	635067

Source: Audit Reports; BNL

4.2 Production Plan of BNL

Production planning is the second step of profit planning and control in a manufacturing company. Past sales data and production data are the basic foundations of production budget. It is affected by the planned ending inventory of finished goods. To find the budgeted production following equation should be considered by the management.

Budgeted production = *budgeted sales + budgeted ending inventory – beginning inventory*

The production plan of BNL is based upon various controllable factors. It is adopted seasonal production that is on peak season and slack season. The management of BNL Company hasn't hard and fast rules but the role of management is concentrated towards the production. The manager of the company prepares production plan with the help of factory supervisors, marketing managers and other members. The industry has sufficient capacity to produce the goods with fulfill the demand of budgeted sales. So BNL is unable to utilize its full capacity. The following table shows the production target and achievement at cost of BNL in RS of five years from 2002/03 to 2006/07.

Table 8
Budgeted Productions and Actual Production in RS '000'

Year	Budgeted Production (X)	Increase/ (Decrease) %	Actual Production (Y)	Increase/ (Decrease) %	Achievement %
2002/03	320000	-	308341	-	96.36%
2003/04	405000	26.56%	376174	22%	92.88%
2004/05	425000	4.94%	371348	(1.28)%	87.38%
2005/06	460000	8.24%	380282	2.41%	82.67%
2006/07	483000	5%	382395	0.56%	79.17%

Source: Audit Reports; BNL

The above table shows that the budgeted production is increased but increasing rate is not uniform. And actual production is also increased up to fiscal year 2006/07 except fiscal year 2004/05. The highest increasing rates in budgeted and actual production are 26.56% and 22% in FY 2003/04. The table 8 shows the production target and production achievement at the period of FY 2002/03 to 2006/07. The table shows that the production achievement is always less than the production target but it is more than 90% achievement in last two years and more than 80% in remaining three years. In the FY 2002/03 actual production is 96.36% of budgeted production that is the best result among the five years period and in the FY 2006/07 only 79.17% of budgeted production achieved which was poorest result among the five years period.

In order to examine the nature of variability of actual production and budgeted production of different years, the arithmetic means, standard deviation, coefficient of variation, correlation coefficient, probable error, regression equation of best fit and coefficient of determination calculated in appendix two, have presented in table 9. From the result, production achievements are less fluctuated than budgeted production being the lower CV of actual

production than budgeted production. Similarly, mean production and standard deviation of actual production are less than that of budgeted production.

Table 9
Summary of Statistical Calculation of Production Data

Particulars	Budgeted Production (X)	Actual Production (Y)
Mean	$\bar{X} = 418600$	$\bar{Y} = 363708$
Standard deviation (S.D.)	$\sigma_x = 62867$	$\sigma_y = 31238$
Coefficient of variation (C.V.)	15.02%	8.59%
Correlation coefficient (r)	0.9202	
Probable error (P.E.)	0.0462	
Regression equation of best fit	$Y = 172308 + 0.4572X$	
Coefficient of determination (r^2)	0.8468	

The above data shows that there is not a systematic and realistic production plan. Budget is based on historical data only and seems that planning section of BNL ignores all other factors that affect the budget. Therefore, the planning section of BNL should search and try to consider those factors that can affect the budgetary process.

Here, value of correlation coefficient is 0.9202 which shows that there is high positive relationship between actual production and budgeted production. The value of probable error shows that the calculated value of correlation coefficient is highly significant, since correlation coefficient $0.9202 > 0.2772$ ($6 \times \text{P.E.}$).

The value of coefficient of determination is 0.8468 which shows that 84.68 % variation in Actual production is explained by the variation in Budgeted production.

The regression equation ' $Y = 172308 + 0.4572X$ ' shows the relationship between actual production (Dependent variable) and Budgeted production (Independent variable) by the use of which we can estimate the value of Actual production from the value of Budgeted production. The estimated actual production ($\hat{Y}$) calculated in appendix two is presented in table 10 below.

Table 10
Estimated Productions in RS '000'

Year	Budgeted Production (X)	Actual Production (Y)	Estimated Production $\hat{Y} = 172308 + 0.4572X$
2002/03	320000	308341	318612
2003/04	405000	376174	357474
2004/05	425000	371348	366618
2005/06	460000	380282	382620
2006/07	483000	382395	393136

4.3 Sales - Profit Relation of BNL

The basic objectives of running any business organization are to earn profit. Profit is taken to measure the competency and efficiency of the management. In other words, profit is the primary measurement of business success in any economy. Profit is a residual income left after the payment for other factors of production. The difference between the outflow of expenses and inflow of incomes is called profit. It is a reward for business activities. Profit determines the strength of financial position of the company.

The uniformity or variability of net profit of BNL is analyzed and relations between actual sales and net profit is also studied under this topic. The actual sales and net profit of the company during the five years period has presented in the table below.

Table 11
Actual Sales and Actual Profit in RS ‘000’

Year	Actual Sales (X)	Increase/ (Decrease) %	Actual Profit (Y)	Increase/ (Decrease) %	Achievement %
2002/03	535494		48610		9.08
2003/04	609654	13.85%	19372	-60.15%	3.18
2004/05	632114	3.68%	21595	11.48%	3.42
2005/06	614739	(2.75)%	34735	60.85%	5.65
2006/07	621827	1.15%	(57319)	-265.02%	-9.22

Source: Audit Reports; BNL

The above table shows that the actual sale is in increasing trend upto fiscal year 2004/05 and it is decrease in the fiscal year 2005/06. But the profit of the company is in fluctuating trend. The high increasing rate in actual sales is 13.85% in FY 2003/04. But the high increasing rate in actual profit is 60.85% in FY 2005/06.

In order to examine the nature of variability of actual sales and actual profit of different years, the arithmetic means, standard deviation, coefficient of variation, correlation coefficient, probable error, regression equation of best fit and coefficient of determination calculated in appendix three, have presented in table 12. From the result, sales achievements are less fluctuated than actual profit being the lower CV of actual sales than actual profit.

Table 12
Summary of Statistical Calculation of Sales and Profit

Particulars	Actual Sales (X)	Actual Profit (Y)
Mean	$\bar{X} = 602765.6$	$\bar{Y} = 13398.6$
Standard deviation (S.D.)	$\sigma_x = 38538.766$	$\sigma_y = 41228$
Coefficient of variation (C.V.)	6.39%	307.7%
Correlation coefficient (r)	-0.500	
Probable error (P.E.)	0.2262	
Regression equation of best fit	$Y = 335812 - 0.5349X$	
Coefficient of determination (r^2)	0.25	

Source: Audit Reports; BNL

Here, value of correlation coefficient is -0.5 which shows that there is negative relationship between actual sales and actual profit. The value of probable error shows that the calculated value of correlation coefficient is not significant, since correlation coefficient $-0.5 < 0.2262$ (P.E.). The value of coefficient of determination is 0.25 which shows that 25 % variation in actual profit is explained by the variation in actual sales, remaining 75% variation in actual profit is due to some other variables.

The regression equation ' $Y = 335812 - 0.5349X$ ' shows the relationship between actual profit (Dependent variable) and actual sales (Independent variable) by the use of which we can estimate the value of Actual profit from the value of actual sales.

Table 13
Estimated Profits in RS '000'

Year	Actual Sales (X)	Actual Profit (Y)	Estimated Actual Profit $\hat{Y} = 335812 - 0.5349X$
2002/03	535494	48610	49376
2003/04	609654	19372	9708
2004/05	632114	21595	(2306)
2005/06	614739	34735	6988
2006/07	621827	(57319)	3197

Source: Audit Reports; BNL

4.4 Raw Material Plan of BNL

Material budget deals with the requirement and procurement of direct materials. The determination of material usage budget demonstrates the build up of the quantities of each material to be used. BNL also prepares the raw material budget, requirement of raw materials for materials for company. Mainly, it imports the raw material from outside of the country. The table no14 shows the purchases and consumption of raw materials in the company over the period.

