CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

A business success depends on the performance of organization which measures in terms of Profit. Profit is the primary measurement and the blood for long period. When business firm can't hold capital, it can't secure and retain other of success in any economy, if firm is not able to earn profit than it fails to hold the capital 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.

Profit planning and control (PPC) is an important approach, which is developed for providing effective performance of management system where, management means co-ordination of human effort for the accomplishment of an organization objective. Profit planning and control has broad application. It is used both profit making and non-profit making organization. It is also used both manufacturing and non-manufacturing organizations. Profit planning is a part of planning of an organization. PPC is identified as a way of management sophistication for the organization. Understanding of PPC is a understanding of PPC. It terms of profit, it doesn't just happen but profits are managed. Profit is one most important indication, which measures the success of an organization. Profit is necessary for any organization to continue business.

Usually, profit doesn't just happen. Profit is managed, when a management plans its profit performance that is known as profit planning. Profit planning is a part of overall planning process of an organization. Before we can make an intelligent approach to the managerial process of profit planning, it is important that we understand the management concept of profit. There are several different interpretations of the term 'profit'. According to an economist, profit is the reward for

entrepreneurship for risk taking, leader of 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.

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

Planning is the first essence of management and all other functions are performed with in 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.

Control can be defined as the process of measuring and evaluating performance of each organizational component of an enterprise and initiating corrective action when necessary to ensure efficient accomplishment of enterprise objectives, goals, policies and standards, planning establishes the goals, objectives, policies and standards of an enterprise. "Planning is the conscious recognition of the futurity of present decision" (Drucker, 1959: 338). "Planning reduces uncertainly and provides direction to the employees by determining the course of action in advance." [Pandey, 1994: 247]

Thus, profit planning and control is an important approach, mainly in profit-oriented enterprises. Profit planning is merely a tool of management. It is not an end of management or substitute of management. It facilitates the managers to accomplish managerial goals in a systematic way.

Profit planning and control is used for the development and acceptance of objectives and goals and moving organization efficiently to achieve the objectives and goals. The broad concept of PPC entails an integration of numerous managerial approaches and techniques, such as sales forecasting, sales quota system, capital budgeting, cash flow analysis, cost-volume-profit analysis and variable budget, time and motion study, standard cost accounting, strategic planning, production planning, management by objectives, organizational planning, managerial planning and cost control. PPC has wide application. It can be applied in profit and non-profit, manufacturing and non-manufacturing organization.

Out of various profit planning tools, cost-volume-profit analysis is the most important tool. The systematic relationship between cost, volume and profit is known as cost-volume-profit analysis. It is an analytical tool for analyzing the relationship among cost, price, profit, sales and production volume. Mainly there are three elements in cost-volume-profit analysis. They are cost, sales or production volume and profit. All these terms are interconnected and depended on one another. 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 under taken through cost-volume –profit analysis. Cost-volume-profit is analysis extremely helpful in profit planning and control management decision, cost control, budgeting etc.

1.2   Focus of the Study

Cost volume profit (CVP) analysis is a powerful tool of planning and controlling of cost of management. Management can get various answers of different questions through CVP analysis. Management can estimate easily that what should be the required sales of the company. Similarly profit can be estimated in different expected sales volume. 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.

The main focus of the study is to analyze the C-V-P analysis of the multi-product firm. The concept of C-V-P analysis for multi-product firms can be explained below.

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 profits. Managers try to achieve that combination, or mix, that will yield the greatest amount of profit. If a company sales 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 through total sales increase. On the contrary, a shift in the sales mix from low margin items to high margin items can cause the reverse effect-total profit may increase even through total sales decrease.

So, a dynamic management therefore uses CVP analysis is to predict and evaluate the implications of its short-run decisions about fixed costs, variable costs, volume and selling price for its profit plans on a continuous basis.

1.3 Brief Overview of Himalayan Distillery Limited and United Spirits Nepal Private Limited

1.3.1 *Himalayan Distillery Limited brief*:

The Himalayan Distillery Ltd. (HDL) is promoted by Jawalakhel Distillery, which play a vital role in Nepal's liquor market and for decades it has been synonymous with quality alcoholic products. The founding chair main, V.K. Shah, is a well-qualified specialist in the field of alcoholic beverage and the family has been in the alcoholic business for the last six generations.

(http:// www.himalayandistillery.com/profile.htm.)

The Himalayan distillery Ltd. is a culmination of a perfectionist's dream. It is not only a modern distillery but also a research unit. While constructing this distillery, the promoter have given paramount importance to selecting the best quality equipment with the sole aim of producing alcoholic beverage of superfine grade making them the benchmarks of quality in the market. The distillery has started its initial operation as of January1999.

The distillery is located in serene surroundings at the foothills of the Himalayan in the southern part of Nepal. Its registered office has situated at Parsa District, VDC, lipnibirta-7, Parwanipur. The distillation unit stands as a landmark and is accessible by road. The local airport (i.e. Simara) is only minutes away and the nearest India boarder Birgunj to Raxaul is 12 Kms from the factory site. The Indian Broad Gauge Rail-way head terminals at Raxaul Boarder. The contact office of the company has stayed at Satdobato Chowk Lalitpur.

Himalayan Distillery, sister concern of Jawalakhel Distillery subscribed to the same philosophy of setting new benchmarks, for producing and selling quality alcoholic products in the liquor world. It produce and market Seagram's Royal stag and Imperial Blue in the first phase and other brands in the second phase. *(http.//www.himalayandistillery.com/sis.htm)*

The company takes utmost care that not a drop of Whisky, Vodka, Rum, Brandy and Gin levels the distillery until it has been sealed in it's bottle ready to be drunk and

enjoyed. Even the flavors used in the preparation of products are directly approved from Europe. The labels are printed in Thailand and Shrink-wraps are used. There is no room for recycled bottles which insures that the product is genuine, has not been refilled and counterfeited.

The HDL and Seagram Manufacturing Limited (SML) have entered into a technical and marketing support agreement on November 5, 1999. The company is producing and marketing Seagram's product in Nepal.

As per the agreement Seagram Manufacturing Limited (SML) has agreed to render the following services to the HDL: *(http///www.himalayandistillery.com/ agreement.htp.)*

➢ Technical support for blending and bottling process including quality control and supervision.

➢ Brand management and marketing support services, for this purpose SML'S marketing and sales executives will visit Nepal on regular basis to vender the support and assist in marketing and promotional activity.

➢ SML will provide marketing and promotional materials to be used in the Nepal for promoting sales of the products.

➢ These products will be exported to India etc.

So, it is a state of the art facility and is the only grain unit in Nepal. The company is about eight times bigger than Jawalakhel Distillery.

Product lines of the Company

The company manufactures multiple products. The product lines of the company are shown in the following table:

SN	Name of product
1	Royal Stag
2	Emporia Blue
3	Ruslan White
4	Cleopatra
5	Triple Cross

6	Bonnie Charles	
7	Ultimate	
8	Play Boy	
9	Ruslan Vodka	
10	Dry Gin	
11	Blue Diamond etc	

Source: Annual Report of the HDL (F/Y 2067/68)

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United Spirits Nepal Private Limited (USNPL) is one of the chemical Processing Company in Nepal for decades it has been synonymous with quality Alcoholic products. The founding chairman, Rajesh Bir Singh Tuladhar, is a well-qualified specialist in the field of alcoholic beverage in Nepal running alcoholic business.

The Mc Dowell's Company was previously renounced in the Alcoholic market in Nepal and Later on its developed and merged with Indian -United Beverage Group of India which is still running with covering the 60% of total Nepal's market. United Spirits Nepal Private Limited is a culmination of a perfectionist's dream. It is not only a modern distillery but also a research unit. While constructing this distillery, the promoter have given paramount importance to selecting the best quality equipment with the sole aim of producing alcoholic beverage of superfine grade making them the benchmarks of quality in the market. The distillery has started its initial operation as of June1982 as Mc Dowell's Company.

It is located in serene surroundings at the greenery area of Tankisunwari -2 Morang in the eastern part of Nepal also over there, but in the Katmandu it's office is located at Kamaladi, Katmandu(Opposite to Rastriya Pragya Bhawan).Basically the main source of the raw material is India. The boarder is Jogbani where the raw material brought from India.*(www.merono1.com.np.htp)*

Product lines of the Company

United Spirits Nepal Pvt. Ltd. is a leading alcoholic manufacturing company operating on a private sector of Nepal. It produces various types of alcoholic product. Today United Spirits Nepal Pvt. Ltd Produces and sales following types of products:

1   Antiquity Rare Premium whisky
2   Signature rear aged whisky
3   McDowell's premium malt whisky
4   McDowell's no.1 reserve whisky
5   Golden gap brandy whisky
6   McDowell's no.1 celebration rum
7   Blue rebind premium extra dry gin
8   White mischief ultra pure vodka
9   Bagpiper Deluxe Whisky etc.

1.4 Statement of the Problem

Most of the manufacturing companies in Nepal have to face number of problems. As other manufacturing companies the alcoholic companies also have to face the number of problems. The industrial act 2049 finds the problems of industrialization but it cannot give effective solution to the investors. It can't act properly. The problems which are faced by the alcoholic companies in Nepal are address in the following points.

1.   Geographically, Nepal is a Land-locked country, so it is very difficult for the collection of Raw-materials.

2.   Because of the political instability, the government policy is very weak. The policies and rules are changed frequently. They cannot implement properly.

3.   Physical human resources are not sufficient. There is a shortage of trained and skilled manpower.

4.   Because of the shortage of capital, It cause higher cost of production, low productivity of inputs, insufficient manpower and technology e,t,c, Investors are unable to attract foreign investment.

5.   Ineffectiveness of one window policy, strong labour policy, and frequently changes in the tax policies.

6.   Small size of market unawareness of the industrial potential.

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.

Both the HDL and USNPL are the biggest alcoholic 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. The success of the industry will not only attract the foreign investment in the country but also increases the private sector within the country. But the financial performance of the industry is not satisfactory and it is bearing a heavy loss every year since the time of its operation.

How the business is being operated largely depends on how the business operation is planned. Poor performance is the outcome of poor planning, controlling and decision-making. The key motive of 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 planning for profit. CVP analysis is immensely helpful for developing alternative strategies in sales planning and cost estimation.

This study is basically designed to solve the following problems by taking into account the budget's role in planning the profit:

1. What will be the relationship between cost, volume and profit?
2. How will profit be affected when sales mix is changed?
3. What will be the effect of planned expansion on C-V-P relationship?
4. Which product or product mix is profitable?
5. What sales volume is needed to achieve break even?
6. What should be the sales volume to earn a desired profit?
7. What will be the profit or loss to the specified level of sales?
8. Which product or operation of a plant should be discontinued?

9.   Should the firm be shutdown the unprofitable product line/(s) temporarily or not?

1.5 Objectives of the Study

This study is analysis for the partial fulfillment of MBS program. It is a mini research. The general objective of this study is to evaluate the C-V-P analysis of alcoholic manufacturing company.

 The specific objectives of this study are as follows:

➢   To provide the over all view of the management of cost-volume and profit analysis.

➢   To show the relationship of cost, volume and profit of alcoholic –products of the two firms.

➢   This study has been taken to know how the company applies different types of accounting tools and statistical tools such as cvp analysis , fixed cost analysis, Break–even point of overall firm, contribution margin, Mean Bar diagram, standard deviation, co-relation analysis, Regression analysis, hypothesis analysis in the calculation of the companies financial data.

➢   To study and analyze different components of cost as per cost behavior.

➢   To evaluate the impact of profit of Himalayan Distillery Limited and United Spirits Nepal Private Limited.

➢   To provide necessary suggestions and recommendations on the basis of major findings of the study to United distillery pvt,Ltd. And Himalayan distillery Ltd.

1.6 Significance of the Study

This study will be significant in the following ways:

➢   It finds out the difference in cost, volume and profit and its impact in the break even point

➢   It provides information on the application of the tool under profit planning in different circumstances.

➢   This study is also directed towards providing necessary recommendations to the related departments of the company.

➢   It provides literature to the researchers, who want to carry on future research in this field.

➢   It examines the application of cost-volume-profit analysis in the company

> ➢ It explores the problems and potentialities of alcoholic manufacturing industry on the basis of selected organizations. It is useful to the potential managers, accountants, policy makers and planners etc.

1.7 Limitations 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 has been conducted with the following limitations.

- ❖ Due to the constraint time, this research study is completed in a limited time. Had there would have more time, this research would be more effective.

- ❖ It is quite difficult of getting relevant data regarding c-v-p analysis. So, the study has been with the available data.

- ❖ As a student, I completed the study work within the constraint of the limited budget. Limited financial resources are another drawback of this research study.

- ❖ This study is focus on the c-v-p analysis of the two alcoholic manufacturing companies. As a result, other various aspects of the company such as, Marketing, HRM planning, Tax planning etc., are neglected.

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

1.8 Organization of the study

This study has divided into five parts Viz. introduction, review of literature, research methodology, presentation and analysis of data, conclusion, summary and recommendations.

Chapter 1 - Introduction

This chapter is introduction framework that includes background of the study, focus of the study, profile of the company, statement of the problems, objectives of the study, significance of the study, limitations of the study and organization of the study.

Chapter 2 – Review of the Literature

This chapter will review the existing literature in the relevant area. Mainly, it includes review of theories and journal, review of previous research work and research gap.

Chapter 3 – Research Methodology

This chapter deals with methodology that includes research design, sources of data, data collection techniques, method of analysis and research variable.

Chapter 4 - Presentation and Analysis of Data

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 Recommendations

This chapter will be the final chapter of the study that includes summary of the study, conclusion and recommendations.

The Bibliography appendix will be included in the last of the thesis.

CHAPETR TWO
REVIEW OF LITERATURE

2.0   Introduction.

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

2.1   Conceptual Framework of Profit Planning and Control

Profit planning and control helps the management to perform its planning functions by developing a strategic and tactical profit plan. Both of these plans include monetary expectation for assets, liabilities, profit and return on investment. The foundation for the strategies profit plan includes the objectives, goals, planning premises and strategies of the enterprises as developed by top management.

2.1.1   Concept of Profit

Profit is the primary of business. Profit is the sign for the allocation of resources and yardstick for judging managerial efficiency. The reliable measure of the effectiveness of performance of a business is a profit. Profit is a primary measure of business success; simply stating the excess of income over cost of production. Generally profit is known as the part of income of the firms. Profit is the motivating force in the business. Success of business depends on profit. Profit promises to provide satisfaction to consumer. We can simply define the world 'profit' as the primary measurement of success of management effectiveness in business enterprise. In other words, profit means the excess of total revenue over total cost of production. Usually, profits don't happen they are managed or produce.

Economic theories on profit may be put in three broad categories: the first theory looks upon profit as the reward for bearing risks: the second view is profit as the consequence of friction and imperfections in the competitive adjustment of the economy to dynamic changes. The third sees profit as the reward for successful innovation (*Joel, 1982; 6).* Profit is a yardstick of management's ability to co-ordinate, plan act in the interest of the consumer. No business sustains if there is regular loss, profit is essential for each enterprise.

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

2.1.2   Concept of Planning

Planning is the first essence of management and other functions are performed within the framework of planning. Planning means deciding in advance what is to be done in future? Generally the planning means future decision. Planning is the heart of each organization. Without proper planning any organization can not be survive. The word 'planning' states thinking and deciding what ought to be done in advance. It is also a process of developing enterprises objectives and selecting future courses of action to accomplish them.

Planning is a hard task because it involves the ability to think to periodic, to analyze, and to come to decide to control the actions of its personnel and to cope with a complex dynamic fluid environment. They bridge the gap between, where they are and where they want to go *(Memoria CB, 1990; 36).* His statement obviously shows that planning as a complex and hard job and as a tool of developing and getting organizational objectives.

Planning is the process of developing enterprises objectives and selecting future course of action to accomplice them. It includes *(Welsch, Hilton and Gordon, 1992,3)*

- Establishing enterprise objectives.

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

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

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

2.1.3 Concept of Control

In simple control means measuring the result with standard to actual. Control can be defined as the process of measuring and evaluating performance of each organizational component of an enterprise and initiating corrective action when necessary to ensure to efficient accomplishment of enterprises goal, objectives, policies, and standards, planning establishes the goals, objectives, policies, and standards of an enterprises. Control is the one most important technique of management. Once the planning is determined, it must be carried out under control. Controlling shares management actively and for this managers compare actual performance against the planned performance and find out the deviations taking remedial steps to remove the deviations to make an improvement in the performance because promptness is the essence of an effective control.

Controlling means evaluating the firm's activities against the plan and deciding what should be done if the plan is not being followed. *(Lynch & Williamson, 1999; 18)*

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

According to Welsch, controlling involves

- Establishing goals and standards.
- Comparing measured performance against the established goals and standards.
- Reinforcing successes and correcting shortcomings.

Control provides timely information that may prompt the revision of goals. The purpose of control is achieved with setting standards, comparing predicted and actual results against these standards and taking corrective actions.

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

2.2   Meaning and Definition of Profit Planning

Profit planning is one of the most important managerial functions, profit planning is merely a tool of management, which is used to plan and control business operation and inter action. Profit is a primary measurement of business success in any economy; if a firm is not able to earn profit then it fails to hold the capital for long period.

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

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

Profit planning is the process of determining the required amount of profit from each principle unit of business. A profit plan is an advance decision of expected

achievement based on the most efficient operating standards of in prospect of time. It is established against which actual accomplishment is regularly compared.

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

Profit planning or budgeting is a forward planning and involves the preparation in advance of the quantitative as well as financial statement to include the intention of management in respect of the various aspects of the business. Profit planning, in fact is a managerial technique and it is a written plan in which all aspects of business operation with respect of definite future period are included. It is a formal statement of policy, plan, objective and goal established by the top management in respect of some future period. Profit planning is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. Thus, we can say that profit planning is a tool, which may be used by the management in planning the future course of action and in controlling actual performance *(Gupta, 1997; 521)*

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

Profit planning is management's primary tool to accomplish its objectives because it *(Noll & Radetsky, 1985; 36)*

- Provides a disciplined approach to the solution of business problems.

- Develops throughout the organization an atmosphere of profit mindedness, encouraging an attitude of the coat consciousness and maximum asset utilization.

- Coordinates the operating plans of the diverse segments of the business into a single, comprehensive plan.

- Encourage a high standard of performance by stimulating competition, providing a sense of urgency and serving as an incentive to perform more effectively.

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

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

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

According to Welsch, the three most relevant aspects of Profit Planning and control concept are:

- PPC requires major planning decision by management.

- PPC entails pervasive management control activities and:

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

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

- The volume of out put in terms of numbers of product or other units.

- The verity to be produced (the product mix).

- The cost to be incurred.

- The prices to be charged

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

A profit plan is a comprehensive statement of intentions, expressed in financial terms, for the operations of the firm for a short period. It is a plan of the firm's expectations

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and is used as a basis for measuring and controlling the actual performance of managers and their units (*Pandey, 1994; 257*).

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

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

2.3   Cost-Volume-Profit Analysis as a Tool of Profit Planning and Control

Cost-volume-profit analysis examines the behavior of total revenues, total costs and operating income as changes occur in the output level, the selling price, the variable cost per unit and / or fixed costs of a product (*Horngreen, Datar & Foster, 1999; 256*)

Cost-volume-profit analysis is a systematic method of examining the relationship between change in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of their relationship CVP analysis simplifies the real world condition that a firm will face. Like most models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations. Never the Less, it is a powerful tool for decision making in certain situations *(Drury, 2000; 287)*

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

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

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

Cost-Volume-Profit analysis is a management accounting tool to show the relationship between the ingredients of profit planning. Profit planning is the function of selling price of the product, the variable costs and volume to be sold. The entire scope of profit planning associated with CVP interrelationship. A widely used technique to study CVP relationship is break-even analysis. Break-even analysis is concerned with the study of revenues and costs in relation to sales at which the firm's revenue and total costs will be exactly equal (or net income is zero). Thus the BEP may be defined a point at which the firm's total revenues are exactly equal to total costs, yielding zero income. The 'no profit' 'no loss' is a break even point or a point at which losses ceases and profit begins *(Khan & Jain, 1993; 265)*

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

2.4 Concept of Cost Volume Profit Analysis

Cost Volume Profit (CVP) analysis is an analytical tool for analyzing the relationship among cost, price, profit, sales and production volume. It is one of the most important and powerful tools that managers have at their command in short term planning. It helps managers to understand the interrelationship between cost, volume and profit. 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 pries and cost of sales. The selling price to a greater extent will depend on the cost and costs depend 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 interconnection is undertaken through cost- volume- profit analysis.