Table 14
Raw Material Plan of BNL in RS '000'

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Opening stock of raw materials	50992	85288	122780	79958	142773
Work in process	572	640	1023	1576	1379
Production of co2 gas	<u>5840</u>	<u>6166</u>	<u>6606</u>	<u>5862</u>	<u>5878</u>
<i>Total opening stock</i>	<i>57404</i>	<i>92094</i>	<i>130409</i>	<i>87396</i>	<i>150030</i>
Add, purchase of raw materials during the year	284041	350780	232947	347870	224047
Add/ (less); transfer from or (to) BNTL	<u>(323)</u>	<u>(8753)</u>	<u>13430</u>	<u>(8555)</u>	<u>(11167)</u>
<i>Total stock available</i>	<i><u>341122</u></i>	<i><u>434121</u></i>	<i><u>376786</u></i>	<i><u>426711</u></i>	<i><u>362910</u></i>
Less , closing stock of raw materials	85288	122780	79958	142773	81601
Work in progress	640	1023	1576	1379	1075
Damaged stock written off	<u>0</u>	<u>0</u>	<u>1308</u>	<u>0</u>	<u>0</u>
<i>Total closing stock</i>	<i><u>85928</u></i>	<i><u>123803</u></i>	<i><u>82842</u></i>	<i><u>144152</u></i>	<i><u>82676</u></i>
<i>Material cost of production</i>	<i><u>255194</u></i>	<i><u>310318</u></i>	<i><u>293944</u></i>	<i><u>282559</u></i>	<i><u>280234</u></i>

Source: Audit Reports; BNL

4.5 Inventory Consideration

Inventory plays an important role in profit planning for every organization. The main objective of the inventory is to meet its future requirement of production and production. Raw materials and supplies, work in progress and finished stock are the main types of inventories. A certain level of inventory is needed for smooth production activities of any organization. BNL HAVE a policy to maintain some stock for primary production. The following table 15 shows the actual inventory of raw material, work in progress and finished goods over the period.

Table 15
Stock of BNL in RS ‘000’

Year	Stock of raw materials		Stock of work in progress		Stock of finished goods	
	Opening	Closing	Opening	Closing	Opening	Closing
2002/03	50992	85288	572	640	5979	7840
2003/04	85288	122780	640	1023	7840	7751
2004/05	122780	79958	1023	1576	7751	10722
2005/06	79958	142773	1576	1379	10722	7466
2006/07	142773	81601	1379	1075	7466	7133

Source: Audit Reports; BNL

The above table shows that the inventory of finished goods in fluctuate trend. It doesn't represent the any type of inventory policy. The table shows that the closing inventory is lowest in the year 2006/07 and it is highest in the year 2004/05.

4.6 Selling and Distribution Overhead Expenses of BNL

Selling and distribution expenses are not product costs and are allocated to specific products. All those cost related to selling, distribution, delivery of products to customers is distributing expenses. Here, the detail selling and distribution overhead for the five year period is given in the table no. 16.

Table 16
Selling and Distribution Expenses in RS ‘000’

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Distribution	25015	24156	24199	19736	16955
Trade discount	18959	44572	52573	51340	56673
Advertisement	7563	7534	5360	3933	2790
Production promotion	17205	18607	13195	5955	4628
Charity and donation	33	47	94	124	139
Rejection and breakages	7897	4201	6710	6638	1902
Product transfer fees	1367	6502	5945	7774	6780
total	78039	105619	108076	95500	89867

Source: Audit Reports; BNL

The above table shows that there are particulars expenses related to selling and distribution expenses. The variation in selling and distribution expenses each year is very high. So the company has not any systematic plan related to selling and distribution expenses.

4.7 Administration Expenses of BNL

The budget includes the expenses of office administration and the overhead expenses of company. BNL doesn't prepare the overhead budget separately. Here are the office and general expenses of BNL for five years period in table 17 given below.

Table 17
Office and General Expenses in RS '000 '

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Production, wages and other employee costs	23156	26691	26560	27881	32743
Contribution to provident fund, gratuity	3814	2906	2876	976	2543
Rent	626	1007	628	402	1381
Repair and maintenance	2892	4063	4793	5001	6764
Security expenses	1570	32	12	382	
Electricity, fuel and water	172	155	103	118	156
Traveling expenses	1717	1363	1847	3240	6790
Sap related expenses					6291
Audit fees	220	220	220	220	220
Legal and professional fees and expenses	533	521	7775	648	1131
Rates and taxes	492	133	182	187	352
Bank charges	4853	153	672	307	288
General meeting expenses	25	21	35	48	52
Insurance premium	215	274	941	87	180
Communication	5075	3305	3690	6844	5493
Printing and stationary	713	680	813	715	1313
Training	11	157	717	1316	8110
Uniform	505	307	517	476	613
Obsolete stock and fixed assets written off	397	556	2655	5805	717
Management fees	1425	2817	4421	6276	6643
Miscellaneous expenses	<u>1837</u>	<u>1031</u>	<u>1238</u>	<u>768</u>	<u>971</u>
Total	50248	46392	60695	61697	82751

Source: Audit Reports; BNL

The above table shows that there is remarkable variation in expenses for different years. So we can say that the performance of administration is not good.

4.8 Cost Heads and Their Variability

Identification of the variability of cost is necessary in planning and control of the cost. Thus the knowledge of cost behavior is very important. Generally, cost behavior in two ways with relation to the volume of output. One is fixed cost that remains constant in total for a certain

level of output and the period. Second is variable cost that changes directly in total with the change of output level but remains constant in cost per unit of output.

In the case of BNL, there is not any applicable basis of cost classification into variable and fixed cost. To segregate the mixed cost into fixed and variable cost the company has provided the information about the degree of variability of the cost. All semi variable costs have segregated on the basis of the given information and details of segregation has presented in appendix four. The following table 18 shows information about the degree of variability of cost provided by the company.

Table 18
Cost Heads and Their Variability

Cost Heads	Cost Variability	Cost Heads	Cost Variability
Direct material	Variable	Rates and taxes	Fixed
Production cost	30% fixed	Bank charges	Fixed
Distribution expenses	30% fixed	General meeting expenses	Fixed
Interest expenses	Fixed	Insurance premium	Fixed
Depreciation and amortization	Fixed	Communication	90% Fixed
Accommodation expenses	Fixed	Printing and stationary	70% Fixed
Staff bonus	Fixed	Advertisement	50% Fixed
Salaries, wages and other employees cost	Fixed	Production promotion expenses	70% Fixed
Contribution to provident fund, gratuity	Fixed	Training	70% Fixed
Security expenses	Fixed	Charity and donation	Variable
Trade discount	Variable	Uniform	Fixed
Rent	fixed	Rejection and breakages	Variable
Repair and maintenance	50% fixed	Management fees	Fixed
Electricity, fuel and water	20% fixed	Obsolete stock and fixed assets written off	Fixed
Traveling expenses	Variable	Product transfer fees	Variable
Audit fees	Fixed	Miscellaneous expenses	50% fixed
Legal and professional fees and expenses	50% fixed	SAP related expenses	Variable

Source: Audit Reports; BNL

4.9 Profitability and Financial Ratios

An arithmetic relationships expressed in the form of percentage or in fraction is known as ratio. Ratio analysis is a technique of analysis and interpretation of financial statement. To evaluate the performance of an organization by creating the ratio from the figures of different accounts consisting in balance sheet and income statement is known as ratio analysis. Ratio can be classified into two broad groups. One of them, profitability ratio shows the overall efficiency of the business concerns. Another one, financial ratio shows the long term as well as short term solvency of the concern.

4.9.1 Profitability Ratio Analysis

Profitability ratios can be determined on the basis of either production or investments. Different profitability ratios calculated in appendix six, table 21 to table 25 are presented in table 19 below.

Table 19
Profitability Ratios

Ratio	2002/03	2003/04	2004/05	2005/06	2006/07
Gross profit ratio	42.76%	38.28%	43.31%	41.87%	43.54%
Operating profit ratio	19.10%	13.56%	16.62%	16.49%	15.92%
Net profit ratio	9.08%	3.18%	3.42%	5.65%	(9.22)%
Return on equity shareholders fund	6.98%	2.80%	3.03%	4.65%	(8.18)%
Return on total assets	4.69%	1.87%	2.40%	3.51%	(5.45)%

Source: Audit Reports; BNL

From the table 19, it can be sad that the rate of return either in term of production or in terms of investment is not stable or it is in fluctuating trend. Gross profit ratio is highest in the FY year 2006/07 and lowest in the FY year 2003/04. Operating profit ratio is highest in the FY year 2002/03 and lowest in the FY year 2003/04. Net profit ratio, return on equity shareholders fund and return on total assets are negative in the FY 2006/07 because of net loss. So net profit ratio, return on equity shareholders fund and return on total assets cannot be considered as satisfactory.

4.9.2 Financial Ratio Analysis

Financial ratios are calculated to see the short term as well as long term solvency of the firm. Different financial ratios calculated in appendix six tables 26 to table 30 are presented in table 20 below.

Table 20
Financial Ratios

Ratios	Ideal Ratio	2002/03	2003/04	2004/05	2005/06	2006/07
Current ratio	2:1	1.49	1.60	2.57	2	1.58
Quick ratio	1:1	0.43	0.28	0.79	0.13	0.36
Fixed assets to capital employed ratio	<1	0.76	0.71	0.62	0.70	0.79
Current assets to fixed assets ratio		0.96	1.09	1.02	1.04	0.88
Proprietary ratio	0.3	0.67	0.66	0.79	0.75	0.67

Source: Audit Reports; BNL

In the table 20, the current ratio is in fluctuating trend and in the FY 2005/06 current ratio is 2 which maintains the ideal ratio. And it is higher than ideal ratio in FY 2004/05 but it is lower than the ideal ratio in other years. Quick ratio is always lower than the ideal ratio but in the

FY 2004/05 it is considerable. And in the FY 2006/07 it is improved than 2005/06 therefore, it can be said that the solvency of the company is being improved. Fixed assets to capital employed ratio are considerable in each year. Current assets to fixed assets ratio is in fluctuating trend. Current assets to fixed assets ratio is the lowest in the FY 2006/07. proprietary ratio is much higher than the ideal ratio because there is no any long term debt of the company shown in the balance sheet expect FY 2006/07. The financial condition and solvency of the company is satisfactory.

4.10 Cost Volume Profit Analysis of BNL

The relationship among cost, revenue and profit is known as cost volume profit analysis. CVP analysis is a powerful instrument in management decision making especially in cost control and profit planning. It helps to determine the minimum production volume to avoid losses and the production volume at which the targeted profit amount of the company will be achieved.

Profit planning can be done only when the management has information about the cost of products, both fixed and variable costs and the selling price of the product. CVP analysis is especially applied for profit planning and control. The cost volume profit relationship will be established by break even analysis.

4.10.1 Break Even Analysis of BNL

Table 21
Income Statement for the year 2002/03 to 2006/07 in RS ‘000’

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Production revenue	535494	609654	632114	614739	621827
Less; variable cost	352344	442872	439687	423915	430753
Contribution margin	183150	166782	192427	190824	191074
Less; fixed cost	145594	149166	160827	150345	163497
Earning before tax	37556	17616	31600	40479	27577
Profit volume ratio	0.34	0.27	0.30	0.31	0.31
Break even production	428218	552467	518797	484984	527410
Percent of break even production	80	91	82	79	85
Margin of safety	107276	57187	113317	129785	94417
Margin of safety ratio	20	10	18	21	15

Source: Audit Reports; BNL

- **Contribution Margin**

The difference between production amount and variable cost is known as the contribution margin. In other words, fixed cost plus the amount of profit is equivalent to contribution margin. Contribution margin can be expressed by

$$\text{Contribution margin} = \text{Production Volume} - \text{Variable Cost}$$

The above table 21 shows the calculation of contribution margin of BNL for the five year period. Contribution margin for the period is in fluctuated trend.

- **Profit Volume Ratio**

It establishes a relationship between the contribution and production volume. The factors profit and volume are interconnected and dependent with each other. Profit depends upon production. It can be expressed by:

$$\text{Profit volume ratio} = \frac{\text{Contribution Margin}}{\text{Production}}$$

The above table 21 shows the calculation of profit volume ratio of BNL for the five year period. An increase in contribution margin would mean increase in profit only because fixed costs are assumed to be constant at all levels of production. This ratio would remain constant at different levels of production since variable costs as a proportion to production remain constant at various levels. Management should try to increase the value of the ratio by reducing the variable costs or by increasing the selling price.

- **Break Even Point**

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

$$\text{Break even point in RS} = \frac{F \text{ Costs}}{P/V \text{ Ratio}}$$

Break even sales of BNL are given in the above table 21 for the five year period. Break even sales is highest in the FY 2003/04 and lowest in the FY 2002/03. It is more in the FY 2006/07 than FY 2005/06.

- **Margin of Safety**

It is the difference between the actual sales revenue and the break even sales revenue. It can be expressed by:

$$\text{Margin of safety} = \text{Actual production} - \text{Break even production}$$

The table 21 shows the margin of safety is in fluctuated trend. The higher margin of safety indicates the better profitability of the company. It is highest in the FY 2005/06 and it is lowest in the FY 2003/04.

4.10.2 Cash Break Even Point

The CVP relationship can also be used to show the liquidity position of the firm. This is done through the computation of cash break even point or cash break even sales revenue (CBEP in amount). It can be expressed by:

$$\text{CBEP} = \frac{\text{Cash Fixed Costs}}{P/V \text{ Ratio}}$$

Table 22
Calculation of Cash Break Even Point for the year 2002/03 to 2006/07 in RS ‘000’

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Production revenue	535494	609654	632114	614739	621827
Contribution margin	183150	166782	192427	190824	191074
Cash fixed cost	93631	89742	94800	88763	98112
Profit volume ratio	0.34	0.27	0.30	0.31	0.31
Cash break even point	275385	332378	316000	286332	316490
Percent of break even production	52	55	50	47	51
Margin of safety	260109	277276	316114	328407	305337
Margin of safety ratio	49	45	50	53	49

Source: Audit Reports; BNL

- **Break Even Point**

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

$$\text{Cash break even point in amount} = \frac{\text{Cash fixed costs}}{\text{P/V Ratio}}$$

Cash break even sales of BNL is given in above table no 22. Cash break even point of BNL is in fluctuated trend over the five year period.

- **Margin of Safety**

It is the difference between the actual production revenue and the break even production revenue. It can be expressed by:

$$\text{Margin of safety} = \text{Actual production} - \text{Break even production}$$

The above table 22 shows the margin of safety of BNL over the five year period. Margin of safety of BNL is in increasing trend up to FY 2005/06 but it is decrease in the FY 2006/07. The higher margin of safety indicates the better profitability of the company. It is highest in the FY 2005/06 and it is the lowest in the FY 2002/03.

4.11 Change Effect and Relationship of CVP Analysis Factors

Profit is the function of variety of factors. It is affected by changes in volume, cost and prices. Profit may be affected by the changes in price, volume, variable cost, fixed cost and combination of factors, which shows proportionate relationship, positive relationship, inverse relationship and no relationship. Lower BEP is better than the higher BEP for the comparison of results.

4.11.1 Change Effect of Sales Value

An increase in the production value will increase profit volume ratio and as a result, will lower the break even point. On the opposite, a decrease in production value will reduce the profit volume ratio and therefore, results in a higher break even point, if increase and decrease of production value by 10% with other factors assumed to remain the same, it gets following result;

Table 23
Income Statement with Change in Sales Value for the year 2002/03 to 2006/07 in RS ‘000’

Year	Particulars	Sales	VC	CM	FC	Profit	p/v ratio	BEP	% change in BEP
2002/03	Original	535494	352344	183150	145594	37556	34	428218	
	10% increase	589043	352344	236699	145594	91105	40	363985	(15)
	10% decrease	481945	352344	129601	145594	(15993)	27	533237	25
2003/04	Original	609654	442872	166782	149166	17616	27	552467	
	10% increase	670619	442872	227747	149166	78581	34	438724	(21)
	10% decrease	548689	442872	105817	149166	(43349)	19	785084	42
2004/05	Original	632114	439687	192427	160827	31600	30	536090	
	10% increase	695325	439687	255638	160827	94811	37	434668	(19)
	10% decrease	568903	439687	129216	160827	(31611)	23	699248	31
2005/06	Original	614739	423915	190824	150345	40479	31	484984	
	10% increase	676213	423915	252298	150345	101953	37	406338	(16)
	10% decrease	553265	423915	129350	150345	(20995)	23	653674	35
2006/07	Original	621827	430753	191074	163497	27577	31	527410	
	10% increase	684010	430753	253257	163497	89760	37	441884	(16)
	10% decrease	559644	430753	128891	163497	(34606)	23	710857	35

Source: Audit Reports; BNL

The above table 23 shows the break even amount has decreased with the increase in production value by 10%, that indicates the price or value of production and break even point has inverse relation. Similarly, the decreased production value by 10% increased the break even production. There is the increment of BEP by 25% 42% 31% 35% and 35% with the 10% decrease in production volume in the year 2002/03, 2003/04, 2004/05, 2005/06, and 2006/07 respectively. Similarly, there is the reduction of BEP by 15%, 21%, 19%, 16%, and 16% with 10% increase in production volume in the year 2002/03, 2003/04, 2004/05, 2005/06, and 2006/07 respectively.

From the observation the rate of increment is higher than the rate of reduction in BEP with the constant change of production volume in the respective years. Therefore, it can be said that the decrease in production affects the company more than the increase in production by same percent. However, the production trend is in increase and decrease order the company should careful in the fluctuation production, especially in those controllable that may reduce the production volume.