CVP analysis is a supplementary tool of profit planning. It tells many things about the relationship between the business variables. Total variables costs are proportionate to the sales volume; where as the total fixed costs remain unchanged within the relevant range of the output levels. That is why; net incomes are not in proportion to sales. Knowing the relationship, one can assess the profit at forecasted sales volume; likewise, required sales can be ascertained for the minimum level of profit. If a company sales more than one product, called the product mix, each product may not be equally profitable. So the company's profit will depend up on the ratio of each products sale on the total sales revenues. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consist mostly of low margin items. Changes in sales mix can cause great variations in a company's profit. A shift to low-margin items can cause the total profit to decrease even though total sales increase. On the contrary, a shift in the sales mix from low-items to high margin items can causes the reverse effect; total profit may increase even though total sales decrease.

Thus, C-V-P analysis is the technique of summarizing the effects of changes in an organizations volume of activity on its cost, revenue and profit. Cost-volume-profit analysis applies marginal or variable costing principles while establishing the effect of the future course of activities on the financial results of the firm. Knowledge of how cost behaves in response to change in volume and how profit beaver in response to change in cost and volume helps management to make numerous short term optimal decisions relating cost control and profit maximization

2.5 Cost and its Classification

2.5.1 Concept of Cost

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

CVP analysis shows in an organization by focusing interaction between the following five elements.

➤ Price of product
➤ Volume of activity
➤ Variable cost
➤ Fixed cost
➤ Sales mix

2.5.2 Classification of Costs

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

2.5.2.1 Behavior wise Classification of Cost

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

- **Variable Cost:** These costs tend to very in direct proportion to the volume of output. In other words, when volume of output increases, total variable cost also increases and when volume of output decreases, total variable cost also decreases. But the variable cost per unit remains fixed. It includes direct materials, direct wages, power, royalties, normal spoilage, small tools, and commission of salesman, etc. The variable cost on production unit are illustrated in figure2.1(a).

Figure 2.1: Variable Cost

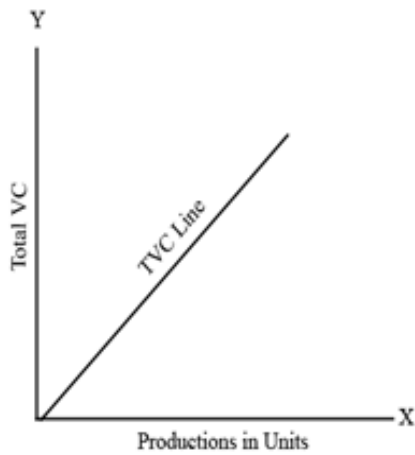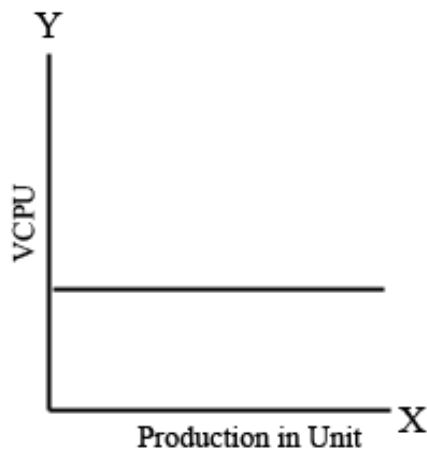**Figure 2.1(a)**   **Figure 2.1(b)**

Fixed Cost: These costs remain fixed in "total" amount and do not increase or decrease when the volume of production changes. But the fixed cost per unit increases when volume of production decreases and vice-versa. Fixed cost per unit decreases when the volume of production increases. It includes rent and leaser, municipal tax, managerial salaries, building insurance, salaries and wages of permanent staffs etc. The Fixed cost volume of activities are illustrated in figure (2.2)

Figure 2.2: Fixed Costs

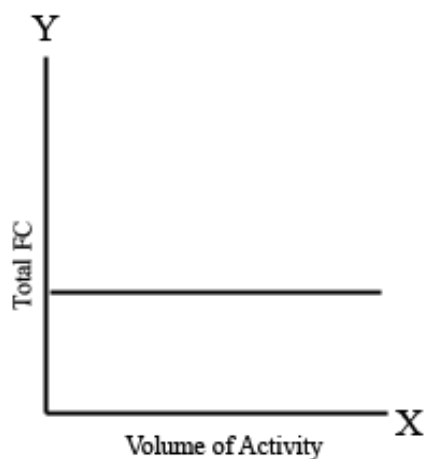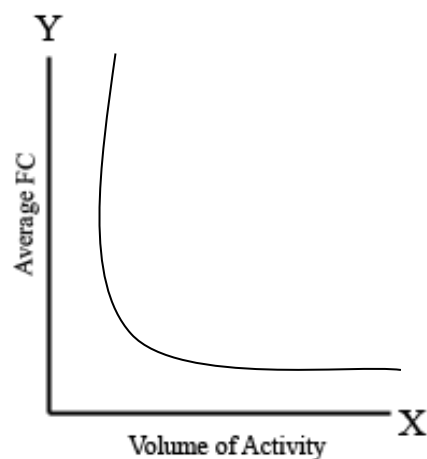**Figure No, 2.2(a)**   **Figure No. 2.2(b)**

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These are partly fixed and partly semi variable costs has often a fixed element below which it will not fall at any level of output. The variable elements in semi variable costs changes either at a constant rate or in lumps. For example, introduction of an additional shift in the factory will require additional supervisors and certain cost will increase in lumps. In the case of telephone, this is a minimum charge and after a specified number of causes, the charges are made according to the number of calls made. Thus, there is no fixed pattern of behavior of semi variable cost. It includes supervision, light and power, telephone expenses, maintenance and repairs, depreciation, compensation for accidents etc. semi variable costs are illustrated in figure 2.3.

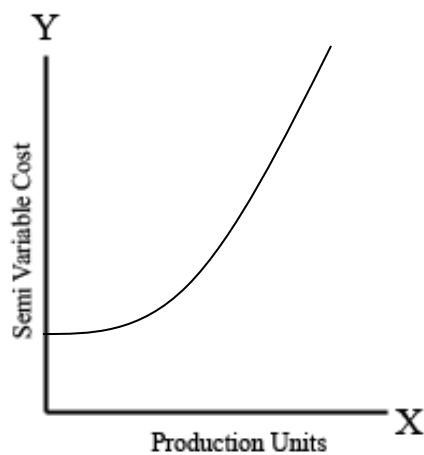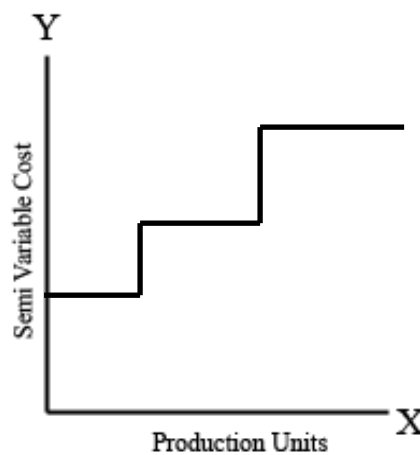<p align="center"><u>Figure 2.3: Semi- Variable/Mixed Cost</u></p>

<u>Figure 2.3(a)</u>   **<u>Figure 2.3(b)</u>**

2.5.2.2 Segregation of Semi-Variable Cost:

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

    a.   High- Low Method

    b.   Least Square Method

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

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

Step 1   To elect highest and lowest level of activity

Step 2   To take the corresponding cost of highest and lowest level of activity.

Step 3   To find out the different between highest and lowest points and ascertains the variable cost per unit by using following formula.

$$\text{Variable cost per unit (b)} = \frac{\text{High Cost} - \text{Low Cost}}{\text{High Units} - \text{Low Units}}$$

Step 4   To find out the fixed cost by using the following equation:

Fixed cost = Total cost – (Variable cost per unit X Activity Level)

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

Step 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):

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

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

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

Notes:
1.   N = Number of Observations
2.   For finding out the value of 'a' the following formula could be used:

$$a = \frac{\sum X^2 . \sum Y - \sum X . \sum Y}{N \sum X^2 - (\sum X)^2}$$

Approaches to Cost – Volume – Profit Analysis

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

i.   Contribution Margin Approach
ii. Cost and Revenue equation Approach
iii. The graphic (break even chart) Approach

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

i.   Contribution Margin = Sales – Variable Cost
ii. Contribution Margin = Fixed Cost + Profit
iii. Profit = Contribution Margin – Fixed Cost

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

P/V ratio = C/S
Where, c = Contribution Margin and S=sales

Profit volume ratio can be calculated in the following ways too:

(i)   P/V Ratio $= \dfrac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}}$

(ii) P/V Ratio $= \dfrac{\text{Sales} - \text{Variable Cost}}{\text{Sales}}$

(iii) P/V Ratio $= 1 - \dfrac{\text{Variable Cost}}{\text{Sales}}$

(iv) P/V Ratio $= \dfrac{\text{Different in profit of two periods}}{\text{Different in sales of two periods}}$

Uses of Profit – Volume Ratio

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

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

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

$$\text{Selling price per unit} = \frac{\text{Contribution Margin}}{\text{P / V ratio x sales unit}}$$

$$\text{Selling Price per unit} = \frac{\text{Variable Cost Per unit}}{1 - \text{P / V Ratio}}$$

ii) **Ascertainment of Profit at a Budgeted Sales Volume**

The profit can be determined with the help of margin ratio. For this purpose, the following elements should be determined before hand:

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

The following formula used to ascertain the profit:

Profit = (Sales x P/V ratio) – Fixed cost

iii) **Ascertainment Profit on Selling Price**

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

Profit = sales units after Break- even sales X unit selling price X P/V Ratio

iv) **Determination of Profit on cost**:

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

$$\text{Profit} = \frac{\text{Variable Cost x P/V Ratio}}{\text{Variable Cost Ratio}}$$

Where, variable cost Ratio = 1 – P/V Ratio

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

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:

Profit = Total Revenue – Total Cost

Total revenue and total cost are affected by sales volume. The addition of quality 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.

Profit = Total Revenue – Total Variable Cost – Fixed Cost
<div align="center">Or,</div>
Profit = (Unit Selling Price x Sales Unit) – (Unit Variable Cost X Sales Units) – Fixed Cost

Or, P = (S x Q) – (V x 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

2.6.3 Break-even Analysis

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

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

2.6.3.1 Computation of Break-even Point

Break- even point can be determined by following method

a)   Algebraic or Formula Method

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

Sales Revenue = Total Cost

Or,

Sales Revenue = Fixed Cost + Variable Cost

For finding out sales Revenue, we have,

Sales Revenue = selling price per unit x sales unit

Symbolically,
Sales Revenue = S x Q

For finding out, total Cost, we have

Total Cost = Fixed Cost + (Variable Cost per Unit x Sales Unit)

Symbolically,

Total Cost = FC + (V+Q)

From the early definition, we have,

Sales Revenue = Total Cost

i.e. S x Q = FC + (V x Q)
or, (S x Q) – (V x Q) = FC
or,   Q (S – V) = FC

➤   Q = FC/(S-V)

Where,

Q = Break – even point in units
FC = Fixed Cost
S = Selling Price per Unit
V = Variable Cost per Unit

b)   Graphic or Chart Method

A break-even chart is used to graphically depict the relationship among revenues, variable costs, fixed costs and profit (or losses). The no profit, no loss point (the break even point) is located at the point where the total cost and total revenue lines cross. Below this point, the firm losses, and above this point, the firm earns profit. (*Bajracharya, ojha, Goet & Sharma, 2004; 231 & 232.*)

In the graph given below the fixed costs remain constant without the relevant range; the fixed cost curve is parallel to 'ox' axis. Variable cost slope downward from the origin to right but the slope depends on variable cost ratio. The fixed costs curve parallels the variable cost curve. So the angle '0' equals the angle 'V' it is because total cost = total fixed cost plus total variable costs at volume 'Q'

Total costs = TFC + Q X VCPU

At, volume 'Q + N

Total costs = TFC + (Q+N) X VCPU

Δ Total cost = O+N x VCPU

Δ Total costs = Δ variable Costs

That's why the slope of the total cost curve equals the slope of variable cost curve. Which is illustrated in figure 2.4.

Figure 2.4: Graphic Approach to CVP
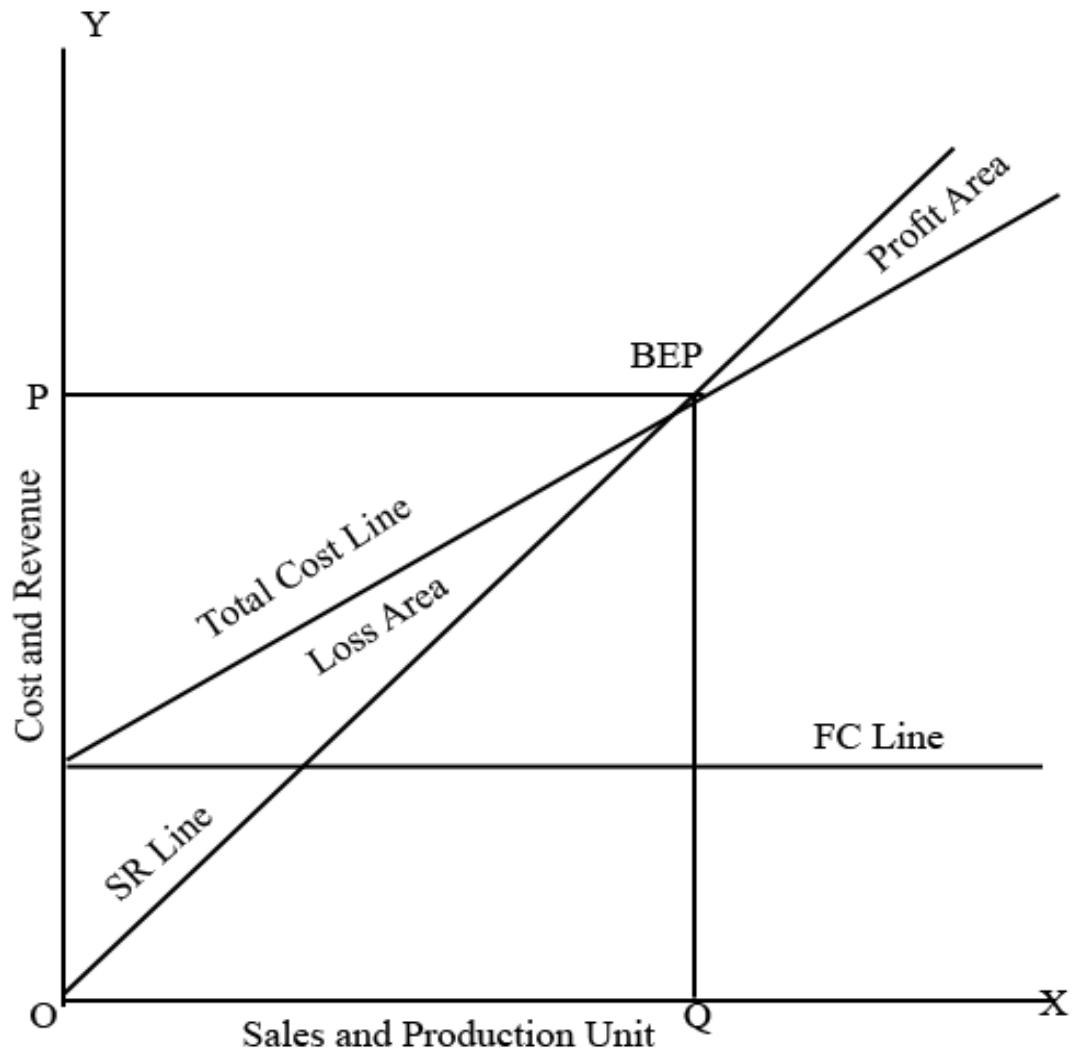
The figure 2,4 shows that if the company can reach the point of BEP it can generate sufficient revenues to cover all its operating expenses. At this point, the total revenues equal the total cost. Here, the revenue breaks up (intersect) the total cost curve that's why this point is called Break Even point. In short, Break Even point is that point where,

Total sales Revenues = Total Costs.

2.6.3.2 Application of Break Even Analysis

Break Even concept can be used to formulate different policies in a business enterprise. Some of these applications are *(Maheshwari, 2000; 182)*

- Determination of profit at different levels of sales and margin of safety.

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

2.6.3.3   Assumptions of Break Even Analysis

Contribution analysis and break-even analysis are based on a specific set of assumptions that should be clearly under stood. These underlying assumptions are *(Maheshwari, 2000; c. 182 – c. 183)*

- All cost can be classified into two parts, fixed cost and variable cost. There is no cost other than fixed and variable.

- There is a range of validity (activity) for using the results of the analysis and sales price doesn't change as units of sales change.

- There is only one product or in case of multiple products, the sales mix among the products remain constant.

- Basic management policy about operation will not change materially in short run.

- The general price level (inflation/ deflation) will remain essentially stable in the short run.

- Sales and production levels are synchronized, that is inventory remains essentially constant or zero.

- Efficiency and productivity per person will remains essentially unchanged in the short run.

If any of the above assumptions were changed, revised budget would be needed for a new analysis.

2.6.3.4 Limitations of Break Even Analysis

Break-even analysis in many businesses situations can be used for effective decision-making, but there is many shortcoming or limitations in its analysis and interpretations. Some of these can be listed as (*Maheshwari, 2000; 184*)

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

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

- With variation of the prices of the items or services, which also depend on the factors affecting its demand and supply will certainly affect the demand of the commodity. This phenomenon is not covered in Break-even analysis.

- Identification of fixed and variable costs involved in production process is very complicated. A shift in product mix may change the break-even point.

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

2.6.3.5 Other Use of Break Even Analysis

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

1. Required sales for desired profit (in units) $= \dfrac{FC + Desired\ \Pr ofit}{CMPU}$

2. Required sales for desired profit (in Rs) $= \dfrac{FC + Desired\ \Pr ofit}{CMRatio}$

3. Required sales in units for DPAT $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{CMPU}$

4. Required sales in Rs for DPAT $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{CMRatio}$

5. Required Sales volume for changes on selling price =

Revised BEP in units $= \dfrac{FixedCost}{\operatorname{Re}vised\ Unit\ Contribution\ M\arg in}$

Revised Break- Even point in Rs. $= \dfrac{FixedCost}{\operatorname{Re}vised\ PVRatio}$

6. Required Sales Volume for changes in selling price:

Revised unit contribution Margin = New unit selling price – Unit variable cost

Revised breakeven point in units $= \dfrac{FixedCost}{\operatorname{Re}vised\ Unit\ Contribution\ M\arg in}$

7. Required sales volume for changes in fixed cost:

New Break even point = $\dfrac{\text{Fixed cost present + Additional fixed cost}}{\text{Unit contribution Margin}}$

2.6.3.6 Break- Even Sales Volume in the Presence of Step or Moving Fixed Cost
Determination of breakeven sales volume, so far, was based on the very assumption that the times of fixed costs will remain stable over a broad, relevant range of normal operating volume. But it may not be so. Though some items of fixed cost such as deprecation and rent may remain consent but other items such as supervision, repairs and maintenance may change various items between the capacity volume and relevant range of normal operating volume. Calculation of breakeven volume in the presence of such step or moving fixed cost items requires more homework.

A process of trial and error or resort to specific steps helps to overcome such a problem. The point to note here is, we are concerned with the most earlier breakeven sales volume as there are numerous breakeven volumes increasing each time with every increase in step or moving fixed cost *(Wagle & Dahal,2004; 4.7)*

2.7   Cost – Volume –Profit Analysis for a Multi Product Firm
The relative proportion of sales of product is called the sales mix or the product mix. In the case of a multi-product firm, the contribution for each product can be found out by deduction its variable costs firm sales revenue. The break-even point for each product can be calculated only if the total fixed costs of the firm are distributed and fixed cost for each product for each product is known. The firms overall break-even can be calculated by dividing the total fixed costs by the contribution ratio for the firm. The multi-product firms PV ratio will be the weighted average of the PV ratios for the entire product, the weights being the relative proportion of each product's each product's sales. The PV ratio for the multi-product firms 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 PV ratio. However a change in the product mix will change the break-even point and profit when products have unequal PV rations *(Maheshwari, 2000; 184)*

2.7.1 Break- Even Point of Multi- Product Company / Firm

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

Following Procedures are followed to calculate BEP for sales mix or multi-product

- Calculate contribution margin or profit –volume ration for each product.
- Calculate proportion of sales max in units or values as follows.

$$\text{Sales mix} = \frac{Individual\ product's\ sales\ units\ or\ value}{Total\ of\ product's\ sales\ units\ or\ value}$$

- Calculate weighted average for all products as follows:

    Weighted average = $\sum$Sales Mix x CMPU

    Weighted CM Ratio=$\sum$ sales mix (value) x P/V ratio

- Calculate break-even point (BEP):

$$\text{Break- even point} = \frac{Fixed\ \cos t}{Weighted\ average}$$

Some Important Formulas for BEP analysis

1. Overall BEP (in units) $= \dfrac{TotalFixedCost}{WeightedCMPU}$

2. Overall BEP in Rs. $= \dfrac{TotalFixedCost}{WeightedCMRatio}$

3. Required Sales for desired profit (in units) $= \dfrac{FC + Desired\ \Pr ofit}{WeightedCMPU}$

4. Required sales for DP (in Rs.) $= \dfrac{FC + Desired\ \Pr ofit}{WeightedCMRatio}$

5. Required sales for DP after tax (in Units) $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{WeightedCMPU}$

Required sales for DP after tax (in Rs) $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{WeightedCMRatio}$

2.8 Margin of Safety

Margin of safety is the excess of the budgeted or actual sales over the break even sales volume. In other words, it is the difference between the budgeted or actual sales revenue and the break even sales revenue. It is the position above the break-even point. It gives management a feel for how close projected operations are to be organizations break-even point. Managers often consider the size of the company's margin of safety when making decisions about various business opportunities. The larger is the safety margin, the greater is the chance for the company to earn profit (i.e. larger the margin of safety, Safer the company). A high margin of safety is particularly significant in times of depression when the demand if the company's or firm's product is falling. A low margin of Safety Company's or firms firm which has a low contribution ratio. When both the margin of safety and the PV ratio are 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. Margin of safety can be ascertained by using the following formula. (*Munakarmi, 2003; 127*)

Margin of Safety = (Actual Sales value – Break- even sales value)

$$= \frac{profit}{profit\ volume\ ratio} \text{ in Amount}$$

$$= \frac{profit}{unit\ contribution\ margin} \text{ in units}$$

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

$$Margin\ of\ Safety\ Ratio = \frac{Actual\ Sales - Break\ even\ sales}{Actual\ Sales} in\ units$$

The following steps are needed to rectify margin of safety.
- With increasing selling price.
- With increasing sales volume, if the capacity of fixed cost is not fully utilized.
- With reducing fixed cost if possible.
- With reducing variable cost (with redacting the cost of raw material, wages and other direct cost).
- With substituting product line by more profitable one.

2.9 Costs -Volume Profit Analysis and its infusing Factors.

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

2.9.1 CVP Analysis with a Single Constraint

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only ion e constraining resource. This can occur if the firm's products are all produced on a single maintained and outer is imagery hours available on this machine. In the same way, single resource constraint arise, if the firms product are all produced with only one material and output is limited by quantity available for that to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scarce resource should be allocated to the alternative uses on the basis of contribution per scarce resource (*Munakarmi, 2003; 146)*

2.9.2 CVP Analysis with a Multiple Constraints

Where more than one scarce resource exists, the optimum production program can not easily be establisher the simple process applied in single resource constraint. Under the circumstances simple allocation of resource or the basis of contribution margin per unit is neither feasible nor desirable. Contribution margin per unit of scarce resources may be different for different scarce resources may be the ranking of product, because production processes are affected by many constraints factored rather than single constraint. In such situation, linear programming technique may be uses to optimize product mix. The loner progr5amming formulation is required to determine a production plan that maximizes contribution from the product mix. Liner programming is a mathematical technique which shows how to arrive at the optimum results, allocation of available with the problem of allocating limit resource among competitive activities in an optimal manner. It is a technique to optimize the allocation of scarce resources in product mix problems which provides a valuable extension to cost –volume profit analyses. (*Munankarmi, 2003; 148)*

2.10 CVP and Leverage

Operating leverage is a measures of the extent to which fixed costs are being used in organization. The relationship is if a company's variable and fixed cost is reflected in its operating leverage. Generally highly labor intensive organization have high variable cost and low fixed cost and this has low operating leverage and a reactively low break even point. Conversely, organizations that are highly capital intensive have a cost structures that includes low variable and high fixed cost 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 cost higher the operating leverage and breaks even point and vice versa. In other words, the firms with relatively high operating leverage ha proportionally high filed expenses; the firms break even point will be relatively high. The operating leverage factor is determined as under. *(Munankarmi, 2003: 145)*

Degree of operating leverage $= \dfrac{\text{Contributin margin}}{\text{Net income}}$

2.11 Assumptions Underlying CVP Analysis

Break even analysis is the most useful technique of profit planning and control It is a device to explain the relation ship between cost volume and profit. The discussing of the CVP analysis (or break even analysis) so far is based on the following assumptions (*Pandey 1999; 241*)

- **Cost segregation** – the total cost can be separate in to 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 directive proportion to the sales volume.

- **Constant Selling Price** – the selling price per unit remains the constant; that is it done not change with volume or because of other factors.

- **Constant Sales Mix** – The firm manufactures only one product or if there are multiple precut the sales mix does not change.

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

2.12 Limitation of CVP Analysis

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

- It is difficult to separate costs in to fixed and variable components.
- It is not correct to assume that total fixed cost would remain unchanged over the entire range of volume.
- If is difficult to use the break-even analysis for a multi produced 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.

2.13 Purpose of CVP Analysis

Cost-Volume-Profit analysis helps management in a number of ways. The following purposes are served by it: *(Dangol &Dangol: 2004; 160)*

- Determinations of new break-even point for changing in cost and selling price.
- Measurement of effect of changes in profit factors.
- Choosing the most profitable alternatives.
- Determining the optimum sales mix.
- Calculation of profit resulting from a budgeted sales volume.
- Calculation of sales volume to break-even.
- Calculation of sales volume to produce desired profit.
- Effect or changes on price, costs and profits
- Determination of capacity and equipment selection.
- Long-term decision on continuance of products.
- Make or buy decisions on sub- assemble or part.
- To contemplate the increase or decrease in profit due to change in method of production etc

2.14 Sensitivity Analysis

Sensitivity analysis is the measurement of elasticity if the change in cost, volume and profit factors or break even point or give profit. The strategist should

focus more on the factor, which is more on the factor, which is more sensitive or responsive for profit. To measure the sensitivity of cost volume profit factors one can see the impact of certain percentage or amount change in volume, price or cost factors on net profit. In other words, sensitivity analysis in the measurement of responsiveness in outcome with the changes is in determination variable. We know that the goal of business enterprises is to maximize profit. Is the excess of revenues over the total cost?

Net profit = Total Sales Revenues – Total Cost

= Sales unit x SPPU – Sales unit x VCPU – Fixed cost – Taxes

So that, profit = F (sales volume , selling price, VC, FC, Taxes etc. means, profit are the function, price, VC, FC, taxes and so on.

But none of the factors remain unchanged; sometime the manger can intentionally change the price and cost factors as a part of strategic decisions. But the strategy should focus more one the factor, which is more sensitive or responsive for profit. Therefore, to measures the sensitivity of cost volume profit factors, we can see the impact of certain percentage or a out change in volume price or cost factors on net profit. *(Bajracharya, Ojha, Goet & Sharma; 2004, 245)*

2.15 A Brief Literature Review

"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 & Frank, 2000; 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 alcoholic-product firm. All these decision rely oh 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, Birnberg, Jacob & Demski, 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 budgets, expenses), 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". *[Welsh, Hilton & Gordon, 1992; 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, 2000; 287]*

2.16 Review of the Related Studies.

There are few research paper concerning cost volume profit analysis has been conducted. Most of the researches are in the profit planning and control. Very few dissertations have been submitted related to cost volume profit analysis. Out of the previous research studies only few research are conducted to analyze the cost volume profit of private enterprise and the study is limited by various constraints. Therefore

this study is attempted to review the previous research work on profit planning and control as well as management accounting. As CVP is one of the tools of PPC, the previous studies related to PPC are reviewed.

A study done by **Mr. Sagar Sharma (2002)** had conducted a research entitled *"Management Accounting Practices in the Listed Alcoholic Companies of Nepal"*. Mr. Sharma had concerned his study to examine and study the practice of management accounting tools in the listed alcoholic companies in Nepal.

Mr. Sharma's research is based on primary data only. Stratified random sampling with proportionate allocation of percentage is followed draw the sample No secondary data has been used for his study. He selected 7 manufacturing companies for the purpose. They are United Spirits Pvt.Ltd., Himalayan DistilleryLtd., Makalu Beverage pvt.ltd., Arun Beverage Pvt. Ltd., Gorkha Bruary Pvt. Ltd., Nepal BruaryLtd. Highline Distillery Pvt. Ltd. In his research, Mr. Sharma has pointed out various finding and recommendations. Some remarkable findings were as follows.

- Lack of information and extra cost burden are the main reason behind not practicing such tools.
- 100% of alcoholic manufacturing companies were practicing the tools of cost segregation and 89% of the companies work practicing break even analysis. Practicing of method of segregation into variable and fixed cost in alcoholic manufacturing companies in Nepal are 44% practiced analytical method, 22% of the companies use high low method, and average method.
- Management accounting is to help managers in overall managerial activities by providing information and helping in planning, controlling and decision making.
- Practicing of regression method for segregating mixed cost into fixed and variable was nil. The reason behind this was regression method is statistical method which is difficult in application. Besides, it requires expert manpower in statistical methodology. Companies were not ready to hire statistical expert to segregated cost.
- Different types of management accounting tools, which are taught in the colleges, are not found applied by the listed companies in Nepal.
- Nepalese listed companies are in infant stage in practicing of management accounting tools. Such as capital budgeting annual budgeting, cash flow, ratio

analysis, zero base budgeting activity based costing, activity costing, target costing and value engineering.

- As Nepal get the membership of WTO, the alcoholic manufacturing companies are recommended to apply management accounting tools to fit with the global environment.

A study done by **Mr Ishwor Raj Chalise (2004)** entitled with *"Profit planning in Manufacturing Company (a case study of Makalu Beverage Pvt.Ltd Jomsom, Jumla)"*.

The primary objective of this research was to highlight the system of profit panning applied and its effectiveness in Makalu Beverage Pvt. Ltd. in coordination to these main objectives that was focused to meet the following objectives.

- To evaluate the variances between target and actual of Makalu Beverage Pvt.Ltd.

- To analyze the various functional plans formulated and implemented in Makalu Beverage Pvt. Ltd.

- To examine the practice and effectiveness of profit panning in Makalu Beverage Pvt. Ltd.

- To evaluate the profit planning process applied in Makalu Beverage Pvt. Ltd with conceptual prescriptions.

- To point out feasible suggestion and recommendation to make betterment of Nepalese alcoholic manufacturing enterprise with special reference on Makalu Beverage Pvt. Ltd.

- To analyze the various functional budgets adopted in this enterprise.

On the basis of different analysis, observation and informal discussion, the following major findings have been drawn;

- The company has no panning division; it has no skilled and expert planners as well.

- The company has no proper practice of cost segregation.

- Yearly budget for income and expenditure prepared by general manger with mutual cooperation of other top level managers and which the board of directors finally approves. The middle and lower level manager and other workers are not participated in preparing the budget.

- The company has been suffering from many internal and external factors in formulating and implementing plans. However, it has no proper practice of environment scanning.

- In Makalu Beverage Pvt. Ltd target sales is more variable than actual sales because there is no any proper plan and policy during the operating period of the company.

- Makalu Beverage Pvt. Ltd there is detail plan of manpower and systematic approach to labour planning. The company plans for direct labor hour and direct labour cost needed to produce the planned quantities of goods.

- The company has not a practice of preparing long range production plan; The Company prepares annual production plans of each product.

- The company has no depth analysis of the company's strength and weakness or opportunity and threats.

- The company has no practice of sales forecasting Sales and production are made on ad- hoc basis.

- The company has not a problem in production labour force and material but suffers from unavailability of market.

  Some suggestions have been recommended on the basis of major finding of the study of profit planning in Makalu Beverage Pvt. Ltd.

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

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

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

- The company should make every effort to run the existing plans and utilize the idle equipment and facilities.

- For better performance, company should prepare strategic and tactical profit plans.

- Makalu Beverage Pvt. Ltd should appoint reliable agents and dealers to improve its sales performance.

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

- Modern strategic management system should be introduced instantly.

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

A study done by **Mr. Madav Rijal (2005)** had studied on the topic *"Cost Volume Profit Analysis to Measure the Effectiveness of Profit Planning and Control (a case study of Gorkha Bruary Pvt. Ltd.)"*. The study was based on both primary data as well as secondary data and analysis was based on only five years data.

The main 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 Gorkha Bruary'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 Gorkha Bruary'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. This contributes for lower contribution margin.

- Gorkha Bruary 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.

- Gorkha Bruary 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;

- Gorkha Bruary Pvt.Ltd. 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 Gorkha Bruary Pvt.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 fished cost.

- All personnel should be participated on decision making and planning process.

A study done by **Mr. Yam Prasad Gautam (2006)** has studied on the topes of *"An Analytical and Comparative study on Cost Volume Profit Analysis of Arun Beverage Pvt.Ltd Arun Khola, Nawal parasi and High line distillery Pvt.Ltd."* *Satungal Lalitpur.* His research was in partial fulfillment of MBS, submitted to the Nepal commerce campus, TU. His objective of the study was;

- To calculate of profit resulting from a budgeted sales volume.

- To calculate break even point, CM analysis, margin of safety analysis and profit volume analysis.

- To calculate sales volume to produce desire profit

- To contemplate the increase or decrease in profit due to the change in volume of production

- To suggest and recommended with the help of major findings.
- To encourage greater use of CVP approach to the alcoholic manufacturing enterprise in profit planning and control.

Mr. Gautam has pointed out various findings and recommendations based on the analysis of data and information.

Some of the major recommendations are as follows.

- Classification of expenses items as variable and fixed or controllable and non controllable must be made with in specific framework of responsibility and time.

- Separate cost control department should be established for the effective management of cost.

- Arun Beverage and Highline Distillery should be consider BEP analysis while preparing sales plan, production plan and selling price of its products.

- Both companies 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 cost should be identified and controlled.

- As Arun Beverage and Highline diltillery are alcoholic manufacturing companies, more emphasis should be provided the product having high contribution so as more have more profit.

- Some person of profit should be allocated to research and development program so that new technology could be found which provide more competitiveness in the market.

- Arun Beverage and Highline Distillery should have proper manpower planning.

- System of periodical performance reports should be strictly followed to be consists about poor performance and take corrective action immediately and timely.

- New market areas should be identifying for the coverage of increased activities of companies.

- A systematic approach should be made towards comprehensive profit. This can considerably contributed to the increase in profitability to Arun Beverage and Highline Distillery Since separate on of cost in to their fixed and variable

elements each and the heart of CVP analysis, all decision makers sought to be fully aware of, and understand the cost structure of their operation otherwise CVP analysis will provide meaning less information.

A study done by **Mr. Udya Kumar Dahal (2006)** has studies on the topics of *"Cost Volume Profit Analysis as a tool to measure the Effectiveness of Profit planning with special reference to Highline Distillery Pvt. 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;

- Examine the variance between target and actual sales and production.
- To show the capacity utilization of Highline Distillery Pvt. 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 Highline Distillery Pvt. Ltd.

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

- Highline Distillery Pvt. Ltd constitutes lack of adequate inventory policy.
- No control over external factor i.e. it has poor SWOT analysis.
- Highline Distillery Pvt. Ltd does not prepare strategic and policies for long term.
- Highline Distillery Pvt Ltd is not able to coordinate among various departments.
- Highline Distillery 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.

- Highline Distillery 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.

2.17   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 multi product cost volume profit analysis as a tool of profit planning and control in the different Alcoholic manufacturing Organizations.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0   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 useful for further application or utilization. The research involves in the discovery of new techniques, a modification of old concepts or a knocking off an existing theory, concept or technique. It may develop a hypothesis and test it by establishing relationship between different variables and identify the means for problem solving.

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

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

3.1   Research Design

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 their achievement and effective application within the conceptual framework of profit planning for solving the problems that has accrued in Himalayan Distillery. 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.

3.2   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

The population of the study would be alcoholic manufacturing enterprises of Nepal. There are 16 alcoholic manufacturing enterprises in Nepal but only two alcoholic mfg enterprises will be selected for the sample of this research study, which is 12.5% of the total alcoholic mfg enterprises. United Spirits Nepal Pvt. Ltd. & Himalayan distillery Limited   are the major alcoholic manufacturing companies in Nepal. These companies are also competitor each other in the market. So for the convenience United Spirits Nepal Pvt. Ltd. & Himalayan Distillery Ltd. will be selected   for sample study.

3.3   Source and Types of Data

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. However, the general classification of data sources has the following dimensions.

i.)   Primary Data:

Primary data are original data generated by the researcher for the research project at hand. Thus, these data are collected through interviews questionnaires, observations and direct meeting with concerned persons.

ii.)   Secondary Data:

Secondary data refer to those for already gathered by other. The sources of secondary data can be divided into two groups: Internal and external. The internal secondary data are found within the collected from published document of the company.

Mainly data sources depend upon annual reports, publications as well as website of concerned organization. External secondary data are collected from sources outside the company. Such sources may include books, periodicals, published reports, data services and computer data banks etc.

3.4   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.

3.4.1 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 a accumulating facts. It does not necessary seek to explain relationships, test hypothesis, make predictions, or get at meanings and implications of a study.

3.4.2 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

3.5   Method of Data Collection

Both primary and secondary data were used in the study. The secondary data were collected from the company's annual reports and other related document, company's website and books published reports etc.

Following Accounting tools and statistical tools are   used for the analysis of secondary data.

3.5.1 Accounting tools

3.5.2 C-V-P Analysis

C-V-P Analysis was included the following techniques:
1.**Contribution margin**: It is the excess of sales price of a unit of output over its variable costs.

Contribution Margin (CM) = Sales – Variable Cost

2.**Contribution margin ratio**: It express the relationship of profit contribution to sales.

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

3.**Break even point**: It is the levelof activity where total cost is equal to total sales. It is the point of no profit, no sales.

a.Break Even Point (BEP) in units $= \dfrac{TotalFixedCost}{SPPU - VCPU}$

b.Break Even Point (BEP) in Rs. $= \dfrac{TotalFixedCost}{CMRatio}$

c.Break Even Point (% of capacity) $= \dfrac{BEPinUnits / Rs}{TotalCapacityinUnits / Rs}$

d.Cash BEP(in Rs) $= \dfrac{FixedCost - NonCashOutlay}{1 - \dfrac{VariableCost}{Sales - NonCashOutlay}}$

4.**Break-even point in a changed situation.**

a.Required sales for desired profit (in units) $= \dfrac{FC + Desired\ \Pr ofit}{CMPU}$

b.Required sales for desired profit (in Rs) $= \dfrac{FC + Desired\ \Pr ofit}{CMRatio}$

c. Required sales in units for DPAT $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{CMPU}$

d.Required sales in Rs for DPAT $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{CMRatio}$

5.**Margin of safety**: It is the excess of the budgeted sales or actual sales over the break-even sales volume.