4.11.2 Change Effects of Variables Costs

The impact of changes 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 decrease profit volume

ratio and as a result, will higher the break even point. On the opposite, a decrease in variable cost will increase the profit volume ratio and as a result, will lower the break even point. If increase and decrease of variable cost by 10% with other factors assumed to remain the same, it gets following result;

Table 24
Income Statement with Change in Variable cost for the year 2002/03 to 2006/07 in RS ‘000’

Year	Particulars	Sales	VC	CM	FC	Profit	p/v ratio	BEP	% change in BEP
2002/03	Original	535494	352344	183150	145594	37556	34	428218	
	10% increase	535494	387578	147916	145594	2322	28	519379	21
	10% decrease	535494	317110	218384	145594	72790	41	355107	(17)
2003/04	Original	609654	442872	166782	149166	17616	27	552467	
	10% increase	609654	487159	122495	149166	(26671)	20	745830	35
	10% decrease	609654	398585	211069	149166	61903	35	426189	(23)
2004/05	Original	632114	439687	192427	160827	31600	30	536090	
	10% increase	632114	483656	148458	160827	(12369)	23	699248	30
	10% decrease	632114	395718	236396	160827	75569	37	434668	(19)
2005/06	Original	614739	423915	190824	150345	40479	31	484984	
	10% increase	614739	466307	148432	150345	(1913)	24	626438	29
	10% decrease	614739	381524	233215	150345	82870	38	395645	(18)
2006/07	Original	621827	430753	191074	163497	27577	31	527410	
	10% increase	621827	473828	147999	163497	(15498)	24	681238	29
	10% decrease	621827	387678	234149	163497	70652	38	430255	(18)

Source: Audit Reports; BNL

The table 24 shows that 10% increase in variable costs increases the break even point and 10% decrease in variable costs decreases the break even point which indicates that variable costs and break even point have positive relationship. There is the increment of BEP by 21%, 35%, 30%, 29% and 29% with the 10% increase in variable cost in the year 2002/03, 2003/04, 2004/05, 2005/06, and 2006/07 respectively. Similarly, there is the reduction of BEP by 17%, 23%, 19%, 18%, and 18% with the 10% decrease variable cost in the year 2002/03, 2003/04, 2004/05, 2005/06, and 2006/07 respectively.

From the observation the rate of increment is higher than 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 than the decrease in variable cost by same percent. Therefore, company should careful in the fluctuation of variable cost especially in those controllable factors that may increase the variable cost and should try to control the cost to get stability in variable cost.

4.11.3 Change Effect of Fixed Costs

A change in fixed costs does not influence the p/v ratio. Other factors remaining the same, a fall in the fixed costs will lower the BEP and raise the profit. An increase in fixed costs causes an increment in BEP and decrease the profit. The changes of fixed costs with other factors remaining the same, it will get the following results:

Table 25
Income Statement with Change in Fixed Cost for the year 2002/03 to 2006/07 in RS '000'

Year	Particulars	Sales	VC	CM	FC	Profit	p/v ratio	BEP	% change in BEP
2002/03	Original	535494	352344	183150	145594	37556	34	428218	
	10% increase	535494	352344	183150	160153	22997	34	471038	10
	10% decrease	535494	352344	183150	131035	52115	34	385397	(10)
2003/04	Original	609654	442872	166782	149166	17616	27	552467	
	10% increase	609654	442872	166782	164083	2699	27	607715	10
	10% decrease	609654	442872	166782	134249	32533	27	497219	(10)
2004/05	Original	632114	439687	192427	160827	31600	30	536090	
	10% increase	632114	439687	192427	176910	15517	30	589700	10
	10% decrease	632114	439687	192427	144744	47683	30	482480	(10)
2005/06	Original	614739	423915	190824	150345	40479	31	484984	
	10% increase	614739	423915	190824	165380	25444	31	533484	10
	10% decrease	614739	423915	190824	135311	55513	31	436487	(10)
2006/07	Original	621827	430753	191074	163497	27577	31	527490	
	10% increase	621827	430753	191074	179847	11227	31	580156	10
	10% decrease	621827	430753	191074	147147	43927	31	474668	(10)

Source: Audit Reports; BNL

The table 25 shows that the 10% increase in fixed costs increases the BEP with same percentage and the 10% decrease in fixed costs decreases the BEP with same percentage. Therefore, it can be concluded that break even point and fixed costs have proportionate relationship. From the observation, the change in fixed cost affects the BEP in same rate and the fixed cost of the company is in increasing trend. Therefore, 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 segregation is not scientific and practical.

4.12 Major Finding

The major finding of this study based on the analysis of available secondary data is pointed out as follows:

- The company has not maintained the broad and long range objectives and periodic report and objectives are limited to the high ranking official only.

- Relevant internal and external market variables are not fully explored.
- Sales and production targets are not achieving because there is not an effective forecasting system.
- Enterprises have no financial plan; they have only sales and production plan in term of required target.
- The company's production trend is in an increasing trend.
- There is no any effective plan for cost reduction and control
- There is lack of effective cost control programmed or techniques.
- The profit trend of the company is not satisfactory as compared to profit proportion is very low with fluctuated trend.
- The company has no detailed and systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for profit planning and control.
- In the company there is no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient and effective.
- BNL has not proper practice of segregating the costs into fixed and variable or controllable and non controllable.
- Management information system is not performance based.
- There are no any proper criteria for performance evaluation for financial tools.

CHAPTER-V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Profit planning of the companies and firms has become very important and necessary tools for both deficit and surplus units of the growing financial markets of our country Nepal. So, profit plan is the lifeblood of every organization, which not only keeps it alive but also assures the future and creates the soundness on it. PPC means the development of objectives, which motivates the organization to achieve the objectives effectively and efficiently. It is one of the most important mechanisms for planning and controlling business operations. The effective operation of a business concern resulting into the excess of income over the expenditure fully depends upon as to what extent the management follows proper planning, effective coordination and dynamic control.

Management can effectively achieve organizational objectives through the efficient use of scarce available resources in a changing environment of business. Future is uncertain which creates risk and only the good management can reduce it. CVP analysis is an analytical technique for studying the relationship between volume, costs and profit which helps manage future costs and profit. Profit planning is management technique and it is a written plan in all aspect of business operation for definite future period. CVP analysis is a technique used to determine the usefulness and effectiveness of profit planning process of the organization. In fact, the entire field of profit of profit planning has become associated with the CVP inter relationship. The main objective of the present research was to examine the use of cost-volume-profit analysis to plan the profit. So, this study was undertaken to evaluate CVP analysis of the company. It has observed that BNL has succeeded in living up to the expectation of general position and main producer company of soft drinks and beverages for all over the country. As per the nature of the study, the secondary data have been used and related other information has collected by informal interviews for production analysis, costs analysis, inventory analysis, contribution margin analysis, p/v ratio analysis, BEP analysis.

From the analysis, the cost-volume-profit analysis shows that the company has low contribution margin, low p/v ratio, high BEP and low margin of safety. The sensitivity test of cost- volume-profit analysis shows that the increase in costs (i.e. variable and fixed), increase the BEP and the decrease in costs, decreases the BEP. But increase of selling price decreases the BEP. It indicates the relationship between selling price and BEP is negative correlate. To fulfill the company's objectives, it takes burden of all types of fixed costs but not control effectively. Company's profit condition isn't satisfactory. Lack of details information and extra cost burdens are main reasons behind not practicing profit planning and control tools like a CVP analysis.

5.2 Conclusion

Different types of theoretical tools and techniques of profit planning have not been applied by BNL. It shows gap between the theory and practice. BNL has not applied cost-

volume-profit analysis and segregation of costs into fixed and variable. Increasing operating and maintenance cost in each year is another remarkable problem for BNL. They have not adopted the cost control programmed. Company had no clear cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. Therefore, BNL has not been able to CVP analysis and make the realistic budget. After analyzing in detail the present practice on the field of profit planning in BNL, the following matters can be concluded.

- **Lack of Clear Cut Objective**

The objectives of the company are not clearly defined. There is not a long term strategic plan to achieve the unclear defined objectives. There is not complete and comprehensive budgeting system. BNL has not prepared long term strategic profit plan but has prepared only short term profit plan in terms of budget for each year.

- **Lack of Skilled Planner and Budgeting Experts**

There is not a scientific budgeting system. Budgets are prepared on traditional basis. There is no planning of materials and production of goods. All overhead expenses are shown in general expenditure budget.

- **Lack of Participatory Management**

The plans are prepared from top level and later it is communicated to the lower level in terms of required target but not in the term of the action plan. There is lack of authorities to formulate various plans in lower level management.

- **Lack of Analyzing System of SWOT**

Company has not analyzed its strength and weakness. Quality products, local manpower, latest production technology etc are the strength whereas high production costs, market competition, difficulties to import raw materials; high fixed costs etc are the weakness of the company.

- **Ineffective Budgetary Control System**

Fixed cost and non manufacturing cost are growing high. Past year actual cost is taken as a budget for the current year and there is not any programmed to study about variation between budget and actual expenditures.