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

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

c. Margin of safety Ratio $= \dfrac{Actual / BudgetedSales - BESales}{Actual / BudgetedSales}$

6.For Multi product Firm

a.Overall BEP (in units) $= \dfrac{TotalFixedCost}{WeightedCMPU}$

b.Overall BEP in Rs. $= \dfrac{TotalFixedCost}{WeightedCMRatio}$

c.Required Sales for desired profit (in units) $= \dfrac{FC + Desired\,\Pr ofit}{WeightedCMPU}$

d.Required sales for DP (in Rs.) $= \dfrac{FC + Desired\,\Pr ofit}{WeightedCMRatio}$

e.Required sales for DP after tax (in Rs) $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{WeightedCMRatio}$

f.Required sales for DP after tax (in Units) $= \dfrac{FC + \dfrac{DPAT}{(1-T)}}{WeightedCMPU}$

3.5.2 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

a.)   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.

b.)   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 denoted by $\overline{X}$. It is defined by the following formula:

Mean ($\overline{X}$) $= \dfrac{\sum X}{N}$

Where,

$\sum X =$ the sum of observations

N = no. of observation

c.) 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:

$$\text{Co-efficient of correlation (r)} = \frac{N\sum XY - \sum X . \sum Y}{\sqrt{[N\sum x^2 - (\sum x)^2]}\sqrt{[N\sum Y^2 - (\sum Y)^2]}}$$

➢ 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.

d.) Coefficient of determination (r^2):

A meaningful analysis is available from the square of correlation coefficient (r^2), which is called the coefficient of determination and calculated using the following formula:

Co-efficient of determination (r^2)

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

OR

$$r^2 = r \times r$$

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

e) Regression analysis:

Simple Regression Analysis:

Regression and correlation analysis are the techniques of studying how the variations in one series are related to variations in another series. Measurement of the degree of relationship between two or more variables is correlation analysis and using the relationship between a known variables and unknown variables to estimate the unknown one is termed as regression analysis. Thus, correlation measures the degree of relationship between the variables while regression analysis shows the variables are related.

Multiple Regression analysis:

Assuming that the variables are closely related, we can estimate the unknown value of one variable from the given or known values of the other variables. Multiple regression analysis, is a logical extension of the simple linear regression analysis. In multiple regression analysis, instead of a single independent variable, two or more independent variables are used to estimated the unknown values of a dependent variables. The fundamental concepts in multiple regression are similar to those of simple regression.

f)   Trend Analysis :

The collection of readings of data regarding to different time period is called time series. There are two variables in this case one must be time and other variables may be population, production, sales, profit etc., a widely and most commonly used method to describe the trend is the method of least square.
The equation of trend line where the dependent variable Y is determined by,

$$Y = a + bx$$
Where,

Y = values of dependent variables
a = y- intercept
b =slope of the trend line
x = values of independent variables

g)   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:

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

h)   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,

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

i)   Testing Hypothesis:

A quantitative statement about the population parameter is called a hypothesis. In other words, it is an assumption that is made about the population parameter and then its validity is tested. It may or may not be found valid on verification. The act of verification involves testing the validity of such assumption which, when undertaken on the basis of sample evidence, is called statically hypothesis or testing of hypothesis or test of significance.

Generally, two complementary hypotheses are set up at one time. It one of the hypotheses is accepted, then the other hypothesis is rejected and vice versa. The two complementary hypotheses that are set up in the testing of hypothesis are the null hypothesis and the alternative hypothesis.

Null Hypothesis: A statistical hypothesis or assumption made about the population parameter to testing its validity for the purpose of possible acceptance is called null hypothesis. Null hypothesis is also called hypothesis of no difference. We should adopt neutral or null attitude regarding the outcome of the sample while setting up the null hypothesis. The null hypothesis is usually devoted by H_O.

Alternative Hypothesis: A complementary hypothesis to the null hypothesis is called an alternative hypothesis. In other words, a hypothesis, which is set up against the null hypothesis, is called an alternative hypothesis. An alternative hypothesis is called hypothesis of difference. It is usually denoted by H_1.

To make the research specific, precise and objective, hypothesis has been posed related to the significant or insignificant relation between cost, volume and profit.

H_O: $\mu_1 = \mu_2 = \mu_3$ there is no significant difference between average cost, volume and profit.

H_1: $\mu_1 \neq \mu_2 \neq \mu_3$ there is significant difference between average cost, volume and profit.

3.5.3 Variables of Studied

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 are assumed:

Table no. 3.1: 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 Primary data collection

The primary data were obtained through general discussion as well as questionnaire method followed in most cases face to face interviews with the concerned person of the profile of the respondents can be shown in the following way

Table no. 3.6 : profiles of Respondents

S.N.	Categories of Respondent	Questionnaires	
		Number	%
1	Top Level	12	60
2	Middle Level	5	25
3	Lower Level	3	15
	Total	**20**	**100**

(Source: Primary data of HDL&USNPL), appendix III)

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.0 Introduction

Profit planning is used for development and acceptance of proper objectives and goals for an organization. It is also used to move the organization efficiently to achieve pre-set objectives and goals. In profit planning, cost-volume-profit analysis can be the most important device to utilize the cost with effective and efficient way. CVP analysis has become a powerful instrument in managerial decision making specially cost control and profit planning. The CVP analysis is a specific way of presenting and studying the inter-relationship between cost, volume and profit.

4.1 Analysis of Budgeted and Actual Sales

HDL and USNPL are the alcoholic manufacturing company producing and selling different types of alcoholic products. The attempt begins to present and analyze the previous budgeted sales and actual sales performance. The following table presents the budgeted and actual sales achievement from fiscal year 2062/63 to 2066/67

Table no 4.1
Total Budgeted and Actual Sales Volume of HDL

Year	Budgeted sales	Actual sales	Achievement in %
2063/64	646,846,800	94,865,090	14.67
2064/65	543,148,000	203,585,108	37.48
2065/66	469,312,000	314,578,626	67.03
2066/67	694,425,821	453,598,946	65.32
2067/68	750,343,377	529,559,164	70.56

Source: Annual Reports of HDL (F/Y 2063/64 to 2067/68)

Table no 4.2
Total Budgeted and Actual Sales Volume of USNPL   '000'

Year	Budgeted sales	Actual sales	Achievement in %
2063/64	27,180.67	26,995.05	99.32
2064/65	28,286.00	30,177.02	106.69
2065/66	27,351.34	27,287.90	99.77
2066/67	32,596.28	32,270.23	98.99
2067/68	38,535.16	36,608.41	95.00

Source: Annual Reports of USNPL (F/Y 2063/64to 2067/68)

The above table no 4.1 and 4.2 shows that there are differences of budgeted and actual sales of HDL and USNPL. By analysis of the total sales revenue of both companies the budgeted sales and the actual sales of USNPL is less fluctuating than that of HDL.

The actual sales shown on the table above are according to invoice issued. The sales are not included excise duty, VAT and other tax. The taxation and charges were shown in the balance sheet of the company as current liabilities.

The above table can be illustrated in fig. no.4.1(a), 4.1(b) and in fig no.4.2(a) and 4.2(b)

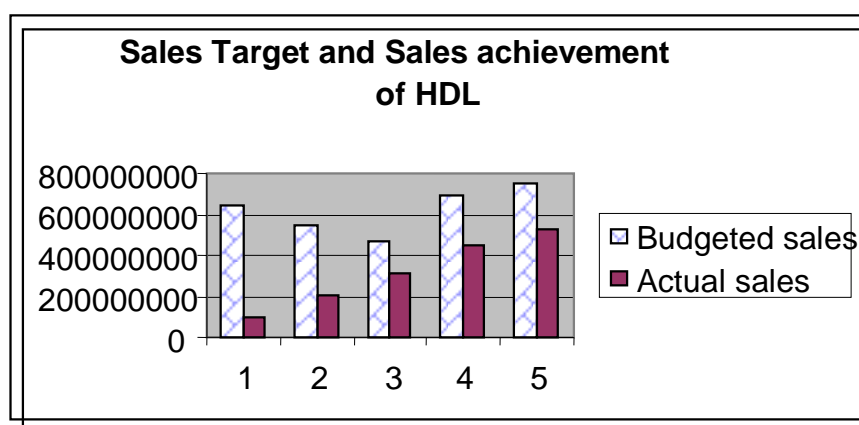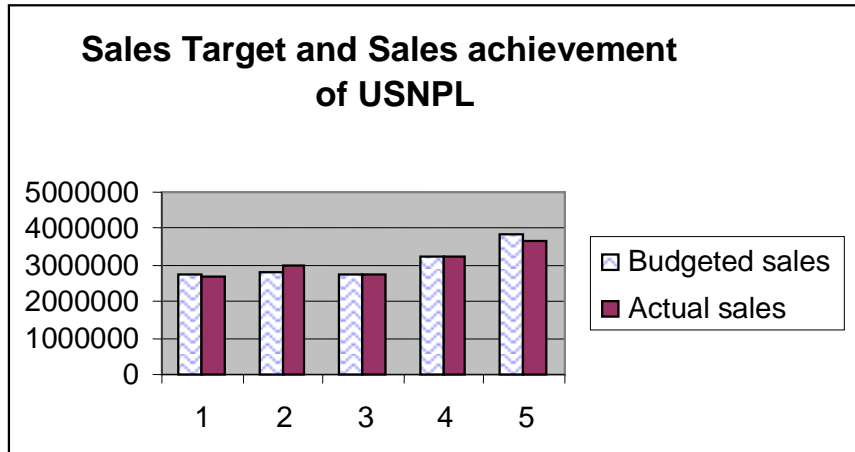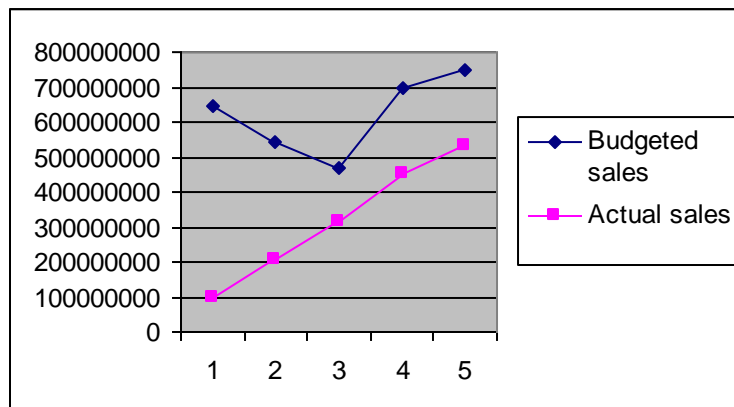**Figure no 4.1(a)**

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**Sales Target and Sales achievement
of USNPL**

Fiscal year

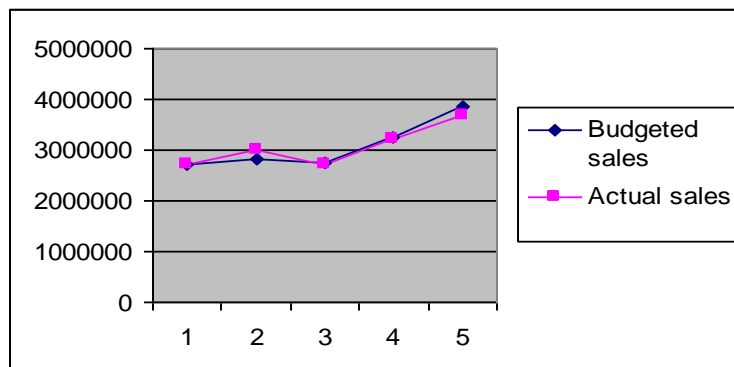**Figure no 4.2(a)**

Sales Target and Sales Achievement of HDL

Fiscal year

Figure no 4.2(b)

Sales Target and Sales Achievement of USNPL

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In the above figure the fiscal years is given in X-axis and the budgeted sales and actual sales are given in the Y-axis. By the analysis of the four figures we get that the budgeted sales and the actual sales of USNPL is less fluctuating than that of HDL.

The above tables and the figures shows that there is gap between the actual sales and the budgeted sales in the fiscal years annually.. The factors which are responsible for the variation in sales revenues are demand conditions of the products, cost of the product, political situations of the company political conflict, government policies, socio-cultural conditions of the country, tough competition with imported products e.t.c. Apart from the above mentioned causes there are other reasons such as depression in international economic activities, transportation problem, insecurity, Maoist insurgency e.t.c. directly or indirectly causes the variation of sales.

The achievement in percentage of both companies is increasing. The achievement in percentage of HDL in the fiscal years (2063/64, 2064/65, 2065/66, 2066/67, 2067/68) are 14.67%, 37.48%, 67.03%, 65.32%, 70.56% respectively. The achievement in percentage of USNPL in fiscal years (2063/64, 2064/65, 2065/66, 2066/67, 2067/68) are 99.32%, 106.67%, 99.77%, 98.99% and 95.00% respectively. By comparing the achievement in percentage we can expect that the gap between the budgeted sales and the actual sales can be fulfilled in the future.

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

Here, Actual sales = X   Budgeted Sales = Y

Table no 4.3(a)

Summary of statistical calculation of HDL

Statistical Tools	Actual Sales (X)	Budgeted Sales (Y)
Mean ($\overline{X}$)	319.24	620.82
Standard Deviation(δ)	158.76	101.84
Coefficient of Variation (C.V.)	49.73	16.4
Correlation Coefficient (r)	0.51	
Coefficient of determination (r^2)	0.2601	
Probable Error (P.E)	0.223	

Source: Calculation from appendix - I

Table.No.4.3(b)
Summary of statistical calculation of USNPL

Statistical Tools	Actual Sales (X)	Budgeted Sales (Y)
Mean ($\overline{X}$)	30,667.57	30,789.89
Standard Deviation(δ)	3,367.49	4,344.46
Coefficient of Variation (C.V.)	10.98	14.11
Correlation Coefficient (r)	0.97	
Coefficient of determination (r^2)	0.94	
Probable Error (P.E)	0.0179	

Source: Calculation from appendix - I

The calculate value of different statistical tools presented above in table no 4.3 shows that budgeted sales mean is grater than actual sales mean in both Organizations. But standard deviation of actual sales is greater than the budgeted sales in HDL vise versa in USNPL. The coefficient of variation of actual sales is more than coefficient of variation of budgeted sales in both Organizations. This shows that the budgeted sales fluctuated less than actual sales for the companies. Having smaller C.V. budgeted sales are more homogenous or less variable or uniform or more consistent than actual sales.

Similarly, table 4.3(a&b) shows that the correlation co-efficient between two variables (i.e. Budgeted sales and Actual sales) is 0.51and 0.97 in HDL and USNPL respectively. It shows that there is positive correlation between two variables of the HDL and Highly positive correlation between two variables of USNPL.

The significance of correlation is tested with probable error. The value of correlation coefficient is greater than 6 PE (i.e. $0.51 < 6 \times 0.223$) the calculated value of r is significant for HDL whereas the value of correlation coefficient is less than 6 PE (i.e. $0.97 > 6 \times 0.0179$) the calculated value of r is insignificant for USNPL.

Simple Regression Equation:

Regression is the estimation of unknown values or prediction of one variable from known values of other variables. For examples, the yield of a crop depends on the amount of rainfall, expenditure of a person depends on his income etc.

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Calculation:

Simple regression equation of HDL between Budgeted sales (Y) on Actual sales (X) be

Y = a + bx ………………. (i)

Then the two normal equations estimating a and b are,

$$\sum Y = na + b \sum X \quad …………………\text{(ii)}$$

And $\sum XY = a \sum X + b \sum X^2$ …………….. (iii)

Also let regression equation of X on Y be

X = a + bY ……………….. (iv)

Then two normal equations estimating a and b are:

$$\sum X = na + b \sum Y \quad …………….. \text{(v)}$$

And $\sum XY = a \sum Y + b \sum Y^2$ ……….. (vi)

Regression equation table

Company	Regression equation	Valve(a) constant	Regression (coefficient)
HD2	Y = 677.99 – 0.179016x	677.9	–0.179016
USNPL	Y = 0.61242 + 0.7970x	0.61242	0.7970.

From the above regression table we can get that, the regression equation of Actual sales in HDL and USNPL. According to the table regression equation of Budgeted sales on actual sales is y = 677.99 – 0.179016x in HDL is in Negative. The value a constant is positive i.e. 677.9 but the regression coefficient (b) is negative i.e. – 0.17901 which indicates that the negative relationship exists between Actual sales and Budgeted sales. It can be said that if budgeted sales is decrease then actual sales also decrease.

Similarly in the case of USNPL, according to the table the regression equation of Budgeted sales on actual sales

Y = 0.61242 + 0.7970x in USNPL is positive. The value a constant is positive i.e. 0.61242, and the regression coefficient (b) also is positive (i.e. 0.7970) which indicates that the positive relationship exists between actual sales and Budgeted sales

of USNPL. It can be said that if budgeted sales is increase and then sales is increase and then actual sales will also increase.

Multiple regression equation:

The multiple regression equation describes the average relation ship between one dependent variable and two or more independent variable and this relation ship is very much useful for estimating the dependent variable. Thus as multiple regression equation of X_1 on X_2 and X_3 is an equation for estimating a dependent variables X_1 from two independent variables X_2 and X_3.

The multiple regression equation of dependent variable X_1 on two independent variables X_2 and X_3 is given by

$$X_1 = a_1 + b_1X_2 + b_2X_3 \ldots\ldots\ldots\ldots\ldots \text{(i)}$$

Where,

$\Rightarrow a_1 = X_1$ – intercept = The value of X_1 when two independent variables X_2 and X_3 are zero.

$\Rightarrow b_1$ = the partial regression coefficient of X_1 and X_2 when X_3 is held constant (i.e. the changes in X_2 for each unit change in X_2 while X_3 is held constant.

$\Rightarrow b_2$ = the partial regression coefficient of X_1 on X_3 when X_2 is held constant.

The values of the constants a_1, b_1 and b_2 and be obtained by solving the following 3 normal equations simultaneously obtained by the method of least squares.

$$\left. \begin{cases} \sum X_1 = na_1 + b_1\sum X_2 + b_2\sum X_3 \\ \sum X_1 X_2 = a_1\sum X_2 + b_1\sum X_2^2 + b_2\sum X_2 X_3 \\ \sum X_1 X_3 = a_1\sum X_3 + b_1\sum X_2 X_3 + b_2\sum X_3^2 \end{cases} \right\} \ldots\ldots\ldots\ldots\ldots \text{(ii)}$$

Where

$$\left. \begin{array}{l} X_1 = sales \\ X_2 = \cos t \\ X_3 = profit \end{array} \right\} in\ '000'$$

Multiple Regression Table

Company	Multiple regression	Value a_1	Regression b_1	Regression b_2
HDL	$X_1 = 1094.18 + 32.029x_2 + 2.1678x_3$	(1094.18)	32029	2.1678
USNPL	$X_1 = 28.7107 + 0.0211x_2 + 0.900x_3$	28.7107	0.0211	0.0900

According to the table regression equation of HDL of sales on cost and profit (ii) $X_1 =$ $(-1094.18) + 32.092x_2 + 2.1678x_3$. q_1 is constant is Negative and the regression coefficient is positive (i.e. $b_1 = 32.029$) and b_2 is 2.1678, indicates that there exists the positive relationship between sales, costs and profit and It shows that if the sales is decrease Net profit and the cost also decrease and if the sales is increase profit and cost will also increase.

According to the table regression equation of USNPL of sales on cost and profit we get, $X_1 = 28.7107 + 0.211x_2 + 0.0900x_3$ in which q_1 constant is positive and the regression coefficient b_1 and b_2 are also positive i.e. 0.0211 and 0.0900 which indicates that there exists the positive relationship between sales, profit and cost. It shows that if sales is increase the cost and Net profit are also increase and if sales is decrease cost and Net profit will also decrease

Trend Analysis

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

$Y \quad = \quad a + bx$

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

$$\sum Y \ = na + b\sum x \text{ ------------------ (1)}$$
$$\sum xy = a\sum x + b\sum x^2 \text{---------------- (2)}$$

Calculation of the trend of total sales of HDL

(Amount in Million)

Year (X)	Total Sales(Y)	X = (x-2063/64)	XY	x^2
2062/63	94.87	-2	-189.74	4
2063/64	203.59	-1	-203.59	1
2064/65	314.58	0	0	0
2065/66	453.59	1	453.59	1
2066/67	529.56	2	1,059.12	4
Total	$\sum Y = 1596.19$	$\sum X = 0$	$\sum XY = 1,119.38$	$\sum x^2 = 10$

Therefore, a = 319.24 and b = 111.94

Thus, y = 319.24 + 111.94 x, is the trend line of sales figure which shows the positive sales revenue in the future

By using this trend equation we can estimate the actual sales, for the F/Y 2066/67

Y = 319.24 + 111.94 x 3

   = Rs. 655.06 Million

Therefore, if the trend doesn't change, the possible sales for the year 2066/67 will be Rs. 655.06 million.

Table 4.5(a)

Calculation of the trend of total sales of USNPL

(Amount in Million)

Year (X)	Total Sales(Y)	X = (x-2064/65)	XY	x^2
2062/63	2,699.5	-2	-5,399	4
2063/64	3,017.7	-1	-3,017.7	1
2064/65	2,728.7	0	0	0
2065/66	3,227.0	1	3,227.0	1
2066/67	3,660.8	2	7,321.6	4
Total	$\sum Y = 15,333.7$	$\sum X = 0$	$\sum XY = 2,131.9$	$\sum x^2 = 10$

Therefore, a = 3,066.74 and b = 213.19

Thus, y = 3,066.74 + 213.19x, is the trend line of sales figure which shows the positive sales revenue in the future

By using this trend equation we can estimate the actual sales, for the F/Y 2066/67

Y = 3,066.74 + 213.19 x 3

= Rs3,706.31 Million

Therefore, if the trend doesn't change, the possible sales for the year 2066/67 will be Rs. 3,706.31 million.

4.1.1 Analysis of Sales by the Alcoholic Manufacturing Companies as a whole

Three product lines of HDL and USNPL are selected for further analysis and interpretation. The following table shows the sales figure of selected company sales.

Table 4.5(b)

Actual sales of HDL   *(Rs. in '000')*

Year	Actual sales	Change %
2063/64	94,865.09	-
2064/65	203,585.11	114.61
2065/66	314,578.63	54.52
2066/67	453,598.95	44.19
2067/68	529,559.16	16.75

The above table 4.5(b) shows that the actual sales of HDL is increasing annually in the five fiscal years (2063/64, 2064/65, 2065/66, 2066/67, 2067/68) but the percentage change in sales is very high in the fiscal year (2063/64) and decreasing annually in the following three years.

The above table 4.5(b) can be shown in the bar diagram also. See fig. 4.3(a).

Figure 4.3(a)
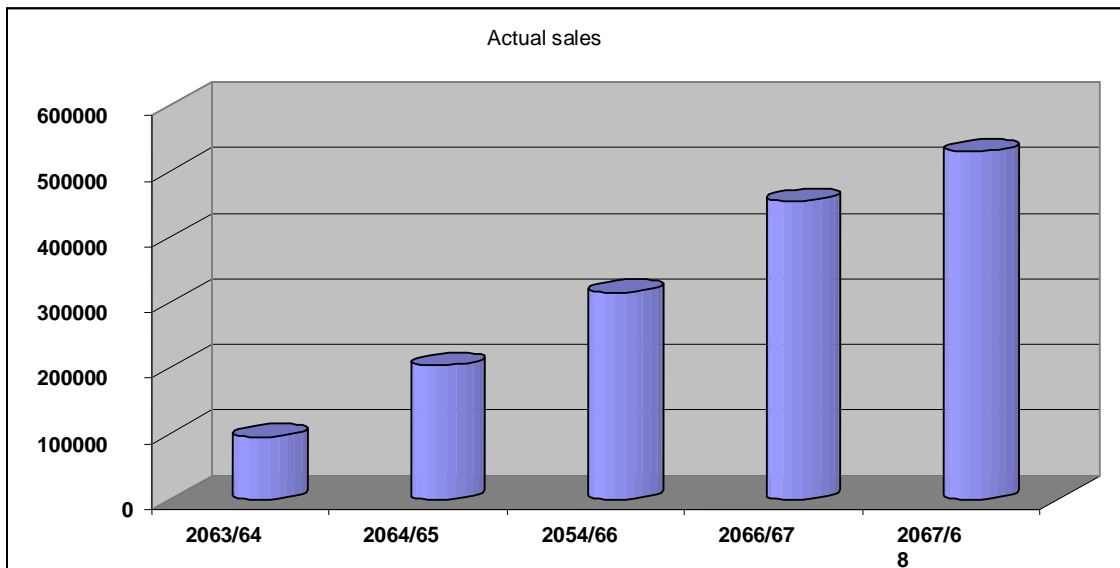
Actual sales

Source: Annual Report of HDL (F/Y 2062/63 to 2066/67)

In the above figure the five fiscal years are given in x-axis and the actual sales are given in the y-axis. By the analysis of the diagram we can find that the sales are increasing annually in the following fiscal years.

Table 4.5(c)

Actual sales of USNPL   *(Rs. 000)*

Year	Actual sales	% Change
2063/64	26,995.05	-
2064/65	30,177.02	11.79
2065/66	27,287.90	-9.57
2066/67	32,270.23	18.26
2067/68	36,608.41	13.44

The above table 4.5(c) shows that the actual sales of USNPL is increasing in the year 2064/65 than that of 2063/64, but it is decreasing in the next year 2065/66 and it is increasing annually in the year 2066/67 and 2067/68. The percentage change in sales is increasing in the year 2064/65 and it is negative in the year 2065/66 and the percentage change in sales is increasing rarely in the fiscal year 2066/67 and it is again decreasing in the year 2067/68. The above table can be shown in bar diagram also. See fig. 4.3(b).

Figure 4.3(b)
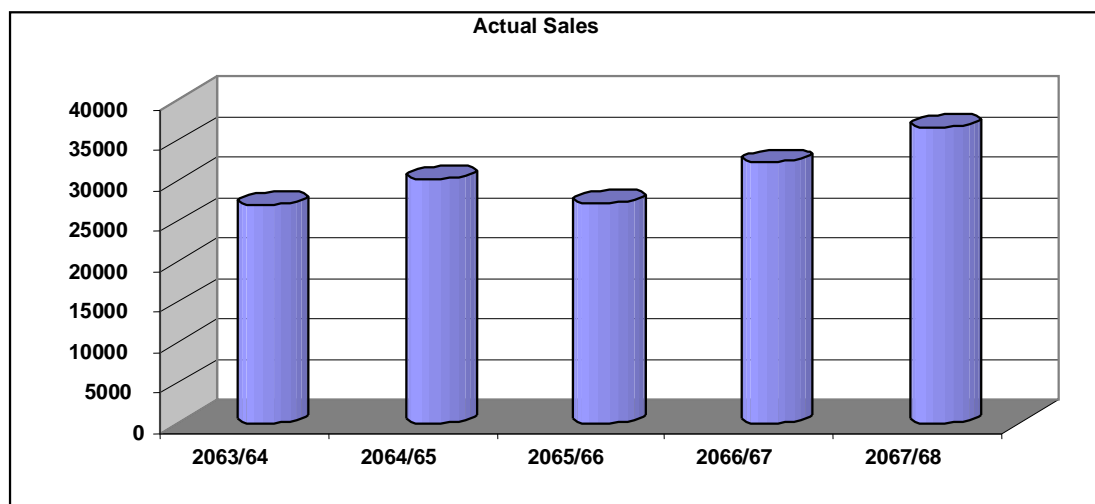
Actual Sales

Source: Annual Report of USNPL (F/Y 2063/64 to 2067/68)

In the above figure the five fiscal years are given in x-axis and actual sales are given in the y-axis. The sales is increasing in year 2064/65 and decreasing in 2065/66 and it is rarely increasing in the year 2066/67 and in 2067/68.

From the above analysis we get that the sale figure is in increasing gradually for company HDL where as the sales of USNPL are fluctuating. For USNPL, in F/Y 2065/66, sales percentage change is negative; however the sales are in the positive trends. For company HDL, the sales trend is in increasing in gradual way whereas in the company USNPL, the sales increasing but fluctuating.

The responsible factors which affect the sales of the company are inflation, deflation, political instability, government policies, socio-cultural conditions, transportation problems, insecurity, etc.

4.2 Profit (Loss) Pattern of HDL &USNPL

Profit is the major element of each and every business endeavors for survival, further development and fulfilling social expectation. In modern business, effectiveness and efficiency of any business organization or management are measured from profit.

For HDL, it is suffering from loss from the beginning of its operation year. The profit (loss) pattern of HDL is presented below. The profit (loss) pattern is analysis on the basis of actual sales achievement

For USNPL, it is gaining really the fruitful profit in the beginning of the research year but decreasing in the last years of research. Profit is just brought for their annual report.

<div align="center">

Table no 4.6

Profit (loss) trend of HDL

</div>

<div align="right">

(Rs. in '000')

</div>

Year	Sales		Profit (Loss)	
	Rs.	**% Change**	**Rs.**	**% Change**
2063/64	94,865.09	-	(62,168.12)	-
2064/65	203,585.11	114.61	(44,142.23)	(28.99)
2065/66	314,578.63	54.52	(21,138.36)	(52.11)
2066/67	453,598.95	44.19	(13,676)	(35.30)
2067/68	529,559.16	16.75	(10,396.70)	(23.98)

<div align="right">

Source: Annual Report of HDL (F/Y 2063/64 to 2067/68)

</div>

<div align="center">

Table No 4.7

Profit (loss) trend of USNPL   *(Rs. in '000')*

</div>

Year	Sales		Profit (Loss)	
	Rs.	**% Change**	**Rs.**	**% Change**
2063/64	26,995.05	-	1,773.63	-
2064/65	30,177.02	11.79	2,033.01	14.62
2065/66	27,287.90	-9.57	472.90	-76.74
2066/67	32,270.23	18.26	158.53	-66.48
2067/68	36,608.41	13.44	55.89	-64.74

<div align="right">

Source: Annual Report of USNPL (F/Y 2063/64to 2067/68)

</div>

The above table no 4.7 shows that the profit (loss) trend is decreasing annually with fluctuation in HDL and profit (loss) is fluctuating in USNPL. The decreasing rates of losses are 28.99%, 52.11%, 35.30% and 23.98% in fiscal year 2062/63, 2063/64, 2064/65 and 2065/66in HDL respectively. For USNPL, the changes of profit are decreasing in the fiscal year 2066/66, 2066/67 and 2067/68by 76.74%, 66.48% and 64.74% respectively rather than the year 2063/64.

The sales and profit trends of the two companies HDL and USNPL are can be shown in the following diagram. See the figure 4.3(c) and 4.3(d).

Figure No 4.3(c)
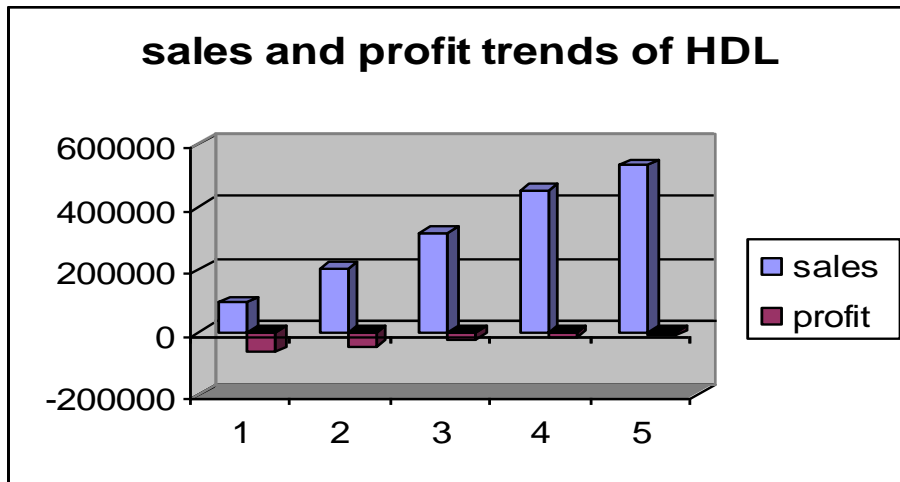
Fiscal year

Figure No 4.3(d)

Fiscal year

4.3 Cost Analysis of HDL and USNPL

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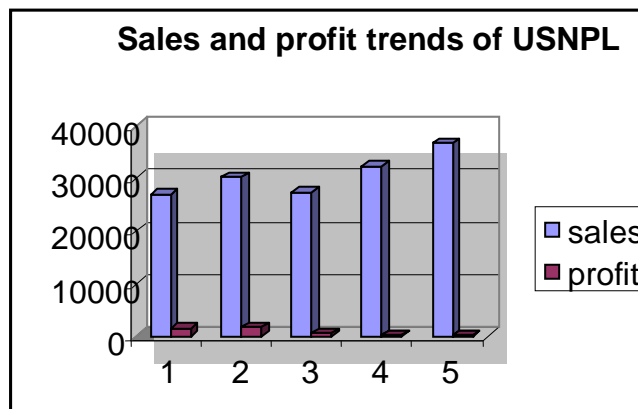and controlling should focus on the relationship between expenditure and benefits derived from those expenditure. Cost analysis is necessary to attain enterprise goals. There are different types of cost incurred in the company. Generally costs are classified in to four categories, which are:

- Cost of production
- Administrative expenses
- Selling and distribution expenses
- Financial expenses

Cost of production: The costs which are related with production and include raw materials, packaging materials, direct expenses, water and electricity, Royalty, Repair and maintenance, Blending charge, other expenses etc.

Administrative expenses: Administrative expenses are a part of management cost. It includes salary and allowance, P/F contribution, printing and stationary, water and electricity, communication expenses, Bank charges, Repair and maintenance, meeting fesses, Traveling expenses, conveyance and fuel expenses, computer software expenses, AGM expenses, Rent, Taxes and fees, Guest entertainment, Notice publication expenses, security expenses, members fees and subscription, legal and professional fees, insurance premium, Training and Recruitment expense, Miscellaneous expenses etc.

Selling and Administrative expenses: It is the costs incurred for selling and distribution of the product and include: transportation and insurance exp., Advertisement, Hoarding Board Rental, Distributions Meeting exp. Traveling expenses of sales man, complementary expenses, sales promotion expenses, leakage and breakage etc.

Financial expenses: It includes interest on overdraft, interest on term loan etc.

4.3.1 Fixed Cost Analysis

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

Table no 4.8

Fixed cost Details of HDL

Details	Year				
Production Expenses	**2063/64**	**2064/65**	**2065/66**	**2066/67**	**2067/68**
Salary and wages	735,390	907,036	1,359,046	2,117,345	2,892,687
Water and Electricity	275,133	383,072	339,920	681,608	668,182
Repair and Maintenance	135,801	371,129	339,863	274,122	602,756
Total (A)	1,146,324	1,661,237	2,038,829	3,073,075	4,163,625
Selling and Distribution Exp					
Advertisement	2,233,518	5,107,918	2780,922	4,111,870	5,816,518
Hording Board Rental	-	-	604,915	3,113,120	7,374,025
Distributors Meeting Exp.	-	370,671	460,576	1,146,267	1,437,099
Total (B)	2,233,518	5,478,589	3,846,413	8,371,257	14,627,642
Administrative Expenses					
Salary and Allowance	7,959,503	8,327,639	11,191,531	14,083,788	14,335,410
P/F contribution	221,475	217,661	271,503	464,602	573,507
Printing and stationary	364,575	429,685	518,615	686,729	617,987
Water and electricity	44,637	201,038	266,592	328,550	419,718
Communication expenses	1,539,852	1,284,442	2,610,051	2,611,511	2,997,966
Bank Charge	246,594	403,446	636,796	142,318	1,853,094
Repair and maintenance	1,077,383	1,295,111	2,878,677	2,433,513	3,162,264
Meeting fees	48,552	75,000	65,000	57,500	46,500
Traveling expenses	1,673,583	2,781,221	2,896,891	2,007,263	3,661,650
Conveyance and fuel exp.	741,053	794,174	1,825,888	2,116,023	2,691,626
Computer software exp.	-	90,000	24,000	24,000	157,360
AGM exp.	13,000	143,964	43,456	-	-
Rent	716,588	659,823	1,057,164	1,260,638	1,454,155
Taxes and fees	134,992	263,902	376,100	560,322	645,839
Audit Fees	80,000	80,000	90,000	90,000	90,000
Guest entertainment	364,184	459,053	660,584	1,205,005	1,728,675
Notice and publication Exp.	-	39,375	80,137	56,264	311,437
Security Exp.	1,046,404	1,049,886	1,135,035	1,523,291	1,914,083
Member fee and subscription.	132,553	88,704	139,438	124,568	178,256
Legal and professional fees	2,609,119	3,141,898	1,621,147	977,510	1,129,822
Insurance premium	3,292,833	2,161,014	2,079,253	2,401,737	3,290,830

Training and Recruitment	17,500	30,246	8,000	37,210	30,700
Miscellaneous exp.	1,048,448	756,968	288,469	1,385,187	1,097,540
Total (C)	23,372,828	24,774,250	30,764,327	34,577,529	42,388,419
Depreciation (D)	21,190,039	21,626,888	2,2043,661	22,332,192	22,736,872
Interest on long term loan(E)	25,493,333	25,493,333	24,535,798	22,667,944	21,788,571
Total Fixed Cost (A+B+C+D+E)	**73,436,042**	**79,034,297**	**83,229,028**	**9,0997,997**	**105,705,129**
Increase/ Decrease %	**-**	**7.62**	**5.31**	**9.33**	**16.16**

Source: Annual Report of HDL (F/Y 2063/64to 2067/68)

Table no 4.9

Fixed cost Details of USNPL					'000'
Details	**Year**				
Production Expenses	2063/64	2064/65	2065/66	2066/67	2067/68
Salary and wages	512.61	746.31	891.29	1,228.47	1,375.55
Water and Electricity	353.40	340.93	338.37	310.52	391.66
Repair and Maintenance	101.83	169.43	189.34	128.96	140.64
Total (A)	967.86	1,256.67	1,419	1,667.95	1,907.85
Selling and Distribution Exp					
Advertisement	123.97	111.25	113.25	47054	48.67
Hording Board Rental	84.17	93.41	102.5	54.50	88.74
Distributors Meeting Exp.	6.39	.93	.29	.52	.70
Total (B)	214.53	205.59	216.04	102.56	138.11
Administrative Expenses					
Salary and Allowance	27.79	33.81	21.58	29.70	26.73
Printing and stationary	20.78	21.43	21.52	31.80	19.99
Water and electricity	4.21	4.57	13.81	15.89	16.73
Communication expenses	20.78	21.43	21.52	31.80	19..98
Bank Charge	4.21	4.56	13.82	15.89	16.72
Traveling expenses	20.79	21.43	21.53	31.80	19.98
Computer software exp.	50.10	59.61	40.07	12.00	10.51
Rent	16.86	22.70	39.14	30.73	25.00
Taxes and fees	4.10	5.20	6.60	6.26	7.20
Audit Fees	20.00	20.00	25.00	25.00	30.00
Guest Exp.	10.09	23.03	20.06	25.00	33.15
Notice and publication Exp.	366.05	4.57	00	00	00
Member fee and subscription.	15.04	4.83	5.46	5.50	4.70
Legal and professional fees	40.00	2.00	2.00	4.25	3.50
Insurance Premium	16.98	15.99	15.35	16.14	16.19
Training and Recruitment	57.68	26.32	19.80	28.96	12.32
Miscellaneous exp.	23.22	2.41	0.76	2.03	1.34
Total (C)	718.86	293.89	287.34	312.75	264.04
Depreciation (D)	815.33	854.75	631.69	731.06	572.24

Interest on long term loan(E)	1,096.84	1,037.36	1,056.80	1,272.05	1,304.23
Total Fixed Cost (A+B+C+D+E)	**3,813.40**	**3,648.26**	**3,610.77**	**4,092.21**	**4,186.47**
Increase/ Decrease	**-**	**-0.04**	**-0.01**	**0.08**	**0.023**

Source: Annual Report of USNPL (F/Y 2063/64 to 2067/68)

The table No.4.6 shows that the total fix cost of HDL is increasing in every F/Y 2064/65 to 2065/66, 2066/67 and 2067/68 by 7.62 %, 5.32%, 9.33% and 16.16%respectively.And table No.4.7 shows that the total fix cost of USNPL is decreasing in F/Y 2064/65, 2065/66 by 4% & 8% respectively,. But the total fixed costs are increasing in fiscal year 2066/67 and 2067/68 by 8% and 2.3% respectively. However, total fixed costs are fluctuating; the rate of decrease in total fixed cost is increasing.

4.3.2   Analysis of Variable Cost

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

To produce finished goods and transfer these goods to the market, the company bears different types of variables cost. The company's variable cost per unit is varying in different years according to HDL's and USNPL's cost detail sheet; the variable costs are presented in the table no.4.10 and 4.11 respectively.