- **Not Optimum Utilization of Fixed Cost**

There is not the optimum utilization of fixed cost because the fixed cost are growing higher with out any reason and from this situation the relation between actual sales and actual profit has become and unpredictable relation.

- **Lack of Systematic Accounting and Classification of Cost**

There is no systematic classification of cost as fixed and variable components. There is not the system of analysis of cost and clear cut policy to separate semi variable cost into fixed and variable. The costs are roughly classified and such classification is not scientific and appropriate.

- **Lack of Suitable Inventory Policy**

BNL has to inventory policy. The finished goods inventory levels have been fluctuating each year.

- **Lack of Systematic and Complete Profit Planning Programmed**

Total sale achievement and production of BNL are fluctuating year after year. Similarly gross profit margin and net profit margin are in fluctuating trend. So, the rate of trend and growth is not stable. The company has not developed the alternative plan to earn profit.

There is significant correlation between sales target and sales achievement similarly productions target and production achievement. It indicates that increased in targeted sales will also increase achievement sales similarly also affected in production plan. The regression line about sales of BNL indicates a positive trend. Coefficient of determination of sales and production shows that there are some other factors are affecting the forecasting of sales and production. But BNL has not searched those factors to make its profit plan complete and systematic.

5.3 Recommendations

On the basis of the study of use of CVP analysis to plan the profit of BNL, it seems necessary to develop, implement and improve the process of CVP analysis form beginning to end with PPC. Nepal is proceeding towards globalization with membership of WTO. Nepalese companies should fit with the global environment with best fitted managerial strategies. For better utilization of the limited resources and achieve goal through strong competition, application of advance profit planning and control tools can be of great help. Thus the recommendations based on the findings of the research study are as follows;

- **To Formulate The Clear Objectives**

The objective are the basic guidelines of the company therefore BNL should clearly define its broad objectives, similarly duties and responsibilities of employees should be clearly defined.

- **To Make SWOT Analysis**

For long life of the company it should analyze its strengths and weaknesses in internal environment of company and its opportunities and threats in external environment of the company.

- **To Apply Participatory Management System**

The participative management can play the important role in implementation of decisions. Therefore the company should try to involvement of more personnel in decision making process as far as possible. The CVP and PPC manuals should be communicated from top to lower levels of the company.

- **To Apply Budgetary Control System**

To strengthen the competitiveness of BNL and to carry out PPC activities, the company should use the profit planning and controlling tools. For budgeting activities tools like CVP analysis should consider for planning.

- **To Proper Account and Analysis of Cost**

Cost control department should establish separately which will identify and analyze the variability and controllability of cost correctly that may give the right ideas to control the cost. From this uneconomical and idle costs will decrease automatically.

- **To Classify the Variability of Cost**

Classification of expenses and cost from their nature of variability is very essential. From this application of CVP analysis and preparation of flexible budgets becomes exact and easier.

- **To Optimum Utility of Fixed Cost**

BNL has invested huge amount of capital in fixed cost. Therefore the company should try to maximum and effective utilization of fixed cost to generate profit.

- **To Use Effective Inventory Policy**

The ending inventory of the company does not show the any inventory policy. Therefore the company should apply the effective inventory management policy, raw material handling and controlling system for continuous production and selling of the product.

- **To Use Systematic and Complete Profit Planning Programmed**

A systematic and complete profit planning programmed should be followed to generate more profit. From this the efficiency and profitability of the company may be improved.

- **To Use Performance Report**

Finally, a system of periodical performance reports should be strictly followed to be conscious about poor performance and take corrective actions immediately.

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C. INTERNET

Website: cvp.com
www.bnl.com.np

Appendix I

Table 1
Calculation of Statistical Measurements of Actual Sales and Budgeted Sales (in RS '000')

Year	Budgeted Sales (X)	Actual Sales(Y)	(X- $\bar{X}$)	(Y - $\bar{Y}$)	(X- $\bar{X}$) x (Y - $\bar{Y}$)	(X- $\bar{X}$) ²	(Y - $\bar{Y}$) ²
2002/03	567000	535494	-132400	-67271.6	8906759840	17529760000	4525468167
2003/04	670000	609654	-29400	6888.4	-202518960	864360000	47450054.56
2004/05	740000	632114	40600	29348.4	1191545040	1648360000	861328582.6
2005/06	745000	614739	45600	11973.4	545987040	2079360000	143362307.6
2006/07	775000	621827	75600	19061.4	1441041840	5715360000	363336970
Total	3497000	3013828	0	0	11882814800	27837200000	5940946082

Source: Audit Report; BNL

$$\text{Mean Budgeted Sales } (\bar{X}) = \frac{\sum X}{N} = \frac{3497000}{5} = 699400 \approx \text{RS } 699400000$$

$$\text{Mean Actual Sales } (\bar{Y}) = \frac{\sum Y}{N} = \frac{3013828}{5} = 602765.6 \approx \text{RS } 602765600$$

$$\text{Standard Deviation of Budgeted Sales } (\sigma_x) = \sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}} = \sqrt{\frac{27837200000}{5 - 1}} = 83422.419 \approx \text{RS } 83422419$$

$$\text{Standard Deviation of Actual Sales } (\sigma_y) = \sqrt{\frac{\sum (Y - \bar{Y})^2}{N - 1}} = \sqrt{\frac{5940946082}{5 - 1}} = 38538.766 \approx 38538766$$

$$\text{Coefficient of Variation of Budgeted Sales (C.V.}_x) = \frac{\sigma_x}{\bar{X}} \times 100\% = \frac{83422.419}{699400} \times 100\% = 11.92\%$$

$$\text{Coefficient of Variation of Actual Sales (C.V.}_y) = \frac{\sigma_y}{\bar{Y}} \times 100\% = \frac{38538.766}{602765.6} \times 100\% = 6.39\%$$

$$\text{Correlation Coefficient } (r_{xy}) = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} = \frac{11882814800}{\sqrt{27837200000 \times 5940946082}} = 0.9240$$

$$\text{Probable Error (P.E.)} = 0.6745 \times \frac{1 - r_{xy}^2}{\sqrt{N}} = 0.6745 \times \frac{1 - (0.9240)^2}{\sqrt{5}} = 0.0441$$

$$\text{Coefficient of Determination } (r^2) = (0.9240)^2 = 0.8538$$

Regression Equation of Actual Sales (Y) on Budgeted Sales (X) is given by:

$$Y - \bar{Y} = r_{xy} \frac{\sigma_y}{\sigma_x} (X - \bar{X})$$

$$Y - 602765.6 = 0.9240 \times \frac{38538.766}{83422.419} (X - 699400)$$

$$Y = 304219 + 0.426$$

Calculation of Estimated Sales:

2002/03	$\hat{Y} = 304219 + 0.4269X$	$\hat{Y} = 304219 + 0.4269 \times 567000 = 546271$
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2003/04	$\hat{Y} = 304219 + 0.4269X$	$\hat{Y} = 304219 + 0.4269 \times 670000 = 590242$
---------	------------------------------	--

2004/05	$\hat{Y} = 304219 + 0.4269X$	$\hat{Y} = 304219 + 0.4269 \times 740000 = 620125$
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2005/06	$\hat{Y} = 304219 + 0.4269X$	$\hat{Y} = 304219 + 0.4269 \times 745000 = 622260$
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2006/07	$\hat{Y} = 304219 + 0.4269X$	$\hat{Y} = 304219 + 0.4269 \times 775000 = 635067$
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Appendix II

Table 2
Calculation of Statistical Measurements of Actual Production and Budgeted Production (in RS '000')

Year	Budgeted Production(X)	Actual Production(Y)	(X- $\bar{X}$)	(Y - $\bar{Y}$)	(X- $\bar{X}$) x (Y - $\bar{Y}$)	(X- $\bar{X}$) ²	(Y - $\bar{Y}$) ²
2002/03	320000	308341	-98600	-55367	5459186200	9721960000	3065504689
2003/04	405000	376174	-13600	12466	-169537600	184960000	155401156
2004/05	425000	371348	6400	7640	48896000	40960000	58369600
2005/06	460000	380282	41400	16574	686163600	1713960000	274697476
2006/07	483000	382395	64400	18687	1203442800	4147360000	349203969
Total	2093000	1818540	0	0	7228151000	15809200000	3903176890