Table no 4.10

Statement of Detail Variable Costs of HDL

Particulars	2063/64	2064/65	2065/66	2066/67	2067/68
Cost Of Goods Sold					
Material consumed	52,791,589	100,430,437	110,696,440	208,507,556	232,918,659
Direct Expenses of purchase	-	-	27,624,338	-	-
Salary and Wages	2,941,560	3,628,142	5,436,182	8,469,380	11,570,747
Royalty	16,677,566	39,353,267	59,558,440	91,133,093	108,164,594
Water and Electricity	2,017,644	2,809,196	2,492,744	2,726,432	2,672,730
Repair and Maintenance	543,205	1,484,517	1,359,451	1,096,490	2,411,025
Blending charges	1,317,783	720,270	1,281,035	1,528,925	1,388,520
Other Expenses	127,993	174,894	799,610	671,958	1,895,953
Total (A)	76,417,340	148,600,723	209,248,40	314,133,834	36,102,2228

Selling and Distribution Exp.					
Transportation & insurance exp.	1,589,167	4,473,749	8,588,130	13,155,969	15,695,919
Traveling exp. & salesman	2,258,036	2,457,080	2,869,649	3,635,295	3,532,756
Complementary exp.	130,733	2,696,753	4,300,342	4,187,263	2,878,391
Sales promotion exp.	2,671,160	9,513,773	23,138,079	35,302,544	42,607,685
Leakage and breakage	476,803	947,845	4,343,515	4,067,395	7,314,990
Goods in transit insurance	-	-	-	1,794,656	1,198,769
Other expenses	53,932	3,120	-	-	-
Total (B)	7,179,831	2,0092,320	43,239,715	62,143,122	73,228,510
Total Variable Cost (A+B)	83,597,171	168,693,040	252,487,955	376,276,956	434,250,738
Change	-	101.79%	49.67%	49.03%6	15.41%

Source: Annual Report of HDL (F/Y 2063/64to 2067/68)

Table no 4.11
Statement of Detail Variable Costs of USNPL

'000'

Particulars	2063/2064	2064/65	2065/66	2066/67	2067/68
Cost Of Goods Sold					
Material consumed	19,292.15	22,155.09	2,0542.52	24,248.45	28,038.68
Direct Expenses of purchase	648.05	694.61	764.51	1,021.47	1,018.67
Salary and Wages	154.80	91.30	40.63	72.17	123.77
Royalty	104.86	34.85	3.87	3.55	51.47
Water and Electricity	18.81	12.55	31.59	36.67	23.08
Repair and Maintenance	192.35	257.50	375.42	443.71	545.80
Blending charges	40.78	57.51	36.22	40.20	29.31
Other Expenses	72.30	40.77	25.94	23.55	7.98
	257.50	323.67	350.22	375.59	506.14
Total (A)	20,788.60	23,668.85	22,178.72	26,269.15	30,350.75
Selling and Distribution Exp.					
Transportation & insurance exp.	226.67	316.18	430.61	960.14	1,139.68
Traveling exp. & salesman	219.77	347.40	402.36	607.06	656.71
Complementary exp.	106.94	94.70	69.24	103.35	104.91
Sales promotion exp.	43.18	34.60	63.19	37.53	54.69
Leakage and breakage	22.86	34.02	60.11	42.93	59.31
Other expenses	6.97	1.00	7.80	3.79	5.84
Total (B)	626.39	827.90	1,033.31	1,778	2,021.15
Total Variable Cost (A+B)	21,408.02	24,495.75	23,204.23	28,020.16	32,366.05
Increase/ decrease	-	0.14	-0.05	0.20	0.15

Source: Annual Report of USNPL (F/Y 2063/64to 2067/68)

Above table No 4.8 and 4.9 shows that there is fluctuation in variable cast under different headings because various factor effected to those cost from different angles.

For the company HDL, all items under selling and distribution expenses are variable cost nature. Material consumed salary and wages, royalty, transportation and insurance expenses, traveling expenses of sales, sales promotion expenses leakage and breakages are increasing annually. Water and electricity are increased in F/Y 2064/65 and 2067/68, but decreased in fiscal year 2064/65 and 2067/68 than the previous year. Repair and maintenance and complementary expenses are in fluctuation condition. Other expenses of cost of goods sold and selling and distribution expenses are increasing and decreasing respectively. The total variable cost is highly increased in the F/Y 2064/65 to Rs. 16,86,93,043 from Rs. 835,97,171, which is 101.79% of the F/Y 2063/2064.In the year 2064/65, the total variable cost is increased by 49.67% from Rs. 168,693,043 and reached to Rs. 252,487,955. In the F/Y 2067/68, the variable cost is reached to Rs. 376,276,956 by increasing 49.03% as compared to F/Y 2064/65. In the final year of the study i.e. 2067/68 the variable cost is increased by 15.41% and reached to Rs. 434,250,738 from Rs. 37,6276,956 of the previous year 2067/68.

For the company USNPL, all the consumable store, and wages and welfare, and electricity power and fuel expenses are in increasing trend where as repair & maintenance expenses are in decreasing trends except F/Y 2067/68. The total variable cost of USNPL are increased by 14%,20% and 15% in fiscal year 2064/65,2066/67 and 2067/68 respectively but whereas the variable cast decrease in year 2065/66. The rate of the increase in total variable cast is higher than the rate of decrease.

4.3.3 Analysis of Semi- Variable or Semi – Fixed Costs

Expenses that can not be categorized as purely fixed or variable is termed as semi variable or mixed cost. Semi-variable casts contain both variable and fixed cost elements. Classification of cost into variable and fixed is very important to plan and control of costs. It helps to determine the volume of operation required to maintain the desired profitability. HDL & USNPL have no practice of using systematic method of practice of classifying the expenses into fixed and variable component. For example, all salary and other administrative expenses are classified as fixed cost since all staffs

are paid monthly basis, but all direct labor cost directly related with production process are classified as variable cost.

Discussion with the company's accountant and other related employees reveal that practice of identification of semi-variable cost and their segregation into fixed and variable was not found.

4.4 Analysis of Sales and Cost Relationship

Cost structure refers to the relative proportion of fixed and variable cost in an organization. There is no categorical answer possible of which cost structure is best. A firm might have many fixed costs but few variable costs or mixed cost and vice versa. A firm's cost structure can have a significant impact on decision; in the matter of risk etc. Company with high fixed cost will incur losses much more quickly than the company with lower fixed cost if the reversionary condition strikes the industry. In sum, company with high fixed cost will experiences wider movement in net income as changes take

place in sales, with greater profit in good year and greater loss in bad year. Company with low fixed cost will enjoy some what greater stability in net income, but if will do so at the risk of losing substantial profit if sales trend upwards in the long run.

The cost analysis of HDL and USNPL are briefly analyzed in the below Table No 4.12 & 4.13 for the fiscal year from 2063/64 to 2067/68.

Table No 4.12

Cost structure analysis of HDL & USNPL

Fiscal Year	HDL			(000)	USNPL			(000)
	Sales Revenue	Total VC	Total FC	Total Cost (Rs.000)	Sales Revenue	Total VC	Total FC	Total Cost
2063/64	94,865.09	83,597.17	73,436.04	157,033.21	26,995.05	21,408.02	3,813.40	25,221.42
2064/65	203,585.11	168,693.04	79,034.30	247,727.34	30,177.02	24,495.75	3,648.26	28,144.01
2065/66	314,578.63	252,487.96	83,229.03	335,716.99	27,287.90	23,204.23	3,610.77	26,815.00
2066/67	453,598.95	376,276.96	90,997.99	467,274.95	32,270.23	28,020.16	4,092.21	32,112.37
2067/68	529,559.16	434,250.74	10,5705.13	539,955.87	36,608.41	32,366.05	4,186.47	36,552.52

Source: Annual Report of HDL&USNPL (F/Y 2063/64to 2067/68)

Table No 4.13

Cost structure analysis of HDL& USNPL in Percentage

Particulars	2063/64	2064/65	2065/66	2066/67	2067/68
% Of variable cost to total cost(HDL)	53.24	68.09	75.21	80.53	80.42
% Of variable cost to total cost(USNPL)	84.88	87.03	86.53	87.25	88.55
% Of variable cost to sales revenue(HDL)	88.12	82.86	80.26	82.95	82
% Of variable cost to sales revenue(USNPL)	79.30	81.17	85.03	86.83	88.41
% Of variable cost increase(HDL)	-	101.79	49.67	49.03	15.41
% Of variable cost increase(USNPL)		14.42	-5.27	20.75	15.51
% Of fixed cost to total cost(HDL)	46.76	31.91	24.79	19.47	19.58
% Of fixed cost to total cost(USNPL)	15.12	12.96	13.47	12.74	11.45
% Of fixed cost to sales(HDL)	77.41	38.82	26.46	20.06	19.97
% Of fixed cost to sales(USNPL)	14.13	12.09	13.23	12.68	11.43
% Of sales increase(HDL)	-	114.6	54.52	44.19	16.75
% Of sales increase(USNPL)	-	11.79	-9.57	18.26	13.44

Source: Annual Report of HDL&USNPL (F/Y 2063/64 to 2067/68)

Table No 4.13 shows that the proportion of variable cost and fixed cost of HDL for fiscal year 2063/64 to 2067/68 are 53.24% & 46.76% 68.09% & 31.91%, 75.21% & 24.79% 80.53% & 19.47% and 80.42% & 19.58% respectively. And USNPL for F/Y 2063/64 to 2067/68 are 84.88%, 87.03%, 86.53%, 87.25% and 88.55% & 15.12%, 12.96%, 13.47%, 12.74% and 11.45% respectively. Overall the proportion of variable cost is higher than the fixed cost in both companies. Similarly the proportion of variable cost and fixed cost to total sales of HDL for the F/Y 2063/64 to 2067/68 are 88.12 & 77.41, 82.86 & 38.82, 80.26 &26.46, 82.95& 20.06 and 82 & 19.97 respectively. And for USNPL, fiscal year 2063/64 to 2067/68 are 79.30 &14.13, 81.17&12.09, 85.03&13.23, 86.83 &12.68 and 88.41 &11.43 respectively .Here, the proportion of variable cost to sales revenue is almost constant but the proportion of fixed cost to sales revenue is decreasing. Again, the percentage of sales increase/decrease and the percentage of variable cost increases/decrease of HDL for the F/Y 2063/64 to 2067/68 is 114.6% & 101.7%, 54.52% & 49.67%, 44.19% & 49.03% and 16.75% & 15.41% respectively. And USNPL for F/Y 2063/64 to 2067/68 is 11.79%&14.42%,-9.57%&-5.27%, 18.26%& 2.75% and 13.44% & 15.51% respectively. It shows that when sales increased then the variable cost also increased

vice versa. Rate of increase in sales is less than the rate of increase in variable cost vice versa. The relationship between sales revenue, fixed cost and variable cost can be shown in the bar diagram which is presented below: (see fig. no. 4.4)

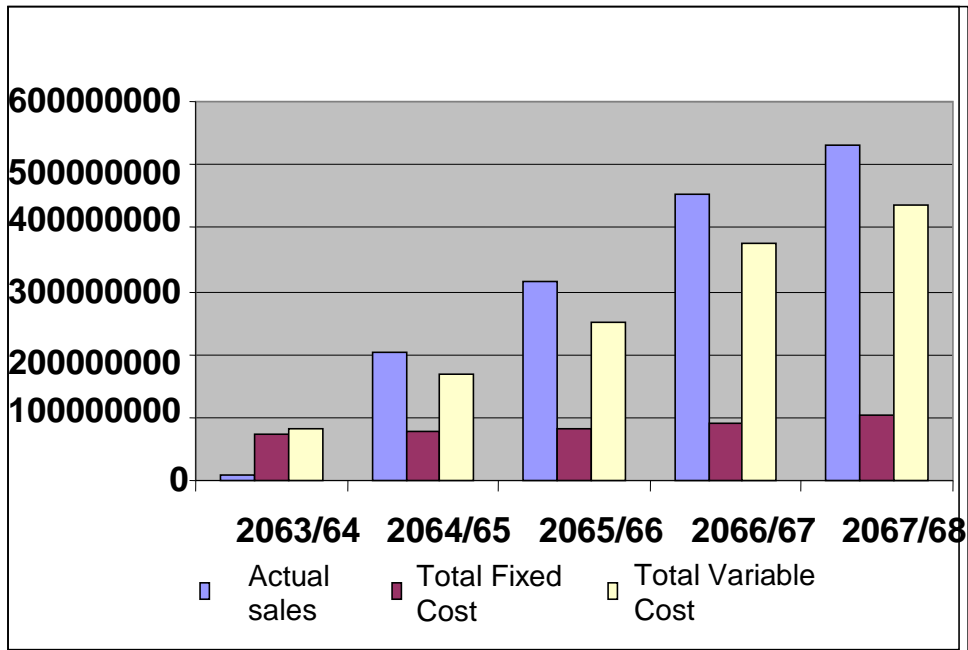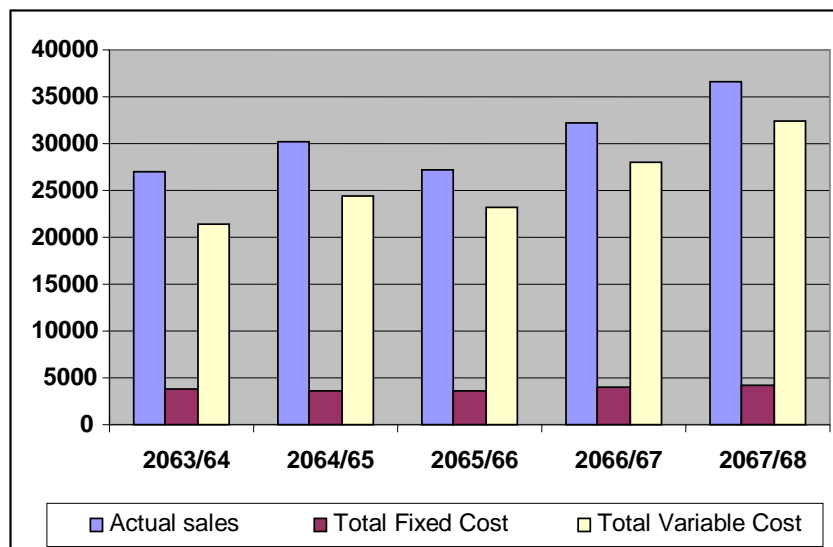**Figure No 4.4**

Sales, FC & VC Trend of HDL

Figure No 4.5

Sales, FC & VC Trend of USNPL

4.5 Cost-Volume-Profit Analysis of HDL& USNPL

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

➢ Activity base is selected in terms of sales revenue.
➢ The concept of cost variability is valid, so costs can be classified as fixed and variable.
➢ Other type of income (non-operating income) is not included in the revenue.
➢ There is no opening and closing stock.
➢ Sales mix ratio among the products remains constant.

Table No. 4.14

Income statement of HDL for the year 2063/64 to 2067/68

Particulars	2063/64	2064/65	2065/66	2066/67	2067/68
A. Sales Revenue	94,865,090	618,148,502	314,578,626	453,598,946	529,559,164
B. Variable Cost: Total Variable Cost	83,597,171	168,693,043	252,487,955	376,276,956	434,250,738
C. Contribution Margin (A-B)	11,267,919	34,892,065	62,090,671	77,321,990	95,308,426
D. Fixed Cost: Total Fixed Cost	73,436,042	79,034,297	83,229,028	90,997,997	105,705,129
E. Profit (Loss) (C-D)	(62,168,123)	(44,142,232)	(21,138,357)	(13,676,007)	(10,396,703)
F. P/V ratio = (CM/Sales)	0.1188	0.1714	0.1974	0.1705	0.18
G. BEP = (FC/P/V ratio)	618,148,502	461,110,251	421,626,282	533,712,592	587,250,717
(A-G)	(523283412)	(257,525,143)	(107,047,656)	(80,113,646)	(57,691,553)

Source: Annual Report of HDL (F/Y 2063/64 to 2067/68)

Table No. 4.15

Income statement of USNPL for the year 2063/64 to 2067/68   '000'

Particulars	2063/64	2064/65	2065/66	2066/67	2067/68
A. Sales Revenue	26,995.05	30,177.02	27,287.90	32,270.23	36,608.41
B. Variable Cost: Total Variable Cost	21,408.02	24,495.75	23,204.23	28,020.16	32,366.05
C. Contribution Margin (A-B)	5,587.03	5,681.27	4,083.67	4,250.74	4,242.36
D. Fixed Cost: Total Fixed Cost	3,813.40	3,648.26	3,610.77	4,092.21	4,186.47
E. Profit (Loss) (C-D)	1,773.63	2,033.01	472.90	158.53	55.89
F. P/V ratio = (CM/Sales)	0.21	0.19	0.15	0.13	0.12
G. BEP = (FC/P/V ratio)	18,425.34	19,378.35	24,127.89	31,478.54	36,126.12
MOS (A-G)	**8,569.71**	**10,798.67**	**3,160.01**	**791.69**	**482.29**

Source: Annual Report of USNPL (F/Y 2063/64 to 2067/68)

4.5.1 Contribution Margin Analysis

Contribution margin is the difference between sales amount and variable cost. In the other words, fixed cost plus the amount of profit is equivalent contribution margin. To fulfill the objectives of the study, BEP and other related computation are necessary to complete. Contribution Margin can be presented as follows:

- Contribution Margin(CM) =sales value – variable cost Or,
- Contribution Margin(CM) = Profit + Fixed cost

For HDL

CM for 2062/63= Rs (94,865,090 – 83,597,171) = 11,267,919

Or,   = Rs ((62,168,123) – 73,436,042) = 11,267,919

For USNPL,

CM for 2062/63 =Rs (26,995.05 – 21,408.02) = 5,587.03 in '000'

Or,   = Rs (1,773.63 + 3,813.40) = 5,587.03 in '000'

The above table No. 4.5 & 4.6 shows the calculation of CM of HDL & USNPL for five fiscal years form 2063/64 to 2067/68. CM for the five years shows the fluctuation trend. High CM is the signal of high profit, low CM is the signal of Low Profit. Above table clearly shows that HDL & USNPL in F/Y 2067/68 and 2063/64 represents the high CM and F/Y 2063/64 and 2064/65 represents the low CM respectively.

4.5.2 Profit Volume (P/V) Ratio Analysis

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

Profit Volume (P/V) ratio = Contribution Margin/ Sales
For HDL,
Profit volume (P/V) ratio for base year 2062/63=   11,267,919/94,865,090 =0.1188
For USNPL,
Profit volume (P/V) ratio for base year 2062/63=   5,587.03/ 26,995.05= 0.21

The above table 4.5& 4.6 show the profit volume ratio of HDL and USNPL for the fiscal year 2063/64 to 2067/68. The P/V ratio of HDL is in increasing and stable movement in last research year and USNPL is in decreasing order. It is highest in F/ Y 2064/65 i.e. 19.74% and 2063/64 i.e. 18% of HDL & USNPL respectively. An increase in CM means increase in profit only because fixed cost is assumed to be constant at certain level of activity. Management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling price.

4.5.3 Break -Even Point (BEP) Analysis:

The point, which breaks the total cost and the sales revenue evenly to show the level or output or sales 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 as:

- Break even point in Rs = total fixed cost/ P/v ratio

For HDL,

- BEP for the base year 2063/64= 73,436,042/0.1188 =**618,148,502**

- BEP for the fiscal year2067/68=105,705,129/0.18=**587,250,717**

For USNPL,

- BEP for the base year 2063/64=3,813.40/0.21=**8,569.71 in '000'**

- BEP for the fiscal year2066/67=4,186.47/0.12=**482.29 in '000'**

From above calculation, the BEP of HDL & USNPL for the base year is Rs 618,148,502 and 8,569.71in lakhs respectively. Similarly the table 4.5 &4.6 shows the break even point for five fiscal years 2063/64 to 2067/68 of HDL&USNPL. The break even amount of HDL & USNPL for five years shows decreasing and increasing trends respectively. The break even point can be also determined with the help of a graph. A break even chart of HDL & USNPL for fiscal year 2063/64 to 2067/68 are illustrated in fig.no 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15

Break even chart analysis of HDL
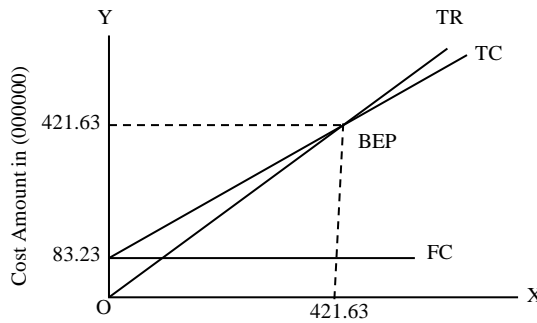
Figure No. 4.6
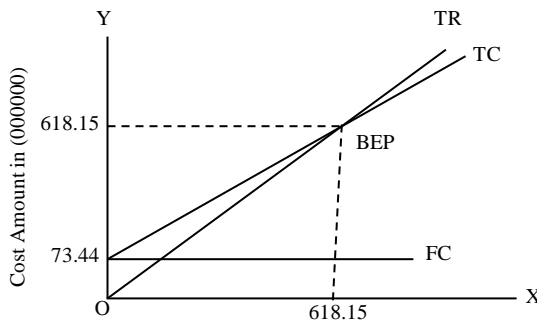
Sales revenue (000000)
Figure No. 4.5: BEP in Graph for
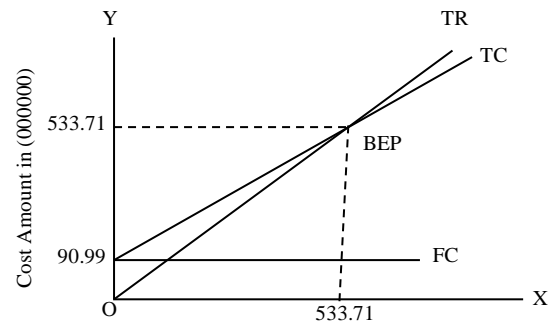F/Y 2063/64

Figure No. 4.7
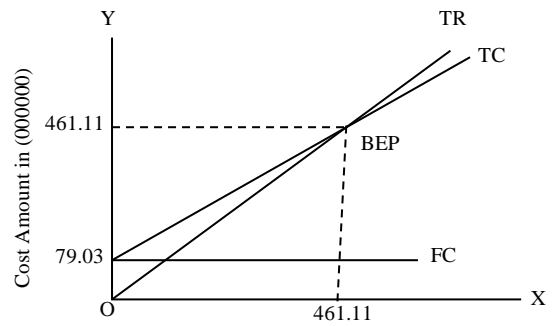
Sales revenue (000000)
Figure No. 4.6: BEP in Graph for
F/Y 2064/65

Figure No. 4.8

Sales revenue (000000)
Figure No. 4.7: BEP in Graph for
F/Y 2065/66

Figure No.4.9

Sales revenue (000000)
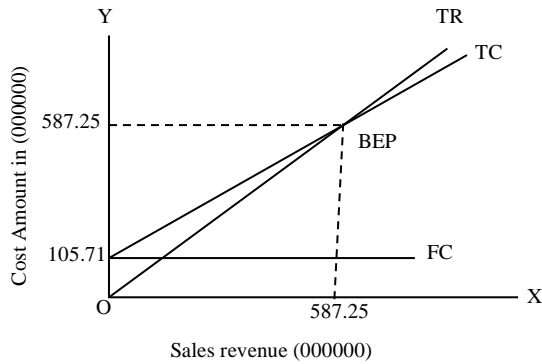Figure No. 4.8: BEP in Graph for
F/Y 2066/67

Figure No.4.10

Figure No. 4.9: BEP in Graph for
F/Y 2067/68

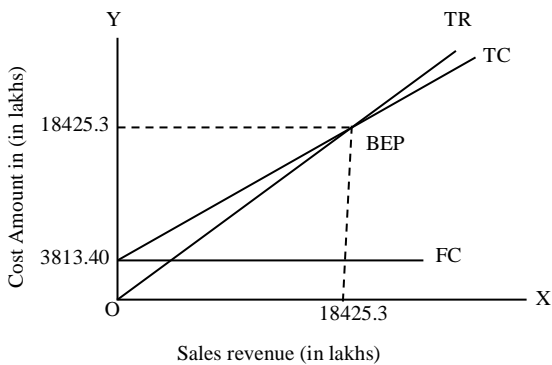**Break even chart analysis of USNPL**

Figure No.4.11

Figure No. 4.10: BEP in Graph
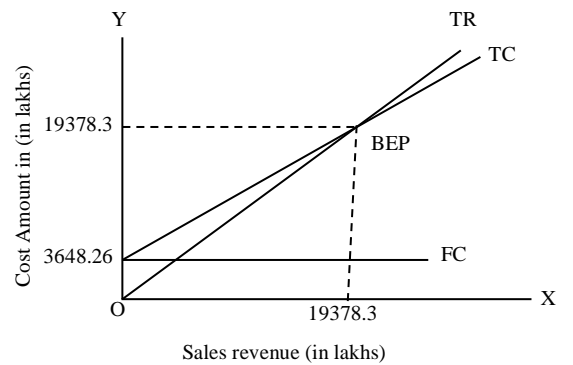for F/Y 2063/64

Figure No.4.12

Figure No. 4.11: BEP in Graph
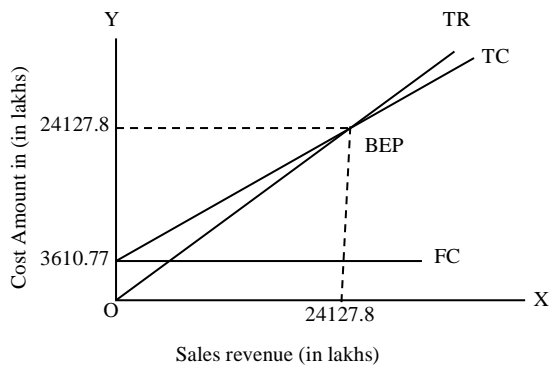for F/Y 2064/65

Figure No.4.13

Figure No. 4.12: BEP in Graph
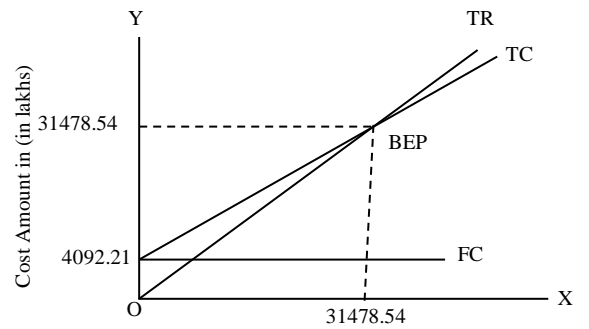for F/Y 2065/66

Figure No.4.14

Figure No. 4.13: BEP in Graph
for F/Y 2066/67
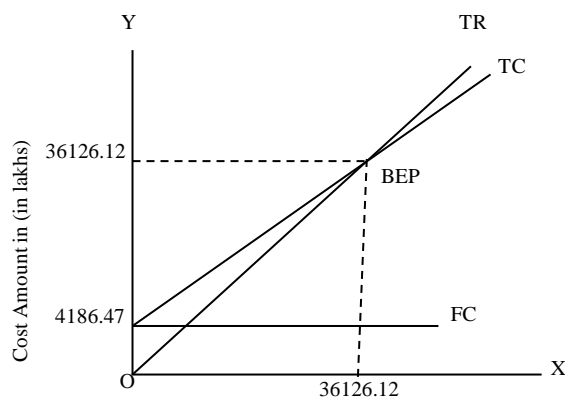
Figure No.4.15

Figure No. 4.14: BEP in Graph
for F/Y 2067/68

From the above illustrated figure shown in page no.80 the sales revenue is shown in X-axis and cost amount is shown in Y-axis. Since, fixed costs remain constant within the relevant range; the fixed cost curve is parallel to 'ox' axis. Variable cost slope upward from the origin to right but the slope depends on variable cost ratio. The total cost curve parallels the variable cost curve, so the angle 'o' equals the angle 'v'. It is because,

Total costs = Total Fc + Total Vc

At Volume 'Q'

Total costs = TFC + Q× vcpu

At volume 'Q + N'

Total costs = TFC + (Q + N) × Vcpu

ΔTotal costs = (Q + N) ×vcpu

Or, ΔTotal costs = Δvariable cost.

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

The above figure clearly states that if the two companies can reach the point of BEP both can generates sufficient revenues to cover all operating expenses. At this point, the total revenues equal the total costs. The revenue curves break up the total cost curves that are why these points are called "break even point" of the fiscal years. In the above figure, the fixed cost of both companies is increasing every year and in the case of HDL the higher portion of fixed cost results higher BEP which can't be recovery but in the case of USNPL fixed cost is steadily recovering.

Causes of higher BEP

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

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

3. **Higher the Fixed Costs:** The fixed cost of both companies is increasing every year. Not recovery of higher portion of fixed cost results higher BEP for HDL whereas USNPL steadily recovering.

4.5.4 Margin of Safety (MOS) Analysis:

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

- Margin of safety (MOS) = Total sales - Break even sales

Although the HDL is not reached at BEP and its CM ratio is also low. In addition to find out either high or low margin of safety of HDL, it is needed to compute margin of safety. It is known that high margin of safety is particularly significant in times of depression

It may be mentioned that the reciprocal of MOS is the operating leverage. A high MOS indicates that a firm has got enough risk bearing capacity as measured by variation in sales. A low margin of safety is the result of high operating cost, other factor remaining constant so,

- MOS of HDL for F/ Y 2063/64= 94865090-618148502=**(523283412)**

- MOS of HDL for F/ Y 2063/64= 618148502-461110251=**(257525143)**

And so on……………………….

- MOS of USNPL for F/ Y 2063/64= 26995.05-18425.34=**8569.71 in '000'**

- MOS of USNPL for F/ Y 2063/64= 30177.02-19378.35=**10798.67 in '000'**

The above calculations shows that margin of safety of HDL & USNPL for the base years and similarly the table 4.5 and 4.6 shows the margin of safety for five fiscal years 2063/64 to 2067/68 in fluctuating trend for USNPL; the MOS of USNPL is maximum in F/Y 2063/64 and minimum in F/Y 2067/68 but where as the Margin of safety of HDL totally negative; it means sales doesn't reach the capacity or cant touch the BEP line. For HDL, MOS is low except in F/Y 2064/65. The low MOS ratio is the

result of low CM ratio. Since, actual sales lower comparatively than BEP, there are not raised conditions of suffering loss regarding sales fall; because actual sales are increasing annually. When actual sales be crossed BEP and there be arise low CM ratio and MOS then the management should be think of the possibilities of increasing the price of sales or reducing variable cost by adopting improvement in the manufacturing process.

Similarly, MOS can be expressed in percentage. The formula for its calculation is

% of MOS=MOS/sales *100   or

= (actual sales -BEP sales)/actual sales *100

4.5.5   Break Even Analysis of Multi-Products & Sales Mix

Sales mix can be defined as the relative combination of product represented in the total sales. Most companies have several products, and HDL& USNPL have also more than 10 products, which are not equally profitable. Profit depends to some extent on the sales mix that company is able to achieve. Profit will be greater if high margin items make up a relatively large proportion of total sales than if sales consists mostly low margin items.

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

$$\text{Overall BE sales} = \frac{\text{Total Fixed Cost}}{\text{Average weighted CM ratio}}$$

For HDL,

$$\text{Overall BE sales} = \frac{105705.13}{0.1799}$$

= 587250.717 ('000)

For USNPL,

$$\text{Overall BE sales} = \frac{4186.47}{0.11588}$$

= 36126.12 (in '000')

The sales mix and CM ratio of each product are classified on the basis of sales. In the calculation, the break even sales of HDL & USNPL are Rs. 587250.717 thousands and Rs. 36126.12 in lakhs for the F/Y 2067/68. This is computed by dividing the fixed costs by the company's average CM ratio. The selected products are chosen for the analysis of multi product Break Even analysis. The details of selected product of HDL&USNPL are at BEP for the F/Y 2067/68 are presented below in table no 4.16,4.17

Table No 4.16
Product wise BEP sales of HDL

S.N.	Products	Sales('000)	Sales mix	Product wise BEP (overall BEP x sales mix)
1.	Royal Stag	354,805	0.5701	334,791.63
2.	Ruslan Vodka	37,069	0.1805	105,998.75
3.	Blue Diamond	68,843	0.1494	87,735.25
Total		**460,717**		**528,525.63**

Table No 4.17
Product wise BEP sales of USNPL

S.N.	Products	Sales(in '000')	Sales mix	Product wise BEP (overall BEP x sales mix)
1.	Bag piper	5,601.83	0.15330	5,527.296
2.	G.G.B.	820.40	0.02241	809.590
3.	Mc Dowell's	19,229.24	0.5253	18,975.900
Total		**25,651.47**		**25,312.786**

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

between individual BEP and product wise BEP is fixed cost. Fixed cost plays the vital role in cost-volume and profit analysis.

4.6   Analysis of Hypothesis Test

Hypothesis 1

Null Hypothesis:

Ho:$\mu_1 = \mu_2 = \mu_3$	There is no significant difference between average cost, volume and profit
Ho: $\mu'_1 = \mu'_2 = \mu'_3 = \mu'_4 = \mu'_5$	There is no significant difference in average cost, volume and profit in different years.

Alternative Hypothesis:

H1:$\mu_1 \neq \mu_2 \neq \mu_3$	There is significant difference between average cost, volume and profit
H1: $\mu'_1 \neq \mu'_2 \neq \mu'_3 \neq \mu'_4 \neq \mu'_5$	There is significant difference in average cost, volume and profit in different years.

Table No. 4.18

Two way ANOVA table of HDL

Sources of Variation	Sum of Square (S.S)	d.f	Mean sum of square (MSS)	F.ratio
Due to common factor	SSC = 44,564,567	C-1 = 3-1= 2	MSC= 22,282,283.5	FC=30.96
Due to Year	SSR=16,804,198.66	r-1=5-1=4	MSR=4,201,049.67	Fr=5.84
Due to error	SSE=5,758,567.02	(c-1)(r-1)=8	MSE=719,820.88	

Table No. 4.19

Two way ANOVA table of USNPL

Sources of Variation	Sum of Square (S.S)	d.f	Mean sum of square (MSS)	F.ratio
Due to common factor	SSC = 2,196.63	C-1 = 3-1= 2	MSC= 1,098.32	FC=1.197
Due to Year	SSR=161.44	r-1=5-1=4	MSR=40.36	Fr=0.044
Due to error	SSE=7,337.93	(c-1)(r-1)=8	MSE=917.24	

The detail calculation of the above table is presented in Appendix-XIII. The tabulated values of Fc & Fr at 5% level of significant for d.f. (2, 8) and (4, 8) are given by:

$F_{c-0.05}$ (2, 8)-Tab. = 4.4590

$F_{r-0.05}$ (4, 8) - Tab. = 3.8379

Decision:

Since, the calculated value of Fc is greater than tabulated value of Fc (i.e. Fc-cal>Fc-Tab.) of HDL. It is significant and null hypothesis (Ho) is rejected. It means there is significant relationship between costs, volume and profit analysis. Whereas, the calculated value of Fc is less than tabulated value of Fc (i.e. Fc-cal<Fc-Tab.) of USNPL. It isn't significant and Null Hypothesis is accepted. It means there is no significant difference between average cost, volume and profit

And the calculation value of F_r is greater than tabulated value of Fr (i.e. Fr. Cal> Fr. Tab.) of HDL. It is significant and null hypothesis (Ho) is rejected. It means there is significant relationship between year wise distribution of cost, volume and profit. Whereas, the calculation value of F_r is less than tabulated value of Fr (i.e. Fr. Cal< Fr. Tab.) of USNPL. It is not significant and null hypothesis (Ho) is rejected. It means there is no significant relationship between year wise distribution of cost, volume and profit.

4.7   Analysis of Primary Data:

The Primary Data are collected through structured Questionnaire to the entire mentioned respondent. Structured questionnaire encircled 15 fixed questions like yes/no, option based, and opinion based. Questionnaire method has been used to analysis the respondent's attitude on the companies C V P analysis and its impact to the companies overall performance. The Numbers of structured questions are put up by means of 20 copies of questionnaire. The questionnaires were forwarded to the different level of respondent of the sample companies. And the respondents' views are presented in Percentage basis;

1. Attitude towards the companies objectives and overall market performance
   Most of the respondents' (i. e. more than 50%) of the companies believe that the company's objective in long and shot run is to be in the supreme in the market in Alcoholic market. Which explores that everyone of the company is dedicated to get the well result in the future?

2. From the questionnaire, we get from the more than 75% respondent of both companies are using the tools of analysis p/v ratio to determine the companies performance but both of the companies are suffers from not using the modern CVP analysis tools like individual product CVP analysis and it effect on the overall performance.

3. Raising cost of material, transportation cost and tax burden. More than 60% respondent of the research claimed that raising cost in each sectors are putting some difficulties to the companies to fulfill their objectives.

4. Towards the companies future plan 60 % of the respondents want to increase to market share, 20% of the respondents keep market in same position and Rest are unknown about the market future plan. The companies want to increase market share by increasing capital and also want to increase dealer points all over the companies.

5. Towards the financial and economical development of the companies all the respondent wants to keep constant sound financial system of the companies. So, 30% respondent give first priority on the production and 50% give priority in research and development of market and rest give priority on employment for the development.

6. About the companies facing problems, 60% of the respondents give their view in to fight with competitions. The most of the problems are faced cut throat situation. 20% of respondent give their view in financial weakness of the companies. The company is in same financial position from last few years. The companies want to increase financial to increase volume of product, so rest of the respondents give their response weak management of the companies. The company also facing the recession problem and tax burden.

7. About companies profit position, 50% of the respondents want short run profit and rest of respondent want to profit in long run. In short run, they want to sustain and increase market share. In long run, they want to increase profit only. The company can increase the volume of product and market share from that they can satisfy profit in long run.

4.8   Major Findings

From the analysis of various data collected by primary and secondary sources and on the basis of observation and discussion, the following major findings have been drawn:

4.8.1 Major findings from Secondary data

Secondary data with the help of different financial and statistical tools was used to analyze. On the basis of data Presentation and analysis some important findings of the study are summarized below:

1. Sales plan of both companies are not properly maintained. There is a fluctuation between Budgeted Sales and Actual Sales in each year.

2. Sales trend of both companies are increasing yearly. It shows that the net loss can be decrease in the future for HDL and profit should increase in USNPL.

3. Expenses trend of both is increasing year by year.

4. The costs of both companies are classified into fixed and variable. There is no practice of identifying semi variable and their segregation into variable and fixed by using scientific techniques.

5. The total fixed costs of the companies are increasing annually. Advertisement, salary and allowance, communication expenses, insurance premium, depreciation and interest on long term are higher portion of total fixed costs and the amounts of these items are highly incremental condition.

6. The variable costs are also at increasing trends and vital items are material with direct expenses on purchase, royalty, sales promotion expenses, transportation and insurance expenses, salary and wages leakage and breakage, complementary expenses, traveling expenses and water and electricity.

7. Some specific products are utilizing their specific fixed costs. Since lower fixed costs, mass production and sales of selective product lines causes profitability.

8. From hypothesis test it is found that there is significant relationship between cost volume and profit of HDL, where as there is no significant difference between averages cost, volume and profit of USNPL.

9. For profit achievement, the company should be adjusted fixed cost, variable cost, sales and profit by PV Ratio analysis.

10. The CM in about 20% which is much low to cover up its fixed costs. The actual sales of major products are more than BEP at the presented fiscal year. The CM ratio of HDL and USNPL are less than and nearly 20%.

11. In the case of HDL. The regression analysis found that there exists Negative relationship between Budgeted sales on actual sales and sales on cost and profit. But in the case of USNPL the regression analysis found that there exists positive relationship between Budgeted sales on actual sales and sales on cost and profit.

8.2 Major findings from Primary data

From the opinion survey of various respondents i.e. Top level, Middle level and Lower level officials, the following findings has been drawn:

1. The company has no detailed and systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for the profit planning and control.

2. Practices of CVP analysis tools are not mostly used to forecast and evaluate cost, volume and profit in the manufacturing companies.

3. Management of the companies are not in favor of segregation of cost in variable and fixed, mostly they used as a variable and fixed cost whatever the nature of cost.

4. Companies show the interest in the PV analysis but there are not proper used of techniques towards it.

5. Companies show the budgeted sales in higher expectation where as condition occurs reverse vice versa in cost too.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Management effectively achieves organizational objectives through the efficient use of scarce resources in a changing environment. Future is uncertain which creates risk and to reduce risk, the only reliable tool is good management. C.V.P analysis is an analytical technique for studying the relationship between volume, costs and profit which helps to manage future cost and profit. Profit planning is a management technique and it is a written plan in all aspect of business operation for specific future period. C.V.P analysis is a device used to determine the usefulness of profit planning process of the firm. In fact, the entire field of profit planning has become associated with C.V.P inter- relationship.