Source: Audit Report; BNL

$$\text{Mean Budgeted Production (} \bar{X} \text{)} = \frac{\sum X}{N} = \frac{2093000}{5} = 418600 \approx \text{RS } 418600000$$

$$\text{Mean Actual Production (} \bar{Y} \text{)} = \frac{\sum Y}{N} = \frac{1818540}{5} = 363708 \approx \text{RS } 363708000$$

$$\text{Standard Deviation of Budgeted Production (} \sigma_x \text{)} = \sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}} = \sqrt{\frac{15809200000}{5 - 1}} = 62867 \approx \text{RS } 62867000$$

$$\text{Standard Deviation of Actual Production (} \sigma_y \text{)} = \sqrt{\frac{\sum (Y - \bar{Y})^2}{N - 1}} = \sqrt{\frac{3903176890}{5 - 1}} = 31238 \approx 31238000$$

$$\text{Coefficient of Variation of Budgeted Production (C.V.x)} = \frac{\sigma_x}{\bar{X}} \times 100\% = \frac{62867}{418600} \times 100\% = 15.02\%$$

$$\text{Coefficient of Variation of Actual Production (C.V. y)} = \frac{\sigma_y}{\bar{Y}} \times 100\% = \frac{31238}{363708} \times 100\% = 8.59\%$$

$$\text{Correlation Coefficient (} r_{xy} \text{)} = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} = \frac{7228151000}{\sqrt{15809200000 \times 3903176890}} = 0.9202$$

$$\text{Probable Error (P.E.)} = 0.6745 \times \frac{1 - r_{xy}^2}{\sqrt{N}} = 0.6745 \times \frac{1 - (0.9202)^2}{\sqrt{5}} = 0.0462$$

$$\text{Coefficient of Determination (} r^2 \text{)} = (0.9202)^2 = 0.8468$$

Regression Equation of Actual Production (Y) on Budgeted Production (X) is Given by:

$$Y - \bar{Y} = r_{xy} \frac{\sigma_y}{\sigma_x} (X - \bar{X})$$

$$Y - 363708 = 0.9202 \times \frac{31238}{62867} (X - 418600)$$

$$Y = 172308 + 0.4572X$$

Calculation of Estimated Production:

2002/03	$\hat{Y} = 172308 + 0.4572X$	$\hat{Y} = 172308 + 0.4572 \times 320000 = 318612$
2003/04	$\hat{Y} = 172308 + 0.4572X$	$\hat{Y} = 172308 + 0.4572 \times 405000 = 357474$
2004/05	$\hat{Y} = 172308 + 0.4572X$	$\hat{Y} = 172308 + 0.4572 \times 425000 = 366618$
2005/06	$\hat{Y} = 172308 + 0.4572X$	$\hat{Y} = 172308 + 0.4572 \times 460000 = 382620$
2006/07	$\hat{Y} = 172308 + 0.4572X$	$\hat{Y} = 172308 + 0.4572 \times 483000 = 393136$

Appendix III

Table 3
Calculation of Statistical Measurements of Actual Sales and Actual Profit (in RS '000')

Year	Actual sales (X)	Actual profit (Y)	(X- $\bar{X}$)	(Y- $\bar{Y}$)	(X- $\bar{X}$)x(Y- $\bar{Y}$)	(X- $\bar{X}$) ²	(Y- $\bar{Y}$) ²
2002/03	535494	48610	-67271.6	35211.4	-2368727216	4525468167	1239842690
2003/04	609654	19372	6888.4	5973.4	41147168.56	47450054.56	35681507.56
2004/05	632114	21595	29348.4	8196.4	240551225.8	861328582.6	67180972.96
2005/06	614739	34735	11973.4	21336.4	254701141.4	143362307.6	455241965
2006/07	621827	-57319	19061.4	-70717.6	-1347976461	363336970	5000978950
Total	3013828	66993	0	0	-3180304141	5940946082	6798926085

Source: Audit Report; BNL

$$\text{Mean Actual Sales } (\bar{X}) = \frac{\sum X}{N} = \frac{3013828}{5} = 602765.6 \approx \text{RS } 602765600$$

$$\text{Mean Actual Profit } (\bar{Y}) = \frac{\sum Y}{N} = \frac{66993}{5} = 13398.6 \approx \text{RS } 13398600$$

$$\text{Standard Deviation of Actual Sales } (\sigma_x) = \sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}} = \sqrt{\frac{5940946082}{5 - 1}} = 38538.766 \approx 38538766$$

$$\text{Standard Deviation of Actual Profit } (\sigma_y) = \sqrt{\frac{\sum (Y - \bar{Y})^2}{N - 1}} = \sqrt{\frac{6798926085}{5 - 1}} = 41228 \approx 41228000$$

$$\text{Coefficient of Variation of Actual Sales (C.V.x)} = \frac{\sigma_x}{\bar{X}} \times 100\% = \frac{38538.766}{602765.6} \times 100\% = 6.39\%$$

$$\text{Coefficient of Variation of Actual Profit (C.V. y)} = \frac{\sigma_y}{\bar{Y}} \times 100\% =$$

$$\frac{41228}{13398.6} \times 100\% = 307.7\%$$

$$\text{Correlation Coefficient (r}_{xy}) = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} = \frac{-3180304141}{\sqrt{5940946082 \times 6798926085}} = -$$

0.500

$$\text{Probable Error (P.E.)} = 0.6745 \times \frac{1 - r_{xy}^2}{\sqrt{N}} = 0.6745 \times \frac{1 - (-0.500)^2}{\sqrt{5}} = 0.2262$$

$$\text{Coefficient of Determination } (r^2) = (-0.500)^2 = 0.25$$

Regression Equation of Actual Profit (Y) on Actual Sales (X) is given by:

$$Y - \bar{Y} = r_{xy} \frac{\sigma_y}{\sigma_x} (X - \bar{X})$$

$$Y - 13398.6 = -0.500 \times \frac{41228}{38538.766} (X - 602765.6)$$

$$Y = 335812 - 0.5349X$$

Calculation of Estimated Profit:

2002/03	$\hat{Y} = 335812 - 0.5349X$	$\hat{Y} = 335812 - 0.5349 \times 535494 = 49376$
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2003/04	$\hat{Y} = 335812 - 0.5349X$	$\hat{Y} = 335812 - 0.5349 \times 609654 = 9708$
---------	------------------------------	--

2004/05	$\hat{Y} = 335812 - 0.5349X$	$\hat{Y} = 335812 - 0.5349 \times 632114 = (2306)$
---------	------------------------------	--

2005/06	$\hat{Y} = 335812 - 0.5349X$	$\hat{Y} = 335812 - 0.5349 \times 614739 = 6988$
---------	------------------------------	--

2006/07	$\hat{Y} = 335812 - 0.5349X$	$\hat{Y} = 335812 - 0.5349 \times 621827 = 3197$
---------	------------------------------	--

Appendix IV

Table 4
Income Statement (in RS '000')

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Sales	535494	609654	632114	614739	621827
Less; cost of production	<u>306480</u>	<u>376263</u>	<u>358377</u>	<u>357350</u>	<u>351080</u>
Gross profit	229014	233391	273737	257389	270747
Other income	1611	1263	90	1161	859
Business expenses :					
Distribution expenses	25051	24156	24199	19736	16955
Administration expenses	<u>103272</u>	<u>127854</u>	<u>144572</u>	<u>137461</u>	<u>155663</u>
Profit from operation	<u>102302</u>	<u>82644</u>	<u>105056</u>	<u>101353</u>	<u>98988</u>
Interest	663	284	4	265	1329
Depreciation and amortization	51566	58868	63372	55777	64668
Dividend received from subsidiary company	(16447)	(10985)	(10985)	(5492)	
(profit)/ loss on sale of fixed assets	-	1	638	-	(2861)
Provision for staff quarter	3328	1724	2574	2540	1793
Provision for bonus	<u>5717</u>	<u>2977</u>	<u>4445</u>	<u>4387</u>	<u>3096</u>
Total expenditure	<u>44827</u>	<u>52869</u>	<u>60048</u>	<u>57477</u>	<u>68025</u>
Profit before tax	57475	29775	45008	43876	30963
Provision for tax	8865	4103	7208	8503	5539
Provision for special fees	=	=	=	<u>638</u>	<u>462</u>
Net profit after tax	48610	25672	37800	34735	24962
Balance brought forward	304834	333955	343583	365178	399913
Provision for tax in respect to earlier year	-	6300	16205	-	24332
Depreciation expenses for earlier year	-	-	-	-	<u>57949</u>
Profit for distribution	353444	353327	365178	399913	342594
Proposed dividend	<u>19489</u>	<u>9744</u>	-	-	-
Balance of profit transferred to balance sheet	333955	343583	365178	399913	342594

Source: Audit Report; BNL

Table 5
Budgeted Sales and Actual Sales (in RS '000')

Year	Budgeted sales	Actual sales
2002/03	567000	535494
2003/04	670000	609654
2004/05	740000	632114
2005/06	745000	614739
2006/07	775000	621827

Source: Audit Report; BNL

Table 6
Budgeted Production and Actual Production at Cost (in RS ‘000’)

Year	Budgeted Production	Actual Production
2002/03	320000	308341
2003/04	405000	376174
2004/05	425000	371348
2005/06	460000	380282
2006/07	483000	382395

Source: Audit Report; BNL

Table 7
Other Incomes (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
sales of post mix cup	35	6			
Recovery of insurance claims	169			366	
Interest income	149	94	6	33	143
Exchange gain/(loss)	191	(102)	(1068)	(807)	74
Sale of scrap and other incomes	<u>1067</u>	<u>1265</u>	<u>1152</u>	<u>1569</u>	<u>642</u>
Total	1611	1263	90	1161	859

Source: Audit Report; BNL

Table 8
Revised Statement of Other Incomes (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Sales of post mix cup	35	6			
Recovery of insurance claims	169			366	
Interest income	149	94	6	33	143
Exchange gain/(loss)	191	(102)	(1068)	(807)	74
Sale of scrap and other incomes	1067	1265	1152	1569	642
Dividend received from subsidiary company	16447	10985	10985	5492	
Profit/(loss) on sale of fixed assets		(1)	(638)		<u>2861</u>
Total	18058	12247	10437	6653	3720

Source: Audit Report; BNL

Table 9
Detailed Administrative and General Expenses (in RS ‘000’)

Particulars	2003/04	2004/05	2005/06	2006/07	2006/07
Salaries, wages and other employees cost	23156	26691	26560	27881	32743
Contribution to provident fund, gratuity	3814	2906	2876	976	2543
Rent	626	1007	628	402	1381
Repair and maintenance	2892	4063	4793	5001	6764
Security expenses	1570	32	12	382	
Electricity, fuel and water	172	155	103	118	156
Traveling expenses	1717	1363	1847	3240	6790
SAP related expenses					6291
Audit fees	220	220	220	220	220
Legal and professional fees and expenses	533	521	7775	648	1131
Rates and taxes	492	133	182	187	352
Bank charges	4853	153	672	307	288
Trade discount	18959	44572	52573	51340	56673
General meeting expenses	25	21	35	48	52
Insurance premium	215	274	941	87	180
Communication	5075	3305	3690	6844	5493
Printing and stationary	713	680	813	715	1313
Advertisement	7563	7534	5360	3933	2790
Sales promotion expenses	17205	18607	13195	5955	4628
Training	11	157	717	1316	8110
Charity and donation	33	4 7	94	124	139
Uniform	505	307	517	476	613
Rejection and breakages	7897	4201	6710	6638	1902
Obsolete stock and fixed assets written off	397	556	2655	5805	717
Product transfer fees	1367	6502	5945	7774	6780
Management fees	1425	2817	4421	6276	6643
Miscellaneous expenses	<u>1837</u>	<u>1031</u>	<u>1238</u>	<u>768</u>	<u>971</u>
Total	103272	127855	144572	137461	155663

Source: Audit Report; BNL

Table 10
Cost of Goods Sold (in RS '000')

Particulars	2002/03		2003/04		2004/05		2005/06		2006/07	
	Rs	Total Rs	Rs	Total Rs	Rs	Total Rs	Rs	Total Rs	Rs	Total Rs
Opening stock ; Raw material	50992		85288		122780		79958		142773	
Work in progress			640		1023		1576		1379	
Finished goods	5979		7840		7751		10722		7466	
Production of co2 gas	<u>5840</u>	63383	<u>6166</u>	99934	<u>6606</u>	138160	<u>5862</u>	98118	<u>5878</u>	157496
Add; purchase of raw material during the year	284041		350780		232947		347870		224047	
Add/(less); transfer from/(to)BNTL	<u>(323)</u>	283718	<u>(8753)</u>	342027	<u>13430</u>	246377	<u>(8555)</u>	339315	<u>(11167)</u>	212880
		347101		441961		384537		437433		370376
Less; closing stock: Raw material	85288		122780		79958		142773		81601	
Work in progress	640		1023		1576		1379		1075	
finished goods	7840		7751		10722		7466		7133	
Damaged stock written off	<u>-</u>	<u>93768</u>	<u>-</u>	<u>131554</u>	<u>1308</u>	<u>93564</u>	<u>-</u>	<u>151618</u>	<u>-</u>	<u>89809</u>
Material cost		253333		310407		290973		285815		280567
Add; production expenditure		<u>53147</u>		<u>65856</u>		<u>67404</u>		<u>71535</u>		<u>70512</u>
Cost of production		<u>306480</u>		<u>376263</u>		<u>358377</u>		<u>357350</u>		<u>351079</u>

Source: Audit Report; BNL

Table 11
Details of Cost Variability and Segregation of Semi Variable Cost (in RS ‘000’)

Cost heads	Cost variability	2002/03			2003/04			2004/05			2005/06			2006/07		
		Total	FC	VC	Total	FC	VC	Total	FC	VC	Total	FC	VC	Total	FC	VC
Direct material	Variable	255194		255194	310318		310318	293944		293944	282559		282559	280234		280234
Production cost	30% fixed	53147	15944	37203	65856	19757	46099	67404	20221	47183	71535	21460	50075	70512	21154	49358
Distribution expenses	30% fixed	25051	7515	17536	24156	7247	16902	24199	7260	16939	19736	5921	13815	16955	5086	11869
Interest expenses	Fixed	663	663		284	284		4	4		265	265		1329	1329	
Depreciation and amortization	Fixed	51566	51566		58868	58868		63372	63372		55777	55777		64668	64668	
Accommodation expenses	Fixed	3328	3328		1724	1724		2574	2574		2540	2540		1793	1793	
Staff bonus	Fixed	5717	5717		2977	2977		4445	4445		4387	4387		3096	3096	
Salaries, wages and allowances	Fixed	23156	23156		26691	26691		26560	26560		27881	27881		32743	32743	
Contribution to provident fund, gratuity	Fixed	3814	3814		2906	2906		2876	2876		976	976		2543	2543	
Security expenses	Fixed	1570	1570		32	32		12	12		382	382				
Trade discount	Variable	18959		18959	44572		44572	52573		52573	51340		51340	56673		56673
Rent	fixed	626	626		1007	1007		628	628		402	402		1381	1381	
Repair and maintenance	50% fixed	2892	1446	1446	4063	2032	2031	4793	2396	2397	5001	2500	2501	6764	3382	3382
Electricity, fuel and water	20% fixed	172	34	138	155	31	124	103	21	82	118	24	94	156	31	125
Traveling expenses	Variable	1717		1717	1363		1363	1847		1847	3240		3240	6790		6790
Audit fees	Fixed	220	220		220	220		220	220		220	220		220	220	
Legal and professional fees and expenses	50% fixed	533	266	267	521	261	260	7775	3887	3888	648	324	324	1131	566	565
Rates and taxes	Fixed	492	492		133	133		182	182		187	187		352	352	
Bank charges	Fixed	4853	4853		153	153		672	672		307	307		288	288	
General meeting expenses	Fixed	25	25		21	21		35	35		48	48		52	52	

Insurance premium	Fixed	215	215		274	274		941	941		87	87		180	180	
Communication	90% Fixed	5075	4568	507	3305	2974	331	3690	3321	369	6844	6160	684	5493	4944	549
Printing and stationary	70% Fixed	713	499	214	680	476	204	813	569	244	715	500	215	1313	919	394
Advertisement	50% Fixed	7563	3781	3782	7534	3767	3767	5360	2680	2680	3933	1967	1966	2790	1395	1395
Production promotion expenses	70% Fixed	17205	12043	5162	18607	13025	5582	13195	9237	3958	5955	4168	1787	4628	3240	1388
Training	70% Fixed	11	8	3	157	110	47	717	502	215	1316	921	395	8110	5677	2433
Charity and donation	Variable	33		33	47		47	94		94	124		124	139		139
Uniform	Fixed	505	505		307	307		517	517		476	476		613	613	
Rejection and breakages	Variable	7897		7897	4201		4201	6710		6710	6638		6638	1902		1902
Management fees	Fixed	1425	1425		2817	2817		4421	4421		6276	6276		6643	6643	
Obsolete stock and fixed assets written off	Fixed	397	397		556	556		2655	2655		5805	5805		717	717	
Product transfer fees	Variable	1367		1367	6502		6502	5945		5945	7774		7774	6780		6780
Miscellaneous expenses	50% fixed	1837	918	919	1031	516	515	1238	619	619	768	384	384	971	485	486
SAP related expenses	Variable													6291		6291
Total		497938	145594	352344	592038	149166	442872	600514	160827	439687	574260	150345	423915	594250	163497	430753

Source: Audit Report; BNL

Appendix V

Table 12
Balance Sheet (in RS ‘000’)