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

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

The C.V.P analysis tool is applied in the Himalayan Distillery Ltd. and United Spirits Nepal Private Limited to find out whether the tool is practicing or not. Himalayan Distillery Ltd. is one of the leading alcoholic manufacturer and United

spirits Nepal Private Limited, another liquor leading and medicine manufacturer, which play the vital role in Nepalese liquor market and for decades has been synonymous with quality alcoholic products, had not practicing C.V.P analysis tools, costs are not segregated as fixed costs and variable costs where there are not proper mechanism to segregate semi-variable or semi-fixed costs into fixed and variable cost. To solve the problems regarding C.V.P analysis and not application, some objectives are formulated: cost segregation as fixed and variable cost, unit variable cost by adopting suitable mechanism and computation of C.V.P analysis by its extension tools. To fulfill the objectives of the study, historical as well as managerial research design is adopted.

Hence, descriptive and quantitative technique are used to analyze and interpretation the data. After it, some major findings and others are also achieved.

5.2   Conclusion

From the above analysis following conclusion is drown that different types of profit planning tools, which are used in the academic field, are not found applied by both companies, that shows the gap between the theory and practice. C.V.P analysis is not applied by both companies as any segregation of cost into fixed and variable, which is the hardcore of CVP analysis. Both of the companies have no clear-cut boundaries to separate cost into fixed and variable. The classification of cost is not scientific and systematic. So, both companies have not been able to use C.V.P analysis and make the realistic and smart budget.

Since, not adopting C.V.P analysis tool for profit planning, before and after operation of venture, HDL and USNPL had incurring loss and little bit profit annually respectively. The huge amount had invested into fixed costs. The contribution margin is very low cause of higher unit variable cost. Depreciation and interest on long-term loan is increasing annually. Other controllable cost is also increasing. BEP of the HDL is fluctuated whereas USNPL is increased. The MOS of the USNPL is low so the percentage decrease in sales revenue can lead to the company huge losses, whereas the MOS of HDL is in negative situation. Overall BEP of both of the companies are very high as the companies have not provided attention to sell more under these circumstances unless management revised their cost structure as soon as possible.

Hence, avoiding C.V.P analysis tool and not utilizing full capacity, the companies are bearing loss as well as not attaining satisfactory profit. Promoter and

director, and staff of the company are enjoying by achieving allowance and salary respectively. Other part, general shareholders are not achieving dividend and government couldn't claim for income tax since loss and loss recovery situation.

5.3   Recommendations

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

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

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

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

4   Both companies 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.

5   Both companies should consider BEP analysis which preparing sales plan, production plan and selling price of its products.

6   Both companies are multi Product Company; more emphasis should be provided the product having high contribution so as have more profit.

7   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.

8   System of periodical performance reports should be strictly followed to be conscious about poor performance & take corrective action immediately and timely.

9   For overall profitability of the company, the company should analyze other profit planning tool i.e. decision making where department wise, product wise,

make or buy, drop or continue, decision are provided. Decision-making tools also can adopt for profit planning purpose.

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

APPENDIX – I

Assume, actual and budgeted sales be denoted by x and y respectively HDL

Fiscal Year	X ('000000)	Y ('000000)	U = X-A	V = Y-B	U²	V²	UV
2063/64	94.87	646.85	(219.71)	177.54	48,272.45	31,520.45	(39,007.31)
2064/65	203.59	543.15	(110.99)	73.84	12,318.78	5,452.35	(8,195.50)
2065/66	314.58	469.31	-	-	-	-	-
2066/67	453.59	694.43	139.01	225.12	19,323.78	50,679.01	31,293.93
2067/68	529.56	750.34	214.98	281.03	46,216.4	78,977.86	60,415.83
N = 5	$\sum X = 1,596.19$	$\sum Y = 3,104.08$	$\sum U = 23.29$	$\sum V = 757.53$	$\sum U^2 = 126,131.44$	$\sum V^2 = 166,629.67$	$\sum UV = 44,506.95$

Computation of Mean:

For Actual Sales:

Mean $(\bar{X}) = \dfrac{\sum X}{N} = \dfrac{1596.19}{5} = 319.24$

For Budgeted Sales:

Mean $(\bar{Y}) = \dfrac{\sum Y}{N} = \dfrac{3104.08}{5} = 620.82$

Let,

A = Assumed Mean for X = 314.58

B = Assumed Mean for Y = 469.31

Computation of Standard Deviation (σ)

For Actual sales:

$$\sigma x = \sqrt{\dfrac{\sum U^2}{N} - \left(\dfrac{\sum U}{N}\right)^2} = \sqrt{\dfrac{126131.44}{5} - \left(\dfrac{23.29}{5}\right)^2} = 158.76$$

For,
Budgeted Sales:

$$\sigma y = \sqrt{\frac{\Sigma V^2}{N} - \left(\frac{\Sigma V}{N}\right)^2} = \sqrt{\frac{166629.67}{5} - \left(\frac{757.53}{5}\right)^2} = 101.84$$

Computation of C.V

For Actual Sales:

$$\text{C.V x} = \frac{\sigma x}{X} x100 = \frac{158.76}{319.24} x100 = 49.73\%$$

For Budgeted sales:

$$\text{C.V y} = \frac{\sigma y}{Y} x100 = \frac{101.84}{620.82} x100 = 16.40\%$$

Computation of Correlation co-efficient(r)

$$r = \frac{N.\Sigma UV - \Sigma U.\Sigma V}{\sqrt{N.\Sigma U^2 - (\Sigma U)^2} \sqrt{N.\Sigma V^2 - (\Sigma V)^2}}$$

$$= \frac{5 x 44506.95 - 23.29 x 757.53}{\sqrt{5x126131.44 - (23.29)^2} \sqrt{5 \times 166629.67 - (757.53)^2}}$$

$$= \frac{204891.88}{793.7976 x 509.2117}$$

$$= 0.51$$

Computation of Probable Error of r (P.E.)

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

$$= 0.6745 \text{ x } \frac{1-(0.51)^2}{\sqrt{5}}$$

$$= 0.6745 \text{ x } \frac{0.7399}{2.23}$$

$$= 0.223$$

Let, actual and budgeted sales be denoted by x and y respectively of USNPL (in lakhs)

Fiscal Year	X ('00000)	Y ('00000)	X^2	Y^2	XY
2063/64	2.70	2.72	7.398	7.29	7.344
2064/65	3.01	2.83	8.009	9.060	8.518
2065/66	2.73	2.73	7.453	7.453	7.543
2066/67	3.22	3.25	10.562	10.368	10.465
2067/68	3.66	3.85	14.822	13.395	14.091
N = 5	$\sum X = 15.38$	$\sum Y = 15.32$	$\sum X^2 = 48.244$	$\sum Y^2 = 47.566$	$\sum XY = 47.87$

Computation of Mean:

For Actual Sales:

$$\text{Mean } (\bar{X}) = \frac{\sum X}{N} = \frac{15.38}{5} = 3.067$$

For Budgeted Sales:

$$\text{Mean } (\bar{Y}) = \frac{\sum Y}{N} = \frac{15.32}{5} = 3.076$$

Computation of Standard Deviation (σ)

For Actual sales:

$$\sigma x = \sqrt{\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2} = \sqrt{\frac{47.567}{5} - \left(\frac{3.067}{5}\right)^2} = 0.3367$$

For,
Budgeted Sales:

$$\sigma y = \sqrt{\frac{\sum Y^2}{N} - \left(\frac{\sum Y}{N}\right)^2} = \sqrt{\frac{48.345}{5} - \left(\frac{3.076}{5}\right)^2} = 0.4344$$

Computation of C.V

For Actual Sales:

$$\text{C.V } x = \frac{\sigma x}{X} x100 = \frac{3367.49}{30667.57} x100 = 10.98\%$$

For Budgeted sales:

$$\text{C.V } y = \frac{\sigma y}{Y} x100 = \frac{4344.46}{30789.89} x100 = 14.11\%$$

Computation of Correlation co-efficient(r)

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

$$= \frac{5 x \, 47.87 - 15.38 \, x \, 15.32}{\sqrt{5 x 48.244 - (15.38)^2} \sqrt{5 \times 47.566 - (15.32)^2}}$$

$$= \frac{3.734}{3.823}$$

$$= 0.97$$

Computation of Probable Error of r(P.E.)

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

$$= 0.6745 \text{ x } \frac{1 - (0.97)^2}{\sqrt{5}}$$

$$= 0.6745 \text{ x } \frac{0.0591}{2.23}$$

$$= 0.0179$$

Calculation of regression equations

Year	X (000000')	Y (000000')	X²	Y²	XY
2063/64	94.87	646.85	9000.31	418414.92	61.66.66
2064/65	203.59	543.15	41448.89	295011.92	110579.91
2065/66	314.58	469.31	98960.58	220251.88	147635.54
2066/67	453.59	694.43	205743.88	482233.02	314986.50
2067/68	529.56	750.34	280433.79	563010.12	397350.05
	ΣX= 1596.19	ΣY= 3104.08	ΣX²= 546523.45	ΣY²= 1978921.86	ΣXY= 103918.66

We get

ΣX = 1596.19   ΣX² = 546523.45

ΣY = 3104.08   ΣY² = 1978921.86

ΣXY = 103918.66

Putting these values in equation (ii) and (iii) we get,

$$\Sigma XY = a\Sigma X + b\,\Sigma X^2$$

103918.66 = aX1596.19 + bX546523.45

$$\Sigma Y = na + b\Sigma X$$

3104.08 = 5a + bX1596.19 …………. (4)

or, 5a + 1596.19b = 3104.08 ……….. (4) `

1596.19a + 546523.45b = 103918.66 ………… (5)

From the above calculation we get the regression equation,

Y = 677.97 − 0.179016X

Calculation of simple regression equation of USNPL between budgeted sales and actual sales.

Year	X(000000')	Y(000000')	X^2	Y^2	XY
2063/64	2.70	2.72	7398	7.29	7.344
2064/65	3.01	2.83	8.009	9.060	8.518
2065/66	2.73	2.73	7.453	7.453	7.543
2066/67	3.22	3.25	10.562	10.368	10.465
2067/68	3.66	3.85	14.822	13.395	14.091
	ΣX = 15.38	ΣY = 15.32	ΣX^2 = 48.244	ΣY^2 = 47.566	ΣXY = 47.87

From the table we get,

ΣX = 15.38, ΣY = 15.32, ΣX^2 = 48.244, ΣY^2 = 47.566, ΣXY = 47.87

Putting these values in equation (i) and (ii) we get

$$\Sigma Y = na + b\Sigma X \ .... \ (ii)$$

$$\Sigma XY = a\Sigma X + b\Sigma X^2 \ .... \ (iii)$$

15.32 = 5Xa + bX15.38 .... (6)

47.87 = 15.38a + bX48.244 ....(7)

From the above equation calculation we get the regression equation

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$$Y = 0.61242 + 0.7970X$$

$$Y = 0.61242 + 0.7970X$$

APPENDIX – II

Computation of variances of HDL (in '000)

Year (X)	cost	Volume	Profit (Loss)	Row Total (Tr)
2063/64	1,570.33	948.65	(621.68)	1,897.30
2064/65	2,477.27	2,035.85	(441.42)	4,071.70
2065/66	3,357.17	3,145.79	(211.38)	6,291.58
2066/67	4,672.75	4,535.99	(136.76)	9,071.98
2067/68	5,399.56	5,295.59	(103.97)	10,591.18
Column total (Tc)	17,477.08	15,961.87	(1,515.21)	T_r=31,923.47

Test Statistic;

Under Null Hypothesis (H$_o$)

$$F_c = \frac{MSC}{MSE} \dots\dots\dots\dots\dots (1)$$

And

$$F_r = \frac{MSR}{MSE} \dots\dots\dots\dots\dots (2)$$

Where,

MSC = Mean sum of square of variation between different cost, volume and profit

MSR = Mean sum of square of variation between different years

MSE = Mean sum of square of variation due to error.

In order to find MSC, MSR and MSE, we need to find SSC, SSR, SST and SSE.

Now, T = grand total = Tc = Tr

N = 5x3 = 15

$$\text{Correction Factor (C.F)} = \frac{T^2}{N} = \frac{(31923.47)^2}{15} = 67940529.12$$

Total Row sum of Square (RSS) = $\sum cost^2 + \sum volume^2 + \sum Profit^2$

$$= 70853234.13 + 63559095.5 + 655532.20$$

$$= 135067861.80$$

Total Sum of Square (SST) = RSS – CF

$$= 135067861.80 - 67940529.12$$

$$= 67127332.68$$

Sum of square due to column factor (SSC) $= \dfrac{\Sigma Tc^2}{Nr}$ -C.F

$$SSC = \dfrac{(17477.08)^2}{5} + \dfrac{(15961.87)^2}{5} + \dfrac{(-1515.21)^2}{5} - 67940529.12$$

$$= 44564567$$

Sum of square due to row factor (SSR) $= \dfrac{\Sigma Tr^2}{Nc}$ - C.F

$$SSR = \dfrac{(1897.3)^2}{3} + \dfrac{(4071.43)^2}{3} + \dfrac{(6291.58)^2}{3} + \dfrac{(9071.98)^2}{3} + \dfrac{(10591.18)^2}{3} - 67940529.12$$

$$= 84744727.78 - 67940529.12$$

$$= 16804198.66$$

Hence,

Sum of square Due to Error (SSE) = SST – SSC – SSR

$$= 67127332.68 - 44564567 - 16804198.66$$

$$= 5758567.02$$

Two Way ANOVA Table of HDL

Source of Variation	Sum of Square (S.S)	D.F	Mean sum of square (MSS)	F - Ratio
Due to column Factor	SSC = 44564567	948.65	$C - 1 = 3-1 = 2$	$Fc = 30.96$
Due to Year	SSR = 16804198.66	2,035.85	$r - 1 = 5-1 = 4$	$Fr = 5.84$
Due to Error	SSE = 5758567.02	3,145.79	$(c-1)(r-1) = 8$	-

Computation of variances of USNPL (in '000)

Year (X)	cost	Volume	Profit (Loss)	Row Total (Tr)
2062/63	25.22	26.99	*1.77*	*53.98*
2063/64	28.14	30.18	*20.33*	*78.65*
2064/65	26.82	27.28	*0.47*	*54.57*
2065/66	32.11	32.27	*0.16*	*64.54*
2066/67	36.55	36.61	*0.06*	*73.22*
Column total (Tc)	*148.84*	*153.33*	*22.79*	*324.96*

Test Statistic;

Under Null Hypothesis (H$_o$)

$$Fc = \frac{MSC}{MSE} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

And

$$Fr = \frac{MSR}{MSE} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where,

MSC = Mean sum of square of variation between different cost, volume and profit

MSR = Mean sum of square of variation between different years

MSE = Mean sum of square of variation due to error.

In order to find MSC, MSR and MSE, we need to find SSC, SSR, SST and SSE.

Now, T = grand total = Tc = Tr

N = 5x3 = 15

$$\text{Correction Factor (C.F)} = \frac{T^2}{N} = \frac{(324.96)^2}{15} = 7039.933$$

Total Row sum of Square (RSS) $= \sum \text{cost}^2 + \sum \text{volume}^2 + \sum \text{Profit}^2$

$$= 4514.175 + 4765.136 + 416.692$$

$$= 9696$$

Total Sum of Square (SST) = RSS – CF

$$= 9696 - 7039.9334$$

$$= 2656.0666$$

Sum of square due to column factor (SSC) $= \dfrac{\sum Tc^2}{Nr} - C.F$

$$SSC = \frac{(148.84)^2}{5} + \frac{(153.33)^2}{5} + \frac{(22.79)^2}{5} - 7039.9334$$

$$= 2196.6302$$

Sum of square due to row factor (SSR) $= \dfrac{\sum Tr^2}{Nc} - C.F$

$$SSR = \frac{(53.98)^2}{3} + \frac{(78.55)^2}{3} + \frac{(54.57)^2}{3} + \frac{(64.54)^2}{3} + \frac{(73.22)^2}{3} - 7039.9334$$

$$= 7201.3759 - 7039.9334$$

$$= 161.4425$$

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Hence,

Sum of square Due to Error (SSE) = SST – SSC – SSR

$$= 9696 - 2196.63 - 161.4425$$

$$= 7337.93$$

Two Way ANOVA Table of USNPL

Source of Variation	Sum of Square (S.S)	D.F	Mean sum of square (MSS)	F - Ratio
Due to column Factor	SSC = 2196.63	C -1 = 3-1 = 2	MSC=1098.315	Fc = 1.1974
Due to Year (row)	SSR = 161.4425	r -1 = 5-1 = 4	MSR=40.36	Fr = 0.044
Due to Error	SSE = 7337.93	(c-1) (r-1) = 8	MSE=917.24	-

Where,

$$MSC = \frac{SSC}{C-1}$$

$$MSR = \frac{SSR}{r-1}$$

$$MSE = \frac{SSE}{(c-1)(r-1)}$$

$$FC = \frac{MSC}{MSE}$$

$$Fr = \frac{MSR}{MSE}$$

APPENDIX – III

Questionnaire

Dear respondent, I am Somant Yadav from R.R.M. Campus, Janakpurdham. On the partial fulfillment of Masters in Business Studies, I am writing a thesis on **"A Comparative Cost, Volume and Profit Analysis of Alcoholic Manufacturing Companies (**A Comparative Case Study of United Spirits Nepal Pvt. Ltd. & Himalayan Distillery Ltd**)**

The main focus of this thesis is concerned with analyzing and interpreting the **Cost, Volume and Profit Analysis of Alcoholic Manufacturing Companies of USNP and H D Ltd**. Your valuable contribution will help to improve the significance of the study.

The information provided will be used for the purpose of the study only and shall not resemble any liability on the part of any person or Company concerned.

1. **Name of the Respondent………………………..**

2. **Designation of the Respondent……………….**

3. **Experience: ………………………… years**

4. **Company: …………………………………..…..**

5. **Address: ………………………………………..**

6. Name of the Offices, Organization (Please Tick)
   a. **USNP Ltd.**
   b. **H D Ltd.**

7. Are the both companies using the CVP analysis tools to determine the company's overall performance?

(Yes/No)

8. Which is the major problem to fulfill the objective of the company? (Please Tick)

    a.   Raising cost of material

    b.   Transportation cost and tax burden

    c.   Lack of Capital

    d.   Lack of skilled

9. Is there fluctuation between Budgeted Sales and Actual Sales?

(Yes/No)

10. Which is the most considerable for financial and economic development of the Alcoholic Company? (Please Tick)

    i.   Priority on the production

    ii.   Priority on the research and development of market

    iii. Priority on employment

    iv.   Use of modern technology

11. Are you satisfied with the Sales Promotion process of these USNP Ltd. & H D Ltd. Alcoholic manufacturing companies?

(Yes/No)

12. Is there systematic expenses plan (Segregation of cost) of Fixed expenses, Variable expenses and Semi-variable expenses in both companies [USNP Ltd. & H D Ltd.]?

(Yes/No)

13. Which are the major problems of **Alcoholic Manufacturing Companies** in Nepal? (Please Tick)

    a. Administrative incapability

    b. Frequent changes in acts

    c. Lack of public awareness

d. Lack of long term policy and strategy

e. Transportation Problem

f. Tax burden

g. Weak Management

h. Above all

14. Is the present policy of Nepal Government in favour of Alcoholic Manufacturing Companies?

(Yes/No)

15. Are the available Capital properly utilized or not?

(Yes/No)

16. What are the *Challenges* of **Alcoholic Manufacturing Companies** in Nepal?

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………………………………………………………..

…………………………………………………………

17. What are the *Opportunities* of **Alcoholic Manufacturing Companies** in Nepal?

……………………………………………………….

…………………………………………………………

……………………………………………………….

18. What is the best way to increase Sales Volume? (Please Tick)

a. Effective Advertising

b. Widening marketing

c. Low price

d. Flexibility in market policy

19.   What are the measures that should be taken to improve the **Alcoholic Manufacturing Companies** in Nepal?

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20.   What is the role of Chamber of Commerce and Industry in the economic development of Alcoholic Manufacturing Companies?

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