Capital and liabilities	2002/03	2003/04	2004/05	2005/06	2006/07	Assets	2002/03	2003/04	2004/05	2005/06	2006/07
Capital and reserves;						Fixed assets	416993	377394	326096	409427	323573
Share capital	194889	194889	194889	194889	194889	Capital work in progress					176107
Reserve and retained earning	501042	510670	532265	567000	509681	Investment	112628	112628	112628	112628	112628
						Current assets;					
Bank loan					72000	Inventories	185341	226861	184980	224070	176936
Current liabilities and provisions;						Trade & other receivables	115210	88039	124178	80845	63657
Current liabilities	189995	184099	117199	164399	210702	Cash & bank balances	29456	5335	13755	1917	35926
Provision	150120	148749	56823	64592	64781	Prepaid, advances, loan & deposits	176418	212148	124918	146379	159526
						Deferred expenses		16002	14621	15614	3700
Total	1036046	1038407	901176	990880	1052053	Total	1036046	1038407	901176	990880	1052053

Source: Audit Report; BNL

Table 13
Calculation of Cash Fixed Cost (in RS '000')

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Total fixed cost	<u>145594</u>	<u>149166</u>	<u>160827</u>	<u>150345</u>	<u>163497</u>
Less; non cash fixed cost					
Depreciation	51566	58868	63372	55777	64668
Obsolete stock and fixed assets written off	<u>397</u>	<u>556</u>	<u>2655</u>	<u>5805</u>	<u>717</u>
	51963	59424	66027	61582	65385
Total cash fixed cost	93631	89742	94800	88763	98112

Source: Audit Report; BNL

Table 14
Inventory Consideration (in RS '000')

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Stores, spares and loose tools	41664	48826	57613	62035	69117
Raw material	85288	122780	79958	142773	81601
Work in progress	1000	1023	1576	1379	1075
Finished goods	7840	7751	10722	7466	7133
Goods in transit	14692	1271	2213	3594	12253
Consumables	3706	5765	6207	6017	4834
Advertising materials	1793	2985	1361	806	923
Bottles and shells	<u>29358</u>	<u>36460</u>	<u>25330</u>		
Total	185341	226861	184980	224070	176936

Source: Audit Report; BNL

Table 15
Calculation of Current Assets (in RS '000')

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Inventories	185341	226861	184980	224070	176936
Trade and other receivables	115210	88039	124178	80845	63657
Cash and bank balances	29456	5335	13755	1917	35926
Prepaid, advances, loans and deposits	<u>176418</u>	<u>212148</u>	<u>124918</u>	<u>146379</u>	<u>159526</u>
Total current assets	506425	532383	447831	453211	436045

Source: Audit Report; BNL

Table 16
Calculation of Quick Assets (in RS '000')

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Trade and other receivables	115210	88039	124178	80845	63657
Cash and bank balances	<u>29456</u>	<u>5335</u>	<u>13755</u>	<u>1917</u>	<u>35926</u>
Total quick assets	144666	93374	137933	82762	99583

Source: Audit Report; BNL

Table 17
Calculation of Total Fixed Assets (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Fixed assets	416993	377394	326096	409427	323573
Capital work in progress					176107
Investment	<u>112628</u>	<u>112628</u>	<u>112628</u>	<u>112628</u>	<u>112628</u>
Total fixed assets	529621	490022	438724	522055	612308

Source: Audit Report; BNL

Table 18
Calculation of Current Liabilities (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Current liabilities	189995	184099	117199	164399	210702
Provisions	<u>150120</u>	<u>148749</u>	<u>56823</u>	<u>64592</u>	<u>64781</u>
Total current liabilities	340115	332848	174022	228991	275483

Source: Audit Report; BNL

Table 19
Calculation of Equity Shareholders Fund (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Share capital	194889	194889	194889	194889	194889
Reserve and retained earning	501042	510670	532265	567000	509681
Less; deferred expenses		<u>(16002)</u>	<u>(14621)</u>	<u>(15614)</u>	<u>(3700)</u>
Equity shareholders fund	695931	689557	712533	746275	700870

Source: Audit Report; BNL

Table 20
Calculation of Capital Employed (in RS ‘000’)

Particulars	2002/03	2003/04	2004/05	2005/06	2006/07
Share capital	194889	194889	194889	194889	194889
Reserve and retained earning	501042	510670	532265	567000	509681
Bank loan					72000
Less; deferred expenses		<u>(16002)</u>	<u>(14621)</u>	<u>(15614)</u>	<u>(3700)</u>
Capital employed	695931	689557	712533	746275	772870

Source: Audit Report; BNL

Appendix VI

Table 21
Calculation of Gross Profit Ratio (in RS ‘000’)

Year	Gross profit	Sales	Gross profit ratio = $\frac{\text{gross profit}}{\text{Sales}} \times 100$
2002/03	229014	535494	42.76%
2003/04	233391	609654	38.28%
2004/05	273737	632114	43.31%
2005/06	257389	614739	41.87%
2006/07	270747	621827	43.54%

Source: Audit Report; BNL

Table 22
Calculation of Operating Profit Ratio (in RS ‘000’)

Year	Operating profit	Sales	Operating profit = $\frac{\text{operating profit}}{\text{Sales}} \times 100$
2002/03	102302	535494	19.10%
2003/04	82644	609654	13.56%
2004/05	105056	632114	16.62%
2005/06	101353	614739	16.49%
2006/07	98988	621827	15.92%

Source: Audit Report; BNL

Table 23
Calculation of Net Profit Ratio (in RS ‘000’)

Year	Net profit	Sales	Net profit ratio = $\frac{\text{net profit}}{\text{sales}} \times 100$
2002/03	48610	535494	9.08%
2003/04	19372	609654	3.18%
2004/05	21595	632114	3.42%
2005/06	34735	614739	5.65%
2006/07	(57319)	621827	(9.22)%

Source: Audit Report; BNL

Table 24
Calculation of Return on Equity Shareholders Fund Ratio (in RS '000')

Year	Net profit	Equity share - holder fund	Return on equity shareholders fund = $\frac{\text{net profit}}{\text{Equity share holders fund}} \times 100$
2002/03	48610	695931	6.98%
2003/04	19372	689557	2.80%
2004/05	21595	712533	3.03%
2005/06	34735	746275	4.65%
2006/07	(57319)	700870	(8.18)%

Source: Audit Report; BNL

Table 25
Calculation of Return on Total Assets (in RS '000')

Year	Net profit	Total assets	Return on total assets = $\frac{\text{net profit}}{\text{Total assets}} \times 100$
2002/03	48610	1036046	4.69%
2003/04	19372	1038407	1.87%
2004/05	21595	901176	2.40%
2005/06	34735	990880	3.51%
2006/07	(57319)	1052053	(5.45)%

Source: Audit Report; BNL

Table 26
Calculation of Current Ratio (in RS '000')

Year	Current assets	Current liabilities	Current ratio = $\frac{\text{current assets}}{\text{Current liabilities}}$
2002/03	506425	340115	1.49
2003/04	532383	332848	1.60
2004/05	447831	174022	2.57
2005/06	453211	228991	2
2006/07	436045	275483	1.58

Source: Audit Report; BNL

Table 27
Calculation of Quick Ratio (in RS '000')

Year	Quick assets	Current liabilities	Quick ratio = $\frac{\text{quick assets}}{\text{Current liabilities}}$
2002/03	144666	340115	0.43
2003/04	93374	332848	0.28
2004/05	137933	174022	0.79
2005/06	82762	228991	0.13
2006/07	99583	275483	0.36

Source: Audit Report; BNL

Table 28

Calculation of Fixed Assets to Capital Employed Ratio (in RS '000')

Year	Fixed assets	Capital employed	Fixed assets to capital employed ratio = $\frac{\text{fixed assets}}{\text{Capital employed}}$
2002/03	529621	695931	0.76
2003/04	490022	689557	0.71
2004/05	438724	712533	0.62
2005/06	522055	746275	0.70
2006/07	612308	772870	0.79

Source: Audit Report; BNL

Table 29

Calculation of Current Assets to Fixed Assets Ratio (in RS '000')

Year	Current assets	Fixed assets	Current assets to fixed assets ratio = $\frac{\text{current assets}}{\text{Fixed assets}}$
2002/03	506425	529621	0.96
2003/04	532383	490022	1.09
2004/05	447831	438724	1.02
2005/06	453211	522055	1.04
2006/07	436045	612308	0.88

Source: Audit Report; BNL

Table 30

Calculation of Proprietary Ratio (in RS '000')

Year	Equity share - holder fund	Total assets	Proprietary ratio = $\frac{\text{equity shareholders fund}}{\text{Total assets}}$
2002/03	695931	1036046	0.67
2003/04	689557	1038407	0.66
2004/05	712533	901176	0.79
2005/06	746275	990880	0.75
2006/07	700870	1052053	0.67

Source: Audit Report; BNL